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NEW WORKING PARADIGMS

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DEAR READER,

Welcome to edition 52 of the Capco Institute Journal of Financial Transformation.

Transformation has been a constant theme in our industry for several decades, but the events of 2020 have accelerated change in employee working patterns, and in the very nature of the workplace itself. This Journal examines three key elements of these new working paradigms – leadership, workforce, and organization.

As we explore in this edition, a key part of any firm's transformation agenda centers around digital leadership and how to tackle the novel challenges created by changes within organizations and society. Leaders need advanced organizational skills to build teams that use digital technologies, as well as to inspire millennial workers who have grown up in a digitally transformed world. They also need deeper technology skills to lead, and a broader understanding of the ethical paradigms introduced by the challenges created through new technologies such as AI. These enhanced skillsets will help today's leaders and their teams fully realize the benefits of new working models.

The topics reviewed in this Journal offer flexibility for employees, increased agility for teams, and a combination of both for organizations. When supported by the right technology, these can create collaborative, outcome-driven environments. Through the resulting remote or hybrid models, organizations can transform their workforce and operations to boost productivity, cost effectiveness and employee engagement, while enhancing resilience and customer experiences.

As always, our contributors to this Capco Journal are distinguished, world-class thinkers. I am confident that you will find the quality of thinking in this latest edition to be a valuable source of information and strategic insight.

Thank you to all our contributors and thank you for reading.

Lance Levy, **Capco CEO**


LEADERSHIP

DIGITAL LEADERSHIP: MEETING THE CHALLENGE OF LEADING IN A DIGITALLY TRANSFORMED WORLD

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ABSTRACT

The digital transformation of organizations and society has created a set of novel challenges for leaders. To succeed in this new context, "digital leaders" require new competencies: new technological competencies to lead in organizations where digital technology is inextricably embedded in everyday activity; new organizational competencies to build and lead teams that can utilize new technologies as well as inspire millennial workers who have grown up in a digitally transformed world; and, finally, new ethical competencies to navigate the ethical dilemmas created by the introduction of digital technologies in their organizations. Developing "digital leaders" is, therefore, a key part of the digital transformation of any firm and a failure to develop digital leadership at all levels will limit the impact of even the best planned and executed efforts at digital transformation.

1. INTRODUCTION

A quick internet search on "digital transformation" vividly reveals the extraordinary level of interest in the impact of digital technology on organizations and society, and the wide range of opinions about what digital transformation is and what its impacts might be. Adding "COVID-19" to the search further reveals that many commentators believe that the recent pandemic has accelerated digital transformation. As Microsoft CEO Satya Nadella famously observed, the COVID-19 pandemic has driven "two years' worth of digital transformation in two months" [Green (2020)]. While some of this is certainly hype, there also seems to be a genuine shift happening that deserves attention.

In this article, I argue that the ramifications of digital transformation for leaders at all levels in firms are significant and complex. I begin by focusing on what digital transformation is at a societal level – and why we use the term "transformation" for what is happening – and then focus on some of the leadership challenges digital transformation creates within firms. My goal is to highlight the challenges and opportunities that digital transformation presents for firms and at least partially explain why it is the focus of so much recent attention in the business media and among academics and consultants.

I then focus on a topic that I believe is critically important for organizations of all kinds: the need to develop leaders who can lead effectively following the digital transformation of their organizations. Firms are spending billions of dollars on digital transformation efforts, but surprisingly little on developing leaders who can exploit the resulting opportunities to improve existing systems and processes, and, even more importantly, to do entirely new things. From my experience working with companies from multiple industries, firms often fail to reap the full benefits of their investment in digital transformation because they fail to spend time and resources on developing the digital leaders necessary to take these transformed organizations forward. As Raskino and Waller (2015: 107) warn "[e]very leader must become a digital leader because every company is becoming a tech company". In other words, new leadership competencies must be developed for leaders

to successfully lead in this challenging new environment or firms risk failing to achieve the potential gains of digital transformation.

It is also important to point out that while much of what I will argue applies to firms in general, and even to other forms of organizations such as departments in government or not-for-profits, at points I will focus more narrowly on financial services as some of the details of my argument vary by industry. For example, my discussion of digital transformation applies broadly as does my claim that new leadership competencies are required for leaders to successfully lead in digitally transformed organizations. In addition, the broad categories of the new leadership competencies also apply broadly. However, the specifics of the new leadership competencies required will differ from industry to industry and from firm to firm within an industry. So, while I provide a framework for thinking through the new leadership competencies that need to be developed following the digital transformation of a firm, more work will need to be done to develop an appropriate competency framework for a specific firm.

2. WHAT IS DIGITAL TRANSFORMATION?

When I speak on this topic, audience members are often surprised when I say that we are only in the earliest phase of the profound changes that digital technology will bring to society. This is not to say that digital technology has not had a significant impact on society already. But, like all technological innovation, "we invariably overestimate the short-term impacts of new technologies and underestimate their longer-term effects" [Collins (2010)]. While much has happened, much more is yet to come, and the rate of change is accelerating. So how should we think about digital transformation and what is yet to come?

2.1 The digital transformation of Western society

Let us begin at the beginning: what is digital transformation? The term seems to be everywhere at the moment and sometimes it seems that anything and everything can be described as digital transformation. But digital transformation is not about new devices and new apps – although those are some of the causes – and it is not about the first trillion-dollar corporation or the way Amazon has changed the way we shop – although those are some of its effects. Digital transformation is, fundamentally, about how digital technologies are changing the way humans communicate and interact, and in doing so driving fundamental change in society, in firms, and, most fundamentally, in what we are as human beings.

Let us begin with the digital part of the term. The digital part of digital transformation refers, of course, to the process of encoding information in ones and zeroes. But the "digital" in digital transformation refers to more than just the simple encoding of information; it refers to the process of virtualization where existing activities increasingly move from the material world to the digital world, and make new activities possible in the process. As an example, think of retail banking, which used to take place in physical buildings – financial transactions involved a visit to your bank – and involved talking to people working with paper files and ledgers. Now, most retail banking takes place using an app on a smartphone and even a visit to a physical bank will lead to a bank clerk rapidly digitally encoding the information you provide in order to conduct the transaction in the "virtual bank". Pen and paper routines have been virtualized and the workers largely replaced with microprocessors and the internet.

But what about the "transformation" part? Calling something a transformation is a strong claim, so we should be sure that the situation we find ourselves in at the moment deserves the label. I find it useful to think about a previous period of profound change in society that was also characterized as a "transformation". The period I am referring to is, of course, the industrial revolution. In fact, Polyani and MacIver (1944) called their famous book on the industrial revolution *The great transformation*, specifically to try and capture some sense of the depth, rapidity, and pervasiveness of the change that occurred during this period.

So why did Polyani and MacIver refer to the period around the industrial revolution as the "great transformation"? Well, for several hundred years before this period of rapid change, the basic way of living in Europe was relatively stable. There were wars, national boundaries shifted, kings and queens came and went, but the life of the average person changed little. Grandparents and grandchildren led lives that were, in most respects, indistinguishable. What people ate and drank, the houses they lived in, how they were educated (or not), the way they worked, and the way they went about their days, was largely the same. Grandparents and grandchildren would have found most aspects of each others' lives unremarkable and familiar.

Then something momentous happened. In a generation, new ideas, new technologies, and new ways of living swept across societies, organizations, and individual lives in Europe and around much of the world. Work became something you did in an office or a factory, education became widespread,

the newspaper appeared, followed by the radio and then the TV, and the vacation was invented as the nature of work shifted. Society, organizations, and the lives of average people were fundamentally changed. Grandparents found the lives of their grandchildren unrecognizable and, in many cases, incomprehensible. It was, as Polyani and MacIver contend, a "great transformation". Western societies changed fundamentally, driven by new technologies and new ways of thinking, and things were never to be the same again.

The transformation that is underway at the moment is, arguably, another of these shifts. Digital technology – and particularly the internet – have transformed the way of life of billions of people. We are now connected and enabled in ways that would have been unimaginable even 10 years ago (remember, the iPhone was only introduced in 2007). A process of virtualization of activity has occurred that has fundamentally changed how we live, work, learn, and interact with each other. Try to imagine doing your job without a computer and the internet. Imagine life without Amazon, Google, Uber, and AirBnB. For better or worse, the internet and digital technology of all kinds have transformed work, education, and leisure in fundamental and irreversible ways. There has been a transformation of society once again, and the lives of grandchildren are again unrecognizable to their grandparents. The digital banks that I discussed earlier are open 24 hours a day, a bank transfer now takes seconds, and you can pay for a taxi with your smart phone. What would your grandparents have thought of that?

But, while what has happened so far is clearly pervasive and profound, the process of digital transformation is just beginning. While the internet, and the devices that connect to it, like the personal computer and the smart phone,[1] have transformed society, we are now on the cusp of the next phase of transformation driven by other digital technologies like the Internet of Things, robotics, and cloud computing that will accelerate and deepen the digital transformation of our society and the combined impact of this change will make the way we work and how organizations function unrecognizable. We will, in two generations, have gone from a society without digital technology, to a digital society.

This transformation has brought both great opportunities and great challenges. And, just as the transformation that occurred around the industrial revolution fundamentally impacted leadership,[2] this transformation is also challenging us to re-think leaders and leadership. The old leadership competencies are not disappearing, but new ones are appearing. Leadership following digital transformation is even more complex and demanding and leadership development in firms must adapt to include developing these new leadership competencies to create leaders to manage the new challenges and opportunities that arise in firms following digital transformation. Let us turn to those now.

2.2 Digital transformation and firms

While digital transformation is exciting and presents many opportunities for firms, it also presents a number of challenges. First, and most obviously, digital transformation is, above all, a process of disruption [Christensen et al. (2015)], where traditional technologies and business models are being disrupted by new, digital offerings that often start out appearing to be low quality on one or more traditional measures, but have something that is found to be highly attractive to groups of customers whose needs are underserved by the traditional offerings of an industry. However, this new digital offering then improves quickly on traditional measures of quality and becomes a viable alternative for core customers, but one with new, added advantages. Suddenly, traditional market leaders find themselves left behind and with little that they can do to regain their positions. The nature of this process, how to spot the possibility of disruption before it occurs in an industry, and what to do in response, is a key challenge facing many incumbent firms as their industries are disrupted and as companies who were never thought of as a competitor start taking away customers.[3]

Second, while the ability to manage diversity has been a core success factor in most organizations for decades, the social change driven by the digital transformation of society, combined with the trend to working later in life or returning to work after a period of retirement [Gratton and Scott (2016)], makes managing generational diversity in organizations an increasingly important organizational competency [Knight (2014)]. The divide between the generation born into a world where digital technology is ubiquitous – digital natives – and the generations born before the arrival of the internet – digital immigrants – is particularly critical [Prensky (2001)] and

[1] Software is, of course, integral to these devices and is a critically important part of this story. As Marc Andreesen famously said, "Software is eating the world" (https://bit.ly/2Spfq2C).

[2] Max Weber, in one of his most influential articles, argues that the social processes that underpinned the industrial revolution also produced a new kind of leader based on a new kind of authority – the rational-technical leader who was fit to lead in the new bureaucracies that appeared with modernism [Weber (1958)].

[3] Imagine you are a successful producer of street maps in Hungary in 2004. Is Google included in your mental map of competitors?

requires both sensitivity to the differences between these groups and new skills to not simply successfully manage this new dimension of diversity, but to gain advantages from the cognitive diversity that this divide brings to groups.

Third, to flourish following digital transformation firms need to develop a culture that supports and celebrates the value of experimentation and where teams who learn by running well constructed experiments can flourish. In a world of increasing uncertainty characterized by ever greater rates of change, experimentation becomes the primary mode of exploring options where information is either expensive or impossible to get [Reis (2017), Hampel et al. (2020)]. But this means that firms need a culture that supports experimentation [Pisano (2019)] and leaders skilled in helping team members put together experiments that test useful hypotheses about internal or external customers or the wider business context while minimizing the cost and risk attached. This is often a method that is diametrically opposed to the information gathering and analysis approach that leaders have mastered over their careers and feel comfortable using.

Fourth, firms will need to become adept at using new digital communication channels to engage with digital natives effectively and leverage the possibilities of the cloud-based tools available for enhancing team interaction and collaboration. Digital tools like Slack and Teams were revolutionizing how teams worked together before the pandemic and this has only been accelerated due to many employees working from home over the last six months. However, we are only at the beginning of this process and much more is possible as these tools improve, and new tools appear. This also means that leaders must ensure that less enthusiastic employees understand why they need to keep using these tools when they return to the office, ensure they know how to use them effectively, and that they develop habits to engage in the resulting revolution in ways of working. Social media tools such as Whatsapp are also important to engage with digital natives and firms have opportunities to connect with their employees, suppliers, customers, and others through these channels in new and exciting ways.

Finally, there are many challenging new ethical issues that digital transformation creates for organizations. Firms must answer the question of what acting ethically means in an organization that is increasingly virtual, exponential, and networked? Discussions of business ethics in firms, therefore, need to be expanded to include an explicit discussion of cyberethics [Spinello (2010)]. For example, machines are increasingly making decisions in organizations and doing so in ways that can be difficult or even impossible to unravel. What does it mean when some of the key decisionmakers in the organization are machines? How should firms keep track of where machines are making decisions and put in place checks and balances to ensure that fairness and the ethical principles of the organization are observed? Equally, new technologies allow the collection of huge amounts of data, but what sorts of analytics can be used on this data before the values of the firm are threatened? This will require firms to develop clear ethical principles for dealing with cyberethics based on an understanding of the ways in which digital technologies are transforming the organization. Digital transformation is, therefore, not just about implementing digital technologies, but also about rethinking the values and ethics of the firm to match the new reality of the digital organization.

3. THE NEW DIGITAL COMPETENCIES

In leadership development, it is common to talk about "leadership competencies" [Conger and Ready (2004)] and I will use this idea here to structure my discussion of digital leadership. Leadership competencies are simply the skills and behaviors that leaders need to successfully navigate the challenges they face in their organizations. But just to be clear, my intention is not to provide a definitive list of the new leadership competencies, but rather to start a conversation about what new competencies leaders need in a digitally enabled world that is networked, exponential, and virtual, and what this means for leaders, for leadership development, and for organizations that need digital leaders.

3.1 Leadership competencies

What makes a leader effective? At a general level, this is not, of course, a new question. The search for the key to leadership success has been a human preoccupation for thousands of years. Early discussions focused on the characteristics of "great men"[4] such as Genghis Khan or Napoleon. By studying these individuals, observers hoped to divine the secret of their success. This approach became more systematic with the development of social science and the appearance of leadership studies. Using social science methodologies, early attempts were made to find a common trait or traits that might predict leadership. These efforts failed, however, and the search continued for a way of understanding leadership success.

[4] The gender bias in this term is reflective of the focus of these early discussion. They were, sadly, focused almost exclusively on men.

Figure 1: Some common leadership competencies

ETHICAL REASONING	CONFLICT MANAGEMENT
INTERPERSONAL SKILLS	DECISION MAKING
COMMUNICATION SKILLS	POLITICAL SKILLS
PRUDENCE	INFLUENCING
COURAGE	AREA EXPERTISE

Eventually, leadership scholars and practitioners settled on the idea of leadership competencies – skills or behaviors that contribute to leadership success – as a simple organizing idea to understand why some individuals move up in organizations while others do not. A number of competencies have been singled out as particularly important for leaders (see Figure 1), including things like influencing, prudence, and courage. And one bundle of these competencies – emotional intelligence – has proven to consistently predict success in moving up the ladder in large companies [Goleman (2004)].

However, while various leadership competencies have proven to be important for leadership success across many firms and industries, what research and practical experience is increasingly showing is that although these well-known leadership competencies are still important, they are no longer enough once organizations are digitally transformed. This does not mean that these traditional competencies are not important, but simply that there are new ones that leaders must develop to lead effectively in digitally transformed organizations. Without these new leadership competencies, leaders can no more expect to be successful than leaders without traditional leadership competencies can expect to be successful in traditional organizations.

3.2 Technological competencies

Let us begin with what I call the new technological competencies. By this I mean the basic knowledge that leaders need to understand the digital technologies being introduced into the firm and their impact on the organization and broader industry. From my experience, three technological competencies are particularly important.

First, leaders need basic **technological literacy** to effectively lead organizations following digital transformation. This is in many ways the most straightforward of the technological competencies and in many organizations considerable progress has been made on developing this competency. The goal here is not to make leaders into technology experts, but simply to familiarize leaders with the main technologies that are driving digital transformation and to make sure they feel comfortable talking about these technologies and engaging with experts and their followers around decisions and investments. As an HR Director in one of the companies I worked with observed pithily, "leaders don't need to be experts, but they need to know enough to be able to spot when what an expert is saying is B.S.!"

Using financial services as an example, all leaders in financial services at all levels need to have a basic understanding of four digital technologies that are transforming the sector: blockchain, cloud computing, big data, and artificial intelligence. It is not enough that "experts" in the firm understand these technologies, all leaders must have a basic idea of how they work and what they do for their use to become ubiquitous and transform the everyday work of the organization. It is middle managers that innovate new business processes and they need to know what these technologies can do in order to see the opportunities for their use. It is critically important that senior leadership identify the technologies that are important for their firm, and then ensure that all leaders at all levels are functionally literate in terms of these technologies just as they must be in terms of accounting, finance, and people management.

Second, leaders must have a **disruptive mindset**. Digital transformation is, above all, a process of disruption where traditional technologies and business models are "disrupted" by new, digital offerings. Without a disruptive mindset across the firm to drive disruptive innovation, market leaders will find themselves disrupted by others with little chance of regaining their positions. The nature of disruption,

how to spot opportunities to be the disruptor, and how to spot disruptive threats in the environment, all need to be widely understood by leaders in organizations if the firm is to have any chance of surviving the digital transformation of their industry.

Third, leaders need to understand the idea of a platform business model and have a basic understanding of **platform strategy** [Gawer and Cusamano (2002)]; they need to be platform strategists. Platform businesses are a common feature of digitally transformed industries that fundamentally change the dynamics of the industries in which they appear. Think of the effect of Booking.com on the hotel industry. Booking.com is a digital platform that has successfully inserted itself between the hotels and their guests in a way that is highly disruptive for incumbent hotels. When this happens, industry dynamics, strategy, and key success factors all change in ways that need to be understood by leaders across the organization if they are going to make the right decisions and ensure the organization thrives in the new digital world that follows the digital transformation of an industry. And this knowledge can not only reside in the minds of key experts or top management; it must be distributed throughout the firm.

3.3 Organizational competencies

In addition to the basic technological competencies that underpin digital leadership, there are also some new organizational competencies that successful leaders require. Rather than the more technical knowledge-based competencies that we have discussed so far, these are more about managing people and creating the organizational context for success during and after digital transformation. I will discuss four that I have found to be of particular importance.

Ironically, one of the most significant impacts of the introduction of digital technology into the workplace is that the need for a **coaching style of leadership**. While it may seem ironic, the more digital technology that enters the workplace, the more leaders need to be coaches rather than managers. Their job becomes more about development and motivation, and less about direction and decision making. The fact that they are leading teams of experts who often know much more about the technical task at hand intensifies this change. Digitally transformed organizations need the full engagement of a highly educated workforce who are motivated by leaders who are excellent people managers and can help them to contribute at the highest level and develop along paths of their choice. For this to happen, coaching skills must become an essential part of every leader's leadership toolkit.

Second, leaders need to expand their skills and become **diversity managers**. As I mentioned above, the social change driven by the digital transformation of society, combined with the trend to working later in life or returning to work after a period of retirement, makes managing new kinds of diversity in organizations an increasingly important leadership competency. This requires both sensitivity to the differences between these groups and new skills to not simply successfully manage these new dimensions of diversity, but to gain advantage from the cognitive diversity that this brings. The point is not to create harmony, but to stimulate creative conflict that brings everyone into the conversation and makes use of the increasing cognitive diversity in the organization to maximize creativity and innovation.

Third, leaders must have an **experimentation mindset** and be competent to lead teams who learn by running well constructed experiments. This means, first, that leaders must understand how to run experiments to test the hypotheses that underpin new ideas and how to run these experiments cheaply and quickly. But this also means that the leaders must create a culture that supports experimentation and the systems and processes to allow rapid failure while maximizing learning. This is often an approach that is diametrically opposed to the "pilot project" and "market research" approach that leaders have mastered over their careers and feel comfortable using.

Fourth, leaders need to become **digital communicators** to leverage the new possibilities of the incredible digital tools available for enhancing team interaction and sharing. Most organizations I engage with are very much at the "virtualize existing work practices" stage and little has been done in terms of really innovating how teams work together and how communication and collaboration happen across organizations. Leaders need to both model the behavior that they want in terms of engagement with social media and cloud-based collaboration tools and also learn how to motivate teams and give feedback in these new environments. Even more problematically, leaders need to learn how to replenish the "social glue" that holds teams together when teams are not co-located. From all accounts, we are not going back to a situation where most of the interaction among team members will happen in an office face to face. Leaders need to not only learn how to lead in a virtual environment but to also enlighten the users of the new tools that continue to appear and that will continue to disrupt our ways of work.

3.4 Ethical competencies

The final set of competencies are what I call ethical competencies. These involve the skills to understand and

manage the ethical challenges that digital technologies create. While leadership has always been about ethics, digital transformation creates entirely new challenges that leaders across the firm need to be ready to tackle. These ethical competencies require that the technological and organizational competencies that I talked about above are in place as the new ethical competencies build on the technological and organizational competencies in a direct way. I would like to talk about two ethical competencies that I think are particularly important, although the exact nature of the ethical competencies are much less clear and more organization specific than those I discussed in earlier sections.

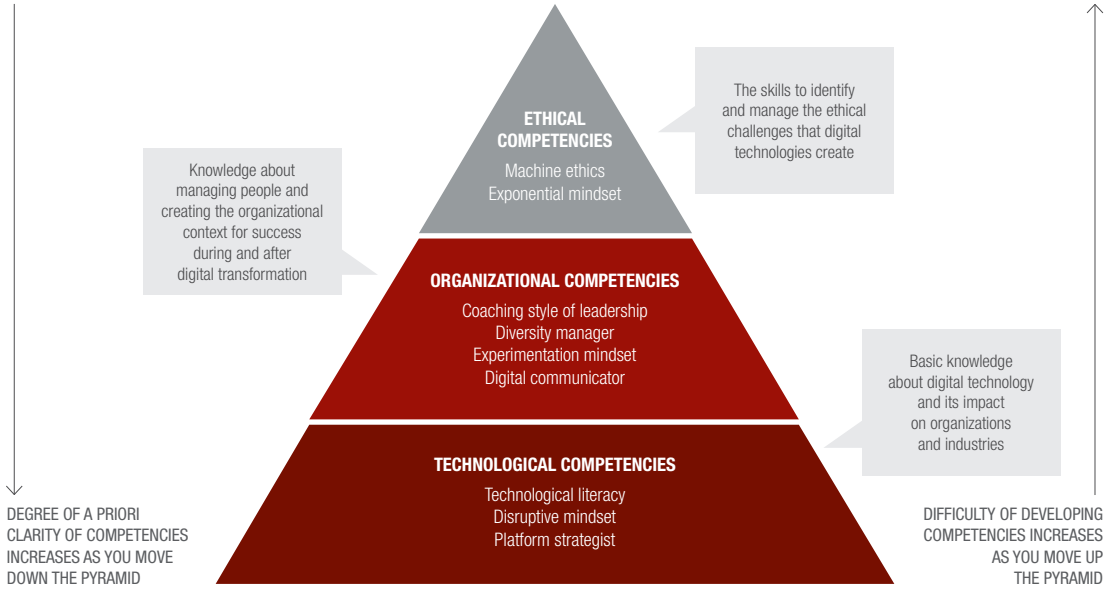
First, digital leaders must have an understanding of the ethical challenges that accompany the introduction of artificial intelligence (AI) into the everyday work of a firm: that is, an understanding of **machine ethics**. This goes far beyond the technological competencies around understanding different kinds of AI and what it can and cannot do (although it is dependent on it). This is about understanding how AI becomes embedded in organizational routines and processes and what this means from an ethical point of view. What are the ethical risks and how are they being contained? Who is responsible for the decisions of the machine and do they understand their responsibilities? While manufacturers are responsible for the ethics built into the AI system, the company that implements them is responsible for the way in which the AI system is trained and put to work. This will require clear ethical principles based on an understanding of the ways in which machines are being empowered to decide and where human responsibility for these decisions are located.

Second, digital technology is exponential, and this requires digital leaders to have an **exponential mindset** [Berman et al. (2020)]. We are moving from a world that was largely linear to one that is increasingly exponential. This characteristic explains the meteoric growth of new digital companies and underpins the arguments about digital transformation I made earlier, but also brings with it a major challenge: we think linearly but need to try to understand the impact of technologies that cause exponential effects. This creates the possibility of huge and unexpected (and often unintended) effects that can raise serious ethical issues for leaders. Many of the ethical questions that arise are completely new, such as those Mark Zuckerberg has struggled with over the last several years. Leaders throughout a firm need an exponential mindset to understand the opportunities of digital technology and also the potential problems that might be caused by decisions and actions that fail to spot exponential dynamics and the astonishing effects they cause.

3.5 Putting it all together

The framework I propose for understanding the competencies underpinning digital leadership – the "digital leadership pyramid" – is depicted graphically in Figure 2. The three types of competencies are shown in the order of dependence

Figure 2: The digital competencies pyramid



and inversely in terms of the difficulty to develop in leaders. Technological competencies are the most fundamental, but also the easiest to develop in leaders; organizational competencies depend on technological competencies and are somewhat more difficult to develop; and, finally, ethical competencies depend on leaders having deep competencies in technological competencies and organizational competencies and are the most difficult to develop. The digital leadership pyramid provides a visual map for senior leaders and HR professionals involved in planning the leadership development plan component of a digital transformation program.

4. CONCLUSIONS AND IMPLICATIONS

At this point, let me go back to where I began: we need to get as good at digital leadership as we are at creating and applying digital technology if the new digitally enabled firms we are creating are going to achieve the potential of digital transformation. We need leaders who can thrive in organizations characterized by the virtual, the exponential, and the networked. The old leadership competencies are not obsolete, but in addition to competencies that led to leadership success in the analogue world, we need leaders with new competencies who are prepared to lead in the new digital world we are rapidly constructing.

This means that any digital transformation plan needs to include a well-thought out leadership development component. To put it simply, there should be no large-scale technology plan that does not have a talent development plan at its center. In addition to asking what technology do we need and how will we roll it out in our organization, change leaders also need to ask how will we develop our leaders to be ready for the new challenges and opportunities that will accompany the process of digital transformation? How digitally savvy is our leadership and what needs to be done to get them ready to lead in the new environment that will accompany the digital transformation we are embarking on? Successful digital transformation programs are about changing technology, organizational processes, and, perhaps most importantly, leaders.

But there is one caveat. In order to make this happen, leaders in organizations are going to need to be more honest about what they do not know. After working with a number of organizations on this problem, I have seen that one of the biggest barriers to developing digital leaders is resistance on the part of existing leaders to admit what they do not know. This is partially a lack of knowledge about what they need to know, and partially a result of a fear of admitting that they do not know. The latter problem is the really difficult one and it takes senior management setting an example to encourage middle managers to admit they do not know.

In summary, digital transformation is happening and holds huge opportunities for companies to do new things, to do existing things better, and to reach new markets for their products and services. However, in order to get the most out of the opportunities associated with digital transformation, companies need to transform their leaders as a central part of the process. Exciting new opportunities to create new areas of business, improve existing processes and systems, and drive efficiency in the business exist, but digital transformation is also creating significant challenges in terms of unfamiliar and hard to evaluate sources of competition, the need for rapid and difficult to quantify change, and profound people management issues. The successful firm of the future will be the one that can effectively build the knowledge and skills among key employees to seize the opportunities and deal with the challenges of digital transformation.

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INNOVATING FOR GROWTH IN AN ERA OF CHANGE

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ABSTRACT

In times of significant technological, societal, and behavioral change such as today's, business leaders already grappling with digital transformation may find themselves facing growth challenges rooted not merely in competition but in a fundamental lack of fit between the solutions they offer and the needs of their customers. In this case, traditional innovation efforts may not suffice and the need may arise to rethink core business models, make riskier investments, and measure success through new and different metrics. By creating two parallel innovation organizations within a business – one focused on "product change", and the other on "product-market fit change" – and testing new solutions in-market using a "jobs to be done" framework, companies can prepare themselves to address both types of change simultaneously and win in a rapidly shifting market.

1. INTRODUCTION

These are uniquely disruptive times. Business leaders already grappling with digital transformation now face growth challenges rooted in ongoing societal and economic shifts, including increasing income inequality, rising environmental and social justice movements, and the coronavirus pandemic.

In order to grow in this era of change, even mature companies with proven business models and large, existing customer bases will need to rethink and revamp their strategies. This may include making eCommerce and fully digital models more central, reactivating customers who have reduced or eliminated their typical spending during the pandemic, and connecting with current and new customers whose attitudes and behaviors have permanently shifted because of COVID-19 or social movements.

Traditionally, businesses have responded to change-induced growth challenges by investing in new or improved products and client experiences; what McKinsey calls "horizon 1 and 2" innovation.[1] Going forward, however, many leaders may see this tried and true approach as insufficient. Viewing the pandemic as a uniquely disruptive event, they may conclude that bolder, riskier innovation – aka "horizon 3" – is necessary. Some leaders may increase their firms' research and development budgets. Others may direct their companies to become players in venture investing or establish new product development ventures and organizations outside of their core businesses that are designed to cannibalize or attack existing products and markets.

Given that investment in "horizon 3" innovation has long been associated with dynamic growth, this strategy makes sense. Once upon a time, Henry Ford's pioneering assembly line methods revolutionized the automotive industry; more recently, novel products such as the iPhone helped take Apple from desktop computing also-ran to one of the world's most valuable companies.

There is a problem with this approach, however: it does not always work.

[1] Blank, S., 2019, "McKinsey's three horizons model defined innovation for years. Here's why it no longer applies," Harvard Business Review, February 01, https://bit.ly/3czA3lR

Leaders investing in disruptive innovation can find that their companies remain stuck in place, with new growth failing to materialize. Worse yet, these investments can distract and confuse organizations, reducing the effectiveness of existing business operations. Even in favorable circumstances, there is no magic formula for better capturing existing markets and/or opening up new ones. And when the environment is rapidly shifting in unpredictable ways as it is now, those goals become more difficult to achieve.

However, by thinking about the three innovation horizons as complementary methods of addressing change – and organizing their firms to tackle those horizons simultaneously – companies can increase the likelihood of continuous growth through effective innovation and product development. That, in turn, can help them remain a step ahead of the deep disruptions of 2020 and beyond.

2. GROWTH AND TYPES OF CHANGE

Across industries, changes driven by customers, competitors, and many other factors can either stunt or accelerate growth. As such, responding to change is the key to continuous growth, which means leaders must anticipate change, recognize it in real time, and have plans ready to tackle it.

In my experience, this requires developing holistic strategies – encompassing people, process, organization, and technology – for dealing with two fundamental types of change: "product change" and "product-market fit change".

To understand the difference between the two, let us start with a basic question: what makes a successful business successful?

Of course, there is no single answer. Every thriving firm has a unique story. On a basic level, however, all businesses that stay in business have three things in common:

1. They have identified a problem that a group of customers needs to solve – what corporate innovation pioneer Clayton Christensen calls a "job to be done."[2]
2. They have developed a product that helps to solve the problem or do the job in question.
3. They have marketed that product to customers who need it.

Consider banks. People need a way to safely store and access money. Banks provide both. And people know that, because banks run advertisements on television, open branch offices on seemingly every street corner, and sometimes buy the naming rights to sports stadiums.

Today's largest, oldest banks continue to capitalize on this basic premise by providing all sorts of complicated financial products and services to a wide range of customers who have varied and complex needs. These days, there are probably more types of loans, cards, and ways to view your bank balance than there are brands of toothpaste on the shelves of your nearest drugstore.

Neither the financial industry nor its products are static – change and evolution occur all the time on multiple fronts. However, the fundamental customer problem that banking solves has remained constant. As long as people need to safely store and access money, banks will remain in business; indeed, a single bank with a single, superior solution could theoretically grow as large as the entire market for banking itself (in a world without antitrust laws, at least!).

Because this is the case, banks achieve continuous growth by constantly improving the client experience and how they deliver on the job they do for customers – that is, through "product change".

3. PRODUCT CHANGE

Product change occurs when competition between companies and/or the emergence of new technologies gives rise to the proverbial "better mousetrap" – innovations that enhance existing solutions in order to offer lower prices, superior experiences, or greater convenience.

This type of change produces a recognizable, S curve-based[3] cycle of innovation and growth that often unfolds as follows:

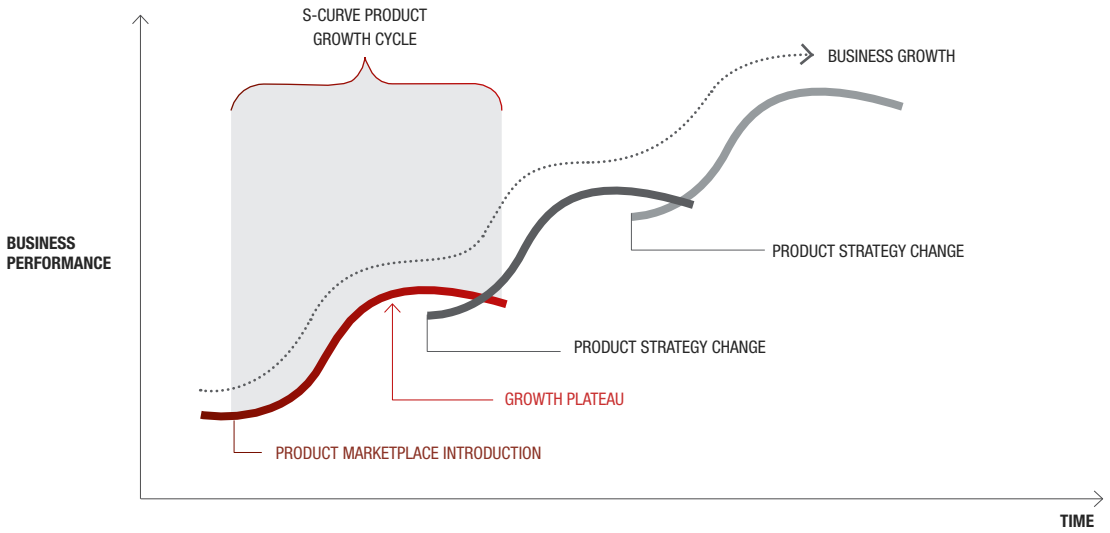
Step 1: a firm introduces a new or improved product, leading to more customers and a spike in growth.

Step 2: growth stalls or reverses when a firm has reached all the potential customers it can, and/or when rivals begin to capture its existing customers.

[2] Christensen, C. M., T. Hall , Karen Dillon, and D. S. Duncan, 2016, "Know your customers' "jobs to be done"," Harvard Business Review, September, https://bit.ly/3ja55Di

[2] LaMarco, N., 2018, "What is the S curve in business?" Chron, November 27, https://bit.ly/30rc9nV

Figure 1: Addressing product change



Step 3: growth resumes when the stalled firm engages in product innovation that helps it reach new customers and/or win back customers from its rivals.

For most business leaders, product change is familiar. While jumpstarting flattening growth is not trivial – it often requires significant investment in new product development, customer experience improvements, and process and organizational change – it is ultimately "business as usual". It represents the traditional competitive threat of a better, more efficient way to do things – the kind of shift that most firms are organized around, and are, therefore, best equipped to recognize and respond to.

Achieving growth in the face of product change means investing in innovations that improve a company's existing products and services. In this case, there is little to no need to explore or question the underlying job to be done, which Christensen defines as the progress a customer is trying to make toward "an outcome they seek or some better state they want."[4]

While this type of investment does not often produce disruptive, headline-grabbing innovations, there is nothing wrong with focusing on it; on the contrary, neglecting incremental product improvements in order to chase more disruptive innovation for innovation's sake can be a mistake, diverting energy, attention, and resources away from where they are needed most.

That said, maintaining a narrow or exclusive focus on product change can also be a mistake. In the late 1990s, for example, a consortium of consumer electronics and music industry companies squared off against Sony and Phillips in a next-generation audio format war,[5] pitting the former's DVD-Audio against the latter's Super Audio CD.

By improving the audio fidelity of traditional, industry-standard compact discs, both of these traditional industry players hoped to capture the consumer audio market going forward. Each assumed the job to be done for the music industry remained the same, and that continued growth would be based on improving sound quality as a feature. Those hopes were dashed by the rapid emergence of MP3s and digital audio file-sharing – a "product-market fit change" that utterly transformed the music business. Technology, consumer behavior, and societal change had reshaped the job of a song towards being individually downloadable and transferable, rendering physical CDs ill-fit for the task.

4. PRODUCT-MARKET FIT CHANGE

Product-market fit change occurs when shifts in technology, society, or customer behavior are so profound that they alter or sever the connection between the solution at the core of a business and the problem that solution seeks to solve.

[4] Christensen, C. M., 1997, The innovator's dilemma: when new technologies cause great firms to fail, Harvard Business Review Press
[5] Schilling, M. A., 2017, "What's your best innovation bet?" Harvard Business Review, July–August, https://bit.ly/309xkKS

For leaders, product-market fit change is generally unfamiliar. It is very much not business as usual. It represents an existential threat; and firms, particularly successful and established ones, are rarely organized around recognizing and responding to existential threats.

Take the newspaper industry, for example. Advertisers have a perpetual problem: they need to put their messages in front of people. Preferably lots of them. For decades, newspapers thrived by offering a reliable solution, attracting the attention of large numbers of readers and selling that attention to advertisers through display ads.

But then the internet took off, allowing websites like Craigslist to one-up newspaper classified sections by providing a cheaper, more convenient way to sell cars, rent out apartments, and find unconventional romantic partners. Meanwhile, advances in computing and telecommunications helped online giants such as Google and Facebook deliver their users' attention to advertisers at unprecedented scale and in micro-targeted ways that simply are not possible with ink on paper.

Google and Facebook are now a formidable duopoly, dominating the multibillion-dollar market for digital advertising revenue.[6] By contrast, the newspaper industry is a shell of its former self. Technological and related consumer behavior changes have permanently weakened newspapers' ability to solve advertisers' problems, leaving news outlets scrambling for ways to make ends meet and monetize their content in the digital age.

Addressing product-market fit change through innovation is usually more challenging than addressing product change. Customer experience enhancements and new product development – the stuff of everyday business competition – are insufficient, because the core problems and solutions that make a particular business possible in the first place have shifted.

Instead, business leaders faced with this type of change need to interrogate their firm's "first principles"; that is, the problems and solutions that make their business possible and established their original S-curve "growth groove." This means asking basic questions such as: what is my product all about? What job is it doing for customers? What jobs do customers need to be done?

At times, this kind of interrogation may even extend all the way to a business's core mission statement. The famous case of Blockbuster versus Netflix poses a good example.[7]

In the mid-2000s, Blockbuster's mission statement[8] was "To be the global leader in rentable home entertainment by providing outstanding service, selection, convenience and value." Entrenched within this frame of reference, Blockbuster believed that it was in a "features and functions" war with Netflix; in other words, a product change competition. As a result, the rental giant failed to change its core measure of business success, assuming that its job was done when a customer checked out a video and not properly viewing Netflix's growing number of subscribers as a threat. When Blockbuster's growth stalled, it strove to match or beat Netflix's product "menu" on an offering-by-offering basis: delivering videos by mail, eliminating return fees, and building streaming capability. But Blockbuster was always a step late, as Netflix exponentially grew its base of engaged, digital subscribers and invested in rapidly scalable digital distribution and content.

Now consider Netflix's mission, according to the Rancord Society:[9] "To entertain the world." How might this mission have made the company's leaders think differently about the jobs their solutions were doing in a world of technological, behavioral, and societal change? And how might this frame of reference have influenced Netflix's approach to client experience, content, distribution, and pricing? Blockbuster's mission, focused on the known and familiar space of "rentable home entertainment," constrained them at a point in time where the rules were being rapidly rewritten.

In this example, the stark differences in mission statements show how two companies that seemed to be in the same business actually were not. Blockbuster was focused on product change in the shrinking home entertainment rental market, while Netflix was building a new and different business atop broader, tech-driven product-market fit change that addressed a fundamentally different job.

Keeping up with product-market fit change may, therefore, require companies to challenge everything they think they know about their business, invest in innovation that is distinct from their core business, establish new metrics, and become more willing to accept the risks that come with rapidly

[6] Perrin, N., 2019, "Facebook-Google duopoly won't crack this year," eMarketer, November 4, https://bit.ly/36gh12y
[7] Though the story has become something of a business cliché, I believe it is worth revisiting through this lens.
[8] Blockbuster.mediaroom.com
[9] Rivera, A., 2019, "Netflix's mission statement and vision statement: a strategic analysis," Rancord Society, November 10, https://bit.ly/3cy1Rqz

exploring and taking to market experimental new products and client experiences. Many of these experiments will not pay off, but all of them are needed.

5. ORGANIZING A FIRM FOR INNOVATION AND GROWTH

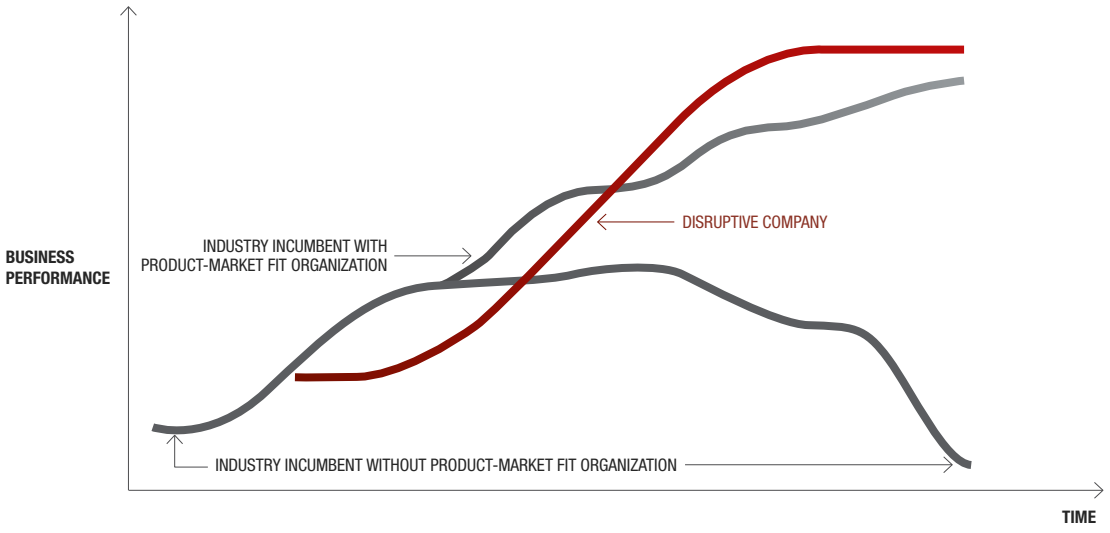
For businesses, being able to recognize and respond to both product change and product-market fit change is essential. Each type of change is likely to create growth obstacles at different times, and in periods of dramatic social, economic, and technological shifts, like the present, leaders may find themselves dealing with both challenges simultaneously.

Firms doing business in the brick-and-mortar retail sector, for example, are responding to the coronavirus pandemic by adopting product innovations, such as touchless payment methods and plastic shielding at store checkout stations. However, they also are facing shocks that might lead to a product-market fit crisis: the decline of in-person shopping and the concurrent rise of online purchasing, as well as potentially significant changes in consumer attitudes, behaviors, and beliefs.

Organizing a firm to tackle both types of change simultaneously requires thoughtful planning and deliberate decision making. In many ways, it means building two enterprises within your company that operate in very different fashions – with people, processes, technology, and risk structures appropriate to each.

1. **Product change organization:** the part of a firm that is focused on product change takes product-market fit as a given, assuming that the core problems and solutions underlying the business are unchanging and well understood. Staffed by people who are execution-oriented, it works relentlessly to drive efficiencies, improve the customer experience, explore new channels of distribution and delivery, and increase customer satisfaction around existing solutions. It uses standard business metrics to measure its success. Its risk structure is typically conservative, favoring decisions and projects that fit existing financial models and have the best chance of yielding immediate return on investment.
2. **Product-market fit change organization:** by contrast, the part of a firm that is focused on both identifying and exploring product-market fit change assumes that fundamental disruptions are inevitable and imminent. Staffed by people who are obsessed with understanding root-cause customer problems – and the unique needs of what might be considered niche market segments – it constantly seeks new concepts, explorations, and investments. This organization also uses metrics that are unusual and expansive, and is much more willing to accommodate projects and investments that carry higher risk and promise longer-term rewards.

Figure 2: Addressing product-market fit change



Within a company, these different approaches to innovation can create a push-pull dynamic, requiring leaders to manage intramural tensions, make decisions in the face of contradictory advice, and allocate resources to achieve seemingly divergent goals. Exploring product-market fit often means challenging the "sacred cows" and fundamental business models of a company's core products and services; similarly, focusing on product innovation can make product-market fit work seem frivolous or irrelevant.

However, none of that should be discouraging. Mature businesses that have found a growth groove during predictable times by mastering product change should still invest in product-market fit change; because when significant and large-scale disruption is at hand, mastery of both is a must. As former Spotify CMO, Mayur Gupta recently put it,[10] "the only moat you have as an organization is your ability to move faster than the competition."

6. MASTERING PRODUCT-MARKET FIT CHANGE

Within the financial services industry, rapid technological, societal, and customer behavior shifts are increasing the risk of disruptive change. As such, the best time to invest in "horizon 3" product-market fit innovation was yesterday. The second-best time is now, with an important caveat: knee-jerk and reactive investments that fail to thoughtfully consider the need for underlying organizational, process, and business model changes will likely prove disappointing.

Instead, leaders seeking ongoing growth should strive to proactively identify product-market fit changes, rapidly and boldly experiment to learn and respond, and methodically transform their organizations to capitalize on the opportunities presented by new jobs to be done. Incorporating three key principles into people, processes, organization, and technology can help produce successful outcomes:

6.1 Learn in market

Always seek to understand the core functional, emotional, and social needs of your customers. Especially in times of rapid change in behavior and expectations, you should also be constantly validating the relevance of your company's job to be done for your customers. The ability to quickly and accurately understand customers can dramatically increase a firm's pace of learning while reducing the cost of those lessons, increasing the number of "shots on goal" and related chances for success.

"Leaders seeking ongoing growth should strive to proactively identify product-market fit changes, rapidly and boldly experiment to learn and respond, and methodically transform their organizations to capitalize on the opportunities presented by new jobs to be done."

This may sound like obvious advice. But for many businesses, especially large incumbents, it is easy to get wrong. One trap involves what Moesta calls "supply-side thinking."[11] This happens when firms rely too much on asking customers in controlled settings how they would use a product, then invest time and resources accordingly into shaping that product's features and benefits.

The best way to validate a value proposition is instead to put it in market, see how customers behave and react in "uncontrolled" settings, make changes, evaluate customer response, and continue testing until you truly understand their problems, goals, and pain points. In the past, this approach has been too costly and cumbersome for many companies, but in the digital world testing and validating value propositions this way is relatively easy.

At Citi, we are constantly looking for new ways to use digital technology to test ideas in market. By doing so, we reach customers at the moments they are seeking to solve problems – and receive unfiltered responses to proposed solutions. My group at Citi, D10X,[12] has a mandate to incubate differentiated

[10] Trachtenberg, J. A., 2020, "Gannett hires Spotify veteran in push for digital news subscribers," Wall Street Journal, September 8, https://on.wsj.com/3n45qKe
[11] Moesta, R., 2020, Demand-side sales 101: stop selling and help your customers make progress, Lioncrest Publishing
[12] https://citi.com/ventures/d10x.html

new products, value propositions, and growth opportunities within our larger bank. We have spent four years exploring customer problem spaces and using in-market validation methods to validate innovative concepts.

In 2019, D10X conceived, validated, and launched a new digital loan platform on a shoestring budget with just four months of development. Rather than relying on controlled primary research and user testing to validate and design the platform's underlying concept, we released a bare-bones prototype into market and let actual people play with it. This nimble approach yielded reams of data and key learnings on a variety of metrics that we are now using to inform future products.

6.2 Expand and change your measurements of success

Force yourself and your firm to look at alternative metrics as well as leading indicators for customer growth, satisfaction, health, and profitability.

Successful innovation often requires significant transformation – and very few businesses can summon the will to remake themselves without seeing a clear need to do so in the numbers. However, those numbers likely will not be found in familiar places. As a leader, you will need to imagine a profit and loss statement that does not yet exist and push your teams to come up with customer satisfaction measures that are not yet used. You will also need to focus on the kinds of leading indicators that inspire new product design, rather than on lagging indicators around marketing campaign performance.

For example, consider the New York Times, one of the few newspapers to successfully manage a digital transition. During the eight-year tenure of departing president and CEO Mark Thompson, the paper has gone from half a million digital subscribers to 5.7 million – more than halfway to Thompson's goal of 10 million subscribers by 2025.[13]

When Thompson came aboard, he knew the Times needed to make major and fundamental changes to its business. Revenues from print subscriptions, print advertising, and digital advertising were all in decline; meanwhile, the company's main source of revenue growth, adding digital subscribers, was quickly plateauing.

Thompson saw adding more subscribers – millions of them, more than traditional newspaper businesspeople thought possible – as the key metric of success. He realized that the Times needed to become a daily habit for its customers, like Netflix or Spotify. Hence, rather than orient the organization around gaining huge numbers of unique daily and monthly

[13] https://mck.co/3kSjOn0

visitors – a click-based metric that can be sold to digital advertisers – he pushed the Times to prioritize audience development measured by user engagement. That led the company to build strategies and products aimed at cultivating users at each step of their journey, starting with "one and done" readers and moving to habitual readers, newly paid subscribers, and finally retained subscribers.

6.3 Measure, evaluate, and manage investments differently

Outsized investment returns are always good. But establishing horizon three venture investing capabilities – whether through external startups, internal new product concepts, or both – can and should pay off beyond the bottom line. It should help your organization become smarter by learning how to identify emerging opportunities and how to measure, evaluate, and manage risky investments.

In turn, these learnings can be applied to internal investment in innovation that produces new and organic growth. The goal? Identifying product-market fit change and ways to quickly scale solutions that address it.

Product change organizations excel at making investment cases based on traditional return on investment (RoI). Product-market fit change organizations need to excel at making investment cases based on "return on learning" – and need the appropriate financial language and well-defined new concept growth and scaling processes to translate that learning into bottom-line growth.

7. CONCLUSION

The world is moving faster in 2020 than ever before, and the stakes for business leaders are sky-high. Innovating for growth is not a luxury anymore. As societal, economic, and technological shifts roil large and small firms alike, it has become a necessity.

In such a turbulent era, understanding the differences between product change and product-market fit change is crucial. So is organizing one's firm and building products and services around those types of change. The leading firms of tomorrow will be able to do both.

The challenge is great, but so is the opportunity.

FIVE KEY STEPS TO ADOPT MODERN DELIVERY IN YOUR FINANCIAL INSTITUTION

POORNA BHIMAVARAPU | Executive Director, Capco
DAVID K. WILLIAMS | Managing Principal, Capco

ABSTRACT

In this paper, we bring attention to the rapid shift taking place in the marketplace, with consumers, employees, and technology impacting the way financial institutions need to organize themselves and deliver their services and features by adopting modern delivery approach. We discuss the key drivers behind this shift, the core pillars of modern delivery approach, and the challenges in adopting them, and offer proven steps to successfully adopt modern delivery.

1. INTRODUCTION – A HOLISTIC VIEW OF MODERN DELIVERY

Throughout history, new technologies have reshaped the economy – from the Industrial Revolution to modern conveniences like navigation systems, on-demand streaming videos, and Amazon's Alexa. Businesses either learned to adapt to radical change, or they did not survive.

We are experiencing a similar transition now. The big difference is that the pace of change is exponential. The internet, smartphones, artificial intelligence, and robotics have created (and destroyed) entire industries over the last two decades. Most likely, more of the same is to come in today's winner-takes-all environment. This is why financial institutions, even those that are comfortable with some elements of their traditional waterfall approach to delivery, need to push beyond their firm's comfort zone to be nimble and embrace a transformative approach called modern delivery.

Adopting modern technologies, tool sets, and agile approaches to delivery is an integral part of modern delivery. At the same time, modern delivery is far more than technology or a process; it is a state of mind, a way of doing things. It is a belief system that affects the entire organization from human resources and information technology to finance and operations. In short, it is a change in culture that is supported by modern technologies and agile approaches. A modern delivery culture embodies a belief that by being more customer-focused, collaborative, adaptive, flexible, transparent, and open, an entire organization can significantly increase the pace of delivery while also creating more positive outcomes for customers and employees.

This holistic view of modern delivery offers financial institutions the opportunity to think more broadly about how modern delivery can affect any "product"[1] that they are building. It is not just about delivering technology, it is about leveraging technology to deliver digital products suited for the modern day, meeting expectations of modern customers and employees.

[1] Throughout this paper, we use the term "product" to broadly represent a digital product; a product is a holistic end-to-end feature offering of a technical capability, such as a digital banking app on a mobile phone, a payment solution, etc.

2. MARKET FORCES DRIVING CHANGE TOWARD MODERN DELIVERY

Three significant market forces are changing the way financial institutions must operate: the accelerated pace of change, shifting customer expectations, and newcomers to the workforce.

2.1 The accelerated pace of change

Advancements in technological innovations, like artificial intelligence and cloud computing, are accelerating the pace of change and simultaneously making it easier to adopt new technologies. Pace of change has been slower in some segments of consumer markets and industries, but the COVID pandemic has completely changed that dynamic. By some measures, change that would have taken ten or more years has been adopted within six months because of COVID-19.

As individual consumers, we can embrace new technology at our own pace. As business and technology leaders of financial institutions, we are not afforded the same luxury. Financial institutions must quickly adopt a culture of extreme agility to stay ahead of the market. Those institutions ahead of the curve will capture the majority of the market share while those behind the curve will struggle to survive. Customers, employees, and the competition drive tech adoption – often faster than our plans can absorb. Changing processes, plans, and practices at scale is time-consuming, risky, and may lead to short-term losses before generating long-term gains.

2.2 Customer expectations have hit an all-time high

Financial institutions will not be able to keep pace in the long term and meet their customers' increasing expectations if they continue to rely on traditional processes, approaches, and methodologies. Retailers and technology innovators like Amazon, Apple, Google, Netflix, and Uber have raised the customer experience bar high. Modern customers have high expectations and demand the same level of speed and ease of use, proactive service, personalized interactions, and connected experiences across the channels that they receive services from online retailers, fintechs, and other new competitors eager to serve them.

Research shows that understanding customers' needs – and exceeding their expectations – are becoming table stakes for businesses to compete. According to the "State of the connected customer" research report from Salesforce,[2] 76 percent of consumers expect companies to understand their needs and expectations.

> *"Modern delivery is far more than technology or a process; it is a state of mind, a way of doing things."*

66 percent of customers also report that it is easier than ever to take their business elsewhere – switching from brand to brand to find the experience that matches their expectations. As disruptive companies leverage breakthroughs in cloud, mobile, social, and artificial intelligence technologies to deliver personalized, valuable, and immediate experiences, customers have more choices than ever.

2.3 Digital-first products

The barrier to create a new financial institution has been drastically reduced with the emergence of digital first products. A holistic end-to-end customer experience can be provided through a web browser or through an app on a smart phone. In banking, companies like Chime, Ally, and Varo are leading the way with top notch customer experience, reduced fees, and even higher interest rates. In wealth management, Robinhood has been a clear leader with over 13 million users.

The push towards a complete digital experience has not only been reserved for younger companies that were conceived as digital first products, but it has impacted larger financial institutions and brick-and-mortar institutions as well. In fact, Capital One no longer offers a traditional bank account for new users. Their digital first product, Capital One 360, is their main checking and savings account offering.

The need and want for products that were designed for the digital age are amplified by late Millennials and Gen Z. From a very young age, Gen Zs have had smartphones or tablets in their hands and quickly learned how to use these digital

[2] https://sforce.co/3hgC3jx

devices. They consume digital content, and are quick to grasp concepts and to move on. The pace of their brain has moved in lockstep with the immediacy of their access to information and instant gratification.

This generation is reshaping the fundamental design of what a product is, as well as how those products are delivered and reflected in the workplace. This generation appreciates quick iterations, varied experiences, and a focus on their passion projects. They prefer roles and assignments that do not require lengthy commitments so that they can learn from the experience and incorporate those lessons into future projects. They get frustrated with traditional, ingrained thought processes and want to focus on what is next. They aspire to take the agile methodology out of job-specific applications and apply it to their careers at large.

Future-looking financial institutions must be willing to break the mold to accommodate and embrace this new generation to deliver digital first products. Moving to a modern delivery mindset and model using innovative technology tool sets is necessary to attract and retain the right kind of talent.

2.4 The way forward

This paper provides five tactics financial leaders can use to face the rising tide of change and give their businesses the opportunity to survive for long-term success by adopting a modern delivery culture.

3. SIX CORE PILLARS OF MODERN DELIVERY

The six core pillars of modern delivery are: coaching and adoption, agile enterprise IT architecture, business-managed IT, workforce modernization, delivery process modernization, and tool chain modernization. Each will be described below.

3.1 Coaching and adoption

Culture is at the core of modern delivery. It is a culture of servant leadership, self-organization, and a fail fast and fail forward philosophy. The culture of modern delivery needs to be inculcated, promoted, and nurtured over time. Coaching creates a foundation for a successful and sustainable transformation away from the traditional mindset, values, and behavior within an institution to adopt a modern delivery culture.

3.2 Agile enterprise IT architecture

Traditionally, enterprise architecture has been viewed as an ivory tower exercise detached from ground realities and taking years to adopt changes. Such an approach to enterprise architecture is not relevant anymore in today's fast-paced world, where both the technologies available, as well as consumer needs, are changing rapidly. At the same time, leaving IT architecture to individual product teams will undoubtedly lead to unwieldy and costly to maintain solutions that will be misaligned with overall business goals of the organization.

Modern day enterprise architecture needs to be evolutionary, flexible, iterative, collaborative, lightweight, and foster innovation. It is based on defining a set of foundational guiding principles at both enterprise and domain level, while leaving realization to collaboration with individual product teams on an ongoing basis. Just enough work is done upfront to create an "architectural runway" to realize near term feature needs while minimizing excessive redesign and delay.

It is estimated that 80 percent of digital businesses will take a collaborative approach to enterprise architecture, involving participants across business, IT, and beyond, by 2022.[3]

Leading enterprises have evolved away from monolithic legacy systems and towards service-oriented architectures (SOA), and have opened up new value chains through microservices and APIs, allowing internal and external consumers to leverage their data.

Adopting an "agile enterprise IT architecture" vision enables cloud deployment, microservices, APIs, DevOps, data analytics, and test automation. Modern delivery principles emphasize a balance between unlocking the power of data as an asset to the business and ensuring agile development with guardrails.

3.3 Business-managed IT

Traditionally, IT has been seen by the business as a cost center that pushes to deliver its own agenda. As organizations are compelled to create products that are more aligned with their business needs, business has grabbed a seat at the table when it comes to IT delivery. According to the Harvey Nash/ KPMG CIO Survey, 64 percent of organizations allow some

[3] Costello, K., "The evolution of enterprise architecture," 2019, Gartner, January 11, https://gtnr.it/32ewwpk

sort of business-managed IT while only 10 percent actively encourage it.[4] As products are becoming more holistic and encompassing of the full customer journey in the digital age, business has become more prescriptive of what they actually want from their digital offerings and technology, making the collaboration between IT and business teams more important than ever. Business-managed IT provides a path for organizations to offer customers a more complete and relevant product.

Business-managed IT provides increased agility during digital transformations through fast feedback cycles that allow business owners to shape products in line with customer needs.

3.4 Workforce modernization

Workforce modernization has two components: sourcing talent with proficiency in modern delivery and digital transformation, as well as retooling and preparing existing human capital with the necessary skills.

It is critical for the entire human resources (HR) organization, inclusive of recruitment, learning and development, performance measurement, and change management, to be the epicentre of workforce modernization and transformation of the employee experience. The employee experience journey consists of every interaction an employee has, from the first contact with recruiting through to hiring, onboarding, deployment, performance management, and to the last interaction as an alumnus.

Modern delivery requires a significant change in people's current roles to agile roles, and for the organization to develop cross-functional teams. The learning and development function within financial institutions is essential to facilitate and nurture an environment that supports continuous learning opportunities, combining fieldwork, classroom digital learning, social learning, on-the-job coaching and mentoring, and short workshops.

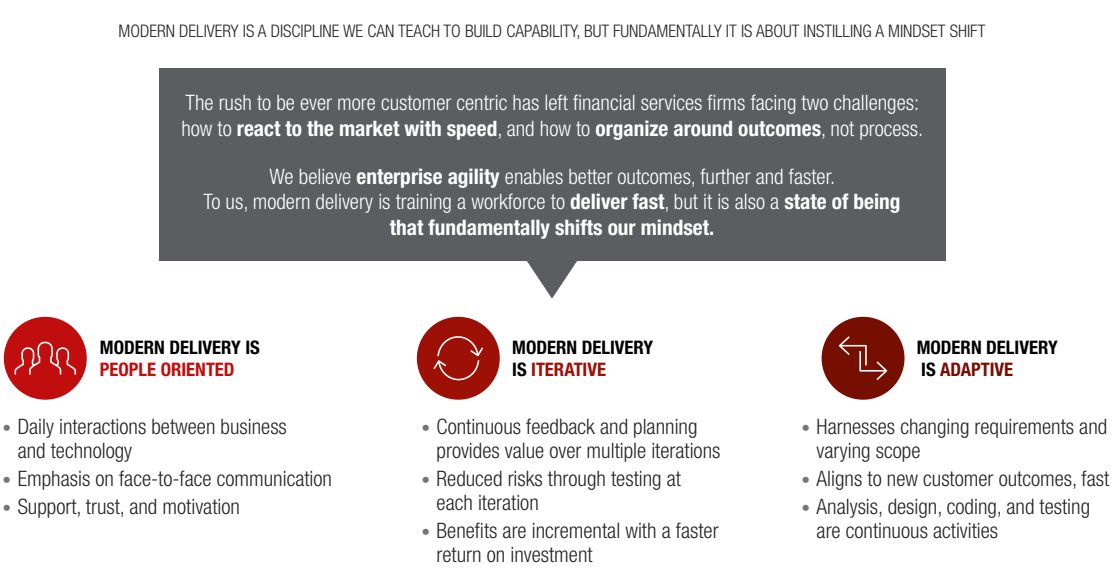
While an organization can provide all the necessary training opportunities, the mindset of employees needs to fundamentally change for them to be successful in a modern delivery organization.

3.5 Delivery process modernization

Using the agile methodology enables financial institutions to modernize their delivery frameworks to reduce waste, improve speed to market, boost quality, and embrace dynamic business requirements. Agile principles promote collaborative and outcome-based work environments, which develop rapid results without compromising on quality or management visibility and business value metrics.

Designing products for the digital age requires a different kind of thinking. A customer wants to feel like their end-to-end journey is complete, comprehensive, and seamless. Design thinking allows for this to be possible. Designers and user experience (UX) experts work alongside the business and IT teams in an agile development environment to build, test, and

Figure 1: Modern delivery



[4] https://bit.ly/3madecE

experiment in an iterative loop, revising from one prototype to the next to learn what will work; all while maintaining a continuous focus on the user of the process or product.

3.6 Tool chain modernization

A modern toolchain that promotes automation and efficiency across the delivery process is absolutely essential in modern delivery. The key to modernizing the toolchain is simple: automate everything that can be automated and think cloud first.

Testing is no longer a manual exercise that requires cumbersome and costly effort but is fully automated through modern testing frameworks. Physical servers have become archaic and even virtual servers are making their way out as they are replaced with containerized or serverless environments. Deployments are not as taxing. Automated deployment tools have replaced the need to manually deploy code to test or production environments, reducing the overhead to productionalize an application and make it easier to make changes to applications. Cloud computing allows for scalability not only in terms of size of servers that are needed or how many that are needed but it also allows organizations to offer services across boarders without the burden of having to standup infrastructure in other regions or countries.

4. MODERN DELIVERY OPPORTUNITIES AWAIT

For financial institutions that transition from a traditional waterfall methodology to a modern delivery approach, the business benefits and opportunities are plentiful across the spectrum of transformation work to deliver digitally native products or improve business operations technology.

Retooling and redesigning an entire business model, inclusive of people and technology, is a commitment, but one that pays dividends. Take BBVA,[5] Spain's second-largest bank, as an example. BBVA made a commitment to a modernization change. It started from the top in 2015, when Honorary Chairman of BBVA Foundation, Francisco Gonzalez, declared the bank's transition to digital, "BBVA will be a software company in the future." BBVA accelerated its digital transformation process with the launch of BBVA Next Technologies.

A scalable and modular customer-centric platform was one of the first priorities and technology investments for BBVA. It operates in real-time to provide mobile customers with the service they demand, such as BBVA Wallet, a mobile payments app that makes the bank competitive against new startups and digital companies.

This rapid-fire ideation and prototyping process, similar to the approach taken by financial technology startups, makes the company agile, more productive, and able to deliver innovation on a timetable similar to digital giants. Gonzalez believes BBVA's most prominent competitors will eventually be tech platform providers like Google and Amazon, so he is focused on proactively transforming his bank well before they enter the industry. BBVA's knowledge of its customers and what they want should be vital in helping the company remain competitive even if tech titans decide to step into banking.

4.1 Modern delivery is faster

Rather than going from functional requirements through development, build, and test cycles, modern delivery and agile techniques emphasize delivering a small piece of functionality and business value early, and then continuously improving and adding more functionality throughout the product's development. With incremental delivery and iterative feedback loops, cross-functional teams yield shorter wait times, help avoid slack, and reduce customer friction by focusing on delivering customer value.

4.2 Modern delivery is cheaper

By incorporating design thinking, user research, and a constant focus on the customer, modern delivery reduces waste by prioritizing the essential features customers want and eliminating unnecessary work to build less significant features that may eventually become obsolete because of rapidly changing technological innovations – embodying the well-known 80-20 rule in software development. According to research by Pendo, approximately 80 percent of features in the typical cloud software product are rarely or never used,[6] amounting to U.S.$29.5 billion in waste.

[5] Semple, C., and L. F. Espinosa, 2017, "BBVA launches its open banking business," November 16, https://bbva.info/3ih1Klv
[6] Baverman, L., 2019, "Pendo data suggests $29.5 billion in global cloud R&D investment squandered when software features go unused," Pendo, February 5, https://bit.ly/3ifCGvf

4.3 Modern delivery is better

Modern delivery enables financial institutions to scale and pivot based on customer needs. With the continuous improvement of the product based on constant customer feedback and faster deployments with automated testing, a higher quality product is delivered to customers every time, resulting in higher customer satisfaction. This also translates into high employee satisfaction.

4.4 Modern delivery is hard

Modern delivery requires a change in mindset of the entire organization all the way from C-suite executives to on the ground execution teams and, at the same time, from client facing business teams to IT teams delivering business capabilities. Such a change in culture is hard and take a lot of commitment from everybody in the organization to succeed. At the same time, there is a massive reskilling of workforce and IT investments needed to adopt to the way of modern delivery.

5. SUCCEEDING WITH MODERN DELIVERY: FIVE STEPS TO HELP YOU ON YOUR WAY

As financial institutions confront the accelerated pace of change, high customer expectations, and demands of a new workforce, five best practices can help ensure the successful adoption of modern delivery.

5.1 Invest in changing the culture first

A shift to modern delivery is an enormous cultural change for the entire financial organization. In order to benefit from a modern delivery culture and approach, the whole organization must transform, and the new assumptions must be taught to all members of the organization as the correct way to perceive, think, and feel about those problems. Starting at the top, each financial services firm will need to define its organization's modern delivery values and purpose and develop a change management program focused on embedding modern delivery culture in every corner of the company.

Management needs to be fully supportive of transitioning to a modern delivery model, hence the first step is to gain executive management buy-in from the board and CEO.

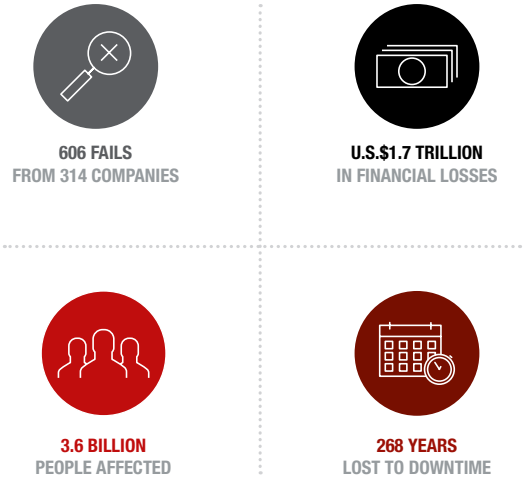
5.1.1 ORGANIZATIONAL CULTURE AND RESISTANCE TO CHANGE ARE BARRIERS TO AGILE ADOPTION

Change is never easy. Most financial services firm have large organizations within IT and project management groups supporting their renovation portfolios. These functions compete and overlap, and are often built around waterfall and legacy development and change delivery techniques. To get organizational buy-in and truly adopt modern delivery, financial institutions must take a hard look at all those internal organizations, understand their relevance and purpose, and engage them in change.

5.1.2 Management needs training first

The transformation to modern delivery needs to start by changing the culture of the management team. The modern delivery culture change will become embedded in the financial institution when the senior leaders of the company are modeling the agile values, mindset, and behavior for the rest of the institution. Operating in an agile mindset from the top enables the same behavior throughout the product teams, allowing for resources to prioritize organizational goals over

Figure 2: Cost of software fails in 2017



personal goals. Leadership and delivery teams should focus on building a long-term relationship built on trust; this provides ownership and decision making power to delivery teams.

5.2 "Shift left" to focus on quality of transformative projects, as well as products

Financial institutions have traditionally taken a tactical approach to testing – using software developers or testers to detect defects at the end of the software development process. However, this approach is fundamentally flawed, and results in errors that cost the U.S. economy an estimated U.S.$1.7 trillion.[7]

The term "shift left" refers to a practice in software development in which teams focus on quality and work on problem prevention instead of detection and begin testing early and often. The goal is to increase quality, shorten test cycles, and reduce the possibility of unpleasant surprises at the end of the development cycle; or even worse, in production.

By shifting integration testing to the left of its usual position in the delivery pipeline, it occurs as close as possible to the build process. In modern delivery, specifications are in constant flux as the team learns about customer needs, hence it is critical to shift the mindset of the team to testing early and throughout the process, not at the end. By using agile development processes and proactively testing early and continuously, delivery teams can isolate the most disruptive, significant defects sooner for faster remediation and discovery of issues related to performance, security, data corruption, or fraud. This smarter approach to continuous testing results in quality at speed. The quality management element of modern delivery should become an engineering practice. With processes in place for concurrent testing and development, quality and speed can be achieved together.

5.3 Embrace speed, change, and failure

Fail fast is an agile philosophy that values early feedback and incremental development to determine whether an idea has value. An important goal of this "fail fast, succeed faster" philosophy is to cut losses when testing reveals that something is not working. Failing fast seeks to take the stigma out of the word "failure" by emphasizing that the knowledge gained from a failed attempt increases the probability of eventual success.

Take, riding a bike as an example. When you first learn how to ride a bike, you are told to move fast and you will not fall. Similarly, succeeding in current fast paced world requires moving fast to gain a certain amount of momentum to achieve a flywheel effect. To keep pace with the market and develop customer-centric products and services at a rapid rate support, you have to move fast, or you will fail.

Conducting retrospectives and taking them seriously is a sure-fire way for management to get comfortable embracing failure and trusting their teams to do their jobs. When done well, these agile meetings can highlight opportunities for change, generate meaningful process improvements, and ultimately move the team in the right direction.

Retrospectives can be used for any team working on a shared project, but the sprint retrospective is especially optimized for an agile production team. The retrospective should create a safe, blameless space for team members to share their honest feedback on what went well and what could be improved for next time. Since there are a lot of moving pieces and people involved, along with the pressure to deliver new features every one or two weeks, miscommunication is bound to arise during the agile process. That is why it is crucial to have open communication and be transparent during these meetings. Miscommunication breeds a lack of trust – and that will kill any team project.

These are a few of the many benefits of retrospectives:

- It provides a platform for the team's opinions to be heard and influence change.
- It enables the team to put a support structure in place to be able to recover quickly from missteps.
- It helps to differentiate various functions of the business on a risk gradient and push for higher risk-taking where allowed.
- It demands trust from everyone in the organization.

[7] https://bit.ly/2Ran1S3; https://bit.ly/2F94B1E

5.4 Fund teams over projects

Financial organizations have relied on traditional project funding and project management methods for decades: an annual planning cycle to select the better opportunities based on a business case and a plan with a fixed scope, schedule and cost, a dedicated project team to execute the plan, and an oversight function like program management office to monitor variance from the plan. These methods are often perceived as complex and bureaucratic, but they have been effective for traditional initiatives.

When moving to modern delivery and agile, many financial institutions typically form teams and yet keep their traditional waterfall project-based funding structure in place because that is the way they have always done it. This conventional approach is easily understood from an operational standpoint as it shows a defined start and end date that is tightly aligned with the cost of the project, and it shows the cost of the work that is on deck to be delivered.

These project-based methods do not work for agile initiatives, since agile practitioners begin with different assumptions. They see that customer needs change frequently and that breakthrough insights can occur at any time. From a modern delivery vantage point, annual cycles constrain innovation and adaptation. Unproductive projects burn resources until their budgets run out, while critical innovations wait in line for the next budget cycle to compete for funding.

Instead, agile organizations adopt a different method for budgeting, called product-funding or capacity team-funding. This method distributes available funding across self-organizing teams. The major shift is moving from the traditional approach of taking people to projects and programs to the modern way of taking the right kind of projects and products to the teams who are well equipped to develop them.

The project management office no longer plans the work for others, nor do they track the cost of the work at the project level. Expenses are fixed, and work that takes longer than expected does not change the budget. Self-organizing teams that operate at peak capacity use a prioritization framework to evaluate and slot new ideas and projects into the pipeline and prioritize them without escalation to management. The key concept is to have a fixed capacity of product teams and variable capacity within reason to quickly support unexpected issues, such as new user feedback on product features and regulatory requirements.

> *"Modern delivery culture change will become embedded in the financial institution when the senior leaders of the company are modeling the agile values, mindset, and behavior for the rest of the institution."*

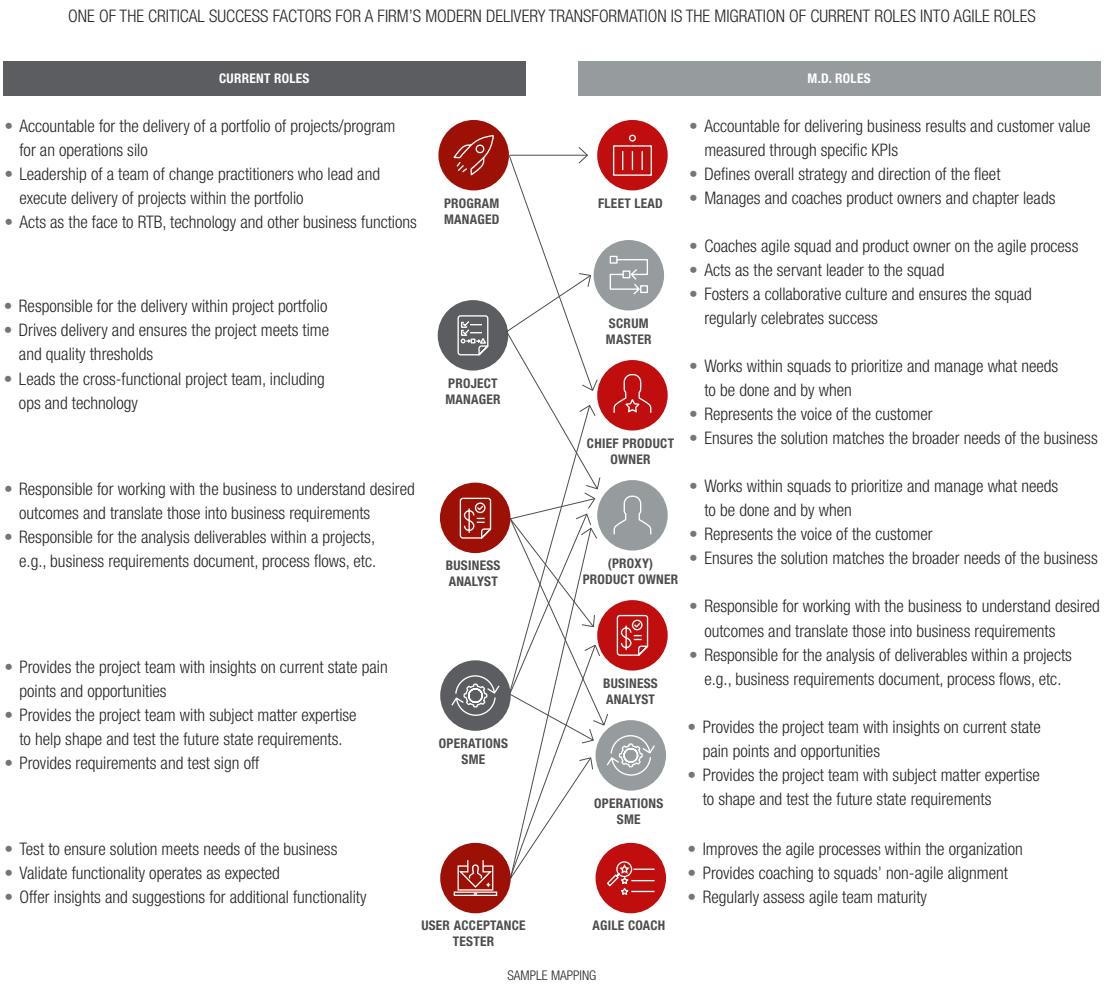
Changing from a traditional framework to a modern delivery model means that funding and planning functions must change to align with a new mindset and paradigm. This new way of funding people over projects must be instilled in the DNA of the business. The financial services firm will incur initial costs to scale throughout the program; however, it is the cost of doing business. Businesses that fail to adopt this approach will be left behind.

5.5 Invest to develop cross-functional teams

One of the critical success factors for a firm's modern delivery transformation is the migration of current roles into agile roles. A common concern for financial institutions is figuring out what to do with all of the people who are still going to have jobs and who are still on the team. Of course, this is a profound challenge. Roles must change, often through "battlefield promotions", where high performing project managers, for example, may be suddenly put in the role of scrum master, or individuals that have never written code may be asked to function as developers.

These battlefield promotions and lack of training – both at the executor level and at the execution level – lead to fear, uncertainty, and doubt. To succeed, it is paramount for senior

Figure 3: Evolution of roles



management and employees alike to be trained in their new modern delivery roles.

The investment in an agile coach is key to building and developing cross-functional teams within an organization. An agile coach is someone who is experienced in implementing agile projects and can share that experience with a project team. The most important responsibilities of an agile coach include:

- Encouraging adoption of the agile culture and mindset from the top-down and bottom-up.
- Modeling agile values, mindset, and behavior to promote cultural change.
- Teaching and sharing insights on agile best practices.
- Helping the workforce transition to an agile way of working successfully.
- Promoting an agile culture across multiple product teams and coaching them to become self-promoters of the agile culture.

With this organizational change, financial institutions require structural changes to focus more on the team for agile development to be successful. New modern delivery teams consist of business, technology, design, and user experience (UX) functions that engage in daily face-to-face interactions.

These teams are supported by business function owners and business operations teams to enable the execution of delivery, sometimes embedding these business subject matter experts or their representatives in the delivery teams themselves.

Figure 3 is a visual that explains how traditional roles need to evolve to modern delivery roles.

6. CONCLUSION

Now is a prime time to commit to a profound and powerful transformation that has a limited window before your competitors – traditional financial organizations, new entrants, fintechs, and technology giants – leapfrog into the winning position.

Investing in a modern delivery culture offers financial services firms an immense opportunity to get and stay ahead of the curve to survive in today's rapidly changing and competitive landscape. This new mindset and way of working allows financial institutions to modernize their workforce to embrace Gen Z while meeting modern customers' ever-increasing expectations. By adopting a more customer-focused, collaborative, adaptive, flexible, transparent, and open agile culture, financial services firms will be able to provide more positive futures for customers and employees like never before.

The alternative scenario of financial services firms attempting to maintain their traditional waterfall approaches on aging technologies in this dynamic environment is less appealing and less profitable, by the day. Leaders of the past who do not change will struggle to survive. New leaders will be on the upswing. Which side will you be on?

LEADING IN THE DIGITAL AGE

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ABSTRACT

Digitization is changing the world of work at a dizzying speed and bringing about new challenges for business leaders. We argue in this article that the key attributes needed for effective leadership under these conditions are technology competence, acknowledgement of basic human needs, and a leader's underlying values. We further discuss the requirements for successful virtual collaboration and teamwork, and give specific recommendations. Finally, we highlight that in order to successfully cope with the demands of the digital age, leaders need to accept leadership development as a task of lifelong learning and present promising approaches in this direction.

1. INTRODUCTION

The COVID-19 pandemic has forced many leaders to make tough decisions, which often include layoffs. Have you ever had to lay people off? If so – how did you do it? Did you take the time to talk to your employees in person and explain the situation transparently, maybe even offering them a severance payment? Or did you choose a communication channel that allowed you to reach many people at once to be more efficient?

A bad example of leadership in this kind of situation seems to have taken place in a U.S. e-scooter company in March 2020, as reported by different media [Bergman (2020)]. Former employees describe how over 400 people got laid off at once via a Zoom webinar. During the "webinar", participants faced a grey screen and heard an anonymous voice telling them that they were all losing their jobs. Participants' cameras and microphones were deactivated so there was no possibility to ask any questions or connect with each other. After the message was delivered, the computer screens of the (former) employees got dark. The employees' computers had been remotely shut down by the company.

The world is changing at a rapid pace and leaders face new challenges in this digital age [Peus and Hauser (2020), Peus (2020)]. As new technologies emerge quickly and challenge traditional business models, production methods, or distribution channels, leaders have to realign their organizations at an unprecedented speed. In some instances, dismissals might be inevitable, but they can be carried out in very different ways, either signaling fairness and respect or ignorance, even contempt for human dignity; providing a true testimony to the organizations' values. As technological advancements provide greater opportunities than ever before, leaders need values that guide them like a compass – because if you do not stand for something you will fall for anything.

Putting human dignity first is more important – and sometimes more challenging – than ever before. It is imperative from an ethical, as well as a business point of view. To value-oriented leaders, fair treatment of, and good relationships with, their employees has always been important. However, due to digitization and the new possibilities it brings, good relations with employees remain important even after the employment relationship is terminated. Overnight, yesterday's employee can be tomorrow's important customer, supplier, or investor. Investing in good relations and keeping the longterm in mind is, therefore, a requirement for leaders in the digital age.

Treating people well is also required as digitization has not only transformed career paths and relationships but also provided new opportunities for people to share their personal experiences. In the 21st century, people have countless options for expressing their opinion publicly. The story of layoff

scenarios or other leadership misbehaviors can be shared with thousands, even millions of people all over the world – within seconds. Complaining about the company or even taking revenge has never been easier and more powerful as this excerpt from a New York Times blog highlights "you can leak business secrets to competitors, send anonymous reports to OSHA or other regulatory agencies, start rumors, cause flat tires on company vehicles, crash computer networks, etc. Be creative, be careful, and remember they deserve it and you will feel better" [Barling (2014)]. Consequently, leaders in the digital age do well in thinking twice about how they lead and end relationships with their employees.

In this article, we argue that leadership in the digital age not only requires treating people with dignity and respect, but that it also requires leaders to understand and consider basic human needs more generally and to act as rolemodels guided by an inner compass of values. This is truer than ever before as the Covid-19 pandemic has been acting like a magnifying glass, revealing the shortcomings of leaders, organizations, and entire systems. In this article, we highlight some of the most important challenges leaders face in the digital age and discuss how they can be overcome. We also give recommendations on how to lead people virtually, which many leaders have been forced to do since the beginning of the pandemic at the latest.

2. GENERAL DEMANDS ON LEADERS IN THE DIGITAL AGE

Digitization makes a leader's words and deeds much more visible. The old saying: "the higher the monkey goes, the more of his behind he shows" [Paschek (2020)] is more pertinent than ever. Leaders set examples, whether they like to or not. They are, therefore, challenged to set examples, be it with regard to technological advancements or with regard to treating people.

2.1 Technology competence

New technologies have revolutionized which business models are profitable, how organizations produce goods, or which communications channels are best suited for reaching employees or customers. As failing to embrace a technological trend can have disastrous outcomes for previously successful companies, as we have learned from prominent examples such as Nokia or Kodak, having an overview of the latest technological developments and their implications is crucial for today's business leaders. Consider, for example, that additive manufacturing revolutionizes how replacement parts or building materials are produced, bio-engineering presents entirely new methods of developing vaccines or medication, and algorithms fundamentally change – or even abolish – professional services such as tax consulting.

Technology competence required of today's leaders includes the ability to scout for technological advancements and understand the implications these developments have for the company. How do they impact the organization's production, distribution, or communication? Do they – in the long run – threaten the business model the company is relying on? Do technological advancements lead to the rise of competitors that had not even been on the radar shortly before (as happened in the automobile industry, for example)? And how can the new technologies be used to the benefit of the organization? What changes are required to leverage the potential these technologies carry?

In line with the requirement of being a role model, leaders have to be examples of the changes they want to implement within their organization. When organizations embark on the journey to digital transformation it is important that leaders know their own digital tools and are open to new experiences and behavioral change to be credible. As real behavioral change requires self-reflection, leaders should ask themselves if they are able to adequately use the tools they envision as necessary and ask their employees to use. Furthermore, approaches such as "reverse mentoring", where younger employees familiarize managers with the latest technological developments and support them in utilizing those, can be helpful. In short, the old saying "don't ask of others what you don't do yourself" is still valid in the digital transformation.

2.2 Acknowledgement of basic human needs

In recent decades, some of the most groundbreaking technological inventions were made, which fundamentally changed how we work and live. The working world is changing at dizzying speed. However, what has not changed for decades, even centuries, is human nature. How humans "work" has only changed marginally over the entire history of mankind. Basic psychological needs stay the same in the digital age: people feel the need to be in control and to experience autonomy. They want to be appreciated and acknowledged for their work. They strive for transparency and fairness, as well as for trust and safety. People also have the need to belong and to be part of a group. Moreover, people are looking for a purpose in their work [Peus and Frey (2009)]. One responsibility for leaders in

the digital age is to be aware of the basic psychological and individual needs of their employees. It is one of the biggest challenges to be able to reconcile these needs with the business needs and the changing work environment.

How can leaders meet the needs of their employees and what constitutes effective leadership? Researchers have been trying to find answers to this question for several decades now. One concept that has received a lot of research attention is **transformational leadership** [Bass (1985)].

Transformational leaders inspire their employees by communicating an appealing vision and expressing optimism that together this vision can be achieved (inspirational motivation). They provide individualized support and coaching to their employees (individualized consideration) and encourage them to think independently and to question the status quo (intellectual stimulation). Finally, these leaders are aware of the daily challenge of becoming a positive role-model for their followers and let their deeds be guided by overarching ethical values (idealized influence).

Can a leadership theory introduced 35 years ago really be of help in the digital age you might wonder? A legitimate question, especially when we consider that in 1985 digitization was in its infancy and the first ever IBM personal computer was only 5-years-old. However, a recent meta-analysis analyzing relations between transformational leadership and relevant outcomes in about 180 studies shows that transformational leadership is in fact associated with higher levels of performance, job satisfaction, trust, identification, engagement, and with lower levels of unethical behavior at work [Hoch et al. (2018)]. Thus, the concept of transformational leadership can still serve as a guiding framework today.

Leaders are increasingly asked to communicate the overall vision or purpose. Concordantly, organizations with a "transformative purpose" have been able to attract top talents to a much higher degree than others. Furthermore, when people understand and embrace the purpose they are willing to accept measures that are annoying or even hurtful to them; however, if they do not understand the purpose or do not believe the reasons that are communicated to be the truly underlying ones, they are likely to rebel (as we have seen during the COVID-19 pandemic).

Trust is a key ingredient of effective leadership in the digital age. The more uncertain the situation, the more ambiguous the information, the more important it is that employees can trust their leaders and look to them for a sense of direction. However, receiving trust from employees usually requires giving trust to them first. How difficult this can be is highlighted by several examples of managers reacting to COVID-19 induced home offices, as described below.

An additional challenge in a work environment full of uncertainty due to rapid changes is employees' need for "fairness". This is an especially tricky one, as fairness is a highly subjective construct and a fair distribution of resources (distributive fairness) can often not be achieved. However, the good news is that the negative consequences of a (perceived) lack of "distributive fairness" can often be compensated for by three other types of fairness [see the meta-analysis by Colquitt et al. (2001)]: first, research on "procedural fairness" points to the fact that people are willing to accept decisions that have negative consequences for them – even dismissals – when they perceive the process by which the decision was made as fair. This is likely to be the case when the following five criteria are met: consistency (the same principles are applied consistently across time and different situations), impartiality (the principles are applied to different people in the same fashion), accuracy (the decisions are based on comprehensive information), representativeness (the decisions take into account the views and needs of different stakeholders), and correctability (criticism or disagreement is allowed). A second important component of procedural fairness is the aspect of "voice". Were employees given the chance to voice their opinions and listened to? The third type of fairness is called "interpersonal fairness", which is evident when people are treated with dignity and respect and criticisms are communicated at eyelevel. The fourth type of fairness, "informational fairness", requires leaders to communicate bad news as candidly and openly as good news, for example in change situations. It is self-evident that the dismissal described at the beginning of the article violated these principles, as employees did not receive the information about their dismissal from their managers and did not even know what the "webinar" they had been invited to was going to be about (informational fairness), were not treated with respect, as they only heard an anonymous voice speaking to them from

a grey screen (interpersonal fairness), and did not have an opportunity to ask questions or articulate their point of view (procedural fairness). It would be surprising if employees had not reacted with emotions like anger and contempt for their managers and intended, or actually shown, acts of retaliation.

Finally, in times of change, and especially in times of crisis, people yearn for control. However, as crisis situations often times mean that people actually do not have influence on important developments – as we have all experienced during the COVID 19 pandemic – leaders are challenged to create "second order control" as far as possible. That is, they have to increase "predictability", i.e., by explaining what the organization is planning for the future, how this will impact the individual employee, etc. Given that even this capacity is often limited in change or crisis situations, at least the lowest degree of control, that is "explainability", has to be established as far as possible. How important control is for human beings is evidenced by psychological research: the higher the degree of control was that inhabitants of a senior citizens home experienced in a randomized field-experiment the higher their life satisfaction, the lower their level of medication, and the longer their lives [Rodin and Langer (1977)].

In summary, the best and newest digital technology cannot be of any use if a leader does not know about the basic human needs and how to address them – be it by exercising transformational leadership, implementing organizational fairness, or creating a sense of control among employees.

3. VALUES AS AN INNER COMPASS

As digitization presents unprecedented opportunities, leaders need values to guide them – but not as a navigation system you can directly follow, but rather as a compass that provides a sense of direction. A stable value system allows a leader to not only clearly articulate what they stand for, but to also quickly make decisions under pressure. Absence of values, on the other hand, challenges leaders to have to decide on the spot, choosing between countless alternatives and stakeholder interests.

A recent example highlighting the lack of a moral compass and its detrimental consequences is the case of Wirecard, a German payment company. This most recent and scandalous disclosure of leadership misconduct (and suspected fraud) was revealed during the pandemic. Several media reported how in June 2020 Wirecard collapsed after the organization's management could not "find" €1.9 billion, which had been listed in their accounts – because the money seems to have never existed. What followed was insolvency, the arrest of the former CEO, and a worldwide manhunt for a former executive board member who has gone into hiding [McCrum (2020)].

Despite this and similar examples, there are many business leaders who are highly aware of their values and enact them, even under pressure. Examples include countless leaders who have been considering all the possibilities for avoiding layoffs during the crisis and who set examples by substantially cutting their own pay. To highlight this kind of behavior and to give attention to leaders who are in fact guided by a moral compass but hardly ever appear in the press (because of their lack of scandals), a number of business leaders in Germany have founded the "values commission". Each year they organize public "values dialogues" and survey more than 500 managers, asking them to indicate which of the following values they deem as most important for their actions: responsibility, integrity, respect, sustainability, trust, and courage. For the last three years, the value that was regarded as most important was trust. Interestingly enough, this year's results [Heidbrink et al. (2020)] show that respect was regarded as much more important than in the previous years [Hattendorf et al. (2019)] – maybe because the COVID-19 pandemic caused managers to regard others more as human beings than as employees and to respect them as persons?

Although many leaders and companies seem to be aware that values-oriented leadership is important, it is obviously not always implemented in concrete leadership behavior. Companies that lay off hundreds of people via email or a zoom webinar within minutes certainly show disregard for important values such as respect. A company suspected of fraud in the billions with one of the former top-level executives currently running from the law is also not what you would call a prime example of values-oriented leadership. With regard to what is technically possible in the future, values become even more important. At that point, values set a moral compass that is essential for leadership in the digital age. Values give orientation besides what is technically possible and what is legal – they give leaders orientations of what is right. It should be added that in August 2020, hundreds of Wirecard employees finally got laid off – via email [Reuters (2020), Schlenk and Hunter (2020)].

4. REQUIREMENTS FOR VIRTUAL COLLABORATION AND LEADERSHIP

4.1 Trust

After a keynote on leading in the digital age at a conference in 2019, one of the participants asked us a question: "How can I control my employees from a distance? How can I keep track if they work at all when I cannot see them?" If we look at the news over the last few months, this seems to be a question that was on many leaders' minds during the pandemic. According to the media, there were numerous cases where bosses bought spy software so that they could track their employees' activities in the home office [Mosendz and Melin (2020)]. However, how employees can be controlled from a distance is the wrong question in the first place. The right question would be: what are the conditions I can create as a leader that allow my employees to bring high levels of performance while working from home?

The first answer comes from transformational leadership: employees need to know what the overall purpose of their work is and what the vision is they are working towards. They need to be given direction and guidance. However, there are several arguments against excessive monitoring. Monitoring employees most likely creates a culture of mistrust and is likely to decrease the psychological safety employees perceive. "Psychological safety" is a concept that leaders in the digital age would want to foster. People who experience psychological safety at their workplace are more likely to contribute new ideas, initiate new projects, or make leaders aware of erroneous developments. Psychological safety is also related to information sharing and learning behavior. All of these are important outcomes needed to successfully handle the challenges of our rapidly changing world [for more information about psychological safety, see the meta-analysis by Frazier et al. (2017)].

Furthermore, at least when it comes to knowledge workers, leaders cannot fully control if their employees are productive anyway. They might be able to track if employees are online and (if legal in the respective country) possibly even take screenshots of their open browser windows and programs on a regular basis, but they cannot look inside their heads. And how do we know that an idea that was evaluated as useless today will not be of major importance for tomorrow's success? Furthermore, a leader that is constantly busy spying on employees in the home office will not have much time left for important leadership tasks like creating a vision, providing orientation, setting goals, or working on the organizational strategy in the face of new technological developments.

At that point, trust is an important ingredient of leadership, which is not new, but more important than ever. At a time in which so much changes so quickly and incredible degrees of specialization in individual fields are reached, it is no longer possible for leaders to be involved in each work step. Trust and a positive human image are, therefore, basic prerequisites for positive human relations and performance. Results of a meta-analysis by De Jong et al. (2016) show that trust within a team is indeed positively related to team performance – even more than the impact of the team's trust in the leader.

Of course, trust needs to be developed and cultivated between two parties and in teams. It also requires clear communication about general terms and conditions for collaborating, specific tasks, deadlines, etc. (although these also do not necessarily have to be developed top-down). Employees also need to know to what extent they have the freedom of decision and action, which in turn depends on the task itself and its required speed of decision making. Yet again, autonomy is also an important antecedent of psychological safety [Frazier et al. (2017)].

4.2 Adequate use of digital tools for cooperation and communication

Digitization is substantially changing how leaders and teams communicate and collaborate. In their recent article, Larson and DeChurch (2020) give an overview of the implications of digital technology for leading teams and how perspectives on this topic developed over time. According to the authors, the oldest perspective on digital technology (starting in the 1990s) was to consider it merely as the context a team works in. Here, technology is understood as certain tools that help with and support regular teamwork, like email or video-conferencing tools. However, from this perspective technology is considered to be separate from the team, as some teams use technological tools while some others do not. The newest perspective, however, now 30 years later is described as the idea of "digital technology as a teammate", fully integrated into the team. This is the case in human-robot teams or human-AI (artificial intelligence) teams, where a distinct team role is fulfilled by digital technology. From that perspective, digital technology also contributes to team performance itself. The authors point out that, depending on the perspective teams and organizations have about technologies, different implications

for leadership emerge. However, not every organization has human-robot teams yet. As the pandemic, and the associated issues due to the lockdown, demonstrated, a substantial number of organizations still seem to have the perspective of technology as context, many of them comprehensively using video-communication for the very first time. However, no matter what stage teams and organizations are at, successful virtual collaboration is one of the main aspects people associate with effective leadership in the digital age. There are several things a team, and also leaders, need to consider here.

For virtual collaboration, clear expectations and agreements between leaders and employees are essential. Collaboration can get easier if leaders communicate their expectations, for example how long and when do they expect employees to be online? How quickly are they expected to answer to messages, and what communication channels should be used for which purpose? When it comes to virtual team meetings, it is also important to set common rules, like how to raise your hand virtually, how to take a team vote, etc. Finally, it is helpful for the leader to know what employees expect of him/her. That does not mean that leaders have to fulfill all of these expectations, rather they can clearly communicate how they want to collaborate and what expectations are not realistic.

In addition to clarifying expectations and "rules of the game", leaders are well advised to mindfully use the different types of media. One aspect to keep in mind is media richness [Daft and Lengel (1983)]. For example, emails or letters are not very rich media, as they provide only written content. Especially when people are new to a team they often do not have the common understanding of expressions and unexplained processes like the other team members, which makes short written messages harder to understand. The lack of mimic and facial expressions, as well as missing cues like the intonation of the spoken word, holds a potential for misunderstandings. In addition, video conferences do not cover the full spectrum as body language and physical signals cannot be transported completely.

Leaders and teams also have to keep another dimension of media in mind that is important for communication: the level of synchronicity [Dennis and Valacich (1999)]. Team members and leaders here also have to deal with differences in available tools and communication channels. Synchronous media interrupt the communication partner, but do make it is possible to discuss things, ask questions, and provide immediate feedback (examples are face-to-face communication, telephone, video conference, chats and messengers, etc.).

Asynchronous media do not interrupt the contact person, as they can decide for themselves when to react to messages (examples are mail, letters, email, voicemail, etc.). Which of the channels you use affects the possible degree of immediate interaction. Consequently, team members and leaders need to agree on certain rules regarding how to collaborate virtually to prevent misunderstandings and wrong interpretations. For newly formed groups, or to help new team members, media with higher levels of synchronicity are more helpful [Dennis and Valacich (1999)]. Furthermore, when we think back to the different levels of fairness, interpersonal fairness would rather demand a synchronous media when life-changing messages, like a layoff decision, are delivered. If a leader and a team have been working together for a long time, expectations and rules of the game are clear and there is a common understanding of concepts, wherefore asynchronous media can be the media of choice. However, one must not forget that every relationship needs to be nourished, hence, taking the time to deliver appreciation and respect for the other also lies within the responsibility of a leader.

4.3 Leadership development in the digital age as a task of lifelong learning

As we find ourselves in rapidly changing times and everything seems to move so quickly, we need to understand that effective leadership in the digital age is a marathon, not a sprint. Along with the disruptive changes of organizations and markets due to digital transformation, leadership development has to change as well. Leadership development can no longer take place for a very select group of people at designated (and comparatively short) times. Consequently, leaders, as well as providers of leadership/HR development programs, need to change their mindsets and approaches in accordance with the idea of continuous transformation: the change does not end – education should not end either just because you have obtained a certain age, position, or status! Leadership development must be seen as a constant companion and, therefore, as a task of lifelong learning.

Both professional and executive education are essential for effective leadership in the digital age. They are likely to be effective if they include a combination of the following components: theories on effective leadership grounded in empirical evidence (such as transformational leadership), practical tools to apply these theories in daily life, self-reflection, and systematic feedback from others. Furthermore, leadership development programs must be designed in a way that they enhance the continuous application of learned content to daily business life, and the possibility to find answers to challenges from business life in the program. Finally, including elements that enable new experiences (in addition to cognitive understanding and skill building) seem important. Digital technologies offer amazing new potential in this regard. Applications, such as a "digital leadership coach", enable a leader to set individual goals and be reminded to implement them by their smartphone. The integration of robots into leadership development programs allow leaders to experience first-hand the upsides, as well as the challenges of working with robots. Finally, virtual reality offers the opportunity to experience situations and try out different behaviors (and potentially their consequences) to an extent that was unthinkable until recently. It offers the opportunity for leaders to not only watch different types of leadership in the same situation, but also experience what they feel like not only from an observer but also an employee perspective. Now, for the first time, they can really experience what it is like to be informed about your dismissal either from a manager who candidly and respectfully explains the reasons and gives you room for questions and voicing your views, or from an anonymous voice during a "webinar". This type of experience is likely to inform how leaders handle this type of situation once faced with it and how they lead in this digital age more generally.

5. CONCLUSION

The world is changing at an ever increasing speed, posing new challenges for leaders. However, what remains constant is human nature. Acknowledging important human needs such as fairness or the quest for purpose, giving trust to employees, and developing a moral compass grounded in ethical values enables leaders to steer their teams and organizations through these challenging times effectively and responsibly. Remaining as such requires lifelong learning.

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DESIGNING A DIGITAL WORKPLACE: INTRODUCING COMPLEMENTARY SMART WORK ELEMENTS

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ABSTRACT

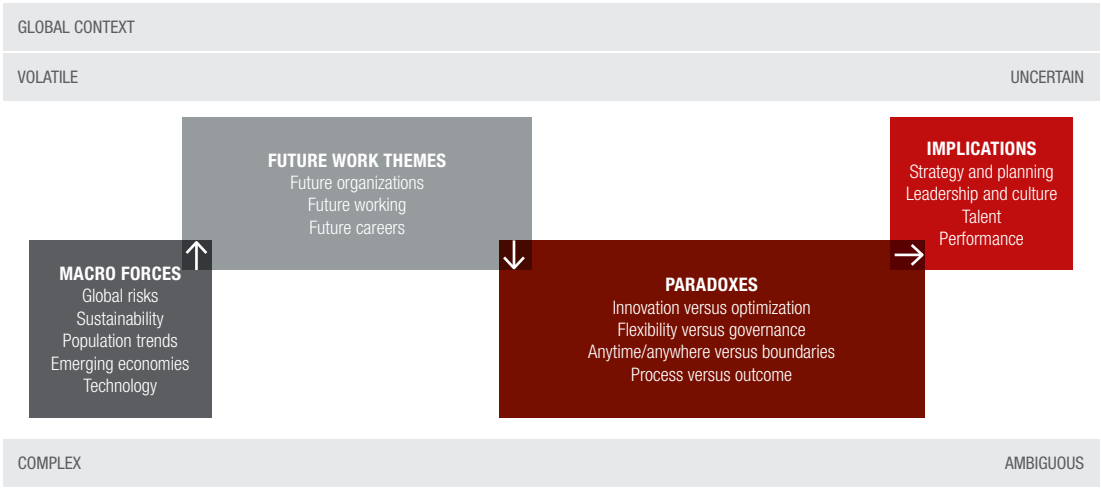
Organizations are taking advantage of new technology to change the way they work in response to the increasing complexity and unpredictability of the business environment. Simply adopting new technology is not, however, enough to ensure the success of a digital workplace design. The technology itself is just one of four key elements that are vital to designing "smart" digital workplaces. The others are the workforce, new ways of working (NWW), and leadership. All four must be considered in terms of the overarching goal the organization is aiming to achieve with its digital workplace transformation. It is crucial to identify the current situation pertaining to each element and any changes required to bring about the desired transformation. Moreover, the four elements are not independent, but interact in various and sometimes unexpected ways; hence, successful digital workplace design must take into account the complementarities between the different elements and adapt accordingly.

1. INTRODUCTION

The rise of the digital economy is fundamentally changing the way organizations worldwide operate their businesses and deliver value to customers. Increasingly, organizations have to maneuver in a world of volatility, unpredictability, complexity, and ambiguity [Baptista et al. (2020)]. In such an environment, organizations need to react quickly to ongoing changes that are often out of their control [Attaran et al. (2020)]. It is becoming more difficult to anticipate events or predict how they will unfold, which means organizations have to take action without much certainty. Furthermore, an organization's environment is more complex and dynamic, with many interdependencies, making it difficult to get an overview of how things are related. Finally, the demands on organizations and management are often contradictory and paradoxical, hence organizations may find they have to act in situations that are unfamiliar and outside the range of their expertise [Forman et al. (2014)].

A number of macro forces, such as globalization, the drive for sustainability, population growth and aging, the rise of emerging economies, and technology trends, are affecting future work trends in different industries in different ways [Sørensen and Pillans (2012)]. In terms of future organizations, new designs, such as networked and flat organizations, are growing in importance – in these designs, many objectives are achieved through collaboration with partners and external contributors rather than with permanent employees [Cappelli and Keller (2013), Evans et al. (2004)]. Hierarchies are replaced with fluid, flexible project teams that work in agile ways [Cappelli and Keller (2013), Okhuysen et al. (2013)]. In terms of future working, there will likely be different impacts on how work is conducted. For example, routine-based and repetitive tasks are being automated, outsourced, or moved offshore [Brynjolfsson and McAfee (2014), Frey and Osborne (2013), Willcocks and Lacity (2016)]. Work that is based on

Figure 1: The future world of work



Adapted from Sørensen and Pillans (2012)

knowledge and expertise is expected to be enhanced rather than replaced by technology [Baptista et al. (2020)]. In terms of future careers, more people will choose to work independently, which will decrease the number of full-time, permanent workers. In addition, more people will accept itinerant work for reasons of economic necessity [Spreitzer et al. (2017)].

These future work trends introduce a number of paradoxes. One is that organizations need to find a balance between growth through innovation and entering new marketplaces and the need to continue exploiting their existing businesses [O'Reilly and Tushman (2013)]. Another paradox is that work can be done anywhere, anytime due to the proliferation of technology and to flexible work options, but such flexibility necessitates some clear work-life boundaries for the individual worker to avoid burnout [Stein et al. (2015)]. A further paradox could be the need to respect employees' individual and collective desire for flexibility in decision-rights while maintaining some level of governance structure of decision-rights in the organization as a whole [Ross et al. (2019)]. Finally, there may be a paradox in how leaders choose to measure the performance of their workers – whether it is on process or the outcome of their work. As long as workers produce the expected outcome, leaders might wish to ignore the process. Yet, some process measures may be important as a way to figure out how to continuously improve processes and become more innovative [Eckhardt et al. (2019)].

As illustrated in Figure 1, these macro forces, future work trends, and paradoxes combine to generate implications for both strategy and operations. For example, many organizations need to improve their corporate foresight capabilities to ensure that future work trends become part of their strategic direction and daily planning [Rohrbeck et al. (2018)]. There will also be a need for a new style of leadership that shifts from traditional command-and-control towards visionary communication and collaboration [Eseryel and Eseryel (2013)]. Visionary leaders tend to be more externally focused and better at identifying new opportunities. Furthermore, leaders need to be able to create and support collaborative environments that foster innovation. Finally, in terms of new ways of working, there will be a need for more flexible career structures [Spreitzer et al. (2017)] and flexible work practices, at the individual, team, and organizational levels [Crocker et al. (2018), Van Diermen and Beltman (2016)].

Collectively, such considerations paint a complex picture of the future world of work. In this paper, we aim to provide suggestions for how organizations can design a digital workplace that tackles this complexity by including a holistic organizational configuration of people, processes, and technologies to improve operational efficiency and to meet organizational goals [Attaran et al. (2020), Ross et al. (2019)]. These suggestions are based on our own and others' state-of-the-art research studying various aspects of work digitalization

[Baptista et al. (2020), Gal et al. (2020), Stein et al. (2015), Ross et al. (2019)], as well as discussions we have had with numerous executives from different industries as part of our teaching engagements at the Copenhagen Business School. The ambition is to propose ways in which organizations can build a digital workplace that supports a new mindset and that drives new behavioral norms in the organization. We argue that new mindsets and behaviors can be created through a synergy of four elements that work together:

1. Technologies of the digital workplace
2. The workforce
3. New ways of working (NWW)
4. Leadership

While we cover each element on their own, we emphasize how these elements work together, sometimes in unexpected ways. It is important to point out that we do not believe that there is one ideal digital workplace arrangement that works across different contexts or even within any one organization [Raguseo et al. (2016)]. Rather, we may be moving towards a future where multiple digital workplace arrangements need to coexist harmoniously [Ross et al. (2019)]. The starting point for organizations when designing digital workplace(s) is to think in terms of complementary "smart work" elements, as described next.

2. SMART WORK ELEMENTS

Smart work is a new worldview, which covers "all the fundamental aspects that determine work, how it gets done, what motivates the worker, and what guarantees the output" [Boorsma and Mitchell (2011)]. Overall, smart work uses digital technology to transform the "workplace" so that work can actually be performed independently of time and place [Raguseo et al. (2016)]. In a smart work culture, the established archetype of 9-5 office work is replaced with working anytime. Similarly, the physical office space is replaced with working from anywhere [Boorsma and Mitchell (2011)]. Furthermore, smart work fosters a social and collaborative work environment based on a networked way of operating that determines how, when, and where work is done. Because of networking technologies, organizations can both optimize their existing work practices and create new ones.

Within the framework of "smart work", we introduce four elements that we consider vital for designing "smart" digital workplace(s) (Table 1).

Next, we briefly describe each of the four elements necessary for designing "smart" digital workplace(s).

Table 1: Smart work elements

SMART WORK ELEMENTS	CHARACTERISTICS
DIGITAL TECHNOLOGY	Digital technology serves as a vital trigger for, and enabler of, smart work practices: digital technology is used to support communication and collaboration, social networks, telework, VR, file sharing, real-time data, mobile work, etc.
WORKFORCE	Workforce characteristics, qualifications, and competencies: these include level of education, IT literacy, skills (upskilling and reskilling), autonomy, motivation, satisfaction, flexibility, readiness, etc.
NEW WAYS OF WORKING	New ways of working covers the extent to which employees can manage their working conditions in a flexible way: this includes cultural change, organizational development, agility, flexibility, etc.
LEADERSHIP	Leadership styles and leaders' ability to influence others: these provide a vision, create consensus, demonstrate emotional intelligence or common sense, etc.

Adapted from Raguseo et al. (2016)

2.1 Technologies of the digital workplace

The digital technology element is often considered as a vital trigger for, and enabler of, new workplace design [Raguseo et al. (2016)]. The development and diffusion of digital technologies and services can support new forms of communication, file sharing, collaboration, and social networking. Employees can use digital technology to interact effectively in real time, even if they are scattered in disperse settings, thereby optimizing their work processes and production [Baptista et al. (2020)].

While technology plays a key role in digital transformation, defining what we mean by workplace technology is not straightforward. Overall, workplace technologies "refer to a range of digital services that enable work within organizations" [Baptista et al (2020)]. According to Gartner, the evolution of digital workplace technologies can be divided into four generations [Attaran et al. (2020), Levy (2015)]. First generation technologies include audio and video conferencing tools, as well as technologies that support group scheduling and discussion forums. The overall aim of first-generation technologies is to increase productivity and to improve internal and external communication [Attaran et al. (2020)].

With second-generation digital workplace technologies, the purpose is to optimize the workspace and to ensure real-time collaboration by use of web-based technologies for instant messaging, online conferencing, and virtual teams. The third generation of digital workplace technologies includes the use of mobile devices, file sharing technologies, and the cloud to provide platforms that support knowledge sharing, real-time decision making, as well as the creation of communities of interest. Finally, the fourth generation includes emerging technologies such as artificial intelligence, machine learning, and robotic process automation to ensure timely decision making and process optimization [Attaran et al. (2020), Eckhardt et al. (2019)]. Over time, organizations have adopted increasingly more complex workplace technologies [Baptista et al. (2020)]. Whereas early workplace technologies supported individual office work (e.g., calculators, emails, and mobile devices), later technologies, such as knowledge management systems, collaboration platforms, and social media, supported group interactions. Most recently, we find advanced workplace technologies that include artificial intelligence, sensors, as well as integrated digital platforms to augment work practices [Baptista et al. (2020)].

Alternatively, workplace technologies can be categorized in terms of their scale. This approach highlights the diversity of workplace technologies. Technologies can range from large-scale global infrastructures like the internet to tiny sensors, with platforms, enterprise systems, and personal devices in between [Sørensen (2017)]. This way of conceptualizing workplace technologies clarifies the role of technology at work on three levels: small, large, and at scale [Sørensen (2017)]. Technology in the small refers to the increasing miniaturization and personalization of computing devices. This includes both individual members of the organization having direct access to computing wherever they are, and also the use of "machine-to-machine" (M2M) technologies that operate without direct human engagement. Both result in greater convenience and flexibility for individuals, but also make those individuals increasingly dependent on digital devices. Technology in the large refers to the expansion of digital networking activities in organizational computing (such as ERP (enterprise resource planning) systems, customer engagement platforms, and supply chain management networks). Connecting into global networks and digital infrastructures enables the development of inter-organizational processes and the creation of new platforms. Lastly, technology at scale refers to complex digital computational processes taking advantage of the exponential growth in computing capabilities [Sørensen (2017)]. These are both data and processing intensive, and will often be carried out in some form of distributed cloud service arrangement, but can also be located within an organization's data center. This level captures computation that powers capabilities like Google search or Amazon Web Services.

There are also technologies that bridge the small, large, and at scale. One example is the SAP CoPilot – a digital assistant for the enterprise (now part of SAP Conversational AI). In the small, CoPilot is an app that an individual can run on their phone. In the large, it draws on business data, data from other applications, as well as on external data to which a business has access. At scale, CoPilot links to data, networks, and computing capabilities that are not owned by SAP, like Amazon Web Services, Microsoft APIs, and the like. In short, it leverages a broad network of technologies and global infrastructure to deliver the best decision making aid for enterprise managers.

In summary, unpacking what we understand by workplace technology is important in identifying what generations or levels of technology are currently present in any given digital workplace, and what generations or levels of technology might be needed.

2.2 The workforce

The workforce element refers to the people working for a particular organization. Alternative work arrangements change the relationship between workers and employers. The workforce of the 21st century experiences increased flexibility both in when they work and in where they accomplish their tasks [Spreitzer et al. (2017)]. Furthermore, the contemporary workforce increasingly demands work to be meaningful, preferring a variety of tasks involving different skills and significance. They also demand greater autonomy, more feedback, and richer measures of responsibility [Lysovaa et al. (2019)]. These workforce demands raise important considerations about the qualifications, competencies, and IT skills of the employees. Leaders can decide to hire workers with the skills needed, but the supply of technical talent is often limited [Donovan and Benko (2016)]. Another approach is to upskill and/or reskill the existing workforce.

New workforce trends go hand-in-hand with changing workplace demographics. There is an increasing number of "born-digital" millennials and other digital-savvy employees. Furthermore, employees want their experience of work to be flexible, real-time, technology-driven, and collaborative. Based on current knowledge of new workforce trends and

the demand for flexibility, Spreitzer et al. (2017) classify "alternative work arrangements" along three dimensions: employment, scheduling, and location. The first dimension is about flexibility in the employment relationship. This includes shifts from standard terms of employment to shorter-term work assignments, such as part-time work, on-call work, seasonal work, freelancing, and contracting. An increasing number of so-called gig workers provide on-demand services via online platforms. Examples could be Uber drivers or workers who offer to do odd jobs on the American online marketplace, TaskRabbit, but also highly skilled programmers and data scientists offering their services on platforms like TopCoder. The second dimension is about flexibility in how work is scheduled. For example, workers can work in such a way as to accommodate customer demands and the changing internal needs of the organization. Research shows that it will lead to less absenteeism when employees can schedule private appointments during working hours and make up for the missed work time later on [Spreitzer et al. (2017)]. The third dimension is about flexibility in the location of where work is accomplished. Today, most work can be performed outside of the place of employment, for example with clients, and people are increasingly working from home, cafes, their summerhouse, or some other location.[1]

Each type of flexibility comes with benefits and challenges for the employer and employees. Research shows that flexibility in where work is conducted is beneficial to the individual worker, as it will often lead to a reduction in work stress, and increase the feeling of autonomy, job satisfaction, and job performance [Lysovaa et al. (2019), Stein et al. (2015)]. At the same time, there are also downsides to such flexibility. Leaders should be concerned about how changes in work arrangements affect the way work is accomplished and how people feel about their work. Technology makes it possible to work longer and harder than employees can cope with [Stein et al. (2015)]. When employees can conduct their work wherever they are, the danger is that all spaces and all times become workspaces and work times. Furthermore, because a manager can always see whether a worker is online or offline, the worker can worry about the consequences of being offline "too much". Over time, the separation between being a "private individual" and a "working professional" may become blurred. Conversely, recent research also shows that employees working at a distance may fear being overlooked, forgotten, left out, or ignored by management [Hafermalz (2020)]. Because of such fear, workers are not concerned about being monitored. On the contrary, they use technology to put themselves "on display" in order to gain attention, influence, and approval from peers and especially management.

To address such dilemmas, Eckhardt et al. (2019) present three readiness dimensions for leaders to consider when preparing their workers to work in flexible ways. First, there is "mental readiness", which concerns whether an employee or group of employees is mentally ready to work in new ways. For example, remote workers should be able to balance both personal and work activities – and manage non-work-related sources of stress while working. Due to the high exposure to technologies, such workers may suffer from techno-stress [Tarafdar et al. (2007)], which may result in work overload, invasion of privacy, and role stress [Ayyagari et al. (2011)]. Second, it is important to consider the "technology readiness" of the organization and whether it is technically geared to support new ways of working [Eckhardt et al. (2019)]. For example, various technologies are needed to enable in-office and remote employees to work closely together. Advanced communication and collaboration skills can enhance working relationships, including know-how in terms of working efficiently with digital media. Technology readiness is also about employees' ability to identify and use relevant information. Third, it is important to assess the "relationship readiness" among team members, so as to create a common identity and foster the mutual trust team members need in order to accomplish highly complex tasks as efficiently and effectively as possible [Eckhardt et al. (2019)]. Here, it is important to provide enough autonomy to the individual and to the team of individuals to unleash creativity. The relationships between a leader and individual should be based on trust rather than control [Lysovaa et al. (2019)].

Unpacking the workforce element is important in identifying the current level of workforce flexibility in any given digital workplace, as well as identifying what flexibility is needed. Similarly, it is important to consider what level of workforce readiness is needed when designing digital workplace(s).

[1] With the COVID-19 pandemic, flexibilities in scheduling and location are becoming increasingly important so that businesses can adjust to the new realities of movement restrictions and social distancing to which employees must adhere. Meanwhile, employment flexibility may offer businesses alternative ways of keeping workers at least partially employed despite temporary financial difficulties.

2.3 New ways of working

Broadly, the new ways of working element includes those policy and administration practices that enable employees to exercise flexibility in their work [Raguseo et al. (2016)]. This could include training programs, new communication plans, new goal management systems, projects that support cultural change, organizational development, and competence development. Smart work requires new standards and a specific working culture that changes the attitude and behavior of employees to promote innovation and risk-taking.

In line with van Diermen and Beltman (2016), we discuss new ways of working at the individual, team, and organizational levels. At the individual level, new ways of working refer to four principles. The first is that employees should be autonomous in managing their own work. Leaders need to exercise trust, not control, and work should be organized independently of location and time. The second principle is that employees should have unlimited access and connectivity, hence the workplace should offer an easy and accessible digital experience. The third principle is that employees should have flexible working relationships. This means that they operate under the principle of "my size fits me", not "one size fits all", and can regulate their own patterns of work. Finally, and as the fourth principle, employees should be goal driven. This means instituting an experimental mindset, so leaders think in terms of metrics over directives.

At the team level, new ways of working refers to agility created through group-level networks formed from employees throughout the organization. Agility in a team can be nurtured by avoiding collaborative overload, engaging the fringe to better resource teams, and leveraging boundary spanners for learning and knowledge-sharing [Crocker et al. (2018)]. Research has shown that collaboration is never equally distributed in an organization. Typically, approximately 30 percent of valuable collaborations come from less than 5 percent of employees. As these people become overly relied upon, they are more likely to experience burnout and eventually resign [Cross et al. (2016)]. Consequently, leaders need to encourage overburdened employees to redistribute collaborative work by agreement with their immediate manager. Agility requires the integration of different capabilities and perspectives, but those who are new to a group, or who do not necessarily see things in the same light as others, are often left out of key projects or teamwork. Research shows that recent hires are at risk of leaving the company before reaching the three-year mark if they are not integrated into projects within the first year [Crocker et al. (2018)]. Leaders can help those on the periphery integrate by creating a demand for their competencies. This can be done, for example, by pairing newcomers with network influencers as part of staffing or mentoring. Agility also requires learning and knowledge sharing via forums or special events that bring together employees from different organizational functions, thus converting them into boundary spanners [Crocker et al. (2018)].

At the organizational level, new ways of working refers to an integrated approach focused on bricks, bytes, and behavior [van Diermen and Beltman (2016)]. Whereas bricks concern real estate, housing, and facilities, bytes refer to computing networks, including hardware and software. The third aspect, behavior, is considered a key determinant of success when building a new workplace. Behavior reflects the human factor, and it is argued that leaders "...should manage on output in a flexible working environment where trust, responsibility, result-driven and autonomy are key aspects to perform well" [van Diermen and Beltman (2016)]. An integrated approach to all three can help establish new behavioral norms in an organization. The individual flexibility and team agility discussed above must be supported by appropriate technologies (bytes) as well as appropriate physical facilities.[2]

In summary, unpacking the new ways of working element is important for identifying what new ways of working are already present and what new ways of working are needed in any given digital workplace.

2.4 Leadership

The leadership element concerns leaders' ability to influence others, to change organizations, provide a vision, create consensus, to use emotional intelligence, or even common sense. There is little agreement in research as to whether leadership is about inherent traits, skills, and/or behaviors [Van Wart (2013)]. While this remains an open question, there is some agreement that good leadership behaviors can be learned. Next, we introduce six well-known styles of leadership with different behaviors [Goleman et al. (2013)].

[2] We do not focus on the bricks element in this paper, but interested readers can learn more about the importance of the physical facilities in van Diermen and Beltman (2016) and Raguseo et al. (2016).

The commanding leadership style is best captured by the phrase, "Do as I say!" Commanding leaders require immediate compliance with their demands. The commanding style is useful for creating fast results but can impede organizational flexibility and lower employee motivation. By contrast, the visionary leadership style is best captured by the phrase, "This is where we are heading: come with me!" Visionary leaders will motivate their employees by showing the way, and work best when clarity on direction is needed. The affiliative leadership style is best captured by the phrase, "People first". The leader will focus on creating harmony and emotional bonds. This is particularly effective when trying to improve morale and the sense of being a team, but the premium placed on recognition can result in a failure to criticize underperformance. The democratic leadership style is best captured by the phrase, "What do you think?" By giving employees a say in the decision process, the leader builds up responsibility and flexibility within the organization. The downside of this style is that it can waste time on endless meetings. The pacesetting leadership style is best captured in the phrase "Do as I do, now." This establishes standards of performance by example, and is most effective with self-motivated and competent employees. Finally, the coaching leadership style is best captured by the phrase, "Try this". Such leaders aim to develop future employees, and to that end will let others experiment with new solutions and generally seek to ensure independence.

According to this framework, the key to success is variation [Goleman et al. (2013)]. Leaders who have taught themselves how to vary between different leadership styles generate the best working climate within their organization and produce the best results. Similarly, in many workplaces the styles could be distributed among different individuals in the leadership team. In a digital workplace, it will be crucial to consider how these different styles can be used together to foster new ways of working, such as employees managing their own work and forming agile teams.

Each of the six styles of leadership embodies a different way in which leaders can influence new behavioral norms in the organization [Maitlis and Christianson (2014)]. In the visionary leadership style, where clarity on the direction is required, leaders can actively frame and disseminate visions and ideas to others to increase their understanding through sensegiving. Here, sensegiving practices include offering descriptions and explanations, and presenting a trustworthy and consistent narrative. A leader can give sense by explaining the who, what, how, when, and why, as well as by providing personalized information to help employees understand how the new digital workplace design will affect them. The leadership team often plays an important role here in clarifying the vision, the values underlying it, and the actual changes required to obtain the desired results [Van Diermen and Beltman (2016)]. However, it is not only leaders that give sense. Others, such as change agents, project managers, and technology super users may also facilitate sensegiving in a more collaborative style [Maitlis and Christianson (2014)].

Different forms of organizational sensemaking [Maitlis and Christianson (2014)] align with the different leadership styles or their combinations. "Guided" sensemaking happens when leaders are actively engaged in constructing understandings and explanations and communicating them to employees. This way, employees are very much engaged in sharing their views and ideas about new ways of working. This can be achieved through a combination of visionary, pacesetting, and democratic leadership. Conversely, "restricted" sensemaking happens when leaders convey overarching explanations to their employees, who tend to accept what they are being told, with few alternative understandings being provided. This approach depends mainly on visionary leadership. It can be advantageous when everyone understands the workplace digitalization initiatives, but it may also reflect an organizational culture in which employees are trying to ignore change. "Fragmented" sensemaking emerges when employees speak up, raise issues, voice concerns, and argue for possible solutions and leaders rely mostly on democratic and affiliative leadership styles rather than trying to organize or guide discussions. In this context, attempts to establish a new work culture may create a chaotic environment and fuel rumors, and most likely not a shared idea of where the organization is heading. Finally, "minimal" sensemaking occurs when both leaders and employees are passive and await each other's reactions to a given situation, often in response to some external trigger. This is also likely to be detrimental to the success of a new workplace design.

In summary, unpacking the leadership element is important in identifying the style or combinations of styles of leadership that are present in any given organization, and those that are needed for effective sensemaking around a new digital workplace arrangement.

Table 2: Strategic complementarities: a practical approach

GOAL: IDENTIFY AND DESCRIBE THE OVERALL TRANSFORMATION GOAL	(1)	(2)	(3)	(4)
(1) Identify and describe a technology capability to achieve the goal		+	+	+
(2) Identify and describe a workforce solution complementary to technology to achieve the goal			+	+
(3) Identify and describe new ways of working complementary to technology and workforce to achieve the goal				+
(4) Identify and describe leadership capability complementary to technology, workforce and new ways of working to achieve the goal				

Adapted from Brynjolfsson and Milgrom (2012)

3. ELEMENT COMPLEMENTARITIES

The four "smart" digital workplace elements described above are not independent of one another. To tease out their interdependencies, we draw on the notion of complementarities. Complementarities are one way of thinking about the combined effect of multiple elements in a configuration. Complementarity or synergy is "the interaction of two or more forces so that their combined effect is greater than the sum of their individual effects" [Brynjolfsson and Milgrom (2012)]. For example, an organization is likely to have an overarching goal they are aiming to achieve with a digital workplace transformation. The organization is then likely to reach a number of decisions and implement multiple initiatives related to technology, workforce, new ways of working, and leadership in order to achieve this goal. The key insight from a complementarity analysis is that these decisions and initiatives "interact" – while each individually may help achieve the overall goal, their interactions might not [Brynjolfsson and Milgrom (2012)]. In designing a digital workplace arrangement, it is, therefore, essential to consider how the decisions and initiatives "complement" or "contradict" each other. In Table 2, we visualize a complementarity analysis for designing a digital workplace.

Each decision about a particular element is numbered and labeled and appears in both a row and a column. Because the complementarity relation is symmetrical, it is enough to check just the upper half of the table. Shaded in grey are those entries that do not need to be checked. A plus sign in the cells of the table represents a complementarity that is hypothesized to be present, a blank cell would represent a lack of a direct interaction and a minus sign would represent a contradiction. In the context of designing digital workplace arrangement(s), the aim is to analyze planned initiatives related to technology, workforce, new ways of working, and leadership to ensure they are as complementary as possible, while avoiding contradictions.

Interestingly, while complementarities are essential for a successful transformation, complementarities are also the reason widespread change is difficult. Because of complementarities, changing only one practice or a few practices at a workplace (e.g., switching to agile principles in teamwork without providing necessary technological support, workforce training, or coaching by leaders), is likely to reduce overall performance. Nevertheless, making multiple changes at once can be difficult because of coordination challenges, implicit mental models, existing assumptions, heuristics that carry on even when explicit practices are changed, as well as synchronization and timing issues [Raguseo et al. (2016)]. Furthermore, it is essential to think about "why" a transformation is necessary to begin with. After all, complementary initiatives cannot be designed effectively if the overarching goal is unclear or underspecified.

In the context of designing digital workplace(s), the starting point is, therefore, always an overarching goal or vision for the transformation. This answers the key question: "why are we building a digital workplace?" Then decisions should be made regarding which smart work elements to put in place and how they are evaluated in relation to this goal and to each other. Given that being digital is key to a digital workplace, a concrete starting point is then to consider how to use technology to achieve the specified goal. It is essential, however, that the digital workplace transformation does not stop with technology capabilities. Instead, the next step would be to consider how to achieve the specified goal with a

Table 3: Strategic complementarities: example

GOAL: UNIVERSITY BECOMES A LEADING ONLINE EDUCATION PROVIDER	(1)	(2)	(3)	(4)
(1) Complementary decision re technology (e.g., partner with an interactive online learning platform; no point in building one's own)		+	+	+
(2) Complementary decision re workforce (e.g., hire temporary help for content production; reduce permanent teaching staff)			+	+
(3) Complementary decision re new ways of working (e.g., retrain professors in online teaching)				+
(4) Complementary decision re leadership (e.g., share and shape vision of future education in own region)				

workforce solution that is also complementary to the desired technology capability. This is followed by a consideration of how to achieve the specified goal with new ways of working that are complementary to the desired technology capability and the workforce solution. Finally, the complementarity analysis considers how to achieve the specified goal with a leadership capability that is complementary to all of the above. As more elements are added, the complexity of the analysis and the planning increases, but so does the likelihood of generating an integrated, coherent digital work arrangement.

To demonstrate the procedure of thinking through complementarities, we introduce the case of a university management team that wants to become a leading online education provider in their region – this is something many universities have been moving towards for a number of years and the process has been dramatically accelerated due to the COVID-19 pandemic. The first thing for the university to consider is how to achieve this goal with a technology capability. For example, the university might decide to partner with an interactive online learning platform like Coursera instead of building its own platform, as that is not its core competency. The next step is to consider how to achieve the goal with a workforce solution that is also complementary to the technology capability. The university management team may decide to hire temporary help to get started on producing content, and then reduce permanent teaching staff over time. This will help the university move fast, and complements the strategy of partnering with a platform; i.e., the university will focus on scaling up content production, which is its core competence, while limiting its responsibility in terms of developing and maintaining technology. Next, the management team needs to consider how to achieve the goal with new ways of working that are complementary to the technology capability and the workforce solution. Here they may decide to retrain professors in online teaching. One could argue that this decision is complementary to partnering with an online platform and to hiring temporary help, as it helps the university in focusing both on their core competency and long-term sustainability. Temporary help allows the university to scale, but it needs renowned professors in order to produce high-quality content that will set them apart from competitors on Coursera. Next, the management team should consider how to achieve the goal with a leadership capability that complements the other three solutions. Here they may decide to focus on a combination of visionary and democratic leadership styles, emphasizing the importance of sharing and shaping the vision of future education locally and globally, while including other university stakeholders in making this vision operational. Arguably, a clear and strong vision will help bring university staff and academics on board for the retraining, it will help alleviate concerns regarding potential reductions in teaching staff, and it will set the university apart from competitors on Coursera. Finally, it is important to note that many iterations of a complementarity analysis may be needed. In this case, questions regarding each of the elements, as well as the overarching goal, may arise that necessitate rethinking the initiatives. For example, the university may want to reflect on whether their goal is to become a leading "online" education provider or a leading "blended" education provider, depending on their market position, placement in rankings, and attractiveness to domestic and foreign students. We have summarized the example in Table 3.

Table 4: Questions to ask when designing a digital workplace

TRANSFORMATION GOAL	TECHNOLOGY SOLUTION	WORKFORCE SOLUTION	NWW SOLUTION	LEADERSHIP SOLUTION	COMPLEMENTARITIES
Is the scope and timeline of the chosen goal/ problem realistic?	What technology solutions are needed? (e.g., among the four generations)	What would be the workforce's demands in terms of flexibility?	What new ways of working practices (individual, team, organization) are needed?	What leadership style(s) are needed? (commanding, visionary, democratic, etc.)	Are the described elements (technology, workforce, new ways of working, leadership) complementary?
Is it the right goal/ problem? Why does it need to be addressed? (e.g., optimize processes, generate new digital offerings)	What level(s) of computing are needed? (e.g., small, large, scale)	What actions are needed to improve the workforce's readiness?	What levers need to be in place to support new ways of working? (bricks, bytes, behavior)	How to facilitate organizational sensemaking?	

4. CONCLUSION

Identifying the four elements and their complementarities helps leaders set the strategic agenda and plan the design of their workplace. Such effort requires as its starting point an overarching goal or vision for the transformation, including careful consideration of its ambition, scope, and timeline. Since organizations have to maneuver in an increasingly uncertain, complex, and paradoxical environment, in which they need to adapt to ongoing changes that are often out of their control, it is vital for the success of the digital workplace design that leaders consider "why" a digital workplace is needed in the first place and whether the goal is realistic. Furthermore, they should discuss what smart work elements are necessary to realize it – see Table 4 for guiding questions that leaders can ask when designing a digital workplace.

Once the transformation goal for the digital workplace is defined, it needs to be made concrete. A starting point is to consider what technologies are already available in the organization and/or what IT solutions are accessible on the market to attain the goal. Furthermore, the IT department should consider how a combination of different levels of computing (small, large, scale) can help achieve an integrated approach. It is important to remember that "a successful digital transformation is not a technology-driven endeavor – rather, more than anything else, it is a cultural and organizational transformation" [Attaran et al. (2020)].

Consequently, the next thing to consider is what workforce solution is needed to achieve the transformation goal. Here, a good starting point for analysis would be inquiring into employees' own demands for flexibility in terms of type of employment, schedule, and location. It is also important to identify their readiness for digital workplace transformation along the three dimensions of mental, technology, and relationship readiness. For example, mental readiness reflects whether an employee is mentally ready to work in new ways. Actions for achieving mental readiness include hiring people with the right skills and attributes, or reskilling or upskilling the existing workforce [Donovan and Benko (2016)].

The next item to consider is what new ways of working practices are needed at an individual, team, and organizational level. It is also worth considering what levers are in place to help establish new behavioral norms in the organization. Here, it is important to provide training in the new ways of working, as well as supporting workers in their time management and in their interactions with others. Similarly, management needs to make sure workers are ready to engage with coworkers in new ways.

Such considerations lead to the final element, which concerns the type of leadership in place to ensure the necessary changes (commanding, visionary, democratic, etc.). For example, it is important for leaders to win their employees' trust by communicating with clarity, being transparent, and by showing appreciation. One approach is to establish a culture that facilitates guided organizational sensemaking. Having identified the issues to address within each of the four elements, it is time to ask whether and how the elements are complementary, and to proceed or adjust accordingly.

Good luck on designing your digital workplace.

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WORKFORCE

TEAM TO MARKET: AN EMERGING APPROACH FOR CREATING DREAM TEAMS FOR THE POST-PANDEMIC WORLD[1]

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ABSTRACT

Teams are the fundamental building blocks of modern organizations, but despite over 50 years of research and practice most organizations are still notoriously inconsistent in creating high performance teams. Traditional checklist approaches have not worked, because successful teams often display contrasting features in member composition, power structures, decision making processes, and resource levels. Teams with identical characteristics frequently deliver vastly different results. Based on recent empirical evidence from 25 leading organizations across seven countries, this paper advances the notion of "team to market" (T2M), an emerging approach that can significantly increase the chances of organizations creating "dream teams" through an outcome-driven culture, an experimental approach, and a greater level of diversity.

1. INTRODUCTION

Teams are the fundamental building blocks of modern organizations. Longitudinal surveys of Fortune 1000 firms have shown a steady increase in the use of team-based structures, which have grown from less than 20 percent in 1980 to 50 percent in 1990, to over 80 percent in 2000 [Garvey (2002)]; and by 2010 nearly all organizations had adopted formal team structures [Bernstein (2014), Bernstein et al. (2019)]. On average, the amount of time people spend in collaborative activities exceeds 50 percent, and in many organizations more than three-quarters of an employee's day is spent on communicating with colleagues [Cross et al. (2016)]. A successful team can deliver results far outperforming a collection of even the most talented individuals. Business success today depends not on how people work but how effectively they work together. Creating and nurturing high performance teams has become a significant source of competitive advantage.

With the rapid proliferation of digital tools – such as Microsoft Teams, Slack, Google Meet, and Zoom – to support remote working and collaboration across time, space, and organizational boundaries, teams are becoming increasingly more dispersed, dynamic, diverse, and digital. Virtual teams allow organizations to create, and recreate, business values and satisfy the growing expectations employees have for flexibility and work-life balance. Such teams have played a critical role in enabling numerous organizations to maintain business continuity during the COVID-19 pandemic.

However, despite over 50 years of research and practice, most organizations are still notoriously inconsistent in creating high performance teams. There is no shortage of advice and guidelines about how to create the dream team, however, traditional checklist approaches, taught in business schools, practiced by consultants, and touted by the media, have not worked. Successful teams often display contrasting features

[1] This paper is based on our independent thought-leadership research at the Business School (formerly Cass), City, University of London sponsored by Slack Technologies, Inc. Some of the ideas featured in this paper have originally been published in Li (2020a).

in terms of member composition, power structures, decision making processes, and resource levels; similar teams often deliver vastly different results. Following a checklist to create teams with certain desirable characteristics offers no guarantee for success.

The COVID-19 pandemic has forced many organizations to adopt full-time remote working, turning countless teams into virtual teams within a very short period of time. Some emergency measures adopted during the crisis are likely to become permanent fixtures in modern life. This has created significant new challenges for managing team cohesion, time-zone difference, cultural diversity, and technological support [Raghuram et al. (2019)]. Previous studies have shown that "always-on" connections can exhaust employees, sap productivity, hamper creativity, and deprive members of uninterrupted time for cognitively demanding tasks [Cross et al. (2016)]. As we slowly come out of the pandemic, leadership focus is increasingly shifting from making ad hoc responses to the pandemic to laying the groundwork for success in the post-pandemic world. Since an organization's ability to create and sustain high performance teams has become an important source of competitive advantage, what could business leaders do to improve the likelihood and consistency of team success?

2. WHAT DO WE ALREADY KNOW ABOUT (VIRTUAL) TEAM WORKING?

We already know a great deal about teams and virtual teams. A search on "Web of science (1970-2020)", the academic portal for comprehensive citation data from different academic disciplines, returned 245,481 papers with the keyword "team" or "teams" in the subject. Many new papers have been published each year, exceeding 20,000 per annum since 2017. A similar search on Google Scholars returned 6,030,000 items.

Management researchers have studied the structural features (e.g., task scope, complexity and structure, technology, and virtuality), compositional features (e.g., member ability, diversity, and churn), and mediating mechanisms (e.g., motivation, conflict, trust, creativity, cohesion, and decision making) of teams and their effect on team performance, but no consistent patterns of what features make a team successful have been identified.

Psychologists and sociologists examined the effect of group norms and team dynamics on performance, but, once again, contrasting features – such as consensus-based decision making versus teams that encourage vigorous arguments amongst members – have been found in equally successful teams. The norms of one successful team often diverge sharply from those of other teams.

Leading businesses have also studied dream teams. Google, for example, conducted an extensive study of over 180 teams but failed to identify any consistent features for team success [Rozovsky (2015)]. Team composition made no difference to performance and the norms of one successful team often contrasted sharply with another equally successful team. The study did find, however, that successful teams shared five essential team dynamics linked to psychological safety, dependability, structure and clarity, meaning of work, and impact of work. However, addressing these issues, singularly or collectively, offers no guarantee for team success.

Despite all the effort made over the last 50 years, the "secret recipe" for creating the dream team consistently remains elusive. New approaches are needed urgently.

2.1 "Hunting for treasure"

Despite the difficulties and challenges in creating high performance teams, such teams have been observed in organizations of all sizes and sectors from all over the world – from Australia, France, and the U.S., to the U.K., New Zealand, Japan, and China. In the midst of the COVID-19 pandemic, it is particularly fitting to revisit the story of Taobao, the eCommerce platform owned by Alibaba.

In early 2003, China was besieged by the deadly SARS (severe acute respiratory syndrome) outbreak, where schools were suspended, social activities curtailed, and many public places closed. On 7th of April 2003, Jack Ma, the founder of Alibaba, called eight employees to his apartment for a secret meeting. He asked them to resign from Alibaba and sign a confidentiality agreement in order to participate in a secret new project. The agreement was written in English, so nobody could understand the terms nor had time to read it, but they all signed it out of trust for Jack Ma.

The project was to develop and launch a C2C e-commerce web portal as quickly as possible. The team included three developers, three operations specialists, one user-experience designer, one accountant, plus Jack Ma and his PA. They camped (literally) in Jack Ma's apartment for the duration of the project, and one month later, on 10th May 2003, Taobao – which means "hunting for treasure" in Chinese – went live. During the SARS outbreak, people were discouraged from going to public places, which created a rare opportunity for e-commerce to flourish in China.

Just before the secret meeting, eBay entered China aggressively in March 2003 by acquiring the leading local player EachNet, which controlled over 80 percent of the C2C market share in China. This move was viewed as an existential threat by Alibaba and it prompted Jack Ma to initiate his secret project. At that time, "eBay was the biggest e-commerce company in the world and a darling of both Silicon Valley and Wall Street. Alibaba's online marketplace was derided as another Chinese copycat with no right to be in the same room as the big dogs of Silicon Valley" [Lee (2018)]. However, by March 2006, Taobao had already significantly outpaced eBay, capturing 67 percent of China's C2C market against eBay EachNet's dwindling 29 percent. On 20th of December 2006, the mighty eBay threw in the towel and admitted defeat. Taobao went on to dominate e-Commerce in China and the rest is history [Li (2018, 2019)].

The question is, how could a team of eight, with modest qualifications and experience, camped in an apartment in a second-tier city in China, with limited resources and blind trust in Jack Ma's vision, have single-mindedly developed and launched Taobao in just over a month, defeated the mighty eBay in three years, and proceeded to dominate the largest e-Commerce market in the world?

3. TEAM TO MARKET (T2M)

The story of Taobao, as improbable as it may sound, is not an isolated case. Many iconic global companies – from Apple, Amazon, and Google, to HP, Dell, Virgin, and Disney – were started by small founding teams in garages [ScoopWhoop (2016)]. Their remarkable successes have given rise to a significant new management concept – "team to market", or T2M.

In France, the concept is already being acted on: the three "technology transfer accelerator offices" (SATTs) in the Grand Est Region are proactively hiring experienced teams of CEOs and business development managers to work with "inventor-researchers" with scientific intellectual properties in order to launch and scale up deep-tech-based startups.[2]

The COVID-19 pandemic has significantly accelerated the uptake of T2M as an emerging approach for team creation. Instead of following a traditional checklist approach to create teams with particular features assumed to be desirable, T2M encapsulates the willingness of senior leaders to set broad parameters for their teams and then empower those teams to perform freely within those parameters. These may include autonomy to recruit and retire members, establish rules and protocols, resolve conflicts and synchronize energy, deploy technologies, manage resources, and recalibrate team strategies and objectives in response to changing internal or external demands. Each team often displays unique – and diverse – characteristics even within the same organization, but our research has shown that such result-driven teams are far more likely to deliver exceptional performance than following the traditional checklist approaches [Li (2020a)].

Team to market should be distinguished from another popular concept – "time to market" (TtM), which refers to the length of time it takes from a product being conceived until it is available for sale. Time to market is important in industries where products are outmoded quickly or for first-of-a-kind products. However, by treating time as the "north star metric" to drive performance, other important metrics, such as quality, cost, and customer experience, are often overlooked or compromised. After all, time is just an arbitrary measure that needs to be balanced with other metrics. In contrast, "team to market" empowers the team to balance multiple metrics (of which time may be one) holistically based on changing circumstances and emerging intelligence to maximize results and business impact.

Team to market is not limited to the founding teams of iconic companies or successful new product teams. Other internal and external facing teams that deliver exceptional performance in customer service, production and distribution, sales and marketing, R&D, strategy and planning, and administrative support are also included. Such teams have inspired Hollywood movies, where underdogs defeat much stronger opponents against all odds, armed only with near spiritual aspiration, unshakable trust in one another, extreme hard work, and unwavering determination to succeed. Workplace collaboration technologies – from Zoom, Slack to Google Meet and Microsoft Teams – have made successes like these more accessible to teams of all sizes and sectors in a wide variety of digital and physical settings.

Different from traditional checklist approaches where teams are expected to adopt certain desirable features, team to market encourages a team to evolve over different stages of a project or product development, rather than adhering to preconceived features and styles. For example, during product or project conception, the team may encourage vigorous debates among members to stimulate idea generation and foster creativity, which call for fluid structures and collective

[2] https://www.team-to-market.fr/

decision making. However, as a project or product development evolves to execution, other performance measures such as efficiency, compliance, and discipline become important, so a clear hierarchy and centralized decision making may become more appropriate. As a senior business leader remarked: "Some teams had a bunch of smart people who figured out how to break up work evenly. Other groups had pretty average members, but they came up with ways to take advantage of everyone's relative strengths. Some groups had one strong leader. Others were more fluid and everyone took a leadership role." By allowing "a thousand flowers to bloom", the odds of creating dream teams in an organization can be significantly increased.

Successes like these are still rare, but they have happened frequently enough to be more than the result of pure luck. Starling Bank, for example, only received its banking license in July 2016 and it has been growing at an incredible rate. It was able to build its IT system from the ground up and launch the U.K.'s first app-only current account in March 2017. The challenger bank embraced channel-based communications across the whole bank from day one, integrated with a full suite of custom business processes and third-party software, which created a level of agility both within and amongst its teams that incumbent banks find hard to emulate. In particular, the collaboration technologies it adopted enabled the technical and customer service teams in the bank to respond to system or customer incidents quickly and effectively.

In team sports, the English football (soccer) team Leicester City FC became the champion of the most competitive football league in the world, the English Premier League, against all odds in 2016. It beat legendary English football clubs with glorious histories, deep pockets, accomplished players, celebrity managers, and steadfast loyal fans. Similar stories have been told in basketball in the U.S. [e.g., Cleveland Cavaliers in 2016 and Dallas Mavericks in 2013; Davis (2019)] and rugby in Australia [e.g., Wests Tigers in 2005 and Penrith Panthers in 2003; Evans (2016)]. Their successes have been the subject of management research and inspired business leaders and entrepreneurs all over the world.

Outside sports, high performance teams have been observed in many less glamorous, everyday settings. These teams often appear ordinary, but somehow, they manage to deliver extraordinary product or service and exceptional performance. What is the "secret recipe" for their success?

4. TEAMS AND TEAMWORK

Teams can be defined as small groups of interdependent individuals who share a common mission, goal, or responsibility for outcomes. They refer to two or more individuals who interact socially, either face-to-face or via digital communications across space, time, or organizational boundaries. A team shares one or more common goals and is brought together to perform tasks relevant to their organizations. Team members exhibit interdependencies with respect to workflows, goals, and outcomes, have different roles and responsibilities, and are embedded in an organizational system with boundaries and linkages to the wider work environment.

There are many different types of teams and they vary significantly in skill differentiation, authority distribution, and temporal stability. Other dimensions, such as team size, market orientation (internal or external facing), organizational seniority (top management teams versus operational teams), and geographical proximity (co-located or dispersed), have also been identified.

One of the earliest studies was the Hawthorne Experiment by Elton Mayo, between 1927-1932, at the Western Electric Company's Chicago Plant on how working conditions affected the productivity of workers. The study concluded that workers were motivated more by psychological than physical working conditions. Working relationships and social interactions, such as teamwork and recognition, rather than physical working conditions, had the greatest effect on productivity.

Over the last 50 years, numerous academic studies have examined what makes some teams successful while others fail. The advent of information and communications technologies (ICTs) has facilitated the rapid proliferation of virtual teams, which have created new challenges and opportunities for workers and organizations. Despite the vast literature, however, consensus remains remarkably lacking in our understanding of what makes a team successful.

As mentioned earlier, while previous studies have examined the structural features (e.g., task scope, complexity and structure, technology, and virtuality), compositional features (e.g., member ability, diversity, and churn), and mediating mechanisms (e.g., motivation, conflict, trust, creativity, cohesion, and decision making) of teams and teamwork and their effect on team performance, no consistent patterns

have been identified. While some successful teams embody features such as members as friends who socialize outside work, other equally successful teams are composed of members with no social contact beyond work. Some successful teams have strong leaders and clear structures, but others are more autonomous with fluid, informal, flatter, and less hierarchical structures. There are even teams with nearly identical constituents and overlapping members but materially different performance.

Psychologists and sociologists examined the effect of group norms and team dynamics on team performance, but once again, contrasting features – such as consensus-based decision making versus teams that encourages vigorous arguments amongst members – have been found in equally successful teams. The norms of one successful team often contrast sharply with those of another. Some studies found that what distinguished good teams from dysfunctional ones was how team members treated one another, but others found that a healthy level of competitive tension within teams was effective in bringing out the best in each member.

Leading businesses have also studied high performance teams. For example, in 2012, Google embarked on an extensive study of team effectiveness – code named "Project Aristotle". They reviewed previous studies, gathered data on 180 Google teams, conducted over 200 interviews, and analyzed over 250 team attributes. Surprisingly, they also failed to identify any consistent pattern in the key characteristics of a dream team. The composition of a team made no difference to performance. The norms of one effective team often contrasted sharply with another equally successful team. However, the study found that the "unwritten rules" or the "team culture", which govern how people interact, structure their work, and view their contributions are key to team performance, and successful teams often share five essential team dynamics [Rozovsky (2015)]:

- **Psychological safety:** can we take risks without feeling insecure or embarrassed?
- **Dependability:** can we count on each other to do high quality work on time?
- **Structure and clarity:** are goals, roles, and execution plans in our team clear?
- **Meaning of work:** are we working on something that is personally important for each of us?
- **Impact of work:** do we fundamentally believe that the work we are doing matters?

The study concluded that what distinguishes a good team from a dysfunctional one is how teammates treat and respect one another. Team chemistry and cohesiveness are more critical factors than even talent or resource for team success. Successful teams often display structures and processes that support clarity and dependability, team dynamics that create psychological safety, and work that is meaningful both to team members and at higher levels. However, while successful teams often display some or even all of these features, they offer no guarantee of team success.

Furthermore, most available studies of teams and teamwork are based on the experience of teams supported by "traditional" workplace collaboration technologies such as emails, video conferencing, and other disparate, proprietary software. Systematic research on how emerging collaborative technologies – such as channel or thread-based communications and emerging collaboration platforms that enable the seamless integration of apps, bots, business processes, and third-party software – affect teams and team performance is still largely absent.

Our research has found that high performance teams require not only effective interpersonal communication but also an ability to leverage all of their existing specialist software with ease and simplicity. The complexity and variety of this software is growing rapidly, with many enterprises today using well over 1,000 different software tools. By integrating existing software tools within a coherent collaboration platform, teams may be able to save time and share knowledge effectively, which would otherwise be isolated within separate applications.

For the greatest efficiency gains, these integrations need to be intuitive and accessible to all users, including those who do not have a deep technical knowledge of coding and programming skills. In doing so, some emerging workplace collaboration technologies are poised to evolve into a new digital working environment that can potentially supersede the proprietary digital platforms that have dominated the workplace for decades to fundamentally transform the way people work, creating sustainable competitive advantages for their organizations.

5. DIGITAL TECHNOLOGIES AND VIRTUAL TEAMS

Today, nearly all teams – including those primarily co-located teams – are supported by a growing range of digital technologies. Virtual work has become the current reality, with people working flexibly from dispersed locations, often involved

in multiple teams, interacting using digital communications. Many businesses are now being run very effectively from their employees' homes in response to the COVID-19 pandemic.

This phenomenon is not new and it has been studied from different perspectives across the world, from telecommuting and teleworking in the 1970s and 1980s, virtual teams and computer-supported cooperative work (CSCW) in the 1990s and early 2000s, to more recently, how a new generation of workplace collaboration technologies can be used to transform teams and teamwork [Raghuram et al. (2019)].

Despite over half a century's research, practice, and policy initiatives, the projected disappearance of traditional offices in city centers has failed to materialize – although 2020 might prove to be the tipping point. During the first oil crisis in 1973, Jack Nils famously advocated telecommuting for office workers. Instead of traveling to offices for work, work can be electronically transmitted to the workers. This concept soon evolved into teleworking, where information resources can be accessed remotely via computers and telecommunications. However, after numerous experiments and repeated failures, it is increasingly recognized that work is not just what you do, but also where you go and who you go with, which gives rise to the notion of team-teleworking and virtual teams [Li (1995)]. Since then, management focus has increasingly shifted from teleworking to using ICTs to support geographically distributed teams working together.

Until the COVID-19 pandemic, full-time remote working remained relatively rare, and only around 5 percent of American workers were full-time remote workers, although 43 percent spent at least some time working remotely [Buffer (2018, 2019)]. Historically, France trailed other OECD countries in telework, but since it was written into French law in 2005, attitudes have changed, and the sweeping overhaul of labor rules in 2017 made the introduction of telework more commonplace. According to a recent study,[3] 29 percent of French employees worked remotely in 2018, up from 25 percent in 2017. By 2019, France already had one of the most flexible working cultures in the world, according to the IWG's 2019 Global Workplace Survey,[4] with 60 peercent of businesses in France offering flexible working policies for employees. In Australia, 68 percent of employers allowed remote working but attitudes are sharply divided, according to research by Indeed (2019). However, the pandemic has forced many organizations to adopt full time remote working to maintain business continuity. Indeed, many businesses are now operating almost entirely from the homes of their employees. Working from home, as recently announced by J.P Morgan and Schroders in the U.K., and numerous other businesses from Silicon Valley, Paris, to Beijing, is being encouraged in the post-pandemic world.

Within virtual teams, members use digital tools to varying degrees to work across spatial, temporal, and organizational boundaries when accomplishing interdependent tasks. Compared with traditional co-located teams, virtual teams face additional challenges associated with geographic separation, time zone differences, cultural diversity, and organizational membership. However, the benefits of virtual teams – both to employers and employees – are also increasingly recognized.

Over the years, numerous workplace collaboration tools have been developed to support both virtual and co-located teams with most teams using stand-alone tools with single or limited functionalities to support meetings or information sharing. More recently, a new generation of integrated collaboration tools with bundled services have emerged, some of which allow the seamless integration of business processes and third-party software. Below is a list of popular tools:

- **Meeting and video conferencing:** Zoom, Skype, GoToMeeting, Google Hangouts
- **Collaboration:** Slack, Microsoft Teams, Cisco Spark, Facebook Workplace, Google Hangouts
- **Messaging and chat:** Slack, Twist, Google Hangouts, Microsoft Teams, Glip, Flock
- **Document storage and file sharing:** Dropbox, Google Drive, Sharepoint, One Drive
- **Document co-creation:** Scribblar, Google Docs
- **Project management:** Trello, Jira, Asana, Microsoft Project, Basecamp, Wrike, Apollo
- **Social networking:** Yammer, Jive
- **Scheduling:** Doodle, Calendly
- **Workflow automation:** Zapier, Microsoft Flow, Monday
- **Shared CRM:** GreenRope, HubSpot CRM, Bitrix24
- **Screen sharing and interactive displays**
- **Immersive technologies**, particularly 3D, VR, or AR supported virtual environment
- **Other emerging tools and technologies**, such as bots, tracking tools, and people analytics

[3] Malakoff Humanis, https://bit.ly/310CVYd
[4] https://www.iwgplc.com/global-workspace-survey-2019

Such tools have enabled virtual teams to improve productivity and accomplish tasks in ways that would have been difficult in the past. As highlighted by some business leaders we interviewed: "Today's knowledge workers expect these tools to be as quick and easy to use as the apps on their mobile devices, highly integrated with other business processes, closely aligned with their work styles, reliable and secure, and easy to set up and use" [CTO of global media firm]. "We bought ourselves a huge head start using some great collaborative software off the shelf, including Slack, Zoom, Airtable and Zapier. With these tools we could do things in an hour that would perhaps take people a month 10 years ago ... We are starting to replace some of them with internally built tools now that we know exactly what we need and need it to scale, but getting up off the ground was much easier for us than for founders in the past" [founder of a unicorn in the U.S.]

Although technology providers are expected to offer tools that enable as much connectivity and transparency as possible, more transparent environments are not always better and privacy is just as essential for performance [Bernstein (2014), Bernstein et al. (2019)]. If unchecked, "always-on" connectivity – when compared to intermittent collaboration interspersed by protected periods of independent work offline – can reduce rather than increase team creativity and performance. For cognitively demanding tasks, scheduled meetings and online collaborations need to be punctuated with solitary work time by creating coordinated "unplugged" time necessary for focused work. There is an enormous and largely unmet, or unrecognized, demand for effective ways to coordinate and align people, a gap some emerging collaboration tools are aiming to fill. Today, email remains the default coordinating point for business communications supporting enormous information flows, but each person has only a partial view, and the rich history held in email systems – the decisions made, questions answered, and information shared – are only partially accessible. If the emails are in the "wrong inbox", or if you are new to an organization, you will have no access to them. Some emerging collaboration technologies using channel or thread-based communications are built to overcome such traditional constraints to significantly increase transparency and alignment, and make the shared history and organizational knowledge equally accessible to everyone regardless of when they join the project.

To mitigate the "transparency and always-on trap", some organizations have even considered abandoning real-time collaborations and explored asynchronous ways of working, but this approach has been criticized as "throwing the baby out with bathwater". Some real-time workplace collaboration tools allow highly personalized control of how these tools are used to mitigate potential problems while enabling new ways of collaboration that are not feasible via traditional collaborative technologies.

The rapid proliferation of workplace collaboration technologies is fundamentally transforming the way teams work, enabling teams to take their products or services to internal and external markets with ease and in ways that were not feasible only a few years ago. This is clearly reflected in the live coverage of FIFA 2018 Football World Cup by Fox's production team. The team consisted of 35 people spread across multiple sites in Russia as well as in Los Angeles, New York City, and Charlotte, North Carolina. In the past, individual producers and teams would have had their favorite workflow and messaging tools and most of the editorial process would be conducted over emails. Teams would not be able to get immediate feedback on assets before broadcasting live or posting on social media. Shared resource teams who worked with multiple programs or departments would have to keep track of a dozen different apps on their phones and their computers. Emails also made it difficult to distinguish between those that required immediate attention and those that were less urgent.

To ensure the seamless live coverage of FIFA 2018, Fox adopted channel-based communications integrated with a large number of workflows and third-party software among its ever-growing pool of productivity and communication applications. These tools enabled the team to collaborate in real time in front of a live audience of millions, from producers to designers to on-screen talent, of whom few were in the same location. They also allowed team members to stay up to date and coordinate coverage as easily as if they were in the same location, enabling them to make rapid decisions about how to make the most of their real-time coverage. These tools also allow freelancers to search for information they needed and get up to speed with the work already done. According to John Herbert, CTO of Fox: "Our video editors, social media managers and producers are creating content by collaborating with each other in real time on Slack, which helps us fulfil our goals of breaking down internal silos while still giving each group a level of control and privacy when needed" [Fox CTO John Herbert].

A further example can be found in Xero from Wellington, New Zealand, a worldwide leader in cloud-based accounting software with over two million subscribers from 180 countries. The company was ranked by Forbes as "the world's most innovative growth company" in 2014 and 2015. In late 2017, Xero rolled out a cohesive communication system across all

business units, using channel-based communications on Slack to replace or integrate a myriad of other messaging and collaboration tools and third-party software used by different business units. By using one universal platform for collaboration and conversation, integrated with a wide range of business processes and third-party software, the customer experience teams, platform services, and product teams were able to communicate easily across its offices in New Zealand, Australia, Canada, Hong Kong, Singapore, the U.K., and the U.S., effectively overcoming barriers arising from distance and time zones when addressing internal incidents and customer issues. Levi Allan, GM Product of Xero, states that: "It has enabled faster and more transparent information sharing across our teams, improving employee engagement and ultimately making it easier to build beautiful products." Matt Simpson, Lead Workfow Coordinator of Xero, adds: "I've got the peace of mind that there's been someone online and that people were going to the right person at the right time."

6. TEAMS TO MARKETS

The notion of "team to market" is not limited to one single team executing a task or fulfilling a responsibility to internal or external customers. People are increasingly involved in multiple teams, and emerging workplace collaboration technologies enable the fulfillment of rapidly changing demands using highly fluid team structures where members join and leave teams as required, old teams dissolved, and new teams formed as demands change. These tools also enable effective collaboration between teams and the efficient handover of a project from one team to another at different stages of the product lifecycle. Importantly, some new collaboration platforms allow the seamless integration with external contractors and partners and shared channels between organizations. The notion of "team to market" is increasingly extended to "teams to markets", as multiple teams evolve and collaborate to satisfy changing demands in internal or external markets, or over different stages of the life cycle of a product or project.

gTech is a support and operations organization within Google, where users and products divisions work together to ensure users and partners get the best service and outputs from Google. Traditionally, gTech was organized around individual products but whenever product strategies shifted (which happens frequently at Google), old teams were disbanded and reformulated into new teams around new products. This model proved to be inflexible as new teams often lacked the right mix of technical and operational skills, and integrating new team members can slow progress. It also offered limited development opportunities for career mobility and knowledge sharing. gTech tried hiring buffer capacity to meet fluctuating demand, but it was too expensive. It also experimented with a rotation program, which proved too rigid.

The solution was to develop a new marketplace approach, which asked employees and managers to "bid" for new assignments. Code named "Project Chameleon", gTech deployed an algorithm to match employees to roles based on their preferences and those of the managers. This project not only improved business prioritization, transparency, agility, and choice, but also significantly increased staff mobility and facilitated networking. The system enabled gTech to deploy a scalable and dynamic staffing model to support frequent strategy shift and employee development. People joined and left teams, and old teams dissolved and new teams formed fluidly as demand changed, giving employees and managers increased choice while significantly improving productivity. This transformation not only enhanced the effective functioning of individual teams in fulfilling their responsibilities, but also enabled different teams to evolve organically in response to rapidly changing internal or external demands.

Similarly, a large residential property business in Asia found providing services to residents was costly for the business and often prompted low levels of customer satisfaction. For large residential properties, the company historically maintained its own service teams on site (comprised of plumbers, electricians, joiners, cleaners, handyman, and child minders) to ensure high quality and prompt services. However, due to fluctuating demands, some service teams often had little to do for long periods, punctuated by sudden high demand, which they could not satisfy in a timely fashion.

An enterprising team leader experimented with an online marketplace based on an instant messaging platform, where new jobs from residents were displayed in real time for service providers to bid on. The system was based on real time communications between the customer, service provider, team leader, and property management staff, keeping all relevant parties informed of progress. Each service team was free to organize its own shifts. The marketplace was so successful that it was soon opened to residents from properties in adjacent areas. Vetted external service providers, alongside the company's own service teams, competed for new jobs. The new system not only allowed the company to turn a loss-making division into a profitable business, but also offered different teams of service staff more flexibility and higher income through a fluid team structure responsive to fluctuating demands. Customer satisfaction soared. This would

not have been possible without the marketplace to match supply with demand in real time and the messaging system that enabled synchronous communications. This scheme has since been rolled out to all managed properties in the group. It also enabled service teams to serve external customers when internal demands are low, and external contractors and partners to bid for jobs during peak demands.

"Teams to markets" is also reflected in the experience of Electronic Arts (EA) during the development and launch of its FIFA19 game, which sold a staggering 260 million copies, the highest volume ever for a video game. The game was the result of a major project involving 600 people in 78 teams and 32 locations, which included external contractors and partners from around the world. These teams used channel-based communications on Slack, integrated with a full suite of business processes and third-party software both for collaboration within each team and the coordination and handover of the project amongst teams during different stages of product development, launch, and after-sale services.

During product development, the design team interacted extensively with the core game engine development team. When launch approached, publishing, analytics, and player development teams were also involved. After launch, the technology operations team and game design team worked together to respond to the rapid increases in user numbers. Crucial for these teams to work together easily to take their respective products or services to internal and external markets around the world were channel-based communications, together with the seamless integration with over 550 third-party applications and workflows within EA. The collaboration platform allowed these teams from different functions and locations, together with external contractors and partners, to carry out the required tasks and hand over the project from one team to another over different stages of product development and launch with confidence.

7. TEAM STRUCTURE AND LEADERSHIP

Since the 1980s, bureaucracy has been under relentless attack for fostering rigid hierarchy and slow decision making. New forms of organizations that promote flatter and more flexible structures, decentralization, and self-management have been advocated. Teams are widely regarded as substituting a peer-based control of work for hierarchical control and coordination [Child (2019)]. Management guru Gary Hamel even called for "the end of bureaucracy", citing the example of Haier, the world's largest appliance maker with annual revenue of U.S.$35 bln and 75,000 employees worldwide. Haier divided itself into more than 4,000 microenterprises – or teams, most of which have 10 to 15 employees with decisions made within these small autonomous teams. Other examples, from Zappos and Medium to Valve and Blinkist, have been used to illustrate new organizational forms that promote self-management and team-based structures, such as holacracy or modularity, where decision making power is conferred to fluid teams, circles, and roles rather than individuals.

New forms of organizations are also emerging along the temporal dimension. For example, flash organizations [Valentine et al. (2017)] allow complex work to be completed via crowdsourcing, by structuring the crowd as organizations. This has been described as the pop-up employer, which builds the team, does the job, and then dissolves the team and says goodbye [Scheiber (2017)]. It uses ephemeral setups to execute a single, complex project in ways traditionally associated with corporations, non-profit groups, or governments.

Keeping bureaucracy at bay is a never-ending struggle, and two categories of solutions have been advanced. The first is "internal market mechanisms", which allows users to decide whether bureaucratic procedures are excessive by putting a "price" on the contributions. The second solution is the "community building approach", which emphasizes strong values and culture, encouraging employees to rise above their formal job descriptions to contribute their discretionary effort propelled by a feeling of belonging and higher purpose.

However, it has also been found that non-hierarchical organizational forms can cause confusion and complication in hiring, compensation, career progression, and in carrying out work, and most of them do not scale easily. Many organizations that enthusiastically adopted such structures have since reverted to hierarchies, albeit with more flexibility, fewer layers, and more decentralized decision making. Today, hierarchy remains the most widely used organizational form for nearly all organizations around the world. Despite the many criticisms it received, hierarchy offers clarity and simplicity, which is particularly effective for virtual teams when members are often in different locations, time zones, and cultures. The limitations of flexible, fluid, non-hierarchical team structures are increasingly recognized. For example, Blinkist abandoned its experiment with radical management after it found that being governed by a rulebook was as onerous as being ruled by a controlling boss and according to its co-founder Niklas

Jansen, "[i]nstead of solving problems, we were spending all our time asking how we solve them Holacratically?"

A recent study found that the clear management structure offered by hierarchies can help firms hire and keep their best people, and more structured managerial practices have a strong correlation with higher productivity in firms [Cornwell et al. (2019)]. For most teams, hierarchy offers the clarity of roles, structures, and decision processes that are essential for team success; and the desire to go to extreme forms of organizing is increasingly resisted. From the perspective of employees, "boss-less business is no workers' paradise" despite the potential benefits, such as greater autonomy and flexibility [Clegg (2019)]. Teams need leaders, and even in self-managing teams with fluid structures, natural leaders and informal pecking orders nearly always emerge over time.

In 1999, Gallup published a mammoth study based on interviews with over 80,000 managers from organizations of all sizes in different industries [Buckingham and Coffman (1999)]. The study explored what great managers do differently from ordinary managers to coax world class performance from their workers, and key issues have been further examined in a series of follow up studies both by Gallup and others. These studies found that great managers balance the priorities and expectations of individual talents with the goals of teams and strategies of organizations. Having great team leaders is not only essential for superior team performance, but also for recruiting, nurturing, and retaining talents. In fact, it has been found that between 60-75 percent of the reasons that people give for quitting an organization refer to their immediate managers. When a team is failing to perform, perhaps the first step should be to review or replace the team leader.

The rapid proliferation of team-based structures is the result of the broader digital transformation of work that is currently taking place. In traditional job design, organizations create fixed, stable roles and then add supervisory and management positions on top. When parts of these jobs are automated or digitized, the work that remains for humans is generally more interpretive and service-oriented, involving problem-solving, data interpretation, communications and listening, customer service and empathy, and teamwork and collaboration. These higher-level skills are not fixed tasks like traditional jobs, so they are forcing organizations to create more flexible positions and roles, supported by team-based structures and rich and flexible collaboration technologies.

8. CONCLUSION: LEADING HIGH-PERFORMANCE TEAMS IN THE POST-PANDEMIC WORLD

"Team to market" is part of a seismic shift in the digital transformation of work and everyday life. On the one hand, the nature of our economy has changed radically, and the success of any organization depends on the productive use of the most valuable resource of our time – information. On the other hand, we have increasingly more powerful digital technologies at our disposal that are ubiquitous, affordable, customizable, and easy to use, which empower each of us to capture, share, and use information in ways we could not have even imagined in the past. This powerful combination has been driving the digital transformation of strategy and organization across different sectors and domains [Li (2020b)]. As the fundamental building block of modern organizations, teams must evolve as an integral part of such a seismic shift in order to meet rapidly changing internal and external demands. "Team to market" allows business leaders and knowledge workers to consider and create effective teams in ways that might have been inconceivable only a few months ago, by taking advantage of the significant new capabilities afforded by a new generation of workplace collaboration technologies.

> *"Team to market" is part of a seismic shift in the digital transformation of work and everyday life.*

Different from traditional checklist approaches for team creation, "team to market" encourages an outcome-driven culture via empowered teams. The leadership responsibility is to set broad parameters around common purposes, team objectives, resource levels, and expectations, and then allow the team to create and experiment with its own structures, rules, and protocols for decision making, team technologies, and channels of communications. The styles and features that each team develops often differ from one another, but all teams are authorized to evolve and recalibrate according to changing internal or external circumstances within the broad

parameters set for them and the overall direction for the wider organization. New collaboration technologies enable teams to form and evolve with greater fluidity and experiment with new ways of working frequently and inexpensively.

The COVID-19 pandemic has forced many services – from education and administration, banking, journalism, and government, to yoga and gym classes, concerts, and medical consultations – to replace face-to-face meetings by video conferencing. The scale of the shift towards virtual teams is unprecedented and will alter the way people think about work and how they live and work for many years to come. Our collective jump from physical to virtual is not limited to business activities, as families and friends have also been forced to learn the techniques of remote communications enmasse. This will significantly improve the general levels of digital literacy in society.

When the pandemic is over, many people are likely to continue to work flexibly from dispersed locations across multiple teams, both out of necessity and as a lifestyle choice. Some leading businesses – from tech firms in Silicon Valley and Beijing to banks in London and Paris – have already announced policies to allow employees to work from home permanently. Our experience during the pandemic has demonstrated that workplace collaboration technologies allow teams to form, evolve, and dissolve with far greater fluidity than we had imagined, while communication patterns, cognitive load, and bottlenecks are effectively managed through a suite of technological tools. Management ethos and expectations are also changing to accommodate the new reality of full-time home working. This experience will help overcome long standing resistance to the introduction of digitally-enabled new work practices in the future.

Furthermore, as has been shown during the pandemic, many traditional constraints for virtual teams, such as time zone differences, cultural diversity, and geographical separation, are not just barriers to overcome, but also new resources to exploit for creativity and competitive advantage. As Xero, the cloud-based accounting firm from New Zealand, has shown, customer service team members located in different time zones around the world can take turns to support global customers around the clock. A British engineering firm has significantly shortened design lead-time when work-in-progress is passed around the globe between team members located in different time zones, so the working day is essentially extended to 24 hours without compromising the welfare and quality of life of individual employees. Such exemplars are likely to stimulate new creativity and imagination in the way teams work using new collaboration technologies.

Our experience during the pandemic also highlighted a range of other factors for teams and teamwork that have not been adequately studied. For example, full-time remote working in virtual teams, ironically, leaves behind visible trails of responsibility and accountability as well as organizational knowledge, which may affect behaviors and make it much harder for anyone to hide poor performance. The “weakest links” can be revealed more quickly and, in principle, the teams can act to address deficiencies and self-regulate through immediate discussions and communications. However, such information can also be misused or abused to monitor employees and measure performance. More research is needed to systematically understand such emerging issues.

Although virtual teams have been with us for decades, we have never been forced to develop a set of best practices for leading remote teams at the capacity that has been brought on by this crisis. Our collective learning is profound. Whatever the future holds, the new normal is going to be significantly different from what we have been used to before the pandemic. Since teams are the fundamental building block of modern organizations, “team to market” offers genuine opportunities to transform organizations and work, and manage the transition to new ways of working by creating a new digital working environment using a new generation of workplace collaboration technologies. Those taking the leap ahead of competitors may find new opportunities to gain sustainable competitive advantages. Those failing to do so risk being left behind and might never recover.

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ENGAGING EMPLOYEES WITH ORGANIZATIONAL CHANGE[1]

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ABSTRACT

COVID-19 has created an unprecedented disruption in organizations worldwide. Financial uncertainty, unpredictable working conditions, and health concerns are building stress within the workforce, and impacting organizations' futures. The impact of the pandemic is driving the need for change in organizations across the globe. One of the vital ways to help ensure the success of organizational transformations is to include key stakeholders, such as employees, in the change. This article explores the importance of engaging employees with organizational transformations, whenever feasible to do so. It considers the antecedents of engagement with organizational change and recommends some practical implications for managers and leaders.

1. INTRODUCTION

COVID-19 has created an unprecedented disruption in organizations worldwide. Financial uncertainty, unpredictable working conditions, and health concerns are building stress within the workforce, and impacting organizations' futures.

The world of work is becoming more complex and diverse with changes being made to business-to-business, business-to-customer activities and internal operating models. Some of these changes are occurring at an unprecedented pace in response to the global pandemic, which is a challenge for many organizations. For instance, changes to business-to-customer activities may be happening faster than the changes to target operating models. This acceleration of the pace of change is exponential and is being driven by technological innovations, which have invaded the workplace at a speed that would have previously been unimaginable. Changes are also being driven by workforce demographics that have shifted substantially, with multiple generations in the workforce, a decline in working age populations in many advanced economies, and an increase in the focus on equality for all workers in relation to pay and conditions. As the workforce has evolved, so have worker expectations, with calls for organizations to do more to help improve individuals' lives, address societal problems, mitigate technology's unintended consequences, and act equitably and ethically. Such requests have become critical as forces for change continue to impact on organizations.

These disruptive global forces are creating an imperative for organizations to rapidly adapt and change to an unprecedented degree. They are continually expanding in scope and velocity, influencing how work is performed, where it is performed, and what capabilities are required. For organizations attempting to keep pace with these fast-moving disruptions, as well as maintaining the ability to stabilize and standardize, the terrain is constantly changing. It is like riding a bike, which is difficult when you first start, but once you are moving it becomes easier. Although this is not a natural or a comfortable state for many organizations, it is a state that they have to learn to exist in, through the implementation of successful transformations.

Successful change is still viewed as elusive, for despite the many approaches to managing changes in organizations and the plethora of advice and advisers it is commonly agreed that the vast majority of transformation initiatives fail. A wide range of reasons is given for the failure of change, ranging from impractical theories to ill-informed practice. More often than

[1] This article is based on Hodges, J., 2019, *Employee engagement for organizational change: the theory and practice of stakeholder engagement*, Routledge

not, change driven from the top down fails to engage properly with the front-line operational staff who are essential for the delivery of high-quality products and high levels of customer service. Successful change does not just happen due to the efforts of one leader at the top of the organization driving the change down, but instead it is due to the involvement of those impacted by the change and amongst whom responsibility needs to be distributed. In other words, change can only be achieved if stakeholders – those individuals and groups who are internal and external to the organization and who will be affected by changes – are given a chance to engage with it.

The success of organizational change in a world of increasing volatility is highly dependent on the advocacy of stakeholders. It is the link between strategic decision making and effective execution, between individual motivation and product innovation, and between delighted customers and growing revenues. For, although leadership envisions and drives change, success is largely contingent upon the engagement of stakeholders. Only by engaging stakeholders does change have a chance of being successful. Engagement of stakeholders with organizational change is "a must-do, not nice-to-have", activity as there are benefits for the organization when people engage across functional and business unit boundaries to bring a range of perspectives and drive change and innovation. Organizational change should, therefore, whenever it is feasible, be constructed or negotiated with rather than to stakeholders, thereby reflecting the plurality of stakeholder interests. Despite being presented as a good thing that organizations should do, there is rather little in the literature about how they should achieve stakeholder engagement with change. Existing theory and research has taken us some way towards addressing how change can be effective. However, given the importance of ensuring that change succeeds and achieves benefits, a key issue is how to promote the inclusivity of stakeholders. The academic and management literature is relatively silent on actions to be taken, apart from the provision of tools to assess levels of engagement in the form of attitude surveys. For academics, the recommended tool is something like the Ultrecht Work Engagement Scale, while for managers it is the Gallup Q,[2] or the equivalent offered by various consultancies. Action to enhance engagement, thus, appears to consist of conducting a survey or more general activities, none of which are in any way uniquely linked to engagement with change. To address how engagement with change can be generated we need to look further than attitude surveys and generic actions.

To start to build approaches for engaging people in transformations there is a need to lay some foundations by refining the concept of engagement within the context of organizational change, developing a much deeper understanding of why engagement with change is important and what drives it, before moving on to what is required to stimulate it. Understanding more about what engagement with organizational change means, the impact of its presence or absence, the factors that influence it, its potential outcomes, and how it can be fostered to improve stakeholders' experience of change are all essential if organizations are to succeed in an era of complexity and chaos.

There is debate in the literature around what influences engagement and what potential antecedents matter the most. COVID-19 has created an unprecedented disruption in business worldwide. Financial uncertainty, unpredictable working conditions, and health concerns are building stress within the workforce, and impacting organizations' futures. In an attempt to address this, consultants have provided lists of a variety of factors that can play a part in affecting engagement. Such checklists can be helpful but are essentially generic and lack any substantial evidence or detail about what influences organizational change engagement. To identify potential antecedents, it is helpful to look at the results of meta-analysis studies. Meta-analyses use advanced statistical procedures to combine the results of individual studies and arrive at an overall best determination of the strength and direction of relationships between constructs of interest. Halbesleben's (2010) meta-analysis study, which is consistent with the "job demands-resources" (JD-R) theory, suggests that feedback, autonomy, social support, and organizational climate, as well as personal resources, such as self-efficacy and optimism, are consistently associated with engagement. Similarly, Mauno et al. (2010) show that increases in employee experiences of job control and support at work consistently predict an increase in engagement over time. Robinson (2006) also suggests that organizational, personal, and job characteristics, as well as employee experiences, all influence engagement. By implication, if these features of work are promoted, then the outcome will be enhanced organizational change engagement. Such studies show that although engagement is a personal attitude of individual employees, it does not occur in isolation. Hence, when considering the sources and consequences of engagement with change, we need to go beyond the individual dynamics and also consider the organizational context and processes. Based on this premise and existing research in my

[2] https://q12.gallup.com/public/en-us/Features

book [Hodges (2019)], I propose that the main antecedents of engagement with organizational change are context, process, and individual. These are the key factors that influence the generation and sustaining of engagement with change (Figure 1).

2. ANTECEDENTS OF ENGAGEMENT WITH ORGANIZATIONAL CHANGE

2.1 Contextual antecedents

Change happens within a context and some contexts are likely to be more conducive than others to the development of engagement with the change. The contextual antecedents of engagement include: the organizational culture, trust, the history of change, nature of organizational change, and change readiness. Contextual factors tend to develop relatively slowly, and their influence is more subtle; as a result, they are not easily modified and do not serve as effective short-term levers for organizational change engagement. For example, trust in management is crucial for organizational change engagement but trust is earned over the long term and cannot simply be switched on when the need arises. Since contextual factors are not easily modified in the short term, they must be managed carefully even during times of continuity and stability.

2.1.1 ORGANIZATIONAL CULTURE

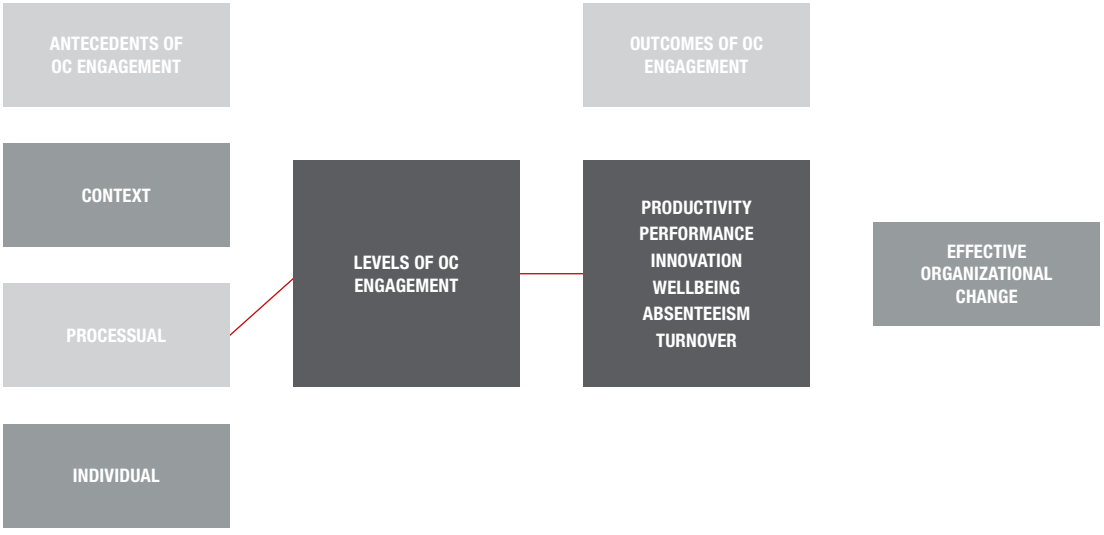
The culture shapes the experience that employees have of change and can drive employees towards becoming engaged with change, or else it can push employees towards disengagement. Organizational cultures can either negatively or positively influence engagement with change. For instance, cultures that stifle innovation and creativity may lead to employees feeling trapped by their work, as opposed to energized by it, leading them to psychologically, if not physically, withdraw and, therefore, disengage. In contrast, organizations that establish a culture of trust maximize the probability that their employees will be engaged with change.

2.1.2 TRUST

A culture of trust is necessary for employees to feel and act engaged. Research has found a direct relationship between trust in managers or leaders and employee engagement [Wang and Hsieh (2013)]. Employees will be more willing to engage with change that is initiated by a management team they trust than one they do not.

Employees who perceive their leader as being able to lead change effectively, who perceive their manager as trustworthy and supportive, and who feel respected are likely to be more willing to accept and support change.

Figure 1: Antecedents and outcomes of OC engagement



Adapted from Hodges (2019)

2.1.3 HISTORY OF CHANGE IN THE ORGANIZATION

The history of change in an organization can shape employees' attitudes towards future change and their behavioral responses to it. As Bordia et al. (2011: 25) state: "... as when driving a car, changing the direction of an organization should involve a 'rear view' inspection of the change management history. We recommend that leaders pay attention to employee change beliefs arising from the history of change in the organization."

Studies indicate the importance of looking in the rear-view mirror of change. For instance, Rafferty and Restubog (2010) found that among organizations going through a merger, those who report having experienced a poor history of change have lower levels of engagement with organizational change than those who have experienced a successful history of change. This suggests that past experiences of change can influence current and future engagement with change. Ignoring the impact of previous changes, particularly if they failed, can cause negative attitudes towards change. This can result in a vicious cycle, whereby employees will avoid engaging in change and consequently prejudice the success of future changes due to their perceptions and experience of past changes. The personal experiences of individual employees can have either positive or negative effects on their willingness to engage with a change. Those who have experienced success might be more likely to commit, whereas those who have experienced failure might become cynical about the motives for change and/or skeptical about their ability to manage it. Hence, the history and experience of change can influence levels of organizational change engagement.

2.1.4 NATURE OF CHANGE

The scale, pattern, as well as the pace or time urgency of change, can influence OC engagement. Time urgency refers to the processing speed required for employees to complete tasks. Pressure to complete change within a given timeframe can tax employees' energy and capabilities, but it can also focus their attention and effort, such that by coping with this demand they experience a sense of personal accomplishment. Time urgency can increase a person's focus on organizational change because it helps to eliminate distractions that would otherwise occupy their time and attention. Empirical evidence supports the assumption that time urgency is associated with increased engagement but also with increased strain. For example, Schaufeli et al. (2008) found that having to work very fast creates engagement as well as exhaustion. Similarly, the type of change (such as incremental, transformational, planned, or emergent) and the pattern of change (for example, gradualist) will have an impact on organizational change engagement. The nature of change is, therefore, a potential antecedent of organizational change engagement.

2.1.5 READINESS FOR CHANGE

Readiness for change may vary at different levels – individual, team, and organization-wide. At an individual level, the self-perceived readiness for change is a function of an individual's beliefs that change is needed, that they have the capacity to undertake change successfully, and that the change will have positive outcomes for their job. At a team and organizational level, change readiness is a function of the shared beliefs and emotional responses of individuals. Team members who are ready to engage with organizational change will exhibit a proactive and positive attitude towards change, which can be translated into willingness to support and own the change. Readiness depends on whether at each of these levels the benefits of change are perceived as outweighing the anticipated risks [Hodges (2016)]. Each person will perceive the significance of change differently and, as a result, the readiness level may vary on the basis of what employees perceive as the balance between the costs and benefits of the status quo and the costs and benefits of change. Readiness to engage with change encompasses the extent to which employees are open and receptive to the need for change and believe that change has positive implications for themselves and the wider organization.

In summary, the contextual antecedents of engagement with change – organizational culture, trust, the nature of change, and readiness for change – influence engagement in various ways. A culture of engagement with change, particularly if based on trust, strengthens the probability that stakeholders will engage with change, while a lack of trust will inhibit engagement. The nature of the change will also include the extent to which individuals engage or not. Change that happens too suddenly, and without warning, or is forced upon people, will negatively affect levels of engagement. Similarly, readiness (or lack of) for change will influence whether or not stakeholders will engage in organizational change practices. These contextual factors are also supported by processual antecedents, which impact on engagement.

2.2 Processual antecedents

The processual antecedents of organizational change engagement include: fairness, justice, relationships, and support.

2.2.1 FAIRNESS AND JUSTICE

The perception by employees about whether or not change is fair or unfair is based on their assessment of fairness, using observations of their own and others' experiences. The ways in which leaders and managers treat stakeholders influences engagement with change. For example, a meta-analysis by Colquitt et al. (2001) of the academic literature on justice shows that an individual's engagement depends, in part, on perceptions of whether the organization treats other employees fairly. This is supported by research, which demonstrates that employee perceptions of the socially responsible activities of their employers towards external stakeholders, such as customers, taxpayers, and charities, are also important determinants of engagement [Brammer et al. (2006)]. Furthermore, when management supports change in ways that go beyond merely selling the need for it or its benefits by visibly caring about what is required for it to be effective, research shows that employees tend to perceive the fairness of change more favorably [Liu et al. (2012)].

Perceptions of fairness and justice are also more likely to reduce individuals' appraisal of the threat of change and cause them to feel obliged to be fair in how they perform their roles by giving more of themselves to change initiatives through greater levels of engagement. On the other hand, low perceptions of fairness are likely to cause employees to withdraw and disengage themselves from change. Fairness and justice thus appear to be important antecedents of organizational change engagement.

2.2.2 RELATIONSHIPS

Relationships can shape the extent to which people engage with change, since organizations are defined by the sets of relationships among people who coordinate their activities in the service of tasks, goals, and missions. Relationships are, metaphorically, the nervous system of the organization, the source of complex social interactions, the coordination of systems, and the integrated processing of concurrent signals. Relationships affect how organizational change gets done and how individuals and teams coordinate, share knowledge, and accomplish change initiatives. Employees get meaning from the relationships that they create with one another at work. Colleagues can provide help to do the work and make sense of ambiguous situations, as well as provide personal support and mentoring. Individuals' work lives matter more when individuals feel connected to others at work and less when they feel isolated and alone. Moreover, good working relationships at work foster creativity, innovation, productivity, and engagement with change. High-quality connections are crucial to building and sustaining organizational change engagement. In support of this, Dutton and Heaphy (2003) identifies what he calls "respectful engagement" – which refers to being present to others, affirming them, and communicating and listening in a way that communicates regard and an appreciation of another's worth – as central to creating relationships that connect and energize individuals at work. Individuals who experience relationships positively at work may be able to engage themselves more fully with change: saying what they think and feel in order to make the change better, working enthusiastically and energetically, and seeking to provide and receive feedback, in order to learn as much as possible to implement and sustain organizational change.

2.2.3 SOCIAL SUPPORT

Social support received from management and colleagues is a key part of effective relationships at work. Social support from line managers and co-workers has been positively linked to engagement, since it can make individuals feel valued and involved. Studies reveal that employees who feel valued by the organization are more likely to engage. For example, support has been found to help create engagement among teachers [Bakker et al. (2007)], dentists [Gorter et al. (2008)], fast-food workers [Xanthopoulou et al. (2009)], and hotel staff [Salanova et al. (2005)]. Positive support is important for engagement with organizational change as it gives employees confidence that they are valued and can create reciprocal mutuality and build trust. To the extent that individuals perceive fairness and support as providing protective guarantees for their self-investments, they may become more willing to take the risks involved in engaging in change. Hence, individuals who engage with organizational change will do so because of the continuation of favorable reciprocal exchanges. As a result, individuals who are more engaged are likely to be in more trusting and high-quality relationships with their employer.

2.2.4 INDIVIDUAL ANTECEDENTS

Organizational change engagement is generated by the contextual and processual aspects of an organization and is also something that an individual brings to the workplace through their own perceptions, personality, and emotions, which shape and direct their attitudes and intentions towards how engaged they will be with change. To a large extent, perception relates to the way in which individuals make sense of their environment and interpret and respond to the events and people around them. Equally, it is important to emphasize that each individual receives information differently. This is because individuals do not receive information about what

is happening around them passively and dispassionately, or in the same way as others. Individuals categorize and make sense of events and situations according to their own unique and personal frame of reference, which reflects their personality, past experiences, knowledge, expectations and current needs, priorities, and interests. A key influence on the process of perception is personality. It is an individual's personal perception of their social and physical environment that shapes and directs how engaged they are, rather than some objective understanding of an external reality. Employees engage with change when they feel that, on balance, it matters to do so. This is partly about self-interest since individuals are more likely to engage with change when it is in their interest to do so. Consequently, individual differences shape a person's ability and willingness to engage with organizational change.

2.2.5 PERSONAL DISPOSITIONS

Dispositions are personality characteristics or general tendencies to experience affective (emotional) states. The disposition that has been most frequently considered to influence employees' engagement with change is locus of control. This trait has to do with the explanations individuals give to the events that occur in their lives. Individuals with an internal locus of control tend to perceive themselves as responsible for what happens to them, whereas those with an external locus of control attribute what happens to them as resulting from outside forces. Relationships have been found between locus of control and employees' reactions to change. In their study, Chen and Wang (2007) found that internal locus of control was positively associated with engagement to change among Chinese customer service staff. Overall, an internal locus of control tends to correspond fulfill more positive reactions to organizational change.

2.2.6 COPING STYLES

How people cope with organizational change will determine their engagement with it. Two main coping styles are problem-focused and emotion-focused coping. Problem-focused coping involves directly addressing the problem, whereas emotion-focused coping is aimed at alleviating the discomforting symptoms, rather than their actual source. In the context of organizational change, a problem-focused coping style has typically been shown to involve a more positive reaction to the change since individuals with a problem-focused coping style report greater readiness for change, increased participation in the change process, and a greater engagement with it. In a study of a merger, problem-focused coping was found to be positively related to identification with the newly merged organization [Amiot et al. (2006)]. Emotion-based coping styles, however, involve the use of maladaptive defense mechanisms, such as denial, dissociation, and isolation and yield greater behavioral resistance to change in comparison with the use of adaptive mechanisms, such as humor and anticipation.

2.2.7 PERSONAL RESOURCES

Personal resources are positive self-evaluations and refer to an individual's sense of their ability to control and impact upon their environment successfully and thus influence their engagement. The personal resources that demonstrate positive organizational behavior (POB) are: hope, efficacy, resilience, and optimism (summarized using the acronym: HERO) [Youssef-Morgan and Bockorny (2013)].

The HERO constructs provide resources that can positively influence organizational change engagement. Personal resources positively impact engagement with organizational change so that employees who are, for example, more self-efficacious and who find their work meaningful are better able to mobilize their own job resources and become more engaged. Individuals who perceive themselves as having the prerequisite abilities to fulfil the demands of organizational change will derive a sense of competence, meaningfulness, and self-worth from change and thus be more willing and able to fully engage and give themselves to their role. In contrast, employees who perceive that they do not have the necessary abilities are likely to experience stress or boredom from perceiving that the change is either too challenging or not sufficiently challenging; both of which reduce the likelihood that they will engage with changes.

Although what influences engagement with organizational change will vary according to circumstances, it is the main antecedents that can be categorized as contextual, processual, and individual factors. The organization's change history, its leadership, and its approach to change are all important, as well as people's perceptions of how they are treated, either fairly and justly as adults or as expendable chattels. There is also a connection between the antecedents, levels of engagement, and various outcomes. Engaged employees will perform better and more vigorously, offer innovative suggestions, and pursue the objectives of organizational change in the face of obstacles. An organization's specific context and conditions will determine, to some extent, the antecedents and outcomes. At an individual level, engagement can be influenced by personal factors, which can distract and deplete energy, or in the case of positive events, result in people being more enthusiastic. An individual's level of engagement may also be affected by the characteristics of the person, such as generally being very

energetic, as well as physical, emotional, and psychological resources available at a given moment. Team engagement can be fostered through collective efficacy, that is people's shared beliefs in their collective power to produce desired change. By understanding the potential antecedents, levels and outcomes of engagement, leadership and management can play a crucial role in enhancing engagement with organizational change.

2.3 Outcomes of engagement with organizational change

As Figure 1 illustrates, engagement levels can be linked to outcomes, such as performance, productivity, innovation, wellbeing, decrease in absenteeism, and turnover. Through these outcomes organizational change engagement can create organizational effectiveness.

2.3.1 PRODUCTIVITY AND PERFORMANCE RELATED OUTCOMES

Engagement can have an impact on productivity and performance. The academic and practitioner support for this view is evident, and research investigating the relationship between engagement and performance continues to expand the understanding of this important longitudinal relationship. Consultancy firms claim that a positive association exists between engagement and business success. For example, studies highlight the links between engagement and performance at business unit and organizational levels [such as Winkler et al. (2012)]. Thus, engagement with organizational change has the potential to increase productivity.

2.3.2 INNOVATION

Innovation is high on the agenda of many organizations as they strive to differentiate themselves from their competitors and peers in an increasingly competitive global environment. Research shows that engaged employees are more likely to foster an innovative environment [Hakanen et al. (2006)].

2.3.3 WELLBEING

Employee wellbeing is an outcome of engagement with organizational change. Engaged employees report positive health outcomes and wellbeing. Studies show that engaged workers in Dutch service organizations suffer less from headaches, cardiovascular problems, and stomach aches [Schaufeli and Bakker (2004)], engaged Finnish teachers report good health [Hakanen et al. (2006)], and engaged Swedish healthcare workers have fewer back pain and neck pain problems, and lower anxiety and depression [Peterson et al. (2008)]. Research findings thus confirm the positive link between employee engagement and employee wellbeing; engaged employees have a greater sense of wellbeing. The benefits of this are that people with higher levels of wellbeing, learn and problem-solve more effectively, are more enthusiastic about change, relate to others more positively, and accept change more readily.

2.3.4 INTENTIONS TO LEAVE

Employees engaged with change are significantly more likely to want to stay with their organization than those who are less engaged. For example, a survey by Gallup [Harter et al. (2009)] demonstrates a link between lower engagement scores and higher employee turnover, both for organizations with historically high turnovers and those with much lower turnovers. In looking at those firms with 60 percent or higher annualized employee turnover, those in the bottom quartile ranked by employee engagement had 31 percent higher employee turnover than those in the top quartile of engagement scores. For firms with annualized turnover of 40 percent or lower, the results indicate that those in the bottom quartile had 51 percent higher annualized turnover. An individual's expressed intention to leave their organization is generally regarded as an important measure of how they are feeling about their work. As noted by Schaufeli and Bakker (2006), engaged employees are likely to have a greater attachment to their organization and a lower tendency to quit. Hence, research suggests that the scope of an individual's engagement will vary from change to change, supporting the proposition that organizational change engagement is transient.

3. CONCLUSION AND IMPLICATIONS

There are a number of practical implications that arise from the discussion in this article including the following:

- **Identify what drives engagement with change in your organization:** review whether and how you build and sustain key drivers of engagement with change. To what extent do you know each of your team members, both collectively and individually, in respect of what influences their engagement with change? How can you do all this better?
- **Build a culture of engagement with change:** assess whether and how you define and communicate a valid and appealing purpose for a change and its linkage to the vision, values, and strategy for change. How can you do this better?

- **Build and maintain trust:** to encourage engagement with organizational change, trust needs to be built and maintained and conversely those actions that erode trust need to be avoided. Trust is two-way; employees must not only have trust in others and the organization to feel safe to engage but must also feel that they are trusted by their managers and the organization. How can you build relationships based on fairness and justice in order to help to make employees feel valued and respected?

- **Identify what influences readiness for change:** managers and leaders need to be aware of what influences employees' readiness for change, such as existing organizational conditions, the nature of the change, and an individual's belief in their ability to engage with change. Creating readiness involves proactive attempts by leaders and managers to influence the beliefs, attitudes, intentions, and ultimately the behavior of employees. How can you improve upon this?

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MAKING COLLABORATION TOOLS WORK AT WORK: NAVIGATING FOUR MAJOR IMPLEMENTATION DILEMMAS

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ABSTRACT

Organizations introduce collaboration tools, such as Microsoft Teams and Facebook Workplace, to stimulate communication and collaboration across hierarchies and silos. However, many firms struggle to successfully get their workers to adopt these new technologies. The result is that both management and employees are frustrated, and neither of them become more collaborative. What are the reasons these collaboration initiatives do not always live up to their expectations and how can this be overcome? In this article we discuss four major dilemmas that firms need to address in order to increase the chances of their initiatives becoming a success.

First, the scope: is the goal of the project a repository of best practices, or a collaborative space for (work-related) exchange of ideas? Second, design of the tool: should it match the expectation of what management envisions, or should it match (and thereby amplify) current work practices? Third, the implementation strategy: should you go for a top-down implementation with champions and KPIs, or does it make sense to "just let go" and let users play around? And fourth, project governance: should you focus on the quantitative data, or on qualitative evaluations of end-users?

Addressing these dilemmas will enhance focus, and ultimately help address the question of how to manage the implementation and use of collaboration tools in relation to broader organizational change: do you want to "disrupt" or "augment" existing ways of working?

1. INTRODUCTION

Organizations continue to introduce collaboration tools, such as Facebook Workplace, Slack, and Microsoft Teams, to create an organization where employees communicate and collaborate across hierarchies and silos, with the help of digital technologies. Whether they are referred to as social software [Gotta et al. (2015)], content collaboration tools [Basso et al. (2018)], or digital experience platforms [Guseva et al. (2019)], most of these tools provide rich features such as collaborative co-authoring, file sharing, closed and open communities, and private and public communications. When more sophisticated collaboration tools started to become more prominent, Gartner predicted that roughly 50 percent of businesses would use collaboration technologies by 2017 [van der Meulen and Riviera (2013)]. Harrysson et al. (2016) conducted a survey of 2,750 global executives and found that, indeed, over 50 percent of organizations are actively using tools for internal communication and collaboration. An increasing number of employees are using collaboration tools on a daily basis, and as these tools continue to be utilized they are becoming an integral part of the digital workplace [Poitevin (2018)].

Despite their widespread implementation, many firms still struggle to make collaboration tools a success. As with many tools that start as hypes, collaboration tools were first considered as "magic bullets" that would magically make people and organizational cultures more collaborative. In this article, we offer business leaders and other decision makers four clear dilemmas that need to be considered, and managed, to ensure that their collaboration initiatives can take off successfully. These dilemmas are based on our extensive practice-based research in a variety of firms, such as banks, consulting firms, healthcare organizations, and public institutions. The first author collected data during his PhD research, whereas the second author continues to collect data through ongoing research projects. In total, we collected user statistics and hundreds of hours of interviews and observations at different organizations. Note that all names of the organizations mentioned in this paper are anonymized. Our research shows that there is a gap between what leaders envision and what is actually happening in practice. A major reason for this discrepancy is the difference between what leaders think their employees need and what their employees actually want. Oftentimes, collaboration initiatives are launched in organizations where the culture and way of working are not necessarily collaborative to begin with.

2. HOW TO MAKE COLLABORATION TOOLS WORK AT WORK

Introducing collaboration tools in non-collaborative cultures is likely to fail; and depending on the goal of the initiative, leaders may need to try to overhaul their organizational culture in order to make digital workplaces work.

Throughout our different studies, the extent to which the technology initiative is aligned with an existing or envisioned culture seems to be decisive. In organizations where the initiative matched the existing ways of working, we noticed how people's ways of working were augmented: they were able to do their work more easily, better, and faster. If, on the other hand, the initiative did not match the existing ways of working, we noticed that there were two potential outcomes: either the initiative failed because of the disconnect between the culture and the new collaboration tool, or the organization needed a large scale cultural change program to shift how people thought about their ways of working and collaborating. Put simply, the technology can augment or disrupt the existing culture and ways of working but it will not act as a magic bullet.

Our research shows that there are four fundamental dilemmas that leaders need to navigate in order to establish long-term performance value from their collaboration initiatives. Each of these dilemmas concerns a specific dimension of the existing or envisioned culture. In this article, we address each of these dilemmas in detail and share our recommendations to help decision makers make their collaboration initiatives a success.

2.1 Dilemma 1: Scope of initiative – repository versus collaboration

2.1.1 WHY DO WE WANT PEOPLE TO USE THE TECHNOLOGY?

The first dilemma concerns "the goal of the initiative". Is the main goal to stimulate and facilitate interaction and collaboration across departments and specializations, or to create an online repository of best practices? The choice for either of these options has implications for how employees will perceive the initiative. Simply put, if the goal of the initiative is to stimulate collaboration, knowledge closely related to practice (e.g., solving problems) will be shared but will not necessarily be documented and codified into organizational knowledge. On the other hand, if the goal of the initiative is to create a repository, knowledge will be codified into a database of organizational knowledge (e.g., high level best practices), but this knowledge is probably going to be less relevant to employees' daily practice.

2.1.1.1 Repository

If the goal is to create a repository of information, such as organizational news, procedures, best practices, and the like, then an important consideration is how to motivate employees to contribute to the repository. Employees will generally perceive the tool as an additional task and/or tool, and not as something that may help them in their daily work. The challenge here is to have a continuous flow of content that is relevant to the different professionals.

At a large multinational IT firm, management wanted both high levels of collaboration as well as the creation of an online repository. Although the idea of collaborating through such an open platform was not necessarily problematic for many professionals, the idea of contributing to a repository did not appeal to them. They reasoned that since they were evaluated based on billable hours they could spend at clients (doing their work there), they focused purely on those types of activities, and that writing best-practices did not contribute to that goal. An employee at the firm complained that their newly introduced collaboration tool is "a business tool, it

is not just social, it is a business tool, so we want to make sure that people realize that and find ways to integrate it into their work."

At GovDep, a large government department in the Netherlands, the goal of implementing a collaboration tool was explicitly framed in terms of creating a "collective brain" that would give employees insight into who-knows-what and who-works-on-what. The initial idea at GovDep was both stimulating collaboration across organizational borders and establishing a repository of organizational knowledge. The collaboration tool would serve as a tool for discussions and collaboration, and whenever some information became "validated" by experts, that information could be stored on the organization's intranet. In practice, this distinction between the two separate but related tools turned out to be difficult to maintain. Since government employees depend on validated documentation to do their work, they generally just waited until someone would validate the information, and hence refrained from using the tool for collaboration. For the organization as a whole, the platform was mainly a repository of relevant information.

A successful example comes from BuildCo, a large international construction and engineering firm with offices all over the world. In order to continuously learn from their experiences with different projects across the globe, management introduced an online platform where best practices (and other learning experiences) could be shared. Although the initiative was not successful at first, management decided to make it mandatory for project leaders to draw up case reports that would contain information about projects in terms of what went well and what did not go well in their projects. Management also made it mandatory that before starting with a new project the responsible project leader should check the platform to see if there had been similar projects before. The result is a platform where best practices are definitely shared, but where only few discussions are taking place.

2.1.1.2 Collaboration

For a collaboration tool to actually facilitate collaboration, it is most important that working together is already part of how people do their work. The tool should basically help them do parts of their work in better, easier, or faster ways. Next to a match with the existing ways of working, employees need to experience a sense of psychological safety: a feeling that it's OK to post something or ask questions without running the risk of, for example, being labeled as uninformed.

A clear example comes from our study at Xhealth, a large healthcare organization that provides specialized care for clients with communication related challenges (e.g., autism, blindness, and deafness) in the Netherlands. At Xhealth there was already a high level of interaction and collaboration between therapists before the collaboration tool was implemented. There was an active exchange of knowledge to stay on top of developments, and to discuss complex clients when necessary. Over time, the collaboration tool became one of the primary channels for these interactions. The therapists felt free to engage in conversations with their peers. They often required additional input from different fields of expertise to come up with a comprehensive treatment plan for their clients, and hence using this tool helped them connect and collaborate with the right people. Management decided not to intervene at all: they started to use the platform themselves but generally did not join discussions to avoid employees feeling that management was watching their every move.

By contrast, our study at the aforementioned IT firm revealed that even though management wanted the technology to be used for collaboration, they made it clear that they were watching what people said and did. Some of the IT professionals we interviewed explained that their contributions were escalated to higher management since their opinions were not appreciated on such an open platform. They felt as if "big brother is watching you." The result was that instead of supporting collaborative behavior, the tool was mainly used to communicate in highly strategic ways to protect and boost their reputations. As one senior professional at the firm explained: "You have to make sure that you're visible. So that you're not only doing good things, but also that the right people know that. Right, if you want to qualify for a promotion for example, or for a salary increase..."

Hence, managers should ask themselves two things: (1) would the people in my organization benefit from collaborating more with each other? And, (2) to what extent are we providing them with a level of psychological safety?

2.2 Dilemma 2: Technology design – management versus user driven

2.2.1 WHAT USER EXPERIENCE SHOULD THE TECHNOLOGY PROVIDE?

The second dilemma concerns the design of the technology: what features should it have? Is the technology designed from the perspective of management (and how they want employees to work with it), or from the perspective of the employees and how they (want to) do their daily work?

The choice for either of these options has to be made upfront and has major implications in the long run for the ways in which the tool will (not) be used. If the tool contains all the

possible features that management desires, chances are that only the appointed champions will utilize the full possibilities of the tool. On the other hand, if the tool is only aligned with the current expectations of employees, chances are that the tool will not bring about a major shift in how work is done. This dilemma has to be weighed carefully, throug some upfront decisions made here may leave room for changes along the way.

2.2.1.1 Alignment with management goals

In many organizations the collaboration tools that are bought and implemented are selected based on the requirements stated by higher management. In other words: executives and programmers decide how the tool is to be designed for "optimal" use by employees. Optimal relates to managerial goals. Many of our studies, however, show that this top-down design of the collaboration tools has a variety of downsides. Most prominent is the fact that since executives are relatively far away from daily practice, they have limited knowledge of what it is exactly that their employees do on a daily basis.

In one example, management decided to purchase a commercial off-the-shelf sophisticated collaboration tool, which facilitated many of the features of different applications on one platform. Beside the basics of sending private and public messages in public and private groups, the tool allowed users to collaboratively work on documents, and facilitated the integration with several external tools (e.g., Sharepoint and Dropbox). The problem with such a wide integration of features into one single tool is that most people – even seasoned technology users – get lost in the jungle of features. In such situations, users often decide to abandon the tool after some time since it costs too much time to get to know the full functionality of the tool while their existing tools work just fine. As several consultants explained to us: "And it's a lot easier to stick something in email, than it is to create a page on the platform. It seems more effort to do it [there] than to knock up a quick email."

Another example is GovDep, where there was a clear management vision driving the implementation: the creation of a "collective mind" for the organization. Interestingly, the choice of the platform technology was made rather independently from this vision, as the IT department was leading the initiative and decided to opt for a supplier that was the organization's main technology partner. The vision driving the whole project was formulated by the organization's communication department, and they were not entirely happy with this choice as they would have preferred a more "open" platform that would have less functionality, but would be easier

> *"Management should consider how to balance the different dilemmas: the technology can augment or disrupt the existing ways of working but will not act as a magic bullet."*

to use and would allow more user-generated content. Hence, while the management vision driving the implementation would have been one of emphasizing collaboration (users sharing knowledge to provide insight into what they know and what they work on), in practice the platform was mainly used as a repository. This was partly due to the technology, which was not really facilitating open sharing and collaboration, but more so due to the organizational culture, which was very formal and hierarchical. It was uncommon for employees to share ideas that were not approved or validated and there was a general feeling that it was risky to share knowledge as this might negatively influence one's position.

2.2.1.2 Alignment with workers' expectations

We encountered a few organizations where the tools were actually not designed upfront along managerial expectations but were fairly basic and allowed to be used in ways that were "appropriate" from the perspective of employees. These collaboration tools, such as Yammer and Facebook Workplace, generally do not differ that much from existing platforms that many employees already have significant experience with. In such situations, we noticed that employees were much more eager to get some hands-on experience with the tool to find out what it could mean for their work. They already know how it works in their private lives, so how could this tool contribute to their work?

The clearest example of a collaboration tool that was aligned with the workers' ideals was the use of Yammer at Xhealth. The tool allowed users to post messages, create open and private groups, connect with peers, and share files, among others. Yammer was initially picked up by a few employees who wanted to stay in touch across geographical boundaries. Over time, however, they started to use the tool to share new developments, research, conferences, and the likes. Since in their work the therapists depend on staying up to date about new developments, the tool incrementally became the go-to

source for new knowledge and information. We also noticed that because more people were visiting the platform, they started to experiment with different ways of using the tool in their daily work. At first, the tool was used for basic tasks, such as setting up meetings and sharing minutes. Over time, however, the tool became an integral part of the way of working at Xhealth: whenever they faced difficult clients, therapists used the tool to consult each other. Yammer became aligned with professionals' ideals of how they should use the technology. Management largely stayed away and merely supported their employees to use the technology as they deemed appropriate. According to one of the therapists, "If I didn't visit Yammer, then I never would have known about that conference, or never about this book, or would have missed this training module, or missed this e-learning course. It gives me so much! It's not just one thing. And that's why I keep using it."

2.3 Dilemma 3: Implementation strategy – leading versus letting go

2.3.1 IN WHAT WAYS ARE YOU STIMULATING OR SUPPORTING EMPLOYEE USAGE?

The third dilemma concerns how the technology is implemented and managed. A popular approach is to implement the technology from the top-down by rolling out the tool, together with a mix of guidelines and instructions. A second, and less conventional approach is stimulating and supporting bottom-up interest for the technology. In this manner, employees get to find ways to integrate the tool in their work, but at the same time management has less control over how the technology is taken up throughout the organization.

2.3.1.1 Top-down introduction

The most often deployed strategy to introduce new technologies in organizations is an orchestrated top-down approach. While such an approach has had many positive outcomes for technologies, such as the introduction of new ERP systems, in the context of collaboration tools our research has repeatedly shown that such a top-down approach either discourages usage altogether or stimulates strategic behavior. Employees seem to use the tool but a closer look at their actual behavior reveals that many, if not most, of the activities on the platform are ceremonial.

One very clear example comes from our study at ATA Consultancy. Management aimed to increase knowledge sharing among employees, and between management and employees. To stimulate adoption of the collaboration tool, management developed an implementation strategy that encompassed promotional activities (e.g., workshops) and also appointed a wide range of champions: consultants who were supposed to stimulate usage of the tool among their colleagues. This approach did succeed in the beginning: initially, the consultants used to socialize with each other and after a while even used it to find other consultants in their field of expertise. Not too long after that, the use of the tool dwindled. The users thought the platform had too little added value: they established their network and the rest of the content on the platform did not help them in their work. The problem in this case is that the idea of the platform did not align with the work of the consultants, so while it "worked" in the beginning, after those first months consultants abandoned the tool. According to one of the consultants at the firm, "if I were to post my question on the platform, I doubt whether I would get a reaction [...] because I don't see other colleagues..."

2.3.1.2 Bottom-up initiative

Although the top-down approach is most often used, we found a few cases where collaboration tools were introduced through bottom-up initiatives (e.g., by a department or by a team). Although management has less control over the exact implementation trajectory in those cases, our research shows that such an approach potentially stimulates employee adoption in the long run. Since employees have the opportunity to experiment with the technology, to find ways in which it fits in their work, the tool slowly but surely becomes part of their daily routines. At first, employees need some time to get acquainted with the tool, but as more colleagues join the experimentation phase, usage slowly, but surely, evolves into activities related to daily practice.

The best example of such a situation comes from our two-year study at Xhealth. The tool – Yammer – first surfaced in early 2011, when a group of social workers wanted to use the tool to collectively oppose a new policy from management. Soon after that, others started to join the tool. Management was not even aware of Yammer at that time, but the employees were very interested in finding new ways to keep each other up to date about their community and field of work. Although in the first few years the tool was mainly used as an outlet for a small group of users, the group of lurkers (i.e., users who join a community and follow/read its content but never contribute themselves) started to grow. Given that there was no push from the management to use tool in a certain way, the growing group of lurkers felt free to slowly experiment with using the tool in new ways. After some time experimenting with using the tool to schedule meetings, organize meetups, and keep each other up to date about new developments, the tool became used as a gateway for asking questions about complex clients

the therapists faced in their daily work. Management did not prescribe anything, and merely supported the initiative by integrating Yammer into the organization's standard intranet website. As a result, over time, the tool became "part of working at Xhealth."

A downside of a bottom-up implementation strategy emerged in our case study at a multinational electronics corporation, Electroco. Electroco employs over 110,000 employees in more than 100 countries and introduced their collaboration tool with the aim of connecting employees around the globe. The general implementation strategy was to be hands-off: the tool was launched and made available to employees with very little in terms of predefined structure or instructions on how to use it. Users were stimulated to connect with like-minded colleagues and start their own communities to discuss relevant issues. What was considered "relevant" here was initially defined very broadly as basically anything that the users themselves deemed relevant to discuss. This led to large-scale adoption: after just over a year, almost 40,000 employees were signed up on the platform. Actual use of the platform, however, turned out to be very fragmented. After two years, "thousands" of communities had emerged, and about 40 percent of those communities were "private", i.e., they were not open to users other than those who were invited to join. Many of these communities were overlapping in terms of the subjects that were discussed, but the owners were generally not willing to merge their communities with similar ones as they maintained that there were significant differences. The fact that over 40 percent of the communities were "private" exacerbated the problem that there was little to no exchange between communities. Hence, at Electroco, a bottom-up approach facilitated large-scale adoption, but in terms of actual use it led to fragmentation and a lack of organizational knowledge sharing.

2.3.1.3 Balancing act

An interesting case that balances between a full top-down versus bottom-up approach is the case of a large national bank. Although the collaboration tool was initially introduced from the top-down, employees were not overly "forced" to use the tool, and rather anyone who showed some interest was highly supported. If people wanted to create private or public groups, they were supported by a team of community managers who helped get everything up and running. These community managers not only supported users in this, but also actively coordinated the process. For instance, they questioned whether a new group was really necessary if similar groups already existed, and actively approached groups with a low level of activity to ask how this could be improved. In this case, the initiative was not necessarily a large scale success because of several cultural factors (e.g., given the high level of confidentiality, employees remained extremely reluctant to share files on the platform), but the case does illustrate that there can be a good cooperation/interaction between top-down and bottom-up elements.

2.4 Dilemma 4: Project success – numbers versus knowledge

2.4.1 WHEN DO WE SEE THE INITIATIVE AS SUCCESSFUL?

The final dilemma managers should consider when implementing, managing, and evaluating their collaboration tool initiatives, is whether they want to measure the success of the initiative through quantitative statistics, such as usage numbers, active members, and number of posts, or through qualitative measures, such as whether the tool helps people make more informed decisions, expands people's networks, or helps people stay up to date about new developments in their field of work.

2.4.1.1 Numbers

Though not surprising given our current-day focus on data-driven decision making, most organizations evaluate the success of their collaboration tool initiatives by looking at usage numbers. Numerous studies, however, have found that such numbers can be deceiving: when usage numbers are high, does this mean that people really help each other, or are people posting stuff simply to satisfy managerial expectations? On the other hand, when numbers are low, does this imply that nobody uses the platform, or that most people are lurking and learning from a select number of frequent users (e.g., experts)?

At ATA Consultancy, a multinational accounting and consulting firm, success was very much measured in terms of numbers: the knowledge managers who were responsible for the gateways were frequently checking their dashboards to see the numbers of users that registered, activated their account, posted something, etc. After a phase of initial enthusiasm, in which people were willing to explore the possibilities of the tool, the numbers stalled and started going down. An important reason for this was the lack of relevance of the content – the paradoxical feeling that there was "too much" information on the gateway, but at the same time "too little." As management was not focusing on the issue of relevance, but on the numbers at the level of the entire organization, they overlooked the fact that in some communities there actually was a lot of activity and enthusiasm because employees with a shared interest (e.g., e-auditing tools) had found a common ground and were

very actively integrating the tool into their daily work. Instead of capitalizing on such successful groups, and trying to learn from them, management focused on the overall numbers. Given that from a holistic perspective the numbers were going down, they declared the gateway a failure and replaced it with a different tool that was more "open", less prestructured, and allowed for more user-generated content. Coupled with this, management adapted their idea of "success", focusing less on critical mass in quantitative terms and more on the actual contribution of what happened on the platform to users' work. As one interviewee explained: "It's all way too broad – 80 percent of what's on the Gateway has nothing to do with my work, but with all of ATA. I never found anything useful there."

2.4.1.2 Knowledge

In fact, ATA's management moved from a purely quantitative determination of success to a more qualitative one. Such an approach requires a more in-depth understanding of what is actually happening: how are people using the platform and what are some of the consequences for their regular work? Although this approach requires more effort, our research seems to indicate that a qualitative understanding of how the tool is used in practice has major benefits compared to just looking at quantitative indicators. A qualitative approach moves beyond the statistics and explores how the use of the collaboration tool actually benefits professionals in their daily work and in the long run. The result of this approach is that managers are better able to support communities and users in getting the most out of the tool. Having said that, a possible pitfall of this approach is that a platform is declared a success on the basis of a few (and possibly very prominent) small groups of users claiming to derive value from it – whereas most of their colleagues do not even use it.

Both at Xhealth and at the national bank, those involved with managing or supporting the tool were interested in what people were actually experiencing when using the platform. At Xhealth, both management and several core contributors felt that almost nobody seemed to use Yammer at some point in time. However, instead of canceling the project they let it exist without much additional support. Over time, some of these core contributors started to notice that people would approach them offline (e.g., in the hallway or during meetings) to tell them their appreciation of the content spread by the core contributors. The content that was produced continuously by those core contributors actually resulted in a certain critical mass of relevant content. At some point in time, these contributors posted so much relevant content on a continuous basis that other users felt an increasing fear of missing out: they felt that they had to visit Yammer to stay up to date. From a quantitative perspective, the statistics did not change much, since most users still remained lurkers. From a qualitative perspective, however, Yammer became increasingly essential for therapists to stay knowledgeable. According to a therapist: "So if you're not active on Yammer, or you're not following posts, then you miss out on that information. And that does not benefit your professionalism!"

At the national bank, the collaboration tool was introduced from the top down, but management provided a lot of freedom for employees to use the technology as they deemed fit. They appointed a community manager who did not necessarily check whether people were using the tool in "the right way" but was rather concerned with helping people get started and continue their use. If the community manager noticed that some communities were silent, they would talk with those people to find out what happened. Sometimes the answer was simple: a project was finished. In other cases, the community manager could share tips and tricks with the community-starters to get their community going on a continued basis.

3. SO HOW TO CONTINUE WITH COLLABORATION INITIATIVES?

To summarize, our research projects at several different large organizations draw attention to the following four dilemmas:

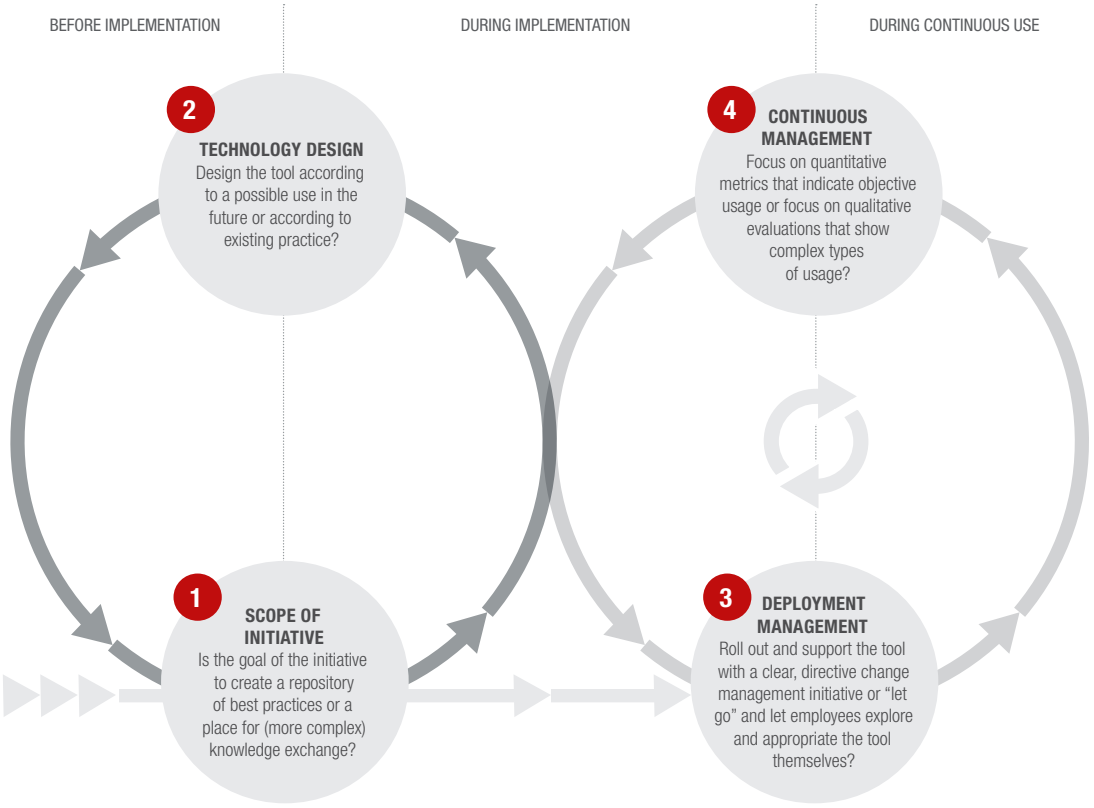
1. **Scope of the initiative:** repository versus collaboration
2. **Technology design:** work versus management-driven
3. **Implementation strategy:** leading versus letting go
4. **Managing continuity:** numbers versus knowledge

The different dilemmas show that it is obviously not just the technology that determines whether digital workplaces work. It depends, to a large extent on the perception and actual usage in practice of the people who will work with the tool. This is the reason that the four dilemmas also emerge at different moments in time when considering the process going from idea to implementation to continuous management. We suggest management consider the four dilemmas at different moments in the process, as presented in Figure 1.

3.1 Dilemmas emerge in phases

Figure 1 indicates three major phases: before, during, and after implementation (i.e., during continuous use). They are depicted as two major feedback loops, since the choices made to tackle the individual dilemmas, also affect some of the other dilemmas.

Figure 1: Process flow of collaboration tool initiative rollout



3.1.1 PHASE 1: BEFORE IMPLEMENTATION

Perhaps the most clear-cut phase is the "before implementation phase", in which management needs to think about the why and how of the collaboration tool initiative. Dilemmas 1 and 2 are most relevant. The scope of the initiative (dilemma 1) and the technology design (dilemma 2) will need to happen before long-term deployment. Notice that a little adjustment can take place during the initial phase of implementation (pilot phases, for example). However, once the tool is in place, it becomes more complex to roll out large updates. Not only because of tool complexity but because employees incrementally develop routines that include the tool in their daily work that can be significantly damaged if the tool is suddenly changed significantly. Think about the troubles of upgrading all staff from Windows 7 to Windows 10.

3.1.2 PHASE 2: DURING IMPLEMENTATION

All four dilemmas are applicable during the initial implementation. Based on preliminary input received during deployment management (dilemma 3) and continuous management (dilemma 4), management can decide to alter the scope and even the technological choices. Especially since new features can continuously be added virtually, the implementation phase can serve as important phase to alter the initiative based on experiences in practice.

3.1.3 PHASE 3: DURING CONTINUOUS USE

Dilemmas 3 and 4 are most relevant during phase 3, in which the collaboration initiative needs to be kept going, either actively or passively. At first it should be considered whether or not to engage in a top-down implementation, or to have a less strict approach where employees are free to use the tool or not (dilemma 3). This approach can be adjusted based on data and insights collected during continuous management. Should you give clearer instructions (typically in hierarchical organizations) or back off and let your professionals experiment (typically in organizations with flat hierarchies) (dilemma 4)?

3.2 What does this look like in practice?

Consider a hypothetical example, purely for informative reasons: a case where management of a traditional financial firm wants to collect best practices in a repository tool. Based

on their scoping, they decide to go for a commercial off-the-shelf document management system (DMS), which turns out to also include strong co-authoring and community features. Based on the tool, management decides to reconsider their scope slightly to also include collaboration. They think: "Who knows, it may spark innovation and break down silos".

During the highly controlled pilot roll out, they notice that people do not seem to use the community and co-authoring feature since it does not integrate with their existing cloud-based document storage tool (e.g., OneDrive, Dropbox, G-Drive). This is a core element of the daily work of many of their professionals, so no integration presents a major hurdle for adoption. Management goes back to the software vendor, who quickly builds the integration. The integration is rolled out to the pilot group and most employees seem to quickly adopt the feature and start to use the community and co-authoring features.

Management decides it is a success and the tool becomes available for all employees through a large top-down introduction program, where champions of all departments are trained at length and now have the mission to stimulate their co-workers to also adopt the tool. Management wants to see increasing usage numbers, more communities, more documents, the works. After several months, the numbers seem to be promising. In practice however, people do not seem to be overly enthusiastic. Many of them, when asked, explain that they played around a bit and uploaded some documents, but started to halt that behavior as it did not really benefit them in any way, colleagues did not seem to notice what they uploaded, and their direct management did not seem to care in evaluation sessions. The general attitude seemed to be: "It doesn't help me do my work better, faster, or easier, so why bother?"

Based on this input, management decides to change the way of framing how the tool should or could support its employees. It starts to emphasize the benefits of using learnings from your colleagues, it highlights successes that showed how much time is saved when using the tool versus working in their legacy environments, and also focuses on the experimental side of the tool. These, and more actions, help to incrementally shift the culture within the organization. People became interested again and slowly but surely started to integrate it into their daily routines.

The whole process might take at least a year, probably several. And, even though this is a simplification, it highlights how the four dilemmas emerge continuously during different parts of the roll out of a new collaborative tool. The implementation of the collaboration tool, making it available to all employees, is really just the starting point, as the ways in which the culture, attitudes, routines, and expectations of employees continuously shift and alter the extent to which they want to (or can) integrate the new technology in their daily work.

4. HOW TO CONTINUE

Since the roll out and continuously managing the collaboration tool provides plenty of uncertainty, we outline two approaches that may provide decision makers with clear handles on how to approach these types of initiatives.

4.1 Augmenting the existing culture and ways of working

If the goal of the initiative is to augment how people do their existing jobs, we strongly suggest that the technology should align with existing procedures, ways of working, and overall culture.

If this is the case, our research repeatedly shows that the technology is adopted relatively easily since most professionals just want to do their jobs the right way. Furthermore, if they see that they can do their work better by using the new technology, it takes very little to convince them of the benefits of using the new technology. The therapists at Xhealth were already working in an environment where collaboration, sharing and challenging ideas, and asking for help or input was the norm. Hence, the introduction of Yammer basically helped them share and collaborate with their colleagues more easily. At Xhealth, the collaboration tool helped to augment the existing culture and ways of working.

In an organization where collaboration is virtually absent, where people have to work with confidential documents, and employees have little incentive for collaborating, introducing a collaboration technology will not help. Our studies show that people might use the technology briefly and/or ceremonially, but over time they will start to get back to their original ways of working. Some consultants explained that they felt conflicted: their boss pays them to work, not to play around on such a platform. The result may be that the technology will only cost money, will not improve anyone's ways of working, and may even damage the organization because of people's growing frustrations.

Managers should consider how to balance each of the different dilemmas in ways that are most appropriate for their organizations and need to have a thorough understanding of the culture.

4.2 Disrupting the existing culture and ways of working

On the other hand, if the goal of the initiative is to disrupt how people do their work, we suggest that the collaboration tool becomes part of a larger cultural change program. Introducing a new technology rarely results in major changes in how people work, and more often results in frustration if the goal is indeed to change existing ways of working.

An example here is GovDep. In this organization, implementing the collaboration tool was seen as a crucial part, or even a driver, of a larger program of culture change: creating a "collective mind". The main aim of this program was to make employees more aware of the importance of the collective knowledge of the organization, and to motivate people to be more proactive in sharing what they knew, and what they were working on. The organization was traditionally not very open to knowledge sharing, and the culture change was deemed necessary to create a "collective mind" for the organization, with increased awareness of what colleagues were working on, and what their relevant knowledge was. In implementing this culture change, often too much emphasis was placed on the collaboration platform, which was counterproductive. As the whole idea of working on the platform ran counter to the existing organizational culture of confidentiality, formality, and individualism, many employees found it problematic to integrate this into their way of working. Apart from that, (as mentioned above) the collaboration tool was seen as complex to use, insufficiently user friendly, and not really facilitating open exchange. All this frustrated the creation of a "collective mind", as people often did not see the practical use of using the platform.

This example illustrates that fundamentally changing an organization's culture takes time and effort, and will require a dedicated team to develop an appropriate strategy for the organization and its workers. A collaboration tool can definitely play a role in facilitating this change but should not be the primary driver of the change. Tools should be introduced at a later stage, after people have had some time to internalize the fundamental principles of the new culture and integrate collaboration initiatives in their existing ways of working. Introducing the tool at a later stage, as an enabler of an already familiar culture change program, will avoid the tool being perceived as a new trigger that may confuse, distract, and even frustrate people. It will show employees that the change initiative is rolled out incrementally and the tool is just one part of the shift.

5. CONCLUSION

As organizations are moving towards digital workplaces, we will see many more organizations working with collaboration tools as the standard way of working. However, before a collaborative culture is common everywhere, we suggest managers carefully consider whether their organization is ready for collaboration technologies. If you think your firm or department is ready, then have a close look at the four dilemmas, as we believe they will be crucial for the long-term success of your initiative.

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HOW TO SUCCESSFULLY WORK IN THE REDEFINED WORLD OF WORK: TIME-SPATIAL JOB CRAFTING AS A MEANS TO BE PRODUCTIVE, ENGAGED AND INNOVATIVE[1]

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ABSTRACT

COVID-19 has proven to be a catalyst for the adoption of new ways of working. During the lockdown, numerous knowledge workers fulfilled their work obligations from home on a full-time basis. Previous research on new ways of working has demonstrated that time-spatial flexibility can have both positive and negative effects on wellbeing, performance, and work-life balance. As organizations are preparing for the "new normal" with greater flexibility regarding where and when to work (i.e., time-spatial flexibility), we argue that it is of utmost importance to make employees' working behavior future-proof. We argue that "time-spatial job crafting" can be considered as a future work skill where employees reflect on specific work tasks and private demands, actively select work locations and working hours, and then potentially adapt the location of work and working hours or tasks, and private demands, to ensure that these still fit to each other. Thus, the successful utilization of time-spatial flexibility requires proactivity on the part of the employee in the form of time-spatial job crafting, a concept we review in this article.

1. INTRODUCTION

The COVID-19 outbreak has accelerated the adoption of new ways of working and has had major implications on the way employees lived and worked during the lockdown. To slow down the spread of the virus, social distancing measures were adopted across numerous countries, resulting in a significant proportion of employees working from home on a full-time basis. According to early estimates from Eurofound (2020), almost 40 percent of those currently working in the E.U. began to telework full-time as a result of the pandemic, as compared to 15 percent who had done so prior to the outbreak [European Commission (2020)].

The term "telework", coined by Jack Nilles in 1976 [Nilles et al. (1976)], implies working away from the central office location with the help of advancements in information and communication technology (ICT) [Becker and Steele (1995), Vos and van der Voordt (2001)] and can be regarded as a central element of "new ways of working".

Although demands for increased teleworking have been around for years (e.g., in Germany), the prevalence of teleworking among employees in the E.U. has only slightly increased over the last 10 years, from 7.5 percent in 2009 to 11 percent in 2019 [Eurostat LFS (2020)]. As a result of the COVID-19 outbreak, greater flexibility over where and when to work is gaining momentum.

[1] This article is a summary of two articles: Wessels and Schippers (2018) and Wessels et al. (2019).

As curbs on social life had started to be lifted in numerous European countries, organizations also began to slowly reopen their offices and are preparing for a "new normal way of working". For larger corporations, the transition between the "old" and "new normal way of working" may not be that pronounced, as many corporates had already adopted some elements of new ways of working pre-pandemic (e.g., Microsoft Netherlands, Accenture Germany). However, for numerous small- and medium-sized companies (SMEs) and governmental organizations, the shift towards the "new normal way of working" is much more difficult. Overall, the "new normal way of working" means that employees will have a greater choice of work locations and working times and thus need to make informed choices about which work location is best suited for a particular work day.

Considering that only 15 percent of those employed in the E.U. had ever teleworked prior to the advent of the outbreak [European Commission (2020)], the resulting lockdown forced both employees and employers to find ways to telework effectively. Blurring the lines between work and private life, IT not working properly, and reduced productivity levels have been among the few reported challenges. Indeed, prior research on new ways of working has found that working from home leads to opposing outcomes. On the one hand, there are employees who regard working from home as something highly beneficial for their work. They feel that they are more productive and happier and have a greater work-life balance. On the other hand, however, there are also employees who struggle with working from home. Blurring boundaries between work and private life, no possibility for detachment, and reduced productivity are the outcome; corroborating the findings of De Menezes and Kelliher (2011), that flexible working practices can lead to both positive, negative, and null effects for employee outcomes.

As many organizations are moving towards a "new normal", where employees either no longer can work five days a week in the office and are thus forced to work from home/work remotely due to capacity limits in the office, or are able to choose for themselves whether they want to work from home/remotely or not, we argue that what is needed is to equip employees with tools that enable them to work successfully in such a new world of work.

In fact, Wessels et al. (2019) introduced "time-spatial job crating" as a future work skill that enables employees to stay productive, engaged, and to become innovative in the new world of work. In this article, we will review the research on time-spatial job crafting and explain how employees can use time-spatial job crafting to work successfully in this new world of work. We underscore the importance of employees' uptake of time-spatial job crafting, in which they reflect on specific work tasks and private demands, actively select work locations and working hours, and then potentially adapt the location of work and working hours or tasks and private demands to ensure that these still fit to each other.

2. DEFINITION OF NEW WAYS OF WORKING

New ways of working are characterized by time-spatial flexibility. Time-spatial flexibility within the new world of work describes the context in which knowledge work employees have the ability to decide when, where, and for how long to work on a daily basis [Hill et al. (2008)]. Employees who have the freedom to determine when and how long they work, have scheduling or time flexibility. A common form of time flexibility is flextime, which gives employees the freedom and control to adjust working hours to their personal needs [Baltes et al. (1999)]. Spatial flexibility allows work tasks to be carried out away from the office (e.g., at home, at a client's premises, on the train, or in a coffee shop), and working away from the central office location is often referred to as teleworking [Nilles et al. (1976), Nilles (1998)]. Advances in information and communications technology have enabled the uptake of this flexible work practice [Becker and Steele (1995), Vos and van der Voordt (2001)] and the introduction of the smartphone in the last decade has made remote working even more accessible.

Wessels et al. (2019) have argued that despite the relative popularity of the uptake of this practice across the E.U. and the U.S., and claims for better performance, wellbeing, and work-life balance, a real business case for flexible working cannot be made as yet [De Menezes and Kelliher (2011)]. Indeed, numerous studies have examined the effects of flexible working practices on various outcome variables and the results have been inconclusive. While some studies have found that flexible working practices do, in fact, have positive implications on performance and wellbeing [Gajendran and Harrison (2007), Kelliher and Anderson (2008)], others have either found none [Staples (2001)] or even negative effects on employees [Kelliher and Anderson (2008), ten Brummelhuis et al. (2012)]. Hence, according to Wessels et al. (2019) and Wessels (2017), despite 40 years of flexibility research it is still not possible to make a strong case for flexible working

Figure 1: A model of time-spatial job crafting

CONTEXT: Time-spatial flexibility

Adapted from Wessels et al. (2019)

practices. Yet, with the preparations currently underway for the "new normal way of working", and with the increase in time-spatial flexibility, it is of utmost importance for both employers and employees to have a better understanding of how to benefit from this increased flexibility.

3. HOW CAN EMPLOYEES PROFIT FROM NEW WAYS OF WORKING? THE CONCEPT OF TIME-SPATIAL JOB CRAFTING

According to Wessels et al. (2019), as knowledge workers are able to execute their work activities anywhere and anytime in the new world of work, but that these practices have led to both positive and negative outcomes for employee wellbeing, performance, and work-life balance, it is important that employees proactively craft changes to the location and timing of work to remain engaged, productive, and to retain their work-life balance on a daily basis.

In the job crafting literature, employees are considered active agents of their own work, which is considered to be a bottom-up approach of work design [Morgeson and Humphrey (2008)]. While early job crafting research looked at job crafting in terms of making changes to the quantity of working tasks and frequency of social interactions [Wrzesniewski and Dutton (2001)], more recent studies have shifted focus and defined job crafting in terms of altering job demands and job resources [Tims et al. (2012)]. According to Wrzesniewski and Dutton (2001), employees engage in job crafting because they want to exercise some form of control over their work, want to produce a positive self-image of themselves in their work, and aim to build and manage their social relationships at work. Tims et al. (2012) argue that employees proactively increase structural job resources, social job resources, and challenging job demands and decrease hindering job demands. While job crafting has traditionally been defined in terms of work, it has more recently also crossed over to other domains outside of work, including life crafting [e.g., Schippers and Ziegler (2020), De Jong et al. (2020)] or leisure crafting [Petrou and Bakker (2016)].

To include the time and spatial dimensions of work, Wessels (2017) and Wessels et al. (2019) have recently extended the notion of job crafting and denoted it "time-spatial job crafting". Time-spatial job crafting is defined as a "a context-specific type of job crafting in which employees (a) reflect on specific work tasks and private demands; (b) select workplaces, work locations, and working hours that fit those tasks and private demands; and (c) possibly adapt either their place/location of work and working hours or tasks and private demands to ensure that these still fit to each other thereby optimizing time/spatial-demands fit" [Wessels et al. (2019)].

3.1 Time/spatial-demands fit

Wessels (2017) and Wessels et al. (2019) suggest that whether time-spatial flexibility turns out favorably or unfavorably depends on how each individual uses the flexibility and the extent to which they manage to optimize the time/spatial-demands fit. Thus, it is not a good or a bad thing per se.

Wessels et al. (2019) postulate that large parts of the negative outcomes of time-spatial flexibility are likely to be caused by a misfit between working hours, work locations, and workplaces and task and private demands. As can be seen in Figure 1, if employees want to stay productive, engaged, innovative, and keep a good work-life balance in the context of time-spatial flexibility, flexible workers should ideally optimize a time/spatial-demands fit. Time/spatial-demands fit is defined "as the fit between work tasks and work locations, workplaces, and working hours on the one hand and private demands and work locations, workplaces, and working hours on the other hand" [Wessels et al. (2019)].

3.2 Components of time-spatial job crafting

In defining the original time-spatial job crafting concept, Wessels et al. (2019) drew from reflexivity research. Reflexivity as a self-regulatory concept at the team level consists of three elements: reflection, planning, and action [Swift and West (1998), for reviews see Konradt et al. (2016), Schippers et al. (2014), Schippers et al. (2017), Widmer et al. (2009)]. These three elements are intertwined as an iterative cycle of reflection, planning, and action [Schippers et al. (2017)]. Similar to this cycle, the time-spatial job crafting concept is composed of a reflection, a selection, and an adaptation component. Reflecting about working tasks, private demands, and working hours and work locations represent the cognitive part, while the actual selection of work locations and the potential adaptation are regarded as the behavioral element. Reflection can be considered as a deliberate process of thinking about the tasks, private demands, working hours, places, and locations of work available on any particular day. Employees are likely to base their decision on past experiences when examining the different work location/working hours alternatives and reflect on the benefits/drawbacks of this choice.

Examples of reflection are: what are my working tasks today? (e.g., I have two meetings, I have to prepare a presentation); what are my private demands today? (e.g., I have to bring my kids to school, doctor's appointment); or which work locations are available today? (e.g., home, train, office).

The second element, selection is deemed as the actual choice of working hours, work locations, and workplaces, which plays a vital role in reaching the best time/spatial-demands fit. The actual choice of a workplace, work location, or working hours is the result of the conscious consideration of and choice between alternatives [Vohs et al. (2008)]. For example, an employee decides to work from home since he or she needs to work in silence to finish a presentation. Hence, selection represents the actual choice of the work location, which stems from scrutiny of the different alternatives [Vohs et al. (2008)].

The last component, adaptation is understood as "performing adaptive behaviors that address changing conditions." [Hirschi et al. (2015)] and Wessels et al. (2019) argue that adaptation of work locations may for instance occur because of a suboptimal work location decision in the first place. Together, these three elements represent a chain in which reflection leads to selection, which is likely to lead to adaption.

3.3 Outcomes of time-spatial job crafting

The time-spatial job crafting model suggests that employees need to take on an active role if they want to reap the benefits from flexible working practices [Wessels et al. (2019)]. The three components of time-spatial job crafting, namely reflection, selection, and adaptation allow for this active role. Reaping the benefits from flexible working is based on the assumption that once flexible workers consciously choose a work location or working hours, they are able to fit the work location/working hours to their own preferences, which is likely to foster engagement, innovation, and productivity. Seeking out work locations that fit to one's task needs and/or private demands should enable employees to invest their capabilities fully at work. Consequently, this should give them more energy and make them more productive. Thus, by proactively modifying spatial and time aspects of the job so that they fit an employee's own task and private preferences, employees are able to increase their own engagement and performance. In addition, consciously choosing work locations should foster innovation, as employees will most likely perform their work tasks in a work environment that fits their own needs. Hence, the work environment can also become a source of inspiration.

4. EVIDENCE FROM STUDIES

Wessels and Schippers (2018) examined the idea of spatial job crafting and its implications for work engagement, productivity, and innovation. They expected that employees, who engage in spatial job crafting, are more likely to be productive, innovative, and engaged with their work. Their analysis has shown that if employees engage in spatial job crafting, they are able to be engaged and innovative. However, spatial job crafting did not increase feelings of perceived productivity. Hence, by reflecting and proactively choosing work locations, employees were able to reap the benefits

from flexibility but only for work engagement and innovation. The authors reasoned that proactively shaping work locations did not make employees more productive at the cross-sectional level and suggested that it might be that productivity implications of flexibility cannot be observed in the short time and, thus, for employees to profit from spatial job crafting for productivity a long-term perspective should be taken. This is indeed what Wessels (2017) found in her research on the long-term effects of flexibility.

While Richardson and McKenna (2014) did not test the idea of time-spatial job crafting directly, they demonstrated in their case study that flexible workers reordered their private lives. They reason that "flexworkers have to assume more responsibility for managing themselves and their whole lives" [Richardson and McKenna (2014)], and reported the case of a manager who stops working at 5pm to spend time with her child and then works after normal office hours. They considered this behavior to be one of a successful flexworker and Wessels et al. (2019) coined this type of behavior time-spatial job crafting.

5. TIME-SPATIAL JOB CRAFTING REQUIRES PERSISTENCY AND EFFORT

While the benefits of time-spatial job crafting seem straightforward, engaging in time-spatial job crafting on a routinized basis may require consistent effort. First, Wessels and her co-authors postulate that employees may resist reflecting at first since conscious reflection may be something that employees are often not used to and may provoke defense reactions. Hence, since time-spatial job crafting is a behavior that needs to be learned, resistance to reflect [Piderit (2000)] may hinder optimizing a time/spatial-demands fit and lead to positive work outcomes in the shortterm.

Second, the authors acknowledge that workdays may also include conflicting demands, exacerbating the selection of the right work location or working hours. For instance, even though an employee might want to work from home in perfect silence, they may also have several meetings that require them to be at the main office. Making choices turns out to be more troublesome whenever various needs, objective, or values, are in conflict [Brandstätter et al. (2006)]. Furthermore, even if employees consciously decide to work from home, unlearning the urge to go to the fridge, to lie on the sofa, or watch TV [Howgego (2019)], hence to procrastinate, can take some effort and time.

Third, there is evidence to suggest that employees base their work location choice on the decisions of their colleagues [Rockmann and Pratt (2015)]. While this is not a bad thing per se, it may conflict with private or task demands.

Consequently, being conscious about and actively managing contrasting demands is difficult and creates extra effort; effort in the form of more reflection, selection, and potentially adaptation. Consequently, Wessels et al. (2019) suggest that time-spatial job crafting can be a strenuous activity in itself, although one would also expect that over time "practice makes perfect", and choices can be made with less effort.

6. CONCLUSION

In this article, we presented evidence that proactively shaping one's workday helps employees work successfully in the new world of work. With the increased uptake of this practice as a result of the COVID-19 outbreak, the question of how employees can be productive, engaged, and maintain their work-life balance has increased in relevance.

Our reflection/proactivity lens on new ways of working gave insights into how employees and their organizations are able to profit from flexibility, especially for innovation and work engagement. The review of Wessels et al.'s (2019) model of time-spatial job crafting presents it as a behavioral tool that organizations can use to derive benefits of flexibility. By promoting time-spatial job crafting inside the organization, flexible organizations are able to show employees how they can profit from time-spatial flexibility. Given that time-spatial job crafting is a skill that needs to be learned, organizations are well placed to offer in-house training to increase awareness of time-spatial job crafting among employees. It is important to show employees how they themselves can increase their own wellbeing, performance, and work-life balance in the new world of work. Against the backdrop of suptoptimal time-spatial choices or lack of awareness of a misfit, the importance of training is underscored. Even though training is key to increasing awareness for time-spatial job crafting, only a continuous assessment of one's own behavior by the employees themselves, managers, or colleagues helps make it possible to optimize time/spatial-demands fit over time. Consequently, since time-spatial job crafting is a behavior that needs to be learned, it is important that employees experience the benefits of reflection and learn this in training.

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ORGANIZATION

CAN BUSINESSES RECOVER FROM THE CRISIS? ASSESSING SCENARIOS, RIDING TRENDS

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ABSTRACT

By 2020, five major long-term trends had been impacting international business. This article examines how the pandemic and related economic crises seriously disrupt these trends and will produce emergent, complex patterns. It then seeks ways forward. Establishing the point of departure, we look at public health and economic policy interventions and future scenarios. We assess the more likely global developments that businesses will need to prepare for. We suggest that the business challenge is to take into account six discernable emerging trends, and plan for and ride these as opportunities, rather than be overwhelmed by them.

1. INTRODUCTION: GLOBALIZATION TO 2020

By 2020 five major trends could be discerned in the global economy. The first long-term trend was the vast expansion in world output and cross-border trading. In 2018, world merchandise trade was U.S.$19.67 trillion, and commercial services U.S.$5.63 trillion, while world trade and gross domestic product (GDP) grew by 26 percent between 2008 and 2018. By the beginning of 2020, the value of world trade was 160 times larger than it was in 1960. Throughout most of the 2008 to 2020 period, so-called "developing" countries equalled or outperformed developed economies in trade and results.

The second major long-term trend was increasing foreign direct investment (FDI). The average yearly FDI outflow increased from U.S.$14 billion in 1970 to U.S.$1.45 trillion in 2016, when the global stock of FDI was about U.S.$27 trillion. Developing nations were increasingly important as destinations for, but also as exporters of, FDI. These trends reflect the internationalization of company operations.

The third trend in the years following the 2008/9 financial crisis was that multinationals were doing less well. In retrospect, multinationals had been overestimating the value of economies of scale, and, more recently, of arbitrage. Profits of the 700 largest multinational enterprises (MNEs) dropped by 25 percent between 2014 and 2019. Meanwhile, return on equity (RoE) fell from 18 percent in 2009 to 11 percent by 2019. RoE on foreign operations investments declined to between 4 and 8 percent across the OECD. Emerging country MNEs fared no better – worldwide RoE was 8 percent. The bright spot into 2021 was technology companies. One should also note that companies were reporting lower RoE in foreign markets than domestic ones. Even before the major disruption arising from the coronavirus pandemic, multinationals were needing to review strategies on the degree of globalization of markets and production, and the sources of competitive advantage.

Meanwhile, a fourth trend has been the continuously shifting political world order. Many former communist nations in Europe and Asia had become more committed to forms of democratic politics and market economies, hence creating new opportunities for international businesses. But there have been more recent signs of growing unrest and authoritarian tendencies in some countries, for example, Russia, Turkey, and Poland. China and Latin America had also been moving toward greater market reforms. Over the years, several Latin American countries have increased their attractiveness as markets for exports and as targets for FDI – for example Brazil, Chile, and Mexico. Will this continue? China, for example, has moved to greater state control since 2012.

A fifth recent trend has been towards deglobalization. During the 2010-20 period, there were indications of the long-term trend towards vertical and horizontal globalization being reversed. The global firm has most recently been in retreat. Some signs: by 2016, multinational cross-border investment had fallen by 10-15 percent, Western firms' percentage of sales outside their home regions has shrunk, multinational profits have been falling, as has new investment relative to GDP. The pace of economic integration has also slowed between 2015 and 2020.

The summary from an international business perspective is that trade stopped getting cheaper, and straddling the world became less profitable. While services were growing in many economies, companies found them harder to export than products (only 7 percent of world GDP is service exports). Meanwhile, "emerging" economies were becoming more self reliant, economic activity became more regional, while protectionism, tariffs and counterattacks against global intruders became more frequent. At the big picture level, the center of gravity for international business has been shifting east and south, with 18 countries there recording 5 percent plus annual growth over the last 20 years. The role for high growth "developing" economies has been expanding, as has the amount of South-South and China-South trade.

Following on from this, the 2020 pandemic has been highly disruptive, and will create new winners and losers, and new globalization and deglobalization trends. Let us, then, look at the pressing questions: how have these trends been disrupted by the pandemic and economic crises, how far will the trends change again, what will emerge, and what actions can businesses take in the new environment?

2. COMING TO TERMS WITH THE CRISIS

The five major trends were indeed highly disrupted by events during 2020. Expansion in world output and trade came to a grinding halt. FDI was put on pause, though many businesses anticipated opportunities in the event of an economic recovery. Multinationals continued to do less well, but some were more likely inheritors of the future than others. The political order continued to be dynamic and shifting, with the economic slump and health crisis creating both political tensions and increased need to cooperate internationally. Deglobalization and protectionism played powerfully into these shifts as potential salves and ways forward in a dynamic, interconnected, and uncertain world. Let us look at such developments in more detail.

By May 2020, The World Health Organization (WHO) had recorded globally over two million cases of coronavirus, and 150,000 related deaths. New cases were coming in at around 85,000, and deaths 6,500 per day. This was likely a substantial underestimate due, for various reasons, to under-reporting. The impacts were unevenly distributed across 212 countries, but major economies, and so the global economy, were largely on semi-pause, and this was likely to continue for some time. Some suggested at this time that it could take most economies more than two years, i.e., until 2023, to recover. In numbers, the most disproportionately affected (in size order) were U.S., Spain, Italy, Germany, U.K., France, China, Iran, and Turkey, but no country was left untouched due to the integratedness of the global economy. By 12 August 2020, the WHO reported over 20 million cases and over 737,000 deaths worldwide, with North and South America, (particularly the U.S. and Brazil) experiencing half of these. The virus was seriously impacting many more countries, while second spikes, often more localized, were occurring in the countries first affected by the virus.

3. THE GLOBAL ECONOMY TAKES A BIG HIT

According to the World Trade Organization (WTO; trade forecast press conference, April 9, 2020), world merchandise trade was set to plummet by between 13 percent and 32 percent in 2020 due to the COVID-19 pandemic. On a relatively optimistic scenario, a sharp drop in trade would be followed by a recovery starting in the second half of 2020. A more pessimistic scenario would see a steeper initial decline and a more prolonged and incomplete recovery. A 2021 recovery in trade was expected, but depended on the duration of the outbreak and the effectiveness of the policy responses (see below). Nearly all regions would suffer double-digit declines in trade volumes in 2020, with exports from North America and Asia hit hardest. Trade would fall steeper in sectors with complex value chains, particularly electronics and automotive products. Merchandise trade volume had already fallen by 0.1 percent in 2019, weighed down by trade tensions and slowing economic growth. The dollar value of world merchandise exports in 2019 had fallen by 3 percent to U.S.$18.89 trillion. The value of commercial services exports actually rose 2 percent to U.S.$6.03 trillion in 2019. But services trade may be the component of world trade most directly affected by COVID-19, through the imposition of transport, social distancing, and travel restrictions, and the closure of many retail, recreational, travel, tourist, and hospitality establishments. Unlike goods, there are no inventories of services to be drawn down now and

restocked at a later stage. Consequently, decline in services trade during the pandemic may be lost forever. Services are also interconnected, with air transport enabling an ecosystem of cultural, sporting, and recreational activities. However, some services were benefiting from the crisis; for example, home delivery services, and, most noticeably, information technology services, as companies enabled their employees to work from home, and people socialized remotely.

In its April 2020 World Economic Outlook,[1] the International Monetary Fund (IMF) projected global growth in 2020 to fall to -3 percent. This represented a downgrade of 6.3 percentage points from January 2020, a major revision over a very short period. Advanced economies would be hardest hit, with negative growth at -6.1 percent. Emerging market and developing economies would have negative growth rates of -1.1 percent (-2.2 percent if China is excluded). But a note here. Emerging market and developing economies faced additional challenges with unprecedented reversals in capital flows if global risk appetite declined, currency pressures, weaker health systems, and more limited fiscal space to provide support. Moreover, several economies entered the crisis in a vulnerable state already, with sluggish growth and high debt levels.

All this would make the 2020 pandemic crisis the worst recession since the Great Depression from 1929 to the late 1930s, and far worse than the global financial crisis, which experienced a -1 percent reduction in economic growth in 2009, though its impact stretched for a long period. For example, following the 2009 crisis merchandise exports never returned to their previous levels.

However, assuming the pandemic faded in the second half of 2020 and that policy actions around the world were effective in preventing widespread firm bankruptcies, extended job losses, and system-wide financial strains, the IMF projected global growth in 2021 to rebound to 5.8 percent. This recovery in 2021 would be only partial as the level of economic activity would remain below the level the IMF had projected for 2021, before the virus hit. The cumulative loss to global GDP over 2020 and 2021 from the pandemic crisis could be around U.S.$9 trillion.

The WTO and IMF projections were, of course, possible scenarios, the main assumption being a V shaped economic recovery from late 2020 through 2021, at different rates for different economies. But given the high uncertainty around the duration and intensity of the health crisis, the pandemic could lead to longer durations of containment, worsening financial conditions, and further breakdowns of global supply chains. In such cases, global GDP would fall even further. This would be more of a U-shaped recovery. The IMF suggested an additional 3 percent fall in 2020, while, if the pandemic continued into 2021, an additional 8 percent decline from the +5.5 percent growth projection. Most research groups at this time were not contemplating the most pessimistic scenario of an L-shaped depression, i.e., a dramatic fall, with no recovery for several years.

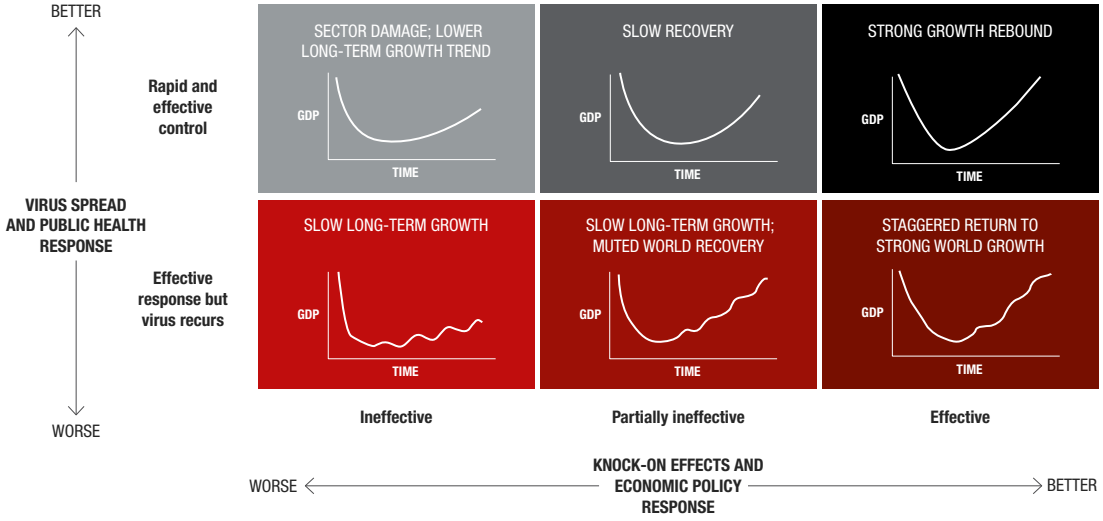
By August 2020, projections were becoming less optimistic, and suggesting long-term disruption before recovering to 2019 trade levels. For example, the U.K. Treasury forecast a central scenario fall of 12.4 percent in GDP in 2020, with the U.K. only reaching the pre-virus GDP peak by the end of 2022. According to the Organization for Economic Cooperation and Development (OECD), Germany's decline in national income (GDP) would be 6.6 percent in 2020, while Spain's GDP would fall by 11.1 percent, Italy's by 11.3 percent, and France's by 11.4 percent. By this time, the OECD was seeing little evidence for a V-shaped recovery for the global economy, citing the long-lasting effects of the pandemic. Meanwhile, as early as May 2020, The Economist was projecting the rise of the "90 percent economy", possibly lasting several years, with some countries and sectors more adversely affected than others.

4. BUSINESS CONTEXT: DISRUPTION AND NEW SCENARIOS

The above is a compelling endorsement of using environmental analysis on a frequent basis in contemporary business environments. But it also suggests changes of emphasis are needed. A common, useful analytical device is the PESTEL framework (political, economic, social/cultural, technological, environmental, legal). Clearly, "social factors" included accelerated moves to home and remote working, and potentially long-term shifting attitudes and preferences amongst consumers and workforces. On the "political, economic, and legal" fronts, we were seeing, during 2020, massive government intervention in the conduct of business. This was contrary to globalization's main direction of travel. Politically and legally, governments took on more command and control functions. Economically, governments moved to support faltering economies and businesses. Among the enormous relief programs to sustain companies and citizens during the lockdowns, the largest was the U.S. stimulus, valued at more than U.S.$2 trillion. Meanwhile, the European

[1] https://bit.ly/2PRH0nR

Figure 1: International business context: scenarios



Adapted from Hirt et al. (2020)

Central Bank (ECB) announced €870 billion in quantitative easing, and, to forestall a credit crunch, also forbade eurozone banks from paying dividends to investors or buying back shares until late 2020. The European Parliament released €37 billion to support small- and medium-size enterprises (SMEs) and the healthcare sector. By May 2020, the People's Bank of China had pumped the Chinese banks with more than 550 billion renminbi (around U.S.$78 billion) in liquidity. The U.S. Federal Reserve Board brought its policy rate near zero (0.00 to 0.25 percent) and announced U.S.$700 billion in quantitative easing.

But for international business, a pressing question arises for future environmental analyses: for how long, and how deeply will government command, control, and intervention persist? During 2020, all governments were building debt they would seek to repay, not least through taxation. Financial innovations that give power to the state may well be kept if they appear to reduce systemic risk. Interventions to preserve firms, industries, jobs, and worker incomes may well endure and become policy, not least to build national resilience in the face of any future crisis. State spending may become permanently higher. **If everyone is a Keynesian in a crisis, what if crises are expected to be more frequent, and impactful?**

If government interventions made previous PESTEL analyses outdated, then global businesses now needed to factor in much more seriously than ever before "technological" factors [Willcocks (2021)]. Technology has proved not only very supportive in business terms during the crisis, but technology and hi-tech companies were probably going to be among the inheritors of the future, following the pandemic. Many businesses were likely to accelerate their digital transformation and adoption of emerging technologies (e.g., internet of things, augmented reality, AI, blockchain), in order to build resilience against future unpredictable risk, and also to recover economic performance by becoming more cost efficient, while driving revenues and competitiveness.

Even more surprising to many has been the new centrality of "environmental" factors. In particular, how one environmental factor – an epidemic – shaped the other PESTEL factors so dramatically and pervasively. Of course, there had been warnings. Climate change correlates with a number of natural disasters in the last 15 years. In 2019 alone there were 15 climate change related natural disasters, including wildfires, floods, rainstorms, cyclones, and typhoons, costing over U.S.$250 billion. The prognosis: such events will become more frequent. There have been pandemics, notably the 1997 'bird flu', the 2002/3 SARS, and the H1N1 'swine flu' in 2009, to the point that Goldin and Mariathasan (2016) suggested that the world had become so interdependent that another pandemic was long overdue. The interconnectedness can explain why a natural disaster such as the 2010 volcanic eruptions of Eyjafjallajökull in Iceland caused enormous disruption to air travel across western and northern Europe during April and May, affecting some 10 million travelers. Likewise, for human-made disasters, such as the 2011 Fukushima Daiichi nuclear

plant disaster in Japan. Hopefully, these and the coronavirus experience will lead to a new business mindset about how interdependent the global economy is, and how, from now on, environmental risk needs high profile attention.

The 2020 pandemic and economic crises have also highlighted for international businesses the criticality of scenario planning. This involves creating a series of more, or less, likely futures from which to derive actions points and business strategy. The secret here is to select the most powerful parameters, and map them against one another. Governments play a central role during and after pandemics, and public policy becomes a key environmental factor for businesses to consider. For 2020, it was useful to map out scenarios that took into account the spread of the virus, public health responses, the knock-on effects, and economic policy interventions.

Figure 1, adapted from Hirt et al. (2020), shows six scenarios generated from this mapping. Within the more likely scenarios, we would choose four to focus on that, in our analysis, contain varying degrees of optimism:

- **Most optimistic:** there is rapid and effective control of virus spread, and no recurrence of the virus. Meanwhile, there is a strong policy response that prevents structural damage and allows return to pre-crisis fundamentals and momentum. This is a V-shaped recovery.
- **Moderately optimistic:** there is an effective public health response but the virus recurs. Despite this, the economic policy intervention is effective and there is a strong global economy rebound. This would be somewhere between a V- and U-shaped recovery.
- **Less optimistic:** the virus is effectively contained, but economic policy interventions are only partially offset economic damage. A banking crisis is avoided, but recovery levels are slower. This would be a U-shaped recovery.
- **Least optimistic:** the virus is effectively contained, then recurs. Meanwhile, economic policy interventions are only partially ineffective. This leads to a muted world recovery and slow long-term growth – a staggered U-shaped recovery.

Note that one factor we have not taken into account is if there was a broad failure in public health interventions. The original McKinsey study did indeed include the possibility of failed public health interventions, but discounted this as unlikely. By April 2020, there was evidence that while some public health interventions were being more effective than others, for example in Taiwan, Germany, South Korea, Japan, and China, there was (as yet) no broad failure simply because governments had no choice. However, by August 2020, with no vaccine yet forthcoming, it was clear that some countries were not handling the pandemic at all well (e.g., U.S., Brazil, and the U.K.) and this would be having even more adverse impacts on economic activity. This point is important because COVID-19 has some distinctive features that make scenario development particularly difficult. First, the virus is highly contagious. Second, symptoms take many days to be noticed. Third, it would take time to develop a vaccine or cure. This creates considerable uncertainty over both length and depth of the contagion, but also in how public health and government agencies can respond.

A further factor not accounted for in Figure 1 was if the pandemic spread into countries/cities with crowded, often poor neighborhoods ill-served by healthcare organizations. This subsequently happened in many countries not at first seriously hit by the virus (e.g., India, Iran, Mexico, and Russia). Given that some informed commentators positioned the pandemic as a likely disaster for developing nations [for example, Goldin and Muggah (2020)], this is a serious limitation in our illustrative example. However, the model does develop scenarios assuming that the virus could recur. The key to scenario planning is not to discount all possibilities, but primarily focus on those adjudged the most likely scenarios, useful to develop action plans for. What is interesting is how the Figure 1 likely scenarios developed in April 2020, look very different by the time one gets to August 2020.

The scenario mapping exercise should not ignore the further possibility that in some countries government "economic" policies might actually be ineffective. By August 2020, it was difficult to make the call as to which countries, if any, were handling economic interventions badly. However, this judgement call may well become easier to make by the end of 2020. The point: like McKinsey, one can generate several more worse case scenarios than Figure 1 accommodates. Welcome to the challenges of scenario planning. An international business would be wise to proceed by taking the four likeliest scenarios and building flexibility and resilience into future strategy and capabilities, sufficient to mitigate the risks if any scenario becomes real. Two other action pointers. One cannot rule out "black swans", that is, seemingly unlikely events that can have massive impact. Some describe the pandemic crisis as one such event, though there were many warnings. Secondly, as evidenced here, a business needs to revisit the scenarios frequently. **We live in an accelerating world, not just of fast presents, but of faster futures.**

5. NAVIGATING THE FUTURE

What emerges from the 2020 crisis? The pandemic and economic downturn saw trade, financial flows, and travel contract, but a single trend towards deglobalization was unlikely. In the longer term, the globalization trends would continue, while reflecting increasingly the growing role of Asia and China with their continued growth in incomes, and homing two-thirds of the world's population. Speculating, we will see an acceleration of the trend towards reshoring production and services to move businesses closer to their final markets. This will be helped by the deployment of automation and digital technologies. Capitalizing on the pandemic experience, managers will also become more digital in order to build resilience in systems, and deal with cost reduction pressures, while responding to customers expecting fast delivery of more customized products and services. There will be a shakeout across business sectors and countries. This will show up weak business models, poor financial positions, and managements who failed to build resilience and adaptiveness into their competitive positioning and operations. Also, during 2020 certain sectors were being hit more severely than others, notably travel, recreation, oil and gas, commercial aerospace, insurers, and (off-line) retail. Think American Airlines, event companies, the smaller oil companies, and Marks and Spencer. Thus, damage is likely to be unevenly distributed. In terms of general damage and the ability of businesses to recover, much depended on the length and depth of the downturn. By August 2020, predictions on economic recovery had become noticeably gloomier, despite the Russian announcement of a possible workable vaccine. It was clear how global the pandemic had become, how it could spike again despite counter-measures, and how inextricably linked the pandemic was with the workings of the global economy [Willcocks (2021)]. Just as a rising tide raises all boats, a receding (economic) tide can ground all too many. **Government support for struggling businesses will be strong everywhere, but cannot be limitless.**

Some firms will emerge from the 2020 general drop in sales and profits even stronger; many firms, where they survive, will be weaker. In the past three recessions, share prices of the top ten American firms in ten major sectors rose by an average of 6 percent, while those at the bottom fell by 44 percent. Some firms had the advantages of large size and strong financial position before 2020. Look at Apple with its U.S.$207 billion cash mountain, and Unilever, able to fund its suppliers during 2020. The Economist (2020) called such businesses "top dogs". Their analysis of over 800 European and American firms showed technology firms making up 48 of the top 100. Microsoft, Apple, Facebook, and Alphabet operate with big cash buffers. High demand for their products surged further during 2020. Cisco Systems, Nvidia, and Adobe were also in this top dog technology group. Another 24 were pharmaceutical and healthcare firms with spare cash and a captive market of people needing drugs. Think Roche, Novo Nordisk, and Johnson and Johnson.

> *"If everyone is a Keynesian in a crisis, what if crises are expected to be more frequent, and impactful?"*

There will also be winners and losers within sectors. As an indication, the technology sector saw Amazon add 100,000 workers to its U.S. workforce, while Softbank was announcing U.S.$41 billion in divestments to raise cash. In the energy sector, BP, ExxonMobil and Royal Dutch Shell vastly outperformed smaller firms, and were better positioned to ride out the 2020 downturn in global oil prices. In cosmetics, L'Oreal has done better than its US rival Coty. In plane manufacturing, Airbus had U.S.$32 billion in liquid funds in March 2020, just as Boeing thought of seeking a U.S. government bail-out. These differing performances reflects previous good results and management, built-in financial and organizational adaptiveness and resilience, prescient long-term planning mixed in with happening to be in the right place, in the right industry, at the right time. As in previous recoveries, the "winner" firms will be better placed to achieve, over time, greater market share and enduring advantage in their sectors. With better cash positions, higher profits, and lower cost of capital, they will be in a stronger position than rivals to make further investments, pursue mergers and acquisitions, restructure the business, and change strategic direction.

6. RIDING FUTURE TRENDS

The problem and reality for all organizations would be highly challenging: how to build an international business organization for the new (ab)normal, that was likely to be increasingly in the hands of governments, developments in China and Asia, and the relatively few large corporations who emerged well from the health and economic crisis. There would be opportunities. Government and populations would need to increasingly address climate change, energy and water supply, and healthcare. In business terms, these all provided the source of not just potential crises, but also were potential growth markets for new products and services. Additionally, management could harness, rather than resist, six major future trends that accelerated during the pandemic period. What are these?

- **Digital technologies and automation:** global businesses has had a crash course in the value of moving to digitalization. Technology may bring more opportunities to create value, while redefining work. However, technological adoption has been uneven across countries, sectors, and companies. There is a growing gulf between those who have embraced technological change and those that have not, which may place many companies, and even countries, at a growing disadvantage as the 2020s proceed.
- **Supply chain restructuring:** the crisis highlighted the need for greater risk mitigation and resilience. This will speed moving a critical mass of production/service closer to home, rethinking processes and suppliers, bigger safety buffers in inventory, and even greater automation.
- **Repatriation and less cross border investment:** this pushes further a pre-existing trend where better financial performance came from shrinking to regional or domestic markets.
- **Flexible labor models:** the pandemic experience will push core-periphery models even further, minimizing the number of, but privileging core workers, while automating more work, and increasing automated control over the part-time, temporary, and contracted workforces.
- **Resilience in the face of uncertainty over business environments and human-made and natural disasters:** while we expect this to be high on the agenda over 2021-22, past experience indicates growing complacency if no further widespread crisis, of whatever sort, occurs for a few years.
- **Greater focus on south and east Asia:** countries here may well recover earlier, contain two-thirds of the world's population, and were already rising to globalism. They will be in prime position to shape the new (ab)normal. Focus here will not just be on prospective markets and sourcing options. What can be learned from Asia is a key question for international businesses. This covers not just innovative uses of technology, but, for example, how retailing can be restructured, and how to mobilize resources fast and at scale. Marrying the learning and the opportunity with what is best for the business will be a key management task. Trade-offs will be necessary. For example, over-dependence on Chinese supply may be reduced by building resilience, and some repatriation of production.

7. CONCLUSION

Global business received a severe shock to the system in 2020, and this will pass into 2021 and beyond. It had received many economic shocks before, but few businesses saw this coming because they had not trained themselves to sufficiently factor environmental human-made and natural disasters into their long-term scanning and scenario planning. Several commentators, including Ian Goldin and Bill Gates, pointed out as early as 2015 that a pandemic was long overdue, and that the world's economies and their businesses were not ready.

We have seen how five major 2015-20 global business trends have been shifted by the pandemic and subsequent crisis. Some businesses will come to terms with the disruptions in different ways. But many businesses will not. And many who survive the crisis might not emerge in such good shape to compete with others who were building themselves more resilient business models even before the pandemic hit. The crisis produced six likely future trends that international business need to ride and seize opportunities from: technology deployment, resilience, restructured supply chains, less foreign investment, greater focus on home markets, but also a greater focus on events and markets in south and east Asia.

This crisis points to the requirement for better forward planning, greater built-in resilience, and **the need for a new set of assumptions for managing what I have been calling the new (ab)normal.** Interconnectedness has turned into a complex interdependence. This has created uncertainty and systemic risk. The pandemic will provide all too many lessons, but the biggest and clearest for businesses, nations, and supra-national bodies alike is: **systemic risk requires systemic thinking, to shape systemic responses.**

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ABSTRACT

In this paper, we look at the emerging trend towards value stream led operating models for organizations. The benefits of value streams include a sharp focus on end-products and services that drive value for the organization, resulting in both monetary gains as well as improvements to the efficiency, morale, and status of the organization as a leading employer. We argue that if one looks beyond the hype, there are genuine benefits to focusing on a clear "path to value". We explore the key challenges to implementation and offer the key measures needed to make the abstract concepts of value streams a pragmatic reality for financial services organizations.

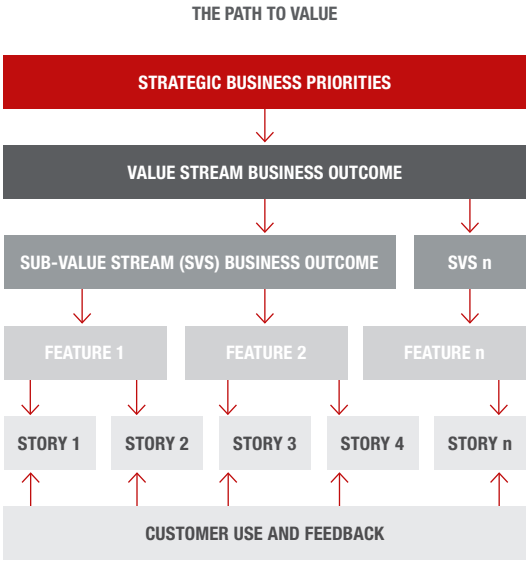
1. THE PATH TO VALUE: MAKING VALUE STREAMS WORK IN PRACTICE

There is a lot of hype surrounding the so-called agile enterprise. Management theory across leading academic and business literature[1] highlights the promise of a leaner, more flexible organization, rooted in agile theory. While the effectiveness of specific models is debated, what is certain is that organizations are responding to this type of agile-led change: 63 percent of organizations have moved to scaled agile models, 21 percent are about to start the change, and only 1 percent have abandoned this approach entirely [Gartner (2019)][2]. What is also clear is that the root concept behind scaled agile models and value streams is here to stay for the foreseeable future, and those that do not explore how it could drive future business models will be left behind, and face their own "Kodak moment" as they become irrelevant against market trends.

Most moves to greater agility focus around one core concept – path to value, from strategic business direction through to customer outcomes. The base concept is that business process and functions align their operations to focus on the value-generating outcomes for the business, whether this is a product, service, or end-to-end lifecycle. This path to value has become a key premise for understanding what is important to the organization, and what waste or low value-add steps should be dispensed with. We have seen similar concepts proliferate with Lean, Six Sigma, and others, but what is different here is putting strategic decision making as close to the customer as possible; building clear feedback loops and market testing of what resonates with the customer base, and building the business value from this point. Figure 1 demonstrates the typical path to value for value-stream delivery.

[1] https://bit.ly/3lT3zqf; https://mck.co/2SWsTz1
[2] https://gtnr.it/3j2F9Zx

Figure 1: The path to value



Set by the **business**, clear strategic direction and allocation of funding to drive the right work. The **value stream business outcome** owner drives the right work to align to strategic goals.

The **SVS business outcome owner** is accountable for the value-stream outcome. The shape is flexible, focused on value-adding features to drive products and services, and moves with the market.

Supported by the **SVS lead**, who leads and drives engagement, and the **technology lead**, who owns the technical authority and alignment with long-term technology roadmap.

Delivery pods are the engine of the SVS, taking features and stories and delivering them to completion, encouraging feedback, and continuously reiterating. They are supported by **change agents** who help with the adoption of positive behaviors and working patterns.

2. WHY DO WE DO IT?

At its core, a value stream facilitates the flow of work. It promises to isolate non-value adding steps in the production chain, thereby making for a leaner enterprise, where resources are not wasted on activities with little or no impact on the end goal.

Businesses have researched incarnations of value stream theory since Michael Porter. What has evolved with current thinking is the way in which we apply value streams to specific business and customer outcomes. Value streams are not just a representation of the whole enterprise anymore, they are focused on the specific value-generating products, services, and lifecycles that mean something to the top-line, and in turn, adjust the structures, norms, and behaviors to refocus resources. Table 1 presents the key differences between traditional and value stream organizations.

The faster pace of societal progression and rates of technology innovation are driving this focus. Exploring productivity and efficiency to drive growth and margin, through smarter allocation of resources and shared platforms to expedite delivery, helps create standard practices and remove the need to rethink every challenge. We produce more unstructured data points now than at any point in history, giving a wealth

Table 1: Traditional versus value stream organizations

	TRADITIONAL ORGANIZATION	VALUE STREAM LED ORGANIZATION
STRATEGIC FOCUS	Individual functional goals that compete as much as they complement	Common business outcomes across the value stream
SUCCESS MEASUREMENT	Volume of outputs, cost of sales, and financial metrics for a function	Quality of outcomes, impact to growth and margin, of the value stream
TECHNOLOGY	Point solutions and legacy technology to support functional aims	Common platforms and standards that solve common value stream and enterprise challenges
DATA	Fragmented data that does not connect or allow true E2E insight on organizational and customer behavior	Principle and standard-led data ownership, which is connected and allows deep insight into data-led decision making
CAREER PATHS	Line management hierarchy, with promotion based on merit and organizational structures	Reward and recognition for outcomes and promotion on specialization and SME advantage for the value stream
DELIVERY FOCUS	Processes and activities that are streamlined and structured to allow standard and repeatable outputs	Collaboration, trust, and autonomy that uses processes where they add value, but focuses on the outcomes they enable

of indicators for where organizations need to focus on improvements to value. We have also recently seen how unpredictable volatilities (e.g., COVID-19, the rise of China as an economic powerhouse, the 2008 crash, etc.) have shown the need for greater flexibility in how we do business and pivot to customer expectations. As just one example among many, millennials are 60 percent more likely to switch who they do business with because of price and are far less dependent on brand loyalty than previous generations [Forbes (2019)].[3] The value stream organization is far more sensitive to these fluctuations.

If we follow systematic analysis of processes and activities to understand waste, we see that the real prize for value stream organizations is the tie-in between minute enhancements to delivery with greater business agility. Consequently, the value stream path to delivery enables the organization to respond more effectively to changes in strategic direction. The workforce is both empowered and viewed as capable of responding to even the toughest market conditions. This happens through well-managed and defined backlogs (accummulation of incompleted work) that focus attention on outcomes, not outputs.

With this approach, we see a closer alignment of customer feedback with the direction the business takes, clear and honest measurement throughout the path to value that is actionable and expressed through real-world customer usage, and an ability to clearly see when dependencies matter across the organization. In other words, a clear framework for multiple delivery teams to operate in parallel with the same release and deployment points. The enterprise scale adjustment required to achieve this gives rise to a new set of challenges. These will be explored in the next section.

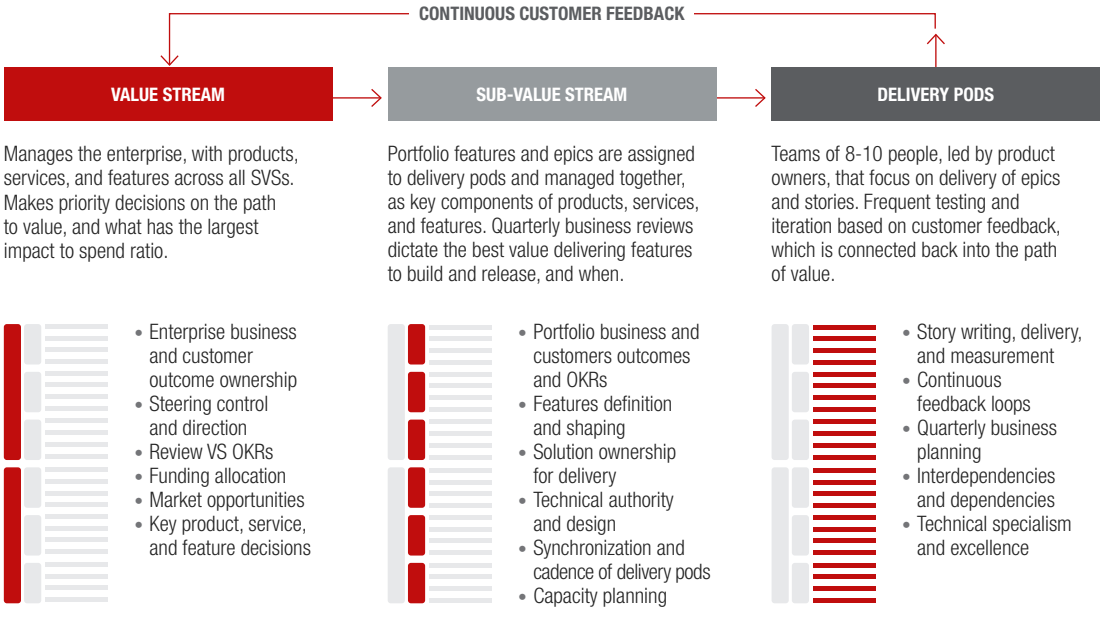
3. THE CHALLENGES WITH VALUE STREAM IMPLEMENTATION

On paper, value streams have a clear raison d'etre and structure, but the pivot from today's organizational norms is substantial. The market has tested many approaches to successful implementation, from "big bang" cut-overs to small "test and learn" pilots. From this, we have learned the common challenges that organizations face when implementing the value stream approach.

3.1 Challenge 1: Art or science?

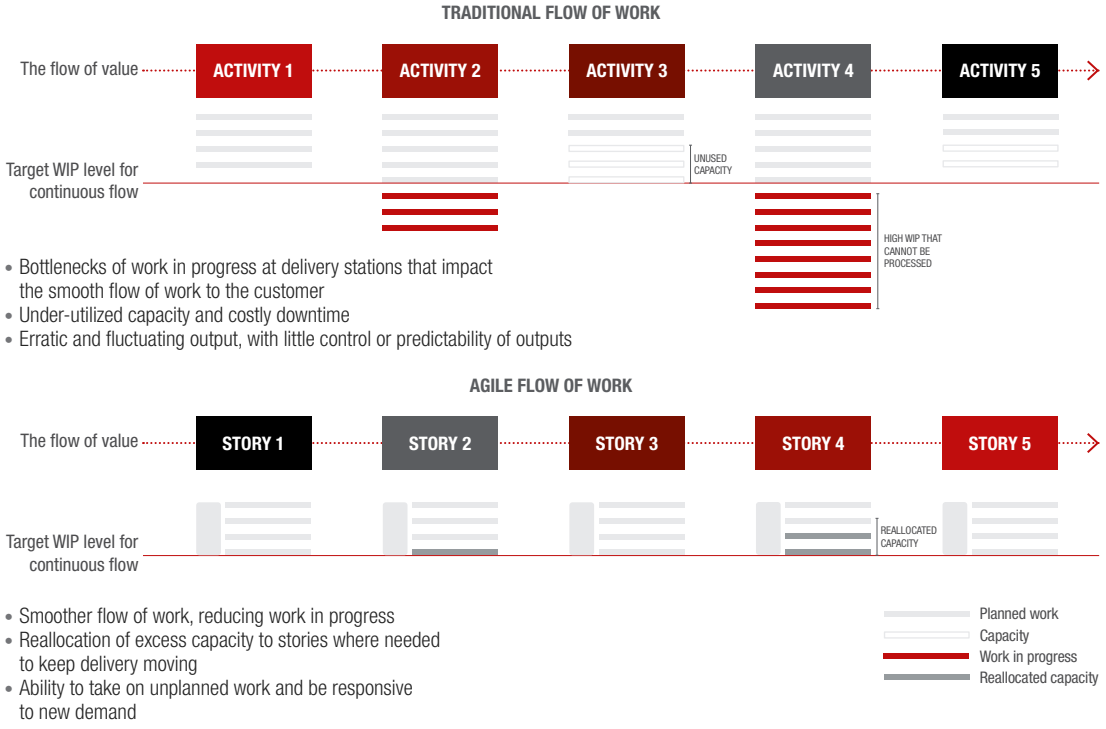
Value stream mapping is a scientific activity, forcing you to focus on the steps to value and recognizing the waste along the way. The outputs of value stream mapping show delivery teams how they can better deliver new products and services. This generates results and gives business leaders a model answer for a lean and efficient way of "doing", but it comes with

Figure 2: The flow of value across the value stream backlog



[3] https://bit.ly/3lOyfJ1

Figure 3: Delivery cycles of planned and unplanned work



operational challenges. Excessive focus on waste is a trade-off with the actual problem businesses are trying to solve. Many get so entrenched in the depths of a specific activity, that they lose sight of the problem. Examples are everywhere – removing clicks for a digital experience moves you towards a "one-click" solution for information seeking, but if the problem is complex site navigation, this is not the whole answer and will not provide the desired outcome. What is needed, rather, is a combination of "doing" and "being"; a re-imagining of the value stream, where the mindset shifts explicitly to the experience a customer has and how the business can better respond to changes in needs. Analyzing and documenting the culture of the organization is a very different type of work to scientific analysis. Gauging an appropriate balance between the two enables both operational realignment and cultural integrity of the workforce.

3.2 Challenge 2: Omitting unplanned work

Forecasts are educated assumptions: guesses at what the world will look like in the future. We know through intelligent analytics how long core business processes and value chains take to complete, but this is often an idealized view of the world that is isolated from day-to-day disruptions. Unplanned work and work in progress damage processes' forecast integrity, causing costs and delay. Value stream design needs to account for unplanned work by recognizing fluctuations and changes in direction; this flexibility is key to success. Whether organizations build contingencies in budget, slack in delivery plans, or flexible resource deployment across delivery teams, they all take account of the same root concept; unplanned work will happen and we need contingency to manage it. Figure 3 illustrates how unplanned work negatively impacts traditional delivery models, and how value streams are better positioned to manage fluctuations.

A truly resilient value stream manages fluctuations in demand and supply. A harmonious point may never be reached, but unplanned work does not break the business or fail to meet customer expectations. Modern technologies and processes are built for these fluctuations, with examples such as elastic-storage and processing demand, or flexible service level agreements for repeatable skills. With value streams, we take the same principles of managing flow and prepare for what we cannot forecast.

Table 2: Root cause analysis approaches

	ISHIKAWA 'FISH BONE'	ART IDENTIFICATION (SAFE)	ROOT CAUSE ANALYSIS (RCA)	FAULT TREE	SIX SIGMA
WHAT IS IT?	Provides a full system's view of a problem and its various root causes. This approach assumes there are multiple factors that explain why something happens and analyzes the depth of each.	Scaled agile framework's approach to identifying value streams and Agile Release Trains. Their approach uses standard canvases and methods to understand the root causes of activity in the business.	The foundation for most root cause analysis. Structured questioning lets the group understand what is happening and why, to reach a root cause.	Based on Boolean logic, this approach gives a simple true or false reasoning behind a step. Causes are branches on a tree, which helps identify the root.	Manufacturing-led approach to reducing defect rates. Six Sigma is comprehensive and the gold standard for removing variations.
MOST EFFECTIVE USE	Larger problem statements where there are multiple functions involved to create an outcome, for example, customer complaints handling.	New solutions where value streams are being established and a fresh perspective on why things happen is needed.	Flexible approach that can be applied in a variety of places; the key is not getting stuck with over-analyzing and calling time to progress a solution.	Problems with logical processes in an organization; for example, technology platforms that support determined outcomes.	It is burdensome, complex, and most suited to specific processes of repeatable tasks and outcomes.

3.3 Challenge 3: Silos still proliferate

Removing silos is critical to successful value chains. Let us be clear, value streams cannot work if teams do not work together. But, as is often attempted, removal of a silo is not accomplished by updating a value stream map or organization chart. Whether people sit in the same delivery pod or not, it is their perception of organizational reality that makes the difference: Who do they report to? How are they remunerated? Where do they receive support? The much referenced "Spotify Model"[4] attempted to remedy this challenge with common role chapters, and other scaled agile frameworks are beginning to look at this challenge more seriously. It makes little sense for an individual to focus their work on one thing but be rewarded for another, unless they are a true altruist in Nirvana. Designing value streams too often focuses on the process steps to value and not the people steps to value. We need to be more mindful of individuals' changing appetite and manage their expectations and opinions. We need to look beyond a person as a capability label and really understand their motivation to support the business outcome, and how they are rewarded for doing so.

3.4 Challenge 4: Embracing the fabled "experimental mindset"

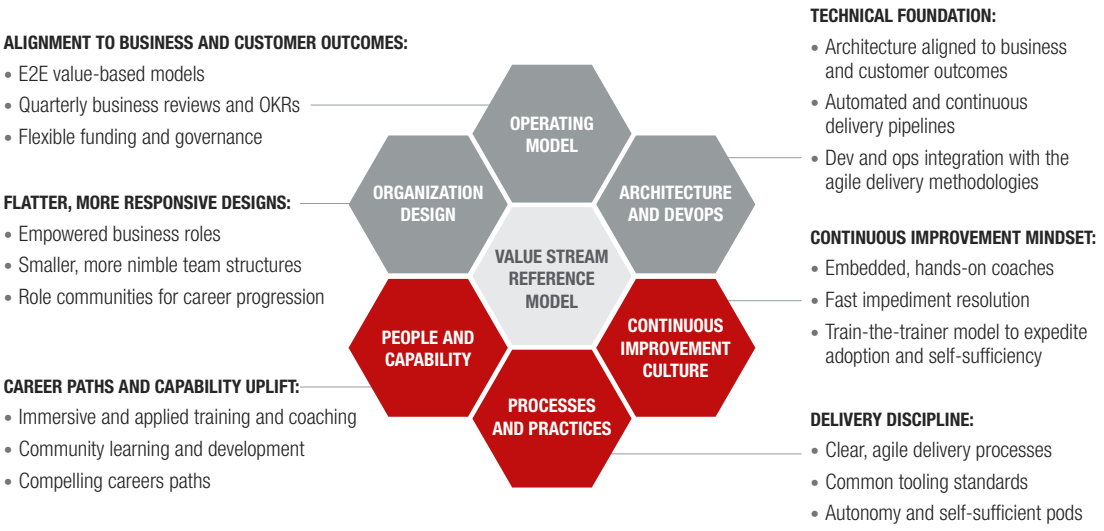
Embracing an experimental mindset means accepting that people are not perfect, and leaders should not expect constant perfection from their workforce. Great discoveries and societal progressions have come from mistakes, and it is only through creating psychologically safe spaces for innovation that we are able to truly uncover the value to be gleaned from mistakes or failures. Moving to a value stream that is dependent on each actor mechanically delivering to their role specification is not a recipe for success. Just as we account for variations in supply, demand, technology, and so forth, so too must we account for the inevitable variation in how people deliver. A culture of expression and innovation helps to make this happen, but it is not the complete answer. What we do with failures is the key here. We should not just consider the flagship failures of new product launch, or market exploration exercise. We also need to consider the minutiae of daily challenges, such as work in progress being stuck in queues, people's diaries being bombarded with important meetings, annual leave commitments, illnesses, and so forth. We need to understand why a failure happened, what we learn from it, and how we build the lessons into the future, which brings us to the fifth and final challenge.

3.5 Challenge 5: Root causes, not culprits

Root cause analysis looks for the root causes of problems in order to help us better manage their potential impacts in the future. Sounds simple, and to a large extent it is. However, root cause analysis often proves ineffectual in application. More often than not, when teams explore problems they seek to find a fault and where to place blame for what happened; this limits our ability to really understand what has happened and how we can work better in the future. This natural behavior

[4] https://bit.ly/37ddhzt

Figure 4: Value stream reference model



damages leaders' reliance on root cause outputs and limits response. Typically, the real cause of a problem is not an individual or one team, it is a systemic failure and collection of factors that lead to an undesirable outcome. When seeking true root causes, organizations should be asking why something has happened. Why does something work as it does? Why do we get these results? Why have we built it like this? Six Sigma is excellent at root cause analysis and isolates very specific effects in production processes. Value streams can take lessons from here, and from complementary approaches, to lift the constraints of the "blame-game", and become more effective in finding true root causes that can be solved as a cohesive group. Table 2 illustrates the key lessons we can learn from popular root cause approaches.

4. THE STEPS TO MOBILIZATION

As we have explored, the merits of moving to value-stream delivery are clear; however, the journey to getting there is not. The inherent complexity and scale of value streams need proper consideration and an approach that is rooted in the same principles we are trying to implement: great business agility with an environment of free thinking, innovation, and one which reimagines the world as it could be. It is a bold and exciting journey.

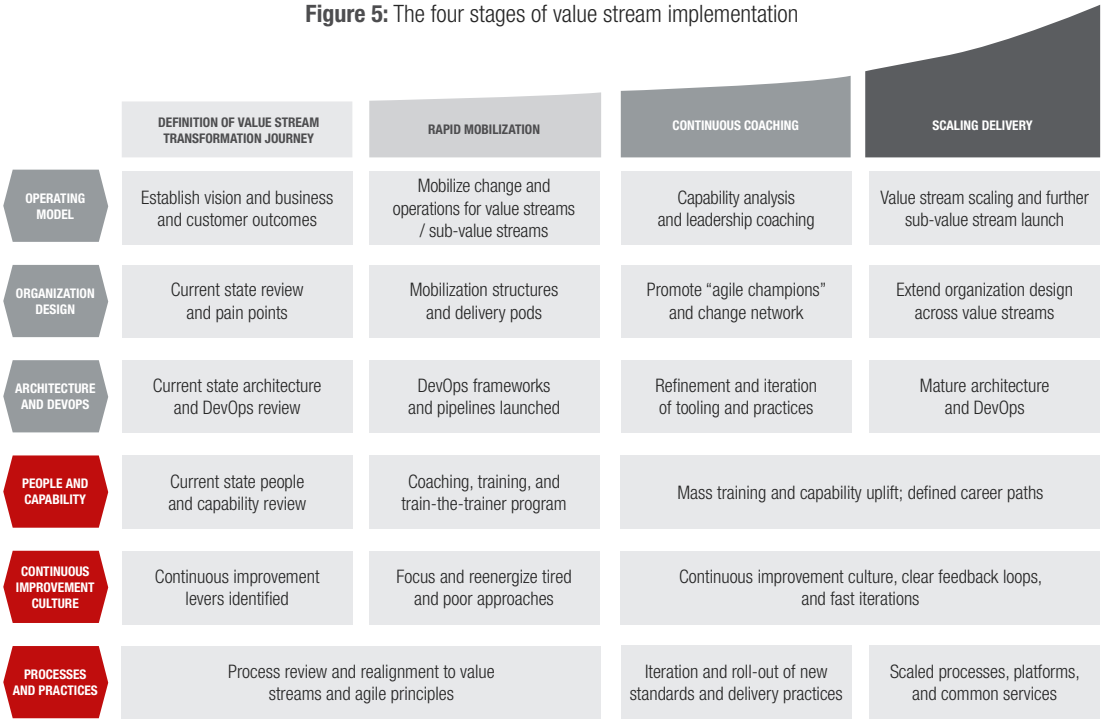
As part of our work, we have brought together human-centered design, lean product development, and emerging technologies to solve this problem. Our solution to the right value stream has a simple formula: customer centricity + engineering excellence + new ways of working = a new value stream blueprint. Our reference model, shown in Figure 4, tackles each of the components that drive this formula:

To really understand what customers want, we look at features and functions that influence and drive the right behaviors. We turn this into a product vision through techniques, such as user journey and experience mapping, to model the overall journey. Key to this is understanding what the customer thinks, feels, and does, with supporting real-world feedback of experiences, pain-points, and opportunities. The product vision, therefore, provides the indicators for the business and customer outcomes that demonstrate success.

Getting the optimal architecture and engineering discipline in place to drive solutions, as part of a comprehensive technology platform or value-stream specific delivery pod, makes this a reality. We explore the right blend of vendors and internal teams to build and revamp legacy technology assets, to exploit the advances in the marketplace, and prepare to build the new features of the future.

Truly believing that enterprise agility enables better outcomes, further and faster, we embrace new ways of working as the heart of value stream discipline. Our clients organize projects around multi-functional teams that are trained to deliver quickly and iteratively, but also in a way that fundamentally shifts belief in the value stream, where we can learn more quickly to succeed faster. This approach affords the flexibility to try, learn, and iterate key designs and delivery, responding to data-led insights, and scaling the elements that work, while quickly pivoting from those that do not.

Figure 5: The four stages of value stream implementation



There are four stages of value streams implementation: definition of value stream transformation journey; rapid mobilization; continuous coaching; and scaling delivery (Figure 5).

4.1 Stage 1: Definition of the value stream transformation journey

The need for a clear strategic direction is not a new or surprising concept; however, it can be incredibly difficult to create a vision that truly galvanizes people at all levels of an organization, particularly when it is not supported by a network of effective coaching and feedback. Within value streams, business and customer outcomes are delivered through dynamic backlog management that pushes work from key product, service, and feature decisions through to the work completed in delivery pods. Decision making is, therefore, kept as close to the customer as possible by leveraging continually iterating customer feedback loops.

In this stage, we identify the core business and customer outcomes and their ownership, key product, service, and feature decisions, steering control for mobilization, and the value stream objectives and key results (OKRs) to measure success. We prepare to manage the portfolio of features and epics, which are assigned to delivery pods and managed together with delivery cadence and release synchronization.

Quarterly business reviews show us where we are generating value against these features and epics, and where we need to work differently to create more value.

Finally, the delivery pods are defined with key roles formalized: the product management network to own the end-products and services; capability-led roles needed to design, build, and test new features; coaching roles to embed the right behaviors; and supporting platforms and service teams providing common commodities and tools to execute quickly.

4.2 Stage 2: Rapid mobilization

Mobilization is a critical step in today's fast-paced, digital environment. And, with the rate of change constantly increasing, rapid mobilization can make the difference between being a success or a failure.

Mobilizing quickly and safely means delivering value from day one, while also building real belief in the change through diverse engagement and communication methods. It is essential that a compelling vison pulls people towards creating a new and better future, while allaying fears and concerns by addressing challenges head on, in order to build an iterative and flexible path towards business and customer outcomes.

We start the transformation with a clear plan and guidelines for business outcomes, first feature and story delivery, and a focus on the key drivers of value. Through the value stream vision, we create decentralized decision making and empower the people closest to the customer to drive the definition of success and the path to reaching it. In alignment with the core agile principles, we deliver this change iteratively and in response to business needs. By leveraging this approach, we are able to create value quickly and simultaneously instill feedback loops that continually align with market shifts.

Objectives and key results are brought to life, with data-led decision making, as a way to accurately measure what is working. Through regular reviews, we align and realign teams and leaders behind areas that need the most support, and recognize achievements to celebrate success and see the impact coming to life.

4.3 Stage 3: Continuous coaching

Coaching is a tool for empowering and driving positive behaviors that promote transparent and authentic communication and an uninterrupted flow of value across the organizational network. Through continuous coaching, stakeholders have an opportunity to co-create new possibilities, explore the foundations of their beliefs, and divest themselves of unhelpful presuppositions that block the exploration of new and valuable approaches.

Through one-on-one relationships at the executive, leadership, and team levels, we move stakeholders towards adoption and acceptance of new ideas, ways of working, and processes. We use reflective inquiry to challenge individual and team behaviors and beliefs, where individuals and teams explore their deeply-held assumptions and jointly challenge their thinking. This approach generates highly valuable insights that open doors to areas of innovation that were previously hidden potential in the organization.

Through creating psychologically safe environments for open dialogue, people feel more able to open up and be vulnerable. The exposure of previously hidden concerns leads to a more deeply integrated and effective team, better able to express their opinions without the fear of misunderstanding or reprisal, and, therefore, significantly more likely to create impactful ideas and successful outcomes.

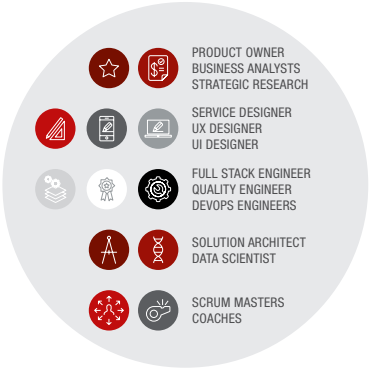
We use individual and team action plans to focus and turn moments of deep insight into transformational outcomes. This works by solidifying ideas and concepts uncovered during the team's moments of realization and simultaneously defining the next steps towards value, while also drawing implicit and explicit commitment from the team as they articulate the path to value.

4.4 Stage 4: Scaling delivery

We have a tried-and-tested method for scaling delivery. We tackle both delivery and capability uplift across business executives, leadership, and delivery pods. We scale what works, quickly, allowing organizations to become self-sufficient and autonomous in their journey.

We are bold and not afraid to dispense with ideas that do not generate value and focus on the ones that do; it is how we operate and forms part of our DNA. Backlogs are transparent

Figure 6: The range of capabilities in a delivery pod



Design
- Service designers
- UX designers
- UI designers
- Researchers
- Motion designers

Product
- Product owner
- Product manager
- Product strategy
- Product marketing
- Customer research
- Artworker

Engineering
- Full stack engineer
- DevOps
- API design/dev
- Back-end engineer
- Data engineer
- Quality engineer

Strategy
- Strategic market analysis expert
- Agile workshop lead
- User experience designer

Ways of working
- Scrum master
- Agile coach
- Enterprise Agile
- Business analysts

Automation
- Automation solution designer
- Automation BA
- Automation developer

Data Science
- Data scientist
- Machine learning experts

Solution
- Solution designer
- Security architect
- Cloud architect
- Data architect
- Enterprise architect

Figure 7: Train-the-trainer approach

and we involve stakeholders to ensure that what resonates is scaled, and has the support needed to be successful. We do this across a range of capabilities that are needed in delivery pods to deliver a variety of solutions, as outlined in Figure 6.

Our engagement does not stop there; we make it real and answer the "what does it mean for me" question. This is a fundamental change and when colleagues get to their desks on the first new Monday morning, they need to know what to do differently. This is achieved through our unique style of coaching that focuses on the individual and how their role is performed in the wider organization. We turn managers into leaders and practitioners into true experts, so that they are ready to join the delivery engine of the value stream. Training is adapted to the specific needs of roles, focused on the business context, and offers certification routes for career progression, with the result being a highly-skilled and sustainable workforce.

We use a train-the-trainer model, where shadowing and reverse shadowing ensures that the organization's own trainers are able to take on future business needs. Those who undertake the training path have the opportunity to learn the key concepts of enterprise agility and deliver them with action in mind. This ensures lessons are experienced as well as simply repeated, allowing for a deeper and more long-lasting learning impact.

By first training members of the executive and leadership team responsible for impacting and delivering outcomes, we are able to create a deeply resonant and authentic vision of the change that will empower the whole organization. It is essential that leaders truly embody the agile values and imbue the change agenda with an energy of belief and commitment.

Finally, by providing applied courses that are pragmatic and focused on value delivery, we ensure that all learning undertaken within the organization is practical and adds value immediately. This approach ensures that people are equipped with the correct mindset and tools to embrace positive change and ensure customer-centric value delivery is always at the heart of their work.

5. GETTING IT RIGHT: KEY LESSONS LEARNED

There is no one-size-fits-all playbook for value streams. Moreover, this type of change is specific and nuanced to the structures, norms, and culture of the organization. Taking a principle-based view of value stream implementation, we can apply grounded theory when planning and executing the change. To do this, we follow these principles:

1. **Use design thinking to reimagine the future.** Empathizing with the problem and the people involved gives a perspective that few other approaches can provide. What does the business outcome look like to the customer? How do they feel about your organization? What is the perception of the key people in your teams who will make this a reality? Getting under the skin of the problem, removing constraints, and thinking through the art of the possible is a critical starting point.
   The workforce may have hunches and intuition, but it is important to play this against the power of the group mind.

2. **Agility is principle-, not rules-based.** If we try to only follow rules, we will inevitably break them or come to irrational decisions that satisfy the rule but are not in the best interests of the outcome. Let principles guide the value stream to its design and fruition, but do not overly constrain by banning documentation, removing processes, and only honoring one outcome. Be flexible and find what works for the context you are in.

3. **Think big, start small.** Value streams are not an exclusive technology story, or a single product, they are an end-to-end process across the entire enterprise. While this is daunting at first, when we start to see the organization as a network of nodes that interplay to create value, it is less difficult to imagine how a change to your node's value delivering capabilities will ripple through the organization. The biggest changes in society happen this way, and so too should your move to value streams. Brave organizations have done it all at once, and some have pulled it off. However, more often than not the risk trade-off just does not stack up.

4. **Include all relevant capabilities and functions.** Agile, engineering, design and development, operations, legal, HR, etc., are all interconnected. Value stream delivery is a story of all the people and capabilities needed to deliver value. Do not let organizationally dictated silos diminish potential. Think beyond them and really look at what is needed to make the better outcome a reality.

5. **Build belief, not just consent.** There is much hype around the "agile mindset shift". While this is not a false premise, it is abstract. What is important is building true belief in the value stream and what if offers. Forcing consent will invariably diminish the semblance of value, because there will be firm resistance to change. If we build genuine belief in the change ahead, we fight tooth and nail to make it happen. Empathize, coach, and understand the people affected by the change.

6. **Align funding to value streams** so that there is flexibility and financial backing to make the change a reality. Negotiating for slices of budgets from multiple teams not only delays any progress, it hampers innovation and lowers morale. If a move to value streams is real, successful companies put their money on the line and believe in the outcome. Payback has been well documented, but so have losses. If you are not bold and do not put the budget on the line, nothing will change. Be flexible with funding allocation and prove the return on investment in shorter, quarterly cycles.

There are, of course, a plethora of factors to get right. In our experience, getting these six principles right dramatically increases your chances of success and implementing market-leading value streams.

6. CONCLUSION

Value streams offer a wealth of potential to financial services organizations. As the market has seen with the fables and realities of agile transformation, this journey is challenging, takes time, and often results in fewer benefits than expected. Success can be found through boldness and willingness to take on the challenges directly, with a sense of pragmatism, optimism, and solid grounding in the delivery outcomes being achieved. Value streams do not happen overnight, but if financial services firms surround themselves with knowledgeable people who understand the finer nuances of business agility, can relate to the problems "on the ground", and offer true insight into what is working and what should be dispensed with, the journey to value streams can result in success and a change that sticks.

MANAGING STRATEGIC AND CULTURAL CHANGE IN ORGANIZATIONS

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ABSTRACT

The need for change within organizations is not uncommon in a world full of technological, political, and cultural transformations. But how can organizations effectively transform themselves in a global world and what can leaders and professionals do to effect meaningful change successfully? This article outlines a model that shows strategic and cultural transformation as an ongoing process. There is no single best way of changing organizations. Consequently, reasons for change are related to suitable change strategies and supportive actions for guiding the change process. Special attention is given to critical capabilities that change masters need to succeed in change as an ongoing play between actors engaged in deep change.

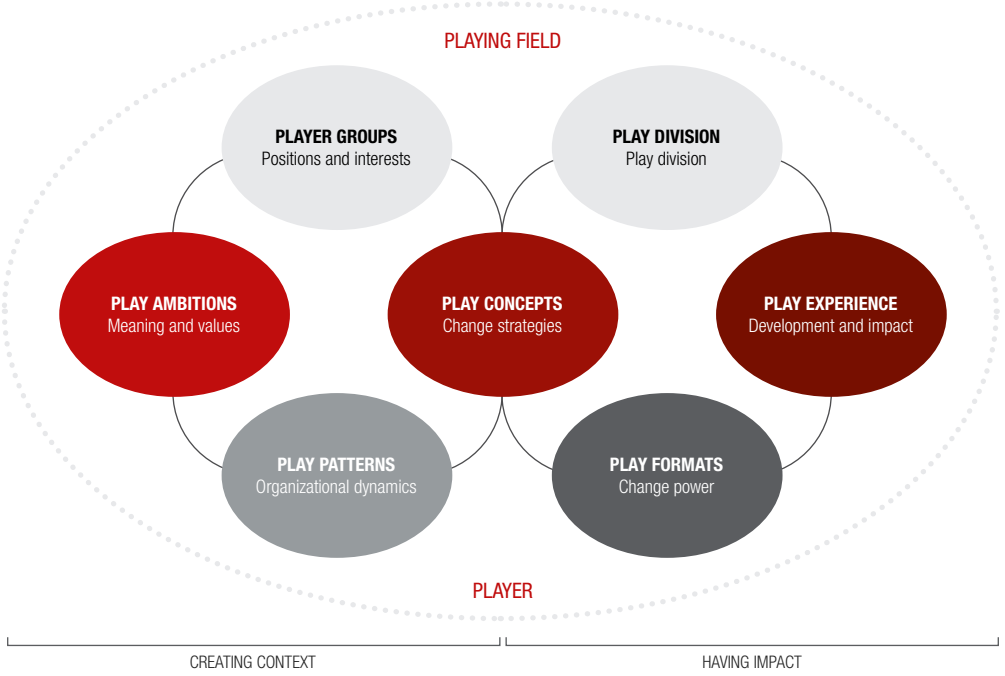
1. CHANGE AS A COLLABORATIVE PLAY

Change in organizations is not a goal in itself, it is for the strategy of the business, the future of the organization, and its contribution to society. This means that there is a continual dialogue with all stakeholders involved about achieving strategic change. The best chance for successful change comes from giving meaning and value to the company, and to what the company wants to mean for customers and for society. Successful leadership in organizational change is connected with passion and a vision of the future and not with a formal position in the company. Everyone can play a role in successful change. Change initiators bring people together with an inspirational vision and move their organization to meet the future. In this article, organizational change is no longer perceived as a planned or programmed effort but as a dynamic and continuous process. The change approach of change as collaborative play may help to shed light this ongoing process. This approach is described below and elaborated in the following sections.[1]

On the "playing field" the essence is to explore the world, inquire what is going on, and understand the dynamics that effect the organization as a collaborative effort of people who create meaning and contribute to customer value. A worldly view may help in this inquiry. A political mindset is needed to map the "player groups" in and around the organization that may foster or hinder the change process. The "play ambition" is based on the meaning and the values of the organization and is related to the business idea of the organization. This is related to a strategic mindset. Exploring "play patterns" may help to understand organizational cultures and visible and concealed dynamics between players within the organization. Play patterns may be discovered by a cultural view. The perspectives on the playing field, the players, the ambitions, and the play patterns offer a solid ground to develop "play concepts" and select a combination of change strategies that fits to context and situation. A dynamic view is needed to choose and combine change strategies. "Play division" is about players enrolled to contribute to the change process. This needs a collaborative mindset. "Play formats" are about supportive actions that engage people and support the change process. An action mindset may support choosing and applying engaging actions. The final play element is "play experience", which is linked to feelings and emotions during the changes and successes of the change process. To sense these experiences, you need a reflective mindset.

[1] This article is based on the book Organizational change as collaborative play by Jaap Boonstra, published in 2019 by Boom | Management Impact, Amsterdam.

Figure 1: Organizational change as collaborative play



The Global Alliance for Banking based on Values (GABV)

In our global world, international collaboration in alliances is developing very quickly. Understanding national cultures in business is a key success factor in building international alliances. The banking sector is one of the most internationalized services in the world, as we have experienced in the worldwide financial crisis and now again with the health crisis, which affects both the economy and society. There is a societal and human need to transform our financial institutions in a more sustainable and value-driven way that serves real economy and society. Sustainable banks must maintain a high degree of transparency and inclusiveness in governance and reporting. In this context, inclusiveness means an active relationship with a bank's extended actors and communities, and not only its shareholders or management. Changing the way of banking is a huge challenge for many players like bankers, customers, businesses, governments, and academics.

In the play ambitions and play patterns within most banks in our Western world, shareholder value and short-term profit still go before people. Fortunately, there are good examples of value-based banking worldwide with different play patterns and play ambitions. In our Western world, Triodos Bank is an excellent example of a bank that pays attention to sustainability and the needs of customers and society. Worldwide, the Global Alliance of Banking on Values (GABV) is an initiative of banks that puts people before profit and is based on values like transparency, long-term resilience, investing in real economy, and long-term client relationships. Value-based banking is profitable otherwise it would not be sustainable in itself. In the alliance, 54 banks are collaborating based on shared principles and values. It is a growing movement that influences the way people do business and create a living. The glue in the alliance is their values and principles.

Change is a continuous play with many actors where bankers worldwide learn from each other's experiences and inspire each other. The play concept is based on a challenging ambition to create a movement for value-based banking worldwide. Dialogue and development are ingredients for change strategies to grow as a global movement. The banks in the alliance create impact though interplay with entrepreneurs, sustainable businesses, microfinance institutions, customers, and non-governmental organizations. Inside the alliance, professionals use formats to play and share ideas with the use of communities of practice, learning cycles, regional chapters to exchange local experiments, development of new ideas, and exchange of best practices. The alliance offers a leadership academy and online courses for values-based banking.

Being a manager or professional in a GABV bank is quite a difficult task since it is not about making money, but about being reasonably profitable in a people's centered organization in which long-term orientation and respect are key values. This means that recruiting and promoting the right executives who combine experiences and technical knowledge with the right values and change capabilities is one of the toughest challenges in the GABV network.

2. PLAYING FIELD: WORLDLY MINDSET

The world around us creates a playing field for organizational life. Many people within organizations experience the environment as unstable and uncertain due to economical, technological, social, cultural, political, and physical developments and constraints. The playing field is "turbulent" as a result of fast technological, political, and cultural changes, which influence each other and become less predictable. The context is dynamic because of new competitors, disruptive technologies, and an increasing number of stakeholders with different and often conflicting values. The field is experienced as "complex" due to the complicated questions in strategic choices regarding market position, differentiation, and investments in innovation. For the future of the organization, leaders need to recognize the dynamics on the playing field and estimate challenges for new business models. The complicated realities demand that the context of our organizational life is explored from multiple perspectives and viewpoints.

2.1 Worldly mindset

Change leaders with a worldly mindset have a deep understanding of the fundamental values in our society. They are conscious of their environment and willing to get into worlds beyond their own. Through sensitivity to what is happening on the playing field they see new possibilities. As a person they are curious, explorative, and have broad interests. They are capable of seeing connections between varying developments and understand what an incidental disruption to a work system is and what symptoms of fundamental change are. Based on their worldly view, they are able to play an initiating and guiding role in strategic and cultural changes within organizations.

3. PLAYER GROUPS: POLITICAL MINDSET

In our business world, many players are active on the playing field. Shareholders are important for the continuity and loyal customers are essential for stability and sustainability of business organizations. Competitors, new entrants, and substitutes may threaten existing business models. Politicians and their political advisors influence business by expressing their opinion and developing new laws and rules. Government committees influence the room to play and set barriers and offer licenses to operate. Unions and interest groups articulate their stakes and influence the reputation and operation of an organization. Opinion makers and traditional media shed light on the impact of organizations on society and frame the value of an organization. Social media is used by customers to share enthusiasm about services, express frustration, and accuse organizations of unethical behavior. To prepare a business for the future, it is essential to understand the playing field and the players who influence the existence of the organization. Internal player groups contribute to more dynamics inside the organization. In a turbulent environment, employees and professionals may become uncertain and demand a clear vision for the future. Innovators may propose new business models, while middle managers act as the guardians of the existing culture and want to focus on stability. Strategists may search for new markets, while employees look for shelter in a competitive market. Non-executive board members and members of the supervisory board may ask for clear answers and results, while executive directors do not have these answers in an unpredictable environment. These different needs and perspectives create confusion and potential tensions between the internal player groups. Mapping the uncertainty, needs, and interest of the internal player groups helps to grasp the political and emotional dynamics between groups inside the organization.

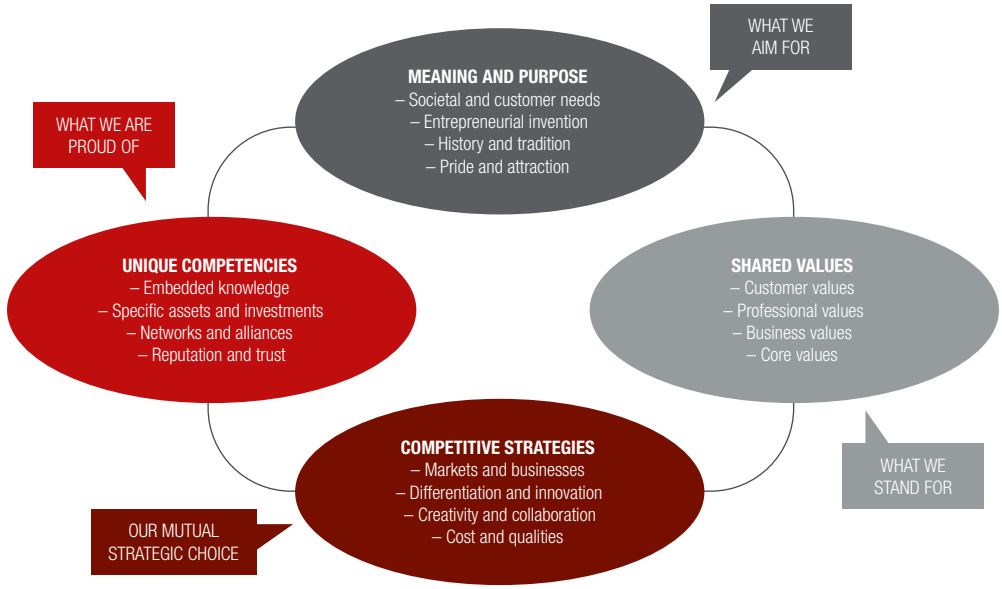
3.1 Political mindset

Strategic and cultural change comes down to forming vital coalitions with people who dare to stick their necks out and take the initiative. Strategic players in organizational change have an overview of the interests and power positions of the players on the internal and external playing fields. They are capable of forming a coalition of people inside and outside the organization who support the change and want to give shape to it. People in a vital coalition come from different backgrounds and have different areas of expertise. They value each other in that difference because they complement each other. Initiators in change are not the followers, they are critical, committed people with their heart in the business and political capabilities to influence others.

4. PLAY AMBITIONS: STRATEGIC MINDSET

In a complex and unpredictable world with many stakeholders, strategic planning might not be sufficient to prepare an enterprise for the future. Formulating a vision that an organization upholds and goes for is a way of working on continuity and renewal at the same time. Visionary enterprises are successful because they are able to create a balance between preserving the core and stimulating renewal. There are two key elements to a vision: a clear identity and an image of the future. The identity is relatively stable, while the business strategy develops continuously subject to the changes in the wishes of customers and the demands from the environment. This raises the question of how a company can preserve its core, be able to distinguish itself and stimulate renewal. A

Figure 2: Play ambition of an organization



value-driven perspective combines the social meaning and identity of an organization, the shareholder and customer value, the unique competencies, and the strategic and market position. The play ambition involves these four connected points of view that together give shape to the creation of value for customers. Figure 2 presents a diagram of the play ambition of an organization.

Working on the play ambition is about how organizations in change can retain their individual character, put their core qualities into action to realize renewal, and make themselves stand out by creating value for their customers. The key question is how a business wants to position itself and distinguish itself by creating value for customers. If the business tackles this, it involves a change that affects the identity and the meaning of the organization, and in which a renewal of strategy, structure, systems, and work processes goes hand in hand with a change of cultural values. In that case, it involves a change in which an organization preserves its identity and stimulates and shapes renewals. Companies that are successful in strategic and cultural renewal are clear about what they stand by and what they are going for.

4.1 Strategic mindset

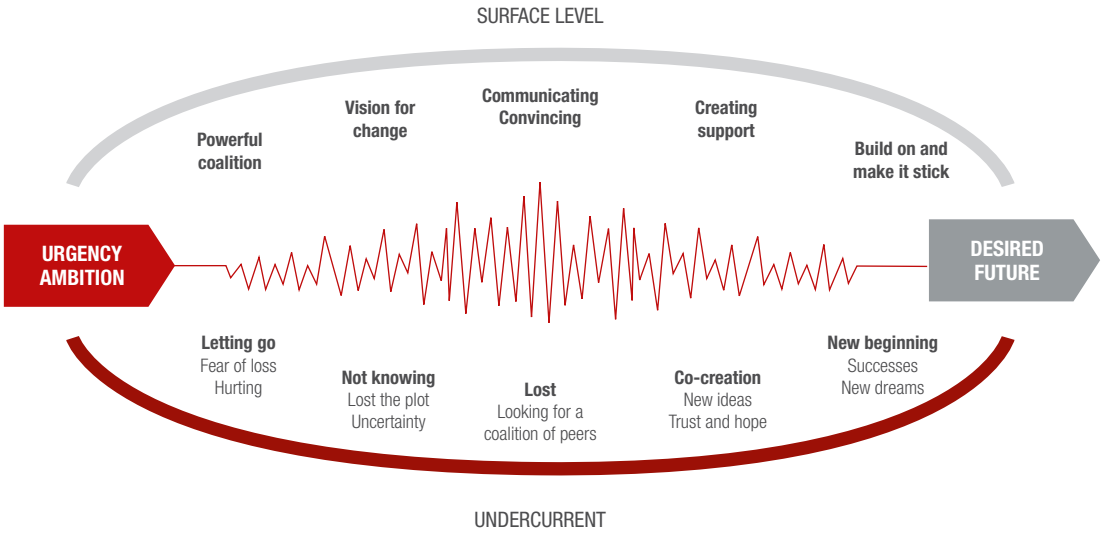
Change leaders know what the organization stands by and what it goes for, and they know what affects their people. People with a strategic mindset are able to manage on the edges between the organization and the various worlds that surround it. They are explicit about what they believe is important, what they attach value to, and what they definitely do not want. Initiators in strategic and cultural change name events, share interpretations, and invite others to share their vision. Through this, they create space for dialogue and give meaning in that. In these interactions, they form the culture of organizations together with others. They also tell stories and inspire others.

5. PLAY PATTERNS: CULTURAL MINDSET

During strategic and cultural change tensions, are obvious and part of the play. Deep change puts the existing values, habits, and forms of conduct under pressure, and tensions and conflicts can arise from this. Conflicts and tensions can be a creative source of renewal of deeper values. Barriers can come from negative experiences with previous change processes, a lack of confidence in management, insufficient belief that the intended change is attainable, or from defense of the existing organizational strategy and culture that offers a certain degree of security. Organizational change usually focuses on the visible elements in a planned process. This surface level perspective is not adequate in an uncertain context because it neglects the underlying tensions and emotions. To be successful in strategic and cultural change, the surface level and the undercurrent both have to be taken seriously.

Dedicated attention to the feelings and emotions in the undercurrent reveals that uncertainties and emotions can be discussed and that there is a willingness to learn from

Figure 3: Surface level and undercurrent in organizational change



earlier experiences. Making it possible to discuss obstacles or barriers can help in clearing them out and creates trust in the mutual relationships. Implicit presuppositions that reflect the current culture come to the fore. It is precisely this that makes it possible to enter into a dialogue about the difference between the existing culture and the desired culture.

5.1 Cultural mindset

Initiators in change are sensitive to the values of the organization and of the social and emotional motives and needs of people. They are socially conscious and aware of the values and standards of a social system they are part of. The cultural mindset goes truly inside the essential meanings of structures, processes, and systems in the surface level. People with a cultural mindset listen to others and have the capability of trusting others and building trust. They are inspiring and know how they have to operate administratively to solve conflicts and realize cultural changes. This enables them to connect to the emotions and ambitions of others and they are able to direct the energy of the people in the organization to the future.

6. PLAY CONCEPTS: DYNAMIC MINDSET

There is no single best way of changing organizations. It involves making conscious decisions about how to set up the

Table 1: Approaches for sustainable change in organizations

POWER STRATEGY	RATIONAL STRATEGY	NEGOTIATING STRATEGY	MOTIVATION STRATEGY	LEARNING STRATEGY	DIALOGUE STRATEGY
FORCING	PUSHING	EXCHANGING	DEVELOPING	DISCOVERING	EXPLORING
• Steered by top	• Initiated by top	• Multiple actors	• Transition	• Active and reflective	• Interactive and active
• Goal oriented	• Solution oriented	• Result oriented	• Problem oriented	• Purpose oriented	• Future oriented
• Position power	• Expert power	• Position power	• Seductive power	• Informal power	• Visioning power
• Input of controllers	• Input of consultants	• Coalitions	• Input of employees	• Input of learners	• Collaboration
• Linear process	• Planned process	• Iterative process	• Circular process	• Spiral process	• Emergent process
• Pressure	• Persuasion	• Negotiation	• Participation	• Action learning	• Mutual learning
• Tell and sell	• Convincing	• Compromising	• Guiding	• Coaching	• Dialoguing

[2] See the following for an elaboration of change strategies: Beer, M., and N. Nohria, 2000, Breaking the code of change, Harvard Business School Press; De Caluwé, L., and H. Vermaak, 2002, Learning to change: a guide for organizational change agents, Sage; Boonstra, J. J., 2004, Dynamics of organizational change and learning, John Wiley & Sons, Ltd.; Cummings, T. G., and C. G. Worley, 2008, Organizational change and development, 9th, South-Western College Publication; Kotter, J. P., and L. A. Schlesinger, 2008, "Choosing change strategies," Harvard Business Review, July–August, 1–10; Boonstra, J. J., 2013, Cultural change and leadership in organizations. A practical guide to successful organizational change, Wiley-Blackwell.

concept of play by choosing and combining change strategies. Change starts with standing still. This not only means finding out the reason for the change and understanding the dynamics between the elements in the surface level and feelings and emotions in the undercurrent, but also thinking through a suitable change approach. Theories about organizational change have described a number of strategies for change.[2] In Table 1, I use these theories as the basis for describing six approaches for strategic and cultural change in uncertain situations.

In the "power strategy", top managers create urgency from the threats from the environment to get people into action. The idea is that people are cautious and only want to change under external pressure. From this perspective, conflicts and resistance to change are unavoidable and have to be overcome through the use of power. Top managers determine the goals and delegate the implementation to middle managers. Controllers monitor whether goals are reached, and top managers intervene if that is not the case. Desired behavior is rewarded and behavior that is not appropriate to the new values and standards is punished.

In the "rational strategy", the basic idea is that people will always choose the most logical solution. The task is to convince people what the best solution is. After the environment is analyzed, management develops a business strategy together with experts. They formulate objectives and implement changes. Experts and advisors have an important role in the problem analysis and the formulation of the desired situation. In the planned approach, managers sometimes use large-scale cultural programs whose aim is to change the behavior of people in the organization.

The "negotiating strategy" concerns parties with different interests and wishes who need each other to realize their goals. The idea is that people focus mainly on their own interests but that they take others into consideration if there is a need to collaborate. Personal interest motivates people to change if that serves their own interests. This strategy is about making force fields visible, articulating one's own advantage, and exchanging interests to establish a solution.

The idea in the "motivation strategy" is that people have enough possibilities within themselves to change as long as there is a good director who can get the best out of them. Creating a safe context and offering clear structures reduces uncertainty and forms a foundation for change. The problem-solving capabilities of the people involved are appealed to in the change process. Usually, the change is initiated and supported by top management. In this change strategy, people who are directly involved work together in the organization to realize the desired change.

The idea behind the "learning strategy" is that people act on the basis of assumptions, emotions, feelings, and almost unconscious patterns. Making people aware of these assumptions and patterns and making it possible to discuss their feelings creates space for learning processes in which people change their behavior. The underlying idea is that

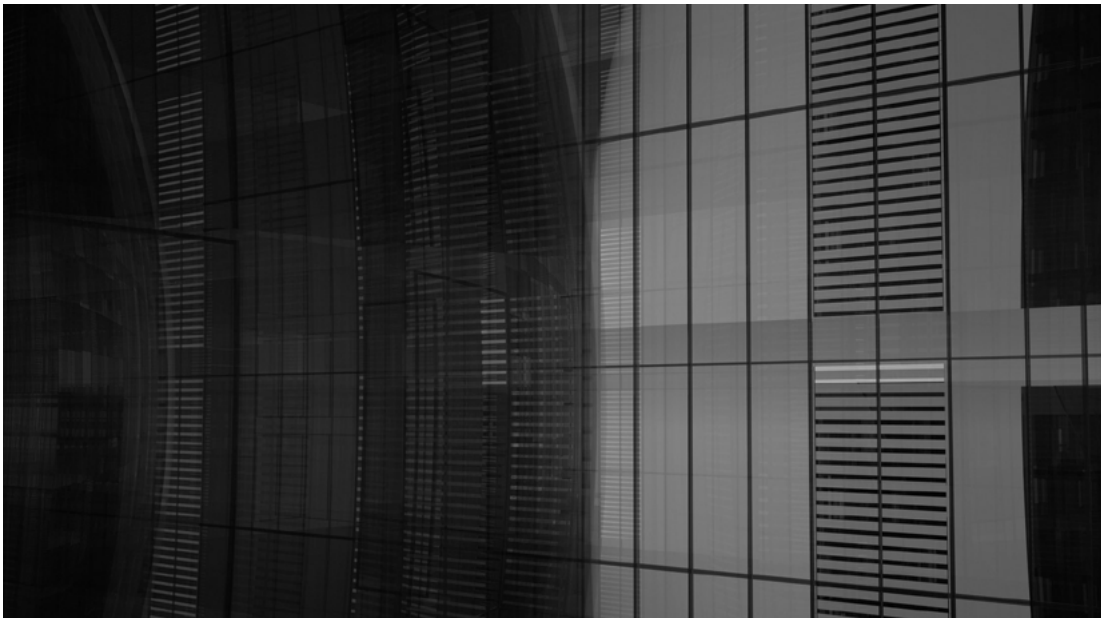
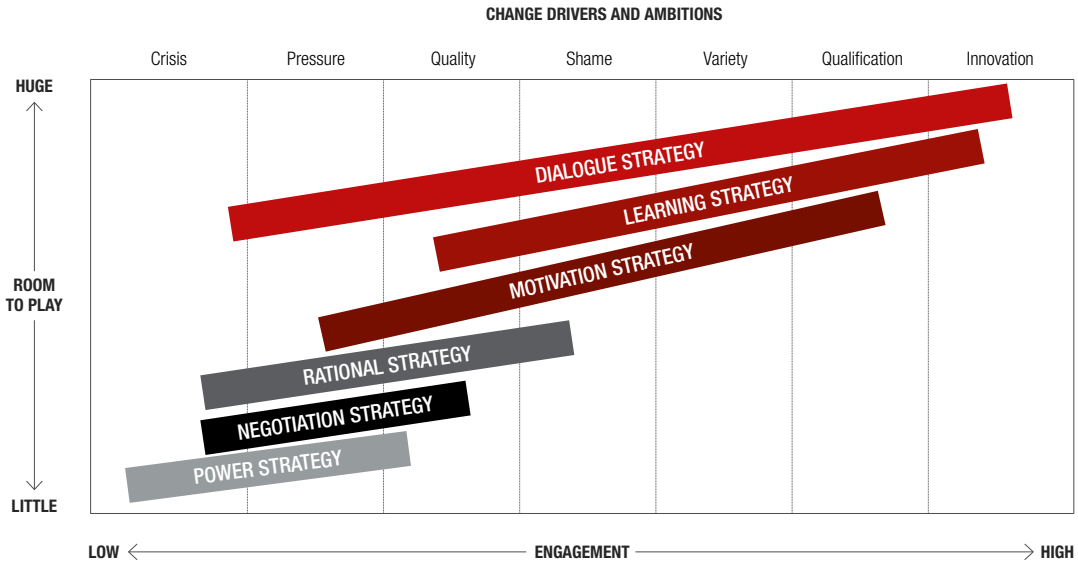


Figure 4: Views to choose and combine change strategies



learning is about mental clearing of limiting beliefs and the creation of new images of reality. Organizations that work successfully on strategic and cultural change almost always pay attention to opening basic assumptions and obstructive patterns up for discussion.

In the "dialogue strategy", people exchange perspectives on organizing, changing, and innovating. They experiment and get innovations going that go beyond their own organization. The idea behind this strategy is that reality is not objective but is anchored in the hearts and minds of people. If this view of reality is linked with a future ideal, energy is created, and people get moving. It concerns multiple examinations of problems, exposing interpretations, and stimulating interactions to produce a number of possibilities for solutions. Meanings and basic assumptions become visible and joint alternative actions are initiated, which lead to a process of discovering new futures and destinies.

One of the most complicated tasks for people who are engaged in organizational change is to develop the concept of play to be successful in change processes. It is a balancing act between three related views on the context and change ambitions, room to play, and the engagement of people needed to effect change. These views are presented in Figure 4.

The first step in choosing and combining change strategies is to consider the dynamics on the playing field and define the "play ambitions" in this change process. The second step is to estimate the "room to play" and time pressure. The third step is to consider the importance of the "engagement" of internal players. In crisis situations and pressure from the environment there is little room to play. Time is limited and compliance of employees is enough to go forward. In this situation, a power and planned strategy might be suitable to stabilize the situation and realize changes that contribute to survival. With a need for quality improvement, a rational and planned change strategy is useful to improve quality systems while a motivation strategy is useful to get people involved in the change process. Professional shame is an important source of energy for renewal of existing relationships and work practices. Feelings like "never again" and "this is not what we want" can contribute to going down new paths. The change gains shape because people want to make a difference on the basis of their own engagement. A change approach based on motivation, learning, and development provides space for innovative experiments and shared learning regarding how to adapt in an uncertain world. Organizations that proactively want to prepare for the future or focus on innovations have room to play and the engagement of internal players usually is easy to secure. In this situation, learning, development, and dialogue is a good combination of change strategies.

6.1 Dynamic mindset

Change has no meaning without continuity. Change leaders are faced with the task of meticulously developing a change approach based on a combination of change strategies and appropriate actions to contribute to this continuity. They have a broad perspective on change strategies and make

considerable choices in choosing and combining strategies for change. Change, to be successful, cannot follow some mechanistic schedule of steps, therefore, people in change with a dynamic mindset deliberately pay attention to specific issues and events and make a choice about the change approach that is needed to bring about strategic and cultural change. In crisis situations, they step forward to identify the situation and tackle it, with the use of a combination of power and planned change strategies. In prosperous times, they are more likely to choose a gradual change and a continuous process of organizational development.

7. PLAY DIVISION: COLLABORATIVE MINDSET

Organizational change cannot be successful without coalitions of players who support the change. Consequently, it is necessary to evaluate the interests and power positions of the players on the internal and external playing field. A view on the ambitions, motivations, and competencies is desirable to assess the capacity for change and to allocate roles in the fulfillment of the change process. Successful change requires a joint effort of people who are capable of realizing change. It is essential to form a coalition of people inside and outside the organization who support the change and want to give shape to it. Key questions are which players need to be fully involved, which groups are asked to participate by sharing information and considering ideas, and who needs to be informed. By organizing roles to play, people are clear what effort and contribution is needed from them. Awarding people for their contribution and involving the right people in the right moment reduces uncertainty and creates support for change. There are many roles to consider, such as initiators, sponsors, change leaders, participants, supporters, problem owners, integrators, communicators, partners, blockades, early adaptors, late followers, and key figures. By connecting issues, interests, and solutions it becomes possible that many players are able to build common ground, share a desired future, develop a strategic vision, and contribute to a collaborative effort in realizing strategic and cultural changes.

7.1 Collaborative mindset

Strategic and cultural organizational change is a collaborative effort of colleagues and partners. Change leaders use their influence to form coalitions of internal and external supporters who help give shape to the change. They actively involve other members of the organization and external interested parties in the articulation of a meaningful, attractive, and feasible vision of the future. When needed, they are willing to change players if this makes the transformation easier. People with a collaborative mindset bring out the positive energy that exists naturally within people. Trust and space to experiment motivate others to get to work on a new vision in their own working environment and invite people to join in and experiment with renewal. Leaders with a collaborative mindset build networks, connect people, stay optimistic, show progress, and make successes visible.

> *“Trust and space to experiment motivate others to get to work on a new vision in their own working environment and invite people to join in and experiment with renewal.”*

8. PLAY FORMATS: ACTION MINDSET

People who take the initiative to change their organization will find that there are many supportive actions available.[3] Supportive actions are the tools for an exciting journey that are needed to realize an ambition. The art is in arriving at a consistent combination of actions that match the reason for the change and the overarching change strategy. All kinds of tools and activities are available in this process while the change is taking place. The skill is in having a vision of the reason and the nature of the change. Supportive actions are embedded in the chosen change approach. It is also relevant to have a perception of the different actors and roles in the change process. The nature of the change, the change approach, and the actors affect the choice of possible actions. Successive actions must connect to each other so that they form a logical whole to maximize the effectiveness of a set of actions. Supportive actions become efficient when there is a clear focus on necessary actions and organizational resources such as time, effort, and money are taken into

[3] Useful overviews of possible play concepts and corresponding play formats are presented on the website, www.changeasplay.com. Readers of this journal have free access to this website with the registration code JB-12345. Choose a username of at least 8 lower case letters.

consideration. Communicating about the change strategy and the supportive actions, making the progress visible, and celebrating successes provide support to the cultural change and the chosen change strategy and intervention mix.

8.1 Action mindset

Changing organizations is an active and continuous process in which people form the identity of an organization together in the way they work and live together. Leaders in change take the initiative and set to work. They mobilize energy around those things that need changing. Through their initiatives, the way people work together changes, as do their interactions with customers. People with an action mindset are aware of the playing field and of what the team is capable of realizing changes, and thereby helping to set and maintain direction, coaxing everyone along. People who participate in a change often have an ambition that guides their actions and are motivated to experiment actively with new ways of working. The action mindset pulls everything together through the process of change.

9. PLAY EXPERIENCES: REFLECTIVE MINDSET

Sensing the dynamics of change as a continuous play of players on a moving playing field is essential to combine surface level and undercurrent and realizes deep changes with a clear ambition and well-considered concept to play. Every change process creates uncertainty as well as moments of joy and enthusiasm when progress is made, and results become tangible. People involved in the change learn during the change process about organizational dynamics, collaboration, and themselves. Sensing weak signals and monitoring experiences that come up during the change process are helpful to adapt to the context and situation by choosing additional actions. Exchanging success stories help in anchoring and distributing the progress of change. Sharing positive results may enlarge the pleasure in change as a continuous play. To grasp these experiences, change masters are open to negative and positive experiences and sensitive to what is going.

9.1 Reflective mindset

Leaders in change know themselves with their strong and weak characteristics. They know who they are, and they know their own motives. There can be no collaboration in change without social and self-awareness. Curiosity helps to discover unwritten rules of the game and the underlying dynamics that guide behavior. A reflective and open mind is needed to understand the assumptions that are taken for granted. Change masters are accessible and can be approached, organize honest feedback, and are not afraid to make emotions discussable. They are capable of self-reflection and have a learning attitude. They reflect thoughtfully on their experiences in the change process and involve others in a learning process to engage them in professional and organizational development.

10. CONCLUSION

Everyone is able to take the initiative in change processes and be a change leader. Initiators in change have a "worldly mindset" and are conscious of developments in their environment. The "strategic mindset" helps to realize that the organization is a collective entity in which people share the play ambition of the organization and are preparing their organization for the future. From a "cultural mindset" they know what is going on in the undercurrent and can sense what people are concerned about. Initiators in strategic and cultural change display a "dynamic mindset." They show the way in an uncertain environment by considering a meaningful combination of change strategies. Successful change leaders form vital coalitions and they work on change from a position of commitment and personal motives. This "political mindset" is connected to a "collaborative mindset" in order to realize change by getting people together and organizing teamwork to make renewal possible. With an "action mindset" change leaders maintain direction and guide people along. Change leaders are conscious players and have a "reflective mindset", aware of themselves and others around them. This helps them create meaning in the change process for themselves and others and add value to the purpose of the organization for customers and society.

THE INNOVATION STACK: HOW TO MAKE INNOVATION PROGRAMS DELIVER MORE THAN COFFEE CUPS[1]

STEVE BLANK | Adjunct Professor of Entrepreneurship, Stanford University

ABSTRACT

Is your organization full of hackathons, shark tanks, incubators, and other innovation programs, but none have changed the trajectory of your company/agency? Finding out why some innovation programs succeed and others fail is not easy, and it took many years for Pete Newell, CEO at BMNT Inc., and I to identify the answer to this question. We now believe that we have a better understanding of how to build innovation programs that will deliver products and services, not just demos. In this article, we explain why an understanding of "Innovation Stack" – the hierarchy of innovation efforts that have emerged in large organizations and consist of "individual innovation", "innovation tools and activities", "team-based innovation" and "operational innovation" – could help organizations build successful innovation programs.

1. INTRODUCTION

Is your organization full of hackathons, shark tanks, incubators, and other innovation programs, but none have changed the trajectory of your company/agency?

Over the last few years, Pete Newell, CEO at BMNT Inc., and I have helped build innovation programs inside large companies, across the U.S. federal science agencies, and in the Department of Defense and Intelligence Community. However, it is only recently that we realized why some programs succeed and others are failing.

After doing deep dives in multiple organizations we now understand why individual innovators are frustrated, and why entrepreneurial success requires heroics. We can also explain why innovation activities have generated innovation theater, but few deliverables, and why innovation in large organizations looks nothing like startups. Most importantly, we now have a better idea of how to build innovation programs that will deliver products and services, not just demos.

It starts by understanding the "Innovation Stack" – the hierarchy of innovation efforts that have emerged in large organizations. The stack consists of: "individual innovation", "innovation tools and activities", "team-based innovation", and operational innovation".

2. INDIVIDUAL INNOVATION

Pursuit of innovation inside large companies/agencies is not a 21st century invention. Ever since companies have existed, there have been passionate individuals who saw that something new, unplanned, and unscheduled was possible. Pushing against the status quo of existing processes, procedures, and plans, they went about building a demo/prototype, and through heroic efforts succeeded in getting a new innovation over the goal line – by shipping/deploying a new innovation.

[1] This article first appeared on steveblank.com

INNOVATION STACK			
Leadership	Guidance/investment/ organizational decision	Innovation as a parallel system	Innovation doctrine Barrier reduction
Operational innovation	Pipeline	Innovation pipeline H4X, ONR	Deliver more, faster Decision points
Single team innovation	Lean/I-Corps	I-Corps@NSF, H4D	Evidence-based MVPs Incubator-ready team
Innovation activities	Activities/training	Lean, design thinking, hackathons, incubators, outposts, maker spaces	Innovation demos, prototypes People
Individual innovation	**Heroic**	**Innovators alliance**	**One-off successes Frustration with system**
	PROCESS	EXAMPLES	DELIVERABLE

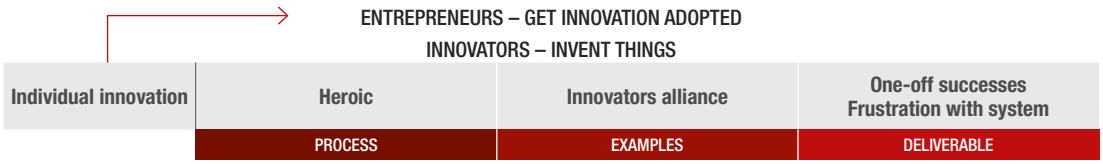
We describe their efforts as "heroic" because all the established procedures and processes in a large company are primarily designed to execute and support the current business model. From the point of view of someone managing an engineering, manufacturing, or operations organization, new, unplanned, and unscheduled innovations are a distraction and a drag on existing resources. (The best description I have heard is that, "Unfettered innovation is a denial of service attack on core capabilities.") That is because until now, we had not levied any requirements, rigor, or evidence on the innovator to understand what it would take to integrate, scale, and deploy products/services.

Finally, most corporate/agency innovation processes funnel "innovations" into "demo days"[2] or "shark tanks"[3], where they face an approval/funding committee that decides which innovation ideas are worth pursuing. However, without any measurable milestones to show evidence of the evolution of what the team has learned about the validity of the problem, customer needs, pivots, etc., the best presenter and flashiest demo usually win.

In some companies and government agencies, innovators even have informal groups, i.e., an Innovators Alliance, where they can exchange best practices and workarounds to the system. (Think of this as the innovator's support group.) However, these innovation activities are adhoc, and the innovators' lack authority, resources, and formal processes to make innovation programs an integral part of their departments or agencies.

2.1 Innovators versus entrepreneurs

There are two types of people who engage in large company/agency innovation:[4] innovators – those who invent new technology, product, service, or processes; and entrepreneurs – those who have figured out how to get innovation adopted and delivered through the existing company/agency procedures and processes. Although some individuals operate as both innovator and entrepreneur, any successful innovation program requires an individual or a team with at least these two skill sets.



[2] https://bit.ly/33LPkxr
[3] https://bit.ly/2FdT4h9
[4] https://bit.ly/2ChwhQr

3. INNOVATION TOOLS AND ACTIVITIES

Over the last decade, innovators have realized that they needed tools and activities that are different from traditional project management tools used for new versions of existing products/customers. They have passionately embraced innovation tools and activities that, for the first time, help individual innovators figure out what to build, who to build it for, and how to create effective prototypes and demos.

Some examples of innovation "tools" are "customer development", "design thinking", "user-centric design", "business model canvas", "storytelling", etc. Companies/agencies have also co-opted innovation activities developed for startups such as hackathons,[5] incubators, internal "kickstarters", as well as "open innovation" programs[6] and "maker spaces"[7] that give individual innovators a physical space and dedicated time to build prototypes and demos. In addition, companies and agencies have set up "innovation outposts"[8] (most often located in Silicon Valley) to be closer to the relevant technology and then to invest, partner, or buy.

INNOVATION STACK

Leadership	Guidance/investment/ organizational decision	Innovation as a parallel system	Innovation doctrine Barrier reduction
Operational innovation	Pipeline	Innovation pipeline H4X, ONR	Deliver more, faster Decision points
Single team innovation	Lean/I-Corps	I-Corps@NSF, H4D	Evidence-based MVPs Incubator-ready team
Innovation activities	**Activities/training**	**Lean, design thinking, hackathons, incubators, outposts, maker spaces**	**Innovation demos, prototypes People**
Individual innovation	Heroic	Innovators alliance	One-off successes Frustration with system
	PROCESS	EXAMPLES	DELIVERABLE

These activities make sense in a startup ecosystem, where 100 percent of the company is focused on innovation; however, they generate disappointing results inside companies/agencies, when 98 percent of the organization is focused on executing the existing business/mission model. While these tools and activities educated innovators and generated demos and prototypes, they lacked an end-to-end process that focused on delivery/deployment. Hence, it should be no surprise that very few contributed to the company's top or bottom line (or an agency's mission).

One of the ironies of the tools/activities groups is rather than talking about the results of using the tools – i.e., the ability to rapidly deliver new products/services that are wanted and needed – their passion has them evangelizing the features of the tools and activities. This means that senior leadership has pigeonholed most of these groups as extensions of corporate training departments and skeptics view this as the "latest fad."

4. TEAM-BASED INNOVATION

Rather than just teaching innovators how to use new tools or having them build demos, we recognized that there was a need for a process that taught all the components of a business/mission model (who are the customers, what product/service solves their problem, how do we get it to them, support it, etc.) The next step in entrepreneurial education was to teach teams a formal innovation process for how to gather evidence that lets them test if their idea is feasible, desirable, and viable. Examples of team-based innovation programs are the National Science Foundation Innovation Corps (I-Corps@NSF),[9] for the Intelligence Community ICorps@NSA, and for the Department of Defense, Hacking for Defense (H4D)[10].

In contrast to single-purpose activities like incubators, hackathons, kickstarters, etc., these curricula teach what it takes to turn an idea into a deliverable product/service

[5] https://bit.ly/2XOyHNO
[6] https://bit.ly/2PEud8d
[7] https://bit.ly/3gOp2ON
[8] https://bit.ly/3fOiBtP
[9] https://bit.ly/30LNo6o
[10] https://bit.ly/3kvgOgJ

INNOVATION STACK			
Leadership	Guidance/investment/ organizational decision	Innovation as a parallel system	Innovation doctrine Barrier reduction
Operational innovation	Pipeline	Innovation pipeline H4X, ONR	Deliver more, faster Decision points
Single team innovation	**Lean/I-Corps**	**I-Corps@NSF, H4D**	**Evidence-based MVPs Incubator-ready team**
Innovation activities	Activities/training	Lean, design thinking, hackathons, incubators, outposts, maker spaces	Innovation demos, prototypes People
Individual innovation	Heroic	Innovators alliance	One-off successes Frustration with system
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by using the scientific method of hypothesis testing and experimentation outside the building. This process emphasizes rapid learning cycles with speed, urgency, accepting failure as learning, and innovation metrics.

Teams talk to 100+ beneficiaries and stakeholders while building minimal viable products to maximize learning and discovery. They leave the program with a deep understanding of all the obstacles and resources needed to deliver/deploy a product.

The good news – I-Corps, Hacking for Defense, and other innovation programs that focus on training single teams have raised the innovation bar. These programs have taught thousands of teams of federally funded scientists, as well as innovators in corporations, the Department of Defense, and intelligence community. However, over time, we have seen teams that completed these programs run into scaling challenges. Even with great evidence-based minimal viable products (prototypes), teams struggled to get these innovations deployed at scale and in the field; or a team that achieved product-market fit building a non-standard architecture could find no way to maintain it at scale within the parent organization.

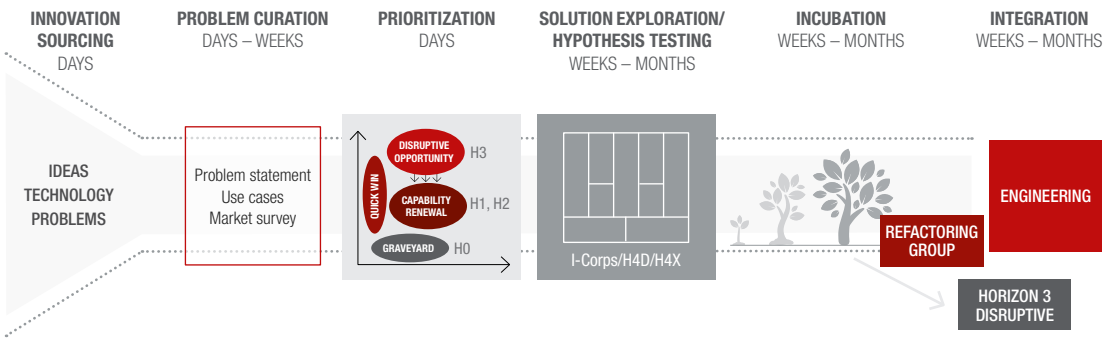
Upon reflection we identified two root causes. The first is a **lack of connection** between innovation teams and their parent organization. Teams form/and are taught outside of their parent organization because innovation is disconnected from other activities. This meant that when teams went back to their home organization, they found that execution of existing priorities took precedence. They returned speaking a foreign language (What's a pivot? Minimum viable what?) to their colleagues and bosses who are rewarded on execution-based metrics. Further, as budgets are planned out years in advance, their organization had no slack for "good ideas." As a result, there was no way to finish and deploy whatever innovative prototypes the innovators had developed – even ones that have been validated.

The second root cause emerged because neither the innovator's teams nor their organizations had the mandate, budget, or people to build an end-to-end **innovation pipeline process**, one that started with innovation sourcing funnel (both internal and external sources) all the way to integrating their prototypes into mainstream engineering production (see below and Blank and Newell (2017)[11]on the innovation pipeline).

5. OPERATIONAL INNOVATION

As organizations have moved from individual innovators working alone, to adopting innovation tools and activities, to teaching teams about evidence-based innovation, our most important realization has been this: having skills/tools and activities are critical building blocks but by themselves are insufficient to build a program that delivers results that matter to leadership. **It is only when senior leaders see how an innovation process can deliver stuff that matters – at speed – that they take action to change the processes and procedures that get in the way.**

[11] Blank, S., and P. Newell, 2017, "What your innovation process should look like," Harvard Business Review, September 11, https://bit.ly/31HXC6K



We believe that the next big step is to get teams and leaders to think about the innovation process from end-to-end – that is to visualize the entire flow of how and from where an idea is generated (the source) all the way to deployment (how it gets into users' hands). Hence, we have drawn a canonical "innovation pipeline" [Blank and Newell (2017)]. For context, in the figure below, the I-Corps program described earlier is the box labeled "Solution exploration/hypotheses testing." We have surrounded that process with all the parts necessary to **build and deliver** products and services at speed and at scale.

Second, we have realized that while individual initiatives won "awards," and incubators and hackathons got coffee cups and posters, senior leadership sat up and took notice when **operating groups transformed how they work in the service of a critical product or mission.** When teams in operating groups adopted the innovation pipeline, it made an immediate impact on delivering products/services at speed.

An operating group can be a corporate profit and loss center or anything that affects revenue, profit, users, market share, etc. In a government agency it can be something that allows a group to execute mission more effectively or in a new disruptive way. Operating groups have visibility, credibility, and, most importantly, direct relevance to mission.

Where are these groups? In every large company or agency there are groups solving operational problems that realize "they can't go on like this" and/or "we need to do a lot more stuff" and/or "something changed, and we rapidly need to find new ways to do business." These groups are ready to try something new. Most importantly, we learned that "the something new" is emphatically not more tools or activities (design thinking, user-centric design, storytelling, hackathons, incubators, etc.) Because these groups want an end-to-end solution, the innovation pipeline resonates with the "doers" who lead these groups.

INNOVATION STACK

Leadership	Guidance/investment/ organizational decision	Innovation as a parallel system	Innovation doctrine Barrier reduction
Operational innovation	**Pipeline**	**Innovation pipeline H4X, ONR**	**Deliver more, faster Decision points**
Single team innovation	Lean/I-Corps	I-Corps@NSF, H4D	Evidence-based MVPs Incubator-ready team
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One example of moving up the Innovation Stack is that the NSA I-Corps team has recently shifted their focus from working with individual teams to helping organizations deploy the methodology at scale. In true lean startup fashion, they are actively testing a number of approaches with a variety of internal organizations ranging in size from 40 to 1000+ people.

However, without a mandate for actually delivering innovation from senior leadership, scaling innovation across the company/agency means finding one group at a time – until you reach a tipping point of recognition. That is when leadership starts to pay attention. Our experience to date is that 25- to 150-person groups run by internal entrepreneurs with budget and authority to solve critical problems are the right place to start to implement this. Finding these people in large companies/agencies is a repeatable process. It requires patient and persistent customer discovery inside your company/agency to find these groups and deeply understand their pains/gains and jobs to be done.

6. CONCLUSION

Companies/agencies have adapted and adopted startup innovation tools (lean, design thinking, user-centric design, business model canvas, etc.) as well as startup activities and team-based innovation (hackathons, incubators, kickstarters, I-corps, FastWorks, etc.). However, because they are disconnected from the mainstream business/mission model very few have been able to scale past a demo/prototype. Use the Innovation Stack and start working directly with operating groups. More importantly, find those who realize “they can’t go on like this,” and/or “we need to do a lot more stuff,” and/or “something changed, and we rapidly need to find new ways to do business,” and you will end up delivering stuff that matters instead of coffee cups.

THE RISKS OF ARTIFICIAL INTELLIGENCE USED FOR DECISION MAKING IN FINANCIAL SERVICES

UDO MILKAU | Digital Counsellor, European Association of Co-operative Banks (EACB)[1]

ABSTRACT

The risks associated with the use of artificial intelligence (AI) have captured the attention of research, regulation, and industry practitioners in recent years. Given that this is a vast topic in its own right, we are using the experiences of the financial services industry, in specific credit scoring, as a proxy for some of the salient features of AI from a sociotechnical perspective. Although it shares some of the operational risk challenges associated with other technologies, a model for decision making reveals how the interfaces with the social context create two new types of risk: naiveté in the use of data for training AI as a statistical classifier and perceptions of the stakeholders regarding its societal implications. While the first can – and has – to be mitigated by increased literacy within an active internal risk management, the latter requires building trust.

1. INTRODUCTION: ARTIFICIAL INTELLIGENCE AS SOCIOTECHNICAL SYSTEM

The European Commission's white paper on AI [European Commission (2020a)] begins with a remarkable introduction: "Artificial Intelligence is developing fast. It will change our lives by improving healthcare […] At the same time, Artificial Intelligence (AI) entails a number of potential risks, such as opaque decision making, gender-based or other kinds of discrimination, intrusion in our private lives or being used for criminal purposes."

It is quite unique that benefits and risks are mentioned side by side from the onset, as compared to other political initiatives such as quantum technology or blockchain, which means that AI is put in the same category as other "high-risk technologies", such as genetically modified organisms, predominantly because of its sociotechnical implications.

The sociotechnical implications of AI demand a wider interpretation of its risks – especially when AI is used in decision making – beyond just operational (including criminal actions) and model risks (e.g., of credit risk models). Aligned with the discussions on sociotechnical safety by Aven and Ylönen (2018), we suggest that because of the risks associated with using AI, a holistic perspective, including the social implications of discrimination, is needed, as well as a recognition that complex (sociotechnical) systems can never be fully predicted and controlled.

One issue needs to be highlighted from the onset, as it has relevance in this context, and that is that it is quite shameful that we still have systemic racism, discrimination[2], antisemitism, and other 'isms' in the 21st century! Nevertheless, we have to analyze the process of decision making and the role of technology to understand how this process can exacerbate the situation, and to distinguish between freedom in an open diverse society and unequal treatment due to systemic discrimination, which violates equal rights and human dignity.

2. TWO ANTAGONISTIC EXAMPLES

The first example is "COVID-Net": an artificial neural network (ANN) designed for the detection of COVID-19 cases from chest radiography images [Wang and Wong (2020)]. The application

[1] I would like to thank Katja Langenbucher and Hans-Christian Boos for their very helpful comments and advice. The views expressed are those of the author and do not in any way represent those of the organizations he is associated with.

illustrates the possibilities of using AI for processing medical images, but also points out certain essential conditions:

- Typically, radiography images are taken under standardized conditions and with equivalent technical devices, which provides comparable images for a given scope.
- The medical images are labeled by experts (COVID-19 – other infections – no observations) according to the best existing human knowledge, and the trained ANN provides a statistical classification for each new case (COVID-19 – other diseases – no diagnosis) within the limits of statistical predictability.
- The tool neither "learns" nor "decides", but it makes a classification of a new image within the existing scope to support human decision making. Importantly, it is not "portable" to other scopes.

Pattern recognition is an archetype for ANN. A recent meta study [Xiaoxuan et al. (2019)] analyzed the diagnostic performance of AI tools versus the performance of healthcare professionals. The analysis showed that the pooled sensitivity (i.e., to correctly diagnose the disease) was 87.0% for AI and 86.4% for healthcare professionals, while the pooled specificity (i.e., the ability to accurately exclude patients who do not have a disease) was 92.5% and 90.5%, respectively. The results illustrate that AI can "emulate" the ability of human professionals for classification of medical images with a similar degree of accuracy.

As AI for pattern recognition has to be trained with labeled data derived from human experience, AI can automate examination and substitute human experts in places where healthcare professionals are not available. In many cases – from the COVID-19 pandemic to places where there are no medical staff for hundreds of miles – technical automation is more than welcome. However, AI can merely "copy" human experience in well-controlled circumstances [for an up-to-date overview of AI in general refer to Chowdhary (2020)].

While the first example presented the "technical prerequisites" for the correct use of AI (and the risks, if ignored), the second example highlights the "social implications" of decision making and the perceptions of the stakeholders regarding outcome.

In a *gedankenexperiment*, a stylized case is assumed with a simple algorithm, which can be executed by human (according to a manual) or technical agents (programmed):

- A European bank decides about new consumer loans solely based on the parameter "free average income" in relation to the required monthly repayment (other data such as the credit history of the borrower are not used for simplification).
- If (free monthly income) > (required monthly repayment + defined threshold) then loan is approved; else not.
- Explicitly, the bank neither processes nor stores sensitive date like "gender" in compliance with the European General Data Protection Regulation (EU-GDPR Art. 9), which prohibits data processing based on a natural person's sexual orientation[3] [European Parliament, 2016].
- On the one hand, the lender has the freedom of contract, as long as it does not violate anti-discrimination legislation (e.g., European directive 2004/113/EC), while on the other hand, it is obligated to assess the financial capabilities of the borrowers. The European Banking Authority emphasized that: "Creditworthiness assessment is important to avoid building up excessive risk and to embed responsible lending and borrowing practices, for both consumers and institutions" [EBA (2019)].
- In Germany (as in most countries), women have a lower average income; yet, the probability of approval will only differ between "women" and "men" if an external observer uses the protected sensitive data item "gender" to classify a certain sub-group.

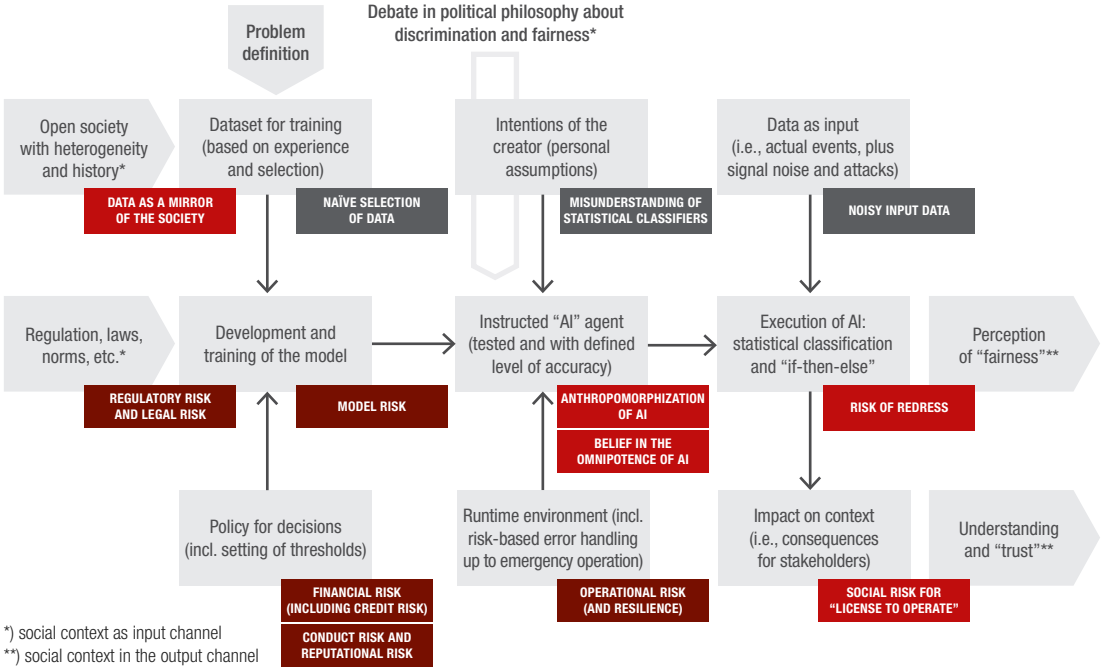
Is this algorithm discriminative? In other words: can an outcome evaluated ex-post on the basis of statistical averages of the entire population and with the use of sensitive data suggest discrimination by an individual economic agent deciding ex-ante, exclusively on the basis of objective financial data?

Unfortunately, there are no straightforward answers to this question. Langenbucher (2020), looking at the doctrines of "disparate impact" according to U.S. law or "indirect discrimination" according to E.U. law, suggested that "Under these doctrines, **intention to discriminate is not a necessary element**. Instead, a facially neutral rule or practice is under scrutiny **because of the real-world effects it**

[2] Systemic discrimination can also be documented with regards to financial inclusion. In the Annual Economic Report 2020 of the Bank of International Settlement [BIS (2020)], it was pointed out that "nearly half of Black and Hispanic US households are unbanked or underbanked" (approximately 15% unbanked and an additional 30% underbanked).

[3] EU-GDPR Art. 9/1: "Processing of personal data revealing racial or ethnic origin, political opinions, religious or philosophical beliefs, or trade union membership, and the processing of genetic data, biometric data for the purpose of uniquely identifying a natural person, data concerning health or data concerning a natural person's sex life or sexual orientation shall be prohibited."

Figure 1: Lifecycle of an AI system embedded in its sociotechnical context with the three main steps of preparation, implementation, and execution



Adopted from Milkau and Bott (2019)

triggers when applied to a mixed group, constituted of members of a protected class and members of a not protected one" (emphasis added by author).

Scholars have proposed different legal doctrines backed by dissimilar political philosophies [Langenbucher (2020)]. One school accepts the "indirect" impact of decision making as long as there is no active evasion of law and masking prejudice. This perspective is linked to the so-called anti-classificatory theories of equality to exclude "artificial, arbitrary, and unnecessary barriers". The other school proposes corrective and redistributive methods and an obligation for lenders to accept a loss of profits to compensate for "indirect discrimination" irrespective of any causality (but based on correlations or the possibilities that "proxies" could be linked statistically to sensitive data).

It is beyond the scope of this paper to discuss these philosophies[4] but a brief comparison reveals that decision making with an impact on the social context is part of the political debate, which leaves financial institution with uncertainty about the accepted norms. This causes a new risk in balancing demographic blindness versus corrective redistribution, although the stylized decision making process is fully compliant to anti-discrimination regulations.

This issue is even more crucial if AI is supporting the decision making process. For example, with the emergence of "fairness in machine learning" [Binns (2018), MacCarthy (2019), Hu and Chen (2020)], there are expectations that machine learning comes with an obligation for equal (re-)distribution of social welfare across various social sub-groups, guided by a social planner in search of an optimum of social welfare. Such demands create dilemmas, because it would require the use of protected sensitive personal data to distinguish between sub-groups to redress historical discrimination in the society, which is prohibited under EU-GDPR and anti-discrimination legislation.

[4] The current discussion echoes an old debate about "social justice" or "distributive justice" between John Rawls and Robert Nozick in the 1970s. F.A. von Hayek (1976) pointed out that the concept of social justice (or fairness) belongs to families, warlords with retinue, or tribal societies in general, but has no meaning in a free open society. The moral idea of "dividing justly" is suitable for a birthday cake or plunder of pirates only. Concerning "economic equality" see also Harry Frankfurt's seminal essay (1987).

3. DECISION MAKING WITH AI AS A SOCIOTECHNICAL SYSTEM

A simplified model for the process of "decision making with AI" is presented in Figure 1. Independent of the implementation and whether the decision making will be undertaken by a human agent (e.g., a loan process defined in a manual including control by the 4-eyes-principle) or a technical agent (with the same algorithm programmed in software), this sociotechnical system reveals a number of risks along the *preparation* → *implementation* → *execution* sequence, with the following 3x3 steps:

1. Preparation (with definition, development, and training)
   a) Dataset for training or as benchmark (as a statistical sample)
   b) Development of the model (for classification)
   c) Policy for decisions (including setting of thresholds)
2. Implementation (with rollout to a runtime environment)
   a) Intention of the creator
   b) Instructed agent
   c) Runtime environment (including testing, risk assessment, monitoring, and resilience)
3. Execution (within the sociotechnical context)
   a) Input data
   b) Execution of "if-then-else"
   c) Impact on social context

1.a) A dataset for training of AI is needed, which has to be representative of the defined problem, but inevitably mirrors the diversity of an open society. As "data" must be generated, data – inevitably – reflect the context of their production and are never "neutral". In general, processing of personal data includes a potential legal risk concerning GDPR, as the GDPR (i) requires minimization of processing of personal data as a first principle (even if consent of the data subject was given), and (ii) is interpreted differently by national data protection authorities. Far more important, there is a new risk of a naïve use of data due to a trend to use "available" data instead of preparing "suitable" data for the specific problem (e.g., image recognition with training data taken from "public" picture databases).

1.b) A model can be based on rules with parameters, on traditional machine learning such as support vector machines (SVM), or on training of an ANN. Every model is – by definition – a hypothesis with parameters to be fitted to measured data and includes a model risk (assumptions, choice of a specific model, parametrization of the model, etc.). Ali Rahimi, a researcher in AI, argued that machine learning has become a form of "alchemy" [Hutson, 2018]. However, this is a generic problem with all sophisticated models – especially non-linear ones. Additional to technology, there is a "regulatory risk", as regulation might be non-proportional, fragmented, or inconsistent.

1.c) Every economic agent defines its individual policy for decision making, based on the freedom of contract and compliance to legislation. One example is loan origination of a bank, based on the individual financial risk management of the institution. Every lender applies its own statistical predictions of the future, including expected losses as an estimation of mean values, unexpected loss contribution due to the standard deviation from the mean, and cost of capital (based on the bank's individual balance sheet structure and rating). Consequently, credit scoring is a statistical concept of the risk-taker, and does not necessarily represent an assessment of the borrower's "worthiness" [as indicated in Hao (2019)].

2.a) The first step in implementation is an articulated human intention, which comes with subjective beliefs and bounded rationality [Simon (1991)]. While decision making has an economic rational (e.g., in credit risk management, the balance between margin and (un)expected losses), there is the danger of misunderstanding statistical classifiers. A statistical classifier can neither provide better results than the input distribution, nor be generalized beyond the defined scope.

2.b) At its core, decision making is an instructed agent, be it a human with a manual, a rule-based program, or a trained AI tool. The original description of AI, as it was presented in the Dartmouth conference of 1956, that AI "is to proceed on the conjecture that that every aspect of learning or any other feature of intelligence ... a machine can be made to simulate it" [McCarthy et al. (1955)], has unfortunately resulted in confusion, since contemporary AI is only "able to fit a function to a collection of historical data points" [Pearl and Mackenzie (2018)]. This confusion culminates in the term "self-learning", as AI systems neither act by themselves (but follow the human intention), nor learn in a human way (but are trained). Johnson (2006) suggests that computer systems do not have any intentions to act, compared to the free will of human beings. However, computer systems – and instructed agents – have intentionality, but this is the "programmed" intentionality of their designers.

2.c) An underrated element in the implementation of AI is the runtime environment. Of course, every computer program has to be tested (for executing as designed), reviewed (for correct design and use of proxies), and assessed (for potential new operational risks), as well as monitored in operation (for

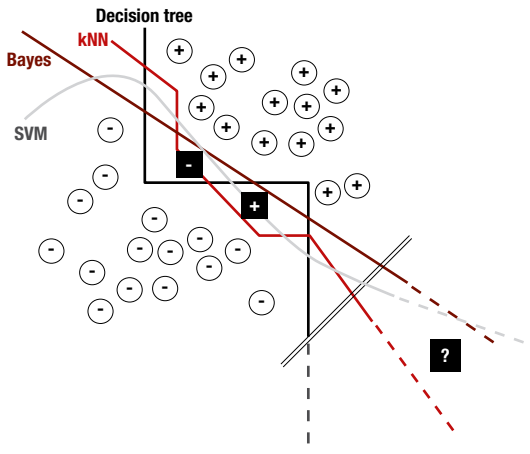
actual incidents or derivation from design parameters). Every software inevitably includes errors, suffers from the so-called "software aging" due to interdependences in the software [Parnas (1994)], could be a target of cyberattacks, or suffer from problems when AI is embedded in extended software systems [see, for example, the so-called "Uber accident" in 2018; NTSB (2019), and the debate about autonomous spacecrafts; Patel (2020)]. Depending on the degree of operational risk, "error handling" could range from controlled exit via emergency operation features (run-flat tyres) to resilience (such as redundant triple systems in airplane auto pilots).

3.a) The execution of decision making starts with actual input data of various quality, which typically include "signal noise". For example, using AI for traffic sign recognition (which is quite simple compared to face recognition) could be susceptible to damage, dirt, snow, night, graffiti, manipulation, or gaming the system. Additionally, AI systems can be vulnerable to adversarial attacks [Eykholt et al. (2018)].

3.b) Execution of an AI-based decision making is – put simply – a statistical classification plus an "if-then-else" rule. While this execution of a pre-programmed decision is trivial from a technical perspective, the social awareness can be different. Decision making based on statistical classification might be regarded as unfair. This perception leads to the above-mentioned call for fairness and the risk of redress for users of AI beyond intent or casualty.

3.c) Finally, the societal impact assessment of decision making (i.e., the consequences for all stakeholders) requires trust in the decision making process based on understanding. As Ebers (2020) stated: "Algorithms also play an increasing role in making substantive decisions. Many important decisions which were historically made by people are now either made by computers or at least prepared by them. [...] Some algorithmic scores have existential consequences for people: They decide to an increasing extent whether someone is invited for a job interview, approved for a credit card or loan, or qualified to take out an insurance policy." In an extreme case, disappointed stakeholders could cause an "outside-in social risk", resulting in the firm losing its "license to operate".

Figure 2: Illustration of machine leaning as "statistical classifier" with the examples of SVM, kNN, Naive Bayes, and Decision Trees



This Figure is adopted from Domingos (2012)

The training data are shown as circles with + and - and new events as squares. Event at the frontiers (or hyperplanes in general) can cause estimated classifications with uncertainty depending on the selected method. New events outside the training data "?" exceed the scope of the classifiers.

The various risks indicated in Figure 1 belong to three different groups. At the bottom left, one can find (traditional) financial and non-financial risks. At the top, there are (internal) risks of AI implementation in a firm. And in the diagonal, there are the (external) social and political issues, when AI is applied in a sociotechnical context. It is beyond the scope of this paper to provide a comprehensive discussion of all aspects, but the following sections will address the main issues of AI as a sociotechnical system: naiveté concerning data, the conflict of statistics versus fairness, public perception and trust-building, and finally the issue of suitable explainability.

4. TECHNICAL RISKS OF AI AND NAIVETÉ

For the purposes of this article, I will use "machine learning" as an example of AI. Machine learning can be conventional, such as "support vector machines" (SVM), or advanced, "artificial neural networks" (ANN). To start with, I will focus on "weak AI", with the intention of solving one specific problem at a time (more advanced concepts are discussed later).

It should be noted that it is not clear how an "artificial general intelligence" (AGI) in the sense of a "general problem solver" could look like. Pearl et al. (2018) state that current AI is "able to fit a function to a collection of historical data points."

The schematic example of machine learning in Figure 2 helps to illustrate its capabilities and the limitations. Different machine learning methods with a distinct "fit function" can provide similar classifications within the scope of the training data, but could result in (i) model-dependent predictions for new events "on the edge", and (ii) doubtful estimations for events "outside the original scope".

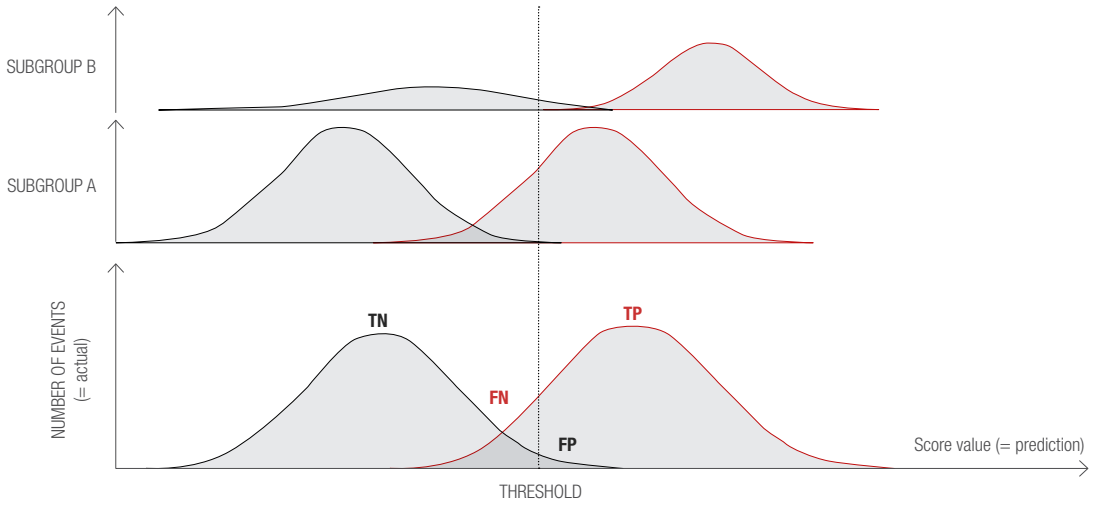
A word of warning regarding ANN, since such "neural networks" do not resemble a human brain, or even a mouse's brain, but single nerve cells, "perceptron" [Rosenblatt (1957)]. An ANN is a transformation of an input vector (e.g., enumerated pixels of an image) via a network of nodes to an output classification and has a straightforward mathematical representation [Erdmann (2020)]. Equivalent to the fitted frontiers in Figure 2, the parameters of the network are fitted to achieve an optimized classification of training data to a given label. After the training, the ANN computes straightforward classification values for a new event. If, for example, an image recognition is trained with pictures of "cats" (as 1), "dogs" (as 2), and "others" (as 0), it will classify new images as 1, 2, or 0, but does not "understand" the high-level concept, i.e., what a cat or a dog is (which cat and dog owners know well!). While ANNs with few layers and few nodes have been around for decades [Schmidhuber (2015)], "deep learning" with a nested structure of numerous layers was developed in recent years.

Unfortunately, billions of parameters exceed our ability as humans and appear to us as "black boxes". However, such a black box cannot achieve more than statistical classifications based on the original training data: classify images as 1, 2, or 0 (for cats, dogs, and other animals).

Developers seem to be keen to use "available" data for training of ANNs (e.g., image collections from social media) without checking for the context. This is different from scientific experiments, which start with a well-defined research questions, followed by the design of a "detector" for data collection, and investing much effort into the analysis of the "detector sensitivity". As all detectors have "blind" areas, researchers need to understand the detector sensitivity before data analysis can be performed. Otherwise, the results would be biased by artefacts due to active versus non-active areas of detection or by some random selection instead of a full "360 degree" perspective.

Given that AI systems must be trained with real-world data, they perpetuate a past situation to future classifications. Obermeyer et al. (2019) looked at "Dissecting racial bias in an algorithm used to manage the health of populations," which analyzed commercial prediction algorithms in the U.S. to identify and help patients with complex health needs. As this application used data about past healthcare costs of a patient (rather than a real illness) as a proxy for the needs of the patient, the data – and not the algorithm – were biased by unequal access to the U.S. healthcare system. Patients with numerous/more expensive medical treatments in the past qualified for more (predicted) preventive treatments, which reflected access to

Figure 3: Schematic distribution of positive and negative events in a population in dependence of a statistical score value with the four classes TP, TN, FP, and FN



A schematic split of the original population in two sub-groups (A and B) is shown, together with a single threshold (for the whole population). Without constraints, the distributions for the sub-groups cannot be assumed to be identical or even similar. Additionally, the variance of distributions can be broader, compared to the difference of the mean values. Any representative sample for such sub-groups has to reflect the statistical characteristics of the distribution, including the TP, TN, FP, and FN values, which do not have to match between sub-classes without additional constrictions.

healthcare and correlated to social stratigraphy, but not to actual illnesses. Additionally, the "healthcare costs" proxy strongly depends on commercial agreements and incentives (e.g., which treatment to be prescribed) [Balzter, 2018]. To avoid such bias, all "sensitivities" have to be known and taken into account: whether it is the "blind spots" of detector systems, selective recording of data due to assumptions of programmers, or our idealizing perception of the structures of society.

Cassie Kozyrkov (2019) pointed out that: "bias doesn't come from AI algorithms, it comes from people" – and from people who do not understand the context of data taking, data selection, or bias in datasets in general. This misunderstanding, ignorance, or naiveté causes an essential risk for the application of AI in all industries, including financial services. Even experts who are very interested in development of sophisticated AI tools are unenthusiastic about the tiresome work of data quality management. This "naiveté" about the training data has to be regarded as a new category of risk for the implementation of AI in every industry, but especially in financial services.

5. STATISTICS AND FAIRNESS

While the previous section elaborated on human carelessness and naiveté, which can be monitored and managed with improved technical and legal literacy within an active internal risk management, this section will focus on the general problem of "statistics versus public expectations".

The example presented in Figure 3 will be used for the following discussion. At the bottom of Figure 3, we have a distribution of "positive" (right side) and "negative" (left side) events in a population based on a statistical score value derived as an ex-ante prediction. The actual positive (e.g., decease) and negative (e.g., no decease) events have some overlap and define four classes: true positive (TP), false positive (FP), true negative (TN), and false negative (FN). This reflects the conditional probabilities P(ex-post actual=x | if ex-ante prediction=y), which always includes "false" predictions (from an ex-post perspective).

For an economic credit decision, a trade-off for a threshold has to be made by the lender, i.e., how many FPs a bank is willing to accept (i.e., accepted loans, but with a negative margin) versus rejecting too many FNs (i.e., lost margin). "If, and only if, additional (hidden) parameters" are used ex-post to separate the population into two sub-groups A and B, these subgroups will have different distributions, and no choice of a single threshold will provide identical metrics. The same holds true, if one uses normalized metrics in the form $m = a/(a + b)$ with $a, b \in \{TP, TN, FP, FP\}$.

One could argue that the choice of one threshold would be "unfair", as the metrics would not provide an equal "fairness measure" to all sub-groups. However, every possible "fairness measure" comes with significant shortcomings:

- Kleinberg et al. (2017) made clear that "except in highly constrained special cases, there is no method that can satisfy [… all fairness] conditions simultaneously."
- As there are various philosophical, sociological, psychological, or cultural conditions of fairness, who should be in charge of selecting the "right" one?
- Finally, the dilemma remains that pre-planned "fairness conditions" for sub-groups, which mirror the structure of the society, requires processing of sensitive personal data, which is non-compliant with the intentions of legislations against discrimination.

While no fairness measure is coherent, there is a public perception that AI should be fair. Yona (2017) states that "One immediate observation that appeared when machine learning algorithms were applied to human beings […], was that the algorithms were not always behaving 'fairly' […] sometimes resulted in algorithms that behaved in a way in which a human observer will deem unfair, often especially towards a certain minority." This perception presents a new type of risk in the sense of an external requirement of fairness, which is independent of any evidence for non-compliant behavior of the individual economic agent.

6. MARKET, MORAL, AND TRUST

It is worth repeating that as Johnson (2006) pointed out, "Computer systems [are] moral entities but not moral agents." This is a crucial synopsis of two important aspects: a warning against anthropomorphization of AI, but in parallel an emphasis on the embeddedness of sociotechnical systems. The following examples – without aiming at completeness – can demonstrate this embeddedness concerning AI and credit scoring.

Discrimination in lending is a long-known issue in the U.S., [Black et al., (1978), Ladd (1998)]. A recent meta study [Quillian et al. (2020)] suggested that "racial gaps in loan denial have declined only slightly, and racial gaps in mortgage cost have not declined at all," in the U.S mortgage market. Unfortunately, this study did not disentangle intended discrimination and

after-effects of historical inequalities. Justifiably, credit scoring demands scrutiny, and some recent studies have described the development of credit scoring in the U.S. [Kiviat (2019a), Fourcade and Healy (2017)].

Kiviat (2019b) suggested that (emphasis added by author): "For policymakers, predictive validity was necessary, but not sufficient, to establish credit scoring as fair. To fill out the picture, policymakers drew on a competing **moral framework, one in which moral deservingness indicated how the market ought to treat people.**"

Consequently, it is of paramount importance to achieve "trust as a reduction of complexity" [Luhmann (1968)]. Coyle and Weller (2020) pointed out that "If an organization is not trusted, its automated decision procedures will likely also be distrusted."

Initiatives about "trustworthy" AI are steps in the right direction. The "G20 AI Principles" [G20 (2019)] proposes that "Principles for responsible stewardship of trustworthy AI," and point out that "AI actors should respect the rule of law, human rights and democratic values, throughout the AI system lifecycle." These principles are based on the OECD's "Recommendation of the Council on Artificial Intelligence" [OECD (2019)]. The Principles feature a combination that "include[s] freedom, dignity and autonomy, privacy and data protection, non-discrimination and equality, diversity, fairness, social justice, and internationally recognized labor rights" going from the human rights via existing legislation (data protection, non-discrimination) to political philosophy (including fairness, social justice), which render the Principles more conceptual than actionable.

The European Commission (2020a) propose an approach of trust by regulation. The independent High-Level Expert Group on Artificial Intelligence, which was set up by the European Commission in June 2018, provided "Ethics guidelines for trustworthy AI" [AI HLEG (2019)], which reiterates (emphasis added by the author):

- "[...] respect for human dignity entails that **all people** are treated with respect due to them as moral subjects, **rather than merely as objects to be sifted, sorted, scored**, herded, conditioned or manipulated."
- "This goes **beyond non-discrimination**, which tolerates the drawing of distinctions between dissimilar situations based on objective justifications. In an AI context, equality entails that the system's operations cannot generate unfairly biased outputs [...]."

One can only appreciate these initiatives to support trust-building in sociotechnical systems. However, they contain a hidden risk of exaggeration. There is a danger for companies to forfeit their "license to operate" if unbalanced expectations of stakeholders would be failed. The European Commission (2020b) revealed that the main concerns raised by contributors to the consultation were (i) possible breach of fundamental rights, and (ii) possible discriminatory outcomes. Give that 90% and 87%, respectively, of respondents found these issues to be either important or very important, a fundamental mistrust of the use of AI among the public has to be recognized.

7. EXPLAINABILITY AND UNDERSTANDABILITY

The European "Ethics guidelines for trustworthy AI" identified four ethical principles that must be respected in the development, deployment, and use of AI systems: respect for human autonomy, prevention of harm, fairness, and explicability. The latter is described as "Explicability is crucial for building and maintaining users' trust in AI systems. This means that processes need to be transparent, the capabilities and purpose of AI systems openly communicated, and decisions – to the extent possible – explainable to those directly and indirectly affected."

The principle of "explicability" belongs to philosophical terminology, but the guidelines clarify that transparency is composed of (i) traceability, (ii) *explainability*, and (iii) communication with a key requirement: "Whenever an AI system has a significant impact on people's lives, it should be possible to demand a suitable explanation of the AI system's decision making process. Such explanation should be timely and adapted to the expertise of the stakeholder concerned […]"

It is important that the requirement for suitable explanation focuses on the entire process (not on a single tool or method) and on communication adapted to the target audience. Likewise, there are different levels of explainability: a global explainability of a model (e.g., for an auditor or a supervisor) and a local one for an individual decision (typically for a consumer or a patient).

Suitable explainability requires "understandability" by stakeholders. In human communication, we do not interpret models by formulas, but explain our decisions. The way a doctor explains the result of a diagnosis (ex-post) and the reasons for a therapy (ex-ante) helps to build trust, because the explanation could be understood by the patient and covers

the whole process. Schematically, transparent communication for credit scoring may possibly be composed in the following way:

- Credit score value with **weighted elements from different sources** covering different time ranges, such as z% current free monthly income, y% aggregated credit history, x% payment pattern of last months,[5] <w% of other data (e.g., employee/freelancer/retired), and no use of sensitive/protected data.
- Threshold for score value represents, for example, an average 30% rejection rate (**also a protection for consumers** with high debt-to-incomes ratio not to run into excessive indebtedness).
- Additional **checks for statistical outliers** – not fitting into the typical distribution within a confidence interval – independent of whether the classification was made by a human or a computer software (so-called "yellow" cases with some ambiguity).
- In the case of a rejection, a suggestion for **possible social support** by governmental promotional banks, social benefit programs, etc.

Such an approach could be a starting point for discussion between financial institutions and regulators to explain that:

1) There is no significant criticality for the decision making process, as independent input data from multiple sources are used, while data from a credit agency would be only one element.
2) There is no discrimination, as no sensitive personal data are used. Only economic criteria for prediction of the individual financial situation of the borrower are applied.
3) Support is provided in the case of a rejection, which could provide help for people with financial problems by the society.

A combination of different types of data can improve the predictive power of a model, as analyzed in a recent Bank of International Settlement (BIS) working paper [Gambacorta et al. (2019)] using leading transaction-level data from a fintech company in China. In this case, traditional information (credit card information) and non-traditional information (usage of mobile apps and e-commerce) were combined.

However, the approach of credit scoring in China is a debated issue. While there is a lot of discussion about (governmental) social scoring systems in China [Matsakis (2019)], less information is available in English media about the financial credit scoring in China. Ant Financial started in 2015 with the "sesame score" [Ant Financial (2015)] based on (emphasis provided by the author):

- "Credit History reflects a **user's past payment history and indebtedness**, for example credit card repayment and utility bill payments.
- Behavior and Preference reveals a user's **online behavior on the websites they visit, the product categories they shop**, etc.
- Fulfillment Capacity shows a user's ability to fulfill his/her contract obligations. Indicators include use of financial products and services and **Alipay account balances**.
- Personal Characteristics examine the **extent and accuracy of personal information**, for example home address and length of time of residence, mobile phone numbers, etc.
- Interpersonal Relationships reflect the online characteristics of a **user's friends and the interactions between the user and his/her friends.**"

The first and the third element resemble financial scores discussed above, the second and the fourth are typical for online merchants (but unusual in the combination of financial data and shopping history), and the last element (behavior in social media) seems dubious from a conservative perspective. Nevertheless, the second major payment system in China, Tencent's WeChatPay, recently announced its own competing credit score system [Gill (2020)], which is to be based on consumers' personal and credit records, as well as "habits", such as their behavior as players of online games – one of the traditional business lines of Tencent. This development raises questions about the boundary between financial credit scoring and behavioral social scoring.

[5] Recently, U.S. agencies published an interagency statement on the use of alternative data in credit underwriting [CFPB (2019)] and pointed out that: "Improving the measurement of income and expenses through cash flow evaluation may be particularly beneficial for consumers who demonstrate reliable income patterns over time from a variety of sources rather than a single job. Cash flow data are specific to the borrower and generally derived from reliable sources, such as bank account records, which may help ensure the data's accuracy."

8. EXPLAINABLE ARTIFICIAL INTELLIGENCE (XAI)

Adequate explanations and clear responsibility of the decision-makers are the cornerstones for building trust among all stakeholders into a new technology like AI. This communication has to be "non-technical" and take people's potential fear of the technology into account. In the case of medical diagnosis, as mentioned earlier, there is a significant difference between whether the results need to be explained to computer experts at the level of "pixels", whether the classification of histologic patterns should be visualized and annotated to a pathologist [Wei et al. (2019)], or whether the diagnosis and therapy should be explained to the patient by a doctor.

The broader usage of AI has increased the demand for "explainable AI" [XAI; Gunning et al. (2019)]. Samek et al. (2019) provide an excellent overview of XAI and an introduction to different concepts. It is beyond the scope of this paper to discuss the technical aspects of XAI, but two remarks are important. Firstly, current XAI tends to be focused on image processing with deep learning. Secondly, the different XAI concepts, such as LIME [Ribeiro et al. (2016)], LRP [Bach et al. (2015)], GAM [Selvaraju et al. (2017)], and TSViz [Siddiqui et al. (2020)], require in-depth technical knowledge and are hardly suitable for communications with consumers or patients.

Advanced XAI concepts like "spectral relevance analysis" [SpRAy; Lapuschkin et al. (2019)] are able to provide meta-explanations. Such approaches can help to evaluate the reliability of the training data by back-tracing classifications to input patterns. For example, analysis has revealed [HHI (2019)] that AI tools might apply unreliable approaches. Although a majority of images could be classified correctly, a tool can lack reliability when context determines the outcome. For example, "ships" were classified due to surrounding water, "trains" due to railways, or "horses" due to copyright watermarks on the images (as training pictures with horses came from a source with such watermarks).

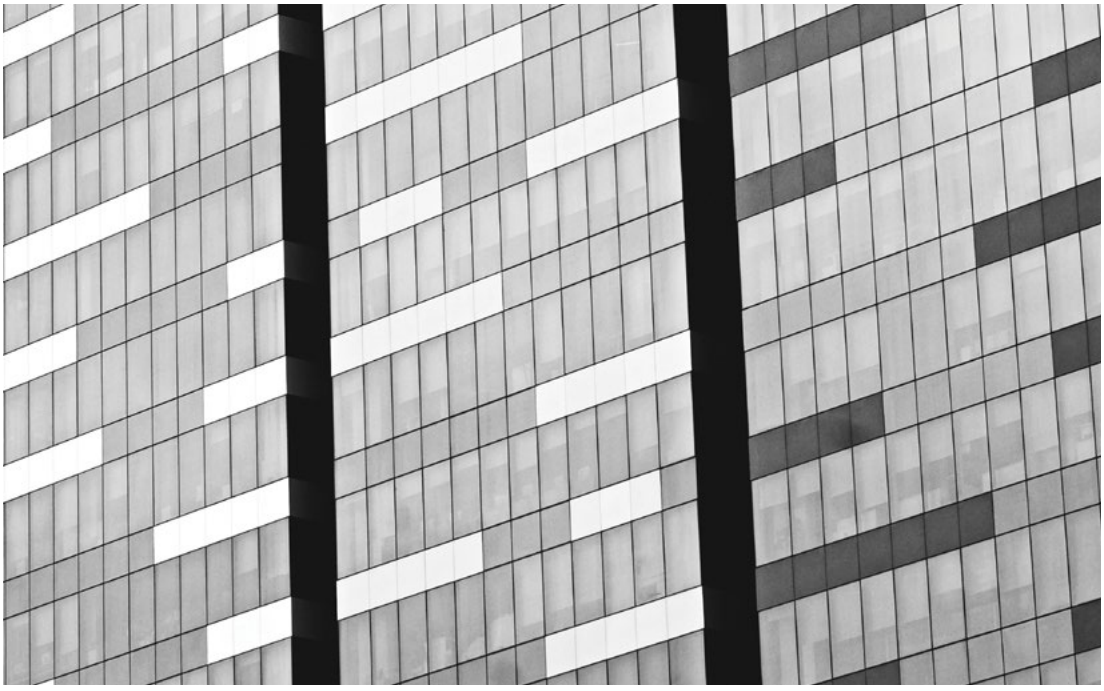
9. A REMARK ABOUT AI BEYOND MACHINE LEARNING

In this article, AI was limited to analysis of machine learning. We have to acknowledge that we neither have any idea what human (natural) intelligence really is, nor how we could emulate it as artificial intelligence. Nonetheless, the technology of AI is a huge toolbox with different methods from "expert systems" of the 1960s to computer vision, robotics, and autonomous vehicles today. Taking AI as a synonym for machine "learning" – as developed in a combination of training data plus chosen method – excludes advanced approaches of AI, which do not depend on tremendous amounts of data. One example is "machine reasoning", which was previously defined by Kaplan et al. (1988) as "computer systems that emulate reasoning tasks by using an 'inference engine' to interpret encoded knowledge of human experts stored in a 'knowledge base'."

Neither the first-generation expert systems (typically programmed in PROLOG or LISP), nor the second approach of Kaplan et al. (1988) (still based on programmed structures) were successful, but there has been a recent renaissance of this idea. With semantic graphs, an atomic piece of knowledge (a "knowledge item" consisting of factual knowledge about the environment, "situational knowledge" about the conditions under which it should be triggered, and "actionable knowledge" about what should be done) can be stored in a "knowledge base" with semantic relations. A graph-based inference engine can use such knowledge items to solve a certain problem, or to derive a new solution based on a new combination of given knowledge items.

> *"The critical success factors for sustainable implementation of AI are awareness about sociotechnical complexities and suitable communication to external stakeholders."*

Machine reasoning is an exception to the current machine learning and is applied for selected use-cases [Boos (2018)], such as automation of IT processes and/or incident handling. Nevertheless, machine reasoning depends on the knowledge items provided by human subject matter experts as an input. Based on this given "experience", the inference engine is capable of linking single knowledge items and of finding new combinations to solve novel problems. Other examples for advanced AI concepts are "causal inference" [Pearl (2016)] and "curiosity-driven learning". The latter was developed by Jürgen Schmidhuber and his co-authors [Kompella et al. (2012)] and Pierre-Yves Oudeyer and his co-authors [Colas et al. (2019)], and applies the concept of "embodied cognitive neuroscience", which states that cognitive processes depend on mind and body as a single entity and origin in an organism's sensory motor experience.



10. FROM STATISTICAL CLASSIFIERS TO A PROXY IN A POLITICAL DISCUSSION

Applications of AI are "statistical classifiers" – with few exceptions. Machines execute predefined programs, while humans make decisions about the uncertain future under conditions of bounded rationality and, consequently, have commercial, legal, and moral responsibility and accountability.

When a bank (as risk-taker) decides – usually with a threshold parameter for "if-then-else" – not to approve a consumer loan based on economic criteria, because the borrower cannot be expected to repay the loan, it is their responsibility to reject the loan. If the society decides that some sub-group in the society suffer from historical discrimination, the society can decide for (tax-paid) redistribution to this sub-group, e.g., with social benefit programs or with guarantees by a governmental promotional bank.

However, there is a subtle change of paradigm from AI being a tool for statistical classification towards AI as a proxy for a fundamental debate about responsibility and accountability. The changing perception was exemplified by Zuiderveen Borgesius (2018): "Most non-discrimination statutes apply only to discrimination on the basis of protected characteristics, such as skin colour. Such statutes do not apply if an AI system invents new classes, which do not correlate with protected characteristics, to differentiate between people. Such differentiation could still be unfair, however, for instance when it reinforces social inequality." "Suppose, for instance, that poorer people rarely live in the city centre and must travel further to their work than other employees. Therefore, poorer people are late for work more often than others because of traffic jams or problems with public transport. The company could choose "rarely being late often" as a class label to assess whether an employee is "good". But if people with an immigrant background are, on average, poorer and live further from their work, that choice of class label would put people with an immigrant background at a disadvantage [...]"

Zuiderveen Borgesius (2018) highlights a shift from autonomy and individual responsibility (of an employee to arrive in time according to the agreed employment contract) to a notion of unfairness based on correlations in the population (by an employer in a performance assessment of the agreed employment contract).

There is a danger for users of AI to get trapped into a political discussion between the traditional nexus of freedom of contract, and individual decision making, responsibility and accountability, and the demand for ex-ante planned outcome with an obligation for individual economic agents – such as bank lenders – to be made responsible to redress[6] historical developments of society.

11. CONCLUSION

As Rosa et al. (2014) stated, it is important to integrate "the lofty whiteness of risk society theory with the sooty details of risk decision making." Perceptions of external stakeholders should be taken into account, as it can result in an increase in the "risks of using AI." In this special sense, a perspective of constructivism helps, as stated by Beck (1986): "because risks are risks in knowledge, perceptions of risks and risk are not different things, but one and the same." People might be concerned that "autonomous machines" could degrade humans to pure objects (as in science fiction movies from Colossus to Terminator), or that "self-learning" AI could amplify existing discrimination in the society. These perceptions of risks by external stakeholders must be taken seriously. With this in mind, perceived risks can construct actual risks for users of technology to lose their "license to operate" in a society fragmenting into identitarian sub-groups.

These outside-in "social risks" arise from external actions of stakeholders and can be triggered by seemingly innocuous decisions – e.g., concerning the use of AI tools – if not communicated effectively.

The suggested model of decision making with AI illustrates how decision making is ingrained within the sociotechnical context and reveals the importance of the end-to-end process from assumptions to the social impact. While programming and usage of data can, and must, be educated (ex-ante), tested (during development and roll-out), and monitored (ex-post), it would be an illusion of control to believe that the external "perception of risk" could be contained. Open communication regarding the functioning of AI tools and transparency with explanation about the decision making processes are the building blocks for mitigating this new risk, while any "security by obscurity" would contradict trust-building at its core.

Although AI requires profound knowledge of sophisticated technical tools, the critical success factors for sustainable implementation of AI in financial services are awareness about sociotechnical complexities and suitable communication to external stakeholders. More research about the aspect of communication to stakeholders concerning risk management of complex sociotechnical systems would be needed to address such new risks of using AI.

[6] The UN (2011) 'Guiding Principles on Business and Human Rights' explicitly do not require remedy, if a firm did not cause or contribute to any adverse impact [quote]: 'Where adverse impacts have occurred that the business enterprise has not caused or contributed to, but which are directly linked to its operations, products or services by a business relationship, the responsibility to respect human rights does not require that the enterprise itself provide for remediation, though it may take a role in doing so.'

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SECURITY TOKEN OFFERING – NEW WAY OF FINANCING IN THE DIGITAL ERA

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ABSTRACT

In this article, we compare the fundraising processes of initial public offerings (IPOs) and security token offerings (STOs) and explain how the STO process can be operationally more efficient and less costly using distributed ledger technology. We also highlight recent technological advancements surrounding STOs and the world of decentralized finance. We collate information about recent developments in regulation and digital exchanges to support the growth of STOs. We emphasize some important issues to tackle before STOs can be widely accepted as the new way of financing for companies. Finally, we argue that although STOs have the potential to revolutionize the security value chain, they do not have to replace IPOs completely, and the two channels can coexist to provide more opportunities for businesses.

1. THE LENGTHY AND EXPENSIVE IPO

For many decades, the initial public offering (IPO) was seen as the beacon of success for many new companies ready to build a public image and expand their investor base. It is an important medium for raising fresh capital for a company's growth, and also a way for some owners to cash out and enjoy the fruits of years of hard work.

But the IPO process is both very time consuming and costly. The actual listing itself typically takes an average of six to nine months, and that is after about 12 to 18 months of thorough planning to assess a company's readiness for going public. Based on a survey of 705 IPOs in the U.S. during the period 2015 – June 2020,[1] PwC found that, on average, companies incur an underwriter fee of between 3.5% and 7.0% of gross proceeds. In addition, firms can incur an additional U.S.$4.2 million of offering costs directly attributable to the IPO. Legal and accounting fees also add up and can increase significantly for larger companies that may face additional complexities in preparing for an IPO. The underwriter fee usually makes up the majority of total IPO costs, and mega deals generate significant earnings for the investment bankers working on them – explaining why many business school graduates are competing for the most coveted investment banking jobs on Wall Street to this day.

Once listed on an exchange, there continues to be expenses that are associated with being a public company. These include costs of running and maintaining financial reporting systems, incremental internal staffing costs, professional fees for legal and accounting advice, and incremental auditing fees. A separate analysis from PwC found that two-thirds of the CFOs surveyed indicated spending between U.S.$1 million and U.S.$1.9 million annually on the costs of being public.

In summary, the costs of becoming a public company can be classified into four main components:

1. **Pre-IPO direct costs:** underwriter fees, legal and accounting fees, incremental roadshow expenses, listing and registration fees, and printer fees.
2. **Pre-IPO indirect costs:** restructuring costs, including the audit committee charter, costs to make financial statements compliant with local legal requirements, valuation services and reports, and articles of incorporation.

[1] https://pwc.to/2Z7AKgL

3. **Post-IPO one-time costs:** costs incurred from developing new financial reporting system and implementing new controls, new board of directors, and new compensation plans.
4. **Post-IPO recurring costs:** new staffing expenses, advisor fees (tax, accounting, and consulting), and other organizational and unanticipated costs.

Being a public company suddenly looks less glamorous when we take all these costs into account.

2. DIRECT LISTING

A related point about the pricing and listing mechanisms of IPOs is balancing the interests of different stakeholders: investors aim to buy shares of a company at a low price, while the company wants to sell shares at a high price. Investment banks hired by the company build on their market experience to advise on the best pricing approach, and to underwrite the offering, in exchange for fees. In the traditional underwriting process, the initial offering price is set by the investment bank, in alignment with the company, and an order book of demand is built. In many cases, the shares of the company are underpriced to trade up on the first day of trading (called an "IPO pop"), which suggests that most public investors may have been willing to pay more for the shares in the first offering. It also implies that private owners of the shares, such as founders, employees, and private equity investors, would typically forego some of their profits in an IPO.

This situation has led to more innovation in listing and pricing mechanisms, most notably the emergence of direct listing, which has accelerated in recent times. In a direct listing, the business sells exiting shares by current owners and investors directly to the public without involving any underwriters or other intermediaries; thus, there are no new shares issued. The opening price is determined in a standard market opening auction on an exchange and the price of this quasi-IPO is determined by whatever clears the market first. It can be argued that private holders of shares in the company benefit from this type of listing, when compared to a traditional IPO. That is why direct listings have become more popular in recent years, with successful listings from technology companies such as Spotify and Slack, as well as planned direct listings by Airbnb and Palantir, amongst others.

While these developments reflect important innovations from within traditional capital markets, there has been a separate and parallel development in what can be considered a new form of capital raising, which originated in the cryptocurrency space. In an era of decentralized finance, where technology is accelerating, the security token offering (STO), founded in 2017, has emerged and received widespread attention. People are excited because STOs could potentially save time and money, and also reduce the operational complexity of fundraising. Just as importantly, in a broader sense, STOs and their capital allocation methods are reaching a different and rapidly growing group of younger investors, most of whom are not active participants in IPOs.

3. THE BLOCKCHAIN-BASED STO

An STO is the process whereby the digital representation of a financial security is issued and recorded on a distributed ledger, subject to securities laws and regulation in the jurisdiction where the STO is conducted. The "token" issued in such a process is called a security token because it represents ownership, and in some cases voting rights of the investor, in the underlying company. Security tokens function much like a stock or share, where the owner is entitled to a share of future profits or cash flows. For example, a security token may represent partial ownership of a specific property or financial instrument, such as a government bond or other debt security, in addition to an equity share comparable to those in an IPO.

STO seems to be an evolution from the initial coin offering (ICO), which peaked in popularity in 2017, when bitcoin prices rose dramatically. However, after a short period of hype, the ICO market has almost disappeared, owing to a lack of regulation and the consequent rampant project scams and failures. An important difference is that in an ICO, investors receive "utility tokens", which give them consumptive rights for products or services developed by the token issuing company but not ownership or voting rights like equity security tokens. As they do not exhibit security-like features, tokens issued from an ICO fall outside the scope of most financial regulation. Technologists then realized that in order to make it work, compliance to regulation is key. Subsequently, security tokens emerged as the better alternative, because they are closer to traditional capital market frameworks and traditions.

But why are security tokens defended as superior to regular shares by their supporters? One could say that most financial securities today are stored digitally in the computer system anyway – we do not hold paper forms of these securities anymore, so how are security tokens different? One important difference is that security tokens are created and stored on a blockchain system, and can be transacted via smart contracts. The technology behind them, "distributed ledger technology" (DLT), enables financial information to be securely transferred

peer-to-peer, leaving a digital record that is almost impossible to alter (immutability). This mechanism also allows for greater transparency, where selective and controlled disclosure of facts that are stored on DLT systems can be considered a golden source of truth. In addition, in our current financial system there are a number of centralized gatekeepers to maintain accuracy and legitimacy of financial transactions: central banks, commercial banks, clearing houses, etc. But with the application of DLT, it becomes possible for digital tokens to change hands directly without going through these centralized gatekeepers, potentially reducing the layers of intermediation and transaction fees (decentralization and disintermediation).

4. THE STO PROCESS

Let us take a look at the STO process a little more closely, which has evolved to adopt some of the traditional capital fundraising principles but yet exhibits some distinct features. While firms have to go through similar due diligence steps like an IPO, different technologies and players are involved. Here are the six essential steps according to Lambert et al. (2020):[2]

Step 1: Preparation: at the first stage, the business team will start to draft a project white paper or prospectus, prepare investor presentation materials, and identify the target investor base.

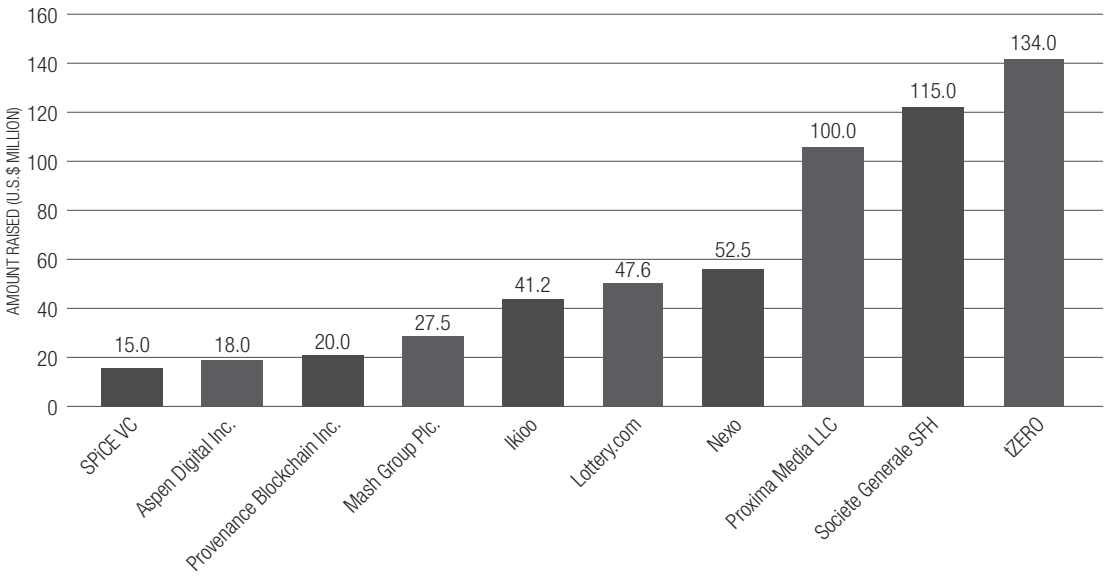
Step 2: Design of the offering: the team will start to appoint corporate finance, legal, and accounting advisors to plan and decide on issues such as type of security, investor rights, soft cap use, valuation, regulation compliance, mandatory lock-up periods, etc.

Step 3: Selection of technologies and service providers: at this stage, the company needs to decide on the appropriate blockchain platform, select the technology provider to develop the platform, and build the mechanism for KYC/AML checks, token distribution, and digital wallets for tokens custody.

Step 4: Selection of financial services providers: here, the company needs to appoint a broker for the sale of securities, a custodian for safekeeping, and payment providers to facilitate money transfers (fiat and cryptocurrencies) related to the fundraising.

Step 5: Capital raising: at the main event of capital raising, firms will organize roadshows either physically or online to pitch their businesses to potential investors; or conduct private meetings with some of them. The offering documents will be released and shared with prospective investors. Investors who are interested will complete registration of their profiles, sign the necessary documents, and wire funds (fiat or cryptocurrencies) to the company. At the completion of sale, tokens will be distributed to investors' digital wallets.

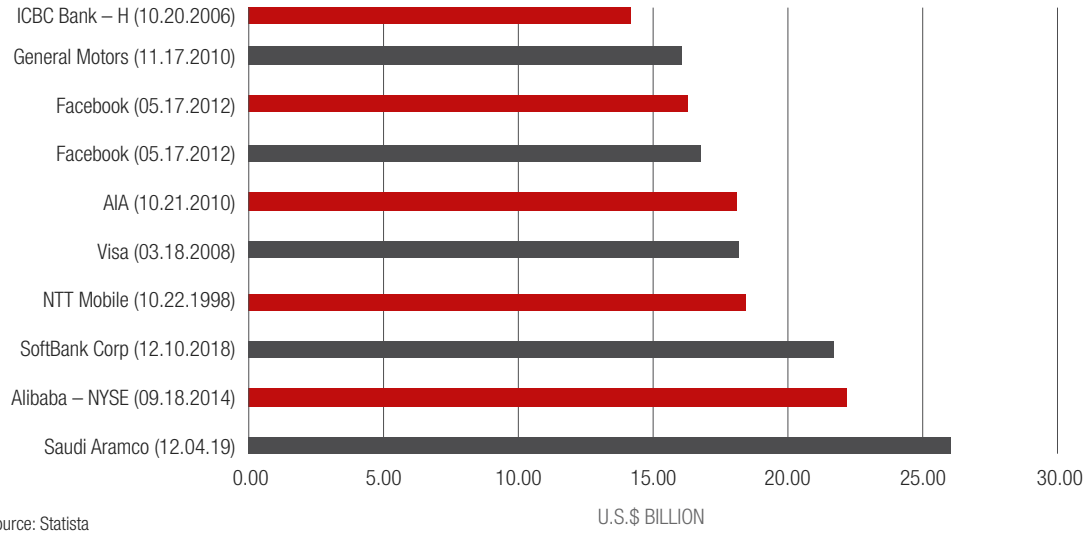
Figure 1: Top 10 STOs by funds raised



Source: Digital Asset Network

[2] Lambert, T., D. Liebau, and P. Roosenboom, 2020, "Security token offerings," SSRN, https://bit.ly/2ZdBYa7

Figure 2: Top 10 IPOs by funds raised



Source: Statista

Step 6: Listing of security on trading venue: at the final stage, suitable exchanges will be selected for the listing of the tokens. Additional promotional activities will be held to announce and market the tokens. Market makers will also be appointed to provide liquidity for the trading of these tokens.

It could take anywhere between six to twelve months to complete these six steps. About 185 STOs have been recorded by Digital Asset Network[3] between 2017 and Dec 31, 2019. Figure 1 shows the top ten by funds raised. Collectively, these ten STOs had raised less than U.S.$1 billion – smaller than even a mid-size IPO deal. Of course, this is based on a short period of activity and the market is still very young. Companies that have launched STOs tend to be small, as compared to traditional IPO candidates, and hence their STO size is also correspondingly small. Compare these with the top ten IPOs on record in Figure 2 – each of these IPOs had raised more than U.S.$10 billion, with the largest, Saudi Aramco's IPO, raising U.S.$25.6 billion in December 2019.[4]

In terms of the costs of launching an STO, they include the following key components:

- **STO direct costs:** legal and accounting fees for audit and compliance procedures, technology development for token structuring and platform technicalities, financial advisory fees for securitization and offering, and marketing and distribution expenses.
- **Post-STO costs:** fees for token listing, custody services, secondary trading, and other expenses on digital asset management.

Analyses from Lambert et al. (2020) show that the total cost of an STO can range between U.S.$180,000 and U.S.$750,000, excluding fees of 1-8% of the offering paid to bankers and brokers. Without the significant expenses of maintaining a public company, post-STO costs are expected to be much lower than the typical IPO.

5. REFORMING SECURITIES BUSINESS THROUGH TECHNOLOGY

An additional implication of innovation in capital markets, beyond the original fundraising mechanism, is the trading of securities. It is worth considering how DLT is helping to simplify this essential step, particularly given that direct listings, as discussed above, share some similarities with STOs. We have already learned that data of an STO is digitally recorded on a blockchain during the primary market offering. To the extent that only one master ledger is kept to record all information, and any changes can be simultaneously updated for all parties, it can help to speed up the book building process for the offering. The ledger provides transparency and avoids duplication of efforts by the participating banks and syndicate members in reconciling their books.

[3] DAN, www.assetnetwork.com
[4] This could be surpassed by Ant Financial's planned IPO of U.S.$30 billion, scheduled for launch in October 2020.

5.1 Settlement

Traditional securities settlement is complicated, as it involves many intermediaries, resulting in long clearing and settlement cycles (generally T+2). Part of the settlement process today is operated manually, which is error-prone. The involvement of multiple parties (banks, custodians, clearing houses, etc.) in a transaction across different time zones adds to the inefficiency and complexity of the whole process.

There are various studies and debates in the market about the potential of achieving T+0 settlement using DLT.[5] By reducing multiple layers of intermediation, it should theoretically reduce settlement times, and as a result help mitigate counterparty and settlement risks. A number of regulators have shown some willingness to consider using DLT in simplifying post-trade processes. For example, ESMA (2017)[6] states that "in theory, clearing and settlement could become almost instantaneous with DLT, as trade confirmation, affirmation, allocation and settlement could be combined into a single step and reconciliations would become virtually superfluous."

5.2 Structuring token terms[7]

Like a traditional security, tokenized securities will also carry legal terms, such as currency denomination, ranking on insolvency, and rate and nature of dividends or interest payments, but it is possible to design more flexible and unique terms on tokenized securities:

- **Form of distributions/dividends:** the "dividends" of tokenized securities can take the form of digital assets instead of fiat currencies.
- **Voting:** different classes of tokenized securities can be programmed to be identical in economic terms except for number of votes attached to a tokenized security.
- **Trading restrictions/lock-ups:** smart contracts on blockchain can facilitate the enforcement of trading restrictions or lock-up periods.
- **Convertibility:** smart contracts can be used to design sophisticated convertible features of securities. For example, in mortgage debt, they can help to create hybrid debt-equity-based home ownership.

6. REGULATION OF THE STO ACROSS SELECT FINANCIAL CENTERS

As security tokens possess security-like features, regulators around the world have approached them in an enthusiastic yet careful manner. In the U.S., they are now subject to U.S. Securities and Exchange Commission (SEC) regulations, and in Europe they are governed by the E.U.'s Markets in Financial Instruments Directive (MiFID II). Within the last two years, The Monetary Authority of Singapore (MAS) has published a guide on digital token offerings, and Hong Kong's Securities and Futures Commission (SFC) has issued statements about STOs and virtual asset trading platforms. These countries are generally taking a cautiously optimistic stance towards crypto assets.

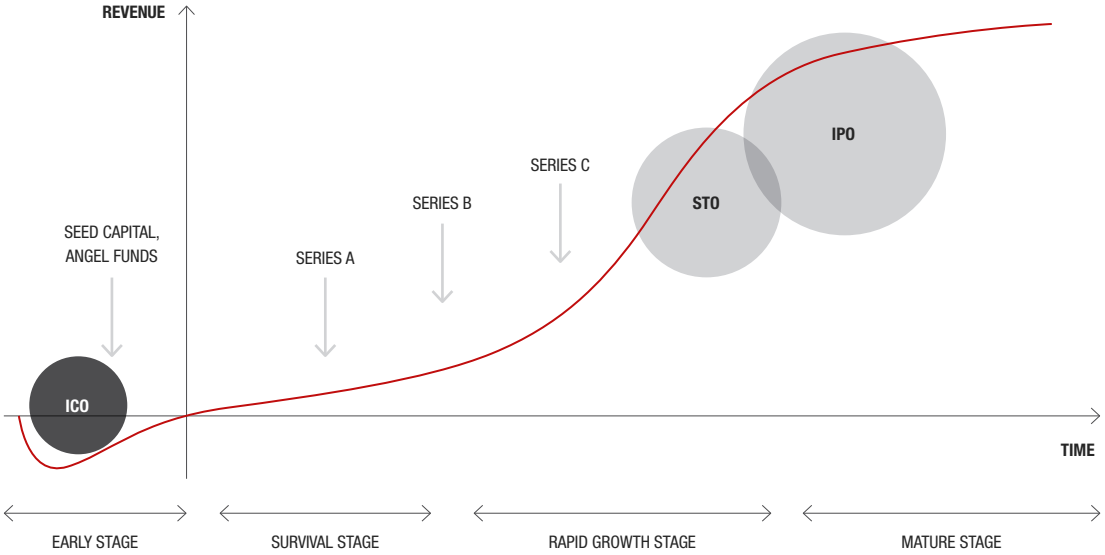
Malaysia and Thailand, two developing southeast Asian nations, are dealing with this new asset class with a friendly yet lawful approach. The Securities Commission (SC) of Malaysia has recently (January 2020) issued guidelines for digital token offerings to ensure that such offerings comply with Malaysian financial regulation. In Thailand, the Royal Decree on digital asset businesses came into effect in 2018. In addition, the Thai Stock Exchange announced in 2019 that it is building a new platform to support the trading of digital assets. Meanwhile, the central banks of Thailand and Hong Kong (Bank of Thailand and Hong Kong Monetary Authority) have been working closely on the Inthanon-LionRock project to examine the feasibility of cross-border digital funds transfer on the blockchain system.

There are many more examples. It is interesting to see that within just a few years, as the application of blockchain technology expands and the number of STOs increases, more countries are joining the field and developing the accompanying regulation to create new business opportunities and to protect investors.

These are positive developments. With a regulatory shield, tokens issued via STOs will become safer for investors – issuing firms, in most STOs, need to pass several due diligence hurdles set by the regulators before the offering, making them more likely to launch an STO later in the startup cycle. It is worth contrasting this with the earlier forms of ICOs. ICOs

[5] See for example: Priem, R., 2020, "Distributed ledger technology for securities clearing and settlement: benefits, risks, and regulatory implications," Financial Innovation 6, 11, https://bit.ly/2Dzhv8a
[6] ESMA, 2017, "The distributed ledger technology applied to securities markets," European Securities and Markets Authority, February 7, https://bit.ly/3i6V614
[7] See details in ASIFMA, 2019, "Tokenised securities – a roadmap for market participants and regulators," Asia Securities Industry and Financial Markets Association, November, https://bit.ly/3jKdopk

Figure 3: Startup financing cycle and example timing of STO



are usually launched very early in a startup's life, sometimes even without a product (and, therefore, in an earlier stage than traditional angel and seed funding rounds). At that stage, the risk of failure is highest, as there is no proper regulatory requirement for the ICO. Figure 3 shows this difference on a typical timeline of a startup financing cycle.

Regulation ensures that STOs are offered to accredited investors who have greater capacity for taking investment risks, unlike ICOs which tend to be marketed to anyone. Moreover, a clear regulatory guidance lays the groundwork for securities advisory firms to provide underwriting services to companies intending to raise funds through STOs. Over time, this convergence of a new fundraising form to the traditional capital markets frameworks will help to boost the acceptance of security tokens.

7. DIGITAL EXCHANGES FOR TOKENS

A central element of bringing a security public is to allow active trading. In the context of STOs, this means that in order to increase the liquidity of tokens, stable platforms that can facilitate their transactions efficiently are needed.

Today's global equity market is very vibrant, thanks to the powerful stock exchanges that have evolved and matured over 400 years, since the founding of the world's first stock exchange in 1602 – the Amsterdam Stock Exchange. Can the same happen for digital tokens? And perhaps over a shorter time period?

Some of the traditional exchanges, such as the SIX Swiss Exchange and the London Stock Exchange, have begun integrating blockchain technology into their systems, and developing new platforms for the trading of security tokens. However, as their main revenue source continues to be traditional securities, such as stocks and bonds, the STO business is unlikely to be their primary focus for now.

Small exchanges catered specifically for cryptocurrencies, meanwhile, have mushroomed since the advent of bitcoin. On Feb 6, 2010, the first bitcoin exchange, "The Bitcoin Market", was created by bitcointalk.org forum user "dwdollar". This was followed by numerous other crypto exchanges, with varying degrees of scale and success – and their fair share of scandals, such as the collapse of bitcoin exchange Mt. Gox in Japan.[8] Many were merely websites to match buyers and sellers of cryptocurrencies, and as most of them were unregulated, institutional participation was low.

[8] See the details of various digital exchanges in Lewis, A., 2018, *The basics of bitcoins and blockchains: an introduction to cryptocurrencies and the technology that powers them*, Mango Publishing

But this is slowly changing, with institutional activity on regulated exchanges gaining traction in recent years. Notable exchanges that have recently taken steps to become licensed include Archax in London, with a multilateral trading facility (MTF) license, and OSL in Hong Kong, which recently received an approval-in-principle from the SFC to operate a virtual asset trading platform under a license for Type 1 (dealing in securities) and Type 7 (automated trading service) regulated activities.

With security tokens coming to the market, there are now also exchanges built specifically for security token issuance and trading, such as Polymath, tZero, Swarm, Harbor, Securrency, Securitize, OpenFinance, iSTOX, Fusang Exchange, etc. To increase investors' confidence, some have worked closely with regulators to obtain the necessary approvals and licenses. For example, iSTOX in Singapore has passed the fintech regulatory sandbox test by MAS, while Fusang Exchange has obtained a license from the Malaysian authority – see Box 1 for more details.

Having a dynamic community of regulated exchanges is vital for the liquidity and continued growth of the security token market. Instead of the sporadic creation of new digital exchanges, some of the more successful ones can collaborate or even merge their services with traditional exchanges in the future to scale up quickly. Furthermore, with the pace of technological developments today, accompanied with the right regulatory framework, the market for STO could take a much shorter period to mature – certainly less than 400 years.

8. OTHER CONSIDERATIONS FOR THE STO TO BECOME MAINSTREAM

There are a few other important issues to tackle before STOs can fully take off. The first concerns the non-fiat form of payment for tokenized securities. While most STOs will probably raise funds in fiat currency, some have also made it possible to accept cryptocurrencies, such as bitcoin and ether, as payment. To the extent that cryptocurrency values are volatile and not anchored by traditional economic fundamentals, valuation of tokenized assets could become complex and include an additional element of market risk for investors. Fortunately, payment technology has advanced, and technologists have introduced stablecoins, cryptocurrencies whose values are pegged to a basket of "stable" assets, with the most well-known being Facebook's Libra. Concurrently, numerous central banks around the world are planning to introduce "central bank digital currencies" (CBDC) as an alternative to fiat money. A modern payment infrastructure using stablecoins and CBDCs could catalyze the adoption of security tokens.

Second, the interoperability and standardization across many DLT platforms remain a critical issue. As companies are still inclined to protect their proprietary information, the public blockchain system, which underpins the bitcoin, has largely been shunned for corporate use, although private blockchains developed by various consortiums (e.g., R3 or Hyperledger) have become more prevalent.

Case study – Fusang Exchange

Fusang Corp (FSC),[9] established in 2014, is the first fully-regulated platform in Asia providing end-to-end infrastructure to support STOs, allowing both retail and institutional investors to access the digital asset markets in a secure, compliant, and convenient way.

In February 2020, Fusang Exchange Ltd, a subsidiary of Fusang Corp, was licensed in Labuan, Malaysia as a Securities Exchange under Part IX, Section 134 of the Labuan Financial Services and Securities Act 2010 (LFSSA). Fusang Exchange is the first fully operational stock exchange in Asia that allows companies to go public through a digital IPO accessible by both retail and sophisticated investors globally. Fusang supports the trading of both digital securities and cryptocurrencies.

The company has also launched the Fusang Vault, a secured digital asset custody platform, and Fusang Digital Identity, an AI-powered KYC/AML solution, operated by Fusang Custody Limited – a Hong Kong Trust company. Fusang Custody also acts as transfer agent for STOs, providing a full platform to manage and operate digital security issuances.

Fusang Corp has issued all of its own equity directly as digital shares (see fsc.fusang.co for the real-time blockchain-based cap table) and has raised U.S.$7.5 million through its digital shares. In June 2020, Fusang Corp launched a pre-IPO fundraising round of U.S.$6.0 million, and is planning for an IPO of U.S.$20 million in 2021. It is important to note that these are actual digital shares, where the digital token directly represents the share certificate, as opposed to mapping to an offline paper share. Fusang Corp has also received approval to keep a fully blockchain-based register of members.

"The future of securities is digital, and we have proven this through issuing our own digital equity" – Henry Chong, CEO of Fusang.

[9] You can learn more about Fusang here: https://bit.ly/3k4DwLV

In time, we might see various clusters of different blockchain systems and philosophies used by different companies, similar to the numerous digital exchanges that have sprung up in the last few years. Consequently, it is essential to ensure interoperability between these different concepts, platforms, and networks, so that tokens can be easily listed and traded across multiple venues, and new financial products can be created and distributed in new pipes.

Third, it is important for token issuers to identify specific operational processes that should be migrated onto the blockchain, because there is no need to use DLT for everything. For instance, pre-trade processes, such as trade matching and confirmation, are already efficient using the current centralized matching systems. As member firms tend to consolidate orders to find the best price during pre-trade, there could be many cancellations, thus making such matching processes unsuitable for migration onto the blockchain. Instead, it may be more efficient to just use blockchain for post-trade processes, namely clearing and settlement.

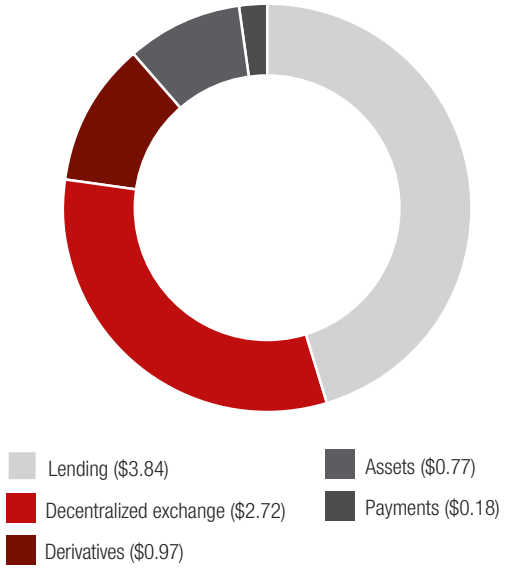
9. THE BROADER MOVEMENT OF "DECENTRALIZED FINANCE" (DEFI)

While the original aim of cryptocurrencies is to create a decentralized store of value different from fiat currency, an STO is the offering of a digital token that represents the rights in an underlying real-world asset.

Decentralized finance, or DeFi, can be considered the next iteration of this development, which focuses on the creation of a broad range of financial instruments separate from traditional centralized institutions, i.e., decentralized financial products. From a capital markets perspective, most of these new instruments show characteristics of securitization or value structuring, and hence may be considered securities. They generally share the qualities of creative new mechanisms for offering investors a specific exposure, spanning a range of traditional product categories. This space is emerging dynamically, with fluid boundaries, and terms and definitions still taking shape.

As of today,[10] products considered under the DeFi umbrella hold more than U.S.$8 billion in value. This "locked value" is the value of the new digital securities created using a particular DeFi framework to support some underlying assets or services – a figure likely to be considerably lower than the value of total managed and transacted assets in DeFi products. While the market volume is still relatively small, it is growing rapidly. Some observers consider the industry to be at the tipping point of reaching critical mass and compare the state of DeFi with the internet 20 years ago. New products and innovative solutions are being built on top of the original innovation of blockchain, DLT, and mechanisms like STOs.

Figure 4: DeFi "locked" value by sector (U.S.$ billion)

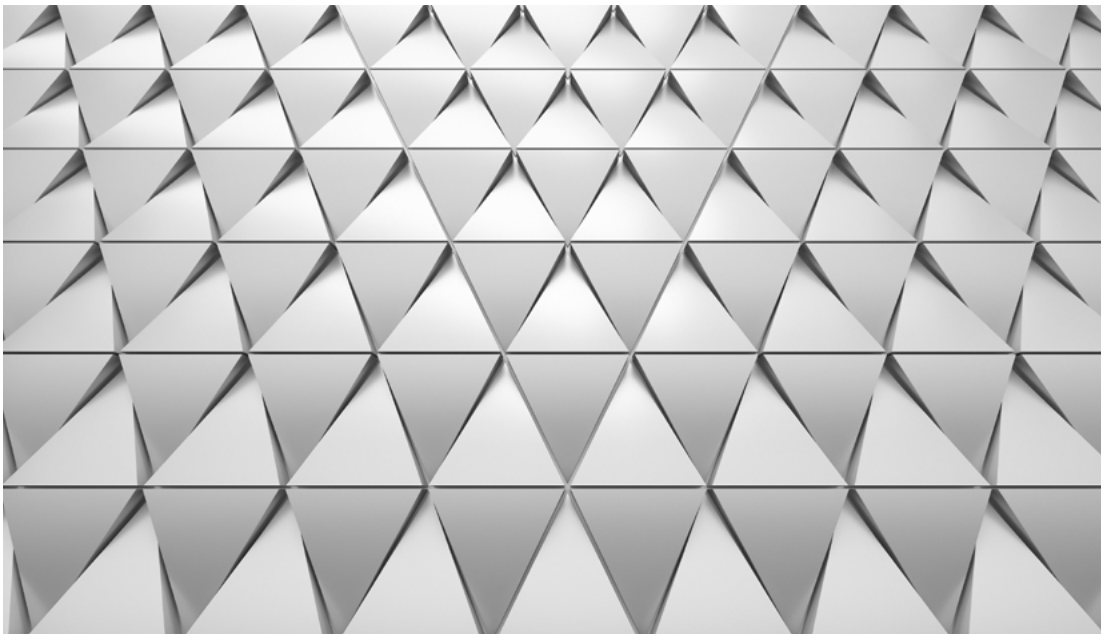


Source: www.defipulse.com

The DeFi universe comprises of a broad range of services that can be mapped to categories as shown in Figure 4.

- **Lending:** DLT protocols enable anyone to earn interest on stablecoins and cryptocurrencies transacted on lending platforms without intermediaries. Example: Aave (U.S.$1.5 billion), an open source non-custodial protocol for decentralized, collateralized lending and borrowing directly between users. Borrowers provide collateral in the form of digital assets and can borrow up to a specific loan-to-value ratio and at a variable interest rate. They are subject to a liquidation threshold.
- **Decentralized exchanges (DEx):** exchanges for cryptocurrencies that operate without a central authority or centralized order book, connecting traders peer to peer. Example: Uniswap (U.S.$1.2 billion), a

[10] Cf. defipulse.com as of 1/9/2020



decentralized on-chain protocol for token exchange that uses liquidity pools created by users instead of order books. Users can swap between the cryptocurrency Ether and any token created on the Ethereum protocol or earn fees by supplying liquidity.

- **Derivatives:** forms of digital assets that derive their value from the price of real-world assets, such as fiat currencies, commodities, stock indices, and crypto assets. Example: Synthetix (U.S.$880 million), a decentralized platform for the creation of so-called “Synths”: on-chain synthetic assets that track the value of real-world assets by following their price curve. After posting of collateral, users can create Synths that are freely tradable tokens based on Ethereum.
- **Payments:** new variants of payment systems that work by directly connecting parties and applying novel mechanisms for securing payments; for example, in the form of a collateral token provided by users. Example: Flexa (U.S.$150 million), a payments network for digital assets that allows users to pay with a variety of cryptocurrencies, Ethereum tokens, stablecoins, or reward points at regular merchants. The payments are secured with a collateral token provided by users who earn a transaction reward.
- **Assets**: typically, this category represents products that allow for the creation, management, and trading of tokens that represent a portfolio of assets themselves. Some of these products combine a number of underliers in a basket and resemble structured products or ETFs, with the benefit of being easily transferable in the form of tokens. Example: Set Protocol (U.S.$25 million), a platform that allows for the creation of tokens that represent a portfolio or basket of underlying assets. Each dedicated token periodically rebalances its portfolio according to a strategy coded into its smart contract.

While this section is an excursus into the latest evolution that emerged out of the original STO movement and reflects the sometimes exotic nature of the sector, it offers a glimpse into what lies ahead and the proliferation of innovative capital market products. This development may still be in its early days, but it is worth taking note that DeFi assets are increasing in volumes and attracting a broad base of active investors.

10. CONCLUSION AND OUTLOOK

In this article, we have seen the merits and challenges surrounding STOs as the new way of financing for companies. The powerful DLT offers an alternative to our current centralized system, and a blockchain-backed STO can be operationally more efficient and less costly than an IPO. By providing greater efficacy and transparency with respect to security issuance, trading, and post-trading processes, STOs have the potential to revolutionize the security value chain, and to drive a paradigm shift towards decentralization of financial services in the future.

The broader movement of DeFi has seen a healthy growth and development in 2020, where traditional financial products are transformed to achieve greater fluidity based on decentralized networks and new technology protocols. The major aim of DeFi is to take out the middlemen and connect financial actors more directly, building on transparency and efficiency.

We have also discussed the key drivers for the further growth and maturation of the STO market, including (i) strong legal and regulatory framework covering digital securities, (ii) efficient exchanges to facilitate listing and trading, (iii) modern payment and custodial infrastructure for the convenience of investors, and (iv) standardization of protocols and interoperability across multiple platforms.

As it may take several years before the STO market reaches a significant size, IPOs and direct listings will likely remain as the main fundraising methods for most companies in the foreseeable future. But we do not have to view STO as an alternative to replace IPO – they could very well coexist together, with STO playing the role of a precursor before an IPO or an alternative route for fundraising, depending on the nature of the project and company characteristics. For a smaller scale offering, the STO is perhaps more suitable as it is less arduous and less costly to execute. Hence, the STO can be used to "test the water" to gauge investors' appetite before a large-scale IPO with more institutional participation. This can help to time the IPO launch better and potentially reduce glitches or failure of the IPO.

Looking beyond security tokens, some experts have begun to think about the possibility of "programmable securities" [Shilov (2019), Singh and Long (2020)],[11] i.e., securities that embody flexible programming language which could depict all the possible features and variants of an investment product. Essentially, the security token can evolve and transform after being issued on the blockchain, where any unexpected corporate actions that would change its initial features can be executed on-chain efficiently. The details are beyond the scope of this paper and would call for more research, but we bring out this last point to show how far technology can bring us, and that the financial services industry will continue to be disrupted in ways that we cannot even imagine now. What an exciting time to be living in to witness all these changes!

[11] Shilov, K., 2019, "Programmable ownership: what security tokens mean for individuals," Medium, July 12 https://bit.ly/3IRJMZ3; Singh, M., and C. Long, 2020, "How programmable digital assets may change monetary policy," FTAlphaville, September 4, https://on.ft.com/2GFQIsd

ETERNAL COINS? CONTROL AND REGULATION OF ALTERNATIVE DIGITAL CURRENCIES[1]

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ABSTRACT

The rise and scams of cryptocurrencies have attracted much public, academic, and economic attention. While most cryptocurrencies have already failed, less attention has been given to the long-term regulation of those that might be successful, all of which purport to be "eternal" stores of value or mediums of exchange. Now is a good time to review this experience and draw lessons for regulators, investors, and promoters interested in better management of risk around alternative currencies, and cryptocurrencies in particular. This paper concludes that conventional risk control concerns are relevant even when a technology is novel. The typical choice of blockchain technology with proof-of-work all but guarantees that efficiency concerns are material, and that the purely digital nature of cryptocurrencies offers opportunities for regulators to insist on comparison of outcomes with simulation modeling as one basis for regulatory control.

1. FUNDRAISING SCAMS

1.1 The issue

The problem, particularly from 2017, was people asking for money to develop the next big thing in cryptocurrencies, then either doing nothing of the kind or doing it incompetently. Exactly why so many people have put so much money into these projects and continue to speculate on cryptocurrencies is not fully understood.

Schemes were promoted energetically, often to people with little understanding of investment or the systems involved, with a thin veneer of respectability provided by websites, endorsements, language that sounded like real finance (e.g., "initial coin offering"), and seemingly-responsible disclaimers. This prompted the SEC to produce a website promoting a fake cryptocurrency project; if you clicked to buy in you were taken to an educational site to teach you to be more skeptical.

Purchasing a cryptocurrency, or investing in an initial coin offering (ICO), is very different to investing in a typical company's shares. Company investment is typically promoted as worthwhile because the company does something useful and should add some value somewhere, with the resulting profit being distributed. Even with the most famous and widely distributed cryptocurrency, bitcoin, the overall situation is that no new value has been created. Miners of the currency have gained economic benefit (or dropped out), hence most likely 'investors', on average, have lost or will lose the wealth that has gone to miners. Two groups that have almost certainly gained are electricity companies and computer hardware manufacturers selling to miners.

Worse than that, most cryptocurrencies launched have already failed. Dowson (2018) estimated that over 60 percent of all initial coin offerings failed to deliver a working cryptocurrency. Benedetti and Leonard (2018) "estimate that the survival rate for startups after 120 days (from the end of the ICO) is only 44.2 percent, assuming that all firms inactive on Twitter in the fifth month did not survive," i.e., 56 percent fail. The jury is still out on those that survive. A study by Satis Group [Dowlat (2018)] claimed that only 15 percent of initial coin offerings in 2017 led to coins trading on an exchange. Instead, 78 percent

[1] Parts of this research were funded by the Cardano Foundation

were scams, about 4 percent failed, and the remaining 3 percent had "gone dead". Of those that did lead to coins trading on an exchange, a significant proportion quickly became dormant or nearly so.

1.1 Potential solutions

One approach to reform is to promote a voluntary code of conduct for promoters of new alternative currencies, with the idea that they can gain credibility and encourage wise investment if they can show that they are following the code sincerely and effectively.

The London Token Fundraising Manifesto [many signatories (2017)] is a good example of such a code and could be developed further with more detail and perhaps also an independent review process, an international standard, and a "kitemark" scheme with appropriate accreditation, certification, and periodic audits. Mainelli and Mills (2016) set out how to manage blockchain risks through standards and voluntary standards markets, concluding that standards would be particularly beneficial in the areas of taxonomies and performance, data governance and liability, and commercial governance and liability.

However, codes of conduct are unlikely to be sufficient for long-term, "eternal" coin projects. In fact, it is difficult to point to long-term fiat currencies. Of reserve currencies, the Swiss franc only dates to 1850, the U.S. dollar to 1972, but a structured U.S. dollar to the formation of the Federal Reserve in 1913. Arguably, the oldest extant currency in economic use is the British pound, circa 1694. If one takes cryptocurrencies to be "digital gold", then longevity comparisons can certainly be extended, perhaps back to the sixth century BCE. Longevity is a rare commodity. Long-term systemic management is rarer. Much further thought needs to be given to consumer and economic management of cryptocurrencies, rather than just "legal or illegal". Such long-term management needs to be appropriate, consistent, enforceable, and paid for.

2. INSUFFICIENT ATTENTION TO CONTROL IN PROJECTS

2.1 The issue

In addition to fraud, a contributing factor to failed cryptocurrency development and launch projects will have been insufficient attention to control of the projects and to designing control into the systems to be developed. This relates to all types of risk.

Typically, attention has been paid to the security issues of greatest interest to cryptocurrency developers (e.g., the details of their protection against Sybil attacks and other attempts at double spending), and to solving governance issues using voting mechanisms enforced by the systems. These issues are often addressed in their "white papers".

Unfortunately, this leaves out a long list of more prosaic concerns covering control during the development and launch project, and control built into the system that is to be created. These include software development practices, computer operations, version control, testing and other quality assurance tactics, progress reporting, documentation, financial control, compliance with laws on sales practices and cryptocurrencies, funding, fraud by social engineering and simple methods like stealing private keys, and control of the currency's supply and value. The extent to which these conventional risk concerns are still relevant to blockchain systems is explored in Mainelli and Leitch (2017), which examines blockchain from an audit perspective.

2.2 Potential solutions

Groups aiming to develop and launch an alternative currency need to have a positive and responsible attitude to managing risk, the skills and experience to do it well, and some kind of framework to help them organize their thinking and activities. Another project under the Long Finance research program has been to develop control frameworks for these purposes [Leitch and Matanovic (2018)].

3. FORESEEABLE TECHNICAL INEFFICIENCY

3.1 The issue

The leading group of current cryptocurrencies have two design features that virtually guarantee that they will not be cost effective compared to established payment systems. Firstly, they have multiple copies of their blockchain-based database – thousands of them in some cases. This means that the basic work of storing the database is duplicated thousands of times rather than the several times that would be necessary for a secure record. They also required all transactions to be communicated to all nodes, hence there is a communication overhead too. As scale increases (in the sense of having more blockchain copies), these systems become less efficient, rather than more efficient as one might expect. Secondly, the existence of each node is confirmed by doing intensive

calculations that are duplicated over all the participants and have no other use. This "proof-of-work" technique compounds the massive duplication problem.

These two problems make these systems inefficient, and this inefficiency was obvious and predictable from the start. They could never have hoped to compete on a sustained basis as electronic payment systems with established services like Visa and Mastercard.

A number of attempts have been made to quantify the resource inefficiency of bitcoin. One of these comes from Mark Carney and the Bank of England. According to Carney (2018), the electricity consumption of bitcoin alone is roughly twice that of Scotland, with a population of over 5 million people. In comparison, the global Visa credit card network uses less than 0.5 percent of this while processing 9,000 times more transactions. (This translates into bitcoin needing at least 1,800,000 times more electricity per transaction than Visa card payments.) Carney further states that the full cost per transaction to retailers of cash is 1.5 pence, cards is 8 pence, and online payments is 19 pence. In comparison, bitcoin's charge for faster processing was £2 at the time but had been as high as £40. The processing speed is vastly better with Visa, which also offers further benefits.

In summary, bitcoin is far more costly than Visa and its established competitors, despite providing a service that is inferior in several ways. If Visa provided a "no frills" service as basic as bitcoin's then it could offer something even cheaper than the service it offers now. Consequently, for an alternative currency to offer a new service that is competitive over a sustained period it requires an inherently efficient design.

3.2 Potential solutions

What can be done to reduce the risk of such mistakes with future alternative currencies? The simplest regulatory response to this might be to decide that new or proposed systems based on massive duplication of computing effort and on proof-of-work cannot be competitive and probably are being proposed as a scam.

Objections might be that the security could be used to solve some problems that override efficiency, so a simple ban might not be acceptable. Another approach would be to require that some calculations be done and perhaps also published if funds are to be raised.

Since these efficiency issues were obvious from the beginning, some straightforward calculations should be enough to compare the future efficiency of new systems with that of conventional designs. The main comparison should be of computer power used, but an expanded comparison might include any human element needed, provided the comparison equates the services provided.

If the efficiency of a system is dependent on scale or on the behavior of users, for example, the calculations should be repeated to cover a wide range of potential future situations.

4. FORESEEABLE ECONOMIC PROBLEMS

4.1 The issue

The volatile exchange rates seen with most cryptocurrencies over the past few years are another predictable problem that needed to be taken more seriously earlier on. A highly volatile exchange rate means that the currency cannot be used as money. Prices of goods will not stay fixed. Money cannot be used as a store of value – only a speculative gamble.

These problems were predictable because they are the result of well-known economic principles and because, by the beginning of 2015, the price history of bitcoin already showed huge volatility.

Economic control of alternative currencies is a complicated but vital area. Typically, cryptocurrencies have had a scheme for creating new coins that creates them over time, but not in a way that is fully responsive to the extent to which the currency is being used. If the cryptocoins are used more widely for more transactions then either the supply of the cryptocoins must be increased or the prices of goods, when stated in cryptocurrency, must fall as the value of the cryptocoins rises.

Beyond this, the technical inefficiency of bitcoin and similar systems was a strong clue that they would not be successful as payment systems and, if they survived at all, would just be traded speculatively. In this role, there would be almost nothing to stabilize their value and reason for holders to welcome large value changes.

4.2 Potential solutions

To investigate these problems, we carried out a project to scope and design a simulation system capable of testing control mechanisms for alternative currencies. Early observations from a prototype were reported in Mainelli et

al. (2018), and illustrative tests of control mechanisms were reported in Mainelli et al. (2019), still using the prototype. The overall program of work also involved:

- An analysis of control needs for cryptocurrencies
- A workshop and survey to explore interest in particular features for an interactive simulator
- Detailed design and description of an interactive simulation system to test control mechanisms for alternative currencies.

The simulator is described in Leitch (2019), in the form of a detailed user guide with technical details including calculations. This describes an interactive, agent-based simulation system with many options for specifying a proposed alternative currency and its environment, then simulating it in stages with human intervention if desired.

All the agents in a simulation make decisions. Modeling those decisions is one of the most complex and important aspects of simulation. The decision rules that agents can use in the specified simulator have been designed with some helpful principles in mind.

- **Agents are diverse and error prone:** the way agents "think" is not the same for all agents and they have differing priorities and circumstances. Consequently, even if they appear to be facing the same decision about the alternative currency they are usually not. In most cases, this is modeled by having the decision process control the probability of each alternative being chosen in a decision, but the final choice is randomized. In addition, agents sometimes have explicitly different philosophies and sometimes make mistakes randomly. Most alternative currency users are not professional currency traders using mathematical models and automated trading, so the simulation reflects reality.
- **Agent characteristics are controllable:** the mix of agents with different characteristics can usually be changed in the simulator as can some important characteristics of those agent types.
- **Collective behavior is broadly rational despite individual lapses:** this is a typical property of human thinking, but especially when people have different sources of evidence. The agents are partly rational and partly consistent, confronted with a theory of the world that is too complex and unquantified for them to deal with.

> *"If the alternative currency cannot be safely simulated, perhaps it is not safe for customers."*

- **Not blatantly stupid:** although individuals may occasionally make blatantly stupid decisions, the collective tendency should be to avoid behavior that is clearly irrational. For example, opting in as a customer when no goods can be bought with the alternative currency, or when the exchange rate is chaotic, is illogical and few, if any, agents should do it in a simulation. (But it might still be logical for a speculator.)
- **Limited intelligence:** where a decision analyst should, in theory, go into detailed and sophisticated modeling but this is not what nearly everyone does, the simulator will sometimes avoid the detail and just choose a number randomly from a sensible range. This again reflects real thinking, which is bounded and inconsistent.
- **Consistent techniques:** where a decision is similar to another taken in the same or a different role then the mechanism of the decision is also similar.
- **Simplicity:** where there is no strong reason for choosing something more complex, the system uses the simplest mathematical approach available. For example, uniform distributions and simple multiplicative or additive models to combine variables. It has been assumed that causes do not interact unless it is clear that they do.
- **Real world variables:** wherever possible, variables have a real world meaning rather than being arbitrary coefficients. For example, a dimensionless index of publicity is not as good as a variable representing combined publicity in a way that might be measured in the real world, e.g., "number of positive messages received per day on average per person."
- **Real world calibration:** where practical, variables have been chosen so that real world data are available to compare with the simulation's numbers. The main limitation on this is that often real-world numbers are not available. For example, the number of people using bitcoin is unknown.

- **Imaginable calibration situations:** for some simulation settings, it is necessary for users to choose a value based on experience and judgement. To make this easier, there will sometimes be suggested defaults and users will usually be asked for a value of something that can be imagined and judged, rather than a seemingly meaningless parameter within a complex mathematical function. In some cases, what users choose is then converted into a parameter within a complex mathematical function.

From this effort, our observations are as follows:

- An agent-based simulation is probably the most suitable. A dynamical model using differential equations is not realistic enough and does not capture the rough and tumble of real alternative currencies.
- A wide range of features of the currency, its users, and related environment events need to be simulated.
- The progress of the currency cannot be reliably predicted, but the effect of control mechanisms may still be relatively predictable.
- The aim should be to test control mechanisms, not predict the future evolution of the currency in detail before it is launched.
- The complexity needed is quite high. Establishing if a currency can be controlled effectively is more difficult than establishing if it is competitively efficient.

Since the effort needed to simulate and test control schemes for an alternative currency is significant, it may be something that developers of alternative currencies with big ambitions need to be required to do by regulators, and it may be a further requirement to provide a simulator for regulators to use. A regulatory performance criterion might be conformance of the alternative currency with simulator predictions. If the alternative currency cannot be safely simulated, perhaps it is not safe for consumers.

5. CONCLUSION

A number of lessons can be learned for regulation and control of alternative currencies from recent experiences with cryptocurrencies.

Firstly, it is clear that conventional risk control concerns are relevant even when the technology is novel and expert attention has been paid to some aspects of security and governance. The honesty of people raising money is always a concern and attention needs to be paid to all areas of risk and all types of control.

Secondly, the typical choice of blockchain technology with proof-of-work all but guarantees that a cryptocurrency will not be a competitive payment system. Predictable efficiency problems like this need to be avoided and requiring some simple engineering calculations early on is an obvious precaution. There are alternative technologies in test, one such example being Mattereum's experimentation of linking the ChainZy high-speed smart ledger with Ethereum's payment platform. If a cryptocurrency can achieve conventional payment system characteristics, arguably, this might leave bitcoin itself as the only survivor of the first wave of cryptocurrencies.

Finally, to make an alternative currency work as a currency requires a much more thoughtful approach to economic control. Testing control mechanisms using agent-based simulation is one way this might be done, but the simulation work is quite difficult and regulatory pressure or facilitation would probably be required to get promoters and developers to do this adequately. The purely digital nature of cryptocurrencies offers opportunities for regulators to insist on comparison of outcomes with simulation modeling as one basis for regulatory control.

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