

LABORe: Collaborative Assessment of Work-Disruptive Technologies

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Abstract: There are several examples of a crowd collaborating to help experts such as citizen science and human sensing. In this paper, we present LABORe, one of such efforts, a crowd-based system for the collaborative assessment of work-disruptive technologies. Our goal is to present the prototype of the system – the result of the first cycle of the Soft Design Science Research methodology – and to propose an evaluation methodology to test this system with the help of the ECSCW attendants.

Introduction

Understanding Work is one of the research themes of the CSCW community and envisioning its future is necessary to help CSCW research to keep its relevance throughout time (Lima & Souza, 2017). One of the main topics of research about the future of work is the automation which has been the subject of several studies in the field (Dogan & Yildirim, 2017; Frey & Osborne, 2017; Laboratório do Futuro, 2017; The Economist Intelligence Unit, 2018). In this work, we present the prototype of our system, Labore, that allows the collaborative assessment of work-disruptive technologies, thus being an application of CSCW techniques to help a smoother transition of societies to the future of work.

Our proposed solution is based on two essential concepts. The first one is work-disruptive technologies which are those technologies that, when applied in the production, impact certain occupations, either destroying or modifying it; an application of Schumpeter's theory of creative destruction (Schumpeter, 2014) to

the world of work. The second concept is Technology Assessment which can be defined as the collective designation of the systematic methods used to scientifically investigate the consequences of technology as evaluated by the society (Grunwald, 2009). Our system seeks to support Technology Assessment.

Related Work

The proposed system shares some similarities to others that also propose a collaboration among a crowd, composed of laypeople, in order to do or help some specialized work. We can highlight successful experiences in this line of work in the field of citizen science such as EteRNA – a massive open laboratory which allowed a crowd of laypeople to test RNA structure designs (Lee et al., 2014; Treuille & Das, 2014) – and Fast Science – a platform that allows experts to set up experiments and recruit the crowd to participate (Esteves, 2016). Recruiting the crowd has also been used for human sensing as in CrowdView, a system that allows citizens to identify and report problems in their city (Silva, 2017).

In the field of Future-oriented Technology Analysis, of which Technology Assessment is part, there are some computational tools such as Autobox, Forecast Pro, and SAS Forecast Server which are focused on Technology Forecasting, not Technology Assessment (Barbosa, 2018). Thus, the system proposed in this paper is built on the ground laden by these previous research but represents a novel application of CSCW, to the Technology Assessment field.

Problem & Requirements

The presented system is the result of the first cycle of application of the Soft Design Science Research (SDSR) (Baskerville, Pries-Heje, & Venable, 2009). We will briefly present the specific problem and its requirements, the first two steps of this methodology, to give an idea of what the system is supposed to accomplish.

The specific problem can be defined as “evaluate the disruption a group of emergent technologies will cause on a group of occupations”. This particular problem can be translated into the following set of requirements. **Requirement 1:** allow the registration of emergent technologies; **Requirement 2:** build a platform for the crowd to collaboratively evaluate the disruption on work caused by the technologies registered; **Requirement 3:** allow the visualization of occupations with their disruption level and related technologies.

LABORe: Prototype of a Solution

Based on these requirements, the first prototype of LABORe was created using (“Marvel,” 2018), a web-based prototyping tool. In this prototype, LABORe is presented as an Android application, but it will also be developed to iOS.

In order to meet the requirements, LABORe is composed of three main modules: **Technology Registration**, used to register a new technology on the platform by providing its name, category – based on (IEEE, 2017) –, description, readiness level – based on (European Commission, 2017) –, references (videos, pictures, news articles, academic papers, etc.); **Technology Assessment**, allows a user to see the details of a registered technology and visualize the assessment made by the community while being capable of making his assessment and debating with other users; **Occupations Ranking**, presents a list of occupations ranked by a series of criteria selected by the user such as disruption level and number of related technologies.

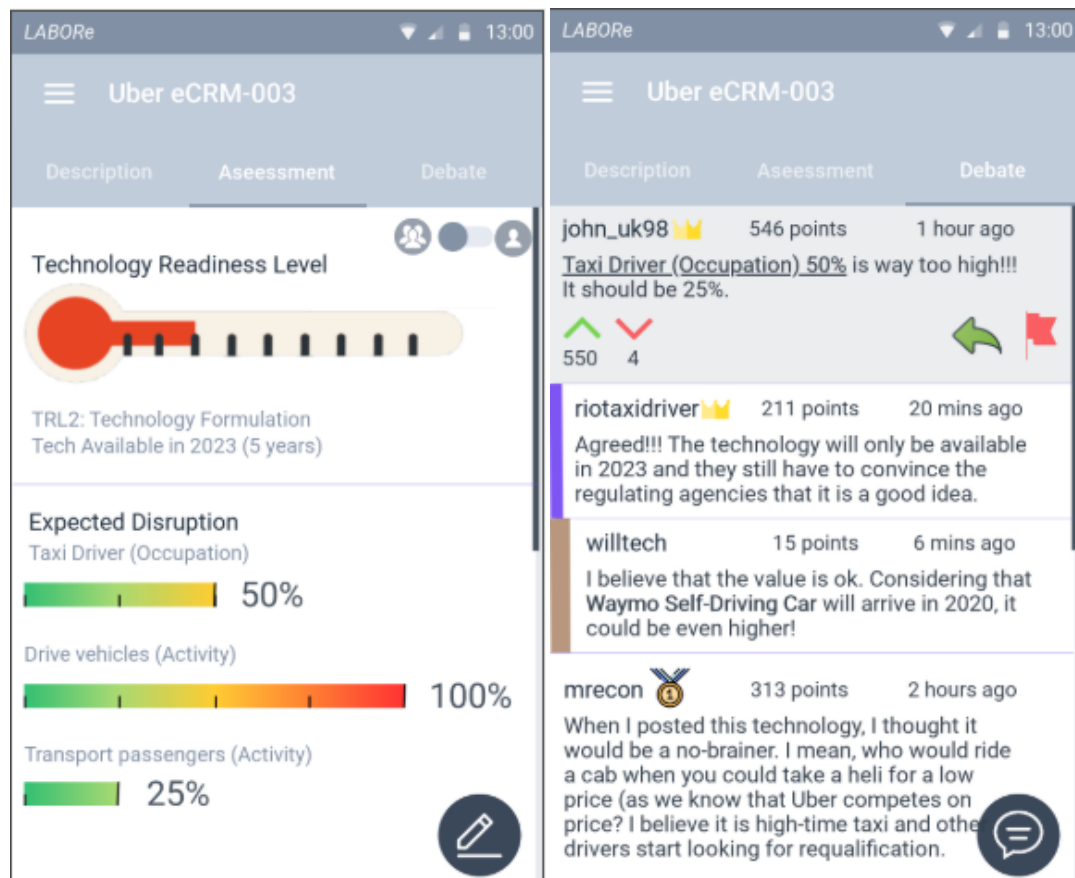


Figure 1: Screenshots of the LABORe prototype representing the Technology Assessment visualization (left) and the debate (right) of the same technology.

Given that this is a short paper, we opted to present only two screens of the second module (Technology Assessment) given that it is the one that has more collaborative elements (shown by the screens in **Figure 1**).

Prototype Evaluation Methodology

In order to evaluate the prototype, we will provide a QR Code and a short URL for the prototype and the questionnaire in our poster. By accessing the prototype link, users will be able to annotate the prototype online, providing an interesting medium for discussion. In the questionnaire, participants will be able to evaluate the system regarding its usability, functionality, and completeness using well-established metrics (Hevner, March, Park, & Ram, 2004).

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