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A Preliminary Evaluation of a Gamification Framework to Jump Start Collaboration Behavior Change

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Abstract—In this notes paper we report on a preliminary qualitative evaluation of a gamification framework to address collaboration issues in software engineering. Findings suggest that the use of game elements indeed is prone to motivate software developers to foster the resolution of collaboration issues in their teams. Our preliminary results motivated us to design large scale, in-depth, and longitudinal studies to further evaluate the framework. In a long run, we expect that our findings will be informative for project managers and tool designers and anyone else who is interested in helping software teams to overcome collaboration barriers and succeed on their work.

Keywords—gamification, collaboration, software teams, motivation, qualitative study

I. INTRODUCTION

Software development demands a large amount of collaborative work of those involved in it. Not surprisingly, a large number of issues faced during software development is associated with people, and collaboration is yet one of them [1]. In our previous work [2], we proposed a gamification framework to help software practitioners jump start behavior change and tackle collaboration issues in their teams. The framework consists of 34 collaboration issues, a set of game elements associated to each issue, a rationale to explain the elements' choice, and a respective example of use. A complete description of the framework along with the methods used for developing it is presented in [2]¹.

This paper note reports on a preliminary evaluation of the defined framework with 15 practitioners. We detail our study and findings as part of a first step towards understanding the role of gamification in supporting collaboration in software development activities.

II. FRAMEWORK PRELIMINARY EVALUATION METHOD

We conducted a qualitative study to evaluate the gamification framework. Based on our personal contacts and chain referrals from these contacts, we invited software development professionals to participate in our study, mainly those with previous experience in leadership (e.g., project managers,

development leaders). We also invited gamification designers. Fifteen (out of 20 sent invitations) people accepted to participate. The 15 participants were located in Brazil, USA, Spain, and Germany, and had an average of 9 years of experience in industry, 5 in leadership, and 2.5 in gamification.

We asked each participant to provide feedback about a sample of the framework based on her personal experience with gamification. We showed the participant a list with the 34 collaboration issues and instructed her to pick 3 that she had experienced the most in her last 6 months of work. Next, we presented the respective samples of framework description and asked the participant to read it and then reflect whether (i) the game elements choices were appropriate, (ii) the rationale made sense, and (iii) the examples were useful. To support the understanding of the game elements, we had a separate document describing each of the elements based on their definition from the BadgeVille wiki [3].

III. FINDINGS FROM THE PRELIMINARY EVALUATION

A total of 19 collaboration issues were selected for discussion during the interviews. We chose to present here 3 of them as a means to exemplify the validity and usefulness of the proposed gamification framework. We picked the most selected issues by the participants given the richness of details.

Lack of Feedback was mentioned by 9 practitioners as a collaboration issue they typically face. This issues has the following game elements associated to it: lottery, achievements, combos, bonuses, appointments, quests, reward schedules, and progression; the first 5 were discussed. Participants reported that getting feedback is crucial when working in teams. P8 (Participant 8) exemplified how lack of feedback negatively impacts the team: “... as a Scrum Master, I soon realized that when people do not speak out during meetings, one can see the impact in the coming weeks; quickly the team starts loosing its sense of cohesion and motivation to keep the things going”.

Most of the participants reported to like the proposal of using the **Lottery** element for tackling lack of feedback in their teams. P15 believes that lottery could create a different approach for feedback sessions: “the process of providing feedback could be more informal with this element”. **Achievements** and **Combos** were also mentioned as potentially useful

¹<http://hdl.handle.net/10923/8570>

game elements. P11 stated that Achievements “could help in creating the plan for the feedback session in a checklist style” and that Combos “could foster different feedback for each group, forcing developers to give feedback beyond technical aspects”. **Bonuses** and **Appointments**, on the other hand, received mixed feedback. For instance, P11 argue that he could see bonuses being applied to a feedback session in order to “reward those who give and receive quality feedback”. In contrast, P1 stated that “Bonuses could foster the quantitative feedback, which is not necessarily the focus when a team is looking to improve the way of working”. P8 debated whether rewarding feedback could cause collateral damage, and suggest that this risk should be considered before adopting it.

The **No Clear Goals** was discussed by 5 participants that commented on the following game elements: epic meaning, instances, cascading information theory, progression, and reward schedules. Quests complete the list of elements. Participants discussed that team motivation is usually affected when goals are not explicitly described. P3 claimed that “when a project goal is not clear, people do not have the feeling of progression and meaning for what they are doing”.

The participants mostly provided positive feedback about the framework proposal for this collaboration issue. More specifically, **Epic Meaning** was the element that most called attention. For instance, P3 claimed that “it could be used to inspire people, by giving them an epic purpose”. P14 stated that “a narrative about the purpose of the project could be useful in some chaotic realities, like mine”. On the other hand, P9 stated that Epic Meaning could be useful, but he pointed that “some people may not be touched by an epic goal, so one needs to consider the personality of each employee—explorer, achiever, killer, like the profile of game players”.

Related to the **Instances** element, P3 mentioned that she liked the idea of creating different paths to achieve the same goal, and had never thought about using this approach before. P9 highlighted despite his agreement on the use of this element that the personality of each team member should also be considered in order to achieve better results with this element.

The **Cascading Information Theory** element, which considers that information should be released in the minimum possible snippets to gain the appropriate level of understanding at each point in time [3], received contrasting reviews. P3 mentioned that he liked it: “creating a step-by-step process for the team, they could stay aware of the goals”. P6 reported her concern: “it will depend on how people read the documents”. Two other game elements were highlighted. P3 stated that **Progression** would be interesting in order to create a sense of progression towards the goal while P10 mentioned that **Rewards Schedules** “looks like the easier element to apply”. P3 suggested that some metrics could be useful in order to track the progression approach.

The **Ineffective Communication** issue was cited by 4 participants who commented on all game elements associated to this issue, namely: appointments, cascading information theory, quests, and user profile. Participants reported that they perceive that a software team is impacted by ineffective communication when members do not share a common ground. P2 stated: “ineffective communication is deadly to a project. When there is no communication, people start to assume things and

this normally causes conflicts”.

The feedback about the framework proposal to tackle this collaboration issue was also mostly positive. **Appointments** was the most mentioned game element. P5 claimed that she liked it because “it would force the communication between team members by defining a time and place for them to communicate”. **Cascading Information Theory** was highlighted by P5. In her opinion “proposing a presentation in the beginning of a project, with all subjects covered, and slowly discussing it in early days of the project could help the team to quickly establish common ground”.

On the other hand, participants had mixed feelings about the use of the **Quests** element. P2 liked the idea of making team members creating a common ground of knowledge by having tasks where they should work in different areas. Differently, P5 was not sure if this could help: “I consider that this will make people feel uncomfortable”. **User Profile** was not considered an interesting game element to support this issue. P5 stated that she could not see how it could mitigate ineffective communication. She suggested the removal of this game element entirely for this issue.

IV. FINAL REMARKS

Our qualitative study aimed to evaluate the proposed gamification framework. The participants were quite excited and confident that the proposed framework is likely to jump start behavior change. Therefore, our initial contribution is as follows: (i) we collected feedback that the framework is valuable to software professionals who target to resolve collaboration issues and (ii) we confirmed that the collaboration issues are comprehensive and that the associated game elements are fit to tackle the respective issues.

We would like to see our findings with care at this time. We understand that behavior change is a long-term commitment and depends on one’s will and motivation to do so. Previous work by Singer and Schneider [4] has reported on the need to conduct in-depth and longitudinal studies to observe whether the new behavior holds over time and in different project settings. We are currently designing a survey study that will evaluate the framework in full to later conduct a multiple case study to gather evidence on side effects of the framework adoption in a long term.

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REFERENCES

- [1] T. Kusumasari, I. Supriana, K. Surendro, and H. Sastramihardja, “Collaboration model of software development,” in *Proc. Int’l Conf. on Electrical Engineering and Informatics, Bandung, Indonesia, IEEE*, 2011, pp. 1–6.
- [2] F. Steffens, S. Marczak, F. F. Filho, C. Treude, L. Singer, and D. Redmile, “Using gamification as a collaboration motivator for software development teams: A preliminary framework,” in *Proc. of the Brazilian Collaborative Systems Symposium, Salvador, Brazil, ACM*, 2015.
- [3] BadgeVille, “Game mechanics - gamification.org,” 2011. [Online]. Available: <http://bit.ly/1Ptbbw8>
- [4] L. Singer and K. Schneider, “It was a bit of a race: gamification of version control,” in *Proc. of the Workshop on Games and Software, in conj. with ICSE, Zurich, Switzerland, IEEE*, 2012, pp. 5–8.