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Persuasive Technology

14th International Conference, PERSUASIVE 2019
Limassol, Cyprus, April 9–11, 2019
Adjunct Proceedings

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ISBN 978-9963-697-37-3 (eBook)

**Persuasive Technology 2019 Adjunct Proceedings
14th International Conference on Persuasive Technology**

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The development process of the *One Health Hub*: a persuasive eHealth platform to support cross-sectoral collaboration to prevent and control zoonosis outbreaks

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1 Background

Zoonotic diseases encompass a large part of all infectious disease. Dealing with these zoonotic infections can be quite complicated and requires cross-sectoral collaboration between human, animal and environmental health sectors [1]. This complexity is mainly caused by (1) the involvement of many stakeholders with diverse interests, (2) the impact on societal and economic level and (3) unclearness about the solution. To deal with this complexity, the One Health approach must be applied, wherein these multiple sectors collaborate in order to achieve better public health outcomes [2]. However based on earlier zoonotic infectious outbreaks, it is safe to say that such cross-sectoral collaboration can be improved [1]. This study aims to contribute to combating emerging and re-emerging zoonosis outbreaks through the development of a persuasive eHealth tool, the *One Health Hub* (OHH). The OHH (1) supports collaboration between sectors by providing a serious game for professionals to coach multidisciplinary decision-making during outbreaks and (2) offers an interactive tailored Q&A system for both professionals and general public. The development process of the OHH (as described in this paper) followed the CeHRes Roadmap, making use of participatory development, persuasive design and business modeling [3].

2 Method

Following a mixed-methods user centered design approach, different methods were used during the development of both the OHH website and the serious game, such as focus groups (n=17), interviews (n=26), online card sort study (n=53), usability tests (n=20), content validations (n=24). During this process, think-aloud protocols, low-fidelity, high-fidelity prototypes and scenario-based tasks were used to help participants to envision their wants and needs for the technology. The involved stakeholders were selected based on the stakeholder identification study (n=36 key-stakeholders) representing the human, animal and public health sectors [4]. Besides key-stakeholders, experts in persuasive technology and general public also participated in this study. All

interviews, focus groups and usability tests are transcribed verbatim and open coding was applied for analysis.

3 Results

Serious game: The game is evaluated in multiple stages of development by potential end-users and experts. According to the results, features of every category of the PSD model are required. One test was conducted wherein all non-player characters (NPC) were evaluated by their real-life characters (e.g. the NPC poultry farmer was evaluated by a real-life poultry farmer) in order to achieve real-world feel, personalization/simulation and recognition within the game. The results showed inaccuracies in the story-line of the game-scenario, which was then re-written accordingly. Also, the scoring system, in-game and end-game feedback had to be re-designed in some respects, so that praise, rewards and social learning better fitted the potential end-users. *Interactive tailored Q&A system:* As results from the interviews and usability tests, the system was designed by tailoring and tunneling the provided information separately for professionals respectively general public. Additionally, it was considered a prerequisite that the information is accurate and written in language level B1 (Dutch language classification). Usability tests showed that searching for and finding the right information was found challenging. Therefore, a smart chatbot (dialogue support) which interacts with the user and guides him/her through the website was embedded in the system.

4 Conclusion

All findings from the iterative formative evaluation cycles with stakeholders were used for the development process. Stakeholders started with formulating their fundamental values. These then led, via low- and high-fidelity prototypes to the eventual persuasive product: the *One Health Hub*. Future steps will be (1) to expand the functionalities of the OHH, to make sure it also incorporates social support via a networking option and (2) to successfully implement the OHH. Furthermore, the effectiveness of the OHH will be studied by a summative evaluation.

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