Digital Maturity in the Public Sector:

Design and Evaluation of a new model

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Abstract

In the quest for digital government, public sector organizations find themselves in dire need of models to aid them in the strive for digitalization. Unfortunately, many of the existing models are built on assumptions that today may prove problematic and less than purposive. This action design study presents the design and evaluation of a new method for digital government maturity assessment. The model is derived from a literature review where pre- requisites for successful digitalization were sought, resulting in the two dimensions of digital capability and digital heritage. The model was evaluated in a pilot-study involving 17 public sector organizations through a combination of qualitative and quantitative methods. The results show that the model has a high degree of reliability and expressed value for the intended users. These findings are discussed in relation to previous literature and implications.

Keywords: Digital government, maturity models, public sector, e-government, digital maturity

Introduction

In the quest for digital government (Osborne & Hutchinson, 2006; Scupola et al, 2016; Janowski, 2015; Tassabehji et al, 2016), public sector organizations are exposed to a veritable maelstrom of models for assessing and improving what is referred to as "digital maturity" or "e-Government readiness". The very outset of this lies in a perception that in order to attain the expected and potential benefits from digitalization, a certain pattern of organizational characteristics need to be in play (Gil-Garcia et al, 2016; Wendler, 2011).

From a research perspective, there have been numerous attempts at identifying said characteristics (Lee, 2010; Andersen and Henriksen, 2006; Layne and Lee, 2001; Carter et al, 2016; Das, Singh & Joseph, 2016). The underlying theoretical framing of these studies is often that of contingency theory (Otley, 2016), where the criteria are causally linked to performance outcomes such as in Wu et al's (2015) study of alignment and organizational performance. Contingency theory has simultaneously received ample critique for over-simplification and over-emphasis on teleological and deterministic perceptions of technology itself.

The models currently utilized by public sector organizations are predominantly derived from consulting and suffer from a lack of scientific reasoning and testing (Wendler, 2011). They are often the product of a particular consulting firms joint experience (see for instance MITs and Cap Geminis model for digital maturity in Fitzgerald et al, 2014). Albeit relevant and potentially valuable, there is still a lack of scientifically grounded models used actively within the public

sector. Previous models such as e-government readiness assessments (e.g. Layne & Lee, 2001 or Andersen & Henriksen, 2006) and others have so far had but limited impact on governments. In addition to this, the models suffer from being tightly linked to the Capability Maturity Model Index (CMMI) approach, which assumes that the more standardized (and static) a process is, the more mature it is.

As we argue in this paper, any model that aims to measure the organizations ability to ascertain the benefits from digitalization (i.e. digital maturity) needs to be based on a dynamic perspective (i.e. *not* CMMI) and take into account the changing nature of digitalization itself. This involves accepting the necessity for both handling the efficiency aspects of digitalization (robotization, automation, rationalization et cetera) as well as the innovation aspects (new services, new operating models, new perspectives on users et cetera). The rationale for this stance lies in previous studies of organizational ambidexterity, i.e. the organizations necessity to be capable of both exploration (innovation) and exploitation (efficiency) in parallel. The necessity for including capabilities for innovation is also seen in the literature surrounding digital government (e.g. Andersen et al, 2011).

The aim of this study is to design and evaluate a method for digital maturity in the public sector assessment. The contribution consists of an empirically evaluated model for digital maturity in the public sector assessment, together with design implications for the continued re-design of the model.

The paper is organized accordingly. After this brief introduction, we present the precursory findings and theoretical framing, presenting the quest for digital maturity in the public sector and the assumptions underlying the design of the model. After that, we present the method which consists of a design science study. This is followed by the results where the model and its evaluation are presented together with the design implications. The paper concludes with a discussion on the findings, and recommendations for future research.

Precursory findings and theoretical framing

The quest for digital maturity in the public sector

Scholars have long sought to identify the precursory conditions of e-government success. Ever since the advent of the field in the late 1990's, we have created models to support both our scientific understanding as well as practice in terms of how best to support the adoption of e-government (Layne & Lee, 2001; Andersen & Henriksen, 2006).

In a review of e-government maturity studies, Wendler (2011) critically examines the underlying scientific qualities of said works with a rather dismal conclusion. Apart from the lack of critical reflection concerning the very notion of "maturity", the main critique offered by Wendler (ibid) lies in the reliance on non-reflective use of industrial influences and the complete lack of validation. In other words, previous research could be seen as merely re-iterating industrial jargon without reflection nor empirical testing (see also Lasrado, Vatrapu & Andersen, 2016).

Putting aside the rather dismal perspective of Wendler for the time being, the predominant perspective within previous research on maturity has been that of evolution. E-government maturity is seen as a strain of pearls, from the ad-hoc (low) to the structured (high). This can be seen as an example of the importing of ideas from the standardization of processes within

predominantly the software industry, in most cases through the use of the Capability Maturity Model Index (CMMI).

CMMI (Team, 2006) offers the perspective of how a process may be standardized and hence reach a state of true efficiency through control. In other words, it equates the higher levels of maturity with the achievement of efficiency-related goals under what is often referred to as diagnostic control (Simons, 1995). Diagnostic control, in this sense, is dependent upon re-occurrence and a lack of external changes to the environment, i.e. a low demand for agility and flexibility. Several of the models that are now part of the canon of e-Government maturity utilize this perspective, including Layne and Lee (2001), Andersen and Henriksen (2006) and Valdés et al (2011).

Valdés et al (2011) presents an attempt to design and evaluate a framework for e-government maturity in a Chilean agency context. Through utilizing inspiration from what they refer to as "best practice" as a foundation for the framework, they effectively build a meta-model for e-government maturity and evaluate this towards 30 agencies.

This approach highlights the underlying critique as presented above. The "best practice" models are the result of consultancy and other influencers work, and albeit often implemented in practice they have moved from being valuable vehicles for governance and control to being part of the underlying problem. The models themselves are the product of a particular time with particular ruling assumptions in regards to digitalization, the environment, the organization et cetera. They were, in other words, the product of "best practice" when conceived, but things invariably change.

New assumptions for digital maturity in the public sector

As seen in Yoo, Henfridsson & Lyytinen (2010) and Archibuigi (2017), digitalization ushers in new assumptions. One of said assumptions is that of scale, where digital technology and digital innovation lead the possibility of close-to-zero margin cost (Rifkin, 2014). Digital services, as opposed to non-digital services, are theoretically not associated with margin-cost, i.e. the provision of Service X to citizen Y+1 does not infer any additional costs than those for Citizen Y. For government as a classical service organization, this brings new potential and questions the underlying organizing logic in place. Instead of striving for economies of scale for attaining efficiency, digitalization calls for economies of scope for attaining innovation capabilities.

We argue that digitalization creates a necessity for three new assumptions that should guide the design of digital maturity in the public sector models:

1. Digital capability is a dynamic capability (Teece, Peteraf & Leih, 2016).
2. Digital maturity is dependent upon the existing information infrastructure (Magnusson & Bygstad, 2014).
3. Digital maturity requires the ambidextrous balancing of activities related to both exploration (innovation) and exploitation (efficiency) (Mithas and Rust, 2016).

Method

Following the recommendations put forth in Wendler (2011), the study is designed to include a validation of the proposed framework through a combination of qualitative and quantitative methods in a design science setting. In addition to this, two core concerns raised in Wendler (ibid) were taken into consideration in the design of the study, i.e. the lack of reflection on the concept of "maturity" and the unreflective use of CMMI and other industry-related methods and building blocks in the conceptual design of digital maturity methods. To address the lack of reflection we devoted substantial time in the beginning of the project on gaining an understanding of what the construct of "maturity" in this particular context inferred.

The action design research study involved three out of the four phases following Sein et al (2011).

1.Problem	The problem was described through a combination of reading and discussions with practitioners working at the Government Offices of Sweden and a collection of agencies, municipalities and regions.
2.Design	In line with Valdés et al (2011) we have utilized a literature review for ascertaining the underlying logic and content of the proposed model. The literature review was conducted in several iterations, from the general analysis of pre-requisite for digitalization success to the more specific analysis of government related pre-requisites and particularities.
3.Evaluation	The evaluation was conducted through a pilot study where the web-based software containing the model was distributed among a group of 17 public organizations to a total of 90 respondents. Each respondent was asked to answer the questions, along with provide feedback on how their experience was. The next step involved creating an interactive visualization aid populated with demo-data, so that key informants could provide feedback to the design of the analysis functionality. Following a minor re-design, the final analysis functionality was provided to the key informants with their organization's data, and a separate evaluation was performed. The reliability of the method was evaluated through statistical analysis (SPSS), using a combination of control question averages and factor averages along with Principal Component Analysis. The utility of the model was assessed through a qualitative survey and the evaluation resulted in a list of design implications for future redesign.

Results

DiMiOS: A model for Government Digital Maturity

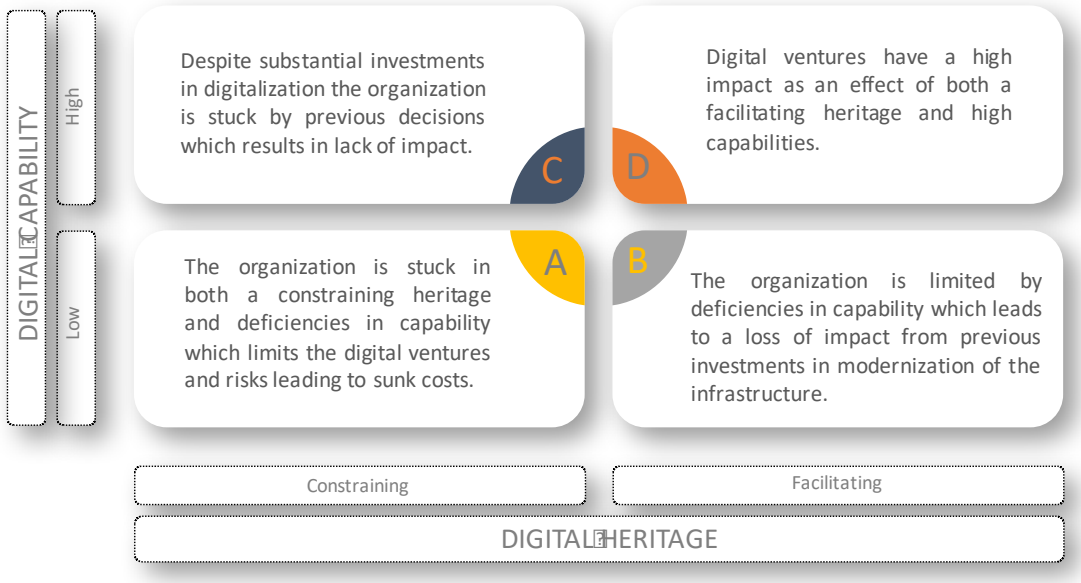

Figure 1. The model of government digital maturity

The model is comprised of two dimensions, Digital Capability and Digital Heritage. Digital Capability is defined as the "ability of the organization to sense, seize and re-configure on the basis of digital opportunities in line with definitions of dynamic capabilities (Teece, 2010). Digital Heritage is defined as the impact of previous investments/initiatives in information infrastructure that either facilitates or constrains organizational maneuverability in line with definitions of technology debt (Magnusson & Bygstad, 2014). On the basis of measuring each dimension, the organization in question is positioned in the matrix in Figure 1, with generalized description for each of the four types.

Each dimension is further broken down into three categories of factors that combined comprise the actual measurements for digital maturity (see Figure 2 and Table 1). The measurement was conducted through an on-line survey with 25 questions where the respondent was asked how they agreed with a statement in line with the capability/factor in question. These questions were complemented with five control questions.

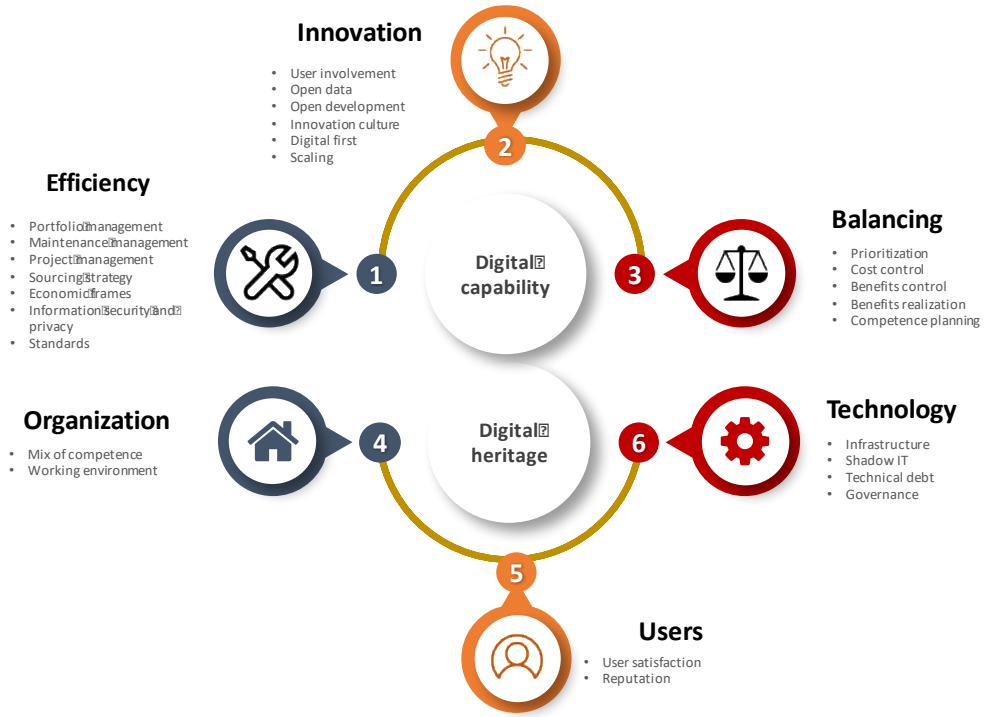

Figure 2. The factors and operationalization.

Each factor is presented along with a description and references to core literature (references are omitted from this paper, but made available in full through www.digitalforvaltning.se/references) due to limited space available according to the paper guidelines.

Category	Factor	Description	Core references
1. Efficiency	Portfolio management	To secure successful prioritization of projects within the portfolio, a well-developed portfolio capability is necessary. Previous research points to that shortcomings and biases in this work, and the necessity to handle different types of investments within the same portfolio.	Xue, Ray & Sambamurthy, 2013; Xue, Ray & Zhao, 2017; De Reyck et al, 2005; Ettlie et al, 2017; Kim, Wimble & Sambamurthy, 2017
	Maintenance management	The operations task is a pre-requisite for both maintenance and development and is seen as core as it constitutes the lion-share of the IT budget. Maintenance management involves the ability to conduct this task in a cost-efficient manner, which requires a foundational maintenance model that creates sustainable prerequisites for both efficiency and innovation.	Murphy, Lyytinen & Somers, 2017; Rubino et al, 2017; Tiwana, Konsynski & Venkatraman, 2013; Tallon, Ramirez & Short, 2013; Tiwana & Konsynski, 2010
	Project management	Since the project is the common form denominator for the bulk of development work, there is a need for a well-developed project management ability. This includes clear pre-requisites and methods that need to be well grounded in the organization.	Ho et al, 2017; Braglia & Frosolini, 2014; Wiener et al, 2016; Kanwal, Zafar & Bashir, 2017; Vijaysarathy & Butler, 2016; Tiwana, 2010
	Sourcing strategy	With increased external dependencies for operations and maintenance, along with new business models for externalized delivery, the capability to work with supply on a strategic level is necessary.	Elia et al, 2014; Gobble, 2013; Schneider & Sunyaev, 2016; Su, Levina & Ross, 2016; Willcocks, Venters & Whitley, 2013; Liang et al, 2017; Schermann et al, 2016
	Funding frames	Sufficient and stable funding is seen as a pre-requisite for long-term cost efficiency within operations. Hence, the long-term securing of financial prerequisites is a core capability.	Saunders & Brynjolfsson, 2016; Mithas, Krishnan & Fornell, 2016; Arsenyan & Büyüközkan, 2016; Ravichandran et al, 2017; Dow, Watson & Shae, 2017
	Information security and privacy	Information constitutes the foundation for digitalization, and through this high requirements and demands are placed on maintaining a high level of information security and privacy. To facilitate this, information security perspectives need to be present throughout the entire information value chain. This requires the integration of information security work in all parts of the organization.	Lowry et al, 2015; Sicari et al, 2015; Garba et al, 2015; Elmaghraby & Losavio, 2014; Bertot et al, 2014; Kim, Trimi & Chung, 2014; Kwon & Rao, 2017
	Standards	Long-term efficiency in operations and maintenance requires the ability to work with the adoption of common technology standards. With the development of standards being an international undertaking, this requires market intelligence, as well as participation and active adoption of viable standards in the choice of technological components.	Spulber, 2013; Mezgár & Rauschecker, 2014; Agostinho et al, 2016; Zhao & Xia, 2014; Mandel et al, 2016; Gil-Garcia & Sayogo, 2016; Rezaei et al, 2014
2. Inno-vation	User involvement	The user has traditionally been a lost source for insight in terms of design of new solutions. Research has now shown the benefits of actively involving the prospective end-users in all phases of development.	Von Hippel, 1986; 1994; 2005; Baldwin & Von Hippel, 2006; 2011; Saidhana, Mithas & Krishnan, 2017
	Open data	Recent development advocates the role of open data as a direct pre-requisite for accelerated digitalization. This is related to innovation becoming more externalized than before, and dependent upon inter-organizational collaboration both within and beyond the public sector.	Dawes, Vidiasova & Parkhimovich, 2016; Vetro et al, 2016; Davis & Perini, 2016; Janssen, Charalabidis & Zuiderwijk, 2012; Kassen, 2013

	Open development	With limited resources in regards to internal development and the emergence of platform strategies as a viable sourcing option, new demands are placed on opening up the development process for external parties. This involves both using inspiration from Open Source Software development and more commercially dominating alternatives.	Kogut & Metiu, 2001; Chesbrough, 2006; Van Alstyne, Parker & Choudary, 2016; McIntyre & Srinivasan, 2017; Parker & Van Alstyne, 2017; Ghazawneh & Henfridsson, 2013; 2015; Brown et al, 2017; Gómez, Salazar & Vargas, 2017; Wassmer, Li & Madhok, 2017
	Innovation culture	An innovation culture involves the existence of the right pre-requisites so that innovation can be prioritized and executed in an effective manner. This includes the ability to manage higher risk assessments, to learn from mistakes and to incentivize initiatives beyond mere exploitation of existing opportunities.	Dobni, 2008; McLaughlin, Bessant & Smart, 2008; Brettel & Cleven, 2011; Moon & Norris, 2005; Kim & Yoon, 2015; Criado, Sandoval-Almazan & Gil-Garcia, 2013; Chou & Liao, 2017
	Digital first	Digital solutions should be the de facto standard for organizational development. One reason for this lies in the increasing percentage of the population being digital natives.	Palfrey & Gasser, 2013; Yoo, Henfridsson & Lyytinen, 2010
	Scaling	To achieve economies of scale on an organization-wide level, the ability to lift digital initiatives from the department (or equivalent) to the central maintenance and operations. This requires processes to identify and propagate digital innovations.	Huang et al, 2017; Foster & Heeks, 2013; Westley & Abtadze, 2010
3. Balancing	Prioritization	The prioritization of new investments is often biased towards efficiency rather than innovation. The prioritization process needs to be adopted in order to handle parallel efficiency and innovation as result goals. One way to achieve this is through the use of digital options thinking.	Gregory et al, 2015; Xue, Ray & Zhao, 2017; Xue, Ray and Sambamurthy, 2012; Mithas & Rust, 2016; Sandberg, Mathiassen & Napier, 2014; Nielsen & Persson, 2017
	Cost control	Cost control is a hygiene factor for both the credibility and execution of digital initiatives. This involves both control and transparency.	Chae, Koh and Prybutok, 2014; Sabherwal & Jeyaraj, 2015; Walterbusch, Martense & Teuteberg, 2013; Alec Cram et al, 2016
	Benefits control	In order for benefits realization to be possible, transparency and control/monitoring of both direct and indirect benefits for previously conducted digital initiatives are necessary. This pushes new demands to both accounting and project management, as well as the prioritization process.	Baker, Song & Jones, 2017; Bardhan & Thouin, 2013; Bloom et al, 2014; Fan, Zhang & Yen, 2014; Hartman et al, 2017; Frisk, Bannister & Lindgren, 2015
	Benefits realization	Previous research identifies clear deficiencies with benefits realization when it comes to digital investments. In order to secure the gains of the investment, an ability for benefits realization is necessary.	Coombs, 2015; Flak, Solli-Saether & Straub, 2015; Nielsen, Matiassen & Newell, 2014
	Competence planning	The access to digital competence (both general and expert) constitutes a growing concern from an international perspective In order for this not to hamper digitalization, the ability to work with competence planning surrounding digital competence on a strategic level is necessary.	Bresciani, Ferraris & Del Guidice, 2017; Tiwana & Kim, 2015

Table 1. Digital Capability

Category	**Factor**	**Description**	**Core references**
4. Organi-zation	Mix of competence	The competence base for the it department needs to match both the current and prospective needs. As the installed base often is built on elements of antiquated technology, this creates a lag in terms of the competence base where this is optimized for maintenance and operations rather than modernization and development of new technology.	Mayer & Nickerson, 2005; McMurtey et al, 2002; Paré & Tremblay, 2007; Hawk et al, 2012; Pérez-López & Alegre, 2012; Kowal & Roztocki, 2015
	Working environment	Deficiencies in the working environment for IT co-workers creates a difficulty in attracting and retaining relevant competence for future needs. The result is an amplification of lack in competence and growing problems associated with staff turnover and sick leave which hinders the ability to deliver.	Tong, Tak & Wong, 2013; Chang et al, 2012; Venkatesh et al, 2017; Ertürk & Vurgun, 2015; Anthony-McMann et al, 2017
5. Users	User satisfaction	Deficiencies in user satisfaction impacts the user's willingness to actively work with the IT department to create improvements. This creates a seedbed of shadow IT and negatively impacts the level of internal IT utilization.	Sun et al, 2012; Woxom & Todd, 2005; Legris, Ingham & Collerette, 2003; Kettinger & Lee, 1994; Leonard-Barton & Sinha, 1993; Hu, Hu & Fang, 2017
	Reputation	Deficiencies in delivery capability over long periods of time creates a reputation where the users have a low level of trust for the IT department. This leads to a passive user culture and hinders future development.	Hirschheim & Lacity, 2000; Reich & Benbasat, 2000; Sweetser, 2014; Purvis, Zagenczyk & McCray, 2015
6. Techno-logy	Infrastructure	Deficiencies in infrastructure leads to potentially long lead times for future changes and a stacked demand for necessary modernizations/re-investments before new innovation with concrete benefits can be delivered. This leads to a marginalization of innovation, lock-in effects and redundant costs.	Duncan, 1995; Henderson & Venkatraman, 1993; Bharadwaj, 2000; Bhatt & Grover, 2005; Khan, Khouja & Kumar, 2012; Kumar & Stylianou, 2014; Hanseth, Monteiro & Hatting, 1997
	Shadow IT	Decentralized investments and non-sanctioned user-driven innovation creates a lack of synergies, efficiency and security.	Györy et al, 2012; West & Gallagher, 2006; Shumarova & Swatman, 2008; Raden, 2005; Silic & Back, 2014; McDonald, 2014; Silic, Barlow & Back, 2017; Myers et al, 2017
	Technical debt	Lacks in previously conducted development in the form of missing documentation and a high degree of shortcomings lead to increasing maintenance costs and difficulties for future development. Following an increased focus on agile development, this phenomenon is expected to increase over time.	Kruchten, Nord & Ozkaya, 2012; Marinescu, 2012; Klinger et al, 2011; Conroy, 2012; Li, Avgeriou & Liang, 2015; Alves et al, 2016
	Governance	Biases in the configuration of governance creates a governance optimized for stability that does not cater to the needs for innovation.	Magnusson, 2010; Banker et al, 2012; Guillimette & Paré, 2012; Prasad et al, 2012; Van Grembergen & De Haes, 2004; Joshi et al, 2017; Dawson et al, 2016; Pang, 2014; Wu et al, 2015

Table 2. Digital Heritage

Evaluation and design implications

The model was evaluated through a pilot study directed towards 17 randomly selected agencies, municipalities and regions in Sweden in the winter and spring of 2018. The evaluation involved

both quantitative analysis of the data and a qualitative survey directed towards key respondents in each organization.

Statistical evaluation of reliability

The quantitative evaluation of the reliability of the model was conducted through comparison of means (Table 3) and PCA (Table 4).

Factor	**Control question**	**Weighed**	**Difference (%)**
Digital heritage	3,83	3,72	1,90%
Efficiency	3,68	3,25	7,10%
Innovation	2,76	2,99	-3,78%
Balancing	2,89	2,85	0,60%
Digital maturity	3,47	3,26	3,54%

Table 3. Comparison of means for control questions

The comparison of means between the control question and the factors displayed no significant difference apart from that of Efficiency (7,1%). Based on this, we conclude that the model seems endowed with a sufficient degree of reliability, warranting factor analysis.

Dimension	**Factor**	**KMO**	**Bartlett (sig)**	**Initial eigenvalues explained by first component**
Digital capability				
	Efficiency	.914	.000	91.384
	Innovation	.889	.000	94.598
	Balancing	.916	.000	94.117
Digital heritage				
	Organization	.500	.000	96.267
	Users	.500	.000	96.494
	Technology	.868	.000	95.304

Table 4. Principal Component Analysis

As shown in the PCA, the adequacy of selection was high in all factors except Organization and Users (which both were measured through merely two questions each). With these displaying a KMO of 0.5, we conclude that this is still an adequate basis for factor analysis. In addition to this, the Bartlett (sig) value below .05 indicates that the correlation matrix is an identity matrix, i.e. additional support for the possibility of factor analysis. Based on the PCA, we conclude that the reliability of the model is high, but that additional testing following more responses will be necessary.

Qualitative evaluation

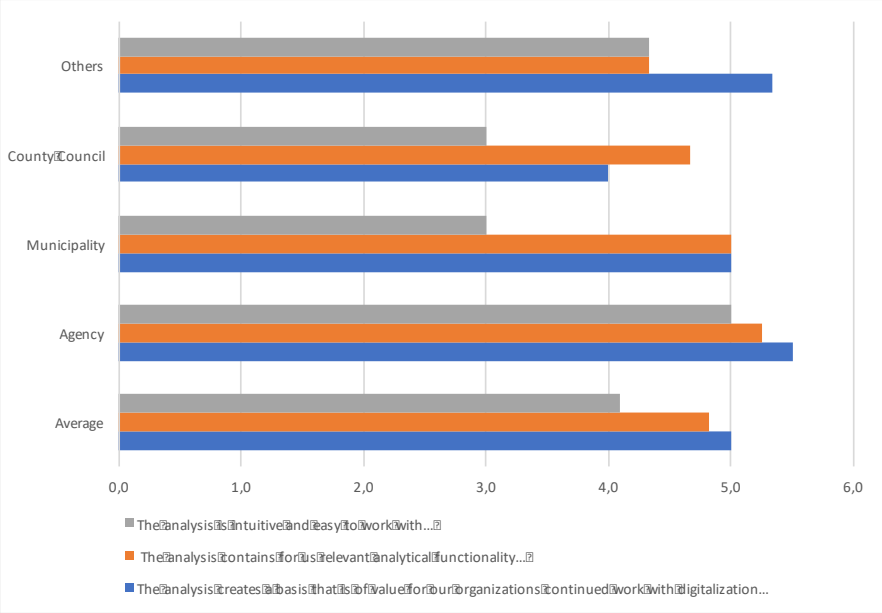

Figure 3. Results of qualitative evaluation

As seen in Figure 3, the perception of utility as expressed by the respondents was high (5 our of 6), ranging from 4 (Regions) to 5.5 (Agencies). This spread requires additional analysis, but the general high level of utility is seen as indicative of the necessity for the measurement of digital maturity in the public sector.

Design implications

The study identified six design implications. First, the longitudinal credibility of the model needs to be continually monitored. Second, the users were given a "Don't know" option for each question, which created the basis for interesting analysis. The frequencies of Don't know responses mirrors the areas where the co-workers lack an understanding, and hence a basis for directed initiatives. Third, the users sharing of recommendations of key initiatives requires additional work. The submitted recommendations of initiatives displayed a high degree of variance in terms of specificity, hence calling for guidelines for what constitutes a recommendation. In addition to this, the analysis of impact of said recommendations for digital maturity also needs to be addressed, striving for identifying different types of recommendations that have a significant impact on digital maturity. Forth, the user support in terms of how the analysis is to be used needs to be further developed in order to assure optimal value and to avoid the risk of suboptimal competition between public organizations. Internal comparison of the quantitative level of maturity is deemed as adding higher value than the external. Sixth and last, the model's relationship with other, incumbent models currently in use in the public sector needs to be addressed.

Discussion

The outset of this work has been that of digitalization changing and challenging several of the previously dominating underlying assumptions of computerization and e-Government (Archibuigi, 2017; Yoo, Henfridsson & Lyytinen, 2010). Findings such as those of Mithas and

Rust (2016), which highlight the necessary dual focus of digitalization, Teece, Peteraf & Leih (2016) that link the notion of agility to dynamic capabilities and those of Magnusson and Bygstad (2014) that stipulate the sometimes-constraining effects of the information infrastructure in organizations. These recent findings call for new assumptions to be used as guiding principles for the design of digital maturity in the public sector models, i.e. an in essence new approach.

The results of the evaluation show that the proposed model is credible (i.e. has a high level of reliability) and that it adds substantial value to public organizations in their quest for increased digitalization. Despite utilizing a similar method as Valdéz et al (2011) in designing the model, we deviated from utilizing "best practices" and solely chose literature published scientifically. The rationale for this was that we perceive the lag between "best practice" and research to be substantial, i.e. any attempt at looking into the current pre-requisites for gaining value from digitalization needs to avoid navigating by looking at the rear-view mirror (or even worse, the *figurehead* to paraphrase Luhmann, 1984).

This study contributes to research through providing a new, scientifically grounded model for digital maturity in the public sector assessment, following along the same path as previous research such as Valdéz et al (2011). In addition to this, the evaluation of said model adds additional insights through deviating from the bulk of scientifically presented models in the past (Wendler, 2011).

The implications for research lies in the choice of deviating from previous norms within maturity studies such as the reliance on CMMI. By treating CMMI as an inherently non-ambidextrous approach, we open up for new takes on digital maturity where the balancing of both innovation and efficiency becomes key. With digitalization unfolding within the public sector, we see the approach of findings new guiding principles and assumptions for assessing digital maturity as a central contribution.

The evaluation of the model through the design of analytical software is an additional contribution to research. By creating a beta-version of the intended use of the model (through analysis), we open up for not merely evaluating the model per se, but also through evaluating the model in complete use, i.e. including the analysis and the creation of actionable insight. This highlights the function of the model as one of improving digital maturity, not solely assessing it. With the model now being employed by 80+ public sector organizations with a significant growth rate and negotiations for becoming the selected national model for digital maturity assessment in its final stages, the model is proving to be relevant. At the same time, a number of examples of what the model actually brings to the table in terms of accelerated digitalization are starting to emerge. Future research is going to partly address these in-situ effects of the use of the model.

The implications for practice consist of the model and use. With the study being able to evaluate both the reliability and the value of the model and its use, it forms a potential basis for transfer into other areas. We see little that would delimit the model to solely the Swedish public sector, and believe the value to be substantial to other contexts such as both other nations public sectors as well as the private sector. The level of generalizability is in other words high, even though adoption in a different sector would require additional analysis and evaluation.

The model is now being propagated into the Swedish public sector through a research consortium, where researchers will continue to develop and fine-tune the model over time, as well as work with ex-post analysis of the data collected (so far more than 4,000 responses from

80+ organizations). This will involve directed studies of particular types of initiatives and their impact on digital maturity (see Magnusson et al, 2019). The goal will be to be able to analyze patterns of digitalization within the public-sector organizations, and to add new insights into strategies and governance configurations for accelerated digitalization in the public sector.

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