



Designing from the Future: Building Prototypes for Digitalized Organizations

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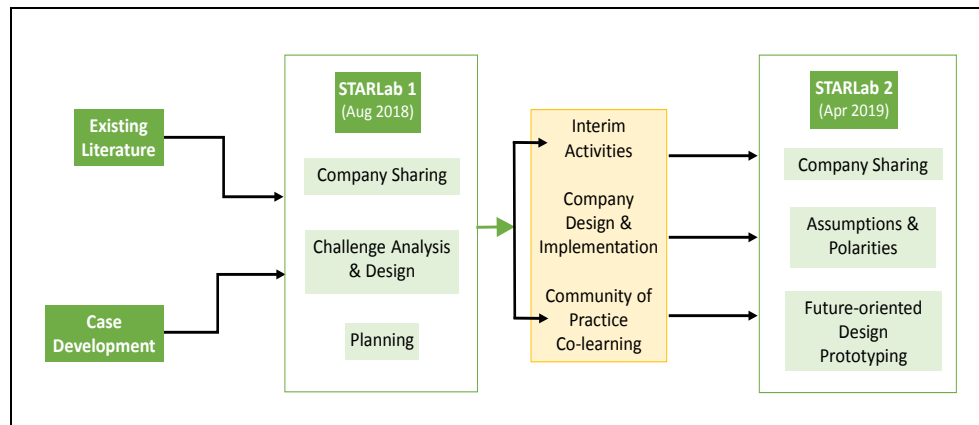
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The [STARLab](#) (Socio-Technical Action Research Laboratory) addresses the gap between the rapid advances in digital technology and the slower evolution of the social systems that are being impacted. Technology advances carry the potential to fundamentally change the nature of work, of the employment relationship, of organizations, and of societies. STARLab's goal is to accelerate the generation of knowledge about how to design socio-technically integrated organizations to simultaneously address economic and human needs. The lab is a forum for collaborative research involving technical, business and HR participants from multiple companies that are in the midst of digital transitions and subject matter experts experienced in organization design, technology, and organizational transformation. The nine participating companies are in different industries headquartered in five countries, and in different stages of digital transformation: Amgen, BASF, Deutsche Bank, Google, InterGlobe, Magellan Health, Microsoft, Shell, and one other Fortune 100 consumer products firm.

To-date, the work of this collaborative group has occurred through two 2-day STARLabs (see Figure 1) and interim activities within each company and among them. STARLab 1, in August of 2018, developed an understanding of the challenges these organizations were facing, and the approaches and solutions they were developing to deal with them (see [Challenges](#) report). In the April 2019 STARLab2, we developed organizational prototypes for the future, generating design specifications for the organizational features and qualities needed to address the integration of technical and social elements of the future organization designs.

The work in STARLab2 built on the outputs from STARLab1, and on learning that occurred in between the two labs. We start with a short synopsis of the inputs to STARLab2, and then address the conceptual design flow and methodology of the lab, and the prototypes that were generated.

Figure 1. STARLab Flow

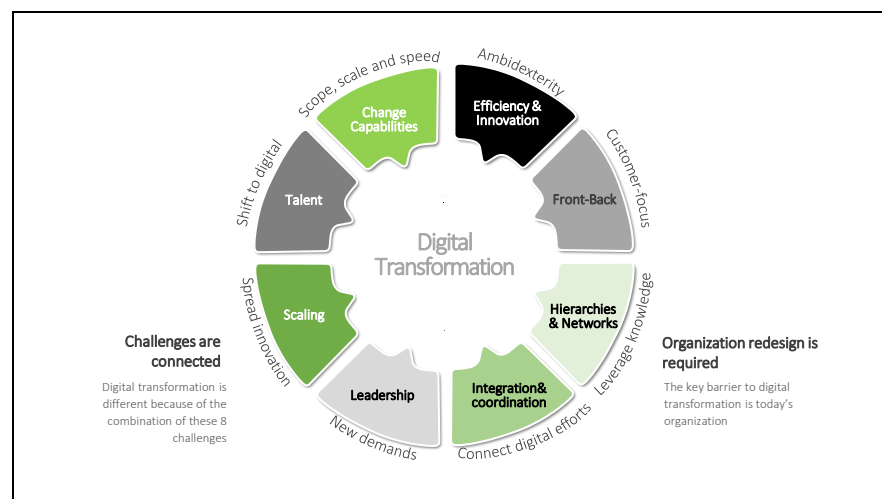


Inputs to STARLab 2

From STARLab1: The Challenges of the Digital Transition

In STARLab1, companies learned from each other by sharing their case experiences and identifying the challenges (see Figure 2) they were facing in moving to the digital future. Many participants were unsure of where their digital journey would lead or how it should be undertaken. They agreed that this transition is characterized by uncertainty, disruption, and rapid technological evolution. These conditions called for discontinuous ways of organizing and working, and for unprecedented levels of continual innovation, learning and ongoing dynamic adjustment. In short, this transition entailed change in the very nature of their organizations. Digitization is not simply something to be implemented; rather it is driving change in all aspects of organization.

Figure 2. Eight Key Challenges



The participants discovered that they were experiencing similar challenges albeit in different industries and with varying starting points and different drivers and focuses of digitalization. They saw the eight challenges they were facing as systemic and interconnected and agreed that the major obstacle in addressing them was the behavior and assumptions embedded in the organization as it was currently designed to operate.

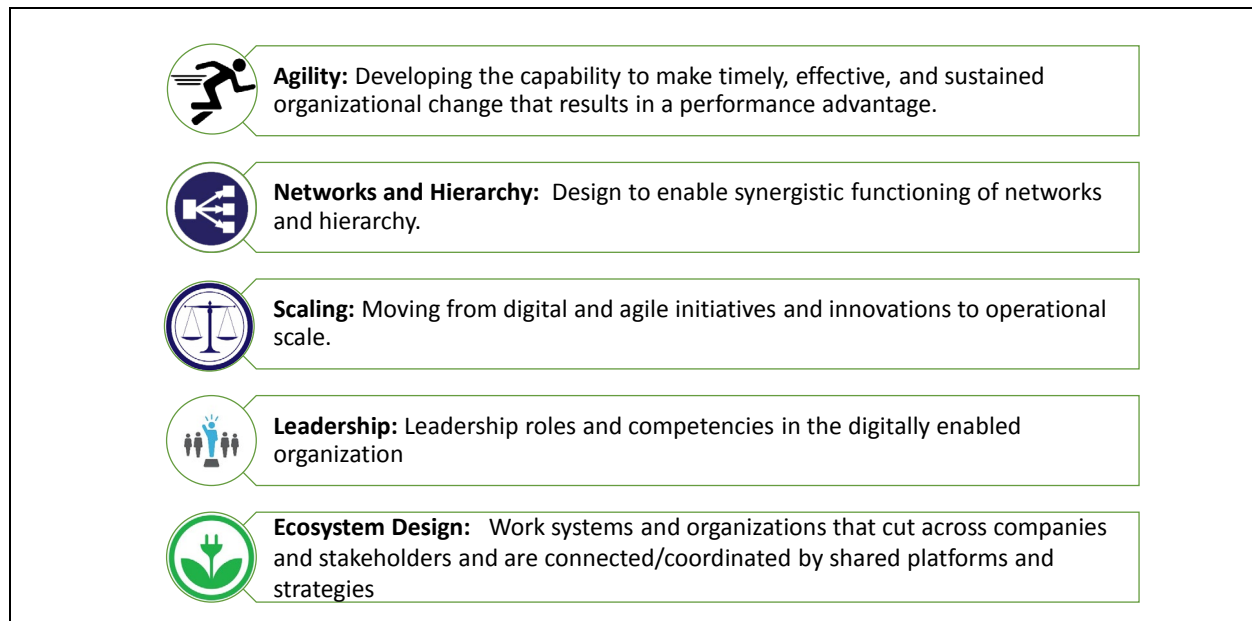
These companies all knew that challenges notwithstanding, they have to make this transition: technology advances are compelling enablers of strategic and business model changes that create more value. If they do not make this transition effectively, they are subject to disruption from companies that do, and from those that are designed from scratch to take advantage of digitalized ways of working and going to market.

From the challenges in Figure 2, and despite a plethora of digital initiatives in these organizations—often with strong support of the executives in the organization—they were confronting the intransigence of the organization. Developing a shared vision and understanding of the digitalized future, designing very different organizational frameworks, rebuilding the knowledge and skills of managers and leaders, and being able to manage the sheer amount and continual drumbeat of change were seen as major challenges that had to be addressed to make the transition.

Interim Learning Activities and Analysis

Communities of Practice: The participating organizations left STARLab1 with nascent plans to adjust and further formulate their transition strategies to address the challenges they were experiencing. Many participants also opted to participate virtually in Communities of Practice (CoP's) that explored a number of substantive design challenges that had emerged during the Lab: achieving organizational agility; the simultaneous operation of networks and hierarchy, scaling innovation, agility, leadership, and ecosystem design (see Figure 3).

Figure 3. STARLab Communities of Practice



Interim Analysis: Being “Stuck” and the Limitations of Digital “Bolt-Ons”. We tracked the activities of the learning network during the eight months between the two Labs, systematically coding the issues that were brought up, the successes companies were experiencing and their learnings, areas where they continued to face challenges, and the changes in what they were focusing on and how they were moving forward.

A major summary observation from the interim data: There was a lot of activity (in many cases taxing the capabilities of the organization for support and coordination), but there was also a sense of being “stuck”—of being unable to make significant transformation to a new way of doing work. Headwinds often came from leaders and other individuals who were digitally inexperienced and accustomed to operating in traditional hierarchical organizations. Other headwinds were simply from “the way things are done” - obstacles were embedded in the structural and process design of the organization, including its policies and procedures. A number of the companies felt that they were making progress, but that it was a slow, uphill battle. Common themes are below:

“...there was a lot of activity ... but there was also a sense of being “stuck”—of being unable to make significant transformation to a new way of doing work.”

Themes from the Interim Activities

- A large amount of effort was going into digitalization initiatives, sometimes emergent, with no common vision of what the organization would look like when optimally digitalized.
- In some organizations, executive leadership professed great interest in and made a compelling case for a digitally enabled transformation. Yet even their deeply embedded assumptions and patterns of behavior, such as about the role of leaders and about how an effective organization ought to operate, flew in the face of the kinds of organization and work systems changes needed to fully benefit from capabilities inherent in digitalization. These assumptions included hierarchy and control, stability, boundaries, standardization and risk control. These assumptions worked against the networking, decentralization, and empowerment objectives and the speed of functioning made possible through digitization.
- A number of tensions and polarities—simultaneous requirements that were seemingly in opposition to one another—had become evident and needed to be addressed to achieve fundamental change. As an example, organizations that had thrived in less turbulent market environments were finding that a careful, risk averse and short term performance orientation, with its emphasis on efficiency, worked against the need for rapid testing and learning, agility, and a long term orientation required to aggressively pursue new digitally enabled ways of operating.

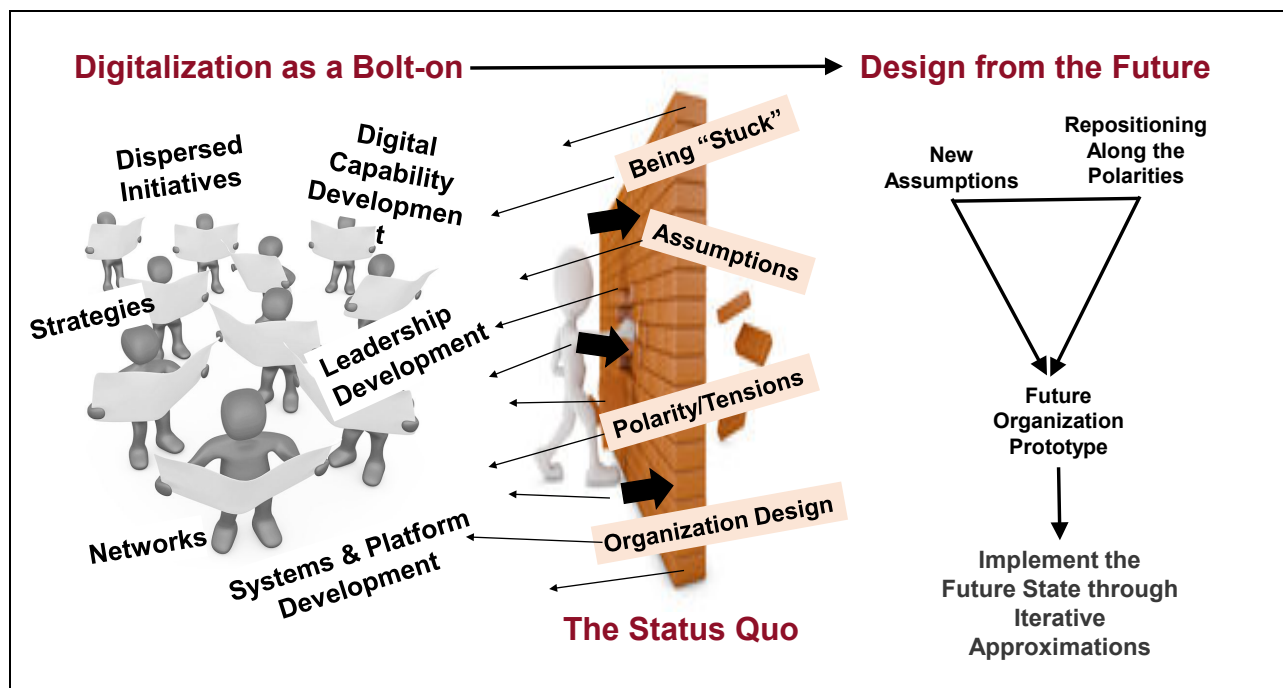
As we coded and interpreted the data, it became clear that most of these companies were trying to bolt digitalization on to an existing social system that was defined by deeply embedded ways of operating, thinking, and valuing that were held in place by the current design. Without a very different shared vision of the organization of the future, fundamental change would be hard to achieve and maintain. Current leaders were often trying use digitalization to do better what the company already did, and not changing the built-in structure of power and authority—a risky strategy in a world where disruptive organizational frameworks were springing up from competitors.

It seems that digital transitions need to be framed with a future perspective—a compelling depiction of the “north star”—that is as disruptive as the technology doing the disrupting. Such a vision would define the qualities and design features that the digitalized organization will have to successfully

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incorporate to be sustainable and thrive through time. Organizations need to stop trying to crash through the brick wall (see Figure 4). Rather than applying digitalization to bolster today's capabilities in a manner that incrementally changes the status quo, a first priority is to define and get a shared vision of the future organization. With such a vision in place, leaders could then chart a clear but flexible and learning-oriented course to get there. In other words, they needed to apply design thinking (Brown, 2009ⁱ). This is what we set out to do in STARLab2.

Figure 4. Interim Co-Learning Observations



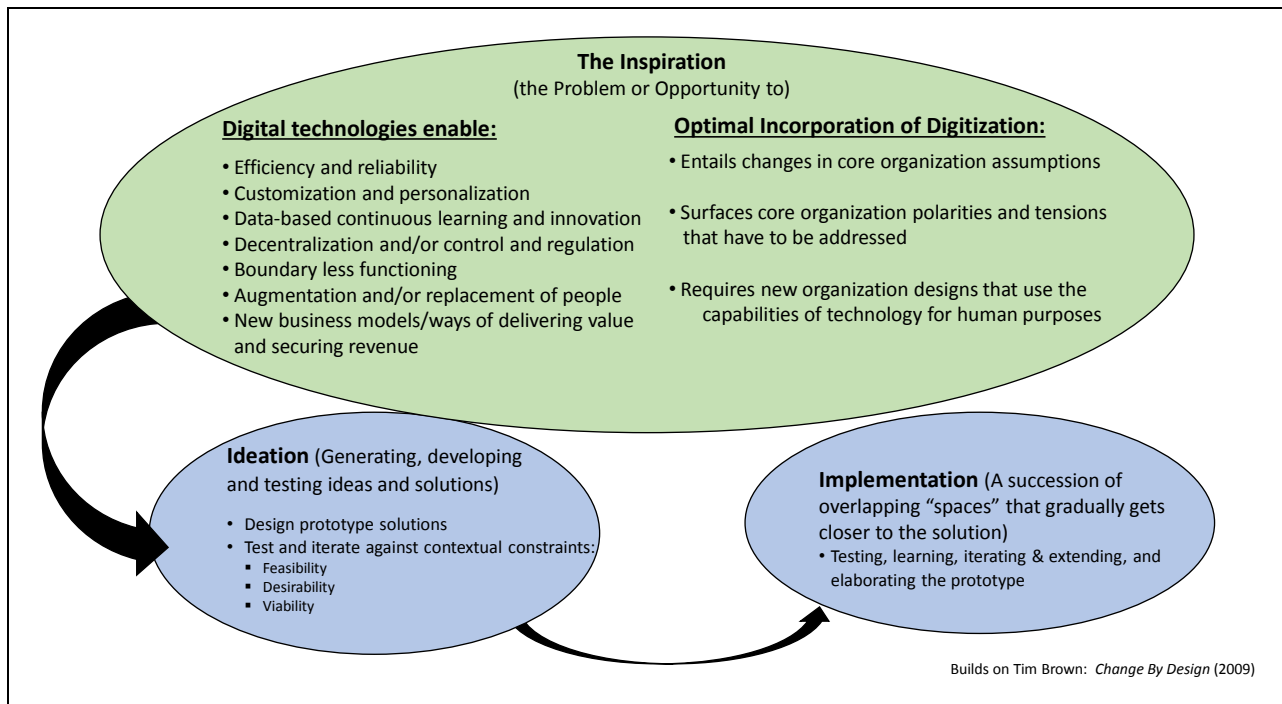
STARLab2 was co-designed with representatives from the participating companies. They wanted to get beyond a transformation approach that was constrained by the status quo, by developing a vision, even if tentative, of where they were heading—of the fundamentally different digitalized organization of the future. STARLab2 would develop prototype frameworks—specifications of the cognitive, behavioral and organizational characteristics of an organization that would optimize the incorporation of technology into how it operated.

"The task should be defined as collectively defining the broad contours of the future organization and then charting a course to get there."

STARLab 2: Designing From the Future

The flow of STARLab2 drew on principles of design thinking first developed at IDEO and through the ongoing work of Tim Brown, the Stanford d.school, and others. Design thinking is a solutions-based approach to solving problems, and provides a process for creative, human centered problem-solving, and for moving through test and learn cycles to solutions implementation and refinement. Figure 5 is a high level view of the lab’s design process, applying the design thinking framework.

Figure 5. The Designing Flow



STARLab2’s problem to be solved—in thinking, the *inspiration*—is to design the future organization that effectively combines human concerns and technological capabilities into new ways of operating that add more value to organizational stakeholders. The ultimate outcome for the company is the development of business and organizational solutions that enable these companies and their employees to thrive and prosper through time as digitalization evolves. In tackling this design challenge, the consortium members took into account what is known about digitalization and its impact on organizations, stakeholders,

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and work systems, and what the companies are learning through their own digitalization experiences. The problem solution will be influenced by a rich amalgam of technological possibilities and of human capabilities, aspirations, beliefs and tensions.

The second lab began with a review of the challenges from STARLab1. Designing activities were then interspersed with companies sharing their progress, their assessments of the speed, quality, and impediments to their transitions, and their learning about the potential technological impacts and benefits on people, work, organization, and value. The lab assumed a rhythm of juxtaposing learnings and design concepts with their real, human journeys and aspirations.

We knew from previous Labs and a growing literature of case studies that organizations are focusing on applying digitalization to different and often multiple performance vectors, including:

- (1) increasing efficiency and reliability of work systems;
- (2) interfacing more effectively with customers and redesigning the ecosystem to deliver increased value to stakeholders; and
- (3) finding new business models that enable the organization to deliver value in new ways.

Practitioner and academic literatures have identified the fundamental impacts that digital technology is having or is expected to have on organizations and work system design. Many of these impacts are captured in the “inspiration” component of Figure 2. To articulate the “inspiration” for the design work, we first turned to the new assumptions that will have to be built into the digitized organization and to addressing some key polarities—tensions between competing value frameworks—that have to be addressed. The challenge would then be to design the organization that would incorporate new assumptions and deal with the polarities to move from the status quo to a future organization governed by different ways of thinking, believing and acting.

Inspiration: Assumptions and Polarities

Sub-groups addressed either assumptions or polarities. Their work was shared, iterated and converged into a set of assumptions and key polarities intended to guide the prototype development stage where they would be asked the following question: “What organizational features will reflect these critical new assumptions and needed positioning along organizational polarities?”

The input to each sub-group was a list of current assumptions or polarities that had been garnered from the coding of the notes and transcriptions of the work of the consortium prior to Lab 2. The group brainstormed, added, edited and deleted, and converged on future assumptions and polarities. Figure 6 and 7 show the major elements of the input and output of this exercise.

Figure 6. Assumptions

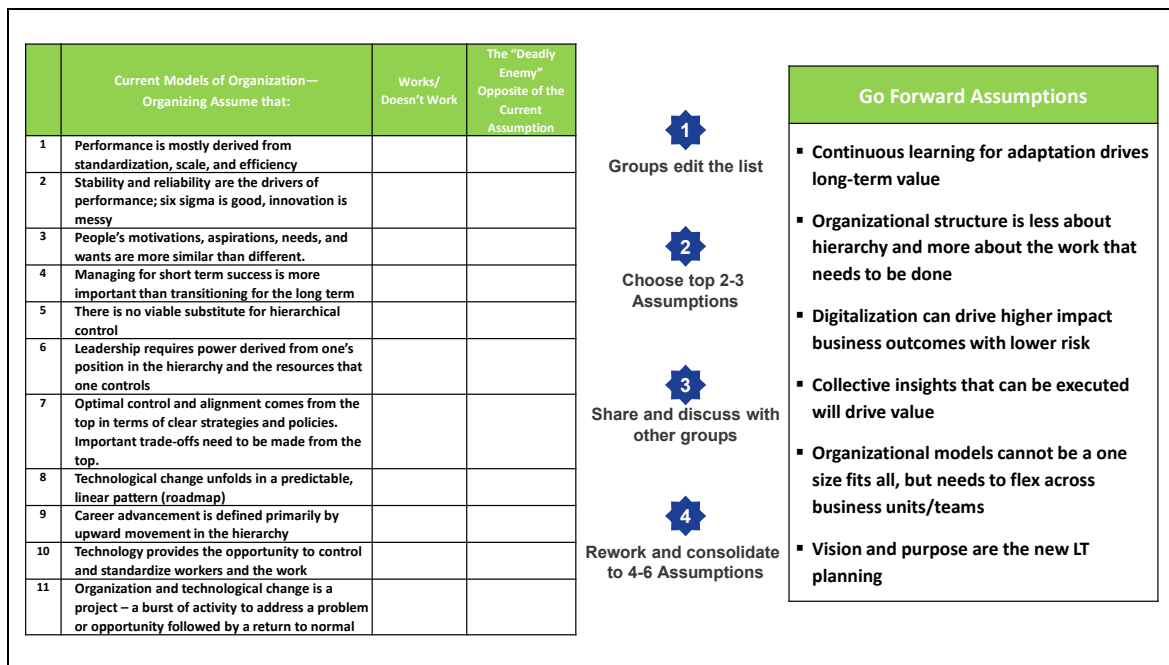
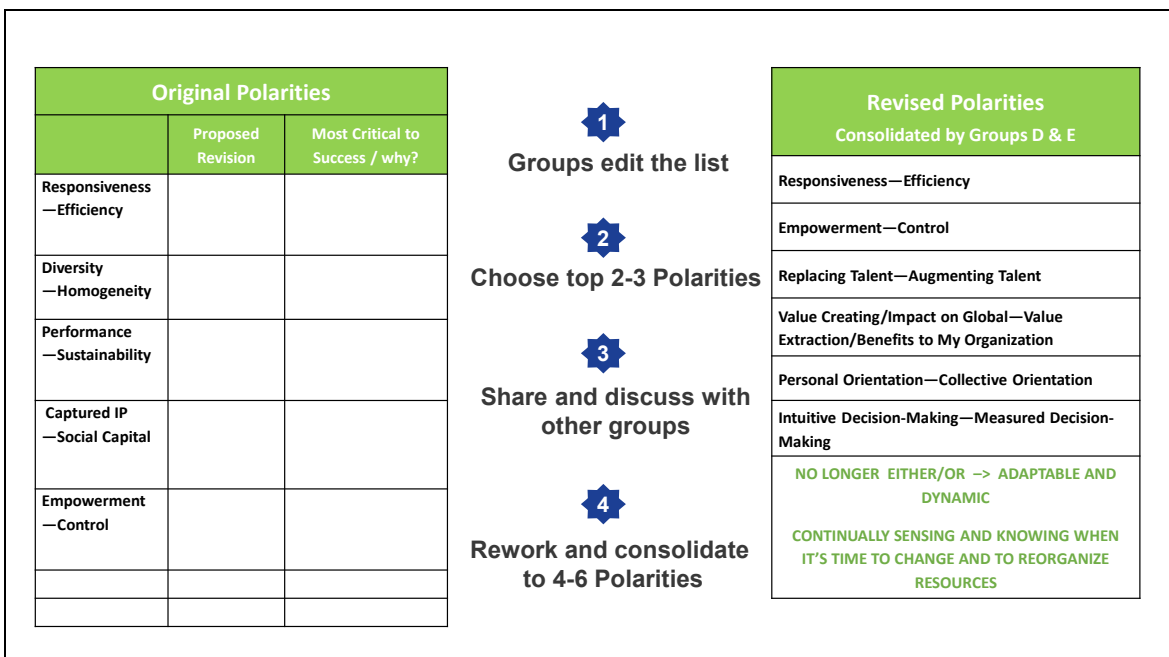


Figure 7. Polarities



Some summary principles emerged during the final plenary discussion of these products:

Aspirational Principles Guiding Organization Design for the Future

- Optimal utilization does not look the same in all organizations or parts of the organization: one size does not fit all.
- Vision and purpose are at the center of long term strategizing.
- Dynamic and adaptable functioning, guided by ongoing sensing and continuous learning, is the core capability and it is increasingly enabled by technological capabilities.
- The value created by the digitalized organization is driven by collective rather than personal/individual orientation and functioning.
- A new balance is required between global, ecosystem level value creation and the extraction of value by the individual organization.
- Dynamic organization structure and operating and management processes will be based on the work that has to be done rather than defined around the hierarchies that are in place.
- Digitalization can help balance the need for measured decision-making and risk reduction with the need to innovate to achieve continuous responsiveness while achieving needed levels of efficiency.
- Designing the new work systems and organization will entail both the augmentation of talent so that it can add more value, and the replacement of talent that can no longer contribute to the organization.

These principles point to the criticality of achieving socio-technical integration, and of creating human-centered organizations. Organizations are human constructions. How they are designed to operate and to address the polarities in the organization impacts the assumptions about effectiveness that people carry around in their minds and hearts, the stake they have in the organization, how they carry out their roles, and the value that they collectively can deliver to different stakeholders. The set of assumptions and polarities were next used as input to the Prototyping phase of the Lab—the *Ideation* phase in design thinking.

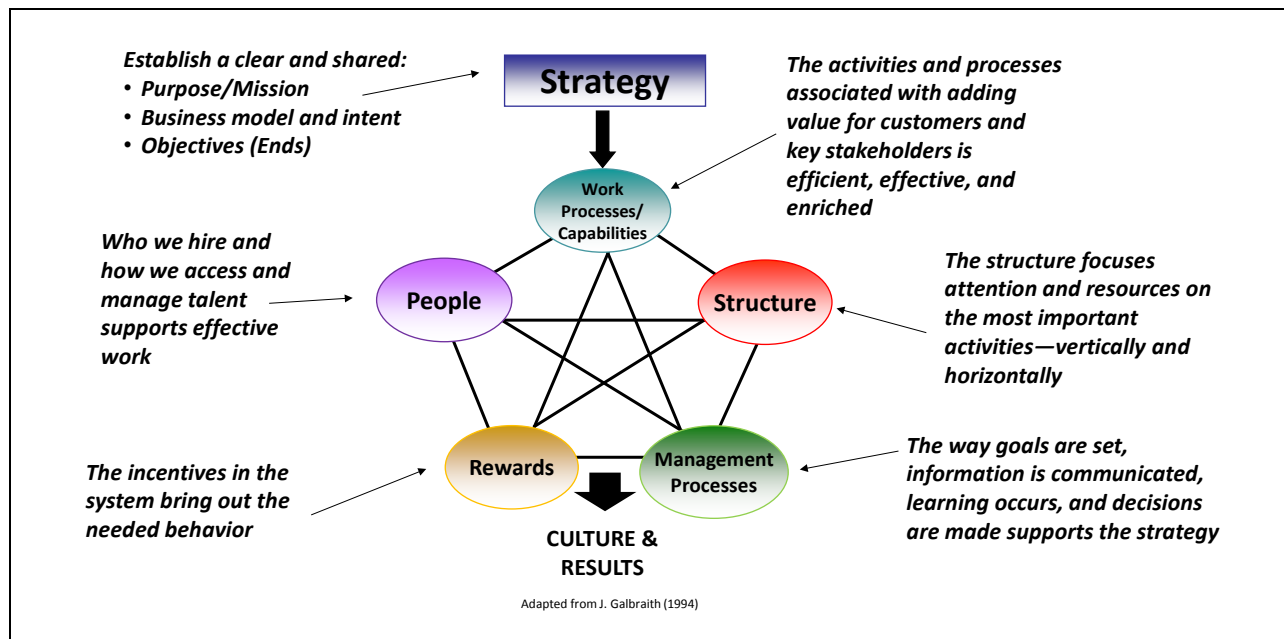
“Organizations are human constructions. How they are designed to operate and to address the polarities in the organization impacts the assumptions about effectiveness that people carry around in their minds and hearts, the stake they have in the organization, how they carry out their roles, and the value that they collectively can deliver to different stakeholders...”

Ideation: Designing the Prototypes.

In the ideation state, STARLab2 participants were explicitly asked *not* to deal with what they needed to do tomorrow to move digitization forward; but rather, to define the organization prototype specifications for the future state. They were asked to be guided by the set of principles derived from having examined assumptions and polarities that reflect where the designers aspire to take the organization.

It had become apparent that many aspects of the existing system “resisted” innovative approaches that would fully integrate digital capabilities into the business and operating models of the company. The ideation work was framed by Jay Galbraith’s STAR model of design (Galbraith 1974ⁱⁱ)—(see Figure 8) to ensure that full organizational system was addressed, and to ensure commonality of approach that would allow for integration of the various prototypes. Galbraith’s STAR was chosen because it was familiar to most of the participants in the collaborative learning lab, a number of whom were already applying it to their work.

Figure 8. How an Organization Achieves High Performance



The coding of the work of the consortium prior to this lab had surfaced a number of core organization capabilities and recurring perspectives on organizational performance that were central to their digital transitions. Four groups each applied a different performance perspective when creating their prototype. Common to all four was the need to integrate technical and social

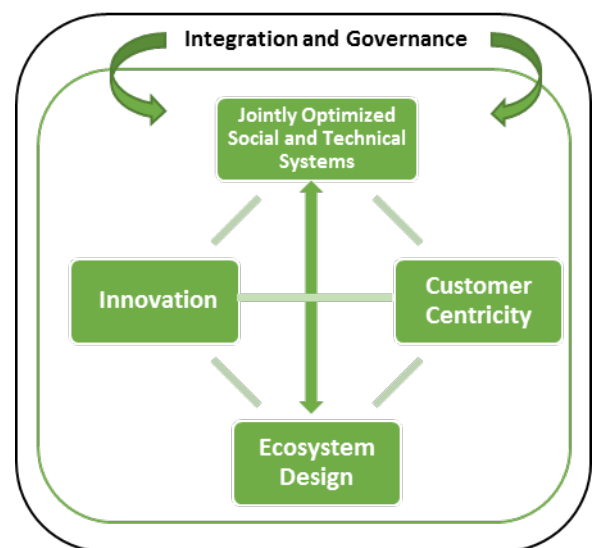
issues. One group focused specifically on this issue, and developed prototype features that specifically looked at what organizational features would underpin this socio-technical integration capability. The other prototyping groups applied one of three specific performance lenses to their prototypes: customer centrality, innovation, or ecosystem level design. These focuses were unequally central to the different companies in the lab, but each appeared to some extent in almost every company's transitions. Four self-selected sub-groups each took one of these four perspectives.

Integration and governance concerns had permeated the conversations in the STARLab. How do we govern and integrate all the different initiatives and projects so that the organization is applying its resources effectively to accelerate learning and transition? This would be an ongoing requirement in a world where technology will enable and demand ongoing organizational evolution. We knew that this would look different in a digitalized organization where networks complement hierarchy and digitalization enables greater and different forms of empowerment. For this reason, all four groups were asked to address system integration and governance approaches (see Figure 9).

Through an iterative process, the four groups shared their prototypes, and then each adjusted their own prototype to reflect what they learned from the other groups. In this way they started to incorporate the multiple simultaneous focuses of digital transitions.

This section briefly describes the prototype design specifications that were developed for each of the four performance scenarios. (We also provide a link to four other papers that delve more deeply into each of the prototypes.) We then examine the commonalities and overarching design principles for socio-technically designed digitalized organizations of the future that emerged from these design activities. Finally, we briefly discuss the implications of this vision of the future for how companies can make the journey to the future state.

Figure 9.
Performance Scenarios for
Organization Prototype Development



Prototype I: Jointly Optimized Social and Technical Work Systems

Organizations are work systems that deliver value to stakeholders. This group wrestled with the reality that powerful new technology enables us to conceptualize and build organizations that operate quite differently from the traditional hierarchical organization. The problem remains of how people will make the digitalized organization work to

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achieve human purposes. In a real sense, this group’s design specifications for how to jointly optimize the social and technical elements of the organization system provides the underpinnings for all other performance scenarios, which face this exact same challenge.

This group specified important attributes of the jointly optimized system (see [Jointly Optimized Prototype](#) report for a more complete version).

Attributes of the Jointly Optimized Digitalized Organization

- A hierarchical leadership structure coexists with a dynamic network structure through which much of the value adding work of the organization is carried out.
 - Leadership has formal responsibility for the overarching vision and strategy, business model, and organizational and work design to deliver value to the organization’s stakeholders, and for enabling and assuring that there is a network of activities that deliver on the value proposition.
 - The dynamic network structure operates within a framework provided by leadership. It is designed to address customer variation, respond to market opportunities and requirements, and continuously learn, innovate and evolve.
 - Governance processes and guidelines link the various elements of the organization to the strategic direction and to enable the empowerment of the elements of full network of activities.
- Decisions are made through dialogic processes that integrate the perspectives of relevant stakeholders, including leadership and network perspectives.
- The organization is driven first and foremost by customer needs. This provides a common focus for the diverse and dispersed activities in the organization.
- Human agency shapes the purpose of the organization and provides the judgement to ensure system alignment. The organizational framework for planning, prioritizing and decision-making includes multi-stakeholder input.
- Digitalization provides the foundational infrastructure for dynamic, databased configuration and reconfiguration of the elements and activities of the organization, and to ensure the movement and processing of information required for effective performance. Common technology and transparent information connects decision makers in the hierarchy and the network. It also provides the mechanism for sensing and connecting with the actors in the environment, and for analysis and interpretation.
- Strategy and organization design are dynamic. Sensing, learning, and adjusting to the environment is built explicitly into the organizational design.
- The rewards and people practices in the organization foster the delivery of value to customers and other stakeholders. Talent management approaches foster the inclusiveness, flexibility, collaboration, and learning and data analytic capabilities that are required to contribute to this digitized organization of the future.

These attributes, which foster the integration of the social and technical aspects of the organization, are increasingly important as technological advances not only enable new ways of delivering value, but also have by default become a dominant force in making decisions about what is good for the people who populate organizations and are impacted by them.

Prototype II: The Customer Centric Organization

Putting the customer at the center is a pillar in all four prototypes. The customer centric prototype group was asked to generate organization design specifications to optimize this performance scenario. Digital technologies allow us to quickly generate insights into customer/consumer behavior, expectations and valued outcomes, and to build a flexible and dynamic customer-centric organization, including the ability to build customer partnerships. Not only will the customer facing part of the organization be organized quite differently to address variation in customer preferences and needs, but the whole value stream will have to be built to support needed variation, flexibility, and responsiveness (see [Customer Centric Prototype](#) report for a more complete version).

Attributes of the Customer Centric Organization

- Design will vary based on the business model (e.g., B2B, B2C/omni channel, multiple customer journeys) and will be iterated through time based on customer sensing.
- A pervasive focus on customer value drives a connected value stream across customer facing units designed for flexibility, responsiveness, personalized experience, speed and convenience and operating units that are designed for efficiency and reliability.
- Connecting the components of the value stream requires end-to-end data analytics and cross-organization processes for prioritization, resource allocation, information flow, and aligned rewards.
- Customer voice is included in all major processes in the organization.
- Integrated data and analytics guides governance, three horizon planning, innovation and decision making. It informs the dynamic evolution of the organization and its work systems.
- People practices extend beyond technical capability and include a focus on diversity, empathy, service, collaboration, and learning. The capacity to work effectively to deliver value to customers depends on using digitalization to augment core human judgement, values and motivations.

Prototype III: Design for Innovation

Adapting to the steady pace of digitalization demands continuous innovation. Digitalization itself is a medium that defines and incorporates fundamentally new ways of innovating. Relevant focuses of innovation extend well beyond products and services to include innovations in the business model—new ways of delivering value to customers and extracting revenue and profit—and in organization and work system design. The design task is to build in an innovation capability to continuously reconfigure strategies, business models, systems, processes and products—knowing that each discontinuous innovation will disrupt the status quo. The organization must enable people to learn to be effective not only in introducing change in the organization, but also in working in a continuously changing context using evolving tools, processes and visions of value delivery. Key design specifications are listed below (see [Innovation Prototype](#) report for a more complete version).

Attributes of the Innovative, Digitalized Organization

- Clear strategy and organization to manage a broad range of innovation at different time horizons. This includes a focus on incremental change that improves the current business model and strategic innovation that reinvents the business model and value strategies.
- A robust innovation strategy, protected allocation of resources for innovation, and orchestration of a networked innovation capability.
- Digital technology platforms provide a basis for internal and external sensing that underpins and guides innovation. Innovation in technology platforms is integral to substantive change in the value stream and work systems of the organization.
- The leadership team is responsible for ambidexterity—simultaneously leading innovation for intentional disruption and for operating excellence.
- The assumption that the context will continue to demand dynamic change underpins this ambidextrous capability, and is a fundamental tenet built into the very definition and reward criteria of leaders.
- A broad range of approaches to innovation are deployed, including through flexible cross functional teams, incubator structures, internal venture processes, and ecosystem collaboration.
- Milestone measurement, innovation outcomes assessment, the success of test-learn-implement—assess cycles, and of scale-up cycles are baked into the management processes of the organization and inherent in its incentive structure.
- Change is a pervasive requirement and capability. People processes stress user focus, new perspectives on the dynamic nature of work and employment, systems thinking, capacity to manage ambiguity, divergent thinking and self-authorship capability to continuously change.

Prototype IV: Digitally Enabled Ecosystem Design

The primary focus of business models and organization design has historically been on the enterprise or business unit, and its ability to optimize the application of its assets to deliver value that yields return to the organization.

Technology has the potential to obliterate boundaries, connecting and giving stakeholders, partners, customers and suppliers visibility to the full value stream. Through open, agile networks connected by powerful platforms, value can be optimized at a broader scale than through each single organization's operations. Navigating an ecosystem design will put unprecedented pressure on people to understand and operate in a much more complex system, deal with ambiguous sources of authority and power dynamics, and make multi-level and multi-organization systems trade-offs in a context of high uncertainty. This group believed that ecosystem organization will be an inevitable outcome of digitalization, because of its capacity to easily move signals, generate data, carry out analytics, learn, foster autonomous activity, interpret dispersed activity and optimize value. Key design specifications are listed below (see [Ecosystem Prototype](#) report for a more complete version).

Attributes of the Digitalized Ecosystem Organization

- One size does not fit all. Ecosystem designs can overlay many component organizations, can separate start-ups, and/or can be centered around a hub company's platform.
- Shared purpose and vision are the bases for ecosystem alignment. Each member also has its own purposes, and needs a clear value proposition for participation in the ecosystem organization. Multi stakeholder governance enables visibility and consideration of shared and multiple purposes, and agreement about the distribution of benefit.
- The network is continuously being co-created by its members through joint governance, co-strategizing, emergent and intentional design changes, and joint innovation.
- The ecosystem is sustained by digitally enabled work processes and transparent data, measures, and analyses.
- There are clear interfaces and decision rights and processes between the members of the ecosystem network.
- Teams, cross-cutting networks and governance forums are the essence of the ecosystem organization.
- Incentives are based on the overall performance of the ecosystem for team and network performance and for overall value produced. Incentives for collaborative ecosystem value creation occur at two levels—internally within companies and across the ecosystem.
- Talent issues are jointly addressed. The network of key contributors are chosen because of collaboration, influencing, and negotiation capabilities.
- Those involved in ecosystem level networks have the skills to simultaneously operate at two levels—considering the ecosystem level outcomes and the outcomes to individual organizations.

Converging on the Socio-technically Integrated Organization for the Digital Era

An important element of the ideation stage was the list of attributes of the digitalized organization (as seen in Figure 5). These came from the literature, including existing case descriptions, as well as from rich discussions among the participants about the impacts they were seeking and beginning to experience in various initiatives. The potential and inherent attributes of this technology were the source of the design problem that had brought us together in a learning community. In this section, we use the attributes of the networked organization that is made possible by advanced digital technology to synthesize the products from the four prototype groups.

The four organizational prototypes may best be understood as socially designed visions of the future digitalized organization. This intentional social design process sought organizational solutions that address the purposes and interests of organizations and people in the face of the technological capabilities that are disrupting the status quo.

As designers, we have to be very cognizant of the nature and logic of this new technology, and how it is different from previous technological transitions. The digitalization transition disrupts many of the foundational assumptions about hierarchy and organization that became embedded in organizations in the industrial and post-industrial eras:

- Digitalization turns work systems into multi-directional communication networks. These networks cut across traditional boundaries through interfaces that connect a large variety of stakeholders and require both coordinated and autonomous activity.
- Behavior in such complex systems is shaped both by purposeful regulation, programing and incentives, and also through the empowered, autonomous actions of individuals and stakeholders. There is a tension between these two modes of influence.
- Because of the prodigious capability in digital networks to gather, interpret, disseminate and be activated by data, digitalized systems are learning systems. Organizations can learn even if their leaders don't. The learning is shaped by the algorithms that are built to process information—algorithms that are the product of people.
- Hubs, the most connected nodes in the network, occupy central positions in the flow of information and impact operations by controlling how knowledge is gathered, processed, and disseminated, who has access to contacts, and the allocation of other resources. These hubs

are as likely to be defined by the natural flow of the work itself as by organizational hierarchy.

- The hubs that exist in the network at one point in time—because of the configuration of activities that are in place—can rapidly be joined by and/or replaced by the emergence of other hubs. This is the source of dynamism in the network.
- Positions, including what we have traditionally thought of as hierarchical leadership positions, will be temporary and minimal. Roles in the system are defined by the work at hand. New roles emerge and existing roles disappear as new focuses emerge to respond to environmental exigencies and market opportunities.
- Time is experienced differently in a digitalized networked organization. Rather than activities being planned and measured in chunks, such as quarterly or yearly results, and careers being seen as orderly progressions through an unchanging archetypical organization concept, the configurations of activities and focuses reflect a continuous flow of work. They will continuously change as strategies and capabilities evolve through time, making the impact of previous standards and ways of doing things meaningful only in a fleeting moment in time.

The potential of the technology is clear. It is so clear the tail is wagging the dog. The design challenge today is how to harness that technology in service of the purposes of people and the needs of natural and human systems. Solving this design problem necessitates the integration of the social purpose and the meaning of work with the technical elements of organizations and their ecosystems.

“The design challenge we face is to harness this technology that carries so much actual and potential disruption in how we think about and enact the organization in service of the purposes of people and the needs of natural and human systems.”

Human agents must be the designers of our emerging socio-technical systems. The design solutions they implement will determine not only the technology that shapes how work is done, but also what aspirations will be addressed, what outcomes will be fostered, and which stakeholders will benefit. Table 1 looks at the prototype through this lens. Our discussion of the elements of this table will intersperse the social and technical features.

Table 1. Comparison of the Socio-Technical Solutions from the Four Design Prototypes

	Jointly Optimized Social & Technical Systems	Customer Centricity	Innovation	Ecosystem Design
Purpose	<ul style="list-style-type: none"> Human agency shapes purpose Leader led Driven by customer need Purposes evolve as customer needs evolve Multi-Stakeholder input 	<ul style="list-style-type: none"> Customer value drives end to end value stream integration 	<ul style="list-style-type: none"> Customer voice in all major processes 	<ul style="list-style-type: none"> Co-developed purpose is the foundation for ecosystem design Ecosystem purpose and purposes of each member co-exist
Dynamic Perspective	<ul style="list-style-type: none"> Dynamic strategy and organization design Strategy is a “living document” 	<ul style="list-style-type: none"> Three horizon planning drives dynamic evolution 	<ul style="list-style-type: none"> Three horizon planning and innovation 	<ul style="list-style-type: none"> Continuous evolution of ecosystem configuration
Variation	<ul style="list-style-type: none"> Global framework, local empowerment for data-based adaptation creates variation 	<ul style="list-style-type: none"> Multiple business models and customer journey frameworks drive variation in customer interface, organization, and in value delivered to customer 	<ul style="list-style-type: none"> Multiple organizational frameworks and focuses for innovation: <ul style="list-style-type: none"> — continual process realignment — ambidexterity; — ventures and spin offs; — business model reconfiguration 	<ul style="list-style-type: none"> Multiple ecosystem logics <ul style="list-style-type: none"> — hub owned platform; — cross company and stakeholder value stream optimization — multiple organization start - ups etc.
Sensing, Learning & Adjusting	<ul style="list-style-type: none"> Digital infrastructure underpins sensing, learning and adjusting; Sensing, learning and adjusting built into the organization’s design 	<ul style="list-style-type: none"> Customer data, analytics and rapid response capability to changes in market trends and customer behavior. Underpinned by digital capabilities 	<ul style="list-style-type: none"> Continuously evolving digital platforms enable integration of real time internal and external data to guide innovation 	<ul style="list-style-type: none"> Shared digitally enabled transparent data and analytics are foundation for ecosystem level sensing, learning and adjusting
Networks and Key Interfaces	<ul style="list-style-type: none"> Between background hierarchy and foreground networks Dialogic processes 	<ul style="list-style-type: none"> Along value stream connections between market facing and operational element Enabled by aligned goals 	<ul style="list-style-type: none"> Cross-functional networked innovation capability Strategic leadership of evolution of organization 	<ul style="list-style-type: none"> Multi-directional, cross-ecosystem teams connected through cross cutting value adding activity networks Governance connections across ecosystem members
Governance	<ul style="list-style-type: none"> Process view: <ul style="list-style-type: none"> — Rapid, transparent flow of information from people closest to the work informs decision making; — Cross-functional, data-based collaboration to build and disseminate meaning to guide local decision making and disseminate decisions across the network 	<ul style="list-style-type: none"> Enabled by data-based management and aligned goals 	<ul style="list-style-type: none"> Leadership team responsible for establishing the discipline of ambidexterity Digital platforms enable portfolio decisions based on strategy, learning, milestones, measures and projections 	<ul style="list-style-type: none"> Co-governance Cross cutting, multi-directional networks and teams contribute to data-based governance of innovation

	Jointly Optimized Social & Technical Systems	Customer Centricity	Innovation	Ecosystem Design
Rewards	<ul style="list-style-type: none"> ▪ Foster delivery of value to customers and other stakeholders ▪ Foster collaboration and inclusiveness 	<ul style="list-style-type: none"> ▪ End to end metrics, including rewards to channel partners ▪ Risk and innovation that benefits customers ▪ One set of customers KPI's drive performance management for all ▪ Based on human experience data 	<ul style="list-style-type: none"> ▪ Assumption of need for dynamic change underpins the reward system ▪ Based on meeting milestones ▪ Intrinsic rewards 	<ul style="list-style-type: none"> ▪ Based on output from the system ▪ Distribution of value is clear ▪ Incentives for risk taking and iterative advances in ecosystem effectiveness ▪ Collaboration, teams and networks rewarded internally and across the ecosystem ▪ Rewards based on framework of defined innovation domains and principles of allocation of value across members
People	<ul style="list-style-type: none"> ▪ Learning, curiosity and flexibility ▪ AI supports assembling of teams, and team decision making and learning 	<ul style="list-style-type: none"> ▪ Digital augments human agency ▪ Person based talent/soft skills vs. technical skill based ▪ Diversity reflects customers ▪ Learners and self-activators 	<ul style="list-style-type: none"> ▪ Ambiguity, user focus, divergent thinking, and self-motivation ▪ Systems thinking ▪ Self-authorship 	<ul style="list-style-type: none"> ▪ Joint capability assessment—decisions about where work goes and build vs. buy ▪ Flexible need based hiring and contracting to address evolving ecosystem requirements ▪ Negotiation, collaboration and influence skills ▪ Joint planning for talent with ecosystem partners

Purpose. All four prototypes address the nexus of human agency and technological capability, and the importance of an overarching purpose to guide organizational evolution toward increasingly digitalized ways of operating. Perhaps reflecting the zeitgeist, they put the customer front and center: the organization should be designed to deliver value to the customer. While the socio-technical integration group emphasizes multi-stakeholder input into organizational purpose, the ecosystem group takes this even further by expanding the purpose beyond the sustainability of the individual company to include enhancing the value created by the full ecosystem of co-acting participants. In ecosystem organizations, participants develop a common work system and integrated digital platforms to achieve that common purpose.

Most importantly, human agents—including leaders, customers, and other stakeholders—are seen to be the definers of purpose and the focus of alignment for the various parts of the organizational system. This at least holds out the possibility that the nature of the organization will be determined with human ends in sight, and not with blind adherence to following a technological imperative to achieve growth and profit. Interestingly, although all the prototype

design groups include in their vision empowerment and the movement of decision making out into the network elements of the organization, none explicitly offers as a purpose to design work systems to make work meaningful and satisfying to people. Nor did they include a purpose of creating the kinds of lifetime progressions for people that allow for a sense of participation and contribution and security amidst technology advances and societal and economic shifts, or the contribution to healthy societies.

Technology-based Organizational Attributes. As captured in the next five rows of the table, the design groups all picked up on five of the principle ways in which organizations will reflect the capabilities made possible by the digital technology. Each raises the fundamental organizational challenge of how to ensure that both human judgement, aspirations and outcomes and technological elegance are addressed.

1. **The dynamic nature of the organization.** All four prototype groups depict continuous change, innovation, and ongoing transformation of the system. This reflects the relative ease with which new digitally based work platforms and products can be designed. It also incorporates the continual innovation requirements driven by the changing expectations and preferences of customers who have become used to digital advances that feed convenience and promote their own agency in society. The digitalized organization will be designed to continuously change, not to be periodically changed.

“The digitalized organization will be designed to continuously change, not to be periodically changed.”
2. **Strategy is a living document,** design is continuously in process, and the organization must be continually planning and introducing changes with a mind to three time horizons. Both the innovation prototype group and the ecosystem group take this one-step further, and acknowledge that the evolution of the organization occurs in and focuses on changing ecosystem capabilities. Again, this raises the question of human agency. All four groups share an assumption that human agents—including organizational and external stakeholders—will provide the signals that guide the organization along an evolutionary pathway.
3. **The increased amount of technical and social variation that the digitalized organization can be designed to accommodate.** The organization design will move away from the mantra that standardization is best and that one size can fit all. Several sources of this variation were mentioned in these prototypes. One is the simultaneous accommodation of global frameworks and local adaptation that becomes

possible as work platforms readily reconfigure in response to data and analytics.

Governance processes must guide trade-offs about what is common and what can vary.

Another is the capacity to adapt to multiple customer journeys through multiple channels and different kinds of customer interfaces. Digitally enabled process variation addresses the need to simultaneously house and make trade-offs among very different kinds of innovation processes and to involve perspectives well beyond those housed in the organization. The ease of data analytics and sharing will enable a complex and dynamic tapestry of activities and relationships across the ecosystem organization that is connected by common digital platforms. For all these sources of variation, there is an underlying assumption that human agency will inform the criteria that guide the trade-offs and learning, and the feedback into company strategy, prioritization, and evolution.

4. **The sensing, learning and adjustment capability that can now be built into the organization.** The prototype design groups emphasize the importance of the digital foundation for rapid sensing, learning and adjustment capability. A digitized organization measures and creates transparent internal and external data to inform responses to market and customer changes, guide priorities and decisions about strategic innovation, and support collaborative ecosystem adjustment and evolution. The groups stress that this capability has to be built into the design of the organization, not simply articulated as goals and strategies. Data and analysis by themselves will not create learning despite the trend toward machine learning. Nevertheless, having a digitally based and network connected data and analytics system greatly increases the capacity of the organization to make both system wide and decentralized trade-offs and decisions. Cross-functional dialogic processes promote coherent strategy and execution, and integrity of organizational identity and purpose.
5. **Designed and emergent networks and interfaces.** Four different kinds of network linkages were salient in the prototypes:
 - a) between the hierarchical elements of the organization and the dynamic network structures that carry out much of the value-adding work of the organization
 - b) along the value stream that allows end to end alignment to address the needs of customers
 - c) cross-functional connections between innovation networks and the operating organization
 - d) cross-ecosystem connections across the networks of cross-cutting value adding activity that enhances the value created by the ecosystem.

Digitalization provides the foundation for and establishes the robust interfaces on which networks will be built. Human judgement and interests activate the connections.

Governance. The prototypes describe a process view of governance. Multi-directional inputs and decisions are made with a transparent flow of information between the people involved in the network of functional and cross-functional value adding activity and those who provide a system wide perspective and direction. Governance is data based, builds on a shared understanding of purpose and strategy, and establishes aligned goals. The innovation group emphasizes the role of leaders in developing and articulating priorities and providing guidance, and in ensuring the organizational discipline to orchestrate successfully the agility required for three-horizon planning and innovation. The ecosystem prototype prescribes co-governance in order to make decisions that acknowledge the requirements of the many cross-cutting activities and organizations required to build a successful ecosystem organization. Digital capabilities provide a critical foundation for the gathering, analyzing, and transparent sharing of information to guide integrated delivery of value. However, the criteria for choices, priorities, and resourcing stem from human judgment, deliberation and purpose.

Rewards and People. The final two rows of the table address rewards and people. These two aspects of the digitalized organization directly link to the social nature of organizations, define the nature of the relationship between workers and the firm and describe the distribution of benefits. The design teams approached these elements largely by describing how rewards and people practices need to change to fit with work systems that will be different because of the technology. They did not set out to think through how digitized work systems will need to be different in order to foster human and societal well-being. Their rewards and incentives specifications focus largely on how to direct people's energies to support and operate effectively in organizations characterized by evolving digitally enabled organization strategies, the network characteristics and the changing definitions of performance described above. Design specifications included the alignment of rewards with delivery of value to customers and other stakeholders, rather than primarily or solely focusing on the extraction of value as manifested in financial performance. Similarly, aligning rewards with contribution to change and innovation as well as collaboration and network performance are seen as important contributions to the evolution of the digitally based business model. These changes focus on *what* is rewarded. Only the ecosystem group addressed the distribution of benefit. They posit that collaborative work across members of the ecosystem to deliver system-level value will demand clear co-developed principles about distribution of value.

Design specifications for people practices focus largely on ensuring that the firm hires and/or develops people with the skills and dispositions required to operate effectively in a digitalized organization. Curiosity, flexibility, soft skills, self-activation, systems thinking, capacity to deal with ambiguity, divergent thinking and negotiation, collaboration skills and the ability to work effectively and make decisions in teams are among the many people characteristics that the groups feel are necessary for success. New process capabilities include the development of AI applications to quickly assemble teams, flexible needs based hiring and contracting, and joint talent planning across the members of the ecosystem. In short, the design groups recognize that organizations will require skills and capabilities well beyond the technical proficiency that has traditionally been the focus of hiring and development. This is ironic precisely because employment increasingly will depend on being able to work in an organizational system designed to benefit from evolving technology.

Constrained by time, the groups did not grapple with the fundamentally changing nature of the relationship between the company and the employees. When people increasingly do work where digital technology augments them, and where roles, priorities, the organizational framework and even the continuity of the employment situation in which they work are changing continuously, there is a need for a point of view. Judgement, trade-offs, collaboration, systems thinking, sensing and continuous learning are becoming the determinants of effective performance. Yet these are in short supply and may require a scope and depth of experience based learning that may not be supported in a world where people move between “gigs”, either within or across organizations. How does an organization navigate this new world in a way that addresses the needs and aspirations of people, and the fundamental sense of cohesion and security that is required in human societies? Are these considerations even being taken into account?

The Task Ahead

STARLab2’s designing activities created four related prototype descriptions of the digitalized organization that move us toward a deeper understanding of the broad parameters of a “north star”. One implication is that the future digitalized organization will be based on new assumptions about organizing, and different resolutions of polarities that are inherent in that process. The transition will require the development of fundamentally different behaviors, capabilities and expectations about employment and careers. A second implication is that without a systemic vision of the future organization, today’s organizations will continue to try to get there through incremental changes to their current designs. The traditional organization will

continue to resist fundamental change because it is designed using significantly different principles and assumptions from those needed to take advantage of the burgeoning technological capabilities of the future.

A third implication is that the gap between the social and technological progression of this transition will continue to widen if the designers of the organization do not recognize the magnitude of change in both arenas, and the criticality of an integrated approach. The social elements of the transition will occur by default and in service of technical optimization if there is not careful and intentional planning to build in human concerns. Either social factors will resist design approaches needed to derive the full benefit from digital technology or technology will define the organization of the future without regard to human well-being. Achieving the needed level of social and technical integration will require moving from broad organizational specifications to a process of testing and learning through implementation. This is the third phase of design thinking, and can be viewed as a gradual learning process with iteration toward the future solution. This phase will happen organization by organization, eco-system by eco-system.

By taking a design thinking approach, and designing from the future, it became clear just how fundamentally different organizations will be in the future, both technically and socially. Technology will, at least theoretically, provide the infrastructure for greatly increased value delivery in organizations whose complexity surpasses the limits of our current hierarchical models of organization. As work systems and organizations take the form of digitally integrated networks, human agency is more important than ever. A critical role of human agency is to ensure that organizations, which are socio-technical systems, evolve in a way that human aspirations and societal needs are addressed.

This need goes far beyond hiring people who are empathetic and have the soft skills necessary to help people adjust to the dynamic and uncertain nature of work in networked organization, work for which they have had little input. Certainly these soft skills are desirable, but they could easily be aimed largely at ameliorating the impacts of technology. Developing a truly socio-technically integrated organization will require much discovery and exploration about how to build the needs of people into the way the networked organization is designed. Discovery and exploration are also needed to design the processes through which decisions are made, innovations are introduced, customer demands are met, benefit is distributed among stakeholders, meaning is created, and learning and evolution are supported. This requires a joint optimization process, considering the inherent logic of technology and the nature of human meaning and motivation. At

this critical juncture, purpose driven, creative design thinking processes must drive the mutual adjustment of the social and the technical.

STARLab2 has painted a framework for the digital organization of the future. The details of what this will actually look like and how to achieve true integration remain as topics for future design labs.

ⁱ Brown, Tim. 2009. Change by Design. New York: Harper Collins.

ⁱⁱ Galbraith JR. 1974. Organization design: an information processing view. *Interfaces* 4(3):28-36.

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The **STARLab Alliance** is a non-profit learning consortium focused on creating next generation organization design and leadership models

The **Digital Organization Design STARLab** is a year-long learning experience that allows participants and subject matter experts to collectively explore and prototype practical and innovative responses to digitalization. STARLab Participants include 3-6 senior leaders from 10 companies, well-into the digital transition of their business models, who will partner with leadership and organization experts. The STARLab accelerates learning and creates organization design solutions that optimize the application of advanced technologies and human capital approaches to achieve agility and sustainable effectiveness.

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