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DEMOS: A Design Method for demOcratic information System — Source link

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DEMOS : a DEsign Method for demOcratic information System

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***Abstract*—The issue of democracy in society is at the heart of our current concerns. Organizations and their information systems are also concerned by this issue. Democracy in organization requires a debate about norms, values and language encapsulated in the information system. Participatory design approaches address this issue by proposing a democratic empowerment for users during design phase of projects. To go further, we propose a structured method to integrate democracy into information system. This method named DEMOS for DEsign Method for demOcratic information System is described and then illustrated by a real experiment provided by a "lifelong training" service at the University.**

Keywords—Democracy, Method engineering, Information system design, Requirement engineering, Viewpoint, End-users, Participatory design, Agility, User centered design

I. INTRODUCTION

An Information System (IS) is not neutral. In his book Brey speaks about "embedded values" in the IS [1]. Mingers says that IT systems embed particular values which have a "moral impact" [2]. In many cases, IT systems managers implement these standards without even realizing it. In 2010, Floridi proposed to elicit those embedded values and to take them into account during the IS development [4]. In 2008, Salles and Colletis described a "three-level grid" highlighting the link between representations, models and norms [4]. They explain how vocabulary, codifications used in the organization's IS are a direct consequence of higher-level models and representations. The need for democracy comes from these observations. On the one hand, those norms and values need to be debated, deliberated and recognized, in a democratic way. On the other hand, if we agree with Salles to say that « democracy is considered above all else to guarantee access to a plurality of worldviews" [5], a democratic IS is a system that respects viewpoints. For that, end-users representing different viewpoints have to be considered in the system design. To go further, viewpoints must be implemented in the IS, to conform to the first issue. The IS should not conform only to a dominant viewpoint.

In the continuity of Van Den Hoven [6], we propose a "proactive integration" of democracy with a Design Method for demOcratic information System, named DEMOS. Our method proposes to integrate democracy in two ways:

- A democratic design method, which lets users debate about IS values and norms, and to bring out viewpoints.
- A democratic IS, which respects viewpoints expressed in the design phase and implements them.

In this article, we first present a state of art of user involvement in design approaches. Then, we identify specific issues for a democratic IS and present how DEMOS can address them. We illustrate this part with a feedback from a real experimentation conducted with "lifelong training" service at the university.

II. STATE OF ART

The lack of user input during design has been identified as being a major factor in the failure of IS to be adopted by users. Users' participation is a way to increase functional qualities of the system and to be as close as possible to their needs. It is also a way of democratic empowerment for users, by a direct participation in decision making [7]. In the IT literature, we find several levels of users' involvement in projects: from considering the user as a "subject of study" in User Centered Design (UCD), to users playing a more collaborative role in co-operative design. With Participatory Design (PD), the user drives the design process himself. [8]. With UCD and co-operative approach, users have an informative or consultative role. As Ferrario says: software developers still "lead the process", whereas users participate by refining their ideas [9]. The quality of the developed system is increased, but the users are not empowered with this method. PD is the most involving approach and can provide a democratic empowerment if users participate in "defining project objectives and initial plans" [10]. According to Kensing and Blomberg, participatory design is an approach in which the participation of people in the co-design of the information system they are supposed to use themselves is a "central tenet" [11]. User is the "co-designer" of the system [12]. Some authors like Sanders defines PD as a "democratic approach" [9].

Agile methods are sometimes considered as participative approaches. In fact, agility and PD share some goals, like improve usability [13]. However, even if users can provide feedback, they don't participate in any design activities [7]. With agile method, the customer is the central partner of the collaboration with developers and design team [14]. In some methods like SCRUM, a Product Owner can play this role of partner, as a user representative [15]. Some authors show that a method as XP can integrate user participation [16]. RAD is definitely the most participatory agile method [18]. But even if users are involved in design, RAD is not always a participatory approach during development.

III. DEMOS : A DESIGN METHOD FOR DEMOCRATIC INFORMATION SYSTEM

DEMOS is a design method for democratic IS. We have identified 4 issues to develop a method which respects a democratic process and produces a democratic IS.

Firstly:involve end-users in a participatory and democratic process. Secondly: allow a democratic debate to let viewpoints emerge. Thirdly: design a democratic IS which takes into account these viewpoints. Fourthly: provide traceability of viewpoints for system maintenance. DEMOS is presented in the form of a MAP : a "navigational structure" [19] developed by Rolland. It allows presenting the method as a selection of intentions (circles) and appropriate strategies (arrows) to achieve it (Fig. 1). Each intention in the MAP is a response to previous issues.

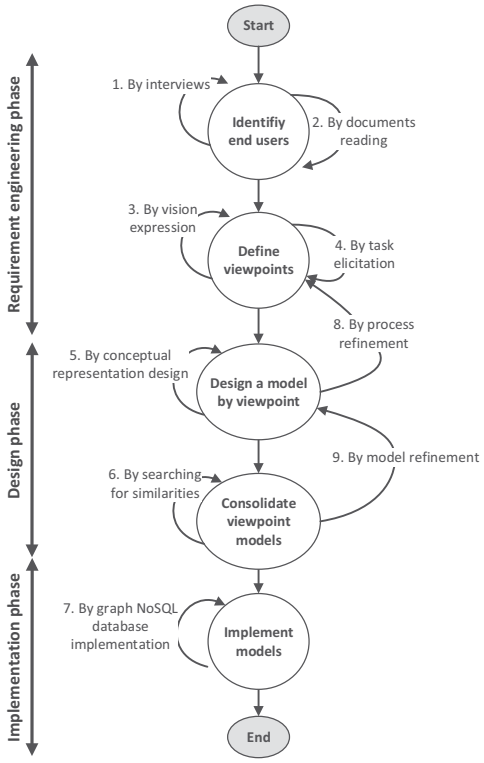

Fig. 1. General view of DEMOS

From January to June 2018, DEMOS has been used for a real project. The project focused on the implementation of an attendance management tool for the Toulouse 1 Capitole university's "lifelong training" service. This experiment was conducted with 8 end-users: 3 teachers, 4 schooling managers and the "lifelong training" service manager. The aim of the project was to develop a prototype to be tested by users. The designed software is currently being implemented.

IV. Discussion

We have shown with DEMOS that a structured design method can contribute to integrate democracy in IS, and we have illustrated our proposition with a concrete case. Following the experiment, we have evaluated DEMOS with semi-structured interviews with end-users. Evaluations revealed that end-users understand intentions of the method. They understand both aspects: a **democratic process** for a **democratic IS** which respects their viewpoints. Viewpoint notion that was not obvious to them at first became clearer during the workshops. Moreover, for users, sequencing of steps was coherent according to the intentions. Overall, they were assisted by techniques and tools used during the process. At the end, they are satisfied with the method results, which are consistent with what they have expressed. The final software is under development and was not considered for evaluation.

During the experiment, and according to the evaluation, each intention has been respected. However, the implementation of viewpoints is guaranteed by the implementation of a database structure that formalizes the IS through the vocabulary of the end-users' viewpoints. As future work, we want to add other intentions to implement activity model and interface model. Thus, we will propose a total implementation of viewpoints. We also want to explore further the possible link between DEMOS and agile development. A method as XP could, if it respects some criteria, extend our design method to the development phase. Thus, the integration of democracy would be effective in the final product

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