Co-design for Government Service Stakeholders

Abstract

Digital services continually evolve to support a growing diversity of users with an ever varying internet-enabled device numbers. The diversity and ambition of digital services is motivated in part by new technology, channels and users within internet enabled smart environments. In order to fully exploit these new digital service environments designers need to step back from product or service centric thinking that overtly focus on discrete product and service features. New approaches to digital service design are required in order to explore how best to choreograph the design process with active knowledge flows between the end user and designer. Collaborative design is well recognized in the design community with innovative and wide ranging collection of co-design tools and techniques. A more flexible approach is required that is configurable to specific collaborative communities who are coming together to design new digital services. The repertory grid technique is used to uncover design process constructs from diverse group of stakeholder– service users, intermediaries (service interface) and service providers. These constructs are then used to extend the Double Diamond framework before operationalization using Business Process Modelling Notation (BPMN).

1. Introduction

Nowadays information and communication technologies (ICT) are the tools that enable people to better handle information [1] - collecting, organizing, and using technology for many communications. Efficiency of service delivery, decrease uncertainty, and improved information dissemination drives this tool development [2]. ICT not only supports users in undertaking their commercial activities at a lower cost, but also increases the capabilities of individual and group to carry out work efficiently and effectively [3]. Digital services, e-Government services being one example, should ideally focus on what makes users satisfied in their daily work, reducing bureaucracy in government agencies and organizations [4,5]. Confidence in the quality of digital services underpins trust towards these e-Government services, which in turn promotes their adoption [6].

Heeks [7] has shown that the majority of e-Government services in developing countries have failed to some degree, with 35% being classified as a total failure, in which e-Government was not implemented at all or just abandoned upon implementation. Furthermore, 50% were classified as a partial failure, in which the goals were not achieved and/or they gave unwanted outcomes. Failure is often attributed to limited resources and money. According to Avgerou and Walsham [8 p.1], "successful examples of computerization can be found…but frustrating stories of systems which failed to fulfil their initial promise are more frequent". Government digital services are typically developed by internal service providers, often neglecting the service end user [9,10]. Subsequent delivery of services can be jeopardized without due consideration of the service user, lacking consideration of their needs and expectations in the design process [11,12,13]. Limited user involvement throughout the design process of e-Government services is often cited [14,15,16]. This research attempts to address this issue, and explore the use of a co-design approach for Jordanian Government to Citizens' (G2C) e-services.

Elbaum and Kyng [17] state the service designers should take user work practices and needs in consideration - users should take part in the design. Effective communication between designers and users is a requirement while working on a design. In addition, user opinions and social interactions regarding a design should be taken into account. Participatory design goes back to 1970's Scandinavian systems design. The design process should ideally respond to user needs such as identity, characteristics, capabilities and preferences. These same user perspectives should form citizen's long-term needs [18].

This paper presents both theoretical and practical "design-led" contributions from a digital service design study. The aims of this research include: 1) Identifying approaches that will improve the quality of e-Government services and maximize user opportunities for participation in the design process, 2) bridge the requirements gap between service user (citizen) real needs and the service providers/designers of e-Government service's and 3) improve the quality and efficiency of G2C e-services through the adoption of a co-design approach including its tools/methods to

support user participation throughout the design process. The paper starts with e-Government background literature and subsequently leads to the solution space encompassing classical user centred design and co-design. Stakeholder exploration then describes the stakeholder groups before their repertory grid interviews are analyzed. A digital service co-design framework emerges from this analysis and is presented before operationalization in BPMN and subsequent user evaluation.

2. Theoretical Background
2.1. e-Government Services

The late 1990s witnessed the emergence of the term e-Government, but the history of computing in government organizations goes back to the beginnings of the computing era. However, literature on 'IT in government' goes back at least to the 1970s [19]. Recent studies have shown successful development of government services that better meet citizen needs. Therefore, these services become more efficient, effective and sustainable [20]. While some of the older e-Government computer issues still exist, such as office automation, they are not as relevant to e-Government service design. Others such as decision making, service processing, and values are felt to be more relevant to this research. Improving citizen satisfaction and improving quality of life are a current focus [21]. More recently, concrete e-services provided by governments have not been citizen-centric and not met end-user needs [22]. The citizen-centric approach for e-Government services is important as e-Government websites have become the typical way of communication between governments and citizens [23,23,24]. Organizations should concentrate directly on human values, putting individuals at the core of their work. An integrated electronic service system implies, at least, information integration of various units of government [25].

e-Government services should be accessible and reliable supporting different types of e-Government interaction such as government to citizen (G2C), government to business (G2B), government to employee (G2E), and government to government (G2G) [26]. E-Government services continue to face problems and challenges, especially in the implementation phase, because of the gap between stakeholder unmet needs and service designs. Furthermore, such a gap is considered to be one of the significant factors that lead to failure of e-Government projects in developing countries [27]. Understanding e-Government development and exploring factors that influence e-Government development have gained interest in the e-Government research community [28].

A citizen-centric approach provides an opportunity to gain a good understanding of expectations and needs of the citizens and the context in which they find themselves with respect to e-Governmental services [29]. However, e-Government services should not just match the needs of the anticipated citizens, but should also match with the needs and work practices of the service providers supplying and delivering services. When a mismatch occurs, a reduction in the quality of the service delivered results [29]. Furthermore, it has been highlighted that governmental ICT projects are likely to fail due to a lack of focus on the interests, expectations and cooperative practices of the service providers for those who use these services [30].

2.2. Design approaches

User-centred design (UCD) approaches started to evolve in the 1970's and became more widespread in the 1990s [31]. User views and ideas are incorporated into the software development process, resulting in greater system or service utilization [32]. UCD proved to be most useful in the design and development of consumer products [33]. In contrast, service design is composed of …"visual communication design, information design and interaction design, [integrated together]. Transformation design, the newest [design] of emergent design [discipline], is based on participatory practices, in combination with user-centred methods" [31 p.10]. Research is required however to guide stakeholders as they progress at the 'doing' level of creativity, provide assistance to people who are at the 'adaptive' level, afford a scaffolds that support and serve peoples need for creative expression at the 'making' level, and offer a clean slate for those at the 'creating' level [31].
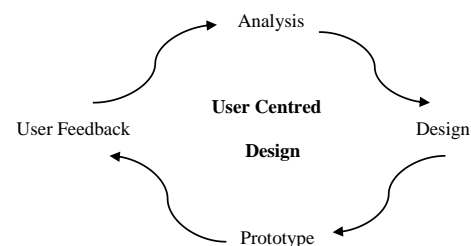

Figure 1: Current state of the user-centred design (Adapted from Sanders and Stappers [1])

Recent technological developments are forcing a stakeholder evolution from passive information consumers into information producers [34,35]. Figure 2 presents a continuum between customers (citizens) and designers. Each process represents a paradigm transition for the stakeholder from passive consumer

into information producer [36]. Stakeholders are willing and interested to shape their services by tailoring them to their own individualistic needs [37]. Therefore, approaches are required to responds to this willingness, and explore the use of a meta-design approach of e-Government services. A meta-design is an emerging conceptual framework as a form of collaborative design practice, which in concerned with the process of design and aims to define and create social-technical environments in which end-users can be inventive [38]. However, e-services should not only match the needs of the stakeholders for whom they are anticipated, but should also match the needs and work practices of the service provider as who supply and deliver the services.
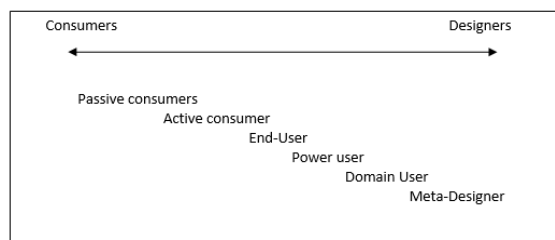

Figure 2: Consumer and Designer - a continuum (Adapted from Fischer [2])

The meta-approach comprises two main phases. The first phase includes an analysis of the diverse perspectives of the stakeholders involved in service construction (i.e. design and development) and usage from varied stakeholders (including employees, citizens, software developers and human computer interaction specialists) [34]. A range of diverse perspectives are engaged by creating and or modifying the service design process to fully engage and support them. The second phase applies a meta-model - derived from a meta-design framework and based on the different stakeholders' perspectives - for a suitable digital service design and development environment. Such an environment is able to help the designer to collaborate with users [37]. Both phases are concerned with the design process. Meta design aims not just to provide advanced design tools to facilitate software artefact creation, but also to uncover their own creativity [34] and provide enjoyment for them as they see their contributions evolve into a viable artefact (e-services).

3. Stakeholder Exploration
3.1. Stakeholder Groups

A Repertory Grid (RepGrid) technique is used within interviews in order to more systematically identify the requirements/characteristics of the G2C e-service

design process from the viewpoint of the interviewees - stakeholders. A number of research studies [39,40] have shown that a small sample size (i.e. 10–25 research participants) is adequate to elicit an inclusive list of constructs [41]. In-fact, this research study is concerned with the issue of who uses the G2C e-service (service users), because these target users are able to articulate their needs and motivations. Interviewing was chosen, as it gives an opportunity to more deeply explore the subject area. In total, 23 repertory grid interviews were conducted, lasting between 45 and 90 minutes. However, the researchers excluded 4 interviews on the basis of the interviewee's background and familiarity with the domain (G2C e-service development process) was insufficient. The breakdown of interviews can be found in table 1. Each interview started with brief overview of authors' questions, in order to ensure they understand the tasks, and then we moved to explain the RepGrid technique in an introductory manner so as to facilitate the interviews process. 19 research participants, all located in Jordan, took part in this study (See table 2). This research study conducted the interviews with government staff through two main authorities responsible for government services (service providers). The first one is the Ministry of Information and Communication Technology (MOICT) and the second being the National Information Technology Centre (NITC). Three semi-structured interviews were conducted with government employees in each organization, employees responsible for G2C services design and development.

A second group represents the government workers, who work in government agencies and act as a bridge or interface between citizens and government. Unsurprisingly, these employees have a fuller knowledge regarding to G2C service design problems and citizens' unmet needs because they face problems whilst dealing with end users and supporting service to citizen interactions. The last group represents typical citizens (end-users) who cover a spread of ages, genders, employers and diverse occupations (university students, lecturers, unemployed and administrators). Each category consists of seven, six, six respondents respectively. All interviews were recorded and transcribed. These preliminary interviews were followed by repertory grid interviews, as described below (see figure 3.5). In this paper, the findings from the repertory grid study are reported in order to understand requirements (and constructs) that are then used for an adapted G2C e-service design process.

Stakeholders	Participants category		Number of Participants	
Government Staff (service providers)	*MOICT	**NITC	3	3
Government Staff (Interface staff)	Various governmental agencies		6	
Typical Citizens (Servicer users)	Universities	governmental institutions	3	4
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Table 1: Sample for Repertory Grid interviews
*Ministry of Information and Communication Technology
**National Information Technology Centre

Research Participants:

Total	**19**		
	1 (n=6)	(n=6)	3 (n=7)
Age group (years)			
19-24	--	1	2
25-34	1	2	3
35-44	4	3	1
45-55	1	--	1
Above 55	--	–	--
Gender			
Male	4	3	4
Female	2	3	3
Education level			
High school	--	--	1
College	--	2	--
BSc	3	4	2
MSc	2	--	2
PhD	1	--	1
Other	--	--	1
ICT skills & competency			
Very low	--	--	2
Low	--	1	2
Average	1	4	2
High	5	1	1
Very high	--	--	--
I don't know ICT	--	--	--

Table 2: Demographic characteristics of research participants (Group 1: service provider; group 2: service interface; group 3: service user)

3.2. Repertory Grid (RepGrid)

Figure 3 presents an outline of the RepGrid interview with each research participant. The interview is based on the RepGrid technique and following the Siau et al. (2010) approach with minor adaptation for this research project. This approach involves five steps: Introduction, element selection, construct elicitation, rating of elicited constructs, and review were adapted from Siau et al. [41].
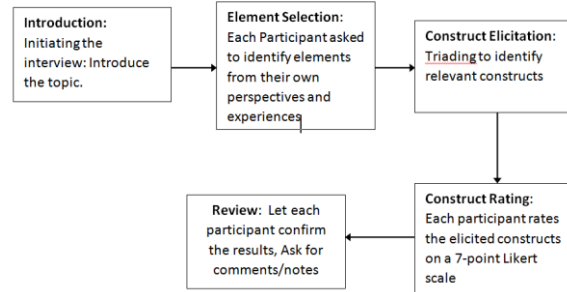

Figure 3: The RepGrid interview process (Adapted from Siau et al. [41]).

At the beginning of the interview, the interviewer introduced the main aim, and related the objectives of the study to each research participant. Service users were asked about their experiences (How did you find the e-services design of the current G2C e-services? How do you like to be involved in future e-services design process during G2C services development?) and government staff were asked about the current design process (What are the steps that you follow when designing current/future (G2C) e-services?) In the element selection step, each research participant was asked to identify his/her elements. Identifiable requirements of G2C e-service design process were elicited from each participant (during these one-one interviews). To minimize the potentially limiting influence on participants, this study suggested that they express their opinion by using free dialogue during interview process. As recommended by Hunter and Beck [40], seven elements provide adequate variability in the subsequent construct elicitation step [41]. In this study, regarding the government staff group (service providers), 3 participants came up with nine elements each; one participant identified twelve elements; and the last two participants had four and eight elements each for this step. Regarding the government worker group (who work in government agencies) 3 participants came up with seven elements each. One participant had five elements; the last two participants came up with eleven elements, while the other one had eight elements. The last group, which includes typical citizens (service user) 3 participants came up with eight elements each. Two participants had seven elements each; one participant had six elements, and the last participant came up with only four elements.

Table 3 is an example of the RepGrid developed from an interview. In particular, from the government staff group, in the example provided, the research participant identified six elements. This research study did not add any virtual elements because most of identified elements reached the 7 or more as Hunter and Beck [40] suggest. Each element is represented,

relying on participant perspectives regarding their experience and thoughts. Construct elicitation was conducted using the triadic sort method. Three elements (the steps of G2C e-service design process) ..."as a triad were randomly selected at a time. For each triad, the research participant was asked to identify"… [the requirements of G2C e-service design process to make these services more effective and satisfied, how two of them were similar, yet different from the third] [41 p.570]. Respondents were encouraged to verbalize their reasoning process. In-addition their narrative comments were audio-recorded and documented, for review purposes.
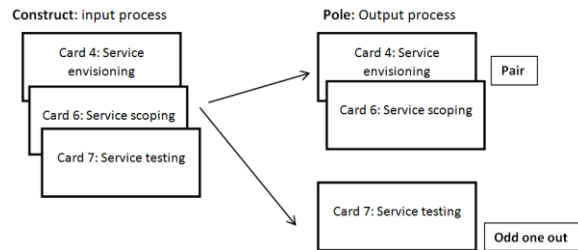

Figure 4: Triad of Task Elements (Adapted from Davis et al. [42])

Scale 1= construct 2 3 4 5 6 7= contrast							Participant No:
Construct	Elements						Contrast
	E1	E2	E3	E4	E5	E6	
1-bussiness phase	5	4	1	1	6	3	Launch phase
2-design level	3	4	5	3	2	1	Development level
3-mock-up prototype	2	6	6	4	1	1	Testing phase
4-input process	2	6	5	3	1	4	Output process
5-scoping	4	2	2	5	7	6	Analysis
6-service requirements	3	7	7	1	3	3	No-requirements

Table 3: An example RepGrid based on the interview with a research participant

In the RepGrid example (see table 3) the G2C e-service co-design process (elements) on each column represents research participant perspectives, on which an element was elicited. The corresponding construct on the same row is expressed by a bipolar phrase. For instance (see figure 4), when the research participant randomly chose three elements (service designing, service implementation, and service workflow process), design level---development level was elicited" as the construct to distinguish them into two groups. The construct elicitation step was then repeated, until the research participant could not elicit any additional constructs" [41 p.571]. This process is repeated until an in-depth understanding is gained. Construct rating is then carried out, where all elicited constructs are reviewed and listed. Respondents

subsequently discussed the elicited constructs with the researcher to explore the elicited constructs (Siau et al., 2010). Each respondent is asked to provide a score for each elicited construct in terms of measure importance using a 7-point Likert scale (1 represents the most important, and 7 represents the least important). Siau et al. [41 p.571] argue that researchers are "interested in the constructs and the labels participants attached to these constructs, rather than the research participants' evaluation on specific elements". The research participants were requested to rate each element based on/against each elicited construct.

In the same RepGrid example (see table 3), the scores in the column 'Rate' are the relative importance of the constructs perceived by the research participant. At the end of each interview, each respondent is asked to review the constructs that were elicited from the interview. The purpose of this step is to confirm and clarify process was to make sure that the derived constructs are accurate, complete, and not misunderstood by the interviewer [41]. The clarification process enables a number of further unifying concepts to be articulated, recording the rating, and providing the basis for a user-driven model of the work context and deeper understanding of what the user requires of the service - and why it is important [42]. These construct then form the basis for co-design framework construction.

4. Emergent Co-design Framework

Designers using design tools and methods for designing services initially have to design the process itself [43,44]. This research, like similar research studies, uses the Double Diamond model from the UK Design Council as an effective means to visualise the design process. Double Diamond has been used to introduce the co-design approach when involving various stakeholders (i.e. citizens, administrative employees in government entities, and service provider) who are using and/or designing the G2C e-services. It was apparent that the process needs to be adapted to meet specific stakeholder needs, perspectives and expectations in the G2C domain. A similar approach was taken here, to fit the research purposes. The adapted version (See figure 5) of the Double Diamond has been produced and proposes a different weight for different phases (see examples of the adapted Double Diamond from 'The Mobile Frontier' [45] - Rosenfeld Media for a different example of redesigning the Double Diamond model and 'The Double Diamond Model of Product Definition and Design' [46]. Different weights and stakeholder engagement are identified for different phases, based on the common interest, tasks and needs

(intersection) between stakeholders in these phases. Consequently, phases have been renamed to fit in more closely with the co-design approach (e.g. discover renamed to co-discover).
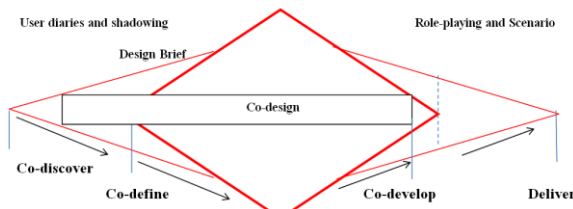

Figure 5: Double Diamond for G2C digital services (adapted from Design Council [47])

The first two steps (i.e. co-discover and co-define) represent the defining process, while the last two steps (co-develop and deliver) represent the designing process. The diamonds in figure 5 represent the convergent and divergent 'mode of thinking' employed in relation to the RepGrid's findings. "Modes of thinking either expand to a divergent approach, or a more focused convergent approach, in order to refine the ideas explored at the previous divergent stage" [48 p.4]. The middle diamond (i.e. 'co-define' and 'co-develop') and 'co-discover' are different, as collaborative phases between stakeholders who they involved throughout these phases. The middle diamond also has a different size (larger than the others) due to the number of the common (intersecting) constructs from RepGrid. Unsurprisingly, the design processes of co-define and co-develop will take longer than a traditional design process. Furthermore, time is needed because the co-design process should be a 'learning opportunity' for all those who are involved (various stakeholders). The two diamonds overlap to indicate that the co-design is starting. The dashed line at the end of the co-design phase (at co-develop phase) indicates where the potential for further development through all stakeholders joined in all the phase of the design process. In many real world examples of co-design, and in particular the social and healthcare service, the delivery stage is led by professionals, due to policies and business issues and restrictions. In fact, in this study, the common constructs did not exist in the delivery phase, due to the absence of construct intersection among stakeholders. On the contrary, in other phases, all stakeholders' constructs/requirements were intersected.

The 'co-define' and 'co-develop' phases need convergent thinking [48], to include different stakeholders to identify concrete planning strategy and suggest alternative practices by synthesizing the problem. Meanwhile, co-discover needs more divergent thinking, due to the coverage of diverse stakeholders for more depth and concrete exploration of the problem phase. The co-develop phase will also include designing an digital service. Furthermore, service launching as a beta version allows for early feedback.

Moreover, in terms of co-define and co-develop, the research findings argue that these two stages were best suited to semi-structured/structured interview method through looking for answers to specific questions and gaining a detailed insights into a specific task, activity or journey. A further reason given is that they were looking for aspirations, emotional reactions and other hidden/non-spoken information. Any model that seeks to visualize the design process should point out overlapping of divergent and convergent thinking that assist service user to be involved in different phases [43].

The adapted double-diamond framework is then operationalized as a set of guidelines for service providers in e-Government service design. This research is intended to provide new ways of collaboratively designing and developing digital services to citizens as service users. The Business Process Modelling Notation (BPMN) is used to design a pragmatic operationalization – including possible design tools for differing stages. Notations have been especially designed to coordinate the iterative processes and connections that flow between diverse participants in different design stage activities. The guidelines comprise three co-design phases (co-discover, co-define, and co-develop) and a subsequent deliver phase.

Co-Discover: This stage represents the first phase of a co-design process, named service initiating and scoping. In this phase, a problem was identified from RepGrid results. Popular design tools and methods support tasks during a constructive interaction with services as an inputs artefact; and these tools/methods work as a processer to generate and express the ideas or views from diverse numbers of participants. The output artefacts are forms of observation an/or insights and may help designers or service providers to understand user needs. These outputs will be an input into the co-define phase.

Co-Define: The define phase works as a filter through the review, selection and discarding of ideas. A combination of the ideas identified in the previous phase are analyzed and synthesized into a brief to help to explore the potential design led-solution. The design brief is a design tool, supporting elicited requirements (RepGrid results). The Co-Define phase ends with a clear definition of the problem(s) and a plan for how to address core reference points for all stakeholders in the co-develop stage.
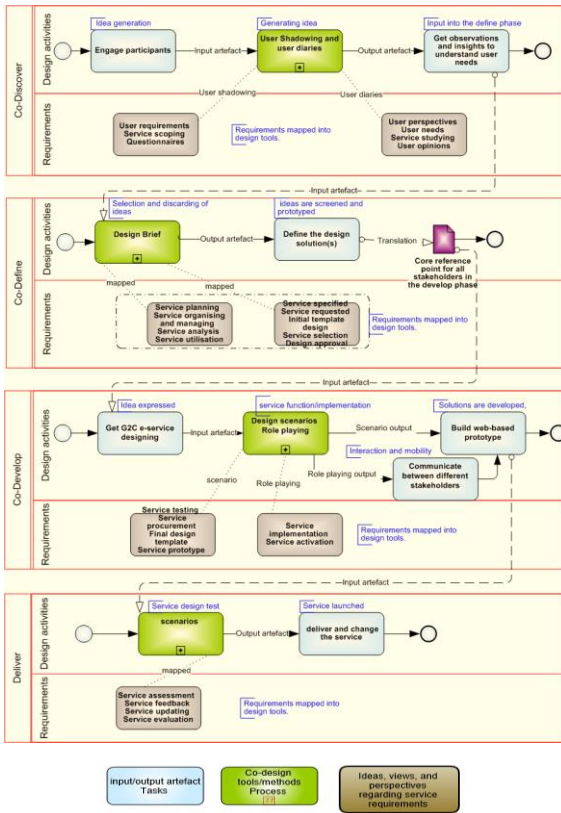
Figure 10: Co-design process for G2C e-service

Co-Develop: During the co-develop phase the G2C e-service participants are taken through a formal design led-solution (for sign-off), which has been given the "corporate and financial support" [49 p.19]. This phase starts by designing solutions for the G2C e-service design process (expressed ideas) as an input artefact for design tools (such as design scenario and role playing). It is critical that communication is facilitated between service users and service interface with design teams within the service internal-provider to implement the service functionality. In the meantime, service providers focus on bringing the agreed service to realization. Design scenario outputs match the elicited requirements with processes to form them as functions or features in the proposed instantiation. At the end of the co-develop phase, the design process will have carried the service development team to a stage where the G2C e-service is ready for delivery and launch a beta-version of service that helps to gain worthwhile feedback to keep the service sustainable and updating.

Deliver: This phase is called service evaluation and updating and represents the final service testing. The resulting artefact can be used as part of a walkthrough covering each touch-point. The design process includes correlation with appropriate internal design teams

without involvement from other stakeholders (based on RepGrids' results), which showed no engagement from the service user or service interface at this stage of design. However, this study argues that using co-design tools in this stage will support collaboration between design teams.

5. User Evaluation

Participants were asked to use the framework and subsequently asked a number of questions to evaluate effectiveness (i.e. facilitation and usefulness) as a framework for open ideation and collaborative communication between stakeholders. Four key themes (generating user ideas/views, collaborative communication platform, opportunities and challenges of involvement; and ability for utilizing co-design tools) and six sub-themes (expressing creativity, collaborative design tools, interaction, communication, engagement and some pros and cons) emerged. All themes and sub-themes were similar between service provider groups, service user groups and service interface groups. However, these groups had diverse views about the opportunities and challenges for applying co-design approach, which involves service user throughout design process. The four major themes and sub-themes have been identified, and where each theme is interpreted and discussed.

Generating user ideas/views

A number of co-design tools and methods have been utilized for generating innovative ideas/views. User diaries and user shadowing (e.g. forum-based discussion and social media tool respectively) as examples of design tools were used to base ideation on users' own stories and needs. Tools were utilized to facilitate communication between participants (e.g. allowing participants an active role in addressing issues or using a specific topic to trigger ideas). Two specific methods/tools ideated the participants' ideas and views: 1) Idea posting and sharing 2) asynchronous online messages. Ideas are posted and available to everyone. The initial ideas are typically based on participant knowledge and perspectives through the exchange.

Collaborative communication platform

The majority of participants reported positive experiences when they were trying a prototype, and even considered it a relatively pleasant and fun approach. Service interface groups were participating in an efficient way. The participants mostly felt that engaging together was more meaningful. However, one participant from the service interface group asked for usability improvements (i.e. apply a demo - video tutorial - to assist different people who come from

diverse background how to use system). This key theme was found by collapsing two themes together (e.g. user participation and communication and collaborative co-design platform) due to insufficient data supporting them.

Participant responses showed that the most popular co-design tools/methods (rating/voting, blog-based discussion (post ideas) and social media) facilitated the involvement of stakeholders throughout different stages of the service design process.

<u>Ability for utilizing co-design tools</u>

Service interface groups joined in this evaluation to share their own perspectives to improve or expand the different stages of the iterative design process, how they are going to represent diverse stakeholders, and participate in e-service design process.

Service provider groups supported the earlier suggestions from the service interface group. However, they focused more on the approach of situating co-design tools within each design process stage, which will aid participants in tailoring their own perspectives. Furthermore, utilizing the standard design stages with suitable design tools could support/facilitate the elicitation of service users' unmet needs, and this in turn would affect the in service design process positively.

At the end of the discussion a number of participants in service provider groups had some concerns regarding involvement throughout design process phases. They then made some suggestions to involve service users throughout discover and define phases rather than develop and deliver phases - arguing that end-user will be actively engaged in the first two phases as they can express their needs and suggest some possible design solution included their requirements. It was felt by participants that the latter phases require more experience and creative skill from practitioners.

<u>Opportunities and challenges of involvement</u>

The service interface groups showed more enthusiasm than service provider groups regarding the adoption of tools. Service providers still have some concerns regarding the service user participation due to the level of knowledge required, especially in a developing country like Jordan. Furthermore, people were not prepared well to interact with this type of technology (lack of experience). However, service interface groups have different opportunities and they tried to reduce these concerns and support participants in more spontaneous and meaningful way. Service interface groups were different from service providers. They spoke about improvements and how they can adopt these improvements to enhance the proposed prototype rather than focusing on the limitations and

shortcomings with respect to service provider suggestions.

6. Conclusion

To recap, in this paper we have described a design science study where meta-design was employed to construct a participant specific e-Government service co-design process. We worked with a number of e-Government stakeholders in Jorden, focusing on the interface between the citizens and government. Citizens, service providers and intermediaries were interviewed and the RepGrid methodology was employed to uncover their cognitive models and perspectives within this government service design context. Element in the cognitive model were then synthesized into an extended co-design framework, itself based on the UK Design Council's double-diamond framework. The framework was then operationalized (as a BPMN model) to depict specific service design processes and supporting tools that are able to facilitate e-Government service co-design.

The framework extends the double-diamond design framework by better representing convergent and divergent 'modes of thinking' as demonstrated in RepGrid findings. The 'co-define' and 'co-develop' phases need convergent thinking to motivate different stakeholders to find concrete strategies for planning and suggest alternative practices by synthesizing the problem. In contrast, co-discover requires more divergent thinking, covering diverse stakeholders for more depth and concrete exploration in the problem phase. The operationalized design process provides an actionable approach that can be used to design digital services in a governmental context. Interestingly, the discursive and rating tools were particularly popular amongst stakeholders.

7. References

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