

# A Conceptual Framework for Evaluating E-Government Systems Success: A Service Ecosystem Approach

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## Abstract

*Despite billions of dollars invested in e-government systems annually, the degree to which these systems deliver public value varies widely. It is posited that traditional means of evaluating these systems overlook important value measures needed to support effective use and ultimate success of e-government. This paper develops a conceptual framework grounded upon Service Dominant Logic to provide a perspective for evaluating these systems. Based on this framework, it is argued that value is created at the intersection of service exchange and that this value is additive across the broader service system within which exchange takes place – the service ecosystem. The contribution of the framework is to assist governments in making complex information system portfolio investment decisions.*

## 1. Introduction

The significant investments made by governments around the world in developing e-government capabilities make it essential to evaluate them systemically, if they are to improve the value they generate. However, there has been inadequate substantive research in this area. A recent conference review on e-government implementations across the OECD concluded that “So far, little has been done to analyse and prove the impact and accrued value of these initiatives”, and appealed for further research to be done [1]. A main barrier inhibiting evaluation of e-government is the absence of a comprehensive, structured, and adaptive evaluation framework.

Past studies evaluating e-government have been somewhat limited, despite the fact that e-government has had an important impact on the way public services have been delivered in recent years. Most published e-government research has either been case studies or theoretical frameworks, focused on analysing a particular e-government implementation [2]. An important challenge fronting e-government is that once implemented the use of the system does not always last,

and so investments often prove ineffective [3]. This finding is supported by international research which has highlighted that approximately 70 to 80 per cent of e-government implementations have failed to deliver the intended outcome [4]. This level of e-government failure is further evidenced by more recent country level studies. For example, in New Zealand, 59 per cent of e-government initiatives were partial failures and 3 per cent total failures [56]; whilst in North America, the US government has reportedly spent over 600 billion dollars on e-government initiatives over the last decade with returns far below the expected benefits from these programmes [57]. These failures which often result from not establishing project success and end up missing citizen expectations and adoption [55] have raised questions about both e-government feasibility and sustainability [54]. This makes the evaluation of e-government systems essential if governments are to use them as a vehicle to deliver public value.

In this paper I intend to synthesise the factors that influence the success of e-government and to propose a conceptual framework for evaluating these systems. I will argue that public value is the most important long term sustainable value measure that determines the success of e-government. Contrasting with observations made in past studies on evaluating e-government systems, I will investigate how citizens acquire value from their service interaction using e-government, and how this exchange value is additive across a broader service system within which exchange takes place – the service ecosystem – creating effective use of the system. I will also show how this effective use of e-government will impact creation of sustainable public value. It is noteworthy that in this study the scope of the factors that influence this value creation is not limited to citizen to government (C2G) interactions but also includes service interaction facilitated by e-government between citizens and the private sector (C2B), non-government, and even other citizens (C2C) themselves. Expanding on research by Heeks into factors impacting e-government success, it is posited that these value influencers have a greater bearing in identifying e-government long term success

than traditional, internally focused government measures [5].

The environment within which government services are conducted is often complex and multi-dimensional in nature, requiring multi-tiered interactions and relationships in order to deliver planned outcomes. Many of these outcomes include goals like social inclusion, connectedness, and even transparency in government. I argue in this paper, that using a service ecosystem approach grounded on a service dominant logic (SDL) perspective provides the necessary theoretical framework for evaluating e-government systems, as this service ecosystem approach emphasises “the complex and dynamic nature of the social systems through which service is provided, resources are integrated, and value is co-created” [6].

The philosophical difference between the proposed theoretical framework and others is that under a service ecosystem approach: (a) all value interactions are included and measured between the citizen and the provider of the service, whether that be government, private sector or the citizens themselves, which is not common amongst the other evaluation frameworks; (b) all value is event-based, generated at the intersection of service exchange between the provider of service and the citizen rather than a general point in time perceived view of value and (c) all value is determined within a context in which a service exchange takes place.

The paper is organised as follows. The next section is used to argue a case for developing an adaptive evaluation framework based on a literature review on current frameworks. In subsequent sections, a conceptual framework based on SDL service ecosystem view is postulated for evaluating government systems. Finally, the paper highlights the theoretical and practical implications of an adaptive conceptual framework for governments, followed by a discussion on possible future research directions.

## 2. Literature Review

The prevailing approaches currently used by governments in evaluating e-government initiatives have a propensity to replicate those of commercial firms, concentrating on delivery against functional outcomes and benefit measures like return on investments and cost reduction [7]. However, e-government systems diverge from those used in the private sector in that they “frequently encompass strategic goals that go beyond efficiency, effectiveness and economy, and include political and social objectives such as trust in government, social inclusion...and sustainability” [8]. The following sections set out the various frameworks commonly used by governments and the theoretical base

on which they are built with a view to understanding the strengths and weaknesses of each.

To provide a context for accessing the appropriateness of these Information Systems (IS) frameworks, I draw on the work of Heeks [5] to obtain a set of criteria against which these frameworks can be appraised. This work sets out seven factors which can be used to determine success or failure of e-government, including: (1) reality gaps between functional design and situational need; (2) suitability and sustainability of technical architecture; (3) completeness of end to end work processes to meet citizen needs; (4) alignment of objectives of key stakeholders; (5) values and social norms within the service ecosystem amongst stakeholders; (6) economic and social cost/benefit from the initiative; and (7) the context or situation within which the e-government system is delivered.

### 2.1. Evaluation frameworks based on IS theory

Most government agencies use frameworks to evaluate systems which have been drawn from IS theory. A number of these frameworks are based on IS success theory which concludes that any comprehensive methodology for evaluating systems should include measurement of a system’s effectiveness and efficiency, based on its specific capabilities [9], [10], [7]. Other evaluation frameworks used by governments are based around IS acceptance theory which supports the inclusion of an assessment of the system’s usefulness, perceived ease of use, and users’ intention to use the technology in the future [11], [12], [13].

The most commonly used of these frameworks is the technology adoption model (TAM). This model measures ease of use and usefulness as value influencers for technology adoption and assumes a connection between ease of use and self-efficacy for driving this adoption. Straub [14] critically argues against this notion that perceived ease of use can be mapped directly to self-efficacy. This was addressed in later research by Venkatesh [15] with the united theory of acceptance and use of technology model (UTAUT) which showed that self-efficacy is distinct from perceived ease of use. The most significant criticism of the TAM is the lack of recognition of variances between individuals’ demographics such as age, prior experience and gender that may influence attitudes about technology [16]. The UTAUT model deals with this to a degree as the model encapsulates performance, effort, and social influence, and uses demographic variables as moderators, for predicting behavioural intention which in turn can predict sustainable usage behaviours [15]. The limitation of these models as an evaluation framework, when viewed against the Heeks success/failure factors, is that the contextual data excludes other situational characteristics

that may influence attitudes about technology [14]. However, the major limitation in setting technology adoption as a driver of success in a mandated environment, like government servicing, is that “the model is not truly measuring technology acceptance because individuals ultimately do not have much choice as to whether to accept the technology” [14].

## **2.2. Evaluation frameworks based on economic theories**

The growth in e-services has also led to the emergence of specialised economic frameworks for evaluating these initiatives [17]. These frameworks provide useful dimensions focused on cost reduction or benefit realisation objectives, with most of them also assessing the quality aspects of the system. The general economic theory that describes how this evaluation approach is used is Transaction Cost Economics. Under this evaluation method value is generated through the reduction of transactional costs in operations. In the case of e-government systems, these transaction costs might be incurred by saving the same data in multiple databases or by keying in the same data many times. The creation of more effective methods of interacting with citizens can create direct and indirect cost-savings. In these instances, “the strategy that drives value generation is motivated by the vision of a more efficient government” [18].

Traditional economic evaluation techniques, such as Return on Investment, Internal Rate of Return, Net Present Value and Payback approaches, are the most commonly used methods to evaluate e-government initiatives in public sector organisations [58]. These techniques are typically based on conventional accountancy frameworks that are explicitly designed to assess the ‘bottom-line’ financial impact of investments. However, as more public sector organisations realise that these techniques are unable to assess the full range of costs and benefits they are left with the dilemma of deciding which approach to use [18]. While most frameworks in this category include overall user satisfaction, they are essentially economically-based appraisals. By not taking into account other value drivers from e-government, these frameworks put “in question the predictive value of those justification processes that are dependent on traditional appraisal techniques” [18]. Even when traditional appraisal methods are applied rigorously, their relevance in the public sector domain is open to question [20].

The reason for this is that typical economic measures such as increased throughput, financial payback and return on capital, are relatively easy to define in private sector environments but have less relevance in public administration. The notion of value for money, which has been advocated as the most applicable economic model

for the public sector, is considered as having met with limited success. This is especially the case with e-government projects, because of the complexity of determining value for money and the difficulty in defining IS success [20].

When compared against the Heeks success/failure factors, most of the frameworks in this category ignore social and democratic values in society and apportion more importance to financial outcomes in the evaluation process [19]. This approach is less useful in complex socio-political environments where citizens’ preferences and values play a critical role [20]. This critique was supported by the World Bank in a statement that “in addition to measuring financial value, an assessment of social benefits is imperative for a comprehensive assessment of any initiative undertaken by governments” [21].

## **2.3. Evaluation frameworks based on public value theory**

Another popular stream of research on e-government evaluation frameworks has been based on public value. The concept of public value is a normative theory for evaluating the performance of public services [22]. In most cases it is used to measure the “context specific preferences of individuals concerning, on the one hand, the rights, obligations, and benefits to which citizens are entitled, and on the other hand, obligations expected of citizens and their designated representatives” [23]. The increased interest in public value as a measure for e-government performance is largely due to the fact that it measures the outcomes of e-government services rather than the technology itself [24]. The main representative papers which have used public value as a way to frame the evaluation of e-government all share a similar notion of public value measured through e-government performance, but each has substantial limitations, as outlined below [25], [26], [27], [28], [29].

The Kearns study, for example, evaluates effective delivery of public service through the lens of public value but does not consider the quality of e-government systems attributes like usability, functionality or information [30]. The other frameworks that are generally extensions of this original work, inherit the problem of insufficient attributes for evaluating systems quality. Public value frameworks are also difficult to adapt as the interpretations and meanings of public value within different societies differ, so this makes the development of a common framework challenging to achieve [31]. Additionally, these values are not constant due to the dynamic and changing nature of societal needs over time [32].

Although the public value evaluation frameworks described above deal more comprehensively with the

factors for success/failure raised by Heeks than other frameworks, they still do not deal with the value created by the extensive stakeholders involved in value creation nor the context within which a citizen engages with e-government.

## 2.4. A case for an adaptive evaluation framework

In order to put the different evaluation frameworks into perspective, it is useful to compare and summarise the coverage of each against a set of e-government success factors developed by Heeks [33]. Figure 2.4.1 highlights three major limitations of the current set of evaluation frameworks when compared to the identified success factors, which are: they do not include technology resources, context, or value co-created with all service providers.

Description	IS Theory	IS/Economic Theory	Public Value Theory
Functional Design – Reality gaps	Yes	Yes	Yes
Technology architecture	No	No	No
Work processes	Yes	Yes	Yes
Objectives of key stakeholders	Partial	Partial	Yes
Values of key stakeholders	No	No	Partial
Economic cost / benefit	Economic	Economic	Economic/ Social
Context or situation	No	No	No

**Figure 2.4.1. E-government success evaluation frameworks matrix**

A key limitation of the existing evaluation frameworks is that they represent ‘moments in time’ and fall short of reflecting the additive value that comes from continued usage or value accumulated through both economic and social interactions within an e-government context. This co-created value is driven through open service eco-systems by aligning the objectives, values and social norms across a wide group of stakeholders which include citizens, government and non-government.

Evaluating the success of e-government therefore needs a comprehensive adaptive system, which should consider value creation of all contributors to public service exchange across the entire service ecosystem. The evaluation framework should recognise that value is additive, contextualised, and inclusive of all parties involved in delivering public service, including non-government. The framework needs to also include the value creation aspects of technology. Furthermore, the framework should distinguish value from both an

economic and social perspective – that is, public value. As posited by Moore [22], public value cannot be created by a public program alone. The creation of public value very much depends on the interactions between public, private, non-government and the citizens themselves [31]. While governments do have the primacy in fostering public value, their potential to achieve this is greatly enhanced through cooperation with others. None of the current evaluation frameworks deal with the above phenomenon.

## 3. Theoretical Background

The current e-government paradigms are being disrupted, as government servicing is less and less in the hands of governments alone. “The increased connectivity of citizens and businesses makes it possible for people to work together, perform tasks and distribute workload across distance and boundaries” [34], making it conceivable that government tasks could be performed by others. This may well make governments “invisible”, where the borders between private and public sector are unclear, and where public services are provided by existing capabilities in the private sector [35]. This requires a broader definition of e-government to be considered. In a modern socio-political environment, e-government may well be defined as:

*“.....a cohesive collection of infrastructure, information, services and capabilities, on which communities can interact, engage, develop and exploit their own opportunities, markets and progress. Such co-production may be substitutive (replacing government efforts with resources from users and communities) or additive (adding more user and community support to professional interventions)”. [36]*

This broader definition of e-government, and the inherent limitations of existing evaluation frameworks outlined above, require a reframing of how e-government is evaluated. In beginning to address the need for an adaptive evaluation framework for e-government, I take as the theoretical base a ‘service ecosystem’ view, as represented by the SDL perspective. I argue that SDL can provide a framework for evaluating the public value created by these e-government systems, as it focuses on the interactions and value co-creation among many service systems, referred to as the service ecosystem [37]. Vargo defines a service ecosystem as a “relatively self-contained, self-adjusting system of resource-integrating contributors connected by shared institutional logics and mutual value creation through service exchange” [38]. It is this service ecosystem view that can provide a sound base for a comprehensive framework to evaluate

e-government that is not captured in other models.

The service ecosystem approach is grounded on a SDL perspective. The central premise of SDL is that economic and social exchange is “service-for-service exchange—that is, service is the basis of exchange” [39]. This is followed by the SDL principle that value is co-created collaboratively [40]. In this respect, the services offered by e-government are only inputs into the value creating activities of the citizen, not the realisation of value. In order for value to be realised, the inputs must be integrated with other resources. Therefore, “value creation is always an interactive process that takes place in the context of a unique set of exchange relationships” [41]. These views are encapsulated into the ten foundation principles of SDL shown in figure 3.1.

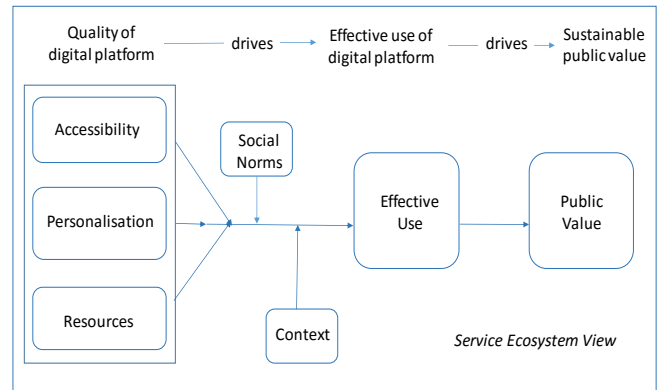
Service Dominant Logic Foundation Principles	
FP1:	Service is the fundamental basis of exchange
FP2:	Indirect exchange masks the fundamental basis of exchange
FP3:	Goods are a distribution mechanism for service provision
FP4:	Operant resources are the fundamental source of competitive advantage
FP5:	All economies are service economies
FP6:	The customer is always a co-creator of value
FP7:	The enterprise cannot deliver value, but only offer value propositions
FP8:	A service-centered view is inherently customer oriented and relational
FP9:	All social and economic actors are resource integrators
FP10:	Value is always uniquely and phenomenologically determined by the beneficiary

**Figure 3.1. Service Dominant Logic foundation principles [45]**

As an illustration of how these principles apply, in government ecosystems the complex nature of servicing often requires multiple parties from across public and private organisations to collaborate in the delivery of outcomes for citizens (FP9). For example, a typical jobseeker, in a social welfare context, would need to interact with a government job capacity assessment advisor (FP7) via e-government, a work placement or skills re-development firm, and possibly a local state housing authority to complete a benefit outcome. The resources from these other systems would need to be combined and connected to e-government to deliver the planned outcome. For the majority of interactions in this space, a citizen receives a service or product from a non-government organisation(s) for which the government pays, creating a multi-tiered relationship (FP8) between the citizen, government and business. It is normal for multiple service organisations to be involved in delivering a single citizen outcome (FP10). This requires a service ecosystem approach in order to capture the value created from all contributors.

## 4. Conceptual Framework

The proposed theoretical framework is grounded on a SDL service ecosystem value estimation model of e-government, including the dimensions, measures and the relationships among them.



**Figure 4.1. A conceptual model for evaluating e-government**

It is worth noting that the SDL service ecosystems view elucidates the notion that the effective use of e-government is reliant on (1) accessibility of the system, (2) personalisation of the system, and (3) quality of resources of the system. It also draws out the importance of context and social norms in determining the co-creation of value amongst resource contributors. As shown in the proposed framework above, it is posited that these factors drive effective use of e-government and long term sustainable public value.

### 4.1. Accessibility as a factor in value creation

To view accessibility from a SDL perspective lens, the aim of service providers are not necessary to customise service offerings for citizens, but rather to enable citizens to access a collection of resources needed to achieve a desired outcome (FP7) [40]. Essentially, it is to allow a citizen easy access to assemble different resources to meet their particular need within their current context. In order to explain this SDL concept of accessibility to resources, Normann suggests the concept of resource density [42]. That is, the amount of resources to which a person can access at any moment to solve a particular need. Importantly, this concept is also logical, that is, the easier the access and adaptation of the system to the circumstances of an individual, the greater the perceived value a citizen will have of the system. This is important from an e-government perspective, as understanding how a citizen accesses these additive resources, like knowledge and information (FP4), will

guide the reinvestment in enhanced features in order to improve effective use of the system. Thereby,

**Proposition 1:** *Systems accessibility will positively impact citizens' effective use of e-government*

#### 4.2. Personalisation as a factor in value creation

System usability is generally defined as a set of design principles applied to bring about the greatest ease of access, learnability, ease of use, and the least amount of distress for those that use the system. Pearrow provides a perspective that “usability attempts to ensure that regardless of how, when, or where [citizens] enter [an e-service], they can use it” [43]. Citizens often need the flexibility to bundle (e.g. personalise) resources because their use of a resource is not exclusive to their current need; it is integrated with other resources that they bring to bear to address future needs. In an SDL view, the personalisation and bundling of resources enhances the citizens' usability experience and strengthens relationships among service providers and citizens (FP9) which will ultimately deliver public value [40]. Thereby,

**Proposition 2:** *System personalisation will positively impact citizens' effective use of e-government*

#### 4.3. Resources (technology) as factors in value creation

Arthur defines technology as an assembly of “practices and components, in order to fulfil human purposes” [44]. The assortment of resources within a technologically built system are considered to be both operant and operand resources. Operant resources can act on other resources in order to create value, unlike operand resources which require action on them by others to be valuable [40], [45]. The SDL service ecosystems view recognises these two groups of resources that need to be continually combined to create value [40]. Akaka and Vargo [6] argue that these technology resources are operant resources because they are dynamically created through the use of knowledge and skill, and are central to inducing value creation. This is important, as within SDL operant resources have primacy (FP4), thereby identifying resources as important factors in co-creating value [40]. Technology resources are also operand resources as when technology is built for a specific purpose it can be recognised as a value input on which others can create value through interaction. Thereby,

**Proposition 3:** *Technology resources will positively impact citizens' effective use of e-government*

#### 4.4. Social norms as factors in value creation

In a service exchange, social norms are the “rules of the game” that guide exchange between parties. They may include perceptions of responsiveness, trustworthiness, openness in engagement, and equity of the service. In an SDL service ecosystem view value is created through interactions that are mutually beneficial (FP6) [40]. The success of these interactions is often dependent on the congruence [46] of the social norms that guide the parties in the exchange. An illustrated example in e-government is that if a citizen believes that a service provider is not trustworthy then the service offer is unlikely to proceed. The corollary is also relevant that if the provider does not believe in the authenticity of the request, they are unlikely to be responsive. Both will influence how a citizen may choose to use e-government as a resource in the servicing of future needs.

To explain this SDL service ecosystem concept further, and make the connection between these exchanges, it is noteworthy that social norms are embedded through the performance of routine and repetitive actions [40]. In an e-government sense these actions are undertaken using technology to determine outcomes. Orlikowski [47] makes the important connection between social norms and technology, arguing that “while technologies may appear to have objective forms and functions at one point, these can and do vary by different users, by different contexts of use, and by the same users over time”. This view emphasises how these routine social norms become rooted in technology and are significant determinants of the success and effective use of a technology. Now increasingly, as technology is becoming part of citizens' lives through applications like Facebook, our social norms, like views on openness, are also evolving with the use of these social media. Thereby,

**Proposition 4:** *Social norms will positively impact citizens' effective use of e-government*

#### 4.5. Context as a factor in value creation

Context is often defined as a way to explain a situation or environment within which something exists or happens. Within SDL, Vargo and Chandler define “a particular context as a set of unique actors with unique reciprocal links among them” [48]. By defining context in this way, it is possible to see how hundreds of citizens and service providers can be linked together to constitute one specific context, while an individual citizen linked to another may constitute a different context. Plausibly, services will likely differ in each context. It is easy to see how service exchanges amongst parties within a

particular context are likely to “influence indirect exchanges beyond that particular context” [49].

From an SDL perspective, value co-creation is not confined to any individual encounter between a citizen and a service provider, it is co-created when existing and new resources are integrated, and is influenced by context [40]. The SDL service ecosystem view aligns with a “complex economic systems approach” [50]. This approach suggests that value is co-created across a multiplicity of social and public organisations, including government agencies, and not just among private sector companies and citizens. The creation of value in this way depends on the relationship links between these separate but connected ecosystems involved in delivering the citizen outcome, as well as the availability of and access to resources (FP8) [51]. Put another way, the citizens’ context, whether this is environmental or situational during the use of e-government, will influence and enhance interaction between parties to optimise value within time and space. Thereby,

**Proposition 5a:** *The context in which e-government interactions transpire will positively impact on citizens’ effective use of the system*

**Proposition 5b:** *The context in which e-government interactions transpire will negatively impact on citizens’ effective use of the system*

#### **4.6. Effective use of e-government as a determinant of public value**

In this study context, the effective use of e-government is “defined as using a system in a way that increases achievement of the goals for using the system” [52]. Normann refers to this phenomenon as maximum resource density, a circumstance in which “the best combination of resources is mobilized for a particular situation, e.g., for a customer at a given time in a given place, independent of location, to create the optimum value result” [42]. Within SDL, this effective delivery of services is achieved as a service ecosystem engage in exchange with other service ecosystems to enhance adaptability and sustainability (FP9) [40].

This effective use of e-government can be achieved through the adaptation and improved learnings of how best to use the system. The need for adaptation stems from the SDL service ecosystem premise that access to resources and capabilities are imperfect. Citizens can overcome these by adapting the system, combining their resources with resources from others to meet their particular needs within their current context. The need for learning is borne out by the notion that e-government systems consist of intricate and multifaceted capabilities, resources and knowledge which invariably require

learning. Learning on how to use the resources of e-government should enable more effective use of the system. It is this adaptive learning environment within the SDL service ecosystem that is a fundamental part of the dynamic and systemic nature that drive value co-creation. It follows that effective use of e-government will enable delivery of public service delivery which drives increased public value [25]. Thereby,

**Proposition 6:** *The effective use of e-government will positively impact public value*

#### **4.7. A summary of the theoretical aspects of service exchange**

Throughout this study, I argue that the use of a SDL ecosystem view perspective can be used as a foundation to propose a conceptual framework to evaluate e-government systems. I identify three main elements which influence effective use of e-government, which impacts sustainable public value outcomes: (1) accessibility, (2) personalisation, and (3) resources. Importantly, the study also highlights context and social norms and their potential influence across all elements in determining overall public value creation. Figure 4.1 provides an ecosystem view from a citizen’s perspective of the relationships between the elements that influence the creation of public value from implementing e-government systems. The SDL service ecosystem also shows that value is co-created at the point of interaction of service exchange between multiple service systems and that this value across all resource integrators needs to be part of the evaluation equation if governments are to make sound investment decisions.

At the beginning of the study I proposed that the Heeks success criteria model could be used as a yardstick for determining the coverage of the framework. I would argue that a service ecosystem approach based on service dominant logic covers those elements of additive value co-creation not sufficiently covered by other frameworks. The proposed framework also highlights the importance of resources through technology and their importance to success of e-government which is largely ignored by other frameworks. However, most importantly it acknowledges the role of context in determining success or failure of e-government.

### **5. Future research**

There are several challenges related to evaluating e-government systems using public value. Hill and Sullivan observe that “the very term public value points to the fact that a set of core values are at the heart of the assessment of outcomes and the processes by which the

outcomes are to be delivered” [53]. Conversely, what these public values are is constantly changing as part of the evolving democratic process and will continue to vary over time as society changes. These challenges are compounded as there is also a view that public values differ by society or within societies, so developing a structured and comprehensive framework may not be possible and that these evaluations need to be focused on specific systems and their objectives.

To begin to address some of these challenges there is a need for future empirical research which would seek to validate the propositions set out in this study. It is my intent to undertake the first step in this direction by using the proposed theoretical framework to evaluate the e-government system supporting the National Disability Insurance Scheme (NDIS) in Australia. The NDIS is a national government funded scheme aimed at supporting citizens under 65 years old who live with a permanent disability. This e-government system is a community online service that enables citizens to purchase goods and services from the non-government sector to assist with achieving life goals, for which government pays. The delivery of the scheme is enabled by an open digital servicing platform, providing a unique opportunity to evaluate the performance of open collaborative e-government. Using the broader definition of public value as encapsulated by SDL service ecosystems, to include social and economic aspects of value as well as context across the totality of value contributors, will provide a modern means for benchmarking e-government into the future.

## 6. Conclusion

The intent of this research has been to develop a theoretically-derived framework for evaluating e-government. To this end, this study has expanded on previous works on e-government evaluation, value creation and effective use, which have been assessed via a SDL service ecosystem perspective. From this it is proposed that three base capabilities – accessibility, personalisation, and resources – are required by e-government as archetypal value creation drivers, each representing a casual nexus relationship between effective use of e-government and creation of public value. It is also proposed that social norms and context will influence the extent of value creation from these value mechanisms. Finally, it is proposed that the value is created at the intersection of service exchange and that this value is additive across the broader service system within which exchange takes place – the service ecosystem. It is postulated that optimising e-government along these lines will drive effective use of e-government and deliver sustainable public value.

The contributions of this work are as follows: (a) an identification of the critical factors for evaluating e-government from a new perspective; and (b) a proposed conceptual framework for evaluating e-government systems. It is suggested that by addressing these research aims, this study contributes to e-government system evaluation approaches by identifying a set of theoretically-derived factors that impact the value created through the effective use of e-government systems which will determine sustainable public value. The study also provides a unique and dynamic lens on how to understand public value creation from a perspective of effective use of e-government. It is posited that the perspectives offered in this study can be applied to all government systems, thus providing a structured, comprehensive and adaptive evaluation framework.

The need for further empirical research into e-government evaluation cannot be overstated. Given government’s broader role in creating public value, there is little evidence that the current set of initiatives are achieving this aim. By optimising only one sub system within the service ecosystem governments could be sub-optimising the overall ecosystem thus creating economic and social waste within the environment. To prevent this will require governments’ role in service delivery to change dramatically, becoming more open and collaborative with the private sector to deliver these public value outcomes for citizens. If governments continue to use evaluation frameworks to substantiate the benefits case of internal e-government investments on economic basis only, they are missing the opportunity to identify and create sustainable and lasting value. Having an adaptive framework to determine the right type of investment to achieve this aim will provide an appropriate mechanism for the prioritisation of scarce capital resource allocation between government initiatives.

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