SYSTEMIC DIGITAL TRANSFORMATION GOVERNANCE FRAMEWORK: TO PROVIDE HOLISTIC PUBLIC SECTOR DIGITAL SERVICE DEVELOPMENT AND PROVISION

Dr. Samantha Papavasiliou

THE UNIVERSITY of ADELAIDE

The Fifteenth International Conference on Digital Society
ICDS 2021
July 18, 2021 to July 22, 2021 - Nice, France

IARIA

IARIA

Presenter Bio

Samantha Papavasiliou recently received her Doctorate of Philosophy specialising in digital transformation and adoption in the Australian Public Sector. She also holds a Bachelors of Psychological Science (2014) and Bachelors of Social Science with Honours (2015), at the University of Adelaide. In 2017, Samantha completed her Master of Project Management Project Systems, and in 2018 her Master of International Trade and Development, also from the University of Adelaide.

Samantha currently works at the Australian Taxation Office as a Project Manager and Data Analyst focusing on Service Redesign and Digital Transformation. In addition to her teaching role at the University of Adelaide, focusing on Post Graduate Project Management.

Her current focus is on supporting organisations undergoing digital transformations to ensure the transformation is holistic and effective, for the organisation, clients and employees. Samantha's key field of research is understanding digital adoption behaviours in the Australian Public Sector (APS). This includes how to streamline and improve digital service creation, updates and accessibility. Samantha's other areas of interest include behavioural analytics in public sector service design, the application of systems theory to holistically understand the needs and expectations of users and the application of predictive modelling to tailor communications between organisations and users.

Contact: samantha.Papavasiliou@adelaide.edu.au

Current Research

Currently completing research in:

- The impacts of virtual learning on teacher and student engagement:
  - Specifically exploring how to improve digital engagement and student/teacher outcomes.

- Digital transformation in the public sector as an enduring process:
  - Role of innovation and culture.

- Digital health and the impacts on patient centred care:
  - Exploring the implications of digital health provision (e.g., telehealth, virtual consultation) on patients centred care,
  - Understanding the role of digital health platforms as ways to seek medical support.

Introduction

- Technological advances are having ongoing and considerable impacts on how governments provide services

- eGovernment initiatives fail due to lack of understanding of processes, functions and concepts related to digitalization

    - Citizens are primary stakeholders and beneficiaries of eGovernment services, however they are viewed homogenously

- 70% of digital transformations fail due to lack of effective management framework to guide digital transformation (Zobell 2017).

Lecture Aims

- Outline the use of the Systemic Digital Transformation Framework and its application on a case study within an Australian Large Government Agency.

- The lecture will outline;

- Background of digital/eGovernment literature,

- Followed by exploring the systemic digital transformation framework generally.

- Then it will discuss the application of the framework in two scenarios:

- Firstly; through the initial application of the framework to the organisational digital transformation process,

- Secondly; through the application during the 2020 COVID-19 response.

- Finally the outcomes will be discussed.

Literature

eGovernment

- The aim of public sector services is to use appropriate channels in order to create more efficient government services.

- Factors impacting eGovernment services adoption include level of awareness and level of satisfaction related to these services, which is linked to intention to use.

- The aim of eGovernment and digital government services is to provide information and public services to citizens in an easy to access manner that encourages platform participation

- Therefore it is vital that the service users are understood to ensure that the potential barriers and factors predicting adoption are known to service designers and policy makers.

Digital Transformation

- Digital transformation is the process in which an organisation implements digital technologies to either create new services or processes or modify legacy systems (Matt, Hess and Benlian 2015).

Benefits

- Greater Transparency,
- Better communication,
- Efficiency (cost and time),
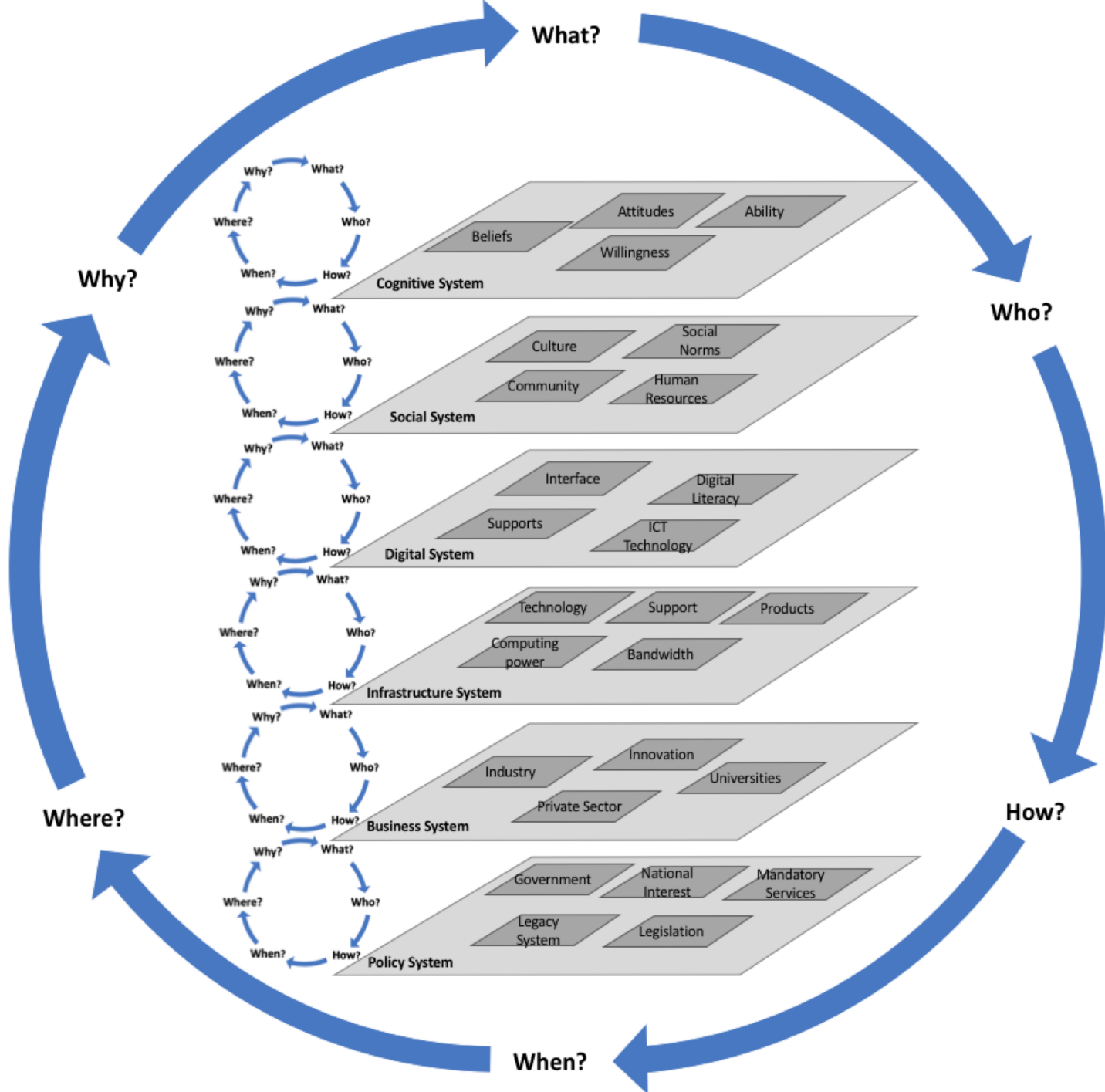- Increased accessibility.

Challenges

- Digital Divide,
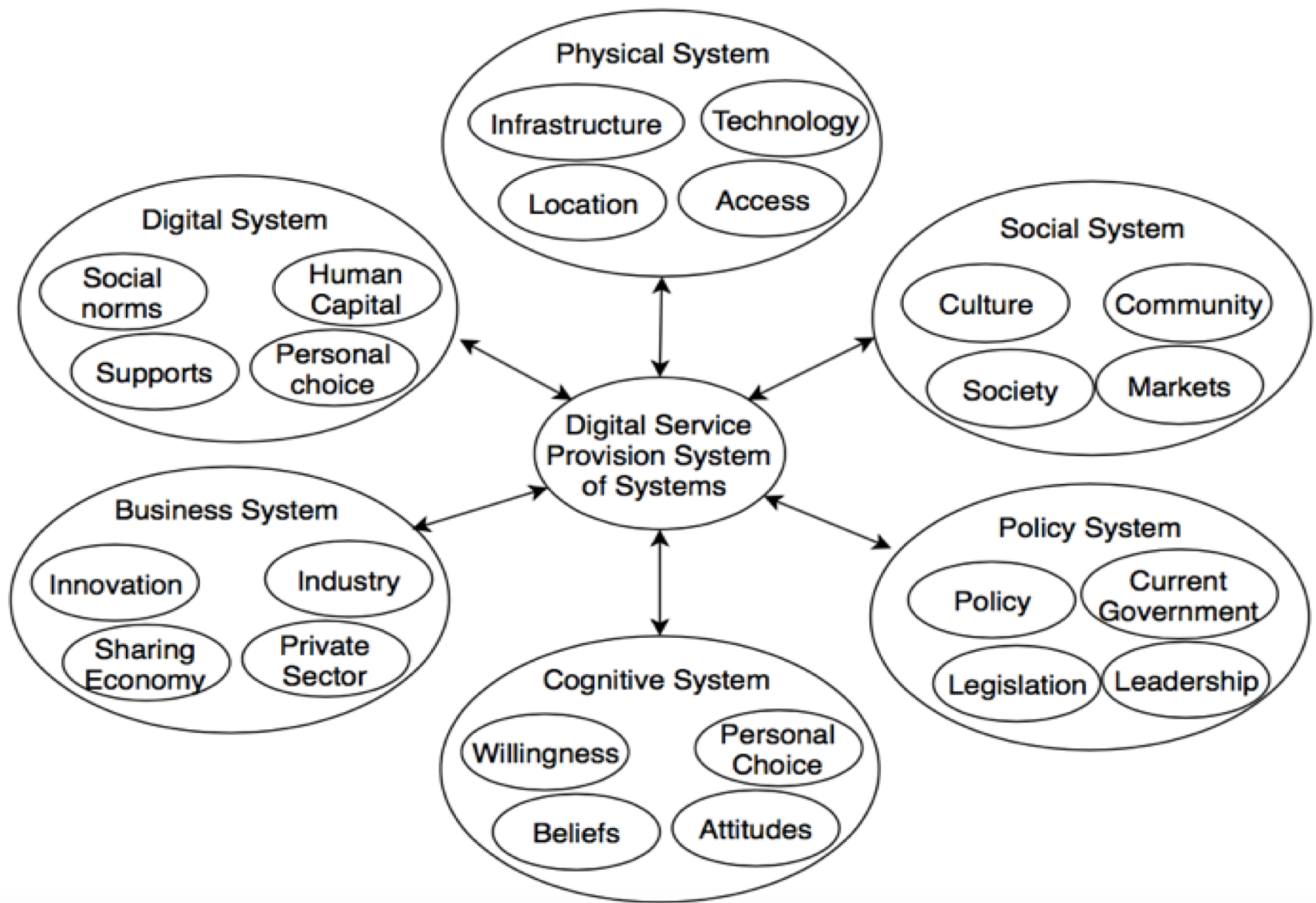- Lack of awareness and trust,
- Issues with security and trust.

Framework

Elements captured within the Framework

- In the previous slide, you saw the overarching framework.
- Now I will explore the different components within the framework to provide context and background. While also supporting the understanding of how they were identified and how they support holistic digital transformation.

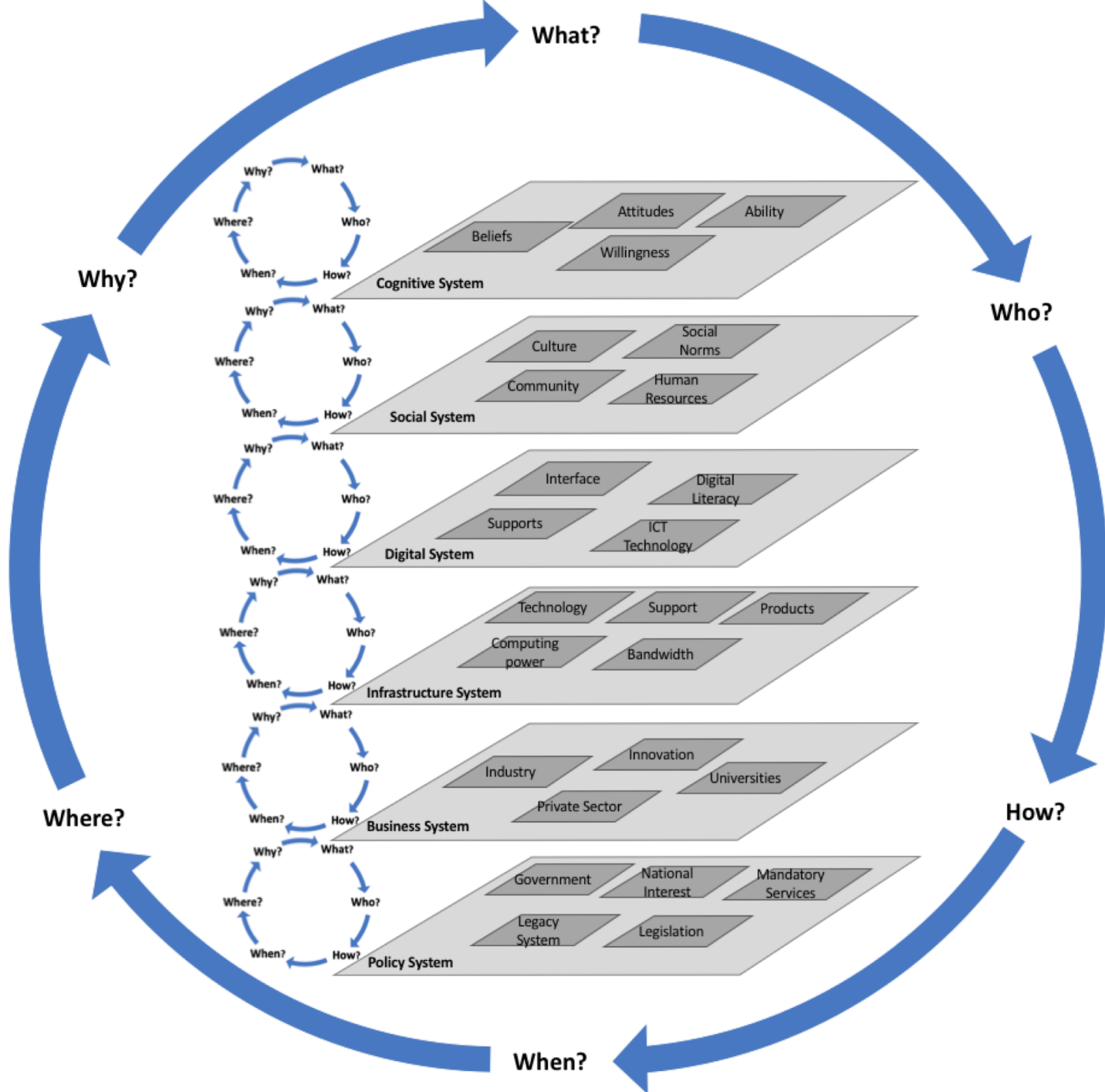| Systems	Comment
Cognitive	A study consisting of 3,990 respondents. Saw 85.6% of respondents (n = 3,414) highlight the impact of different components within the cognitive system (Papavasiliou et al, 2019)
Social	As per Dan (2017) 2,009 people surveyed for a digital innovation in government report, all respondents indicated the role of social factors.
	As per Australian Taxation Office Corporate Perceptions Survey (Colmar Brunton 2017), with 2,157 people surveyed within a 12 month period. All respondents indicated the role of social factors
Digital	A study consisting of 3,990 respondents. Saw 67.7% of respondents (n = 3,062) highlight the impact of different components of the digital system. (Papavasiliou et al, 2019)
Infrastructure	A study consisting of 3,990 respondents. Saw 61.4% of respondents (n = 2,450) highlight the impact of different components of the infrastructure system. (Papavasiliou et al, 2019)
Business	A study consisting of 3,990 respondents. Saw 42.6% of respondents (n = 1,699) highlight the impact of different components of the business system. (Papavasiliou et al, 2019)
Policy	As this research is focusing on eGovernment services, there is underlying role of government and change in policy that needs to be understood when undergoing digital transformation.

Framework Application

- The guidelines for application relates to the questions presented in the next slide.
- These questions were derived from the five W's and H of systems approaches and the basis of enterprise architecture (Hester and Adams, 2014).
- The questions were linked back to the emergent themes, the types of assistance sought by the individuals using digital services, the previous literature and research by the Large Government Agency in Australia.

Development of Questions

Questions	Purpose
What?	These questions highlight the approach and purpose of each constituent system and how they relate to different measures of success, specifically related to the constituent systems and the System of Systems under review.
Who?	These questions outlines the various actors involved, specifically the decision makers, users and service designers and how they relate to the constituent system and the System of Systems under review.
How?	These questions summarise by what means the performance will be measured and actors will be identified and engaged in each constituent system and the System of Systems under review.
When?	These questions highlight at what time performance reviews will occur and feedback provisions will improve the approach and how they relate to the constituent system and the System of Systems under review.
Where?	These questions determine the boundaries of the constituent system and System of Systems under review and where the approach will be located and how that relates to the specific constituent system and the System of Systems under review.
Why?	These questions outline the motivation behind the approach being applied and how it relates to the specific constituent system and the System of Systems under review.

What?	How?	When?	Who?	Where?	Why?
What is the purpose of the system?	How external factors might affect the system?	When do reviews occur?	Who are the stakeholders in this system?	Where in the system is the feedback coming from?	Why is this approach meaningful to stakeholders?
What are the areas in the system that need development?	How well can the approach perform in this system?	When is feedback provided?	Who are the decision makers in the system?	Where are the boundaries of the system?	Why this approach was chosen?
What is the approach?	How is feedback provided?	When is feedback received?	Who is responsible for providing support?	Where are the constituent systems within their respective lifecycles?	
What are the known constraints/risks?	How are the needs being met?	When is change documented?	Who manages risks in this system?	Where are the interfaces between systems?	
What's the role of people?	How management constraints are taken into consideration?	When is system intervention most effective?	Who will use the system?		
What's the role of technology?	How do constituent systems interact with each other?	When interactions between constituent systems occur?	Who defines success measures in this system?		
What are the characteristics of an acceptable solution?	How is emergent behavior documented and observed?	When are legacy components considered?			
What are the measures of success in the system?	How are risks addressed within this system?				
What are the incentives for the constituent systems to belong to the SoS?					

Application to Case Study

Case Study – Large Government Agency

- The framework applied to the Australian Large Government Agency (LGA) was used to highlight how the responses to the questions could be applied to digital transformation.

- The service offer of this LGA was significantly impacted by the COVID-19 Pandemic and numerous natural disasters along Australia's East Cost in 2020.

- Shifting from a compliance organisation to a help and assist.

- As the LGA had already adopted the framework being discussed today, an update on their planning and considerations were required.

- We will be talking through the application of the framework to the COVID-19 pandemic and natural disaster approach.

	Responses related to Digital Services
What?	The creation of digital services to enable clients obtain support, quickly and easily. Fast transformation of legacy services to digital, moving specific forms and capabilities (individual and business) to online platforms. Creation of new online services to provide access to COVID-19 government initiatives. This is the result of legislative changes to support clients impacted through the pandemic to obtain financial support. *In accordance with the digital first 2020 policy. Also a need to ensure legacy systems are maintained, to ensure inclusiveness of services.*
Who?	The 'who' discussed within this section includes the decision-makers within the organisation and across the systems. The users are those who are the primary stakeholders in the digital services provided by government, specifically who the information is provided to, whose expectations are to be met and the actual users of the services. Also the service designers who are those that are deemed responsible for developing the services and undertaking much of the digital transformation process.
How?	The process of how various elements within the process are undertaken in the current state and should be moving forward. Firstly, within the whole system how can the approach perform for each individual system and how does that relate to the systems, e.g. the optimal performance of digital services is long-term adoption (more than one use) of 95% of the population. Meeting the needs of the systems through understanding the various stakeholders, views and goals, however understanding how these can be linked together is poorly documented within the digital transformation process.

	Responses related to Digital Services
When?	The timing of the interactions between the various individual systems and the whole system. Namely understanding how feedback occurs, specifically when the users have a negative or positive experience, at what time do the stakeholders provide feedback and how. When the data is obtained or provided directly to the organisation, when is the data actually used and applied to future changes in the services or assistance provided. *This includes supporting the new legislative changes to support COVID-19 impacted clients.*
Where?	The boundaries of the systems, and how they relate to the digital services and digital transformation in the government space. The majority of transactions and boundaries occur digitally, with the exception of the need for assistance or providing feedback. For much of this system, geographic location is important as it relates to access of infrastructure and digital technology.
Why?	Why the digital transformation has been conducted, specifically how in this circumstance digitalisation occurs as a result of legislation. Furthermore, how government organisations (this LGA) the improvements made to shift digital, can be used to support and assist users with easier to access services Furthermore, how the creation of digital services are more cost effective for government agencies than legacy services.

Responses at Constituent system level (part 1)

	What is the purpose of the system?						
	Cognitive	Social	Digital	Infrastructure	Business	Policy	Whole System
Initial Framework Introduction	Outline the different abilities of individuals (e.g. knowledge), their attitudes towards LGA and digital services, and willingness to adopt the services provided by LGA.	Outline the different communities who are affected and their social and cultural norms (e.g Languages)	Outline the appropriate interface (e.g. platform) and supports (e.g. platform support) provided to ensure they meet the different digital literacy levels.	Identify different infrastructure required (at the lowest level) to ensure the digital transformation is accessible (e.g. bandwidth, ICT availability)	Outline the value for business to use and share digital services, ensure the provided services meet their needs.	Identify the changing legislation, responses to current government and encourage individuals to meet their legislative obligations.	Meet the needs of the stakeholders for each system, ensure that there are appropriate supports and infrastructure in place to encourage the digital transformation and assist with questions.
COVID-19 and Natural Disaster Response	Outline the different needs of the clients, (e.g., what support is required, how quickly do they require it, what information do they need?).	Outline the different communities and the affect that COVID-19 and Natural Disasters have had on them, and prioritise responses (e.g., local council areas, post codes, states).	Outline interface requirements for new services, ensure they are easy to use and find.	Identify alternative options for interactions if digital is not available, ensure the services are consistent across platforms.	Share the value with business, encourage them to see support, engage through different mediums to ensure maximum engagement.	Respond to policy changes quickly, identify the primary elements.	Meet the needs of the stakeholders, utilise an adaptable workforce to shift to priority work, support the mindset of help and support the community.

The responses to this question demonstrates how the different systems have different underlying purposes, highlighting that they are autonomous and not homogeneous.

- However, when they join the whole system they lose elements of their autonomy, shifting their goals to meet the requirements of the systems as a whole.

- Thus demonstrating how the whole is greater than the sum of its parts.

- Therefore, the LGA was able to identify through various stakeholder consultations and engagements the purpose of the system through these different perspectives. The LGA was then able to consider how to best respond to these needs *(detailed discussion to follow in coming slides).*

Responses at Constituent system level (part 2)

	What is the approach?						
	Cognitive	**Social**	**Digital**	**Infrastructure**	**Business**	**Policy**	**Whole System**
Initial Framework Introduction	Increase education, foster an environment of willing participation, ensure transparent decision making in digital services. This includes providing assistance for questions.	Increase information provision, through advertising the value of digital services, appeal to the cultural and linguistically diverse groups	Provide multiple avenues for support to provide available assistance (including call centres, online and in person). Provide a tested platform for the use by different stakeholders	Ensure that the capacity of infrastructure is widely available to users, that these levels are not exceeded when providing and designing services.	Bring value to businesses by meeting their needs and expectations with iterations of service design.	Outline the elements of the policy that need to be address, provide clarity to stakeholders, and implement policy that has minimal negative implications.	Create digital service interfaces that are inclusive and provides multiple avenues for access and support for the various users.
COVID-19 and Natural Disaster Response	Provide easy to understand and access information and support.	Engage with clients across multiple mediums to share what support is available to them.	Utilise multiple avenues for interaction – prioritise digital however have other sources available.	Services must meet the minimum level of infrastructure (e.g., bandwidth, operating systems)	Share the value, engage with business early and maintain support throughout.	Implement the policy quickly.	Create an environment of help and support, encourage clients to seek support and assistance. Adapt the workforce to priorities.

Initial Introduction of Framework Outcomes (Part 1)

Performance criteria	2017-2018	2018-2019	2019-2020
Cost of compliance	Unchanged	Unchanged	2.5% decrease *
Digital – proportion of inbound interactions through digital	88%	89%	91%**
Individual interactions	97%	97%	98%
Business Interactions	82%	85%	88%
Individual Registrations	96%	96%	97%
Business registrations	100%	100%	100%
Payment arrangements	25%	28%	48%

*Target to remain steady
**Target 90%

Initial Introduction of Framework Outcomes (Part 2)

We also saw improvements to:
- **Decreased cost of compliance;**
    - 2.5% decrease from previous year.
- **Improvements to Client Community Confidence survey responses;**
    - 65/100 surveyed indicated a positive and high confidence in the products, information and services provided by the LGA.
- **Decreased complaints associated with digital services provided;**
    - 20% decrease in the number of complaints associated with business as usual services provided and ongoing upgrades.
- **Decreased cost of printing and postage costs;**
    - Cost of postage and print services have decreased to between 1.2% and 3.6% of the operating budget.
- **Ability to respond to the changing environment was improved;**
    - Which will be discussed as part of the COVID-19 response.

Policy introduced when the pandemic was announced to change the role of the LGA to providing access to financial support during the period. As a result:

- Demand for services increased rapidly during this period
- New online services were created in less than 14 days
    - Including supporting information materials
- The workforce was adaptable with many staff members shifted from compliance work to help and assist (e.g., telephony)
    - Training was created and provided within a number of days
- Opening hours of contact centres were increased, including over weekends.
- Engagement and communication regarding the available support was shared through various mediums;
    - Television advertisements,
    - Social Media,
    - News segments,
    - Client level campaigns (e.g., SMS, letters)

Externally:
- 127,000 interactions with the new service during the first day of opening enrolments.
- More than 270,000 logins to online services on top of business as usual demand in the first day.
- Between March and June 3 million calls were answered (more than double the previous years daily average).
- $35 billion dollars in stimulus packages were distributed to clients (between March and June).
- 2.5 million individuals sought early release super payments to support them.

Internally:
- Digital service platform was created for clients to seek support within 2 weeks.
- Over 4,000 employees were temporarily reassigned – trained to perform priority tasks.
- Within 2 weeks 14,500 staff and 1,000 call centre staff were transitioned to work from home.

COVID-19 Response – What was the outcome (part 2):

Using the framework the LGA was able to:
- Understand and respond to different stakeholder expectations
- Provide tailored help and support
    - Utilise data to understand populations or groups most impacted by the natural disasters and/or pandemic and engage staff to support
- Rapidly implement changes in a holistic manner
- Consider the impacts of changes across one area of the system on other systems or groups within it
- Engage the community throughout the pandemic and implement changes as needed
- Implement an adaptable workforce who were able to transfer roles to business critical or priority areas
    - Improved training provided to be tailored to the work and level of employees
    - On the job support increased
    - Changes in level of autonomy and decision making to bottom up

- The responses to this question demonstrates how different approaches are required to respond to the different constituent systems.

- These approaches vary depending on the purpose of the system, the roles and interactions.

- The following approach for the system as a whole, does not incorporate every system level approach, it instead focuses on the meeting the needs and goals of the system as a whole.

Conclusion:

- The Framework creates value for eGovernment through integrating multiple autonomous decentralised systems to bring about effective digital transformation.

- Many of the emergent properties that occur as the by-product of the systems' interactions can be captured within the whole system through the framework.

- The framework offer organisations, digital service designers, and policy makers the ability to obtain more knowledge on how different systems affect digital transformation, allowing them to create more dynamic services and generate higher levels of productivity and preparedness in responding to unforeseen circumstances. However, further research is suggested in different eGoverment settings to validate the framework across various sectors

References

- A. Backlund, "The definition of a system", Kybernetes, vol. 12, pp. 444-451, 2000.

- W. C. Baldwin and B. Sauser, "Modeling the characteristics of system of systems", IEEE International Conference on System of Systems Engineering, June 2009.

- S. Bondar, J.C. HSU, A. Pfouga and J. Stjepandic, "Zachman framework in the agile digital transformation", Transdisciplinary Engineering: A Paradigm Shift, pp. 67-74. 2017.

- Colmar Brunton. "Shaping community beliefs, attitudes and norms". Australian Taxation Office, 2018. https://www.ato.gov.au/About-ATO/Research-and-statistics/In-detail/General-research/Shaping-community-beliefs,-attitudes-and-norms/ 2019

- J. Dan. "Connected Government: The Innovation Dimension". Telstra. 2017.

- T. Field, E. Muller, E. Lau, H. Gadriot-Renard and C. Vergez, "The case for eGovernment: Excerpts from the OECD report "The E-Government Imperative". OECD Journal on Budgeting, vol. 3, pp. 61- 131, 2003.

- D. Fisher, "An emergent perspective on interoperation in system of systems", (CMU/SEI-2006-TR-003), Pittsburgh: PA, Software Engineering Institute, Carnegie Mellon University, 2006.

- J.R. Gil-Garcia, "Exploring eGovernment benefits and success factors". Encyclopedia of Digital Government, Chapter 122, pp. 803- 811, 2007.

- A. Gronlund and T. A. Horan, "Introducing e-gov: history, definitions and issues', Communications of the Association for Information Systems, vol. 15, 2005.

- P.T. Hester and K. M. Adams, "Systemic Thinking: Fundamentals for understanding problems and messes", Springer: New York, 2014.

- C. Matt, T. Hess and A. Benlian, "Digital transformation strategies", Business and Information Systems Engineering, vol. 57, pp. 339-343, 2015.

- J. McGovern, S.W. Ambler, M. Stevens, J. Linn, V. Sharan & E. Jo, *The Practical Guide to Enterprise Architecture*, UK: Prentice-Hall 2003.

- S. Papavasiliou, A. Gorod & Reaiche, C, "A System of Systems Framework for Digital Transformation in eGovernment". System of Systems Engineering Conference. 2020.

- S. Papavasiliou, C. Reaiche, & P, Ricci. "Digital Adoption Strategy: A Public Sector Ecosystem". International Journal on Advances in Internet Technology. 2020.

- J. A. Zachman, "A framework for information systems architecture', IBM Systems Journal, vol. 26, 1987.

- Zobell, S. "Why digital transformations fail: closing the $900 billion hole in enterprise strategy", Forbes, 2018. https://www.forbes.com/sites/forbestechcouncil/2018/03/13/why- digital-transformations-fail-closing-the-900-billion-hole-in-enterprise-strategy/#227ca8597b8b