Demos

Construction Site Chaos:
An Edutainment Game for Construction Site Workers

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Abstract. This demo shows the result of a design project in the edutainment field. The tries to raise safety awareness among construction site workers.
Contribution statement: The purpose of the demo is to raise safety awareness amongst construction site workers via an immersive serious game

Keywords: safety game, construction site, behavioral safety, edutainment.

1   Purpose of the system

Every year a large number of construction site workers get injured because they tend to disobey, or are unfamiliar with safety regulations. Construction Site Chaos is a playful and humorous reminder on what can happen when these rules are neglected. The game addresses everyday dangers that construction site workers can encounter during their work. The game uses ideas from gamification [1, 2] to enable discussions about safety related topics, and force workers to be more safety aware.

A big issue in the field is that workers dislike wearing personal protective equipment. Reasons are a personal lack of motivation, uncomfortable designs, and a lack of sense of necessity [3]. A game will not make these designs more comfortable, however it can address the lack of motivation and the lack of sense of necessity.

While playing the game players are swallowed into a fast paced reaction game. At the start of the game, players see a randomly selected, short animation that shows an accident (Fig 1.). The accident is always caused by the ignorance or neglectedness of the game's protagonist (Fig 1.). At the end of the animation, the protagonist starts to fall down himself. The construction site on which he stood seems to be endless and the only thing left to do, is steer left and right to dodge his co-workers. Once the protagonist is falling, there is no turning back. By avoiding all co-workers, tools, obstacles, and picking up some power-ups the goal is to fall as far as possible. When the protagonist hits three or more co-workers, a cruel animation will play and the game is over. Playing the game is not all about having fun. A connection to the real world makes it suitable as an intervention tool. During their workday, workers can take pic-

tures with their mobile phones of personal protective equipment. By doing so, their avatar will collect digital versions of this protective equipment and benefit from better protection during their fall. The game focuses on younger construction site workers between 16 and 30 years.

Fig. 1. On the left a screenshot from introduction movie. In the center, the game's protagonist and on the right the Interactive installation

2   Status of implementation and deployment

The first version of the game and interactive installation were finished in November 2013. The game has not been deployed to construction sites. The first step is to conduct user tests with the current version of the game.

3   Contents of the demo

During the conference a playable demo will be presented, similar to the version shown in our YouTube movie (http://youtu.be/kodqiyJ4_dY). The demo includes the game (Fig 1.), the interactive installation (Fig 1.), and the scanner/profile Android app.

4   Validation

One of the next steps is to conduct user tests with construction site workers. During the user tests gameplay and behavioral effects of the game will be studied. These tests are planned for summer 2014.

References

1. Deterding, S., Sicart, M., Nacke, L., O'Hara, K., Dixon, D.: Gamification. using game-design elements in non-gaming contexts. Proceedings of the 2011 annual conference extended abstracts on Human factors in computing systems - CHI EA '11. p. 2425. ACM Press, New York, New York, USA (2011).

2. Korn, O., Schmidt, A., Hörz, T.: Assistive systems in production environments. Proceedings of the 5th International Conference on PErvasive Technologies Related to Assistive Environments - PETRA '12. p. 1. ACM Press, New York, New York, USA (2012).

3. De Boer, J., Teeuw, W.B., Heylen, D.K.J.: Applying the Behavior Grid for Improving Safety in Industrial Environments. In: Berkovsky, S. and Freyne, J. (eds.) CEUR Workshop Proceedings. p. 6. CEUR, Sydney, Australia (2013).