Applying Idea Management System (IMS) approach to design and implement a collaborative environment in public service related open innovation processes

Marco Alessi[1], Alessio Camilo[1][✉], Valentina Chetta[1], Enza Giangreco[1],Mona Soufivand[1][✉], Davide Storelli[1]

[1]*Engineering ingegneria informatica SPA, R&D Department, Lecce, Italy*
alessio.camillo@eng.it, valentina.chetta@eng.it, enza.giangreco@eng.it,
davide.storelli@eng.it, marco.alessi@eng.it, m.soufivand@gmail.com[✉]

Abstract. Novel Ideas are the key ingredients for innovation processes, and Idea Management System (IMS) plays a prominent role in managing captured ideas from external stakeholders and internal actors within an Open Innovation process. Considering a specific case study, Lecce-Italy, we have designed and implemented a collaborative environment which provides an ideal platform for government, citizens, etc. to share their ideas and co-create the value of innovative public services in Lecce. The application of IMS in this study with six main steps, including: idea generation, idea improvement, idea selection, refinement, idea implementation and monitoring shows that this, remarkably, helps service providers to exploit the intellectual capital and initiatives of the regional stakeholders and citizens, and assist service providers to stay in line with the needs of society.

1   Introduction

Value co-creation is one approach to create innovative services. Co-creation is the process by which products, services and experiences are developed jointly by companies, their stakeholders and final customers, opening up a whole new world of value [19]. It is a new way of thinking about providing public services in a reciprocal relationship between service providers, professionals, service users and citizens, which makes such services much more effective, efficient, and far more sustainable [4]. Progress in technologies such as Web 2.0 phenomenon [18], offers the ideal platform for service providers, users and other actors to communicate and interact with each other for exchanging ideas and opinions, which are necessary (but not sufficient) to foster the process of value co-creation. Great ideas are the key parameters of innovation process for organizations and communities. The ideas flowing without a proper managing mechanism to evaluate, categorize and prioritize them, would not assist innovation process. As stated by Geoff Mulgan [17], ''Innovation is often given complex definitions'' but he prefers the simple one: ''new ideas that work''. Reviewing related literature shows the importance of ideas in the innovation processes. As an example, the European Foundation for Quality

Management (EFQM)[1] defines innovation as "the practical translation of ideas into new or improved products, services, processes, systems or social interactions". Ven and Poole (1989) [24] argue that "invention is the creation of a new idea, but innovation is more encompassing and includes the process of developing and implementing a new idea. The development of innovation is not a linear process (a pipeline of sequential processes), but it needs a systemic approach". Therefore, Innovation starts with 'management of ideas' [3]. The formal process such as Idea Management System (IMS) to structure the aforementioned stages including: capture, filter, evaluation and implementation of the best ideas, seems essential. Lack of this system may cause superfluous innovation efforts [23]. The complex interactions between many individuals, organizations and their operating environment is an open innovation process [5,][6]. Chesbrough defines open innovation as: "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. Open innovation is a paradigm assuming that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology" [7] [6] [21]. The Open Government (OG) concept, which emphasizes on including citizens and society as well as administration members within governmental processes, is a translation of open innovation in governmental processes. OG seeks to engage citizens in order to increase efficiency within political/organizational decision process leading to society's satisfaction [10].

2   Problem Description

According to the Edelmann, governments are aware of the significance of citizens engagement in decision making processes by integrating their potential in innovation process and acquiring better outcome [10] which reflects a paradigm shift in public administration; however, as stated by Collm & Schedler, innovation process in public sector up to now has occurred in closed-off processes mainly handled by internal public administration and sometimes with the consultancies support [8].

Public administration has understood the need to encourage stakeholders and citizens to participate nevertheless, it still has not found its role in the virtual atmosphere [10]. The ubiquitous presence of ICT together with the recent willingness of citizens to participate and contribute online, can enable government agencies to restructure their interaction with citizens in order to achieve better collaboration results [13]. IMS has been successfully implemented in private sector with the purpose of identifying the real demands in order to generate services and products based on them [23]. However, the current discussion on open innovation has hardly touched upon the public sector. For example, Brunswicker has investigated the possibility to applicate crowdsourcing platform in the governmental context. These studies showed that design principles derived from open innovation projects in the corporate world may not be directly applied in the governmental context: they need to be adjusted and integrated [15]. In this study, we propose a conceptual framework describing the idea of life-cycle and the tools enabling collaboration between citizens

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[1] http://www.efqm.org/

and Public Administration, with particular focus on Idea Management System and its role in each step. In this paper, we present the Idea Management System[2] developed in the Puglia@service[3] project supporting the co-creation activities in the initiative for Lecce candidacy as European Capital of Culture 2019[4].

2.1 Case Study

The Municipality of Lecce (Italy) has decided to change the approach of creating a shared path towards a social model in which a direct participation and collaboration of the citizens is included in order to generate innovation.

Public administration and citizens are generally not coordinated with each other, since the traditional approach of urban planning is top-down and often does not match citizen needs. Citizen's involvement and their needs definition are important elements for Lecce. For these reasons the Municipality of Lecce organized LUAC`s (urban, open, creative laboratories) which are a kind of informal debate aiming to satisfy citizens' participation. "Lecce 2019 – Idea Management System" was adopted to integrate LUAC`s and other initiatives that enable interaction between citizens.

The implementation of the "Lecce 2019 - IMS" was performed using the tool Gi2MO IdeaStream[5]. It consists of a set of modules able to customize Drupal [9] in order to implement it as a system of Idea Management.

As for access to the platform, the correlation between the number of visits and the interest shown by citizens and local associations towards the initiative Lecce in 2019 is evident. The launch of the website, which took place in July 2013, was accompanied by a steady increase with a peak in September, close to the deadline for submission of the bid book[6]. From then on there was a decline in the month of November at the announcement of the results of the first phase of selection, which shows that the number of accesses and interactions is strongly influenced by the diffusion of the various initiatives and different maturities (See Table 1).

In this regard, Caritas Diocesana of Lecce proposed, within the IMS, the idea of creating a network of solidarity aimed at collecting and distributing food. This idea has been voted and commented by other voluntary associations (Red Cross of Lecce, Comunità Emmanuel, etc.) and by some local shops, all enthusiastic and ready to participate. The Municipality of Lecce by considering the idea interesting for the local community and evaluating, thanks to sentiment analysis indicators, the interest shown on the web for this topic, has intervened, proposing itself as guarantor and coordinator of this network. Meetings and focus groups were organised in order to create a "network of solidarity" involving several actors, such as: voluntary associations, Confcommercio, Confesercenti, Confindustria and the managers of the Puglia@service project. The latter have given their availability to implement a

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web/mobile application able to facilitate the matching of demand and supply of unsold food. The execution and monitoring phase is in progress.

Table 1.   Detailed data of the idea collection process.

Time Running			General	
Time since first idea posted	1 years	6 months	Number of idea	2248
Time since last idea posted	1 months		Number of idea contests	9
Time since last contest created	1 years 6 months		Total users	1226
Time since last comment posted	1 months		Total votes cast	328

3   Literature review

Literature on Idea Management (IM) are predominantly associated with innovation management in organizations [14]. As Baumgartner has reported, the practices on innovation management are not new and have been introduced in several organizations much before the IT systems explosion (e.g. 30-year history of innovation management in Toyota, had been always oriented on the road to the capture of novel ideas) [2]. However, what nowadays is known as the term 'idea management' in IT sector related, has been created in reference to systems that appeared in the late 90s [20]. In order to evaluate captured ideas precisely, Westerski et.al have tried to resolve the problem by introducing annotation of ideas through which the characteristics of ideas can be described highlighting their distinctive features. Reviewing IT related literature remarks the development of IM dealing with applications of IMS. Xie and Zhang, for instance, have designed an IMS to support the process of idea generation, evaluation, improvement and implementation [28]. The work of Westerski et al. [26] deals with the development of IMS and extends it from being nothing more than a box where employees could submit their ideas on a piece of paper to the web 2.0 techniques. Such transformation allows complex submission of data and data handling in IMS. They also suggests the use of semantic web principles to link organizational systems for better idea assessments [27]. IMS can also be considered as a sharing point among users and organizations [22], besides, in this manner it can be utilized as a managing and controlling tool for open innovation [11]. An example of Idea management System is OpenIDEO[7] that enables people to collaborate in developing innovative solutions to press social and environmental challenges. Idea Management System can be defined therefore as a process of needs recognition and ideas generation and evaluation [23] [16]. Those platforms aim to aid all aforementioned practices of idea management and allow organizations to collect community ideas during enterprise procedures [25]. The main contribution of this paper is to develop an approach based on idea life cycle which uses the concept of open innovation and to apply it in the context of Public Administration in order to co-create innovative public services. In this approach, all steps of life cycle are supported by the Idea Management System that interacts

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[7] https://openideo.com/about-us

through a number of technological and methodological tools to facilitate collaboration and co-creation.

4   Conceptual Framework

The proposed idea life-cycle is characterized of the following six steps (Figure 1). Each step is carried out in collaboration with citizen or between citizen and public administration. It is characterized by tools that allow the responsible of each step to perform the functions in a collaborative way. IMS, starting from designed process in BPM, gives users the opportunity to create a social network where they can share, vote and promote ideas. This environment is designed around local government and citizen needs and it provides an engagement approach more efficient and effective than the usual BPM interfaces.

Idea Generation. This is the phase of ideas input from users. It can take place via two techniques: Push (the ideas about particular topics are required from public administrator) and Pull (citizen can suggest ideas to Public Administration). The actors involved are Public Administration and citizen. The importance of this phase is the free expression of citizen able to generate ideas of public and common utility and to encourage service co-creation and the participation to "*res nostra*".

Idea Management System supports the idea collection, contest creation and allows the idea sharing on most important social networks in order to encourage discussion and the promotion of the IMS. Tags and categorization of ideas allow simplifying the idea organization and research.

Idea Improvement. This is the collaboration phase and collective development of ideas. Once generated, the ideas are shared and improved thanks to the continuous collaboration between the users, who may contribute to the enrichment of ideas with comments, pictures, links, etc. In this way, from one or more initial ideas a process of co-creation, socialization and exchange of experience and knowledge is triggered. Ideas are made available to the whole community that collaborates to transform them into a structured project. Therefore the community, properly supported, can improve ideas, exploiting know-how and multiple perspectives emerging from the system. To encourage the engagement of the citizen and to create participatory behavior, gamification tools were developed.

Idea Selection. This phase supports the evaluation, selection and ranking of Ideas. Idea Management System allows to vote for the ideas that leads to a ranking. This ranking points out ideas with greater priority or the ones considered by users to be better than others. The indicators used for the evaluation are, for example: the number of threads or the vitality index that expresses how the idea remains active over time. In addition, it is possible to make even an indirect analysis of ideas through sentiment analysis that allows identifying the issues particularly important for the citizen/user. The output of this phase is the selection of those ideas to be analyzed in detail by studying the sustainability. Charts show the most popular ideas and suggest the most active members of the community. In addition to Idea Management System, a tool of sentiment analysis and a dashboard that shows (to both the PA and citizens) intuitively the data collected has been implemented.
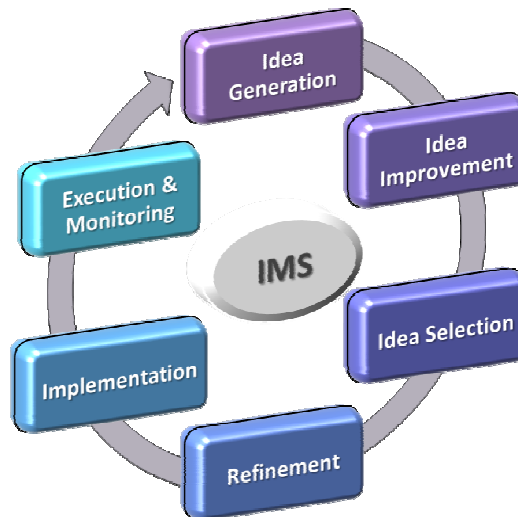
Fig. 1. Main steps of idea's life-cycle

Refinement. In this phase the selected ideas are refined thanks to the involvement of expert users (citizens or employees of PA) able to describe in detail all the steps and evolutionary processes that accompany the same idea. The expert group is formed through social office tools, by comparing the roles specified by the author of the idea and the co-authors, as necessary for the execution and implementation of the idea itself. The skills available in the profiles of each user are entered during Idea Management System registration. To assess the social and economic sustainability of the idea, is develop a methodology[12] based on Value Network Analysis [1] supported by simulation tools. The output of this phase is the transformation of the idea into a sustainable product/service in technological, economic and social terms. So, it is important to identify the role of the user, through the tools of the social office.

Implementation. The actors involved in this phase are both the PA and the citizens, experts and not. When the ideas require the development of an application and/or an information service, IMS provides a collaborative tool, allowing the user to report the needs useful to develop a service. This notification supplies with documentation and models created using the tool. The technologist will try to implement the new service by the integration of existing applications in marketplace. Where it is necessary to develop a new application that is not in the marketplace, the tool allows the user to report these needs to technologist. During each phase, in order to engage and encourage users to continue their collaboration, IMS allows both the collaborative resolution of problems, emerged during the implementation of the idea. Moreover, IMS transparently associates additional information to each phase as follows: Update on the status of implementation of the idea; Resources (technical, human ...) associated with implementation of the ideas; Information about any problems encountered in the implementation phase; Financial data; Timelines.

Execution and Monitoring. The final stage of the process of co-creation is to run the service and continuously monitor the results. The monitoring phase is very

important because it allows evaluating and monitoring the success or failure of the new service through the feedback received from users and the PA. Monitoring techniques are questionnaires, interviews, surveys, reviews and feedback, collected on Idea Management System. Also in this phase, sentiment analysis tools are used. The functionality of "Analysis, filtering and tracking of ideas" provides statistics and graphs that depict the performance of the Idea Management System over time. All contents of the system in the form of a summary table and the frequency of interactions within the community can be displayed. The feedback of the users and the data collected, allow to generate suggestions for improvement and new ideas that will reopen the cycle.

5   Results and Future Developments

The proposed approach is used in the context of Public Private Partnership for a charitable cause. This need was expressed by citizens through the IMS platform and has been taken into consideration by the Local Government. The idea was to create a ''food bank'' for collecting the excess food. Based on this idea, a specific platform, which enables both donators and poor citizens to interact, has been developed. Such system reduces the food waste and, at the same time, increases the support for needy citizens. A more user-friendly interface and a mobile version could be valuable additions. A new extension, called "Social sentiment index'' is currently under development. This new extension aims at integrating the potential of sentiment analysis to identify the greatest interest of the community. However, the usage of an Idea Management System to support strategic planning in an open environment, such as urban areas, introduces a problem: administrators need further tools to prioritize efficiently interventions in the urban context. For this reason, we are working to extend the capabilities of the Idea Management System by introducing an algorithm that could calculate the user participation. The Social sentiment index will be calculated from a set of input parameters, resulting not only from the Idea Management System, but also by means of the major social networks like Facebook, Twitter, Google+ and LinkedIn. On the other hand, sentiment analysis tools, using specific algorithms as well as semantic function, will have the purpose to simplify and to categorize contents. Founded on the concept of interoperability, the project proposes a number of solutions using metadata and providing new methods of evaluation: metrics based on opinion mining, taxonomy and categorization of innovation, as well as metrics based on reports of the idea.

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