Research Gaps on Public Service Delivery

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ABSTRACT

This paper follows the research framework for context-specific public service delivery presented at ICEGOV 2016 [1]. The research has been conducted at the UNU-EGOV unit during the last year. The paper presents the research landscape for ICT enabled public service delivery scientific and policy literature. The findings are analyzed and presented in a conceptual framework allowing us to identify the core dimensions and sub-dimensions of public service delivery.

The paper concludes by outlining the research gaps identified by the study and a series of policy recommendations to enhance public service delivery. The results showed that the Innovation and Evaluation dimensions and their sub-dimensions, Innovating Public Procurement, Collective Learning and Intelligent, Evidence-Based Policy Making and Social Media Impact are the areas with less investigation.

CCS Concepts

Social and professional topics → **Government technology policy**

Keywords

Policy-Driven Electronic Governance; Context-specific Public Service Delivery; Dimensions; Research Gaps; Recommendations; Public Service.

1. INTRODUCTION

Public Service Delivery (PSD) is challenged by diverse social needs, ageing societies, economic pressure, income inequality, and unequal access to services. For example, the failure of PSD in many developing countries is not just due to the scarcity of resources but to the problems of incentives, accountability and governance that vary from one context to another [2]. Similarly, the quality of PSD may differ from one context to another, resulting in universal public service provision intended to reduce inequality achieving the exact opposite.

Under the title Electronic Governance for Context-Specific Public Service Delivery, UNU-EGOV is currently conducting research on how digital innovation, ICT facilitated PSD systems can be used in different national, local and sectoral contexts. The aim is to identify the critical factors affecting the performance of PSD systems and how such factors operate in different cultural and contextual settings, and examine how ICT and digital innovation could be used to transform such systems and enhance their performance vis-à-vis PSD [3] and the UN Strategic Development Goals (SDGs) [4].

As part of the ongoing work at UNU-EGOV this paper presents the results of a classical literature review of the current landscape of ICT facilitated PSD. The paper is structured as follows. Section 2 outlines the key aspects of public sector service delivery. Section 3 presents the research methodology. Section 4 shows the research landscape of public service delivery in terms of disciplines, institutions, countries, types of publications and venues of publications. Section 5 analyzes three international and one national public service delivery policy frameworks and based on that analysis extracts the dimensions and sub-dimensions of public service delivery. Section 6 presents the research literature review on ICT and public service delivery in light of the dimensions and sub-dimensions identified in previous section, i.e. the list of the selected papers on the subject have been classified under the dimensions and sub-dimensions.

Finally, Section 7 presents the main findings of this study in terms of research landscape, policy and literature review and research gaps, and concludes the paper by making some recommendations on public service delivery grounded in the outcomes of this study.

2. BACKGROUND

Public services as a term is difficult to define because it depends on the context and tradition of a given country and organization. For instance, the Anglo-Saxon perception of public service differs from a Weberian continental perception.

In the Anglo-Saxon model, a capitalist model, the public managers try to mimic private sector best practices, which are mainly oriented to the profit, and the public sector should provide fewer services [5]. The Weberian approach, a bureaucratic model, the public organizations has a hierarchical structure and are governed by rational-legal decision-making rules [6].

The Merriam-Webster Dictionary defines public service as "*the business of supplying something (such as electricity, gas, or transportation) to the members of a community; something that is done to help people rather than to make a profit; work that*

someone does as part of a government: the work done by public servants" [7].

Typically, public services include the following areas of public management: 1) central and local government; 2) health, education, defense, judicial system, internal affairs and 3) noncommercial semi-state organizations [8]. In this regard, public service may be defined as "*services which are mainly, or completely, funded by taxation*" ([8], p. 6 - For discussion see [8] pp. 6-9). Others differentiate between "*core government services*", i.e. activities that one must do as a citizen (e.g. pay taxes, apply for pensions or permits) and "*public value adding services*" i.e. what one would like to do as an individual (e.g. find the nearest playground, transportation directions, participate in decision making).

Public service composition also has several definitions. The OECD [9] defines it in terms of what information (right data) needs to be provided by a citizen or business and when (right time) and how (design) it needs to be provided in the public service request and delivery process. Others argue that all public services can be separate in "*information based services*", i.e. getting an answer to a question (e.g. how, when, how much does one receive from a service) and "*transactional services*" i.e. applying for something (e.g. a permission, a subsidy, a license).

A public service therefore consists of one or more of the following elements: 1) *Informational Data* (i.e. relevant information and content); 2) *Personal Data* (i.e. personal data such as identity, geographical location, income, etc.) and/or 3) *Transactional Data* (i.e. finding or applying for something) required by an authority to deliver the correct answer to a question or process an application (adapted from [10]). As illustrated in Figure 1, this means that personalized services must combine one or more relevant elements i.e. information, transaction capability, and data.
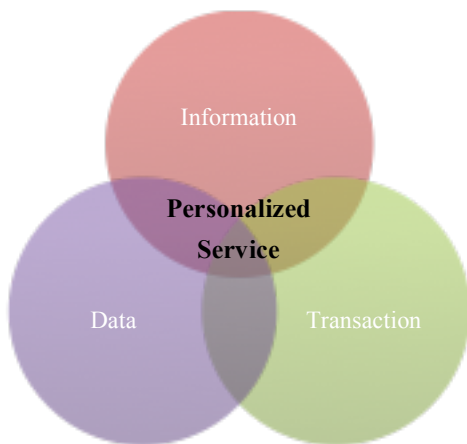

Figure 1: Personalized Service (Adapted from [10]**)**

When examining public services, it is essential to look at the delivery channel. Service delivery channels cover various contact and interaction points through which a public service can be requested by a citizen or company. Four general delivery channels exist: 1) the physical *in person* channel (e.g. one-stop-service centers); 2) the written requests (i.e. traditional paper mail, paper forms and increasingly e-mails); 3) the voice (e.g. telephone or video conferencing); and 4) the online self-service (e.g. websites, e-Services, apps requiring an internet connection).

Channel strategies, is in turn defined as the delivery strategy applied to a given service area. The objective of any organization's channel strategy is to direct users to the most appropriate and most cost efficient channel for a given service. Analysis by Local Government Denmark (the national association of municipalities) highlight that online self-service is between 2 and 3.75 percent cheaper than other public service delivery channels in Denmark [11]. While the numerical costs of service delivery vary across channels, service types, organizations, and countries, the strengths, weaknesses and real expenses of the four channels in relation to one another are confirmed by practitioners to largely hold in a European context, as well as in Austria, Finland, Georgia, the Netherlands, Oman, Japan, Singapore and Sweden [10].

In order to have a better understanding of public service delivery, the public service concept, areas of public management, personalized services and channel strategies have been revised in this section. The next section presents the methodology used to conduct this research work.

3. METHODOLOGY

As showed in Figure 2, the adopted methodology for searching literature included two steps: 1) Identifying Relevant Policies and 2) Identifying Relevant Research.
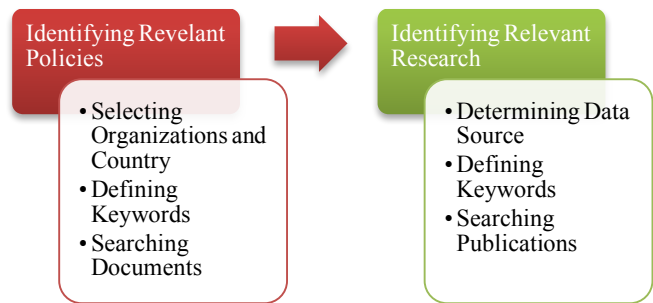

Figure 2: Searching Methodology

The policy review process started with the selection of policy documents on public service delivery from international organizations and another from a target country - Ireland because it is well-documented and actual - for comparative reasons.

In contrast, the research review was carried out as a classical literature review [12][13], starting with a search on the two most relevant scholarly databases. Scopus [14] and Web of Science [15] were chosen as they are both leading sources of scholarly research data, and provide a reliable, integrated and multidisciplinary source of research. The identification of scientific databases was followed by the definition of the keywords to be used in the search for publications. The key words ("Public Service Delivery" AND "Information and Communication Technology") were applied to both scientific databases, Scopus and Web of Science, which returned 286 and 127 publications, respectively.

The data collection process comprised three main phases: 1) determining the data sources to search relevant literature, 2) defining the appropriate keywords to collect the most relevant publications, and 3) doing the search for publications on the selected data source with the defined key words.

Figure 3 shows the number of publications per year since 1999 until 2015 from the search on Web of Science database. Figure 4 shows the result of the same search in the same period on Scopus.
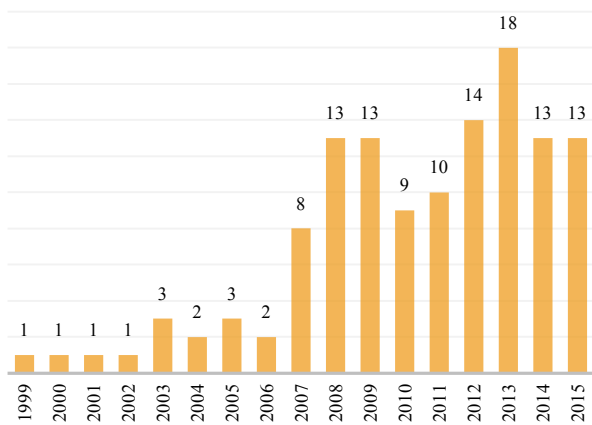

Figure 3: Search on Web of Science

As it can be seen in **Error! Reference source not found.** and Figure 4 both graphs show a similar curve trend in terms of growth of publications, but with a vastly different number of publications returned. The key word search in Scopus returned 286 publications, twice the number of Web of Science's 127 publications. As a result, the output of the two key word searches was screened in terms of relevance. Scopus was subsequently selected as the main data source due to its broad coverage on public service delivery and ICT investigation.
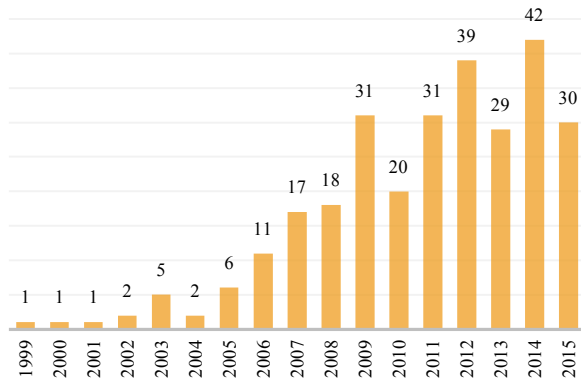

Figure 4: Search on Scopus

Figure 4 shows that the growth of Public Service Delivery research started in 1999 when the first paper on the topic was published. From 1999 until 2006, the popularity and growth rate of the research area remained relatively low, with only 29 papers published during this eight-year period. However, in the following years, the publication rate increased considerably with 97 publications between 2006 and 2010 and a yearly average above 34 between 2011 and 2015. When the last eight years (240 publications) are compared with first eight years (18 publications), the number of publications increased more than tenfold.

The chosen keyword search was applied to Scopus on April 12, 2016 against article titles, abstracts and author defined keywords. The Scopus search produced 286 publications. A brief extract of the bibliographic information of the publications obtained in Scopus is shown in Table 1.

NO	YEAR	AUTHORS	TITLE
1	2016	Höchtl J., Parycek P., Schöllhammer R.	Big data in the policy cycle: Policy decision making in the digital era [16]
2	2015	Lucas H.	New technology and illness self-management: Potential relevance for resource-poor populations in Asia [17]
3	2015	Sundar D.K., Garg S., Garg I.	Public health in India: Technology, governance and service delivery [18]
4	2015	Islam M.M., Ehsan M.	E-governance as a paradigm shift in public administration: Theories, applications, and management [19]
5	2015	Masrom M., Ai Ling E.L., Din S.	E-participation behavioral in e-government in Malaysia [20]
6	2015	Islam M.M., Ehsan M.	Understanding e-governance: A theoretical approach [21]
…	…	…	…
285	1978	Cramp D.G., Carson E.R.	A model-based framework for public health: A vehicle for maximising the value of telecare? [22]
286	1975	Pratchett L.	New technologies and the modernization of local government: An analysis of biases and constraints [23]

Table 1: Results of the Search on Scopus

After collecting and selecting the relevant literature on the topic, as showed in Figure 5 the remaining research methodology used to conduct this study was: 1) drawing the research landscape (Section 4); 2) making the research literature analysis (Section 5); 3) making the research literature analysis (Section 6) and 4) describing the findings and writing the conclusions (Section 7).
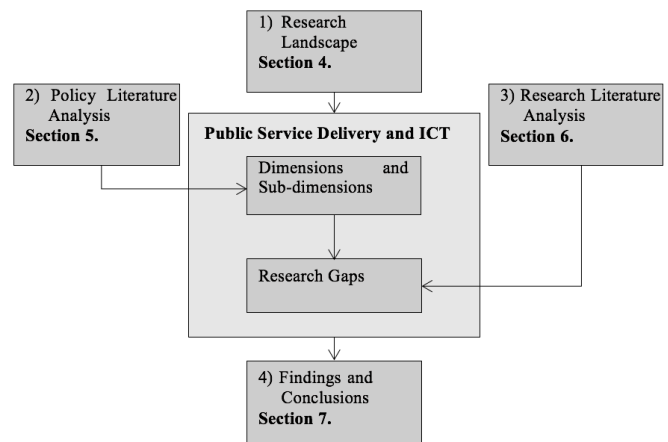

Figure 5: Research Methodology

4. RESEARCH LANDSCAPE

The 286 papers obtained from the data collection in Scopus have been analyzed quantitatively to produce an overview of the research landscape on ICT facilitated Public Service Delivery. The analysis was focused on five research aspects, each one covered by subsequent sections:

1) Researcher Disciplines – Sub-Section 4.1
2) Researcher Institutions – Sub-Section 4.2
3) Researcher Countries – Sub-Section 4.3

4.1 Researcher Disciplines

Based on the discipline affiliation of the authors, the list of contributing disciplines and the percentages of researchers belonging to them are depicted in Figure 6 and Table 2.
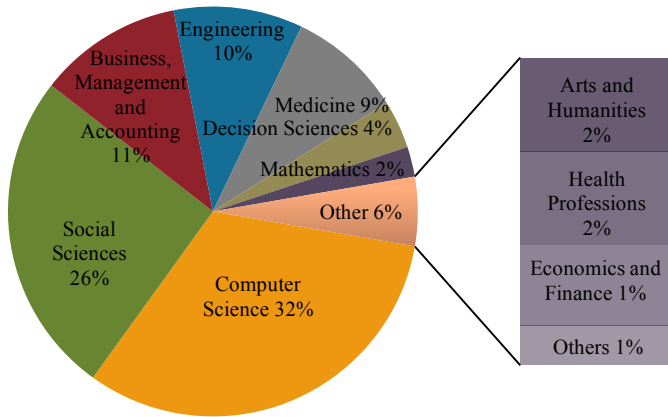

Figure 6. Research Landscape – Researcher Disciplines

The area is dominated by Computer Science (32%) denoting that Electronic Public Service Delivery strongly relies on technologies. The strong technological research focus is closely followed by Social Sciences (26%) highlighting the importance of the social dimensions of Public Service Delivery. Other research disciplines include Business, Management and Accounting (11%), Engineering (10%), Medicine (9%), Decision Sciences (4%), Mathematics (2%), Arts and Humanities (2%), Health Professions (2%), Economics, Econometrics and Finance (1%) and Other Areas (1%).

The high number of disciplines with an interest in Public Service Delivery research shows its multi-disciplinary nature, but also highlights the complexity of the scientific domain and the need to address cross-cutting problems in different areas.

NO	DISCIPLINE	RESEARCHERS	PERCENTAGE
1	Computer Science	136	32%
2	Social Sciences	108	26%
3	Business, Management and Accounting	48	11%
4	Engineering	43	10%
5	Medicine	38	9%
6	Decision Sciences	16	4%
7	Mathematics	10	2%
8	Arts and Humanities	7	2%
9	Health Professions	7	2%
10	Economics and Finance	6	1%
11	Others Areas	3	1%

Table 2. Research Landscape – Researcher Disciplines

Table 2 lists the disciplines contributing to the research on Public Service Delivery and the percentages of researchers in each discipline, and Figure 6 illustrates the same in a pie chart.

4.2 Aspect 2 – Researcher Institutions

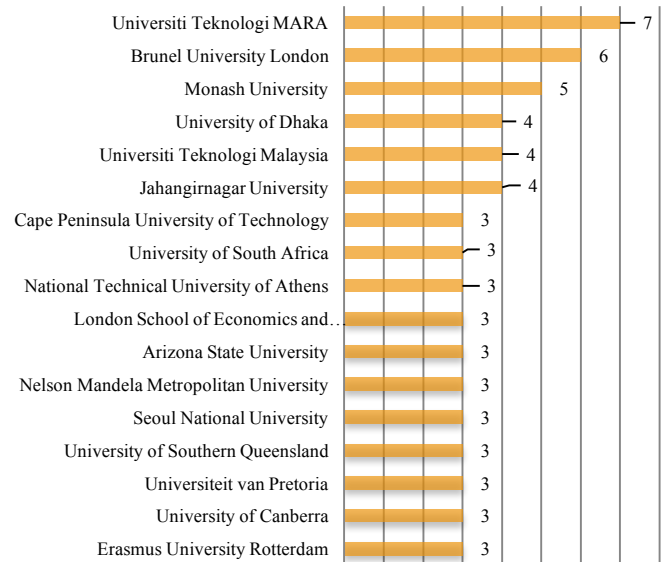The leading research institutions are depicted in Figure 7 and listed in Table 3.

Figure 7. Research Landscape – Researcher Institutions

Based on researcher affiliations, the most productive research institutions on Public Service Delivery include: 1) Universiti Teknologi MARA, Malaysia, with 7 publications; 2) Brunel University London, United Kingdom, with 6 publications; 3) Monash University, Australia with 5 publications; 4) University of Dhaka, Bangladesh, Universiti Teknologi Malaysia, Malaysia, and Jahangirnagar University, Bangladesh, with 4 publications each. In position five (5) is Cape Peninsula University of Technology, South Africa, University of South Africa, South Africa, National Technical University of Athens, Greece, London School of Economics and Political Science, United Kingdom, Arizona State University, United States, Nelson Mandela Metropolitan University, South Africa, Seoul National University, South Korea, University of Southern Queensland, United States, Universiteit van Pretoria, South Africa, University of Canberra, Australia, and Erasmus University Rotterdam, Netherlands, each with 3 publications.

Clearly, United Kingdom and Southern Asian countries dominate the field.

NO	INSTITUTION	COUNTRY	PAPERS
1	Universiti Teknologi MARA	Malaysia	7
2	Brunel University London	United Kingdom	6
3	Monash University	Australia	5
4	University of Dhaka	Bangladesh	4
5	Universiti Teknologi Malaysia	Malaysia	4
6	Jahangirnagar University	Bangladesh	4
7	Cape Peninsula University of Technology	South Africa	3
8	University of South Africa	South Africa	3
9	National Technical University of Athens	Greece	3
10	London School of Econ. and Political Science	United Kingdom	3
11	Arizona State University	United States	3
12	Nelson Mandela Metropolitan University	South Africa	3
13	Seoul National University	South Korea	3
14	University of Southern Queensland	Australia	3
15	Universiteit van Pretoria	South Africa	3
16	University of Canberra	Australia	3
17	Erasmus University Rotterdam	Netherlands	3

Table 3. Research Landscape – Researcher Institutions

4.3 Aspect 3 – Researcher Countries

Based on researcher and institutional affiliations, the leading countries in producing Public Service Delivery research are:

United Kingdom, India, United States of America (USA), South Africa, Malaysia, Italy, Australia, Bangladesh, and Canada. The results, including the number of publications produced per country, are depicted in Figure 8 (please note that one publication just count once even if it is more than author with the same nationality). This should naturally be taken with a caveat as our literature search only covers research published in English.
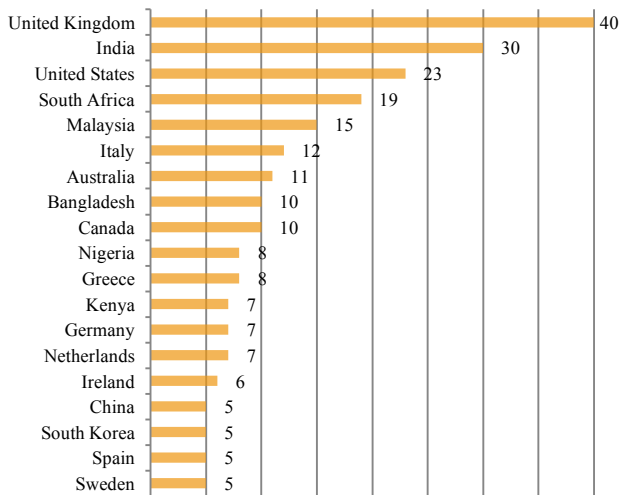

Figure 8. Research Landscape – Researcher Countries

The results show that the United Kingdom has the highest number of publications with 27% more than the second country in the list, United States. Regionally, the majority of the leading countries United Kingdom (172), Spain (88), Germany (78), Netherlands (52), Italy (46), Finland (43), Belgium (41), and Greece (30) are located in Europe, with the exception of the USA (125) which is in the Americas and Australia (43).

4.4 Aspect 4 – Types of Publications
As depicted in Figure 9, the majority of the scientific work on Public Service Delivery was produced as Conference Papers – 126 (44%), followed by Journal Articles – 89 (31%). Other types 39 (13%) Book Chapters, 17 (6%) Conference Reviews, 8 (1%) Reviews, 5 (1%) Books and 2 (1%) Articles in Press.
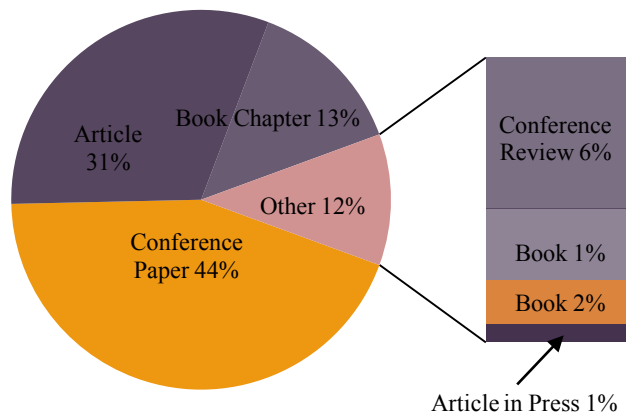

Figure 9. Research Landscape – Types of Publications

4.5 Aspect 5 – Venues of Publications
Considering the types of publications, preferred venues to publish such publications include, by order of popularity: "Government

Information Quarterly" by Elsevier Limited, "IFIP Advances in Information and Communication Technology" by Springer New York, "Innovation and the Public Sector" by IOS Press, "International Journal of Medical Informatics" by Elsevier Ireland Ltd, and "Public Administration" by Wiley-Blackwell. Figure 10 depicts the venues with three or more publications, and Table 4 lists all venues with two or more publications.
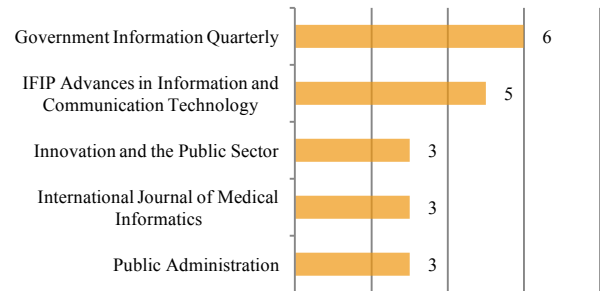

Figure 10. Research Landscape – Venues of Publications

NO	VENUE	TYPE	PAPERS
1	Government Information Quarterly	Journal	6
2	IFIP Advances in Information and Communication Technology	Journal	5
3	Innovation and the Public Sector	Journal	3
4	International Journal of Medical Informatics	Journal	3
5	Public Administration	Journal	3
6	European Journal of Social Sciences	Journal	2
7	BMC Medical Informatics and Decision Making	Journal	2
8	International Journal of Healthcare Technology and Management	Conference	2
9	Lecture Notes of the Institute for Computer Sciences Social Informatics and Telecommunications Engineering	Journal	2
10	Information Polity	Journal	2
11	International Journal of Construction Education and Research	Journal	2
12	Regional Development Dialogue	Journal	2
13	Social Science Computer Review	Journal	2
14	Social Science and Medicine	Journal	2
15	Transforming Government People Process and Policy	Journal	2

Table 4: Research Landscape – Venues of Publications

5. POLICY LITERATURE ANALYSIS
In this section three frameworks for public service delivery developed by international organizations and one national administration are reviewed and analyzed. The national framework for public service delivery is from Ireland and was chosen because it is one of the earliest and a well-documented example. The Irish example has therefore been included for illustrative purposes. The four frameworks are:

1) United Nations e-Government Survey 2014 - United Nations Department of Economic and Social Affairs (UNDESA), United Nations [24];

2) Innovative Public Service Delivery: Learning from Best Practices – UNDESA, United Nations [25];

3) Rebooting Public Service Delivery: How Can Open Government Data Help to Drive Innovation - Organisation for Economic Co-operation and Development (OECD) [9], and;

4) Improving Service Delivery – Ireland Government [8].

Each of the four frameworks has been analyzed in terms of their focus, vision, strategic dimensions, and characteristics. After the policy documents were analyzed, their features and attributes have been organized and classified into four main dimensions, which include:

1) Strategy;
2) Capacity;
3) Innovation, and;
4) Evaluation.

Table 5 highlights the key recommendations made by the frameworks for each of these public service dimensions. Regarding the strategy dimension the frameworks' recommendations point out to the importance of having a policy context and strategic framework for public service delivery and to promote the integration of services between public organizations.

DIMEN.	UNDESA	UNDESA	OECD	IRELAND
Strategy	Connected Services	Policy and strategic framework for public service delivery	The policy context for OGD implementation	Improve the integration of services between public service organizations
Capacity	Use of e-Government	Governance, structure and capabilities for public services	Building the next generation of empowered civil servants	Innovative approaches to public involvement in development of the services
Innovation	e-Participation and mobile government	Collaboration and innovation for public services	Stimulating engagement and participation to spur innovation	Innovative approaches to public involvement in development of the services
Evaluation	Service usage	Reorientation and cultural change on public services requires to focus on meeting customer needs	Monitoring & Evaluation	Using predictive data analytics to spot trends and societal needs Linking open government data with evidence-based policy making

Table 5 : UNDESA, OECD and Ireland Policy Recommendations

The capacity dimension stresses the importance of the use of ICT in government, development of governance structures and capabilities for public services, and the empowerment of civil servants. The innovation dimension promotes the engagement and participation, it highlights the importance of stimulating the engagement and participation of the intended end-user (i.e. citizens or businesses) in the development of new services, for instance using mobile apps and the collaboration and innovation in the public services. The last dimension, evaluation, emphasizes the importance of measuring the impact of public service delivery on society, analyzing the data to investigate the trends and societal needs and evaluating the service use.

Figure 11 illustrates the conceptual map and the most relevant dimensions of public service delivery identified in the analyses of the four frameworks. It shows the four dimensions of public service delivery emphasized by the policy review. The four dimensions include: "Strategy", "Capacity", "Innovation, and "Evaluation".

Figure 11: Public Services Delivery Dimensions

5.1 Strategy Dimension

The Strategy dimension is composed by the policy and strategy that provides the overall direction, priorities and guidelines for public service delivery and by the programme formulation which operationalizes the overall policy and strategy.

At the policy level, the political will to provide incentives, funding and other resources to ensure policy coherence, collaboration and social inclusion, as well as a legal and regulatory framework for a good service provision, is a key goal to ensure that public service policies and strategies contribute collectively to national development goals, and improved quality of life for citizens. At the strategy level, three strategies are particularly important. First, poverty eradication, second, gender equality in public services, and third, of the use of risk management strategies to cover disasters [26][27][28][29]. At the planning level, implementation measures need to be defined in order to achieve and operationalize the policy goals.

Figure 12 below shows a conceptual map with the Strategy dimension. It outlines eight key aspects for the Government dimension covered and highlighted in the reviewed policy documents. Noticed that these eight aspects are not covered in all policy documents, some of them only cover part of the aspects. The eight aspects include: 1) Policy, strategy and planning; 2) Infrastructure development; 3) Resource mobilization and utilization; 4) Leadership and accountability; 5) Law, security and property; 6) Policy context; 7) Overcoming main challenges; and 8) Promotion of public service.

Figure 12: Strategy Dimension

5.2 Capacity Dimension

The Capacity dimension is concerned with institutional development in the public sector and civil servants' skills and capacity development and level of empowerment vis-a-vis initiatives and policies as well as decision making. Public service delivery requires a multi-dimensional approach, i.e., knowing the individual, organizational and institutional levels and how they interrelate and interact. In order to implement this approach a

strong public leadership at all levels of government structures is required. The leaders are the agents of change and have a key role in building organizational capacity. The development and empowerment of civil servants through suitable training, applications and processes are demanded to have an efficient, effective and operational public service delivery.

Figure 13 outlines the conceptual map of the main policy recommendations for the Capacity dimension. It shows the nine aspects constituting the Institutional dimension covered and highlighted by the reviewed frameworks and policy documents. The nine aspects include: 1) Enhanced information services; 2) Multichannel service delivery; 3) Bridging digital divide; 4) Integration of services; 5) Organizational reorientation; 6) Empowered civil servants; 7) Evolving public sector internal dynamics; 8) Public awareness and consulting; and 9) Providing services.
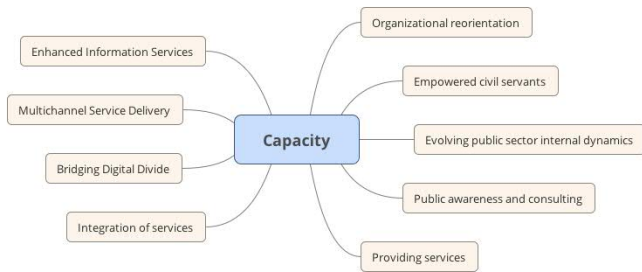

Figure 13: Capacity Dimension

5.3 Innovation Dimension

The Innovation dimension consists in promoting collective learning, collective intelligence, and social participation in service delivery and policy making. Civil society, the private sector and the public sector engage in order to introduce social innovations capable of addressing the societal challenges. In order to engage the various stakeholders in value creation, public entities must encourage individuals or groups to participate in public service delivery.

Figure 14 illustrates the seven sub-dimensions in a conceptual map of policy recommendations for the Innovation dimension. It shows the seven aspects of the Innovation dimension covered and highlighted in the reviewed policy documents. The seven aspects include: 1) Mobile Government; 2) Innovating ordinary citizens' experience; 3) Innovations in public procurement; 4) Collective learning and intelligence; 5) Innovation for public service; 6) Engagement and participation; and 7) Public involvement in the service development.
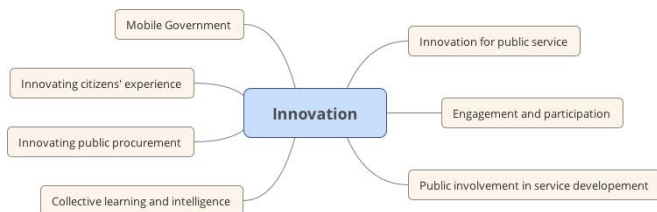

Figure 14: Innovation Dimension

5.4 Evaluation Dimension

The Evaluation dimension essentially focus on the monitoring and measuring of the impact of public service delivery, the design,

development, implementation and actual use (e.g. on different channels). Above all, the Evaluation dimension focuses on the assessment of the cost to authorities in delivering, and the impact and benefits to society, of public service delivery. The public sector, as well as other public service providers, must collect relevant data and evidence to justify the decisions made regarding service delivery – not just in relation to financial costs and benefits, but qualitative, social and environmental impact. The evaluation of costs and benefits, and comparisons with other similar studies on the subject to learn from good practice, are advisable.

From the measurement it is possible to monitor and evaluate whether the costs out weight the benefits planned and realized benefits, and adjust accordingly when there are significant deviations. Using predictive data analytics also makes it possible to identify societal needs and trends. The public services must reflect the political, social, and cultural context, therefore measuring is crucial for evidence-based policy-making.
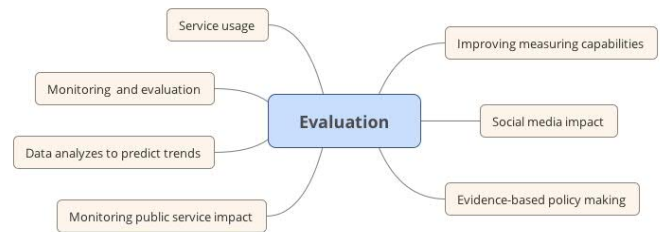

Figure 15: Evaluation Dimension

Figure 15 below illustrates the policy recommendations for the Evaluation Dimension as conceptual map. It shows the seven aspects about the Monitoring dimension covered and highlighted in the reviewed policy documents. The seven aspects include: 1) Service usage; 2) Monitoring and evaluation; 3) Data analyzes to predict trends; 4) Monitoring public service impact; 5) Improving measuring capabilities; 6) Social media impact; and 7) Evidence-based policy making.

6. RESEARCH LITERATURE ANALYSIS

This section presents the analysis of the content of 193 research papers that have been selected, as relevant for the project [3], from the initial pool of 286 papers. The number of relevant papers were narrowed down from 286 to 193 by the UNU-EGOV research team based on criteria of the publication relevance and importance for the project [30]. Some publications were also eliminated because were repeated or the full text was not available.

The analysis aimed at establishing if and how the selected papers address each of the four dimensions of the Public Service Delivery identified in the previously section, namely: Strategy, Capacity, Innovation, and Evaluation. The results are outlined in subsequent subsections:

1) Strategy Dimension – subsection 6.1.
2) Capacity Dimension – subsection 6.2.
3) Innovation Dimension – subsection 6.3.
4) Evaluation Dimension – subsection 6.4.

Figure 16 illustrates the number of publications in each of the PSD dimensions. It shows that the Evaluation Dimension has the smallest percentage with 11% (i.e. 28 publications), the Innovation has 60 of the publications (23%), Capacity has 80 of

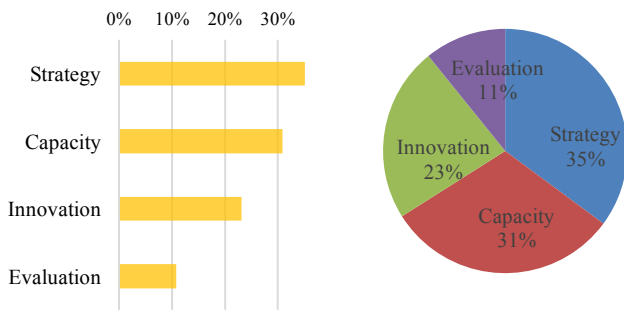the publications (31%) and Strategy has the highest percentage with 35% i.e. 91 of the publications.

Figure 16: Percentage of Publications in Each Dimension

6.1 Strategy Dimension

In the previous section eight sub-dimensions have been identified as relevant in the Strategy dimension, namely: Policy, strategy and planning; Infrastructure development; Resource mobilization and utilization; Leadership and accountability; Law, security and property; Policy context; Overcoming main challenges to; and Promotion of public service.

Figure 17 illustrates the number of academic publications addressing one or more of each of these eight sub-dimensions of the Strategy dimension. The sub-dimension with the highest number of publications is the "Policy, strategy and planning" with 32, followed by "Overcoming main challenges" with 13, "Infrastructure development" with 12, "Policy" with 11, "Promotion of public service" with 10, "Leadership and accountability" with 9, "Law, security and property" with 6 and, with the lowest number of publications, "Resource Mobilization and Utilization" with 4.
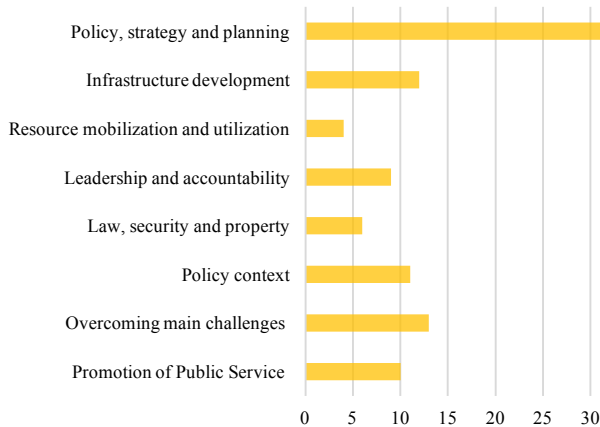

Figure 17: Number of Publications in Each Sub-dimension of Strategy Dimension

6.2 Capacity Dimension

In the previous section nine sub-dimensions have been identified for Capacity dimension, which were Enhanced information services, Multichannel service delivery, Bridging digital divide, Integration of services, Organizational reorientation, Empowered civil servants, Evolving public sector internal dynamics, Public awareness and consulting, and Providing services.

Figure 18 illustrates the number of publications in each sub-dimension of the Capacity dimension. The sub-dimension with

highest number of publications is "Enhanced Information Services" with 18, followed by "Organizational Reorientation" with 11, "Providing Services" and "Integration of Services" with 8 each, "Evolving Public Internal Dynamics" with 6, "Empowered Civil Servants" with 5. The lowest is the "Public Awareness and Consulting" with 1.
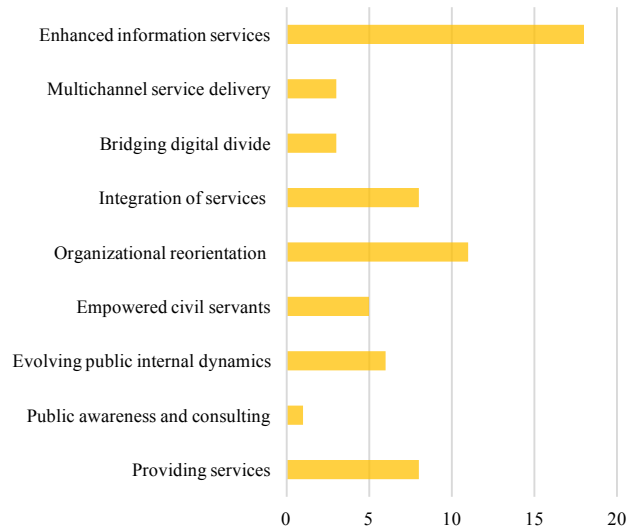

Figure 18: Number of Publications in Each Sub-dimension of Capacity Dimension

6.3 Innovation Dimension

In the previous section seven sub-dimensions have been identified for the Innovation dimension, which were Mobile government, Innovating citizens' experience, Innovating public procurement, Collective learning and intelligence, Innovation in public services, Engagement and participation, and Public involvement in service development.
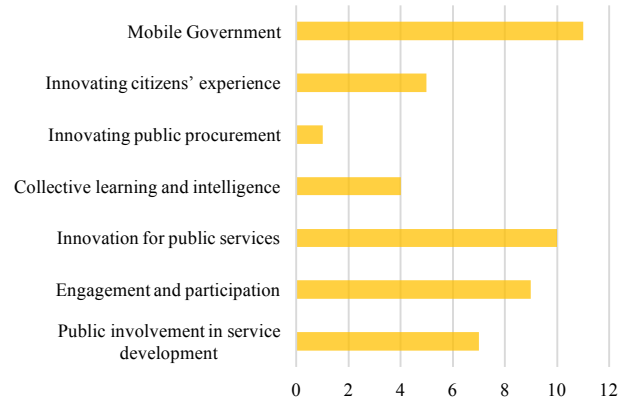

Figure 19: Number of Publications in Each Sub-dimension of Innovation Dimension

Figure 19 illustrates the number of publications in each sub-dimension of the Innovation dimension. The sub-dimension with the highest number of publications is "e-Participation and Mobile Government" with 11, closely followed by "Innovation in Public Services" with 10, then comes the "Engagement and Participation" with 9, after the "Public in Service Development" with 7 and "Innovating Citizens' Experience", "Collective Learning and Intelligence" and "Innovating Public Procurement" with 5, 4 and 1, respectively.

6.4 Evaluation Dimension

In the previous section seven aspects have been identified for Evaluation dimension, including Service usage, Monitoring and evaluation, Data analyzes to predict trends, Monitoring public service impact, Improving measuring capabilities, Social media impact and Evidence-based policy making.
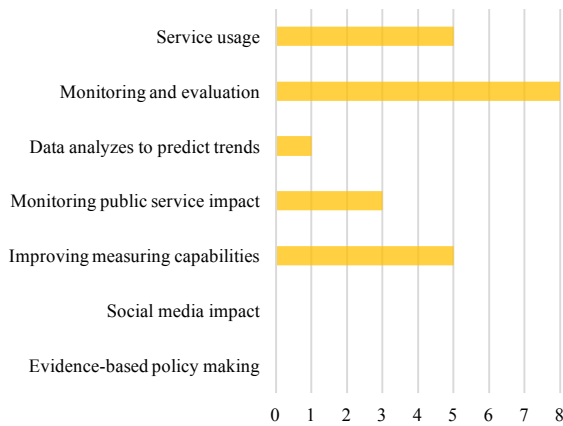

Figure 20: Number of Publications in Each Sub-dimension of Evaluation Dimension

Figure 20 illustrates the number of publications in each sub-dimension of the Evaluation dimension. The sub-dimension with highest number with publications is the "Monitoring and evaluation" with 8, then is the "Service Usage" and "Improving measuring capabilities" each one with 5, "Monitoring public service impact" with 3, "Data analyzes to predict trends" with 1 and the remaining sub-dimensions, "Social media impact" and Evidence-based policy making" with zero. It can be noticed that no publication was found for the last two sub-dimension.

7. FINDINGS AND CONCLUSIONS

The illustration of the various aspects of the research landscape demonstrates the multi-disciplinary nature of public service delivery with its high variety of disciplines – in fact, more than 11 contributing to the academic literature identified. That said, the computer and social sciences are the main contributors to the academic discourse, accounting for 32% and 26% of the identified literature, respectively. The maturity of digital innovation and ICT facilitated public service delivery seems to be relatively low, with most research being published as conference papers (44%). Based on this observation it is recommendable for more multi-disciplinary teams to research public service delivery.

In light of the four policy frameworks reviewed, the most important factors to consider to enhancing public service delivery are: Strategy, Capacity, Innovation and Evaluation. By comparison, the public service delivery academic literature reviewed highlights that most scientific research relates to Strategy (35%) and Capacity dimensions (31%) with less attention been given to the Innovation dimension (23%) and even less to the Evaluation dimension (11%). It is therefore recommended that future public service delivery initiatives and scientific research take into account the importance of transforming traditional public services delivery and providing innovative solutions capable of improving the quality, efficiency and user experience with service. The continuous evaluation from the idea and design to roll-out and realized outcomes is extremely important to achieve fundamental attributes in public services such as, transparency, accountability and awareness in public policy-making process.

By analyzing the research results on the sub-dimension of Strategy, it is noticeable the predominance of research in "Policy, strategy and planning" (33%), "Overcoming main challenges" (13%) and "Infrastructure development" (12%) but there is a big research gap on "Resource mobilization and utilization" (4%) and "Rule of law, justice, respect for human rights, law and order, security of person and property" (6%). Looking at the sub-dimensions of Capacity is evident a higher amount of research in "Enhanced services" (29%) and "Organizational reorientation" (17%) issues but a significant research gap in areas such as "Public awareness and consulting" (2%), "Multichannel service delivery" (5%) and "Bridging digital divide" (5%).

The analysis of the sub-dimensions of Innovation revealed a strong research in "e-Participation and mobile government" (23%) and "Innovation in public services" (21%) although, a lack of research on "Innovating public procurement" (2%) and "Collective learning and intelligence" (9%). Finally, in relation to Evaluation the two sub-dimensions more investigated by the scientific community are "Monitoring and evaluation" (36%) and "Service usage" (23%) whereas the areas of "Evidence-based policy making" (0%) and "Social media impact" (0%) do not showed in our study any attention by scholars.

Finally, it is recommendable to establish a unanimous and global research agenda on public service delivery, capable of join the efforts of all scientific community in turn of this so crucial subject for achieving a sustainable development around the world, as highly stressed out by the United Nations 2030 Sustainable Development (SD) Agenda [4].

In line with objectives and outcomes of the project, the next steps will be to develop a framework able to address the areas where research gaps were found, i.e. innovation and evaluation areas, as well as, to develop a toolkit and test it in different contexts (e.g. sectoral, cultural, governmental, etc.) and services areas through a number of pilot projects. The toolkit will be built based on framework and will serve to inform government policy and practice in developing countries. By utilizing this framework, it is expected to obtain digital innovations in Public Service Delivery. This framework will help governments in developing countries in carrying out structural improvements of their Public Administration systems using digital technology.

8. ACKNOWLEDGMENT

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