

# Implementation of the Road Map to Digital Government Transformation (DGT)

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The fundamental purpose of digital transformation is not only to digitise an existing business operation but to re-imagine an entirely different development and business model that habitually places technology at its core. This paper provides guidance on digital transformation and how to re-image entirely different development and business models with technology at their core. This paper proposes the use of an approach that uses a 'Digital Start-up' mentality. We then use our experience with the CARM tool utilising Digital Government Transformation (DGT) as an example to show how digital start-up principles can be beneficial. present the framework for using digital start-up principles concluding with the provision of the road map implementation solution for digital government transformation.

Keywords: Digital start-up, digital government transformation, Road Map Implementation

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## 1. INTRODUCTION

A Digital Start-up is a new agile and nimble organisation designed to search for a sustainable and scalable business model (Green, 2020; Blank and Dorf, 2020). Digital start-ups are a new coalition with unique visions that provide specialised fresh services. They are part of a larger ecosystem, operating autonomously through interoperable processes and operations. As opposed to large organisations with centralised governance bodies, digital start-ups are distributed, self-organising, subject-matter clusters or specie groups that are part of an ecosystem allowing smaller coalitions with common objectives and shared values. Digital start-ups are oriented around results and impacts, enabling agile and rapid development that is less costly to manage, communicate within and govern. Digital start-ups provide a pivotal role to Digital Government Transformation (DGT). Some well-known digital start-ups and ecosystem examples include Uber's distributed logistic network that disrupted the

entire taxi industry and Airbnb's housing value chain that disrupted the traditional hotel sector. The success of both Uber and Airbnb happened in a relatively short period of time and they are essentially technology companies versus the traditional service companies. Digital start-ups and entrepreneurship are the most important driver of economic development (Kraus, Palmer, Kailer, Kallinger and Spitzer, 2019; Nambisan, Wright and Feldman, 2019; Zaheer, Breyer, Dumay and Enjeti, 2019).

## 2. CHALLENGES IN DIGITAL GOVERNMENT TRANSFORMATION

Digital transformation is defined as the application of new digital technologies such as artificial intelligence, blockchain, cloud computing and the Internet of Things (IoT) technologies enabling major business improvements to satisfy different stakeholders, to ensure a sustainable environment, and to create new business streams (Fitzgerald, Kruschwitz, Bonnet and Welch, 2014; Warner and Wager, 2019).

Liu, Chen and Chou (2011) characterised digital transformation as an organisational change that incorporates

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digital technologies and business processes in a digital economy. Rogers (2016) wrote that “digital transformation is fundamentally not about technology, but about strategy,” meaning that it is necessary to develop innovative digital transformation models that optimise financial interests of shareholders, satisfy different stakeholders’ needs and expectations, improve the efficiencies of internal business processes, and facilitate learning, innovation and growth within organisations, industries and sectors.

Common issues to be addressed by DGT are:

- 1) Inconsistent business processes.
- 2) Duplicated ICT systems.
- 3) Reliance on off-systems tools.
- 4) Existing systems not providing a timely and accurate business report as required.
- 5) Limited system capability to support operations.
- 6) Risk of business failures due to essential software no longer being supported by vendors.
- 7) Lacking end-to-end visibility and transparency.
- 8) Inflexibility in adapting leading practice or data migration.
- 9) The requirement for significant resources and manual effort to validate, reconcile and govern data and processes across hundreds of ICT systems and off-systems tools.
- 10) Inability to implement compliance with agreed government recommendations.

Common questions surrounding the implementation of DGT are:

- 1) Is there a method or a best practice that is available to apply directly to DGT?
- 2) Is there a best method for the DGT road implementation?
- 3) What are the benefits or targets that can be achieved through DGT?
- 4) What is a start-up project and why is it the best for DGT?
- 5) How can technology transformation be integrated with *business* transformation?
- 6) How can technology transformation be integrated with the *culture* transformation?
- 7) How can we ensure that DGT is achieved?
- 8) What are the challenges in DGT implementation?
- 9) How can stakeholders’ needs be addressed in the DGT?
- 10) How can the DGT implementation maturity be measured?

The essential digital transformation will result in:

- 1) Creating a unique, single trustworthy source of organisation data;
- 2) Responding to business, customer or citizen needs using quality information;
- 3) Improving human performance and organisation capability through artificial intelligence; and
- 4) Informing preparing and providing staff with timely information and trustworthy technologies.

### 3. THE ROAD MAP FOR DIGITAL GOVERNMENT TRANSFORMATION (DGT)

A ‘road map’, in this context, is defined as a guide to follow and reach the destination with success (Daim and Oliver, 2008). It usually includes three specific phases, namely defining the current situation, specifying where they want to be, and developing a road map that will lead from where they are now to where they want to be. The road map process addresses the identification, selection, acquisition, development, exploitation and protection of technologies (product, process and service) needed to achieve, maintain and grow a desirable position and performance matching with the related sector’s objectives (Toro-Jarrín, Ponce-Jaramillo and Guemes-Castorena, 2016).

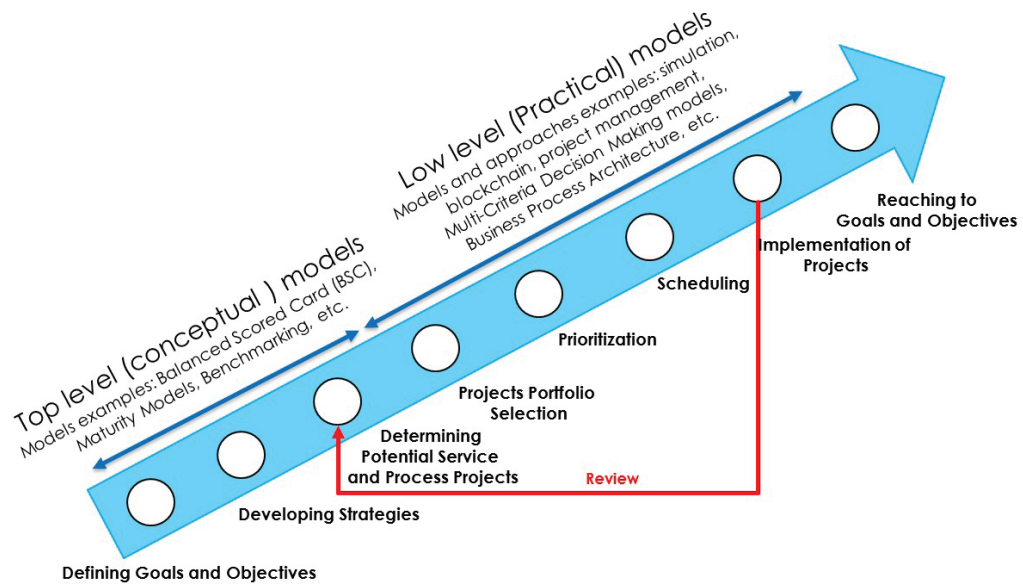
The key steps of the road map are as follows:

- (1) Defining the goals and objectives for DGT
- (2) Developing strategies to achieve those goals and objectives
- (3) Determining potential projects for business services and processes improvement
- (4) Eliciting the projects through innovation, competition and benefit portfolio
- (5) Prioritising the return on investments for key impact projects
- (6) Scheduling short-term and long-term digital service delivery
- (7) Implementing the project and performing benefit evaluation
- (8) Reaching the goals and objectives through maturity measurement

The road map of any digital transformation project should allow for setting strategic goals and identifying the potential of new technologies, products and services (Vishnevskiy, Karasev and Meissner, 2016).

Sarvari, Ustundag, Cevikcan, Kaya and Cebi (2018) proposed a technology road map for Industry 4.0 and digital transformation of organisations. Their proposed road map for digital transformation is applied and customised here, in Figure 1, for the Defence sector.

As can be seen in Figure 1, the proposed road map has the following steps:



**Figure 1** The road map for digital government transformation

- 1) **Defining Goals and Objectives:** In this step, the goals and objectives for digital transformation of Defence are identified. The objectives for digitalisation of Defence are clearly identified. What features are expected from the digitalised Defence? Goals and objectives can be sought using the available models and frameworks in collaboration with Defence experts.
- 2) **Developing Strategies:** Strategies clarify what has to be done to achieve the desired outcome (Osterwalder and Pigneur, 2010). A strategy outlines where an industry/sector is, where it needs to go, and how to direct it there. To develop a proper strategy for Defence, evaluation of its digital maturity is required, clear targets set in order to achieve the highest levels of maturity and reach to the objectives of Defence digital transformation. Evaluating the maturity level of all processes, services and sections of Defence can help identify what the current situation, strengths, inefficiencies and infrastructures of Defence are, and which systems and processes are needed to get Defence to the desired point. The focus should be beyond the technical details and consider the impacts of Defence digital transformation on its internal stakeholders such as employees as well as external stakeholders such as clients, suppliers, the public sector and technology partners. However, in the process of developing strategies, we should be aware of new and emerging technology as these technologies have important impacts on strategy development (Sarvari et al., 2018).
- 3) **Determining Potential Service and Process Projects:** In this step, the potential projects for digitalising services and processes of Defence are determined. This step needs collaboration with experts from Defence.
- 4) **Project Portfolio Selection:** Among the potential projects, the required projects that are more feasible, less costly, less risky and more productive in achieving the

digitalisation of Defence are selected. This step also needs collaboration with experts from Defence.

- 5) **Prioritisation:** In this step, projects are prioritised based on the benefits of the target processes and services and the sequence that projects need to be implemented to reach the objectives of the Defence digital transformation.
- 6) **Scheduling:** In this step, milestones and project statuses are defined. Project management skills are one of the critical requirements. The output of this stage is a timely, ordered and multi-perspective map of the overall approach towards the digitalised Defence. Using the scheduling output, the strategic frame for concrete actions can be built.
- 7) **Implementation of the Projects:** Projects are implemented according to scheduling pertaining to the objectives of the project. Project management is a critical skill required in this step.
- 8) **Reaching the Goals and Objectives:** The final step of the road map is to utilise the maturity model to measure the success of the digital transformation.

#### 4. THE METHOD FOR THE DGT ROAD MAP IMPLEMENTATION

The DGT Road Map implementation methodology is driven by the concept of digital start-up projects.

The concept of digital start-up projects is inherited from the concept of “digital start-up” companies, which refers to small, flexible companies with specific ideas, often limited investments, few personnel and yet they can create extraordinary results, products or services, and social impact with greater agility than most large, national or multi-national organisations. Some examples include Google, Airbnb and Uber at their conception.

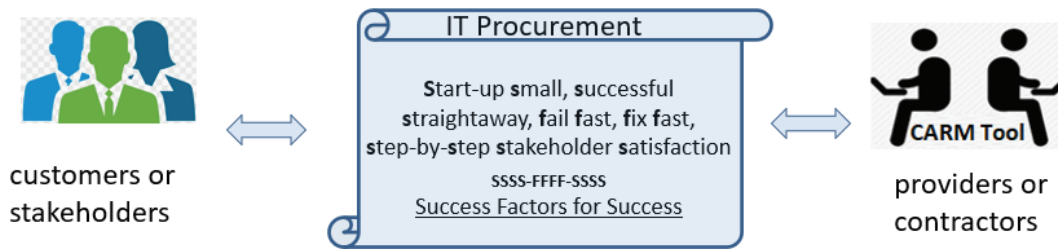


Figure 2 Conceptual view of the method for DGT road map implementation (4S4F4SFactors for success)

The method is, here, described as *start-up small, successful straightaway*, and *fail fast, fix fast* and *step-by-step stakeholder satisfaction (SSSS-FFFF-SSSS)*, shortened to 4S4F4S, as the guiding principle for digital government transformation.

The DGT involves stakeholders of which there are two perspectives of the digital transformation, namely:

- a) The DGT customers the procurement side of the digital technology procurement, encompassing a purchaser or the relevant end users of the product or service, and the workforce, customers, operation officers, the project funding bodies, subject matter experts, and the executive of the organisation.
- b) Providers and contractors are, here, defined in the context of IT procurement as the IT expert or specialist who is paid to deliver the IT and digitised product or service in accordance with the contractual agreement.

SSSS-FFFF-SSSS (4S4F4S) focuses on success factors for all parties as illustrated in Figure 2.

Each DGT project must achieve a transformable change in workplace processes or organisation operations with well-defined requirements that are developed by the subject matter experts. The three key components are:

- 1) The first SSSS – *Start-up small, successful straightaway*  
 “Start-up small” is a method that helps people to understand and appreciate the clear problem definition, concepts and objectives making them uncomplicated and specific.

“Successful straightaway” refers to the tasks, whether small or large, commencing quickly and completed on time and towards a very high success or confidence rate

The first underlying philosophy of the start-up small project is the mentality of digital start-up companies, which start small but may create big results with low risk investment.

The second underlying philosophy of the start-up small project is the opportunity provided for both parties to build subject-matter-expertise being a primary success factor to any procurement project for any digital transformation.

- 2) FFFF – *Fail fast and fix fast*

This refers to the speed and adaptability afforded to flexible start-ups in their fast identification of failures in reaching objectives and the ability to quickly rectify them.

The underlying philosophy of the start-up project fail fast and fix fast is the indication of low risk, low cost, and fast recovery displaying great agility and constant capability building of not only the systems but the stakeholders’ knowledge of the emerging technology and the suppliers’ skills in modern solution development This allows changes to occur quickly and earlier on to avoid high cost and long delay. This is a typical situation in a constantly changing business environment.

- 3) The second SSSS – *Step-by-Step Stakeholder Satisfaction*

Stakeholders are not just end-users or customers but also executives, organisation leaders, funding bodies and so forth involved in the project.

Step-by-step is the strategy to avoid rush-in or big-bang overlord approaches, which have proven to be costly and potentially lead to project failures.

Step-by-step stakeholder satisfaction allows lower investment at each stage or system module’s delivery before waiting for the final product or service when stakeholder dissatisfaction, or out-dated digitalisation may only then be revealed. This reduces the risk commitment from all parties in the procurement process and builds collective intelligence for understanding the organisation’s needs and changes in the requirement and solution development.

Another underlying philosophy of step-by-step stakeholder satisfaction is the consideration of leadership accountability, funding bodies’ responsibilities and procurement teams’ capabilities rather than the end-user or customer as the only recipients of the procurement.

## 5. THE TARGET OF DGT ROAD MAP IMPLEMENTATION

The DGT road map implementation targets three core capabilities, namely:

- Cognitive capability;
- Technology capability; and
- Enterprise capability.

These three capability targets were used in the digital start-up project as an innovative approach to DGT as described by Green (2020). The method of 4S4F4S enables continuous



Figure 3 The method for implementation of DGT enables 3 capabilities’ development within the government enterprise

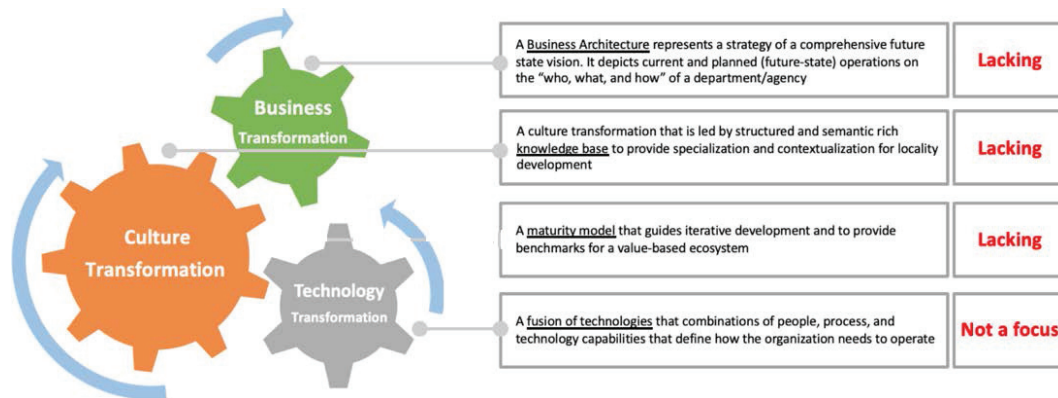


Figure 4 Public sector projects and usage of enabling tools

development of these three enterprise capabilities during the digital transformation and addresses the needs of the key stakeholders as depicted in Figure 3.

Green (2020) described the three sets of capabilities as follows:

- 1) *Cognitive Capability*: A workforce’s or stakeholder’s ability to use emerging technologies for organisation operations and achieve improved decision making, leading to better human performance, productivity and efficiency.
- 2) *Technological Capability*: A capability for speed, accuracy, security and automation within the system allowing for utilisation of emerging technologies such as blockchain AI analytics, Geo-Spatial intelligence and mobile platforms.
- 3) *Enterprise Capability*: The capability through digital start-up projects and enablement of the organisation to have greater ability to manage its resources.

## 6. THE EXECUTION FRAMEWORK FOR DGT ROAD MAP IMPLEMENTATION

It is noted that affective DGT implementation will lead to a truly ‘whole-of-government’ approach instead of silo-oriented government departments which could have lead to duplication or conflicting use of resources.

DGT requires fundamental transformation of the business, technology and culture aspects within the government organisation and the ability to use capability maturity models and metrics to guide the measurement of success of the DGT and provide feedback loops to the DGT implementation.

Our study shows that many existing DGT methods failed to implement business transformation and three capability developments to ensure an iterative and cohesive execution road map for DGT. In addition, there is a lack of consideration of cultural change when implementing DGT. There has been no method of adopting DGT implementation maturity models and metrics. Figure 4 shows the enabling tools and the status of the Defence sector corresponding to each tool.

## 7. THE APPLICATION OF DGT ROAD MAP IMPLEMENTATION

The framework was also trialled with the Compliance Assurance and Risk Management tool known as CARM.

### 7.1 The CARM Project

The CARM framework, as utilised for the digital start-up project, is an operation risk management tool (Green S. 2020) designed to manage the organisation’s assets such as alignment of data between different isolated systems,

or between physical records and computer records for any equipment purchases, or financial approvals with the right entitlement, checking asset availability, value and volume discrepancies, and stock item owner accountability in terms of compliance and assurance performance. It provides situation awareness in real time. The information visibility will trigger continuing improvement and inspire joint solution development for better performance. To date, there is no such data visibility support within the organisation (Green S. 2020).

## 7.2 Adoption of the 4S4F4S Method for DGT Road Map Implementation

Illustrated in the previous DGT road map implementation method, it was defined as:

- 4S as start-up small, successful straightaway.
- 4F as fail fast and fix fast.
- The 2<sup>nd</sup> 4S as step-by-step stakeholder satisfaction.

Each DGT project should start small, in that it started with less than a page of project requirements from the project initiators with clear objectives, issues to be address, outcomes and the benefit, that can be presented within five minutes to the key stakeholders and the project duration should be three months development with one year maintenance and update. Funding is subject to the negotiation with team size being shaped by the budget. Once these are established, project implementation starts and a regularly weekly meeting for the first three months should be conducted. The stakeholders should bring the sufficient subject matter expertise to the team to help understand the requirements quickly and precisely and support prototyping as well as evaluation. All parties should appreciate the importance of well-defined issues to be solved. The quick proof-of-concept prototype delivery offers confirmation that the project is on the correct path to be endorsed by the stakeholders.

The rapid delivery, once every three weeks, allowed an iterative feedback loop enabling fail fast and fix fast. Stakeholders were in control of the progress and the development team at the academy was gratified when the stakeholder was satisfied.

## 7.3 The Cognitive Capability Development

Improvement in the system design and development aims to mitigate human performance shortfalls while maximising system effectiveness. The framework includes important relationships within the utilisation of the engineering principles and allows stakeholders such as subject matter experts, workforce specialists, end-users, and the hierarchy of program managers and executives, to work together with the system analysts to define the requirements to contribute design ideas and gain feedback on the prototype systems for the CARM tool (Green, 2020).

## 7.4 Technology Capability Development

Organisations need to develop the technology capability for speed, accuracy, security and automation. This requires continuous innovation to meet the organisation's needs. The emerging technologies may need customisation, modification, enhancement or innovation to fulfil those needs. As shown in an example offered by Green (2020), if an existing best-of-breed AI algorithm is utilised for image recognition and interpretation and obtains 70% accuracy over two hours to compute 300 folders over 1000 heterogeneous files, the procurer may not be satisfied and request 90% accuracy with less than 30 minutes computation time. A new solution is required.

## 7.5 Enterprise Capability Development

The digital start-up project such as the CARM tool, needs to develop an enterprise's capability that includes human performance, cost, customer services and risk management. An example is risk management in large complex enterprises, like the Australian Department of Defence, such as the compliance and assurance with regards to the accurate finance, asset or data/information management, which impacts the organisation's reputation. Proof of concept utilising the digital start-up project is an agile approach to effectively digitalise a government's workforce and workplace (Green, 2020).

## 7.6 Workplace Business and Culture Transformation

Technologies and digital transformation are having a major impact on government processes (Schwab, 2016) leading to long-term gains in business and operational efficiency and productivity. However, technology transformation must coincide with the business and culture transformation. Business leaders and senior executives need to understand the changing environment, challenge the assumptions of their operating teams, and continuously innovate (Schwab, 2016) not just technology replacement or digitisation but also transform the organisation's culture. If the business model and culture of embracing DGT were neglected, then the large government department cannot evolve and will face increasing challenges socially and economically. Particularly, a strict 'top down' approach (Schwab, 2016) to organisation governance needs to transform into a more agile, cooperative, bottom-up approach leading to DGT, otherwise it will affect any DGT effort and innovation initiatives. Further detailed study on these topics can be found in Huang's research (2020).

## 8. RESULT DISCUSSION AND STRATEGIC REVIEW OF THE IMPLEMENTATION

In the following sections, the experience of a real world DGT implementation in a large complex government organisation is discussed.

## 8.1 Considering Stakeholders

How can people including management, customers, end-users and other stakeholders be taken into consideration with the transformational objectives and how can the appropriate skills and culture align with the transformation process and on-going activities?

The required relationships with various stakeholders including investors, partners, employees, customers and suppliers should be identified and formalised in the first stages of the project. That is, the *Goals*, *Objectives* and *Strategies* for organising various projects for digital transformation should be determined. Moreover, different stakeholders should be involved in the *Processes* and *Outcomes* of digital transformation. Digital transformation will depend on the way management builds and combines capacities, and to what extent the new organisation will impose new rules that could produce results for various stakeholders. Various groups will engage more effectively in the transformational process when they realise that their values are satisfied by the outcomes of the digital transformation. There is good literature available on effective ways of enhancing stakeholder engagement with transformational procedures in organisations such as that by Andriof, Waddock, Husted and Rahman (2017).

It is necessary to assess the current status of the company, enterprise, organisation or industry sector and so forth with their stakeholders regarding whether and how much they are aligned to the transformation process in terms of infrastructure, culture, resources, skills and the like. There are some available tools and models in the literature including those provided by Janowski (2015) and Schumacher, Erol and Sihm (2016) that can be applied to evaluate how different stakeholders are appropriately skilled and culturally aligned to the transformation process and on-going activities.

## 8.2 Technology and its Alignment with Organisational Transformation

With the focus on using and upgrading technology for change, does this truly transform an organisation and how can it be applied to the government and public sector?

There are different levels of applying technology in organisations. In the initial levels, there may be lower degrees of digital transformation but, in the higher levels, organisations are truly transformed into a digitised format. For example, Janowski (2015) proposed a *digital evolution model* for government, which can be applied for other entities like organisations and the public sector. This model outlines four stages for digital evolution of government as Digitisation, Transformation, Engagement and Contextualisation. The Digitisation stage does not include redesigning, improving or changing existing processes, services or practices, but merely digitising and automating what already exists and making the outcomes available to the same stakeholders and customers through digital networks. If a process or service were inefficient prior to digitisation, it is likely to remain equally inefficient afterwards. However, the Contextualisation Stage considers Digital Government as a vehicle for social,

economic, political, cultural transformational development inline with the needs and aspirations of countries, cities, communities and other territorial and social units and their people (Janowski, 2015). Thus, digital transformation can truly change organisations through an evolutionary process.

This can be applied to the government and public sectors. In fact, all the procedures, road maps, models and approaches that are applied in one context such as organisations can be used for other contexts such as the government and public sectors. However, we need to adapt and customise the related procedures, road maps, models and approaches for the new contexts.

## 8.3 DGT Implementation to Eliminate the Silo Affect

DGT implementation can help eliminate the silo affect of departments through digital transformation by harmonising people, organisations and technology.

The existence of the silo affect has a direct affect on the business model used by any ITC enterprise. The silo affect creates a bottleneck that not only weakens organisations' capabilities and growth potential, it destroys any value created by that organisation. It happens when different units or departments of an organisation fail to integrate, collaborate and work together to achieve a common objective. Its contribution slows service delivery whilst increasing customer's despondency. However, elimination of the silo could help overcome barriers within divisions, improve customer experience and increase productivity (Mohapeloa, 2017).

The digital transformation of organisations and application of appropriate technologies can enhance collaboration within the divisions of organisations and lead to fewer conflicts and delays to achieve the desired outcomes.

## 8.4 Private Sector Frameworks versus DGT

The methods/frameworks that are used in the private sector cannot be directly implemented for DGT or customised or adjusted for DGT.

There are several studies that have developed models/frameworks for digital transformation in different contexts such as organisations and governments. From this point of view, these models/frameworks have been divided into two groups: Conceptual level models/frameworks and Practical level models/frameworks. The conceptual level models/frameworks can mostly be applied for determining the goals, objectives and strategies of digital transformation as well as designing the plan and projects to achieve the objectives. A number of these models/frameworks are digital maturity models, digital evolution models, Balanced Score Cards (BSC), digital road map transformation and benchmarking. Different studies have dealt with the conceptual level models/frameworks for the digital transformation purposes such as (Estevez and Janowski, 2013; Janowski, 2015; Schumacher *et al.*, 2016).

On the other hand, the practical level models/frameworks are mostly applied for implementing the plans and projects to operationalise digital transformation. Some of these models/frameworks are simulation methods, technological tools such as blockchain, project management methods, mathematical and analytical models such as Multi-Criteria Decision Making (MCDM) models and the like. Various studies have applied the practical models/frameworks for the digital transformation purposes (Al-Khoury, 2011; Luna-Reyes and Gil-Garcia, 2014; Mittal, Khan, Romero and Wuest, 2018; Warner and Wäger, 2019).

## 8.5 DGT and Assessing Progress Across Stakeholders

It is likely that each transformation will reach different maturity at different times. Can DGT road maps assess the change and progress across different stakeholders/organisations? How do we orchestrate organisations/agencies at different maturity levels?

There are several studies that have developed maturity models to assess the change and progress of digitalisation across different stakeholders/organisations (Caiado, Scavarda, de Mattos Nascimento, Ivson and Cunha, 2018; Schumacher *et al.*, 2016; Sukrat and Papasratorn, 2018). Schumacher *et al.* (2016) proposed a maturity model to assess the Industry 4.0 maturity of industrial organisations. This model comprises nine dimensions and assigned 62 items for assessing Industry 4.0 maturity. The dimensions are Products, Customers, Operations, Technology, Strategy, Leadership, Governance, Culture and People.

These can be applied and adapted to the maturity models provided by the literature to build a valid road map for digital transformation. In fact, a deep understanding of the current status of digitalisation of stakeholders/organisations is critical for a successful digital transformation. The digital maturity of stakeholders/organisations needs a clear view and then exploration of the opportunities of digital technologies to develop a digital transformation road map can be undertaken. Then, repeatable improvements can be made by assessing the ongoing maturity using performance measures and indicators and improve the digital maturity of stakeholders/organisations to enhance the values of all stakeholders.

## 8.6 Using the Digital Start-up to Accelerate Government Improvement: Mission, and Capability

Digital start-up business model implementation is a long process that requires it to be patiently built up and synchronised with the three sets of capabilities: 1) **Cognitive Capability**: It is the ability to see, understand and meet market demand. It covers Artificial Intelligence needed to carry out and execute real-time data collection, machine learning, problem solving, and permanent screening of the internal and external factors that impact the company strategy. 2) **Technological Capability**: It mainly includes the technologies supported

by hardware and software, which are developed by the start-up project and designed to deliver (alone or integrated to other technologies) the value proposition through a specific business model. 3) **Organisational Capability**: It is the start-up's ability to manage human resources effectively including employees, contractors or freelancers, in order to execute its strategy and gain an advantage over competitors. In a digital start-up, organisational capabilities focus on the *learning loop* and how to manage knowledge as a key asset. A performing digital start-up additionally needs to develop a strong *culture* that gives meaning to its actions. This relies on rituals and management practices complete with collaboration and communication rules (Khanfir, 2018). Thus, digital start-ups are not just digitalising the processes and activities but also about using *innovative ideas* to make governments, industries and smaller sectors, more agile and less costly. In this case, it is possible to produce additional added value and to play a pivotal role through information technology and taking advantage of the availability of capabilities on the market (Khanfir, 2018).

Digital start-up and digital technologies have influenced government activities and operations in various aspects and improved governments' performance and capabilities. Several studies have dealt with the ways digital start-ups and digital technologies enhance the government effectiveness (Das, Sharma and Ratha, 2019; Engin and Treleven, 2018; Ogra and Thwala, 2014; Schulte, 2018). For example, Schulte (2018) explored the culture of start-ups as it entered government through the U.S. Digital Service (USDS). She explained how and why the digital start-ups and digital technologies became a solution to both technological and civic problems and a model for "venture government". Then, Schulte (2018) concluded that digital start-ups and digital technologies allow the government to harness industry popularity, expertise and credibility to tap efficient production and public trust in government. Thus, by investigating various related studies in the literature, we can better articulate how digital start-ups accelerate government improvement.

## 9. CONCLUSION

Despite 20 years of effort in digital government transformation (DGT). Many large government organisations still operate on a manual based process level with poor reputation in data management. This paper presented the new method to implement the road map for the DGT. It incorporates the 4S4F4S method, three capability targets and framework to incorporate organisational and cultural transformation together with the technology transformation. This new execution framework can be used for the DGT road map implementation. Application of such an execution framework was also presented and explained with the findings. The innovative framework of *start-up small, successful straightaway, fail fast, fix fast and step-by-step stakeholder satisfaction (SSSS-FFFF-SSSS)*, or 4S4F4S for short, was shown to efficiently and effectively address this. The CARM project clearly shows the *SSSS-FFFF-SSSS* framework reduces risks of the big bang approach to improve workplace efficiency,



agility, timely delivery of information and services. It allows the creation of extraordinary results, products or services, with greater agility and adaptability.

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