empatia

Evaluation Plans and Guidelines

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Executive Summary

This document is the first report of activity performed for Working Package 4 – EMPATIA's Evaluation and Impact Assessment, which outlines the guidelines for evaluation and requirements for EMPATIA's pilots.

The overall objective of this deliverable is to provide the guidelines for evaluation and requirements for EMPATIA pilot in selected sites (cases).

This deliverable outlines the overall methodological and logistical material for the pilot evaluations, identification of the entry and exit criteria for the four pilots in relation to the specification of pilot configurations and the key performance indicators (KPIs) for evaluating the EMPATIA platform. The KPIs identified are measures to evaluate the impact of PB on e-participation, transparency and democratic process.

The KPIs have been identified through a state-of-the-art analysis consisting of a systematic-focused-literature-analysis of academic and grey literature. In particular, this deliverable has identified the behavioural-usability, technical, process and political related KPIs, which will feed into WP1 and WP2 as requirements and form part of the evaluation and impact assessment plans for the pilots being conducted in WP3.

The deliverable is composed of five chapters including the introduction, methodological considerations, KPIs proposed for evaluating EMPATIA, overview of the requirements for the EMPATIA pilots and conclusion.

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Acronyms

Acronyms	Description
D	Deliverable
ICT	Internet Communication Technology
KPI	Key Performance Indicator
SOTA	State-of-the-art
T	Task
WP	Work Package
UTAUT	The Unified Theory of Acceptance And Use of Technology
IS	Information System
UC	Use Case
SQuaRE	Systems and software Quality Requirements and Evaluation
e-services	Electronic Services
SERVQUAL	A Model for Measuring Service Quality
BI	Behavioural Intention
PE	Performance Expectancy
EE	Effort Expectancy
SI	Social Influence
IU	Intention to Use
FC	Facilitating Conditions
PB	Participatory Budgeting

1 Introduction

The EMPATIA (hereinafter mentioned as the "Project") – one of the European Commission H2020-ICT-2015 projects (Grant number 687920) that seeks to radically enhance the inclusiveness and impact of PB processes, increasing the multichannel participation of citizens by designing, evaluating and making publicly available an advanced ICT platform for participatory budgeting, which could be adaptable to different social and institutional contexts across European countries. The ultimate ambition is to produce a platform, which could be useful for not only supporting PB as an isolated experiment of participatory decision-making, but also larger and interconnected "*systems*" of complementary participatory devices, which could count on PB principles as a pivotal pillar for their coordination.

This is demonstrated in the Project through providing access to such service in the context of Use Case Pilots. Work Package 4 (*WP4*) aims to develop the implicit understanding of the effect that EMPATIA will have on the piloted services and the end-users, to ensure that the services are successfully adopted. This deliverable is the result of *Task 4.1* of Work Package 4 and it aims at defining the metrics (i.e. Key Performance Indicators, KPIs) and evaluation plan for EMPATIA platform assessment on both technical and non-technical perspectives.

1.1 Purpose and Scope

This deliverable defines the evaluation metrics of the EMPATIA platform and the requirements for field trials. The evaluation metrics are based on a comprehensive state-of-the-art (SOTA) literature review analysis, resulting in the identification of a set of Key Performance Indicators (KPIs). The SOTA literature analysis includes a comprehensive investigation of existing approaches for evaluating technology adoption and diffusion in the context of ICT-led service delivery platforms. The analysis is broadly distanced into two perspectives: the technical and the non-technical. The technical perspective refers to assessing the operation and performance of the EMPATIA platform from a "network" and "architecture" angle. The non-technical perspective refers to evaluating the social, economic, behavioural and political dimensions. When evaluating any new technological innovations, especially in the context of public sector where multiple stakeholders of different interests are involved – it is imperative that both technical and non-technical aspects are taken into consideration.

Firstly, technical KPIs are presented based on metrics proposed in multiple sources for service evaluation, such as public bodies, standardization bodies, and vendors and other data communication and network element suppliers and evaluators. These include metrics for performance, usability, maintenance, and monitoring, among others.

Next, the behavioural (user-centred) KPIs are presented based on existing literature including widely known technology-acceptance theories. Drawing on the dominant theories applied in Information and Communication Technology (ICT), a proposal of an integrated model for evaluation is developed based on 'Unified Theory of Acceptance and Use of Technology (UTAUT)', 'IS success model' and 'inclusion of perceptions regarding information privacy'. The information privacy concept is introduced because in the event of wide adoption of such service on the Internet, potential users may be exposed to information security and privacy concerns (Dinev and Hart, 2006).

Then the economic and social dimensions are presented including indexes for cost saving, openness, trust, legal compliance and business operations. Subsequently, two categories of process KPIs, i.e. user requirements and process requirements, are outlined. The user requirements category is built

around usability features, satisfaction and reliability, while process requirements category focuses on end-to-end processes across different scenarios.

Lastly, the political dimension is analysed with a particular focus on the impact of the participatory platform on the evolution of internal and external efficacy of users and overall trust in democratic institutions.

1.2 Relation to Work Packages and Deliverables

The aim of this deliverable is to report on the activities carried out as part of Task 4.1, one of the first activities of the WP4 and will feed into WP1 and WP2 as requirements. Based on the metrics identified in this deliverable, the identified pilot sites will define the requirements for the trials as part of task 4.3.

1.3 Document Structure

The deliverable is structured as follows:

- Section 2 presents the analysis of literature review, consisting of proposed evaluation metrics in terms of technical, behavioural, socio-economic, politic and process key performance indicators (KPIs).
- Section 3 briefly outlines the methodological approach and guidelines that were adopted, and will be adopted in defining user requirements and evaluation metrics for EMPATIA platform.
- Section 4 reports in detail the pre-field trail requirements in terms of both entry criteria (e.g. system requirements, field trial dates etc.) and the exit criteria (e.g. quality measurements and resource conditions).

Finally, key conclusions are outlined along with list of references and a number of appendices that include the additional supporting materials relevant to this deliverable.

2 Literature Review and Proposed Indicators

The task to develop the key performance indicators (KPIs) was informed by a comprehensive state-of-the-art (SOTA) literature review. In such an analysis, existing approaches for evaluating technology adoption and diffusion in the context of public service delivery were investigated. Investigation results were classified into two broad spectrums of technical and non-technical KPIs, before being evaluated and selected as the project's KPIs. The methodology process used for defining evaluations metrics for EMPATIA project is graphically illustrated in Figure 1. The details were described in the following sub-sections.

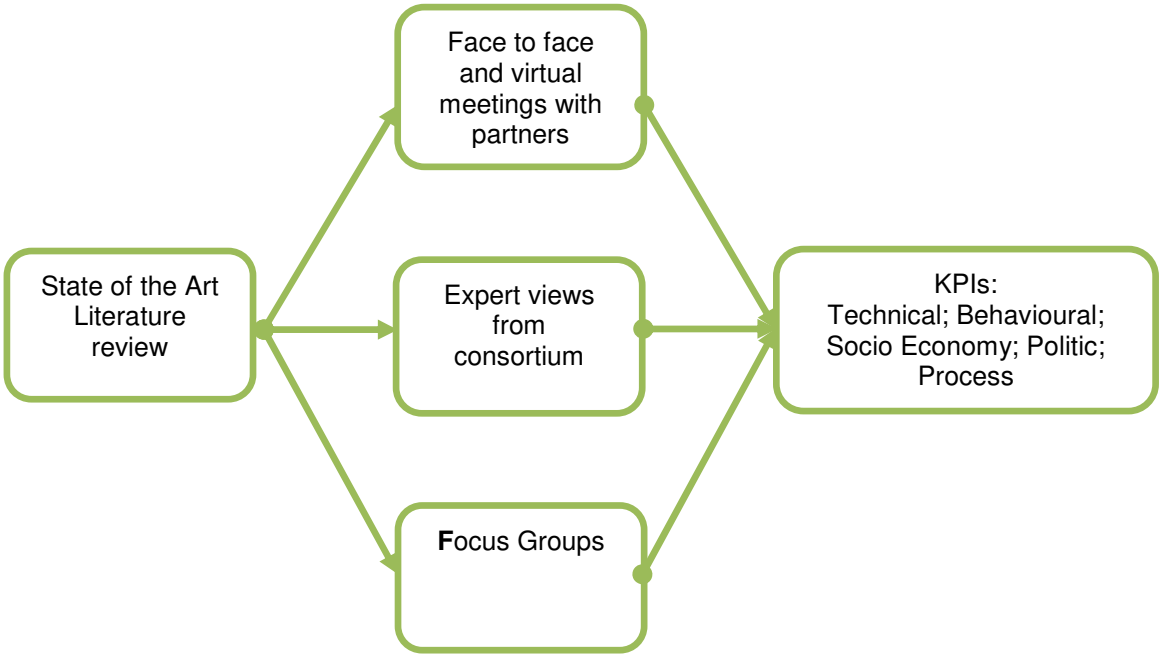

Figure 1: Research Methodology defining evaluation metrics

2.1 Technical KPIs

The inclusion of technical KPIs is an explicit need that was derived directly from the main definition of the Project. Internet-based platforms are considerably new and evolving. Hence, retrieving such information from the existing literature for the KPIs is extremely challenging. Due to this reason, we have adopted a very simple process, starting from criteria assessment, followed by proposing the technical KPIs and some research on available information from relevant organisations.

2.1.1 Assessments of the main attributes

The definition of technical KPIs will allow us to measure the performance of various service platforms (i.e. through mobile, personal computers and kiosk access) piloted in the EMPATIA Project, as well as for determining the causes when the performance of EMPATIA changes.

The EMPATIA Use Case (UC) Pilots planned are very different from each other, involve different user, and service provider communities. As reported in D1.1, the three EMPATIA pilots will take place in Germany, Portugal and the Czech Republic. While some of the KPIs will be used for evaluating the overall EMPATIA infrastructure, each service offered by the EMPATIA infrastructure will inevitably consider different performance metrics for assessing the different User Case scenarios as described in *WP2*, *WP3* and *WP4*. Therefore, it is also necessary to design service-specific metrics. In order to develop a good profile of the performance of the application, it is necessary to take into account various aspects.

In the last years, there have been numerous assessment frameworks dealing with the evaluation of the technical performance of IT systems, targeting different phases of the software development life cycle. When it comes to e-Government systems, our bibliography is full of work that corresponds to the assessment of such frameworks, but most of the approaches tackle the context and methodology part that is supported by such systems, without much focus on the core IT systems that support the operations involved.

In the context of EMPATIA, the project's consortium will try to put a stronger emphasis than past attempts on the assessment of the supporting IT systems during the pilot operation, keeping however, the focal point of the assessment to the behavioural assessment criteria that pursue to identify the appropriateness and ease of use/usability of the system. The technical assessment of the EMPATIA platform during its pilot operation will be based on an assessment model that includes a set of KPIs and criteria that are being extracted from the ISO/IEC 25010:2011, known as "Systems and software engineering - Systems and software Quality Requirements and Evaluation (SQuaRE) - System and software quality models" standard (see Figure 2). Following the main directions of this standard, different elements and criteria will be selected and indicators specific to each element will be defined in order to produce a technical assessment model that can be used for evaluating the technical operation of the EMPATIA platform.

The ISO/IEC 25010:2011 standard has replaced the previous standard on software quality, which was the ISO/IEC 9126-1, and provides a new view on how software (and thus software platforms) should be assessed. In more detail, the ISO/IEC 25010:2011 defines as stated in its official website[1]:

- *A quality in use model composed of five characteristics (some of which are further subdivided into sub-characteristics) that relate to the outcome of interaction when a product is used in a particular context of use. This system model is applicable to the complete human-computer system, including both computer systems in use and software products in use.*

- *A product quality model composed of eight characteristics (which are further subdivided into sub-characteristics) that relate to static properties of software and dynamic properties of the computer system. The model is applicable to both computer systems and software products.*

As mentioned in the ISO document, *"the characteristics defined by both models are relevant to all software products and computer systems"*; thus, they are considered to be also a good match for assessing the EMPATIA platform.

[1] http://www.iso.org/iso/catalogue_detail.htm?csnumber=35733

However, since the assessment and evaluation in the context of EMPATIA covers a larger scope, and the platform to be developed is not the only element to be assessed, in this section the focus is on the "product quality model". The product quality model classifies software quality in a structured set of characteristics (each of them including other sub-characteristic), which are the following:

- Functional suitability: Refer to the degree to which the product provides functions that meet stated and implied needs when the product is used under specified conditions.
- Performance efficiency - Refer to the performance relative to the amount of resources used under stated conditions.
- Compatibility: Refer to the degree to which two or more systems or components can exchange information and/or perform their required functions while sharing the same hardware or software environment.
- Usability: Refer to the degree to which the product has attributes that enable it to be understood, learned, used and attractive to the user, when used under specified conditions.
- Reliability: Refer to the degree to which a system or component performs specified functions under specified conditions for a specified period.
- Security: Refer to the degree of protection of information and data so that unauthorized persons or systems cannot read or modify them and authorized persons or systems are not denied access to them.
- Maintainability: Refer to the degree of effectiveness and efficiency with which the product can be modified.
- Portability: Refer to the degree to which a system or component can be effectively or transfer efficiently, from one hardware, software or other operational or usage environment to another.

However, not all sub-characteristics of the above-mentioned core characteristics are applicable for the EMPATIA platform. The following table shows the characteristics for each category and indicate their relativity to the EMPATIA platform.

Figure 2: The product quality model view of the ISO/IEC 25010:2011 standard

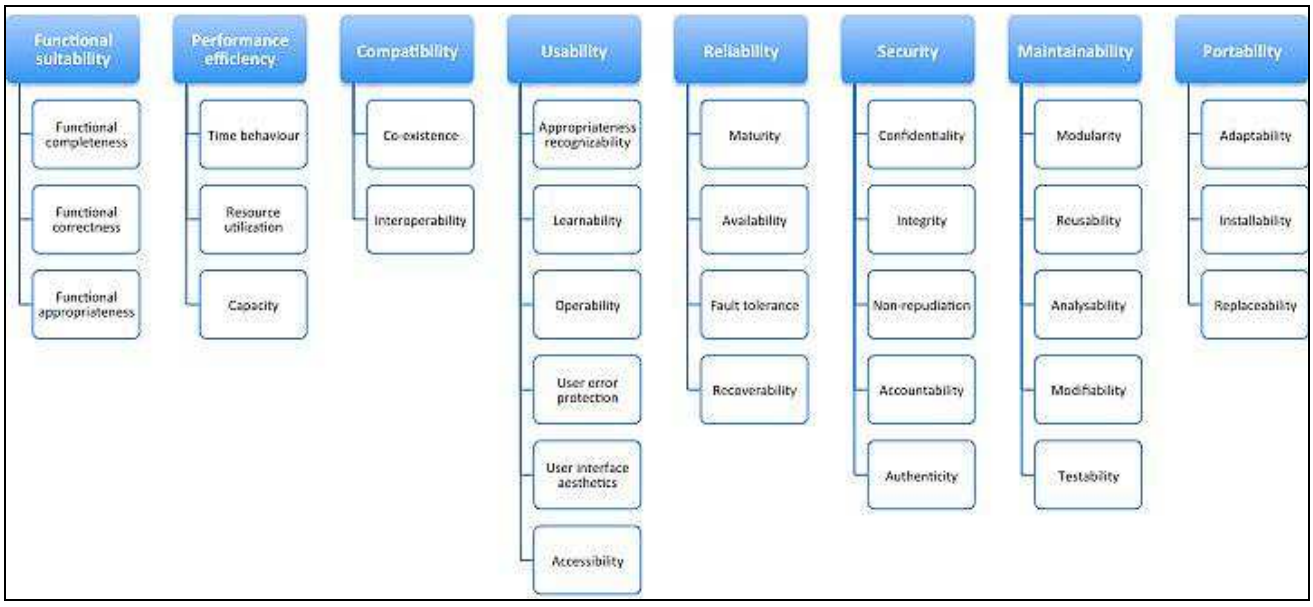

Table 1: Technical Characteristics, Sub characteristics and Relevance to Empatia

Sub characteristics	Definition	Relation to EMPATIA Technical KPIs	Remarks
Functional suitability			
Functional completeness	Degree to which the set of functions cover all the specified tasks and user objectives.	NO	Not a technical assessment issue of the platform's operation, concerns mainly the design phase
Functional correctness	System provides the correct results with the needed degree of precision.	NO	Not critical to be tested during the project
Functional appropriateness	The functions facilitate the accomplishment of specified tasks and objectives.	NO	Not a technical assessment issue of the platform's operation, concerns mainly the design phase
Performance efficiency			
Time behaviour	Response, processing times and throughput rates of a system, when performing its functions, meet requirements.	YES	
Resource utilization	The amounts and types of resources used by a system, when performing its functions, meet requirements.	YES	
Capacity	The maximum limits of a product or system parameter meet requirements.	YES	
Compatibility			
Co-existence	Product can perform its functions efficiently while sharing environment and resources with other products.	NO	Not to be tested during the project
Interoperability	A system can exchange information with other systems and use the information that has been exchanged.	YES	
Usability			
Appropriateness recognisability	Users can recognize whether a system is appropriate for their needs, even before it is implemented.	Partially	Not a core technical assessment issue of the platform's operation, concerns behavioural assessment

Learnability	System can be used to achieve specified goals of learning to use the system.	Partially	Not a technical assessment issue of the platform's operation, concerns behavioural assessment
Operability	System has attributes that make it easy to operate and control.	Partially	Not a technical assessment issue of the platform's operation, concerns behavioural assessment
User error protection	System protects users against making errors.	Partially	Not a technical assessment issue of the platform's operation, concerns behavioural assessment
User interface aesthetics	User interface enables pleasing and satisfying interaction for the user.	Partially	Not a technical assessment issue of the platform's operation, concerns behavioural assessment
Accessibility	System can be used by people with the widest range of characteristics and capabilities.	YES	
Reliability			
Maturity	System meets needs for reliability under normal operation.	YES	
Availability	System is operational and accessible when required for use.	YES	
Fault tolerance	System operates as intended despite the presence of hardware or software faults.	YES	
Recoverability	System can recover data affected and re-establish the desired state of the system is case of an interruption or a failure.	YES	
Security			
Confidentiality	System ensures that data are accessible only to those authorized to have access.	YES	
Integrity	System prevents unauthorized access to, or modification of, computer programs or data.	YES	
Non-repudiation	Actions or events can be proven to have taken place, so that the events or actions cannot be repudiated later.	YES	
Accountability	Actions of an entity can be traced uniquely to the entity.	YES	
Authenticity	The identity of a subject or resource can be proved to be the one claimed.	NO	Not a technical assessment issue of the platform's operation, concerns mainly the design phase
Maintainability			

Modularity	System is composed of components such that a change to one component has minimal impact on other components.	YES	
Reusability	An asset can be used in more than one system, or in building other assets.	YES	
Analysability	Effectiveness and efficiency which it is possible to assess the impact of an intended change.	NO	Not a technical assessment issue of the platform's operation, concerns mainly the design phase and code authoring principles
Modifiability	System can be effectively and efficiently modify without introducing defects or degrading existing product quality.	YES	
Testability	Effectiveness and efficiency of the criteria can that be established to test the system.	YES	Not a technical assessment issue of the platform's operation, concerns mainly the design phase and code authoring principles
Portability			
Adaptability	System can be effectively and efficiently adapted for different or evolving hardware, software or usage environments.	YES	
Installability	Effectiveness and efficiency of successful installation or uninstallation of a system.	YES	
Replaceability	Product can be replaced by another specified software product for the same purpose in the same environment.	NO	Not to be tested during the project

2.1.2 Proposed Technical KPIs for EMPATIA

As we can see, Table 1 presents series of potential measurable criteria for EMPATIA. Nevertheless, since the specific attributes (i.e. how the criteria should be measure) for each sub characteristics was not defined in the ISO/IEC 25010:2011 standard, the following list of indicators has been devised in order to allow the technical assessment of the EMPATIA platform (see Table 2). Such indicators will be assessed according to the methods as presented in the table. Due to the nature of the project and operation conditions of the pilots, some of the proposed indicators are optional – for their measurement might not be possible, or might not produce meaningful results.

Table 2: Technical KPIs selected for EMPATIA Platform

Sub characteristics	KPIs	Calculation Type	Mandatory/ Optional
Time behaviour	Average Latency	(Total Response Time)/(No. of Requests)	M
	Throughput	(Total No. of Kilobytes)/(Total Time of Operation)	O
Resource utilization	Mean % CPU Utilisation	(Σ (% CPU utilisation probes))/(No. of probes)	O
	Mean Memory Usage	(Σ (RAM Megabytes used in each probe))/(No. of probes)	O
	Max. Memory Used	No. of max Megabytes of RAM Memory recorded	O
	Max. Processing Power Used	max % CPU utilisation recorded	O
Interoperability	Ability to expose services with APIs	YES/NO	M
	Ability to consume services through APIs	YES/NO	M
	% Utilisation of Open Standards for Data Exchange	(Open Standards Used)/(Total No. of Data Schemas Used)	M
Accessibility	WCAG 2.0 Conformance Level	None/A/AA/AAA	M
Maturity	Max. Concurrent Users Supported	No. of Max. Concurrent Users Recorded	M
	Load Size	(Concurrent Users at any Instance)/(Total Operation Time)	O
	Simultaneous Requests	No. of Simultaneous Requests	M
	Requests per Second	(No. of Requests)/(Total Time of Operation)	M
Availability	% Monthly Availability	1- ((Downtown Time Minutes)/(Month Days*24*60))	M
	Error Rate	(No. of Problematic Requests)/(Total Number of Requests)	M

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Sub characteristics	KPIs	Calculation Type	Mandatory/ Optional
Fault tolerance	Number of Software problems identified without affecting the platform	No. of Non Critical Software Errors	M
	Number of Hardware problems identified without affecting the platform	No. of Non Critical Software Errors	M
Recoverability	Mean time to recover from software problems	(Total Recovering Time due to Software Issues)/(Total Software Issues resulting to recovery)	M
	Mean time to recover from hardware problems	(Total Recovering Time due to Hardware Issues)/(Total Hardware Issues resulting to recovery)	M
Confidentiality	Incidents of ownership changes and accessing prohibited information	No. of incidents recorded	M
Integrity	Incidents of authentication mechanism breaches	No. of incidents recorded	M
Non-repudiation	Log reports for activities	(No. of Logs Report Categories)/(No. of all system operations)	M
Accountability	Usernames included in each log entry	YES/NO	M
Modularity	% Modularity (excluding backbone infrastructure)	(No. of components that can operate individually)/(Total number of components)	M
Reusability	% of Reusable Assets	(No. of assets that be reused as is)/(Total number of assets)	M
Modifiability	% of Update Effectiveness	(No. of updates preformed without noticing operational problems)/(No. of updates performed)	M
Adaptability	Mean No. of Errors per Hardware Change	(No. of Total Errors recorded)/(No. of Total Hardware Changes)	M
	Mean No. of Errors per Software Change	(No. of Errors recorded)/(No. of Software Changes)	M
Installability	Mean Installation Duration	(Total minutes recorded for installation)/(Total No. of Installations)	M
	% of Installation Errors	(No. of Installation containing Errors)/ (Total No. of Installations)	M
	Mean No. of Errors per Installation	(No. of Total Errors recorded during Installations)/(Total No. of Installations)	M

2.1.3 Research on Available Information

This section offers a short description of the sources and documentation obtained from a set of bodies and organizations providing "key information" about the uninterrupted service platform. In essence, the available information was obtained from the following:

- Public bodies;
- Standardization bodies;
- Vendors and other relevant suppliers;

2.2 Behavioural KPIs

In this section, state-of-the-art key performance indicators for the EMPATIA Project are developed based on a behavioural perspective. In doing this, related performance indexes refer to the assessment of EMPATIA services from an end users' viewpoint, and specifically with regard to their acceptance and satisfaction derived from using application. Such indexes were extracted from the comprehensive reviews on the 'technology adoption and associated behavioural evaluation' literatures.

Several researchers have proposed indicators for evaluating user satisfaction with innovative and/or new technology-based services. Johnston (1995) compiled 18 determinants of service quality that have been used for assessing electronic services' (e-services) quality, including availability, reliability, friendliness, functionality, access, aesthetics, etc. Parasuraman et *al.* (1988) have developed a widely-accepted model, known by the acronym "SERVQUAL," for measuring service quality, which includes five dimensions as following: tangibles, reliability, responsiveness, assurance, and empathy. Information system researchers have adopted and modified the SERVQUAL model for e-services quality, by including dimensions of website design, reliability, fulfilment, security, responsiveness, personalization, information (accuracy, comprehensibility, etc.) and empathy (Li and Suomi, 2009). Similarly, Zeithaml et *al.* (2001) have adopted the SERVQUAL model for e-service quality evaluation and have proposed 11 dimensions: access, ease of navigation, efficiency, flexibility, reliability, personalization, security/privacy, responsiveness, assurance/trust, site aesthetics, and price knowledge. Moreover, several information system researchers have applied technology acceptance theories in order to evaluate e-services from a user's perspective.

During the past three decades, there have been numerous studies regarding ICT acceptance and numerous information system (IS) acceptance studies have focused on the reasons why potential users accept or do not accept technology. Such studies involved development and validation of numerous research models, including: The Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975); Social Cognitive Theory (SCT) (Bandura, 1986); Technology Acceptance Model (TAM) (Davis, 1989) and extended TAM 2 (Venkatesh and Davis, 2000); TAM 3 (Venkatesh and Bala, 2008); Theory of Planned Behaviour (TPB) (Ajzen, 1991); Model of PC Utilisation (Thompson et *al.*, 1991); Motivation Model (Davis et *al.*, 1992); the model combining TAM and the TPB (Taylor and Todd, 1995a); and the Innovation Diffusion Theory (IDT) (Rogers, 1995).

The line of research in technology acceptance models was culminated by the Unified Theory of Acceptance and Use of Technology (UTAUT), which was developed by Venkatesh (Venkatesh et *al.*, 2003). The UTAUT aims to explain users' intentions with regard to an information system and subsequent usage behaviour, and the model has been empirically examined by numerous studies. The UTAUT model integrates eight previously developed models and theories that relate to technology

acceptance and use. Venkatesh et *al.* (2003) observed that IT researchers have choices of a multitude of models. They were confronted to choose constructs across models or choose an ideal model, thus ignoring the contribution from alternative ones. Therefore, the researchers compared the eight dominant models in explaining technology acceptance behaviour that have been previously used by researchers and scholars. The eight prominent models included are outlined below, in *Table 3*.

Table 3: Prominent Models, used to study User Behaviour in Technology Adoption

Theory(s)	Authors
Theory of Reasoned Action (TRA)	Fishbein and Ajzen (1975)
Technology Acceptance Model (TAM)	Davis (1989)
Motivational Model (MM)	Davis, Bagozzi and Warshaw (1992)
Theory of Planned Behaviour (TPB)	Ajzen (1991)
Combination of Technology Acceptance and Theory of Planned Behaviour models (C-TAM-TPB)	Taylor and Todd (1995a)
Model of PC Utilization (MPCU)	Thompson, Higgins and Howell (1991)
Innovation Diffusion Theory (IDT)	Moore and Benbasat (1991)
Social Cognitive Theory (SCT)	Compeau and Higgins (1995)

Another dominant stream of research in the information-systems and technology-evaluation fields focuses on information systems (IS) success including several conceptual and empirical studies. In 1979, an assessment of IS research factors was conducted by Zmud (1979) to review issues addressed by most academics and practitioners concerning the influence of individual differences upon management information system design, implementation, and usage. In 1983, Bailey and Pearson (1983) outlined that evaluating and analysing computer user satisfaction, is an aspiration to improve the productivity of information systems by organizational management. According to the authors, productivity in computer services means both *efficiently supplied and effectively utilized data processing outputs* (Bailey and Pearson, 1983). Soon after, in 1984, a study was conducted by Ives and Olson (1984) emphasizing the importance of users' involvement. After a decade, a study followed by Davis (1989) developed TAM, which explained the relationship among information systems beliefs (e.g. perceived usefulness and ease of use, attitudes, and behavioural intentions and systems usage). DeLone and McLean (1992) reviewed over 180 articles and came up with the information systems success model, which consisted of information quality, system quality, use, user satisfaction, individual impact and organizational impact. In 1995, Goodhue and Thompson (1995) developed the task-technology fit model. The authors argued that the model services as the basis for a strong indicative tool to assess whether an information system including systems, policies, IS staff, and services in a given organization are meeting user needs. Among the above-mentioned studies, DeLone and McLean's IS success model (1992) has gained great attention from scholars and widespread attention in the information success literature (Vaidya, 2007).

Given the above-discussed context to the study of information technology and systems adoption, we present the two most widely accepted evaluation models (i.e. the UTAUT and the IS success models), which will be used to determine the KPIs for the EMPATIA Project from a behavioural perspective.

2.2.1 The Unified Theory of Acceptance and Use of Technology

The Unified Theory of Acceptance and Use of Technology provide a useful tool for managers that aim at assessing the likelihood of success for new technology introductions and helps them understand the

"drivers" of technology acceptance, in order to proactively design interventions targeted at users that might be less inclined to adopt and use new systems respectively (such as training, marketing, etc.). The UTAUT model consists of three indirect determinants of behavioural intention, and two direct determinants of use behaviour.

The three core constructs in the UTAUT model, which declare to impact behavioural intention (BI) directly, are: (i) Performance expectancy (PE); (ii) Effort expectancy (EE), *and;* (iii) Social influence (SI). Intention to use (IU) and facilitating conditions (FC) are declared to "impact" indirectly on use behaviour.

UTAUT includes four moderators (i.e. age, gender, experience and voluntariness of use), which contribute to a better understanding of the complexity of technology acceptance by individuals. *Figure 2,* as below, illustrates UTAUT's core constructs.

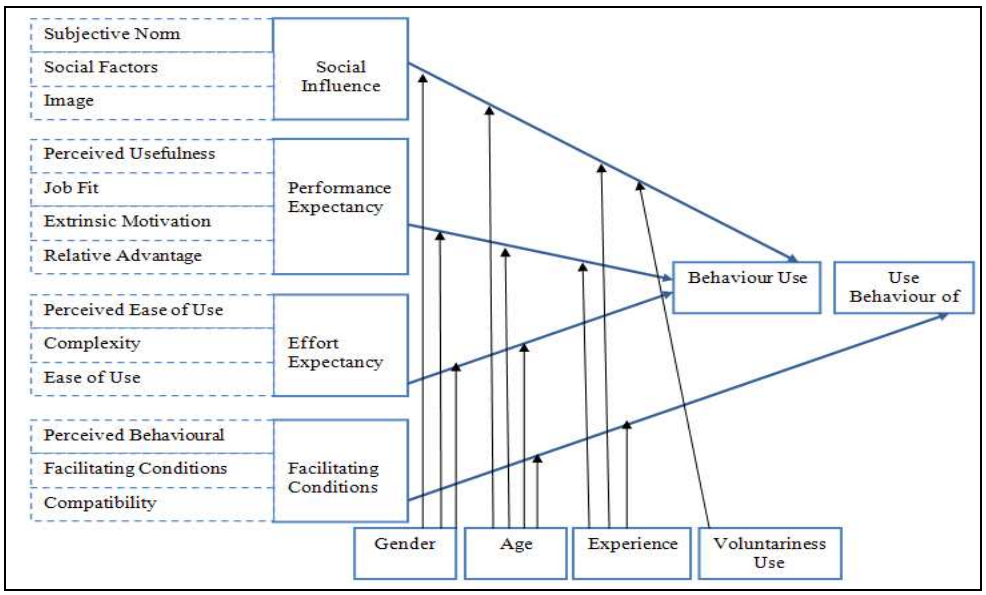

Figure 3: UTAUT's Constructs and Root Core of Constructs

Additionally, the UTAUT model suggests the following:

(i) Gender and age moderate the relationship between performance expectancy and behavioural intention;
(ii) Gender, age and experience moderate the relationship between effort expectancy and behavioural intention;
(iii) Gender, age, experience and voluntariness are suggested to moderate the relationship between social influence and behavioural intention, *and;*
(iv) Age and experience are declared to moderate this relationship between facilitating conditions and behaviour intention.

The following *Table 4* summarizes the core constructs of UTAUT model and its root constructs.

Table 4: Core Constructs and Root Constructs of UTAUT Model, relevant for EMPATIA Evaluation

UTAUT Constructs	Definition	Root Constructs	Definition	Models Derived From	References
Performance Expectancy	The degree to which an individual believes that using the system will help him or her to attain gains in job performance	Perceived Usefulness	The degree to which a person believes that using a particular system would enhance his or her job performance.	TAM	(Davis, 1989)
		Extrinsic Motivation	The perception that users will want to perform an activity because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay or promotions.	MM	(Davis, Bagozzi and Warshaw, 1992)
		Job-fit	Defined as perceived job fit and measures the extent to which an individual believes that using a PC can enhance the performance of his or her job.	MPCU	(Thompson, Higgins and Howell, 1991, p.129)
		Relative Advantage	The degree to which an innovation is perceived as better than the status quo.	DOI	(Moore and Benbasat, 1991, p.194)
		Outcome Expectations	Relate to the consequences of the behaviour.	SCT	(Compeau, Higgins and Huff, 1999; Compeau and Higgins, 1995)
Effort Expectancy	The degree of ease associated with the use of the system	Perceived Ease of Use	The degree to which a person believes that using a particular system would be free of effort.	TAM	(Davis, Bagozzi and Warshaw, 1989; Davis, 1989)
		Complexity	The degree to which an innovation is perceived as difficult to understand / use.	MPCU	(Thompson, Higgins & Howell, 1991)
		Ease of Use	The degree to which an innovation is perceived as difficult to use.	IDT	(Moore and Benbasat, 1991),
Social Influence	The degree to which an individual perceives that important others believe he or she should use the new system.	Subjective Norm	Perception of having to do or not to do the behaviour based on the thoughts of people who are important to us.	TRA, TPB, C-TAM-TPB	(Thompson, Higgins and Howell, 1991)
		Social Factors	The individual's internalization of the reference group's subjective culture & specific interpersonal agreement that he / she has made with others, in specific social situations.	MPCU	(Thompson, Higgins and Howell, 1991)
		Image	The degree of which the use of innovation is perceived would enhance one's image or status, in one's social system.	IDT	(Rogers, 1995; Moore and Benbasat, 1991)

UTAUT Constructs	Definition	Root Constructs	Definition	Models Derived From	References
Facilitating Conditions	Amount of support (i.e. organisational and technical) available for system usage (from individual's perceptions)	Perceived Behavioural Control	Reflects perceptions of internal & external constraints on behaviour & encompasses self-efficacy, resource facilitating conditions & technology facilitating conditions.	TPB, C-TAM-TPB	(Taylor and Todd, 1995a; Taylor and Todd, 1995b; Ajzen, 1991)
		Facilitating Conditions	Objective factors in the environment that observers agree make an act easy to do, including the provision of computer support.	MPCU	(Thompson, Higgins and Howell, 1991)
		Compatibility	The degree to which an innovation is perceived as being consistent with existing values, needs, & experiences of potential adopters.	IDT	(Rogers, 1995; Moore and Benbasat, 1991)
Behavioural Intention	A measure of the strength of one's intention to perform a specified behaviour			TRA, TAM	(Davis, Bagozzi and Warshaw, 1989)

2.2.2 IS Success Model

One of the most popular information systems success assessment models, which has resulted in highly significant contribution in the literature, is the DeLone and McLean IS success model conceptual model (IS Success model). The IS success model categorizes existing IS success measures under six dimensions (these have been discussed, *correspondingly,* by: Hussein et *al.*, 2007; Hu et *al.*, 2005; Gable, Sedera and Chan, 2003; Molla and Licker, 2001; Seddon, 1997, *and;* Seddon and Kiew, 1996). As Gable, Sedera and Chan (2003) note, the development of IS success models (*such as the DeLone and McLean model)* has been an important contribution towards our improved understanding of IS management. Almost, 1000 studies have used the IS success model and approximately 150 empirical studies have examined some or all of the relationships in the model (Petter and McLean, 2009; Wangpipatwong, Chutimaskul and Papasratorn, 2009).

The IS success taxonomy and its six success categories are based on a process model of information systems (DeLone and McLean, 2002; DeLone and McLean, 1992). Additionally, strong cause and effect relations exist among the six dependent variables. The six dimensions are interrelated, resulting in a success model, which illustrates that causality flows in the same direction as the information process does (DeLone & McLean, 2002). The six major variables of the IS success model are:

1) System quality;
2) information quality;
3) use;
4) user satisfaction;
5) individual impact;
6) organizational impact

In the IS Success model, system quality measures technical success, information quality measures semantic success and use, user satisfaction, individual impact, and organizational impact measure effectiveness success of the system measured. *Figure 3* illustrates the IS Success model.

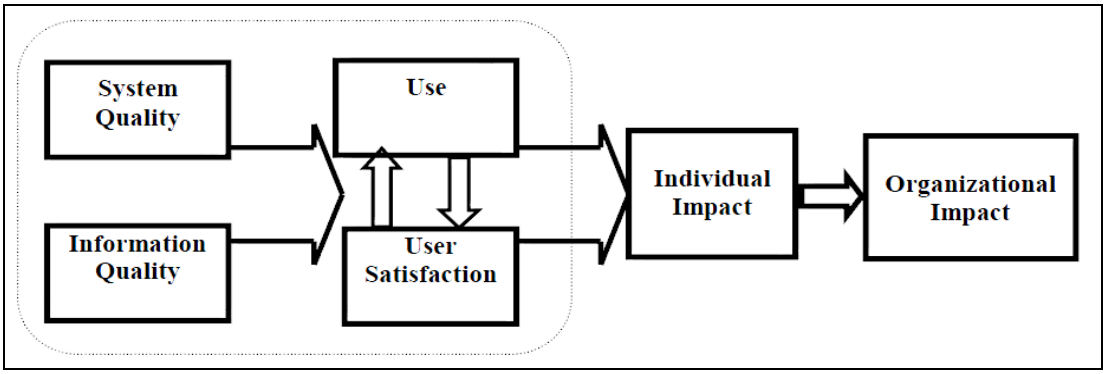

Figure 4: DeLone and McLean IS Success Model (1992)

One of the strongest criticisms about the IS Success model is the lack of service quality among the variables. According to Pitt, Watson and Kavan (1995), there is the danger that researchers will wrongly measure the IS effectiveness; if they do not include in their assessment criteria a measure of IS service quality. Service is an important part of information systems department; thus, service quality is a critical measure of information system effectiveness (Chatterjee et *al.*, 2009; Van Dyke, Kappelman and Prybutok, 1997). As a result, in order to measure information systems effectiveness properly, many researchers believed that service quality should be included in the IS success model as a success measure (Kettinger and Lee, 1997; Myers, Kappelman and Prybutok, 1997; Pitt, Watson and Kavan, 1997). Pitt, Watson and Kavan (1997, p.210) posit that "the IS community needs to be aware of problems that might be experienced in using an instrument to measure so critical a construct as IS service quality".

Having realised the importance of e-services, DeLone and McLean (2003) outlined that in frequently used systems, not only the benefits to the users but also the quality of the system should be considered as well. In response to the call of other researchers who criticized the original model, and due to the advent and growth of Internet based e-services, DeLone and McLean (2003) decided to "add" service quality to their new model as an important dimension of IS success, noting the significance of customer service in the e-services environment. Therefore, in an attempt to contribute towards a universal model, DeLone and McLean (2003) introduced their updated model ten years following its introduction in 1992. The model includes six success dimensions, and holds that the constructs of information quality, system quality, and service quality individually and jointly affect the factors of use and user satisfaction, whereas user satisfaction and use jointly affect net benefit. *Figure 4* illustrates the updated DeLone and McLean Success Model.

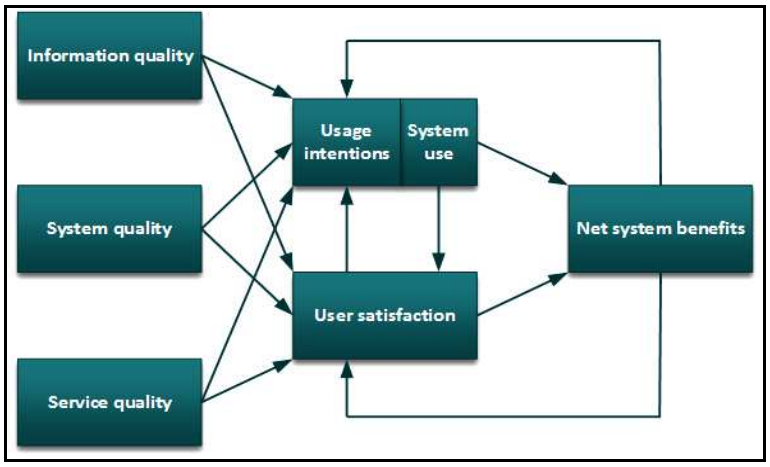

Figure 5: The Updated DeLone and McLean IS Success Model (2003)

The updated model of DeLone and McLean (2003) includes six success dimensions to measure the success of a system in the e-services domain. The six major variables of the 2003 IS success model are as following:

1. *Information quality* is defined as quality of the information that the system is able to store, deliver, or produce affecting both – users' satisfaction with the system their intentions to use the system, which, in turn, impact the extent to which the system is able to yield benefits for the user and organization. This dimension requires measurement of information relevancy, reliability, completeness, understandability and security (i.e. privacy of information that could affect user's trust in submitting the information).

2. *System quality* indirectly impacts the extent to which the system is able to deliver benefits by means of mediational relationships through the usage intentions and user satisfaction constructs. This dimension requires measurement ofthe desired characteristics of a system, such as quality of usability, availability, reliability, adaptability, and response time (e.g., download time).

3. *Service quality:* refers to the quality of service that the system is able to deliver. It has a direct impact towards usage intentions and user satisfaction with the system, which, in turn, impact the net benefits produced by the system. To increase the system quality, it is important to know about the extent of the overall services delivered by the system, including system's support from the service provider (i.e. operational support such as help on using the system, and technical support from the information systems or information technology department or the internet service provider).

4. *Usage (Intention and Actual):* This dimension is influenced by information, system, and service quality. It is posited that the actual usage could influence a user's satisfaction with the information system, which, in turn, is posited to influence usage intentions. To know more, *measurement on* all activities that include visits to the website, navigation within the website, as well as information retrieval and execution of a transaction are needed.

5. *User satisfaction* directly influences the net benefits provided by an information system. It refers to the extent to which a user is pleased or contented with the information system, and is posited directly affected by system use. Therefore, to increase satisfaction, measurement of users' opinions towards the system –reflecting their entire experience from information retrieval throughout received of decision, is required.

6. *Net benefits* of a system are when the system is able to deliver is an important facet of its overall value to its users or to the underlying organization. It is affected by system use and by user satisfaction with the system. In their own right, system benefits are posited to influence both - user satisfaction and a user's intentions to use the system. To enable the contribution towards this dimension, there is a need to capture the "balance" of the positive and negative impacts of the system on the stakeholders, especially the users, organizations, and even society as a whole.

Hu et *al.* (2005) attempted to establish a suitable and systematic appraisal framework of public sector e-services success based on the IS Success Model presented by DeLone and McLean in 1992, which is relevant to the EMPATIA Project. *Table 5* summarizes the relevant KPIs for evaluating EMPATIA Project.

Table 5: Factors Relevant from IS Success Model Factors for EMPATIA Evaluation

KPIs	Evaluation Aspects	Descriptions	References
System Quality	Reliability	Refer to the dependability on the system. .	(Wixom and Todd, 2005)
	Flexibility	Refer to the way the system adapts to changing demands of the user.	
	Integration	Refer to the way the system allows data to be integrated from various sources.	
	Accessibility	Refer to the ease with which information can be accessed or extracted from the system.	
	Timeliness	Refer to the degree to which the system offers timely responses to requests for information or action.	
Information Quality	Completeness	Refer to the degree to which the system provides all necessary information.	(Wixom and Todd, 2005)
	Accuracy	Refer to the user's perception that the information is correct.	
Service Quality (SERVQUAL Scale)	Reliability	Refer to the ability to perform the promised service dependably and accurately.	(Parasuraman, Zeithaml and Berry, 1988)
	Responsiveness	Refer to the willingness to help customers and provide prompt ability to inspire trust and confidence.	
	Empathy	Caring, individualized attention to firm provides its customers.	
Information Use	Usefulness	Refer to the degree to which a person believes that a particular information system would enhance his or her job performance.	(Davis, 1989)
	Ease of Use	Refer to the degree to which a person believes that EMPATIA system would be free of effort.	
User Satisfaction	System Satisfaction	Refer to the degree of favourableness with respect to the system and the mechanics of interaction.	(Wixom and Todd, 2005)

2.2.3 Integrated Model for Evaluating User Experience of EMPATIA

For the purpose of evaluating the user experience related to technology and e-services, the two noteworthy models (i.e.: UTAUT and DeLone and McLean IS success model) are integrated, based on theoretical evidences presented in the previous two sections as depicted in *Figure 5* below.

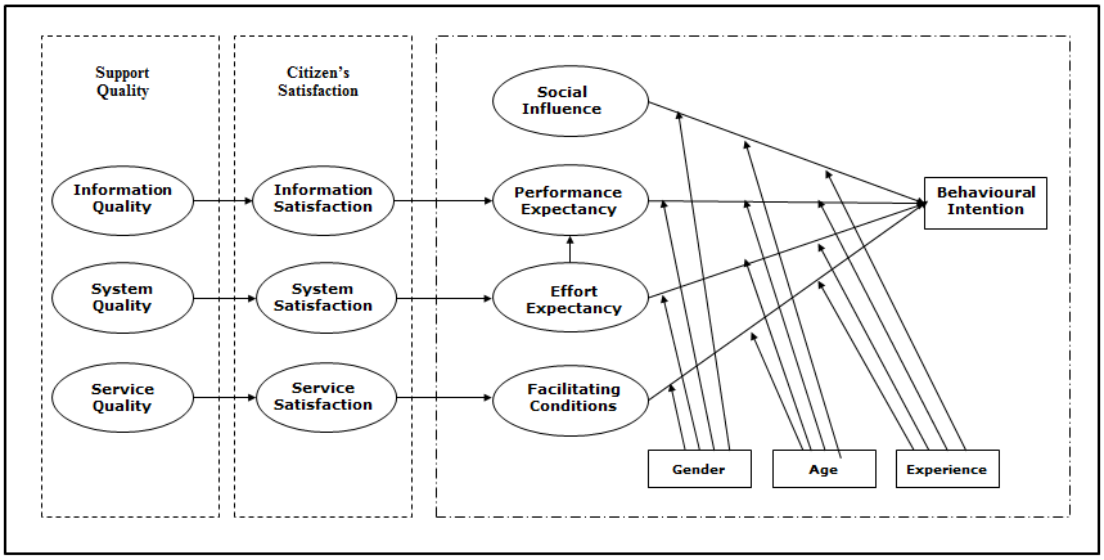

Figure 6: Integrated Model of UTAUT and IS Success Model

The integrated research model presented in Figure 6 merges the "quality dimensions" of the IS Success model (see Figure 5) with UTAUT model (see Figure 3) as antecedents for "intention to use". This was done in an attempt to reveal the role of "perceived service quality" towards "intention to use" in the context of EMPATIA system.

The acceptance of the EMPATIA system is defined through the behaviour intention to use the associated services. The proposed integrated research framework consists of eleven constructs: one dependent variable and ten independent variables. The dependent variable is behaviour intention to use EMPATIA services, while the independent variables are: (i) Information quality; (ii) Information satisfaction; (iii) System quality, (iv) System satisfaction; (v) Service quality; (vi) Service satisfaction; (vii) Social influence; (viii) Performance expectancy; (ix) Effort expectancy, *and;* (x) Facilitating conditions.

Moreover, the key factor impeding the Internet-based services adoption is the "perceived customer or end-user perception on information security and privacy" (Hogben and Naumann, 2009). Therefore, information privacy should be an assessment variable integrated in the model as an independent variable. For that purpose, we adopt the research of Dinev and Hart (2006) who identify the factors representing elements of a privacy calculus in the e-commerce domain. Therefore, under the user satisfaction variables, we add the parameter of willingness to provide personal information (as depicted in *Figure 6*).

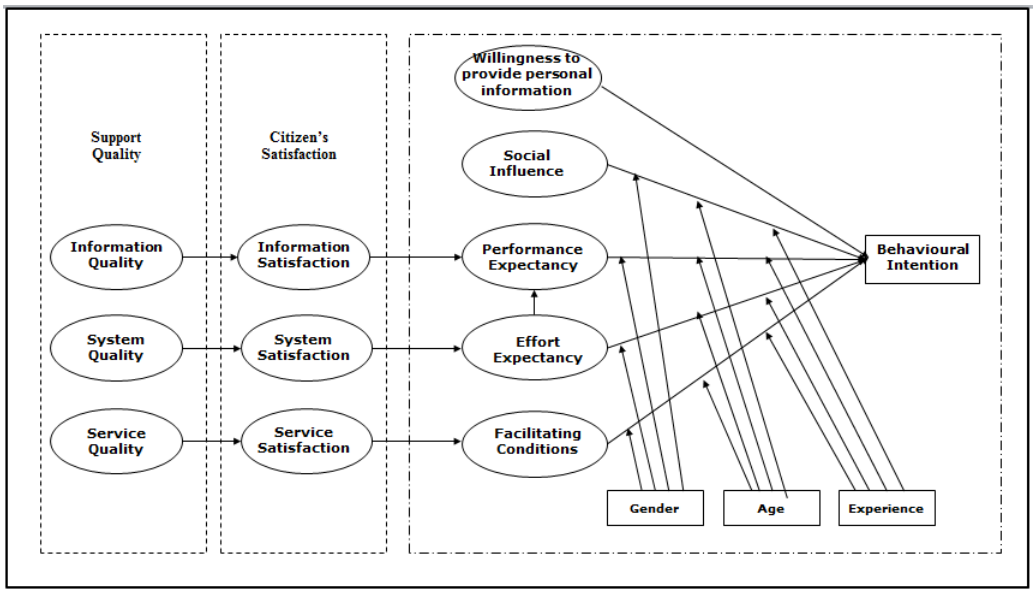

Figure 7: Integrated Model for EMPATIA Services on the Internet, incorporating Trust

The following table provides information about the "intended information privacy" construct, relevant in the wider EMPATIA context (the information has been adopted by Dinev and Hart, 2006). Four constructs are identified as relevant: (i) perceived internet privacy risk; (ii) Internet privacy concerns; (iii) Internet trust, and (iv) personal internet interest (as services provided by the EMPATIA Project are delivered over the Internet). *Table 6* provides a definition of each of these constructs.

Table 6: Information Privacy Construct relevant for EMPATIA (adopted by Dinev and Hart, 2006)

Construct	Root Constructs	Definition
Willingness to provide personal information to an e-service	Perceived Internet privacy risk	Beliefs about the potential negative consequences related to users selves-disclosure on certain information, especially their personal information, in the internet-based system. Most explicit negative consequence in this context refers to the misuse of personal information, which could happens when the system owner loss control over such personal information that were submitted through the EMPATIA system.
	Internet privacy concerns	Concerns related to the personal information, submitted over the Internet by the respondent in particular.
	Internet trust	Trust beliefs rejecting condense that personal information submitted to EMPATIA services will be handled competently, reliably and safely.
	Personal Internet interest	Personal interest or cognitive attraction to EMPATIA Internet content overriding privacy concerns.

2.2.4 Proposed Behavioural KPIs for EMPATIA

Previous sections have outlined the review and findings of analysis on technology adoption and associated behavioural evaluation literature, which demonstrate the existing models for evaluating IS acceptance / use, success and user experience. Based on such models, a list of behavioural key performance indicators summarising generic user adoption and satisfaction is outline to evaluate user adoption and service quality for EMPATIA platform (see

Table 7).

Table 7: Summary of Generic Behavioural (user adoption and service quality) KPIs for EMPATIA

KPIs category	KPIs	Evaluation method
Performance Expectancy	Perceived Usefulness	Survey after field trial
	Extrinsic Motivation	Survey after field trial
	Job-fit	Survey after field trial
	Relative Advantage	Survey after field trial
	Outcome Expectations	Survey after field trial
Effort Expectancy	Perceived Ease of Use	Survey after field trial
	Complexity	Survey after field trial
	Ease of Use	Survey after field trial
Social Influence	Subjective Norm	Survey after field trial
	Social Factors	Survey after field trial
	Image	Survey after field trial
Facilitating Conditions	Perceived Behavioural Control	Survey after field trial
	Facilitating Conditions	Survey after field trial
	Compatibility	Survey after field trial
KPIs category	**KPIs**	**Evaluation method**
System Quality	Reliability	Survey after field trial
	Flexibility	Survey after field trial
	Integration	Survey after field trial
	Accessibility	Survey after field trial
	Timeliness	Survey after field trial
Information Quality	Completeness	Survey after field trial
	Accuracy	Survey after field trial
Service Quality	Tangibles	Survey after field trial
	Reliability	Survey after field trial
	Responsiveness	Survey after field trial
	Assurance	Survey after field trial
	Empathy	Survey after field trial
Information Use	Usefulness	Survey after field trial
	Ease of Use	Survey after field trial
User Satisfaction	System Satisfaction	Survey after field trial
Willingness to provide personal information to the e-service	Perceived Internet privacy risk	Survey after field trial
	Internet privacy concerns	Survey after field trial
	Internet trust	Survey after field trial
	Personal Internet interest	Survey after field trial

The questionnaire to assess these indicators can be referred in Appendix 2 (Section 2).

2.3 Socio-economic KPIs

The existing literature lacks a consensus model for the socio-economic assessment of e-government services. Alshawi and Alalwany (2009) investigate the citizens' perspective in evaluating electronic government services, and present a set of evaluating factors that influence citizens' utilization of electronic government services, including technical, economic and social dimensions.

Technical issues refer to performance and accessibility of electronic government services. The economic and social dimensions also include cost saving, openness and trust, as further described in the following table.

Table 8: Socio-Economic Electronic-enabled Service Evaluation Factors Relevant for Empatia

Dimension	Construct	Root Construct	Description
Economical Issues	Cost Saving	Money saving	How much time the citizens are saving by using EMPATIA services.
		Time Saving	Time saved per service.
Social Issues	Openness	Openness	The value of information in terms of amount, quality and transparency that government organizations provide to the citizens.
	Trust	Trust in the Internet	Degree of the trustor making him/herself vulnerable, which implies that something of importance could potentially be lost as a result of engaging in the trusting relationship.
		Trust in government organisations	A state of perceived vulnerability or risk that is derived from individuals' uncertainty regarding the motives, intentions, and prospective actions of the government organisations that implement the EMPATIA system.

Considering the literature findings and the project context, the criteria that are listed in the following table are selected as indicators, which will be used to assess socio-economic dimensions of EMPATIA platform.

Table 9: Summary of Generic Socio-Economic KPIs for EMPATIA

KPIs category	KPIs	Evaluation method
Cost Saving	Money saving	Survey after field trial
	Time Saving	Survey after field trial
Openness	Openness	Survey after field trial
Trust	Trust in the Internet	Survey after field trial
	Trust in the organisation	Survey after field trial
Business/Operational Issues	Operational cost	Survey after field trial
	Capital expenditure	Survey after field trial
	Cost of migration	Survey after field trial
	Vendor lock-in	Survey after field trial
Legal and regulatory compliance	Forensics	Survey after field trial
	Data retention and track back	Survey after field trial
	Organisation's control over the data	Survey after field trial

The questionnaire to assess these indicators can be referred in Appendix 2 (Section 3).

2.4 Political KPIs: Inclusiveness and Political Alienation

To evaluate the political impact of the EMPATIA platform we focus on two related set of indicators. The first, "Inclusiveness," investigates the profile of the participants (Schlozman, Verba & Brady 2010). Our questionnaire builds upon recent research on the impact of the introduction of e-voting in participatory budgeting in Brazil (Spada, Mellon, Peixoto, & Sjoberg, 2016).

The second set of indicators, "Political Alienation," instead focuses on exploring the impact of the platform on categories of political alienation as relating to "incapability" and "discontentment" of participants (Olsen 1968). For this second set of KPIs we borrow questions from European surveys such as Eurobarometer, the European Social Science Survey and the British Electoral Study. Using standardized questionnaires allows us to compare the impact of the platform on participants' attitudes, with the respective baseline representative samples of the population in the same region, and allows us to continue an ongoing international investigation conducted by Participedia, one of our research partners. In particular, our questionnaire has direct comparability with the questionnaire used to evaluate the Citizens' Assembly Pilots implemented in 2015 in the UK (Flinders et al. 2016, Spada et al. 2016).

2.4.1 Inclusiveness: who participates?

The concept of inclusiveness in participatory innovations, such as the pilots implemented by the Empatia project, refers to the diversity of participants and the extent to which groups traditionally excluded from a process may be effectively included (Roberson 2006). In this respect, optimistic views support a mobilization hypothesis, which states that the introduction of online modes of participation will increase the participation of citizens previously marginalized in participatory processes (Norris 2001). While there is significant reason to believe that online channels of engagement will significantly boost inclusiveness, the empirical literature finds mixed results (Vassil and Weber 2011; Pammett and Goodman 2013).

In fact, at odds with the mobilization thesis, much of the digital divide literature suggests that unequal access to the Internet will disproportionately increase the representation of economically advantaged groups who are already politically active (Schlozman, Verba, and Brady 2010; Bélanger and Carter 2011; Brandtzæg, Heim, and Karahasanović 2011; Alvarez and Nagler 2000). Often referred to as the "reinforcement thesis," such studies posit that people with the resources and motivation to participate, who are usually the better-off, will be further empowered by the introduction of online modes of participation (Norris 2001; Davis 1998).

The study of Spada, Mellon, Peixoto, & Sjoberg conducted in one of the largest digital participatory budgeting processes in the world, the state-level process in Rio Grande do Sul in Brasil, engaging 300,000 participants every year, highlighted how the online channel attracted a new set of "internet-only voters," ostensibly increasing the diversity of the process. Nevertheless, such voters were on average younger, male, of higher income and educational attainment, than other voters that declared themselves to also be participating face to face. The limit of Spada's study is to explore just the demographic characteristics of the participants in the online channel.

The Empatia platform, due to its multichannel nature, allows the deployment of an identical questionnaire both in the online and face-to-face channel of engagement. Thus building upon the research design of Spada, we have created two complementary sets of KPIs that will be deployed in

both the online and face-to-face channel of participation in each pilot and will allow to evaluate the inclusiveness of each channel.

More formally, our analysis explores the following three research questions adapted from Spada:

- *Q_1:* Does the presence of "multiple channels of engagement" increase participations by attracting 'online-only' participants and 'face-to-face-only' participants?
- *Q_2:* If so, what is the socio-economic profile of each of these groups?
- *Q_3:* What channel is more elastic? (By "elasticity" we mean the capacity of a channel to attract participants that are also willing to participate in other channels.)

2.4.2 The rising tide of political discontentment: can participatory budgeting be the solution?

Contemporary politics is afflicted by a rising tide of political discontentment. Evidence across many advanced democracies points to development of an anti-politics orientation among citizens (Pharr and Putnam 2000; Torcal and Montero 2006; Stoker 2006; Hay 2007; Norris 2011; Flinders 2012; Allen and Birch 2015; Jennings and Stoker 2016; Clarke et al. 2016). Expressions of anti-politics are found in negative sentiments towards politicians, (formal) politics and political institutions. These attitudes range from negative assessments of the motivation, the quality and the behaviour of elected representatives to distrust or scepticism about the integrity and quality of the political process and government – in its ability to solve problems, its deference to vested interests, and its short-termism (see Jennings et al. 2016). Disengagement from politics is also diagnosed from trends of declining voter turnout and party memberships (Norris 2011), and in the hollowing out of democracy more generally via the rise of a professionalised political class disconnected from wider society (Mair 2013). The common theme across such accounts is the emergence of a gap between citizens, on the one hand, and politicians, political processes and political institutions on the other. Many citizens feel that politics does not represent them, that it favours the rich and powerful in society, and that there is little scope for ordinary people to influence decision-making.

How to respond to the degree of political alienation currently afflicting democratic politics is therefore a significant challenge for both students and practitioners. Many have claimed that participatory budgeting is particularly suited among the variety of democratic innovations and mini-public to restore trust in local institutions, reduce anti-politics sentiment and promote the internal and external efficacy of participants (Abers 2001, Baiocchi 2005, Avritzer 2009, Pinnington, Lerner, & Schugurensky, 2009, Wampler 2010, Talpin 2012, Wu & Wang 2012, Rocke 2014, Gilmann 2016). However, there are many variants of participatory budgeting and the current state of the art does not analyse the impact of different institutional designs and channels of engagement on trust, anti-politics and efficacy. In order to fill this important gap in the social science literature and to also optimize the legitimacy enhancing characteristics of different deployments of the Empatia platform, we have built a specific research design that investigates the impact of each pilot on a variety of widely used metrics of trust, efficacy and anti-politics.

2.4.3 Categories of Political Alienation: Efficacy and Discontent

Debate over the health of western democracies is not new. There has been periodic re-telling of tales of democratic crisis. Indeed, the current generation of research on anti-politics has strong echoes of earlier wave of studies on political alienation and distrust (e.g. Litt 1963; Olsen 1968; Finifter 1970; Miller 1974a; 1974b; Citrin 1974; Easton 1975), especially focused on 1960s America where

"…protest, violence, disillusionment, estrangement, disloyalty and rebellion became major themes in American politics" (Citrin et al. 1975, p. 2).

While this project is not concerned with the question of whether or not political alienation has deteriorated further in the intervening period, the puzzles it seeks to resolve entail some of the same challenges. Just as political alienation came "to function as a catch-all term signifying almost any form of 'unhappiness' about politics or dissatisfaction with some aspect of society" (Citrin et al. 1975, pp. 2-3), 'anti-politics' has come to serve as shorthand for a range of expressions of political disaffection, disengagement, cynicism and negativity. Yet in order to assess the impact of new forms of deliberation on political discontent, it is essential to start with the question: how can political alienation be conceptualized and measured? This matters in particular because democratic innovations typically seek to transform both the capacity and outlook of participants.

Olsen's (1968) classic distinction between categories of political alienation as relating to "incapability" and "discontentment" is useful because it highlights that democratic innovations might alter the terms of contemporary politics either through empowering citizens in terms of their feelings of being able to participate effectively within the political system, on the one hand, or by addressing expressions of negativity or cynicism towards that system on the other. The first category of political alienation, as relating to efficacy, can be disaggregated to distinguish between (i) citizens' self-assessments of their own political judgments (internal efficacy), versus (ii) citizens' perceptions of their own influence over political decisions taken by others (external efficacy). It is possible, for example, that some citizens might feel confident in their own capability to comprehend and engage in political debate, but still feel they have little scope for influencing political actors.

Democratic innovations such as participatory budgeting are specifically designed to enhance the political competence of citizens, while participation might leave individuals feeling empowered in terms of their political influence (depending on design of the democratic innovation). The second type of alienation, discontentment, refers to a broader negative affectation towards the object(s) of the political system, such as the processes and motivations of actors in the institutions. The examples for political discontent are a belief that a certain government policy is bias, and distrust in political authorities. Some deliberative scholars suggest this sort of democratic discontent might be remedied by political engagement, by restoring trust in the integrity of decision-making processes and authorities. Others have argued that the effectiveness of deliberative-style cures is likely to be limited to 'dissatisfied democrats' (more affluent, educated and engaged citizens), whereas 'stealth democrats' (citizens of lower socio-economic status who are less interested in politics) tend to favour direct democracy (Hibbing and Theiss-Morse 2002; Webb 2013). The ways in which democratic innovations are deemed to impact on political alienation thus may depend upon the particular construct that is being measured.

2.4.4 Democratic innovations and anti-politics

There is extensive evidence of the capacity of citizens to participate in democratic innovations. It is widely accepted that citizens are willing and able to come to reasoned and considered judgements on complex political and constitutional issues (Smith 2009). Where we lack evidence that is more systematic is the impact of such deliberative forums on the broader attitudes of participants towards extant political practices. As such, we draw on the EMPATIA case studies to help build the evidence base on whether different designs of democratic innovations counter anti-political sentiments, be they related to internal or external efficacy or to broader expressions of discontent. In particular, the multi-channel nature of the EMPATIA platform allows us to investigate if the face-to-face and online channel affect differently the participants' attitudes.

We expect that feelings of efficacy will likely be enhanced due to the opportunities of political learning and discussion that are offered by the participatory budgeting format. While James Fishkin

has offered evidence of the impact of deliberative polls on participants' internal efficacy, the evidence from other deliberative experiments (Grönlund et al. 2010; Morrell 2005; Nabatchi 2010) is less sanguine. Research on external efficacy again points in different directions, with Fishkin (2009) and Nabatchi (2010) offering positive results for deliberative polls and 21st Century Town Meetings respectively, but Grönlund et al. (2010) suggesting a negative relationship. The even smaller body of work on system-level trust and confidence tends to suggest a positive effect (Davis 1999; Grönlund et al. 2010). Our expectation is that political negativity and cynicism should be reduced through re-connecting citizens with politics, as well as through the exposure of participants to political actors during deliberations. Lastly, there is a growing consensus that online participation has weaker effect on individual attitudes than participating face to face. Thus, our expectation is that the effect of the online channels of engagement should be, *ceteris paribus*, weaker than the face-to-face ones (Min 2007; Baek, Wojcieszak & Delli Carpini, 2011). More formally, our analyses test the following hypotheses:

H_1: Participation in participatory budgeting increases internal efficacy

H_2: Participation in participatory budgeting increases external efficacy

H_3: Participation in participatory budgeting decreases political discontentment

H_4: Participation in face-to-face channels has stronger effects on citizens' attitudes than participating online

2.4.5 PRE/POST design & measures

During the EMPATIA pilots, we will conduct surveys of participants at two points in the process, before the voting during the ideation phase, and six months after the results of the process are announced. An identical survey will be deployed in online and face-to-face channels of engagement.

The key element of this design is that we will ask three questions twice to the participants, before and after the process, so that we can track the impact of face-to-face and online PB. The following table shows examples of deployment. Actual deployment will be adapted to each case. Column 2 describes the deployment in the online channel; column 3 describes the deployment in the face-to-face channel. Note that in this example, all the POST surveys will be deployed via email, but nothing prevents us to have a paper-based post survey in case the city organizes a face-to-face ceremony to close the participatory process.

Table 10: Examples of Deployment

Time period	Example of Online Channel Deployment	Example of Face to Face Channel
T1: During the participatory process, but before the vote occurs	Login survey [platform]	PRE survey, before or at the voting meeting (minimum target at least 50 participants) [paper]
	Login validation [platform]	
T2: During the voting process	Pre-vote survey [platform]	
T3: After the process is complete and a public meeting or a public report has been published (around 6 months after the vote)	POST survey [email]	

This enables us to assess how the perceptions and attitudes of citizens evolve during the deliberative process, and to benchmark the attitudes of our participants with the general population based on identical questions fielded in the European Social Science Survey.

This multi-wave approach has seldom been used to study participatory budgeting, where surveys have tended to track the characteristics of the participants during the ideation phase, or their opinion after the process had ended.

One of the main objectives of the research design is to explore the impact of online and face-to-face channels of engagement on metrics of efficacy and political discontent.

The advantage of using questions from the European Social Science Survey is twofold. Firstly, these survey questions have been pre-tested and are established measures of efficacy and discontentment. Secondly, the questions had been fielded in the same regions in previous years, which provide opportunities for comparing the baseline attitudes of participants with the random samples of the wider population (such as comparison of the level of attention to politics).

Below we summarise the survey questions that are used to test the effects of deliberation on efficacy and discontentment in this analysis. These can be distinguished, as above, as relating to internal and external efficacy and to political discontentment. The table also includes descriptions of additional information that will be included in the survey in order to explore the participants' profile.

Table 11: Political-KPIs for Assessing EMPATIA Platform

Dimension	Description	Objectives	Included in the PRE survey	Included in the POST survey
Inclusiveness I: who participates?	Gender, postal code, age, education, profession, Progressive/Conservative attitudes, Attention to Politics, past voting behaviour	Explore the profile of the participants	YES	NO
Inclusiveness II: Channel elasticity	Metrics that evaluates the willingness of the participants to change channel from online to face-to-face and vice versa	Explore substitution effects of the presence of multiple channels.	YES	NO
Political Alienation I: Efficacy	Internal & external efficacy	Explore the impact of participating in the process on efficacy indicators	YES	YES
Political Alienation II: Anti-politics	Systemic and local measures of trust and anti-politics	Explore the impact of participating in the process on trust and anti-politics indicators	YES	YES

The questionnaire to assess these indicators can be referred in Appendix 2 (Section 4).

2.5 Process KPIs

An initial set of process KPIs were obtained from consultation with the organisations and partners involved in the participatory budgeting projects. The KPIs are divided into user and process requirements.

User Requirements: the involved users and the respective level of User Experience relate them to the actual utilisation of the PB service. KPIs are built around:

- Usability/Ease of Use: EMPATIA service shall be easy to use by different classes of users;
- Satisfaction: captures the different levels of the user experience;
- Reliability: reflects user point of view regarding reliability aspects of the EMPATIA provision.

Process Requirements: they are related to the end-to-end process tailored to the various PB provision scenarios.

In the context of EMPATIA, the criteria proposed to evaluate both the user and process requirements for the EMPATIA platform are outlined in the following table. The questionnaire to assess the process indicators can be referred in Appendix 2 (Section 5).

Table 12: User and Process Perspective Evaluation Criteria for Empatia

	KPI Description		Evaluation method
User perspective	Usability/Ease of Use	Ease of use.	Survey after field trial.
		Navigation	Survey after field trial.
		Help features.	Survey after field trial.
		Background and Colour.	Survey after field trial.
		User involvement in parameterization.	Survey after field trial: Number of user actions required for application parameterization.
		Menu simplicity.	Survey after field trial: Number of actions through the menu before the user achieves the desired results.
	Satisfaction	Delighted with systems.	Survey after field trial.
		Pleased with the system.	Survey after field trial.
		Satisfied with the system.	Survey after field trial.
		Image Quality.	Survey after field trial.
	Reliability	Number of interruptions during a session.	Survey after field trial.
		Boot time for the application.	Survey after field trial.
		Response time.	Survey after field trial.
Process Perespective	Anonymity of sensitive data.		Examine during field trial.
	Encryption of Sensitive data and communication.		Examine during field trial.
	Data storage in a physically secured location.		Examine during field trial
	Data Security.		Examine during field trial
	System development cost.		Evaluation of resources committed to build and deploy the system; train doctors and patients versus the cost of running typical, on-the-spot examinations.
	Time for decission making process.		Time required to reach the decission with and without the application.
	Local government resources committed for the new system.		Examine during field trial.
	Learning time for new system use.		Interview.
	Time-to-staffs: Meeting the staff and starting the examination.		Time required to reach the staff with and without the application.
	Waiting time for decission.		Waiting time until decission was informed to the public.
	Number of staff / public involved in the pilot.		Count during field trial.
	Conformance to decision.		Through EMPATIA it is expected that members of public will monitor easier the conformance of a proposed and agreed projects towards implementation timeline / budget. Objective is also to improve monitored level of conformance (Providing online feedbacks and further suggestions).

3 Overall Methodological Consideration and Guidelines

The overall methodological approach that is being adopted and will be adopted for ongoing work in the EMPATIA project in relation to user requirements-gathering and evaluation of the platform will consist of a mixed-method strategy combining focus groups (Yin, 2009) and the use of comprehensive survey questionnaires (Saunders et *al.*, 2002). The mixed-method approach that is being adopted for the study allows the triangulation of findings from different angles or multiple perspectives (Kaplan and Duchon, 1988; Jick, 1979).

Triangulation emerges as result of the weaknesses of other approaches, which appear to be a complementary rather than against other types of research (Jick, 1979). No single approach alone will provide rich information about a single phenomenon (Kaplan and Duchon, 1988). Therefore, many researchers promote the mixed-method approach to make their research more effective (Kaplan and Duchon, 1988). According to Jick (1979), triangulation is about scaling, reliability and convergent validation, with some time to capture the holistic and contextual portrayal of the unit(s) under study. According to Johnson and Turner (2003, p.298), triangulation (or Intra-method) involves "mixing which must include either a combination of qualitative and quantitative approaches within a single method, or a method that is neither purely quantitative nor purely quantitative."

Within the mixed-method approach, the agenda for the focus groups and the survey instrument was developed by drawing from the state-of-the-art review and expert views from the consortium (see Appendix 1). Focus groups were useful in providing the necessary focus needed to probe the requirements for the EMPATIA platform from the municipality workers' perspective, particularly given that the use of EMPATIA services as a research domain is exploratory at present (Whitman and Woszczynski 2004, Yin 2003). Although it was not necessary to design a structured focus-group agenda to ask questions in a specific order (Yin 2003), the literature review and conceptual work, together with expert views from the consortium, provided the themes to be explored during the empirical work (i.e. the KPIs provided the key issues to be explored).

The main advantages of using questionnaires as part of the mixed-method research approach for user requirement-gathering from citizens' perspective is that it is easy to distribute to several locations at the same time and it is less costly to administer relative to other data-collection strategies such as interviews (Bryman and Bell, 2007; Yin, 2003). When developing and administering the survey, basic principles for conducting quantitative research as proposed by Saunders et *al.,* (2002) and Creswell (2008) will be followed. The questionnaires consist of four main sections to record and evaluate: a) demographic; b) application; c) acceptance, and; d) process-related information and a separate section to record additional qualitative comments.

This research has received ethics approval from Brunel University's Research Ethics Committee on November 2016. Therefore, it is governed by the committee's code of ethics, which outlines guidelines for the conduct of research. Additional materials relating to participation information and ethical issues that were prepared and distributed to the focus groups during the data-collection process are included in *Appendix 1.*

4 Requirements for EMPATIA Pilots

The EMPATIA pilots formalising and planning covers the three aspects of pilots' preparation, implementation and completion. The tasks of pilot requirements formalization and pilot planning were encapsulated in D3.1, led by D21 (January – September 2016) and Zebralog (September 2016 to present). They have strong connection with WP4, which is the guideline for evaluation of the pilots (i.e. D4.1).

Pilot formalization exercise involves four crucial steps, as listed below:

(i) Meeting with potential pilots

(ii) Documents Preparation

(iii) Approval of pilot descriptions

(iv) Contract signing

Step (i) is very critical, where WP3 partners are required to have extensive communication with the potential pilots (municipalities) to clarify the expected involvement aspects from both sides (i.e. partners and pilots), such as human resources (i.e. roles, capacity and commitments), technicalities (equipment, specifications and integration of existing works), and pilot protocols. More details about these steps can be found in D3.1 report. It also involves having common understanding and agreement on the start and exit criteria of the pilots.

The entry requirements must be satisfied before the fieldwork for the user pilots can begin. The exit requirements apply during the running of the pilots, and must be satisfied before the pilot can end. Each criteria item will be described in this section, on what is required and why. The requirements have to be defined in detail for each pilot before the field trials starts, where the general criteria must be specified for each pilot, although the detail requirements may differ depending on the pilots' situations and necessities.

As reported in D3.1, three pilots has been identified. The pilots are the city of Lisbon (Portugal), Ričany (Czech Republic), and Wuppertal (Germany). Wuppertal (Germany) was chosen to replace the city of Bonn, due to several operational issues (see D3.1 report for details). Nevertheless, pilot partners also indicate the need to test EMPATIA against different scenario and contexts to enable rigorous system development. Therefore, the pilots potentially being extended to two more cities, i.e. Milan and Condeixa.

The next stage after formalization is pilot planning. In this stage, all pilots are involved in developing a participation model, where requirements for the EMPATIA platform are collected and consolidated based on the EMPATIA's key objective – that is to build a platform that is highly flexible and that can be used for different participation models. In this document, the detailed set-up of the field trials for the user pilots is specified, giving an outline of the potential participants, the hardware and software, and the physical organisation of the work. The detailed process will be defined, including detail activities, their chronological orders, how the pilot study will be executed, and how the pilot study results are reflected in the plan. The standard procedure for this stage consists of two phases namely

planning / design, and platform evaluation and testing, which was elaborated in D3.1 report. This procedure, however, varies according to unique necessities and situation of the pilots.

The completion of the pilots will be the major event for pilot studies, where all of the logs during the execution of the user pilots will be transferred to the other work packages (WP2 and WP3). Result for each identified KPIs (see section 2 of this report) will be recorded, and any new emerging KPIs will be used to update the corresponding D4.2.

According to the report produced (i.e. D3.1), Wuppertal and Lisbon are in the midst of designing the process and gathering platform requirements, while Říčany is already running the pilot when this report is produced.

The following subsections outline the general requirements that have to be defined for each pilot before trial starts. Again, the detailed requirements may differ according to situations or necessities of each pilot.

4.1 Preparation for Pilots

The specific use case scenarios and the associated identified KPIs are needed to be known at least six (6) weeks before the start date of the specific pilot, in order to ensure effective planning and preparation for the user pilots; this also includes arranging of the appropriate locations, necessary human resources (and stakeholders) and technical equipment. In this case, however, the pilots have been

4.1.1 Planned User Pilot Period and Locality

The user pilot dates will need to be decided at least six weeks prior to commencing the pilots and will need to last “at least” one full day for each use case, to ensure full and proper operation and evaluation of the PB services. The proposed start- and end-dates (these will be subject to compliance with the entry and exit criteria, respectively) that will be used for the Field Trials have to be defined. For the dates, a favourite period and more than one fall back period should be defined. In particular, this is needed to select and determine the “best” dates for the Field Trials for each User Pilot, with specific conditions and to have fall-back solutions.

4.1.2 Field Trial contacts

The Field Trial contacts describe the structure of the human resources participating in the User Pilots, identify the people that will fulfil specific roles during the User Pilots and finalise their responsibilities / tasks before and during the User Pilots. The contacts for the User Pilots have to be defined in order to make a clear reporting and responsibility structure of the human resources and to enable an appropriate User Pilot execution.

4.1.3 Evaluation Method and KPIs

The evaluation method pilots are defined in this report, according to the identified KPIs (see section 2). In general, the evaluation results could help to improve EMPATIA’s performance and specifications, which would contribute towards the achievement of EMPATIA main objective (i.e. to build a platform that is highly flexible and that can be used for different participation models).

4.1.4 Additional Documentation Requirements

A User Pilot Field Trial overview document is required for a third-party use; it will contain the Field Trial’s purpose, scope, dates, locations, contact details, assessment process, roles and responsibilities of each stakeholder. This is useful as a reference document to help the participants involved, and for external stakeholders to monitor the Field Trial.

4.1.5 Progress Updates and Quality Log

This document will define how to discuss progress, to record any problems (and to fix major ones) and for gathering information during the User Pilots. This is needed as once the Field Trial for the User Pilots is underway, additional requirements come into play. Amongst these are discussing progress, recording any problems (and fixing major ones) and gathering information for assessment purposes. In

fact, the Field Trials for the User Pilots should not be brought to a successful conclusion until all of the required subjective and objective information has been gathered.

As EMPATIA entails different pilots in different cities, it is essential that the crossover of best practices and learning are shared between the pilots and synergy is well established. We propose to maintain a "How-to" guide with the purpose of provoking action so that the positive learning becomes embedded in the Project's way of working, and that the Project avoids any negative outcomes. The Project will adhere to a communication plan containing a description of the means and frequency of communication between the Project partners (i.e. internal parties) and any other stakeholders (i.e. external parties). A part on EMPATIA's web-portal will be dedicated to maintaining the daily quality log. The frequency of quality reviews will be established for each pilot, outputs of which together with the daily quality log will form the lessons learned (i.e.: "How-to" guide) for Empatia. This guide will be a living document owned by all Project partners. Any updates from the quality review or daily quality log will be notified to all Project partners and reflected in the website.

4.2 Entry Criteria

It is suggested that the pilot studies not to start until decisions have been made about critical aspects as pointed during the pilot formalisation meeting as well as planning. Although a number of decisions could probably being made in advance prior to pilots commencement, it is recommended that meetings between the partners and pilots should be held intensively two to three weeks prior to the planned start date, in order to discuss existing decisions and close off any potential gaps. These criteria worth consideration prior to the implementation of Wupertel, Lisbon and potentially Milan and Condeixa, as Říčany already started the study when this guideline is produced,

4.2.1 Human Resources: Roles and Capacity

All necessary human resources from the Project team will need to be allocated for the execution of the User Pilots for setting up, running and managing the applications/software as well as the provision of technical and operational support during the pilot implementation.

4.2.2 Technicalities

The necessary technical equipment for conducting the pilots needs to be identified and allocated. It is also important to identify which of the existing works at pilots would be affected by the EMPATIA, which potentially requires process integration. The integration has to be completed, tested and commissioned prior to the pilot study, in order to enable genuine assessment on all of the KPIs.

4.2.3 Development of Protocols

To secure the pilots' commitments, there are four protocols should be developed by the partners and agreed by the pilots. The protocols are:

(i) A protocol to distinguish services

(ii) A pilot descriptions

(iii) A declaration of cooperation

(iv) A guideline on ethics for pilots

4.3 Exit Criteria

Alongside the entry criteria, we expect a number of exit criteria to be satisfied for the Field Trials for each of the User Pilots to conclude. While some of these criteria will be Use Case-specific (i.e. depending on their necessities and situations), the main criteria are outlined here.

4.3.1 Exit based on measured facts amount / quality

A minimum amount and minimum quality of measure have to be defined by the partners and use case stakeholders. If the minimum level is met, then the Field Trial for the specific User Pilot may be exited. Similarly, the exit criteria will need to be agreed as to which measurements have to be executed in order to evaluate the system with the highest user satisfaction.

4.3.2 Exit based on system or resource conditions

The minimum human and technical resources should be defined that are needed to produce measurements to be used for the evaluation method. This should take into account defining a way of proceeding with bad conditions. Due to unforeseen extreme conditions, it could be necessary to exit the Field Trial for a specific User Pilot or to change/“move” some parts. The Field Trials need to be prepared for such situations.

5 CONCLUSIONS

This deliverable has presented both the evaluation metrics and requirement for field trials for the EMPATIA pilot projects at selected sites. Specifically, the report has in detail outline the technical, behavioural, socio-economic and process metrics for the evaluation of the EMPATIA platform.

The KPIs have been drawn from the existing literature and relevant constructs that are particularly important for diffusion and adoption of public e-services has been included along with socio-economic and information privacy factors that may influence EMPATIA platform. Moreover, KPIs have also been drawn on practical knowledge, such as public bodies' reports for this deliverable. In addition, input from expert work package leaders and partners was used to outline a list of functional, technical, application, process and user-centred KPIs that need to be considered for ensuring the successful implementation and functioning of the EMPATIA platform. These KPIs outlined in T4.1, will feed into WP1 and WP2 as requirements and form part of the evaluation and impact assessment plans for the Pilots being conducted in WP lead by the EMPATIA pilot partners.

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APPENDIX 1:

Ethics Approval and Protocol

1 PARTICIPANT INFORMATION SHEET

Study title: Enabling Multichannel Participation through ICT Adaptations

Invitation Paragraph:

You are being invited to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask me/us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

What is the purpose of the study?

This survey is being conducted in the context of EMPATIA, an EC H2020 funded project, and will be delivered by the partners of the EMPATIA Consortium. The purpose of this survey is to investigate:

- the impact of Democratic Innovations on **inclusion and diversity** with a particular focus on exploring if these innovations engage already active citizens or engage previously inactive citizens.
- the impact of Democratic Innovations on **trust**
  - Trust on local institutions
  - Systemic trust in democracy and anti-politics sentiment
- the impact of Democratic Innovations on **efficacy**
  - Internal efficacy (knowledge production and transfer)
  - External efficacy (the perception of the participants of being able to influence politics)
  - the usability of the digital tools for the design and management of Democratic Innovations

For more information about the project and the consortium, please visit https://empatia-project.eu .

Why have been invited to participate?

We are asking for your help given your active engagement in one of the Pilots of the EMPATIA project where you have the chance to experience the methodology and tools developed within the framework of EMPATIA.

Do I have to take part?

As participation is voluntary, it is up to you to decide whether to take part. If you do decide to take part, you will be given access to this information sheet and be asked to sign a consent form. If you decide to take part, you are still free to withdraw at any time and without giving a reason.

What will happen to me if I take part?

We will need you to complete a survey, which will not take more than 5-10 minutes at the most.

What do I have to do?

If you agree to take part, all you need to do is complete the survey through one of the two following methods:

- online, through the digital form provided on the platform https://*pilotname*.empatia-project.eu
- in person, filling the paper survey provided the personnel of the EMPATIA Consortium.

What are the possible benefits and risks of taking part?

There are no risks attached to this study. Benefits include some interesting information regarding research in your subject area via a report that will combine the results from all the institutions, which take part.

What if something goes wrong?

If you are harmed by taking part in this research project, there are no special compensation arrangements. If you are harmed due to someone's negligence, then you may have grounds for a legal action.

Will my taking part in this study be kept confidential?

All personally identifiable information collected about you during the course of the research will be kept strictly confidential by Data Processors, identified in the partners composing the EMPATIA Consortium. Hence, your personal data will not be transmitted to any other third party.

What will happen to the results of the research study?

We will combine the results from all the participants that take part in the study. In the first instance the information will be synthesised and a report will be compiled which will contain some interesting and useful information for you. Scientific articles based on the data collected could be published in specialized journals. The H2020 Program promotes an Open Access Strategy (http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/amga/h2020-amga_en.pdf#page=213). Accordingly, research data collected through EMPATIA will be made available as Open Data, only at the condition that your name and address will be anonymized so that you cannot be identified from it.

Who is organising and funding the research?

Organised by Brunel University London on behalf of the EMPATIA Consortium and Funded by European Commission H2020. The EMPATIA project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 687920.

Who has reviewed the study?

The College of Business, Arts and Social Sciences Research Ethics Committee have reviewed the study.

Brunel University is committed to compliance with the Universities UK Research Integrity Concordat. You are entitled to expect the highest level of integrity from our researchers during the course of their research.

Contact for further information and complaints

Contact Information:

Professor Giovanni Allegretti, Principal Investigator of the EMPATIA project

Center for Social Studies (CES), University of Coimbra, Portugal

Giovanni.allegretti@ces.uc.pt

Professor Vishanth Weerakkody, Professor of Digital Governance

Brunel University London – Vishanth.weerakkody@brunel.ac.uk

Chair of the College of Business, Arts and Social Sciences Research Ethics Committee, Brunel University- james.knowles@brunel.ac.uk

Thank you for taking part in this study!

2 CONSENT FORM

Title	"EMPATIA"
Project Sponsor	Horizon 2020 – grant agreement 687920
Principal Investigators	Professor Giovanni Allegretti, Professor Vishanth Weerakkody
Ethics reference	[Approval number]

The participant should complete the whole of this sheet

Please tick the appropriate box

	YES	NO
Have you read the Research Participant Information Sheet?	☐	☐
Have you had an opportunity to ask questions and discuss this study?	☐	☐
Have you received satisfactory answers to all your questions?		☐

Who have you spoken to?

Do you understand that you will not be referred to by name in any report concerning the study?

Do you understand that you are free to withdraw from the study:

- **at any time?**
- **without having to give a reason for withdrawing?**

Do you agree to take part in this study?

Signature of Research Participant:
Date:
Name in capitals:
Witness statement
I am satisfied that the above-named has given informed consent.
Witnessed by:
Date:
Name in capitals:

Researcher name:	**Signature:**
Supervisor name:	**Signature:**

3 ETHICS APPROVAL LETTER

Brunel University London

College of Business, Arts and Social Sciences Research Ethics Committee
Brunel University London
Kingston Lane
Uxbridge
UB8 3PH
United Kingdom

www.brunel.ac.uk

11 November 2016

LETTER OF APPROVAL

Applicant: Dr Sankar Sivarajah

Project Title: Participant Survey for Pilot Sites - EMPATIA

Reference: 4399-LR-Nov/2016- 4397-1

Dear Dr Sankar Sivarajah

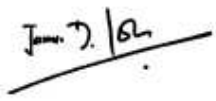
The Research Ethics Committee has considered the above application recently submitted by you.

The Chair, acting under delegated authority has agreed that there is no objection on ethical grounds to the proposed study. Approval is given on the understanding that the conditions of approval set out below are followed:

- The agreed protocol must be followed. Any changes to the protocol will require prior approval from the Committee by way of an application for an amendment.

Please note that:

- Research Participant Information Sheets and (where relevant) flyers, posters, and consent forms should include a clear statement that research ethics approval has been obtained from the relevant Research Ethics Committee.
- The Research Participant Information Sheets should include a clear statement that queries should be directed, in the first instance, to the Supervisor (where relevant), or the researcher. Complaints, on the other hand, should be directed, in the first instance, to the Chair of the relevant Research Ethics Committee.
- Approval to proceed with the study is granted subject to receipt by the Committee of satisfactory responses to any conditions that may appear above, in addition to any subsequent changes to the protocol.
- The Research Ethics Committee reserves the right to sample and review documentation, including raw data, relevant to the study.
- [delete for staff applications] You may not undertake any research activity if you are not a registered student of Brunel University or if you cease to become registered, including abeyance or temporary withdrawal. As a deregistered student you would not be insured to undertake research activity. Research activity includes the recruitment of participants, undertaking consent procedures and collection of data. Breach of this requirement constitutes research misconduct and is a disciplinary offence.



Professor James Knowles

Chair

College of Business, Arts and Social Sciences Research Ethics Committee
Brunel University London

4. FOCUS GROUP PROTOCOL

Materials for the focus group:

i. Participant Information Sheet
ii. Demographic Information Sheet
iii. Consent Form

Introduction and Consent Process:

A) Script for the Facilitator

Good morning/afternoon ladies and gentlemen and thank you for being here today. My name is [*full name of the facilitator*] and this/there is/are [*full names of any other participants]* from [*Name of your organisation]*. We are part of a project consortium funded by the European Commission to develop an ICT based platform to facilitate the PB process. *Please elaborate a bit about the project….*

Through this focus group interview we hope to learn about your views about PB encapsulating both your experience of engaging in PB using different processes / systems and your thoughts about what features you would like to see in any potential ICT based platform for PB, such as the proposed EMPATIA platform. With this information, we expect to be able to design a more accessible, more user-friendly and more efficient PB process to empower citizens to participate in PB and the wider democratic process of contributing to decision making in government. Before we get started, we want to draw your attention to the participation information sheet and the consent form. These documents provide you the important information about the research process, voluntary nature of this research and research confidentiality. We would like to highlight the following:

- It is important to capture the thoughts, opinions, and ideas expressed within the group in the natural setting. This is the reason why we would like to ask your permission to record the focus group interview. No names will be attached to the recordings and the tapes will be destroyed as soon as they are transcribed.
- The focus group is voluntary; you may refuse to answer any question or withdraw from the study at any time.
- The information exchanged within the focus group is strictly private and confidential. We kindly ask participants to respect each other's confidentiality.

Please take a minute to read the provided documents, complete the consent form and return it to one of the interviewers. Moreover, please fill in the demographic information form; all demographic information is collected only for the purpose of research.

B) Explanation of the process

Previous participation: We would like to ask if any of the participants has previously participated to a focus group. If so, please share your experience.

Background on focus groups: Focus groups are a form of qualitative research in which a group of people are asked about their perceptions, opinions, beliefs, etc. towards a product, service, concept, advertisement, idea, and others. Focus groups have mainly been used in the health, social and marketing fields. The foundation of the focus group research is that the group discussions produce data and insights that would not be otherwise produced; they are generated by the interaction within the group members, such as listening to others' experiences, which stimulates memories, ideas, concerns etc.

Ground Rules: We would like to establish some commonly agreed ground rules for the focus group. Would the participants like to suggest any?

[The facilitator should make sure that after any brainstorming the following should be established:

- Everyone should participate and express ideas
- It is commonly agreed that information exchanged will be kept confidential
- There will be no side conversations
- Cell phones should be closed

In case the group is reluctant to propose ground rules, the facilitator should help the process. Any other suggested and agreed ground rules should be recorded and followed throughout the process.]

Focus Group Process

A. Initiation Process

Turning on recorder: The facilitator should remind to the participants that the focus group will be recorded and turn on the recorder.

Questions: The facilitator should ask the participants if they have any questions. If so, these questions should be addressed.

Introductions: The facilitator should ask everyone to introduce him or herself in a go around the table sequence. The participants would present information that they find relevant, such as name, job, residence, how often they have used video-to-video services, etc.

Scope of the focus group: Focus groups interviews are conducted in an unstructured and natural way and respondents are free to express naturally their views for the relevant issues. The facilitator should each time set the scope of the focus group and that people take their time to think before answering to the questions. When repetitive information is exchanged, then the discussion should be the discussion should be moved forward.

B. Questions for the Facilitator

The facilitator should repeat the purpose of the research and try to convince the participants to reply thoughtfully.

(Questions Attached Separately)

C. Closure Process

The facilitator should thank the participants for their time and for sharing their opinions. The participants should be ensured that the information provided is going to be useful for the project and for designing more accessible, more user-friendly and more efficient video-to-video services within the project, with respect to their concerns. Contact information should be reminded in case the participants have more questions.

4.1 Demographic Information

Instructions: Please provide a response for each of the following questions.

Gender: Please choose of the following options.			
Male		Female	
Age: Please tick the appropriate box from the following categories.			
18-25			
26-35			
36-45			
46-55			
56-65			
Other:			
Education Level: Please tick the highest level you have completed.			
Primary school			
Secondary School			
High School			
Undergraduate University			
Postgraduate University			
[Usage of/Working on] [municipal/health/education/other] services: How long have you been [using/working on] [municipal/health/education/other – please specify] services?			
Less than one year			
Less than two years			
Less than five years			
Less than ten years			
More than ten years			

4.1 Focus Group Questions

1. Tell us how you participated in the PB program.
2. What is motivating you to participate in this program? (Under what conditions do you like to participate?)
3. How will you encourage a friend to participate in this program?
4. What did you like best about the existing way of PB program? (What has been most helpful to you?) Should it be continued or upgraded in the new system?
5. What did you like the least about the existing way of PB program? (What has been frustrating about the services?) Should it be removed from the new system?
6. Do you have any information on the municipal budget for your council/area? If yes, what do you know about the available budget?
7. Is it easy for you to access facts and figures (from authorities) about different issues within your area/council?
8. In general, can you identify any pressing issues, problems or concerns within your area/council where you would like to see the money from PB being invested?
9. Do you think the public money in your council is being fairly managed and invested in the interest of the citizens? If not, please explain how/why?
10. What do you like best about using an ICT based platform for PB, such as the proposed EMPATIA Platform (ICT-enabled PB)?
11. Do you have any advice for us as we introduce the ICT-enabled PB?
12. What would make an ICT based platform for PB work better compared with current PB processes and/or systems that you have used?
13. Of all the things we discussed, what to you think is the most important?
14. Have we missed anything? Is there anything we should have discussed that we did not?

15. Factors Relevant from EMPATIA platform Success:

Please Rank from 1-5 (with one being least important to 5 being most important) which of the following factors matter most to you as a user			1	2	3	4	5
System Quality	Reliability	The dependability of system operation.					
	Flexibility	The way the system adapts to changing demands of the user.					
	Integration	The way the system allows data to be integrated from various sources.					
	Accessibility	The ease with which information can be accessed or extracted from the system.					
	Timeliness	The degree to which the system offers timely responses to requests for information or action.					
Information Quality	Completeness	The degree to which the system provides all necessary information.					
	Accuracy	The user's perception that the information is correct.					
Service Quality (SERVQUAL Scale)	Reliability	Ability to perform the promised service dependably and accurately.					
	Responsiveness	Willingness to help users and provide prompt ability to inspire trust and confidence.					
	Empathy	Caring, individualized attention that is provided to users					
Information Use	Usefulness	The degree to which a person believes that a particular information system would enhance his or her task performance.					
	Ease of Use	The simplicity of the system (or amount of effort needed to use the proposed system)					
User Satisfaction	System Satisfaction	A degree of favourableness with respect to the system and the mechanics of interaction.					
Willingness to provide personal information to an e-service	Perceived Internet privacy risk	Perceived risk related to the disclosure of personal information submitted by users					
	Internet privacy concerns	Concerns related to the personal information, submitted over the Internet					
	Internet trust	Trust beliefs that personal information submitted through an ICT based PB system will be handled competently, reliably and safely through the internet					
	Personal Internet interest	Personal interest or cognitive attraction towards an ICT based platform to engage in PB					

APPENDIX 2:

Questionnaires

1. EMPATIA Technical KPIs

Sub characteristics	KPIs	Calculation Type	Mandatory / Optional
Time behaviour	Average Latency	(Total Response Time)/(No. of Requests)	M
	Throughput	(Total No. of Kilobytes)/(Total Time of Operation)	O
Resource utilization	Mean % CPU Utilisation	(Σ (% CPU utilisation probes))/(No. of probes)	O
	Mean Memory Usage	(Σ (RAM Megabytes used in each probe))/(No. of probes)	O
	Max. Memory Used	No. of max Megabytes of RAM Memory recorded	O
	Max. Processing Power Used	max % CPU utilisation recorded	O
Interoperability	Ability to expose services with APIs	YES/NO	M
	Ability to consume services through APIs	YES/NO	M
	% Utilisation of Open Standards for Data Exchange	(Open Standards Used)/(Total No. of Data Schemas Used)	M
Accessibility	WCAG 2.0 Conformance Level	None/A/AA/AAA	M
Maturity	Max. Concurrent Users Supported	No. of Max. Concurrent Users Recorded	M
	Load Size	(Concurrent Users at any Instance)/(Total Operation Time)	O
	Simultaneous Requests	No. of Simultaneous Requests	M
	Requests per Second	(No. of Requests)/(Total Time of Operation)	M
Availability	% Monthly Availability	1- ((Downtown Time Minutes)/(Month Days*24*60))	M
	Error Rate	(No. of Problematic Requests)/(Total Number of Requests)	M
Fault tolerance	Number of Software problems identified without affecting the platform	No. of Non Critical Software Errors	M
	Number of Hardware problems identified without affecting the platform	No. of Non Critical Software Errors	M
Recoverability	Mean time to recover from software problems	(Total Recovering Time due to Software Issues)/(Total Software Issues resulting to recovery)	M
	Mean time to recover from hardware problems	(Total Recovering Time due to Hardware Issues)/(Total Hardware Issues resulting to recovery)	M
Confidentiality	Incidents of ownership changes and accessing prohibited information	No. of incidents recorded	M
Integrity	Incidents of authentication mechanism breaches	No. of incidents recorded	M
Non-repudiation	Log reports for activities	(No. of Logs Report Categories)/(No. of all system operations)	M
Accountability	Usernames included in each log entry	YES/NO	M
Modularity	% Modularity (excluding backbone infrastructure)	(No. of components that can operate individually)/(Total number of components)	M
Reusability	% of Reusable Assets	(No. of assets that be reused as is)/(Total number of assets)	M
Modifiability	% of Update Effectiveness	(No. of updates preformed without noticing operational problems)/(No. of updates performed)	M
Adaptability	Mean No. of Errors per Hardware Change	(No. of Total Errors recorded)/(No. of Total Hardware Changes)	M
	Mean No. of Errors per Software Change	(No. of Errors recorded)/(No. of Software Changes)	M

Sub characteristics	KPIs	Calculation Type	Mandatory / Optional
Installability	Mean Installation Duration	(Total minutes recorded for installation)/(Total No. of Installations)	M
	% of Installation Errors	(No. of Installation containing Errors)/ (Total No. of Installations)	M
	Mean No. of Errors per Installation	(No. of Total Errors recorded during Installations)/(Total No. of Installations)	M

2. EMPATIA Behavioural KPIs and Questionnaire

KPIs category	KPIs	Evaluation method
2.1 Performance Expectancy	Perceived Usefulness	Survey after field trial
	Extrinsic Motivation	Survey after field trial
	Job-fit	Survey after field trial
	Relative Advantage	Survey after field trial
	Outcome Expectations	Survey after field trial
2.3 Social Influence	Subjective Norm	Survey after field trial
	Social Factors	Survey after field trial
	Image	Survey after field trial
2.4 Facilitating Conditions	Perceived Behavioural Control	Survey after field trial
	Facilitating Conditions	Survey after field trial
	Compatibility	Survey after field trial
2.5 System Quality	Reliability	Survey after field trial
	Flexibility	Survey after field trial
	Integration	Survey after field trial
	Accessibility	Survey after field trial
	Timeliness	Survey after field trial
2.6 Information Quality	Completeness	Survey after field trial
	Accuracy	Survey after field trial
2.7 Service Quality	Tangibles	Survey after field trial
	Reliability	Survey after field trial
	Responsiveness	Survey after field trial
	Assurance	Survey after field trial
	Empathy	Survey after field trial
2.8 Information Use	Usefulness	Survey after field trial
	Ease of Use	Survey after field trial
2.9 User Satisfaction	System Satisfaction	Survey after field trial
2.10 Willingness to provide personal information to the e-service	Perceived Internet privacy risk	Survey after field trial
	Internet privacy concerns	Survey after field trial
	Internet trust	Survey after field trial
	Personal Internet interest	Survey after field trial

Answers for the given questions are to be rated in the scale of 1 to 5 as follow:

1 = Strongly Disagree;

2 = Disagree;
3 = Neutral / No Opinion;
4 = Agree;
5 = Strongly Agree

2.1 Performance Expectancy

1. I would find the EMPATIA platform useful in my job.
2. Using the EMPATIA platform enables me to accomplish tasks more quickly.
3. Using the EMPATIA platform increases my productivity.
4. If I use the EMPATIA platform, I will increase my chances of getting a pay rise or promotion.

2.3 Social Influence

1. People who influence my behaviour think I should use the EMPATIA platform.
2. People who are important to me think that I should use the EMPATIA platform.
3. The local authority official has been helpful in the use of the EMPATIA platform.
4. In general, my community has supported the use of the EMPATIA platform.

2.4 Facilitating Conditions

1. I have the resources necessary to use the EMPATIA platform.
2. I have the knowledge necessary to use the EMPATIA platform.
3. The EMPATIA platform is not compatible with the other platforms I use.
4. A specific person (or group) is available for assistance with difficulties when using EMPATIA.

2.5 System Quality

1. The EMPATIA platform is easy to use
2. The EMPATIA platform is user friendly
3. Compared with other software, the EMPATIA platform is easy to learn.
4. I find it easy to get the EMPATIA platform to do what I want to do.
5. It is easy for me to become skilled at using the EMPATIA platform.
6. I believed that the EMPATIA platform is cumbersome to use.
7. Using the EMPATIA platform requires a lot of mental effort.
8. Using the EMPATIA platform is often frustrating
9. It is difficult to navigate within the EMPATIA platform
10. It is easy to go back and forth between the EMPATIA platform
11. The EMPATIA platform is not always available
12. The EMPATIA platform loads all the text and graphics quickly
13. It only takes a few clicks to locate information on the EMPATIA platform

2.6 Information Quality

1. The information on the EMPATIA platform is free from errors; has no errors and covers all information needed

2. The information on the EMPATIA platform is outdated
3. The information presented in the EMPATIA platform is relative to my needs
4. The EMPATIA platform provides me with all the information I need.

2.7 Service Quality

1. The customer service support of EMPATIA platform is difficult to access.
2. The customer service support of EMPATIA platform has deliver their tasks accurately according to my need
3. The customer service support of "EMPATIA" platform takes time to respond to my enquiries
4. The customer service support of "EMPATIA" platform acts in my best interests
5. The customer service support makes me feel like I have a good relationship with your organisation

2.9 User Satisfaction

1. I am disappointed with the information gained from "EMPATIA" platform
2. I like the overall functions of EMPATIA platform
3. I feel that my concerns related to EMPATIA platform are unresolved.
4. I feel that the service provided by EMPATIA platform benefits me
5. I am satisfied with the complete services offered by EMPATIA platform, in terms of customer service, features and benefits.

2.10 Willingness to provide personal information to the e-service

1. Privacy of my personal data is a concern for me when using EMPATIA platform.
2. Security of my personal data is a concern for me when using EMPATIA platform.
3. I decided not to use the EMPATIA platform again for future transaction / reference
4. I will be likely to recommend others to use this service from EMPATIA platform
5. I will be likely to use your online platform in future, based on my experience with EMPATIA platform
6. I prefer EMPATIA platform better than other similar online platforms

3. EMPATIA Socio-Economic KPIs and Questionnaire

KPIs category	KPIs	Evaluation method
3.1 Cost Saving	Money saving	Survey after field trial
	Time Saving	Survey after field trial
3.2 Openness	Openness	Survey after field trial
3.3 Trust	Trust in the Internet	Survey after field trial
	Trust in the organisation	Survey after field trial
3.4 Business / Operational Issues	Operational cost	Survey after field trial
	Capital expenditure	Survey after field trial
	Cost of migration	Survey after field trial
	Vendor lock-in	Survey after field trial
3.5 Legal and regulatory compliance	Forensics	Survey after field trial
	Data retention and track back	Survey after field trial
	Organisation's control over the data	Survey after field trial

3.1 Cost Saving

1. Time taken to deploy EMPATIA platform is longer than time taken to deploy other platforms or PB processes Cost spent to deploy EMPATIA platform is less than cost spent to deploy other platforms or PB processes
2. Annual Operational cost spent to maintain EMPATIA platform is high

3.2 Trust

1. I became more confident that related public agencies are trustworthy after using EMPATIA platform.
2. I became more confident that the local authorities care about providing services more efficiently after using EMPATIA platform
3. Experience with EMPATIA platform lowered my confidence that my personal data is handled with high security level.

3.3 Legal and regulatory compliance (Questions for Local Authority)

1. EMPATIA made auditing of service usage more difficult than before
2. EMPATIA prevents duplication of data.
3. EMPATIA prevents accidental deletion of data

4. EMPATIA Political KPIs and Questionnaire

As indicated in Section 2.4.3, there will be two stages of surveys for political KPIs: pre-voting or during the meeting – where online and face-to-face surveys will be conducted; and post-voting – where survey will be sent through email.

4.1 INCLUSION I: Who participates?

1) Email [with reminder to provide an email that they frequently check because we will send important messages and updates via email]

2) Age (this question will be asked in the format that maximizes comparability with existing datasets on the same region)

3) Gender (this question will be asked in the format that maximizes comparability with existing datasets on the same region)

4) Area code (this question will be asked in the format that maximizes comparability with existing datasets on the same region)

5) Education (this question will be asked in the format that maximizes comparability with existing datasets on the same region)

6) Profession (this question will be asked in the format that maximizes comparability with existing datasets on the same region)

7. Talking with people about the last local election, we have found that a lot of people didn't manage to vote. How about you, did you manage to vote in the local elections? PLEASE CROSS (X) ONE BOX	
I did not vote	
I thought about voting this time, but didn't	
I usually vote, but didn't this time	
I voted once, but didn't this time	
I am sure I voted	

8. How much attention do you generally pay to politics? **Please use the 0 to 10 scale, where 0 means no attention and 10 means a great deal of attention.**											
PLEASE CROSS (X) ONE BOX A great deal of attention									No attention		Don't know
	0	1	2	3	4	5	6	7	8	9	10	

9. In politics, people sometimes talk of left and right. Where would you place yourself on the following scale?												
PLEASE CROSS (X) ONE BOX	Left										Right	Don't know
	0	1	2	3	4	5	6	7	8	9	10	

4.2 INCLUSION II: Channel elasticity

4.2.1 Online version

10. **Why did you decide to vote online instead of voting in the face to face meeting? [online version]** **PLEASE CROSS (X) ALL THAT APPLY**		
	YES	NO
I have no time to participate face to face (convenience)		
I am too far away from the face-to-face meetings (convenience II)		
I did not know I could participate also face to face (knowledge)		
My friend and community is using it (social influence peer)		
It was recommended from a public official (social influence top-down)		
I do not feel confortable participating face to face (behavioral)		
I value the anonymity of the online participation mechanism (behavioral)		
Other, please explain:		

11. Would you have participated in PB if the process required to participate in person? [online version] PLEASE CROSS (**X**) ONE BOX **THAT APPLY**	
Yes	
No	

4.2.2 Paper survey version deployed in face to face meetings

10. Have you used the online platform for participatory budgeting? PLEASE CROSS (**X**) ONE BOX **THAT APPLY**	
Yes	
No	

If you answered YES to Q.10, please answer Q10(a); else, please proceed to Q10 (b)

10a. **How did you use the online platform for participatory budgeting?** **PLEASE CHECK ALL THAT APPLY**		
	YES	NO
To obtain information about the process		
To submit an idea on the online platform		
To do something else, please explain:		

10b. **Can you tell us why you did not use the online platform for participatory budgeting?** **PLEASE CHECK ALL THAT APPLY**		
	YES	NO
I have no time to participate online (convenience)		
I do not have access to the internet (convenience II)		
I tried, but it was too difficult (ergonomics)		
I did not know I could participate also face to face (knowledge)		
My friend and community participate in person (social influence peer)		
It was recommended from a public official (social influence top-down)		
I do not feel comfortable participating online (behavioral I)		
I value the experience of participating face to face (behavioral II)		
Other, please explain:		

11. Would you have participated in the participatory budgeting process if it was conducted ONLY online? PLEASE CROSS ONE BOX	
Yes	
No	

4.3 Political alienation

12. How much do you agree or disagree with each of the following statements? PLEASE CROSS ONE BOX IN EACH ROW [first 4 answers from British Electoral Study, 5 custom]						
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
People like me don't have any say in what the national government does.						
I have a good understanding of the important political issues facing our country.						
People like me don't have any say in what the city government does.						
I am well enough informed to make recommendations on how the city is governed.						
The solutions for the city problems are simple, but politicians refuse to implement them.						

13. **How much trust do you have in:** **[first answer taken from British Electoral Study, second and third are custom]**								
PLEASE CROSS (**X**) ONE BOX **THAT APPLY** A great deal of attention No attention								Don't know
PLEASE CROSS ONE BOX	1	2	3	4	5	6	7	
Members of Parliament in general?								
Your city politicians?								
Your city bureaucracy?								

14. On the whole, how satisfied or dissatisfied are you with the way that democracy works in the ***add name of the country*?** PLEASE CROSS (**X**) ONE BOX **THAT APPLY [taken from British Electoral Study]**	
Very dissatisfied	
A little dissatisfied	
Fairly satisfied	
Very satisfied	
Don't know	

5. EMPATIA Process KPIs and Questionnaire

KPIs category	KPI Description		Evaluation method
4.1 User Perspectives	Usability/Ease of Use	Ease of use.	Survey after field trial.
		Navigation	Survey after field trial.
		Help features.	Survey after field trial.
		Background and Colour.	Survey after field trial.
		User involvement in parameterization.	Survey after field trial: Number of user actions required for platform parameterization.
		Menu simplicity.	Survey after field trial: Number of actions through the menu before the user achieves the desired results.
	Satisfaction	Delighted with systems.	Survey after field trial.
		Pleased with the system.	Survey after field trial.
		Satisfied with the system.	Survey after field trial.
		Image Quality.	Survey after field trial.
	Reliability	Number of interruptions during a session.	Survey after field trial.
		Boot time for the platform.	Survey after field trial.
		Response time.	Survey after field trial.
4.2 Process Perespective	Anonymity of sensitive data.		Examine during field trial.
	Encryption of Sensitive data and communication.		Examine during field trial.
	Data storage in a physically secured location.		Examine during field trial
	Data Security.		Examine during field trial
	System development cost.		Evaluation of resources committed to build and deploy the system; train organisational staff and system champions versus the cost of running manual process (time and money).
	Time for decission making process.		Time required to reach the decission with and without the platform.
	Local government resources committed for the new system.		Examine during field trial.
	Learning time for new system use.		Interview.
	Time-to-staffs: Meeting the staff and starting the examination.		Time required to reach the staff with and without the platform.
	Waiting time for decission.		Waiting time until decission was informed to the public.
	Number of staff / public involved in the pilot.		Count during field trial.
	Conformance to decision.		Through EMPATIA it is expected that members of public will monitor easier the conformance of a proposed and agreed projects towards implementation timeline / budget. Objective is also to improve monitored level of conformance (Providing online feedbacks and further suggestions).

5.1 User Perspectives

Answer for question 1-3 should be rated according to the following scale:

1 = 1-5 times;
2 = 6-10 times;
3 = 11-15 times;
4 = 16-20 times;
5 = More than 20 times

1. How many times did you encounter an operation that did not work as described in the user manual?

2. How many times did you encounter any of the following situations?

   2.1 Incorrect or imprecise results.
   2.2 Inconsistency between actual operation procedures and the ones described in the user manual.
   2.3 Differences between the actual and reasonable expected results.

3. How many times (on average) did you encounter failures in any of the following situations:

   3.1 When starting the platform?
   3.2 When trying to connect and disconnect from the platform?
   3.3 When trying to adjust the settings?
   3.4 When trying to submit the proposal?
   3.5 When using the budget's information panel?

Answers for question 4-8 are to be rated in the scale of 1 to 5 as follow:

1 = Strongly Disagree;
2 = Disagree;
3 = Neutral / No Opinion;
4 = Agree;
5 = Strongly Agree

4. It is easy to understand how to start the platform.
5. It is easy to understand how to connect and disconnect from the platform.
6. It is easy to understand how to adjust the settings.
7. It is easy to understand how to submit the proposal.
8. It is easy to understand how to use the budget's information panel.

Answer for question 9 should be rated according to the following scale:

1 = Less than 1 minute;
2 = 1 – 5 minutes
3 = 5 – 10 minutes
4 = 11 – 15 minutes
5 = More than 15 minutes

9. How much time (on average) did it take to understand:

9.1How to start the platform
9.2How to connect and disconnect from the platform
9.3How to adjust the settings
9.4How to submit a proposal
9.5How to use the budget's information panel.

5.2 Process Perespective

Answers for the given questions are to be rated in the scale of 1 to 5 as follow:

1 = Strongly Disagree;
2 = Disagree;
3 = Neutral / No Opinion;
4 = Agree;
5 = Strongly Agree

1. The decision-making on budgeting has improved because of using the EMPATIA platform.
2. The administrative costs have been reduced as a result of using the EMPATIA platform
3. The local authority's public communication has improved because of using EMPATIA platform.
4. It was easier for the local authority to update on public spending and project progress.
5. Public had easier access to the budget information.
6. The public perception of budget allocation has improved.
7. The budget management has improved.
8. The number of audiences that have been involved in participatory budgeting has improved with the introduction of EMPATIA.
9. The conformance of budget proposals with the LA guidelines has improved because of using the EMPATIA platform.
10. It is easier to process the proposals that were submitted through EMPATIA than the manual procedure.
11. The time for budget allocation decisions decreased.
12. The number of queries regarding budget spending and progress on public projects decreased.