

WPI

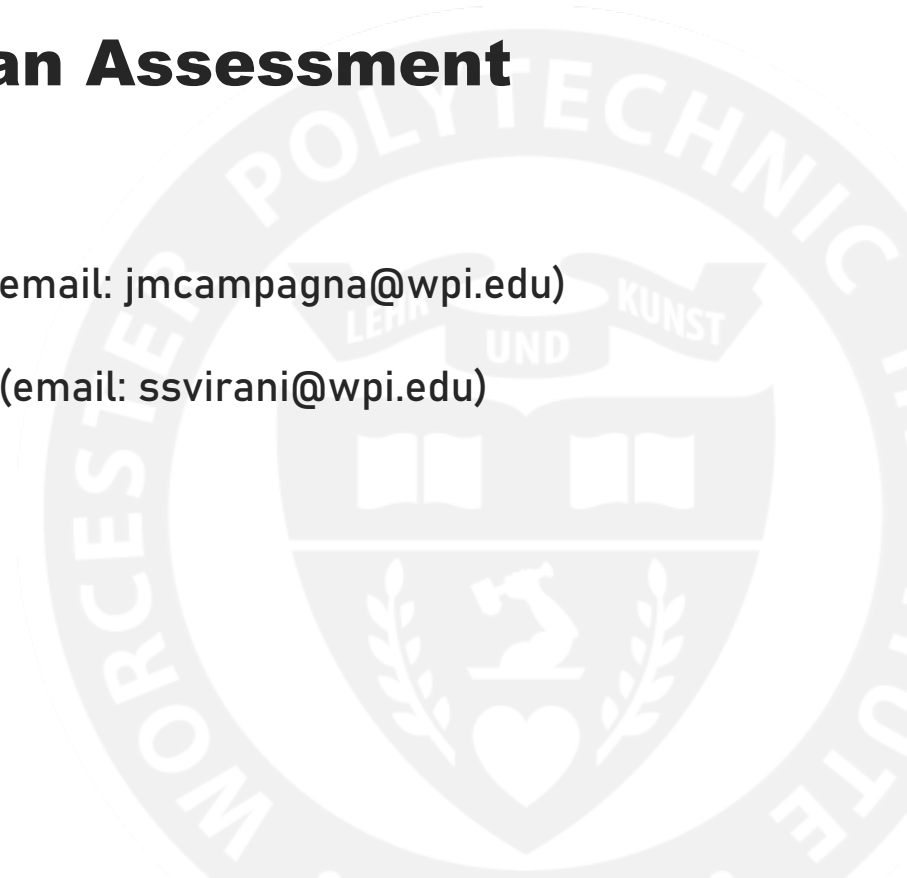
NDIA

Accelerating Digital Transformation using an Assessment Survey of Strategic Adoption Conditions

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26th Annual Systems & Mission Engineering Conference
Forging a New Era: Digital Transformation and DoD
October 16-19, 2023



The Genie is out of the bottle



<https://www.amazon.com/Good-Smile-Disneys-Aladdin-Multicolor/dp/B07L9BYLX8>



Amazon.com search

Campagna, J., The Origins of the Digital Engineering Ecosystem and its place in the Fourth Industrial Revolution, ASEM 2021 International Annual Conference

Change is possible



SUCCESS

“The first U.S. Air Force aircraft designed using the digital approach, the eT-7A Red Hawk, embraced model-based engineering and 3D design tools which reduced assembly hours by 80% and cut software development time in half. The aircraft moved from computer screen to first flight in just 36 months.”

<https://www.af.mil/News/Article-Display/Article/2346441/secaf-unveils-new-eseries-classification-in-nod-to-departments-digital-future/>



SUCCESS

“SpaceX reduced the cost of access to space by a factor of 10.”

Top, Left:
<https://www.floridatoday.com/story/tech/science/space/2016/05/27/spacex-launches-falcon9-rocket-lands-first-stage-atlantic-ocean-drone-ship-thalcom8/85051798/>

Bottom, Left and Quote:
<https://digital.hbs.edu/platform-digital-submission/spacex-enabling-space-exploration-through-data-and-analytics/>

Campagna, J., The Origins of the Digital Engineering Ecosystem and its place in the Fourth Industrial Revolution, ASEM 2021 International Annual Conference

PROBLEM STATEMENT

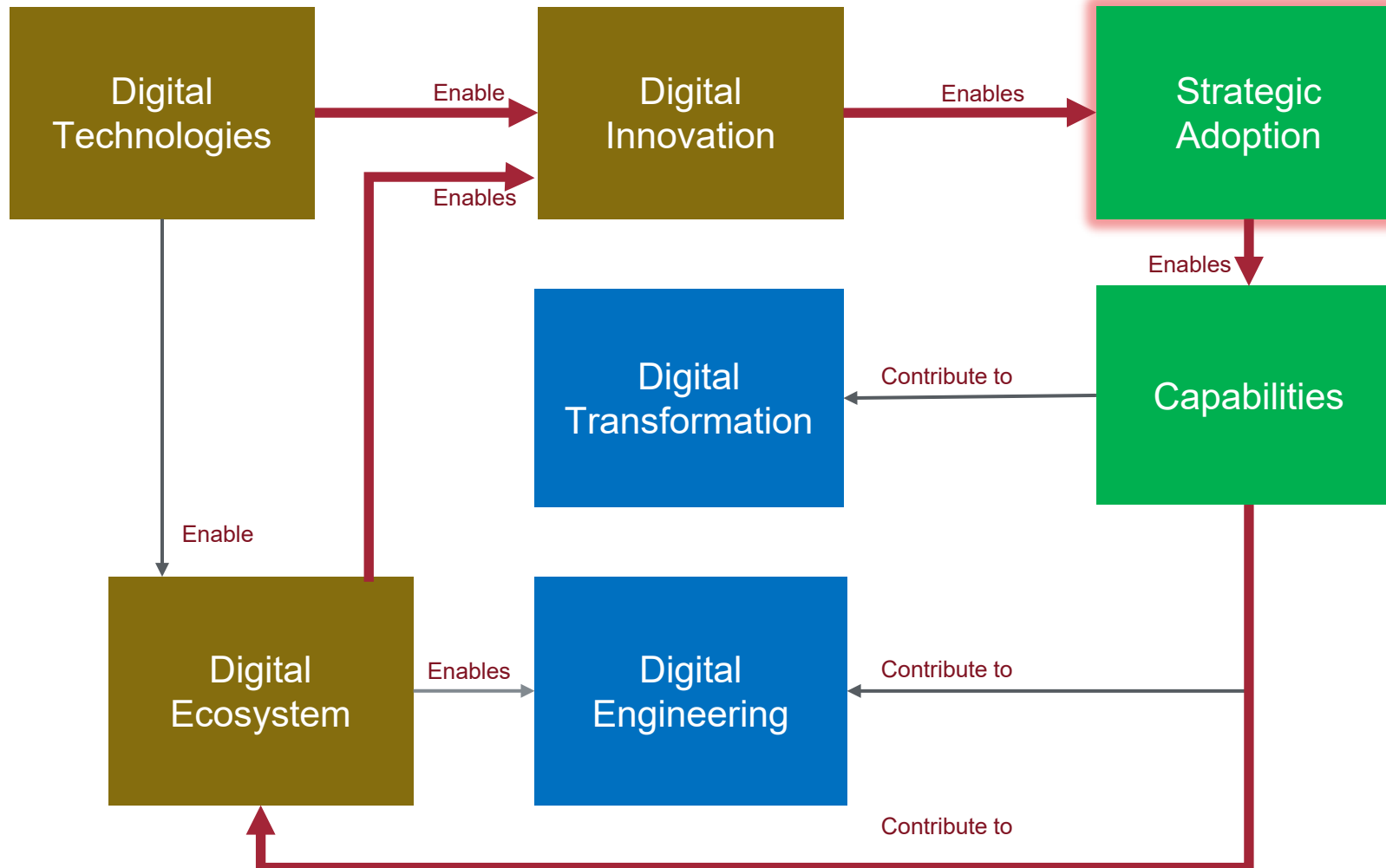
"Random Acts of Digital"

- Deloitte Consulting
Commenting on state of defense industry with respect to Digital Transformation

Background

- Adoption research is very robust spanning over 50 years, yet it has largely focused on a single technology or single innovation
- Digital Transformation requires a strategic approach given the plethora of technology and innovation choices
- We coined the term “Strategic Adoption” to represent adoption that leads to the building of a digital ecosystem for strategic renewal and value (i.e., digital transformation vs. “random acts”)
- This research identifies what is significant in terms of influencing strategic adoption

Digital Transformation Relationships



Unlocking the power of a reinforcing causal loop requires an understanding of the impediments to strategic adoption

*“Technology alone is rarely enough to
create significant benefits.”*

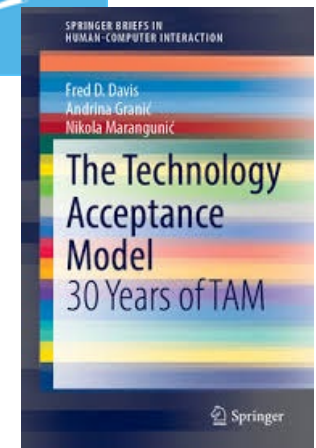
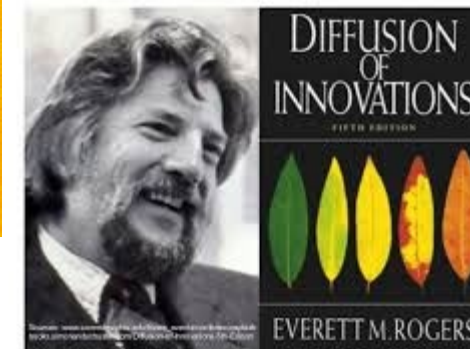
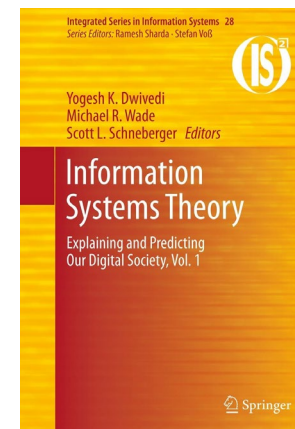
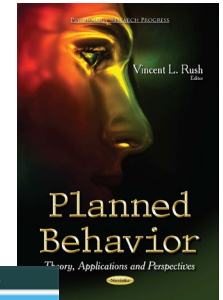
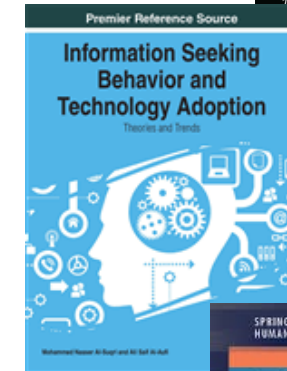
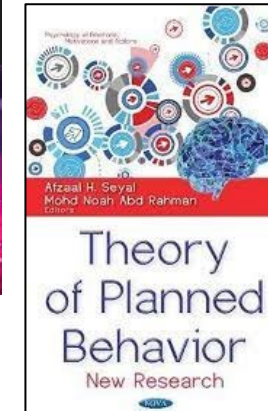
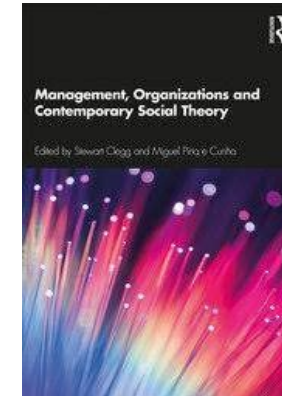
- Georgios Petropoulos & Erik Brynjolfsson (MIT & Stanford researchers)

Research Approach

Examined 24 adoption theories relevant to technology and innovation and 144 unique adoption factors

Established 12 unique **strategic adoption influencers (SAI)**

SAIs are related to Individuals, Organizational Entities, and/or the Environment (external to the entity)



Value to Industry

Research Objective



Identify and Validate Strategic Adoption Influencers (SAI)

- Seeking qualified survey participants to help validate the SAIs

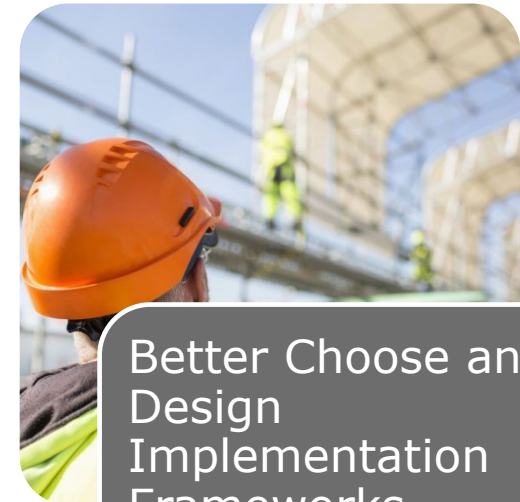
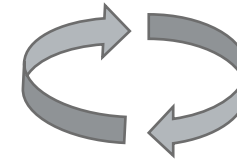


Industry Practice



Utilize Assessment Survey of Strategic Adoption Conditions

- Utilize within your organizational entity
- Manage strategic adoption conditions over time



Better Choose and Design Implementation Frameworks

- Accelerating Digital Transformation!

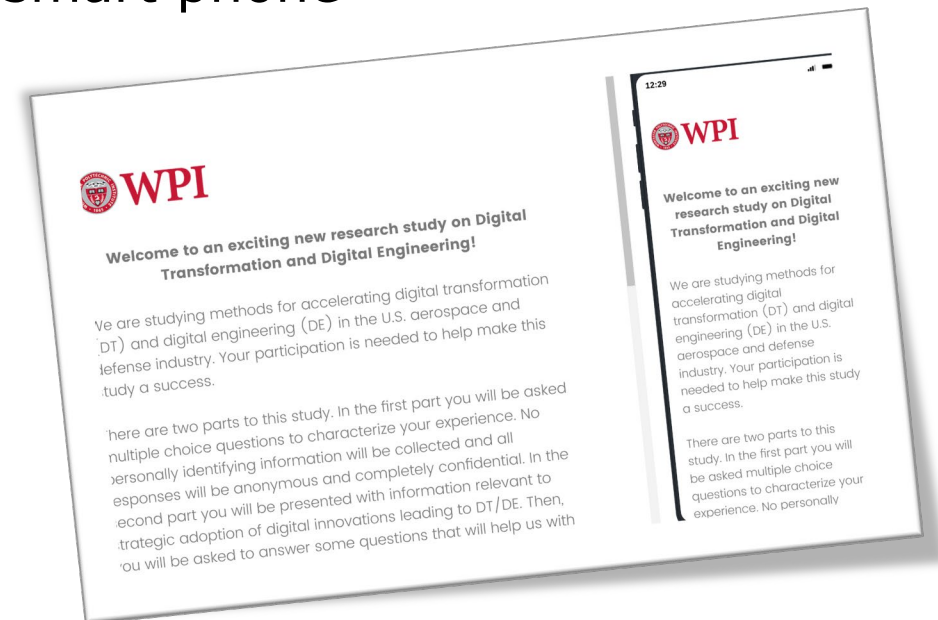
Need your help!

Need survey participants to validate Strategic Adoption Influencers

- Seeking digital transformation and digital engineering professionals in industry and academia
- Focused on those serving the defense industry

About the Survey

- Takes ~15 minutes
- Online – can be done via computer or smart phone



12 Strategic Adoption Influencers

#	Adoption Influencers		Relationship to Entity			Affinitized Adoption Factors
	Affinitized Adoption Factor Category	General question to be answered for each affinitized category	Individual within entity	Entity	Environment external to Entity	
1	Facilitating Conditions	Do conditions exist within the entity that facilitate adoption of DI/DT?		✓		Championship, Change instruments, Change strategies, Coercive forces, Communication channels, Communication processes, Conflict management, Decision processes, Extrinsic motivation, Facilitating conditions, Innovativeness of the decision-making unit, Interactivity, Leadership, Managerial innovativeness, Network centrality, Network density, Owner/family influence, Performance gap, Presence of champions, Resources, Risk-taking culture, Superior's influence, Time, Timeliness, Top management support, Voluntariness of use
2	Perceived Outcome & Value	Do I expect positive outcomes and value from my performance or the capabilities of the entity by adopting DI/DT?	✓	✓		Behavioral beliefs and outcome evaluations, Control beliefs and perceived facilitation, Cost benefit, Data quality, Efficiency, Funding requirement, Job relevance, Job fit, Outcome expectancies, Output quality, Perceived direct benefits, Perceived fee, Perceived financial cost, Perceived usefulness, Perceived value, Performance expectancy, Price value, Relative advantage, Result demonstrability, Task outputs, Time to positive cash flow, Total expected discounted benefits, Value network centrality, Value network density
3	External Pressure & Influence	Do conditions exist outside the entity (in the environment) that influence me or the entity to adopt DI/DT?			✓	Competitive pressures, Consumer readiness, Contracts and agreements, Environmental factors, External variables, Government championship, Government policy, Government regulation, Regulatory environment, Industry adoption, Industry characteristics and market structure, Market structure, Market uncertainty, Market value potential, Maturity of the environment, Mimetic forces, Perceived government pressure, Perceived industry pressure, Regulations and legislations, Regulatory support, Trading partners' readiness

Sample of Digital Transformation Implementation Frameworks

Portfolio Mgmt (PfM)

Lifecycle management for digital solution development



* <https://www.smartsheet.com/phase-gate-process>

Maturity Model (MM)

Assess capabilities and create maturity targets



* <https://acuityppm.com/ppm-101-assess-portfolio-maturity-in-order-to-get-there/>

Strategic Planning and Renewal

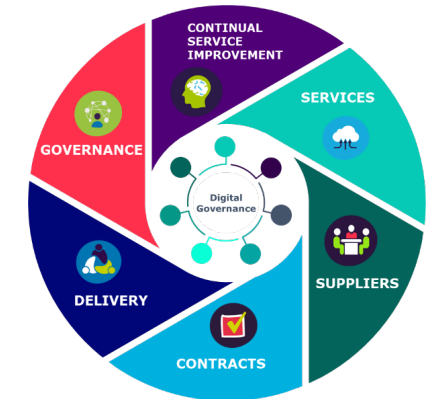
Defines needed capabilities to achieve an organization's vision, mission, and goals



* <https://www.linkedin.com/pulse/facing-strategy-change-claire-wright?articleId=6511212221266296832>

Digital Service Model

Governance around the delivery of digital services



* <https://www.cappemini.com/us-en/insights/expert-perspectives/the-digital-governance-imperative/>

Sample of Digital Transformation Implementation Frameworks

Change Management

Implement strategies for effecting change & helping people to adapt to change

Activity-based Management

Analyze business activities and costs with the intent of aligning to organizational goals

Project Management

Planning, organizing, and managing projects to deliver value

Performance Management

Enhancing and developing human resource performance at work



* <https://change.walkme.com/theories-of-change-management/>



* <https://activitybasedmgmt.wordpress.com/2011/04/02/activity-based-management-abm-and-enterprise-performance-management-epm/>



* <https://www.projectengineer.net/the-five-pmbok-process-groups/>



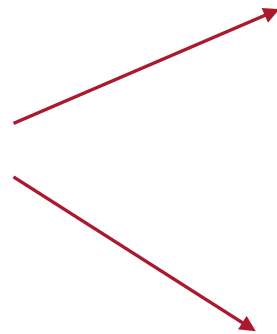
* <https://www.linkedin.com/pulse/total-performance-management-series-article-7-review-event-hughen>

How can this accelerate digital transformation?

- Assessment survey could be used to understand areas of weak strategic adoption conditions in an organization over time
- Implementation frameworks can be evaluated, chosen, and/or designed to improve areas of weakness

Example Area of Weakness:

Perceived Outcome & Value



* <https://www.smartsheet.com/phase-gate-process>



* <https://www.linkedin.com/pulse/total-performance-management-series-article-7-review-event-hughen>



Portfolio Management

Improve Perceived Outcome & Value – Publish catalog of available digital solutions with feedback on its usefulness and ease of implementation; identify ROI from adopting digital solutions

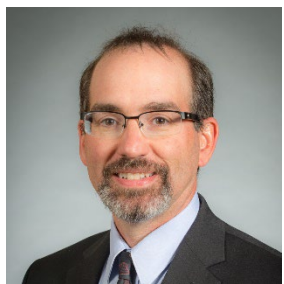
Performance Management

Improve Perceived Outcome and Value - Provide recognition and reward for digital transformation efforts, Provide mentoring and training for new and valued skills, align performance goals

Questions?

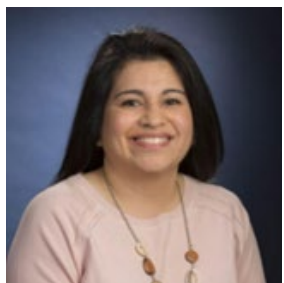


About the Authors



Joseph Campagna is a doctoral candidate at Worcester Polytechnic Institute (WPI) with research interests in Digital Transformation and Digital Engineering. He is also an Associate Director in Systems Engineering at RTX Collins Aerospace. He currently holds a B.S. in Electrical and Computer Engineering from Clarkson University, a M.S. in Systems Engineering from WPI, and a M.B.A. from University of Rhode Island. He has spent much of his career successfully leading complex programs either at the enterprise level or for complex systems development programs. He is a recognized expert in the use of Lean and Agile and is a certified Six Sigma Expert and Program Management Professional (PMP). Prior to joining RTX-Raytheon, Joseph held positions of COO at Knowledge Sciences LLC, Director at BBN/Genuity, AVP at Comverse Network Systems, Director at Boston Technology, Manager at Viewlogic Systems, and Engineer at IBM Corp.

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