



Advancing a Digital Transformation (DX) Framework for Defense Modernization

Adapting to digital innovation in DoD organizations



Overview

Today's complex operational environment characterized by **rapid technological change** demands responsiveness and innovation to effectively modernize U.S. Department of Defense (DoD) capabilities and to secure competitive military advantage to deter war and protect national security (Department of Defense, 2018)

- To mobilize the resultant changes, it becomes critical to **orchestrate a model to fundamentally reimagine organizational capabilities and mindset** based on the current state of its technology, operations, and culture
- Modernization cannot be successful by integrating digital technologies alone; it must reshape ways in which the DoD **thinks and operates**



#1

2019/2020 Strategic Risk

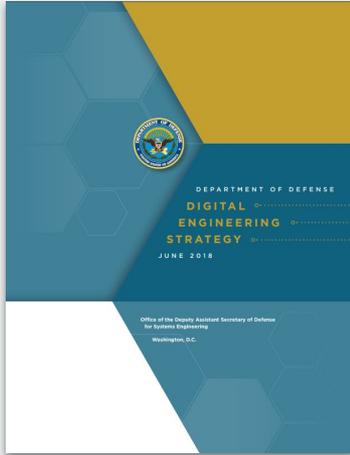
Enterprise Risk Management Initiative

NC State Poole College of Management

“Rapid speed of disruptive innovations enabled by new and emerging technologies (e.g. artificial intelligence, robotics, machine learning, hyperscalable platforms)...may outpace our organization’s ability to compete and/or manage the risk appropriately, without making significant changes to our business model” (Protiviti, 2020, p. 5)

Transformation vs. Born Digital

“Existing operations, legacy IT infrastructure, and insufficient embrace of digital thinking and capabilities may not meet performance expectations related to quality, time to market, cost and innovation...”



Modernization Priorities

1. Artificial Intelligence/ Machine Learning
2. Biotechnology
3. Autonomy
4. Cyber
5. Directed Energy
6. Fully Networked C3
7. Microelectronics
8. Quantum Science and Computing
9. Hypersonics
10. Space

<https://www.cto.mil/modernization-priorities/>

Digital Modernization



Purpose

Advance a digital transformation framework to govern the sociotechnical shift resulting from digital innovation in DoD organizations



Navigate digital disruption

Gain an understand of the strategic capabilities that must be encoded into the organizational DNA in order to storm and summit the digital journey



Rethink leadership and talent

Common picture of a digitally ready workforce and culture to successfully implement and sustain digital transformation



Become a digital organization

Relevant dimensions that need to be cultivated to institute change and deliver technology transformation and digital excellence

Digital transformation

“A process that aims to improve an entity by triggering **significant changes to its properties** through combinations of information, computing, communication, and connectivity technologies.” (Vial, 2019)

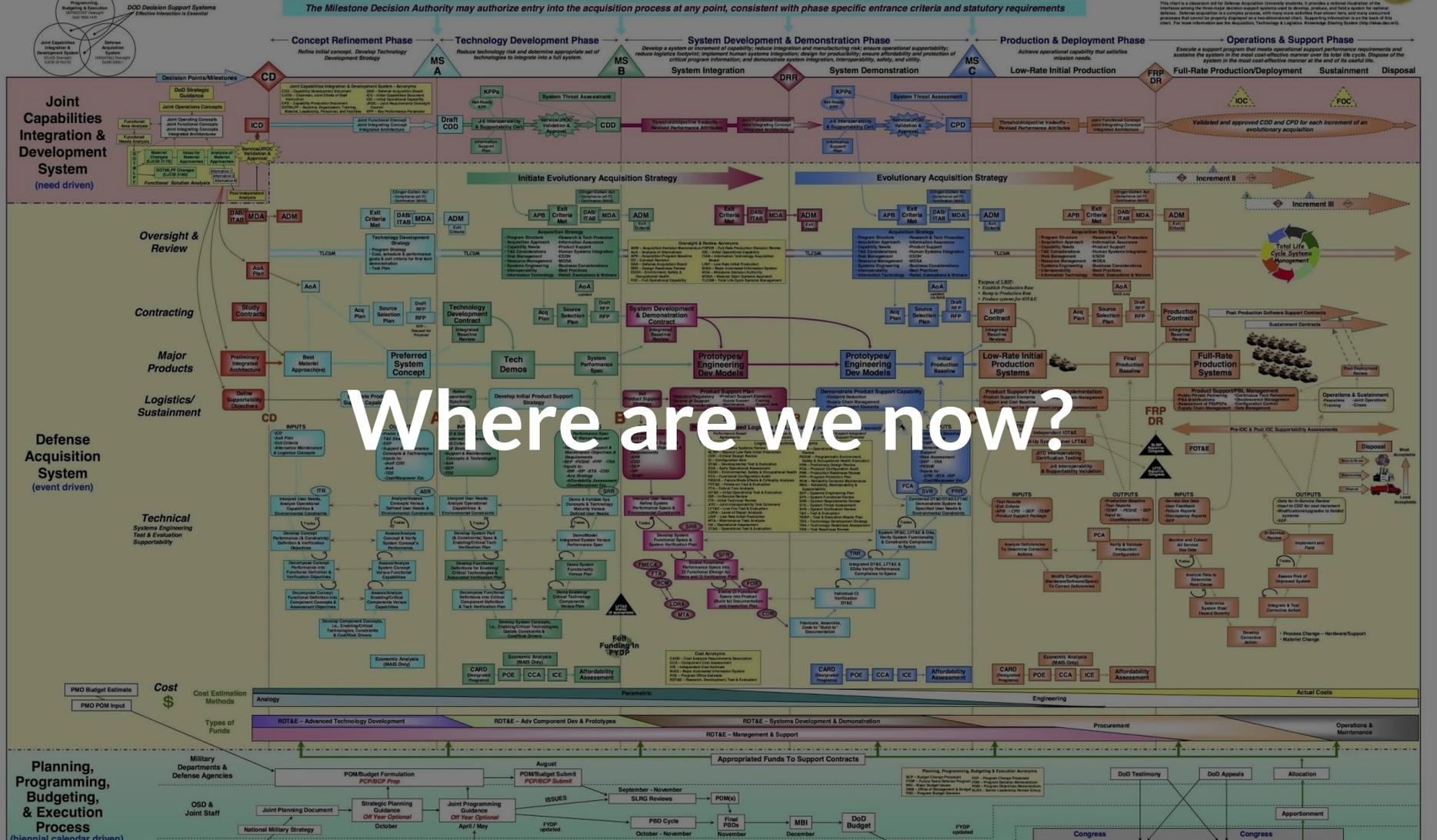
dig·i·ti·za·tion

Process of changing analog information to digital format for use by computer systems
Digitizing a DoD Form for submission

dig·i·tal·i·za·tion

Application of digital technologies to change business model and roles
Using algorithmic software to automate predictive maintenance

At the heart of technology transformation and digital excellence is the ability to deliver digital technologies **quickly, reliably, and safely** (Forsgren, Smith, Humble, & Frazelle, 2019)

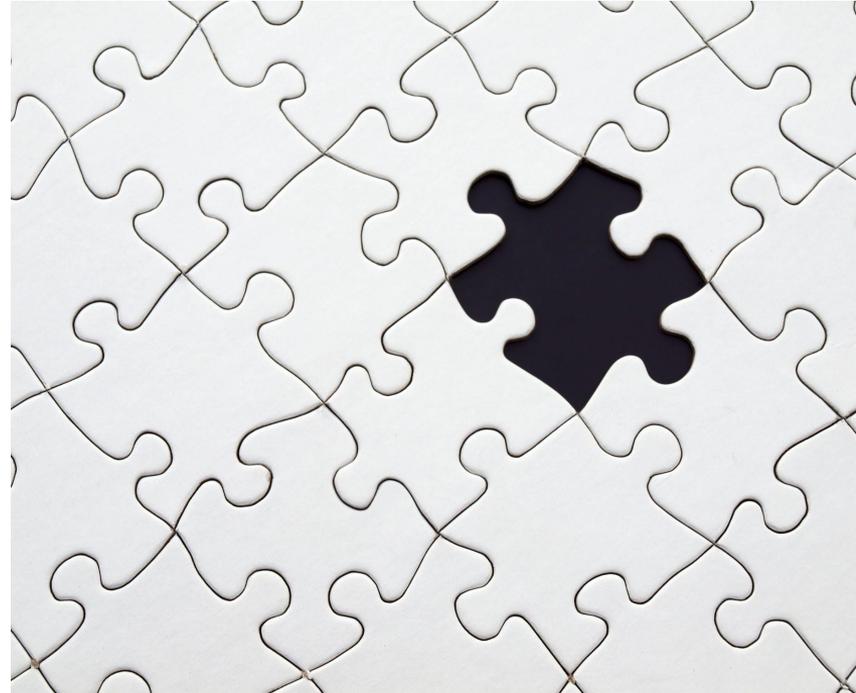




Framing the approach

The approach investigates the relevant capabilities and levers to better understand the implementation of DX initiatives in order to identify a suitable model to enable digital innovation within DoD organizations

- 01 | What key differentiators influence effective implementation and alignment of digital initiatives in DoD organizations?
- 02 | How do DoD organizations shape organizational strategy to accelerate the adoption of digital drivers to modernize capabilities?
- 03 | What aspects of organizational culture are predictive of digital readiness and operational performance?





Organizational Drivers

01

Dynamics capability drivers trace to individual and organizational competencies to harness DX developments and must be embedded into a **strategic framework** for effective implementation and alignment (Mata, Fuerst, & Barney, 1995)

Transformation cannot be achieved by technology alone, it must address: strategy, structures, process, talent, and culture

Digital Maturity

Teichert (2019) provided a systematic review of digital transformation maturity and identified the most common attributes in general models

- Digital culture
- Technology
- Operations & Processes
- Digital Strategy
- Organization
- Digital Skills
- Innovation
- Customer Insight & Experience
- Governance
- Vision
- Digital Ecosystem
- Leadership
- Compliance & Security
- Products & Services
- Business Model



Enabling DX Initiatives

Mhlungu, Chen, & Alkema (2019) identified four statistically significant dimensions of underlying factors of a successful DX initiative

- 01 | Customer Centricity
- 02 | Governance
- 03 | Innovation
- 04 | Resource Attainment

They further confirm that both IT and non-IT leaders perceive these factors similarly

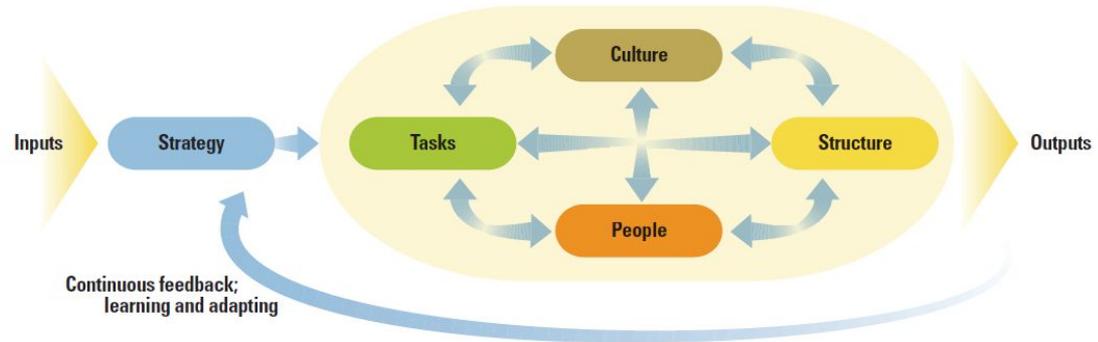
Outcomes provide a digital landscape of technologies providing seamless integration with products, services, operations, and interaction and awareness within organizational communities

- 01 Take a user-centric approach and experiment with new technologies to meet end user needs
- 02 Provide coordination to monitor and benchmark DX progress and reduce silos and disparate processes
- 03 Establish suitable mechanisms to encourage innovation throughput and conceive new models
- 04 Synchronize resource allocation, both human and financial, with the strategy to stimulate progress

Organizational Alignment

Digital congruence: the alignment of culture, people, structure, process with one another and the overarching strategy (Kane et. al., 2016)

“...a conservative and hierarchical organization populated with energetic entrepreneurs may not be able to harness their drive and energy.”



■ Strategy

- Adopt “zoom out/ zoom in” planning
- Communicate both vision and risks
- Integrate digital strategy into corporate strategy
- Learn, innovate–repeat

■ Tasks

- Modularize work where appropriate
- Build stronger relationships with partners
- Organize work around projects, rather than functional silos

■ Culture

- Build risk/failure| tolerance
- Pilot projects rather than large initiatives
- Drive scalable learning
- Hire for culture fit ahead of tech fit

■ People

- Adopt a talent replenishment model
- Rethink traditional models of working (e.g., employee / employer models – adopt “tours of duty”)
- Balance soft and tech skills at all company levels

■ Structure

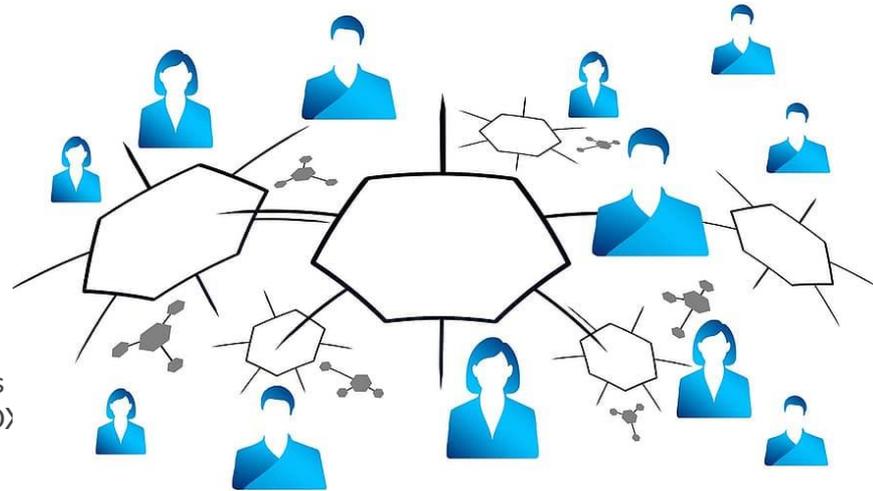
- Build collaborative and distributed leadership
- Define and build out your business ecosystem
- Scale back to scale ahead
- Distribute leadership

Digital Workforce

02

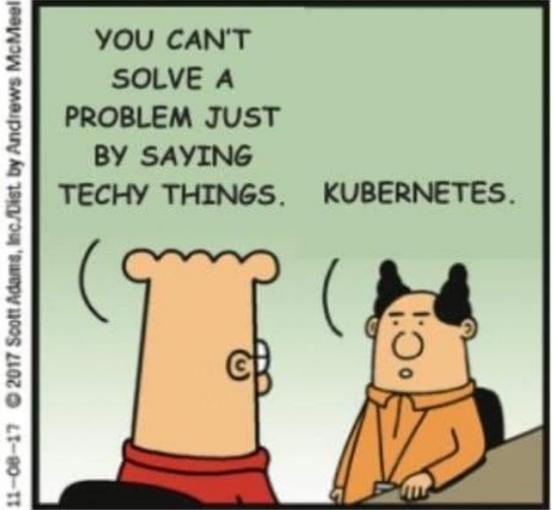
An overwhelming consensus exists on the need and prioritization of **digital skills and expertise**

- A lack of digital skills was noted as the most important and common barrier to DX (Tannou & Westerman, 2012)
- Need for digital leadership and digital empowerment requires development of digital skills to contribute to innovation and DX effectively (Bohmann & Meyer-Blankart, 2015)
- Requires support from senior leaders and executives to embrace values of information transparency, adaptiveness, and resilience (Bharadwaj, Sawy, Pavlou, & Venkatraman, 2013)



“It is your people who will fuel-or-thwart your digital transformation” (Kane et. al., 2019, p. 46)

Synchronizing digital leadership



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Digital Skills

Technical Skills

Importance of **technical skill** development to coordinate activities and reconfigure products and services to address digital disruption (Sousa & Rocha, 2019)

- Information technology
- Data science
- Analytics
- Security

Change Skills

Surveys by Kane et. al. (2016) and Buvet et. al. (2017) found a majority of DX leaders prioritized **change skills** over technology knowledge

- Transformative vision
- Forward-thinking
- Change-oriented mentality
- Creativity and autonomy



Deploying Digital Expertise

DX leaders are more likely to organize via cross-functional teams, which has reported to reduce friction in bureaucratic structures (Kane, 2019)

A heterarchical structure encourages autonomy, self-determination, and collaboration as integral to practices combined with diffusion of leadership tasks and responsibilities based on team dynamics (Burchardt & Maisch, 2019)

Table 1. How to build an innovative digital team

Digital team lever	Challenges with traditional IT team	Effective practices
Diverse and targeted team composition	<ul style="list-style-type: none"> Composition based mostly on functional expertise, not leadership abilities Unaware of others' experiences and motives Same people targeted, resulting in overburdened team members 	<ul style="list-style-type: none"> Create cross-functional teams that extend beyond the IT function, including product design, operations, and consumer behaviorist roles Include team members that are T-shaped, having both deep, functional expertise and the ability to engage with stakeholders across the business Use 'ninja' teams to bring in specific expertise at different points in a project Leverage team workshops before a project starts to build empathy and a common understanding
Iterative goal setting	<ul style="list-style-type: none"> Leaders tend to micro-manage Focus is mostly on incremental improvements Lack of clarity on project vision Low alignment with business strategy Metrics mostly tactical and project-based Traditional annual technology budgeting process not optimal 	<ul style="list-style-type: none"> Practice servant leadership to remove barriers Use stretch goals to go beyond incremental innovation Ensure continuous alignment between project objectives and business strategy Balance self-empowerment with accountability with feedback at critical junctures Pitch for funding over time
Continuous learning	<ul style="list-style-type: none"> User requirements gathered mostly at the beginning of project, not throughout Team members not encouraged to actively challenge assumptions 	<ul style="list-style-type: none"> Gain customer feedback from the outset using design thinking Use gamification to model creative behaviors Establish psychological safe zones for members to take risks and experiment
Talent management	<ul style="list-style-type: none"> Focus is mostly on software training and skills development Project leadership associated with project management versus coaching and mentoring 	<ul style="list-style-type: none"> Establish digital hubs as centers of excellence for agile and design thinking processes Train and mentor digital team members through leadership and onboarding programs Train members on not only agile/design thinking methods, but also leadership behaviors

Four levers of an innovative digital project team (Guinan et. al., 2019)



Digital Culture

03

Shortcomings in culture represents a significant barrier to digital transformation and effectiveness, with notable deficiencies being **siloed mind-sets, risk aversion, and weak customer focus** (Goran, LaBerge, & Srinivasan, 2017; Buvat, et al., 2017)

Developing an inclusive, process-oriented culture fostering communication and collaboration becomes essential to channel **innovation, collaboration, openness, risk-taking, and adaptability** (Fischer, Imgrund, Janiesch, & Winkelmann, 2020)

This defines **who we must be**, i.e. the presence and behaviors of the organization. Nurturing an open-minded culture that promotes these principles is one of the keys to sustaining DX implementation.



Defense News Army Futures

Command is leading a cultural shift, much to the delight of industry

<https://www.defensenews.com/digital-show-dailies/ausa/2019/10/16/army-futures-command-is-leading-a-cultural-shift-much-to-the-delight-of-industry/>



Digital Culture Attributes

"Organizations will struggle to jump start an innovation culture by solely setting up an innovation center without the backing of multiple complementary behaviors, an innovation and collaborative mindset, or partnership approaches to working with start-ups.

A system thinking approach is required to drive cultural changes. This approach hinges on enacting multiple changes at the same time so that the organization develops reinforcing loops of behavior"

Based on the Digital Culture Challenge (Buvat et. al., 2017), digital culture is defined by seven key attributes:

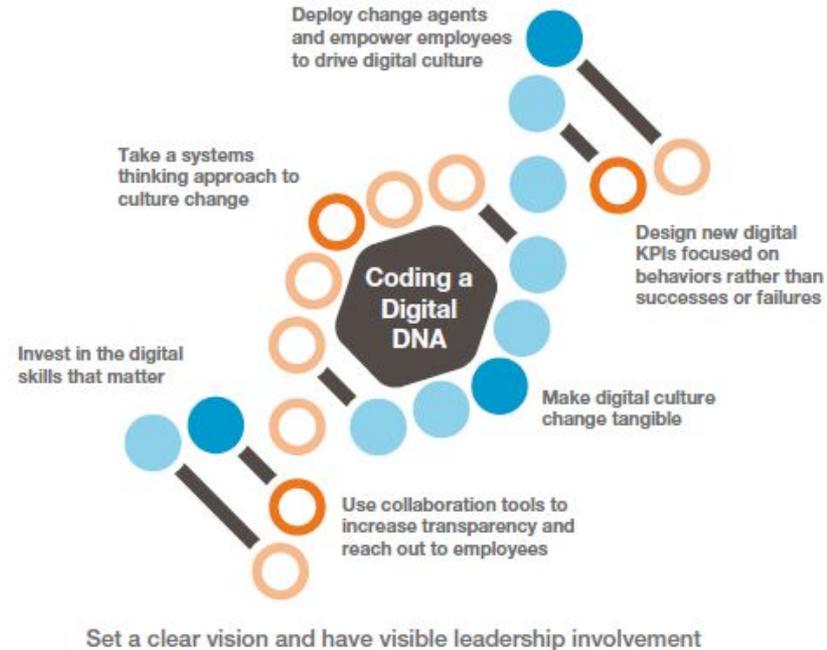
- **Innovation** is the prevalence of behaviors that support risk taking, disruptive thinking, and the exploration of new ideas
- **Data-driven decision-making** harnesses data and analytics to make better business decisions
- **Collaboration** creates cross functional, inter-departmental teams to optimize the enterprise's skills
- **Open culture** influences the extent of partnerships with external networks such as third-party vendors startups or customers
- A **digital first mindset** where digital solutions are the default way forward
- **Agility and flexibility** to optimize the speed and dynamism of decision-making and the ability of the organization to adapt to changing demands and technologies
- **Customer centricity** is the use of digital solutions to expand the customer base, transform the customer experience and co-create new products

Employee centricity connects each attribute, stressing employee engagement and empowerment as a centerpiece

Evolving a digital culture

An optimized culture for information flow, trust, innovation, and risk-sharing is predictive of technology delivery and operational performance (Forsgren, Smith, Humble, & Frazelle, 2019)

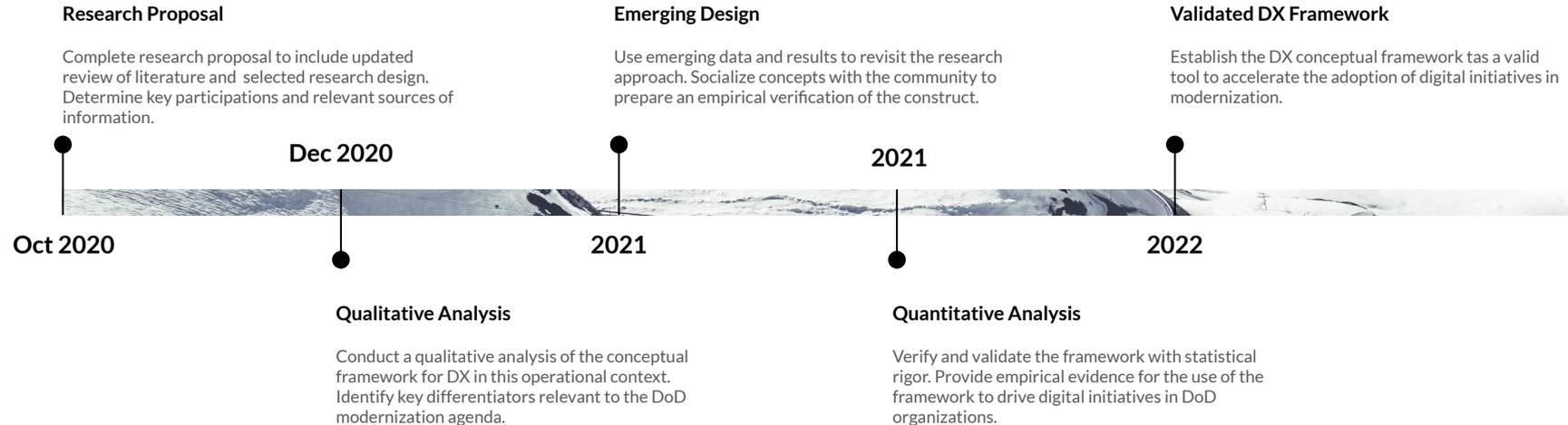
- **Build with, not for.** Deepen integration of the user in design offerings to reduce risk in experimentation and help readily adapt to changes
- **Embrace risk mindfully.** Provide balance between opportunity and risk, requiring a willingness to experiment and adapt through initiative, creativity, and digital thinking
- **Mobilize collaboration and innovation.** Nurture the innovation ecosystem and emphasize a culture of learning, creativity, and collaborative work



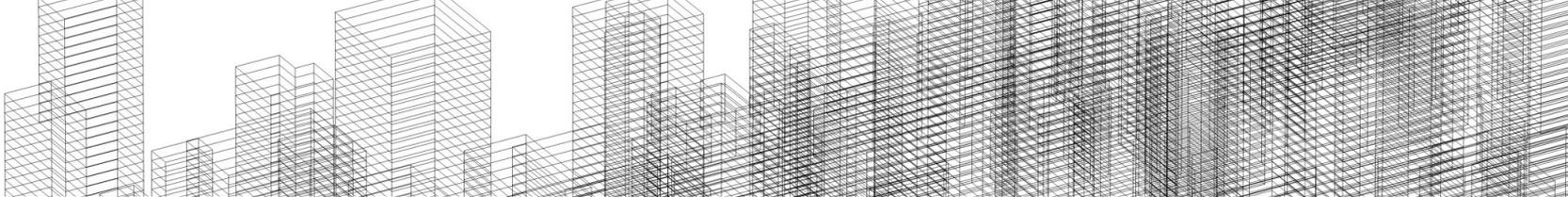
Digital Culture Challenge (Buvat et. al., 2017)



Next Steps



Change management is essential to move forward to improve and modernize our digital culture and engagement



Thank you.

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Innovate. Integrate. Inspire.



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