Digital Innovations and Transformation in the Public Sector of Panama

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Abstract Digital innovations and transformation have changed the way in which the public sector works, whilst massive digital disruption took place during the pandemics. The research gap that this article looks at is the lack of academic research on this phenomenon in Panama. The paper presented here is as a qualitative case study of 9 public organizations in Panama and aims to the explore the issue from the theoretical framework of the theory of affordances using semi structured interviews and focus group as well as to serve as a steppingstone for further research of the subject in Panama and in the rest of the Latin American region.

Keywords Digital · Transformation · Innovation · Disruption · Developing country · E-government · Women · Public sector · STEM · Public management

1 Introduction

This research paper was presented at the XXXIII ISPIM Innovation Conference "Innovating in a Digital World" Copenhagen, Denmark in June 2022. It concerns public sector digitalization, presenting a literature review of the current state of the art and contributing areas for further research and exploration. Moreover, the objective of this paper is to share the theoretical background, explain the problem addressed, the research objective and questions, the research design, an overview of the findings, contribution, practical implications, limitations and a recommendations section.

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2   Theoretical Background

Digital transformation refers to the social and economic undertaking of online operations and the overall change in the way organizations work to the online arena (Ciuriak and Ptashkina 2019, p. 1). Moreover, according to an article about this issue in the energy sector, digital disruption is caused by digital transformation though it brings "new and important opportunities for our societies, both in strengthening the reliability and resilience of our grids and even highly ambitious climate change goals" (Chase and Berzina 2018, p. 48). The core idea here could be transversal to other sectors of society. Thus, it is essential to consider how the public sector is coping with digital disruption and how besides the challenges it might present, it also may open opportunities.

Digital transformations might produce status quo disruption in the organization internal procedures, changes may occur in the way power is held by stakeholders and, the very core of the organization might completely change. Management needs to consider the pro and cons and make sure they have the right tools to face the complications that going digital could bring (Von Kutzschenbach and Brønn 2017, p. 1). In the midst of this need of change from traditional procedures to digital ones digital innovation will be catalysed. For managers the challenge is "successfully managing the transition from where the organization is toward a desired future state" (Li 2020, p. 809).

According to Nambisan et al., digital innovation is "the use of digital technology during the process of innovating. Digital innovation can also be used to describe fully or partly, the outcome of innovation" (Nambisan et al. 2017, p. 223). In this manner new digital solution may emerge to new or old problems. It also puts together digital and physical aspects in order to develop new solutions (Yoo et al. 2010, p. 725). As mentioned here, the physical aspect is also important to consider, given that there is physical equipment that is necessary to develop digital innovation and capacity building of it is also required so that the backend users (public servants) and end users (citizens) are comfortable with it.

Furthermore, when considering digital innovation in the public sector, it could be important to analyze it in a wider context. Avgerou and Bonina suggest that public sector technology professionals need to consider the social aspect to be able to fully grasp the objectives of the IT projects that are assigned to them. This is especially important in developing countries where resources are more limited and unstable political condition can put IT implementation at risk faster (Avgerou and Bonina 2019, p. 91). This might be a highly important reflection to this research project considering that Panama is still categorized as a developing country and most of the countries of the Latin American region are too.

Additionally, in an article about digital affordances, the authors point out that they are based in the "technical architecture of digital infrastructures, and they support an economy-wide redesign of value creation, delivery and capture processes" (Autio

et al. 2018, p. 74). Therefore, it could be inferred that because of the rapid technological change the world is facing right now, there is the possibility that the perception of digital affordances also changed.

Another interesting aspect to look at is the participation of women in all of these, according to a study about gender gaps in Research and Innovation of the European Commission, women represent "48% of Ph.D. graduates, 33%o f researchers, 24% of Top-level researchers (grade A) and, 22% of Heads of higher-education institutions" in the European Union as of 2020 (European Union 2020, p. 1). This could be an indication of how the gender gap grows as the complexity or the level of seniority increases. It also elucidates that even though this particular study shows a gap, there is a presence of women in the field therefore, their perspective is relevant.

Meanwhile regarding the gender gap in sciences, technologies, engineering and mathematics (STEM) in Latin America, Arredondo Trapero, Vásquez and Velásquez mention that social and cultural factors related to women must be considered in order to be able to diminish the gender gap in the region, thus providing the conditions for Latin American women to change their own perspective and see themselves as part of the science and technology field (Arredondo Trapero et al. 2019, p. 154).

Moreover, it seems that the root cause of this issue goes beyond the problem itself. In fact, "some gender and IS research imports gender theories from disciplines such as feminism, sociology and psychology to study both gender and IT use, and gender in the workforce" (Trauth 2013, p. 285). This is a very complex area of analysis that requires efforts from different areas of study.

An author notes as part of the conclusions of her study, that social, political and economic conditions are decisive factors for women in innovation leadership positions and, that there should be policies that take these factors into account (Carrasco 2014, p. 421). Thus, it's possible that having the perspective of women on such issues and particularly on digital innovation could help broaden its understanding as a topic and perhaps even help empower women to get involved in this field somewhere in the future.

Looking at innovation through the gender lens makes it possible to understand the particular gender concepts within the area of innovation and, the ways in which they are deep within the mindset of those developing innovation (Pecis 2016, pp. 2119–2020). Incorporating this lense to this research project, even in a small way could also provide a deeper comprehension which would enrich the analysis.

3 Problem

Public sector organizations have been relatively slow in their adoption of digital innovation with it being even a novel idea until recent years. However, rapid technology development in digital innovation alongside the effect of rapid adoption to counter the global pandemic, digitalization has become a global necessity with increasing policy calls for adoption. To keep citizens safe through the pandemic, countries implemented several new technologies thus, digital transformation took place, bringing

with it digital disruption in the areas where these changes happened too suddenly. In Panama, this was also the case, and the speed of digital transformation provided research opportunity. This is where this study is focused.

4 Research Objective and Questions

Research question: How do managers in Panamanian public sector perceive the affordance of digital innovation?

And my sub questions are:

- What is the understanding of digital innovation in the public sector?
- What is the perception of women and women in management positions of digital innovation in the public sector?
- How is digital innovation in the public sector developed and implemented?

5 Research Design

Regarding the research methodology for this project, I am conducting a qualitative and exploratory type of research. The goal is to understand the research topic and explore it, instead of aiming to study large samples in order to have outcomes that are representative of some area (Ambert et al. 1995, p. 880). Also, I will be using the inductive approach for this endeavor, the general idea is to gain insight on the participants perceptions regarding the research topic and questions and, to provide a description of it (Yilmaz 2013, p. 313) to be able from to gain understanding from the research participants views. The intent is that my research can also help other researchers on the future, thus also building on it and looking further other more specific interest areas.

In reference to my research philosophy choices, ontologically I have chosen constructionism which "refers to the construction of knowledge through active interaction with environments, emphasizing the purposeful production of knowledge" (Trainor and Graue 2013, p. 13) and, that interaction with the environment is part of the learning process which leads to construction (Packer and Goicoechea 2000, p. 3). In other words, knowledge is constructed from different interpretations of realities therefore the idea is that there is not one single truth.

Moreover, epistemologically I am using hermeneutics, an approach that "provides insight into ways of interpreting textual material, which can comprise both formal written texts and spoken words that can be recorded (Easterby-Smith et al. 2012, p. 170). As an epistemology, hermeneutics "maintains interest in issues of human knowledge: it does help to explain how humans come to know" (Bineham 1994, p. 307). Thus, the interest is to understand the topic from human experience and to have different views according to the perspectives of the participants gathered

from the data collection, which will enable the possibility of making a wholesome analysis.

It is important to mention that I will use of secondary data and of comparing the results from the data collection in Panama with research from other countries in the Latin American region, the larger scope of the context will help understand better the experiences from the Panamanian participants and find perhaps some commonalities or differences which could enhance the depth of the analysis and reflections for the research project.

Also, it is relevant to highlight that the Theory of Affordances provides an interconnection structure from which to analyze the different aspects of technology which can possibly change (Evans et al. 2017, p. 36). Thus, this theory would be very relevant to the analysis part of this study given as it provides a specific ground where this research project attempts to contribute to knowledge.

This is a qualitative multiple case study of the affordances of digital innovations in the public sector of Panama. I am using the case study method which according to Simmons "is an in-depth exploration from multiple perspectives of the complexity and uniqueness of a particular project, policy, institution, programme or system in a´real life´ context" (Simons 2009, p. 21) which aligns exactly with the intention of this project.

It is also relevant to mention that I chose to use this method over others such as surveys, because the case study seeks to explain the items of study and surveys attempt to indicate the occurrence of certain events and to predict possible results (Yin 2003, p. 7) and the intention of my study has been from the beginning to understand the topic at depth. On the other hand, even though ethnography is another qualitative method that has a similar approach, I did not choose it mainly because it's a type of study that requires long periods of time to undertake and the researcher spends most of its time immersed in one organization carrying out observations and informal interviews (Reeves and Hodges 2008, p. 514) Therefore, ethnography was not a suitable method for this research project, given that I would like to contact more than one public institution in order to compare the results and the long term required access to a public institution would probably be a sensitive matter.

Regarding the data collection, I used mainly semi structured interviews in 9 public institutions and was able to carry out one focus group in one of the organizations. Whilst the data for this research project will be gathered in these two manners, I will also rely on secondary data, using research from the topic of study focusing on other Latin American countries for comparison, specifically Brazil and Mexico given that they are two of the biggest countries in our geographical area and Costa Rica and Chile which are some of the most technologically advanced countries of the region. Nevertheless, I might also use research from other parts of the world as a reference especially in the context part of the thesis.

The aim of the interviews was to get insight in regards of the perception on organizational change of digital innovations in the public sector and, to get people´s overall view, thoughts, and even personal experiences regarding this issue, also following the lines of my sub questions specific areas of interest. And for the focus group, they had the same general objective, with the difference of aiming to get their viewpoints

the implementation processes and adoption of digital innovation which might differ from the perceptions of their own managers, and to see the interaction amongst the group, which could also lead to more a more in-depth grasp of the topics discussed. The samples were small, given that the interest was to dig deeper into each person's perspective rather than to get information that would be representative of some niche.

6   Findings

9 semi structured interviews with senior public managers were carried out in 9 public institutions in Panama, and 1 focus group with the team members of one of those public managers.

It´s important to mention that it was the original intention of the Project to have a focus group which each of the team members of each public manager, however it was not possible mainly due to their preference to keep their participation in the study completely anonymous even from their own team.

The data collection took place in two parts, 1st part during the last 3 months of year 2021 in which 5 semi structured interviews and 1 focus group were carried out, and the 2nd part during the first 3 months of year 2022. The interviews conducted lasted between 45 and 60 min, and the focus group, about 90 min.

The participants were approached by sending them an invitation letter to participate in the study which was addressed directly to them, the communication with the public managers and coordination of the meetings was facilitated by the fact that I personally knew most of them, given that I had worked as a public manager for almost 5 years at that moment. Thus, not long after the invitations were issued, I was able to start the data collection.

Regarding to the data analysis framework for this study, it's based on the Gioia methodology, which intends to improve qualitative strictness in its "approach to analyses, especially in terms of organizing the data into 1st- and 2nd-order categories to facilitate their later assembly into a more structured form" (Gioia et al. 2013, p. 20). This allows to see the qualitative data in a much more organized way, which might make it easier to understand for both the researcher and the reader.

The first step towards the analysis, was to transcribe the interviews, and to translate them. Then the information was coded by common themes, concepts and later on creating categories. Following the Gioia methodology, 1st and 2nd order concepts related to 3 different aggregate dimensions came up, which are: digital innovation development, gender gap perceptions and digital innovation affordances. Moreover, the interviews with the participants provided much in-depth information from their own experience regarding digital innovations and transformation in the public sector in Panama.

7 Contribution

This research aims to contribute to the theory of affordances, by giving insight on its application on digital innovation and transformation research analysis and how understanding what the subject affords to the public sector provides value to a qualitative type of analysis.

The paper also expects to contribute practically to public policy, hoping that the case of Panama could serve as a reference for further study in other Latin American countries, and/or into more specific subjects of digital innovation and transformation in the public sector, such as: artificial intelligence, open innovation and, cybersecurity.

8 Practical Implications

Challenges to the adoption and implementation of digital innovations were identified, which could have practical implications for decision makers and can be used as lessons to learn.

Some of the challenges identified in the data analysis so far are: having an adequate IT infrastructure throughout the whole country in order that all of the population may have internet access, not enough prepared professionals in digital innovation and transformation related areas, acceptance of change, new cybersecurity threats and the need of citizen centred digital innovation developments, among others. These represent serious challenges to a government (and its managers) that is still trying to process very rapid digital transformation processes, and to citizens who are still trying to learn how to use new technological developments, or to find a way access them. Bearing in mind the ongoing health crisis, which still requires many resources from the government.

9 Limitations

The main limitation for this research was that it was not possible to carry out a focus group with the team of each public managers interviewed, given that most of them had a strong preference of their participation in the study remaining anonymous even from their own team. Given that this was considered in the original research design, this issue presented an interesting finding, which can be related to the fact that all of the interviewees were senior managers, and had many years devoted to public service, which caused them to be more apprehensive towards keeping their opinions and insights completely private and knowing that what they would share with the author would not affect them or their post in any way, and this could be only secured by providing total anonymity.

Another aspect that can be considered as a limitation worth mentioning, was just how broad the subject of digital innovation and transformation in the public sector has become, and as the empirical data collection took place, it came to be obvious how it has affected many different aspects and how the research could only be but a small general steppingstone for a research subject that will require much attention and detailed research into various specific areas of study. However, this limitation also became an opportunity to highlight these areas in the coming recommendation section, so they can be considered by other researchers.

10 Recommendations

Digital innovations and transformation in the public sector of Panama in the context of the pandemics, rapidly increased the speed at which digital disruption took place, and it also opened the way for more specific sub areas of development and research, such as: artificial intelligence, open innovation and cybersecurity. It is true that in concept they already existed, but at a practical level, perhaps only partially and in terms of academic research on it in Panama and in the Latin American region, it was almost unexplored. However, as the adoption of these new technologies have been implemented throughout the public sector it is important to continue to research on them, so that countries may strategically consider them when public policy planning is taking place and when resources are being distributed, hopefully as a priority.

Other areas that were brought to conversation during the empirical data collection by the participants that are interesting to develop further research on them, are: the age gap and the difficulty of the older generations to adapt to digital transformation and, the lack of access of indigenous communities to the internet which leaves them excluded from any and all digital government initiatives, and the importance of adequate infrastructure for information technologies in urban and rural areas as well.
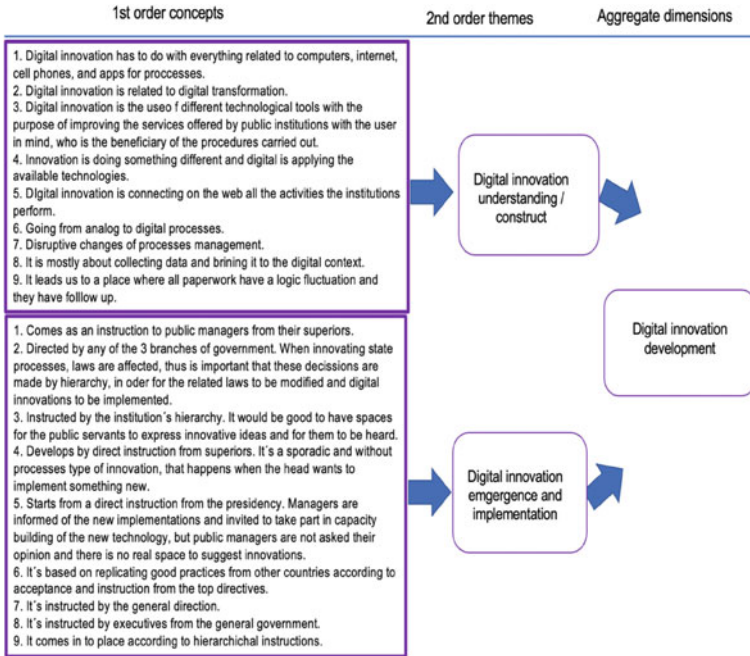
Appendix

See Figs. 1, 2 and 3.

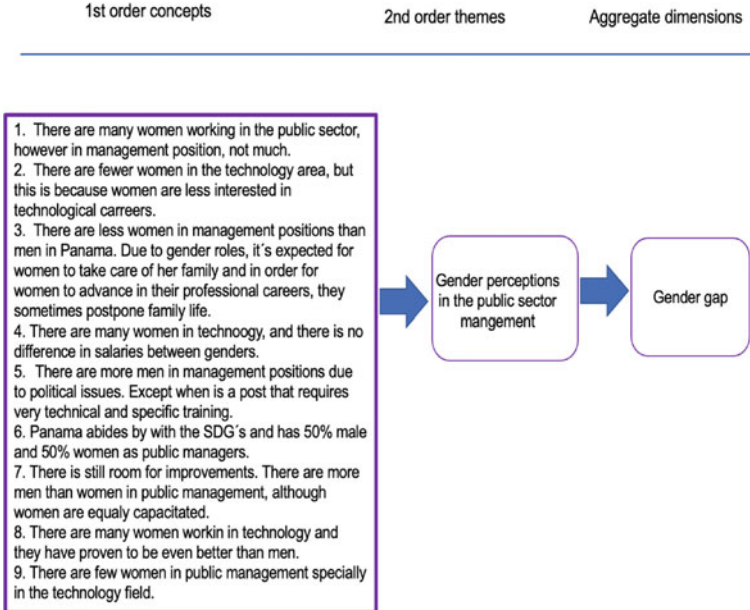**Fig. 1** Graphic. Data structure

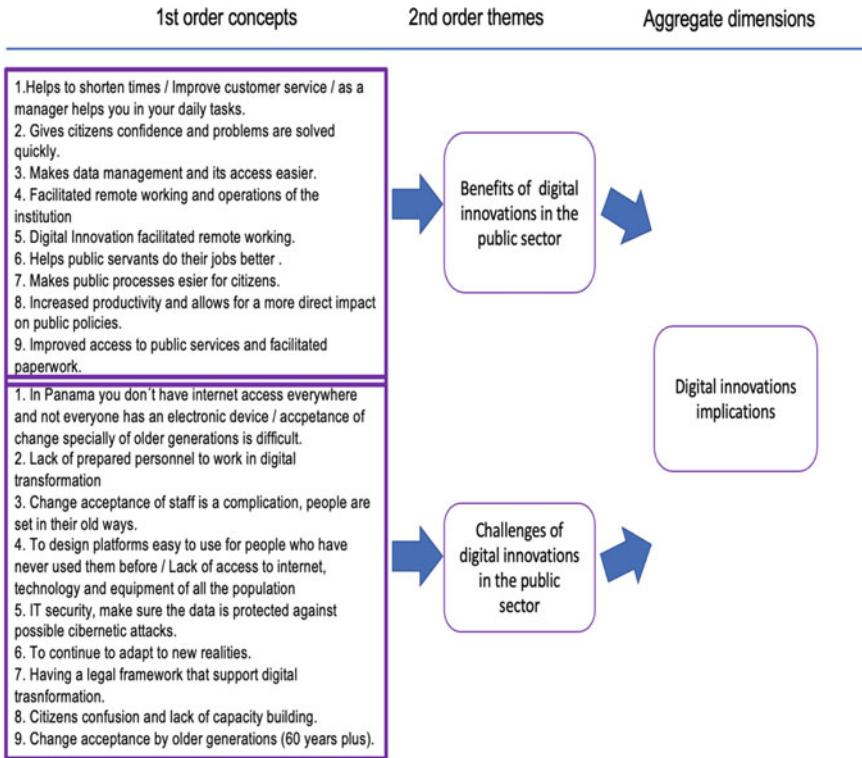
Fig. 2 Graphic. Data structure 2

Fig. 3 Graphic. Data structure 3

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