Gamification - persuasion for behavior change using formal argumentation
Additional documentation of the systematic literature review

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1 Systematic literature review methodology

This paper followed a three-arm methodological approach where *features* (*e.g.*reminders, suggestions, etc.) and *strategies* (*e.g.* gamification, pro-activeness, etc.) of persuasive technology were identified. We followed the Kitchenham's protocol in [23] to perform our systematic literature reviews (SLR), which was part of the methodological procedure used in this paper (see Figure 1).
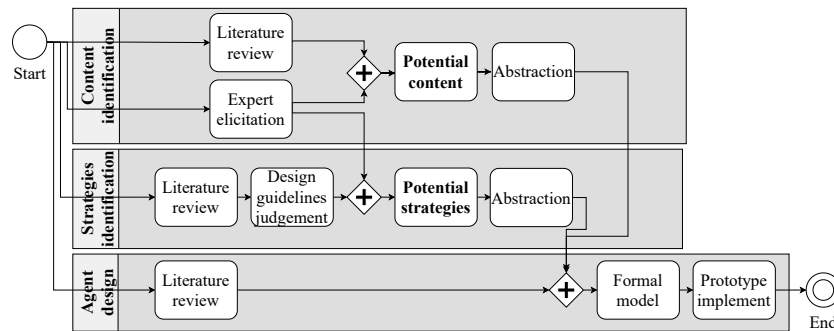

Fig. 1: 3-armed methodological process to integrate: 1) expert elicitation of persuasive features of a coaching technology, 2) strategies used in persuasive technology, and 3) formal models of software agents.

1.1 SLR Research questions

The questions that the SLR was aiming to solve were:

Q1 What features *w.r.t.* content a persuasive or coaching system has? and
Q2 What strategies *w.r.t.* behavior of the software presenting content a persuasive or coaching system has?

1.2   Databases

We collect results from seven databases: IEEE Xplore, Web of Science, PubMed, Taylor and Francis, Scopus, EBSCO and Cochrane reviews. The time frame selected for this review was from January 2000 to December 2020.

1.3   Databases queries

We use systematically the following keywords in our search strategy: `ALL (''coaching system'') OR ALL (''behaviour change system'') OR ALL (''persuasive system'') OR ALL (''support system'') AND PUBYEAR > 2000 AND SUBJAREA (comp OR medi OR nurs OR heal) AND TITLE-ABS-KEY (*health AND behavior AND change AND ''social network'' OR ''social media'') AND (LIMIT-TO (DOCTYPE , ''cp'') OR LIMIT-TO (DOCTYPE , ''ar''))` , where SUBJAREA is a refining keyword for specifying the subject area, *e.g.* "comp" computer science, "medi" medicine, "nurs" nursing, "heal" health area in general. TITLE-ABS-KEY specifies that the search will be performed inside of the title, abstract or keywords. DOCTYPE limits the search in two types of documents: "cp" conference papers and "ar" journal articles.

1.4   Inclusion and exclusion criteria

We used a set of assessment criteria to evaluate the quality of every paper:

CR0 It is connected with cardio-vascular diseases in people older than 40 years old;

CR1 Describes any AI-based approach used to detect, predict, anticipate, infer or deduce a (un)desired/(un)wanted specific behavior;

CR2 Mentions how methods or approaches are joined/linked;

CR3 Describes the type of methods or approaches used for coaching (during intervention);

CR4 Include characterization of behavior causality and the consequent recommendation or feedback for the user.

Every criteria has a quantitative score of 1, 0 or -1, which correspond to answering the criteria with values: Yes, Partially or Not, respectively. A total score is calculated by adding the individual criteria values. Our total selection score was equal or greater than zero.

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