Introducing gamification tools into developers' team meetings to enhance engagement and outcomes

Aleksandra Postola

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Aleksandra Postola
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Laurea University of Applied Sciences **Abstract**

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Low participants engagement, lack of motivation, and inactivity in online meetings is a problem faced by organizations around the world. The issue grew during the COVID-19 pandemic, when work moved from offices to homes and is still present as the remote workstyle has stayed in many organizations. The objective of this thesis project was to design and introduce gamification tools into online meetings to increase participants' engagement and to measure the engagement afterwards.

The case study was done with the client company, a cloud consultancy business headquartered in Helsinki, Finland, with offices around Europe. The research focused on a team of cloud developers in the Application Management department of the company and the monthly team meetings held online.

The approach was to put the meeting's participants in the center and design the meeting practices in a way to engage participants and enhance their motivation. From this approach two frameworks were chosen. Firstly, a service design model was used to structure research methods in four phases: research, ideation, prototyping, and implementation. Secondly, a gamification framework, Player Centered Design, was used to identify the research subjects' motivations and to design gamification activities for the meeting. A selected number of research subjects were interviewed and asked to respond to tests to find their motivation characteristics and player types. Based on the findings, the meeting scenario was designed.

It was found, that adding gamification to an online meeting increased the participants' engagement and satisfaction. The results were obtained through a test measuring users' engagement done by the participants after the meeting was ended. The test results scale was from 1 to 5. The test was sent after a meeting without facilitation and after a session with designed gamification tools to compare the results. The aim was to gain 1 point in the scale after introducing the gamification to the meeting. It was marginally reached with the result of a 0,9 point increase.

For further exploration, the author suggests continuing the approach of including gamification in the team meetings and experimenting with other gamification elements. The proposed meeting scenario could be utilized in other meetings with minor modifications. The research opened the door to introducing creative tools to meetings and moving the focus of the meeting to its participants.

Keywords: gamification, online meeting, participants' engagement, motivation, player-centered design

Contents

1 Introduction

Getting participants attention in a virtual meeting is a demanding task and an everyday challenge in many work settings. From a participant's perspective, it is easy to go on a "stand-by" mode by turning off the camera and muting the microphone. Sitting at own's computer in the home office settings does not feel like attending a meeting and the urge for multitasking arise (Cao et al. 2021). While partly listening to the presentation, participants check their Slack conversations, respond to emails, or scroll the Internet to read some news or social media feed. Getting distracted in the meeting is a common problem. It has been present in face-to-face meetings (Lehmann-Willenbrock et al. 2016) long before virtual meetings became a norm, but after people switched to the online settings, the problem grew further.

How to combat difficulties with gaining participants' attention? We asked, what caused the passive behavior and how to make the meetings more engaging for the participants so that they get most out of them. Based on existing literature, we suggested adding gamification, that is using some game elements in non-game settings (Deterding et al. 2011) to boost participants' motivation. The core purpose of gamification is to increase humans' engagement and motivation, which as a result brings more effectiveness to the outcomes (Mora et al. 2017). We started from formulating the problem, observing the environment, and getting to know the participants and their motivations. Based on the findings, we attempted to design gamification tools to be used in a meeting to make it more effective for the participants.

The research objective was to design and incorporate gamification elements into a virtual meeting to increase participants engagement and to measure the engagement afterwards.

1.1 Choosing the case

The thesis was done with the client company that operates in the cloud consultancy business. It is a Finnish private sector company with several offices in ten countries in Europe, with over 1500 employees. It serves B2B customers, mostly from industrial and public sectors. The structure of the company is not based on geographical location, which means people working for the same department or a team can be dispersed throughout many countries. This structure requires virtual work settings with all the communication going via online tools like Slack channels and online meetings. This virtual work environment was present in the company also before the COVID-19 pandemic.

The research focused on a team of software and cloud developers in the Application Management department of the company. The team comprises 22 people with some of them

in other then programming roles, like team leaders and customer success managers, grouped into four small squads (ranging from four to six team members). The team operates in a fully remote mode, with all the meetings held online. Team members are placed in several cities around Finland as well as in the other countries in Europe, hence there is no possibility to meet face-to-face. The author of the thesis is also part of the team. The described specifics of the work style settings of the developers' team made it an ideal case to study participants behavior and engagement in the online meeting.

1.2 Problem definition

The focus was on one type of a meeting, which had an informational and learning character and involved the whole team. The meeting was held once a month with a duration of 1,5 hours. It contained from one to three presentations, usually covering technical topics, like new tooling for developers, improvements in the code, guidelines etc. The meetings are intensive, packed with a lot of new information, technical, and lengthy. For those reasons, they are demanding, sometimes overwhelming, or boring if the topics are not of some people's interest. The topics are important for the developers, hence the need to get their full attention and active participation is high. The common problems occurring in the meetings were inactivity of most of the participants, lack of discussions, difficulties with keeping focused, turned off cameras which made it hard to know, if people were actually present, monotone way of giving presentations, overloading with information. We chose the particular type of meeting because we thought, there was a space for improvement and because of the value those meetings should bring, we should make them as best as possible for the participants.

1.3 Thesis structure

The thesis is structured in the following way: first chapter gives a short introduction to the topic and presents the research questions and objectives; second covers the theory base and presents the research on working in remote environment, focusing on things like virtual meetings, participants' engagement and motivation, and reviewing methods of measuring it. It describes the theoretical frameworks used in the thesis. Third chapter describes research methodology applied in the thesis, that is service design process with descriptions of data collections and analysis. Fourth chapter covers how the research was conducted, how the framework and design methods were applied; in fifth chapter we discuss results of the study and in the sixth present the conclusions.

2 Theoretical frameworks

In this chapter, we discuss research done on working in remote environments. We start from presenting data on switching to remote work during the COVID-19 pandemic (George at al. 2021, Sutela 2020). Then, we focus on the online meetings environment and their challenges, like losing concentration (Cao et al. 2021), feeling of fatigue from a long time spent in videocalls (Bailenson 2021), to the problems with engagement and motivation. We also cover methods of measuring participants' engagement, from manual, like questionaries, to semi-automatic and automatic, that is machine learning methods, and statistical models (Dewan et al. 2019). We propose an adapted questionnaire for measuring participants' engagement developed by O'Brian et al. (2018), which will be used as a tool in the thesis.

Next, we briefly present the history of games from the ancient times, as well as provide a definition of a game in contrast to a play (Gray et al. 2010). We go next to the concept of gamification, which is a way of using game elements in non-game environments (Deterding et al. 2011). In the end, we review the most used gamification frameworks, and we finish with one that will be adapted for the thesis.

2.1 Working in remote environment

Working from home has become a standard for companies during and after the COVID-19 pandemic. Working remotely is associated with both benefits, like increase in productivity and reduced stress but there are also shortcomings, like decrease in meaningfulness of work-related tasks and increase in health problems (George et al. 2021). The same study found, that for over half of the survey participants (56% and 61% respectively) working remotely has changed their way of work positively and they would like to continue it. Still, for about one fifth, the shift to remote work had overall negative effects. The study was conducted online in June and July 2020 on 278 U.S. workers (George et al. 2021).

Remote work has become a standard in some industries, especially Information Technology, with computing jobs ranking top in occupations that can be performed remotely (Dingel & Neiman 2020). During the COVID-19 pandemic, percentage of people who switched to remote work was highest in Finland among all European Union countries, according to data gathered by Eurofound, the European Foundation for the Improvement of Living and Working Conditions, in May 2020 (Sutela 2020). Nearly 60 percent of respondents answered that they switched to work from home after the pandemic outbreak. The high percentage comparing to other European countries (in Greece, Croatia, or Bulgaria it was roughly 30 %) was possible because of the occupational and industrial structure. In Finland there is many people in information jobs and the percentage of female employees with university degrees is highest in the EU (Sutela 2020). In another study by Sutela and Pärnänen (2021) reported by Minna (2022) in a Finnwards blog post it was stated that in spring 2021, 79 percent of highly

educated professionals in Finland worked remotely. Of those, who switched to remote work, nine out of ten said they were relatively pleased with the change. Moreover, the study showed that majority of employees (67 percent) wanted to continue working remotely after the pandemic. According to another study conducted by Kantar TNS Finland for Suomen Yrittäjät (Koskenranta 2021), over 70 precent of surveyed employees said they wanted to work remotely in the future.

2.2 Online meetings

Part of remote work consists of remote collaboration with other team members. This can be done via different online collaboration tools like e-mails, chats, and online meetings. Exchanging written messages among co-workers is a popular way of remote collaboration and tools like Microsoft Teams or Slack play a crucial role. The other way of communicating, which is thoroughly investigated in this thesis project, is an online meeting. In the past couple of years, the most popular videoconferencing tools are Zoom, Microsoft Teams, and Google Meet. They all offer high performance video calls for large groups of participants, with breakout rooms and chats as built-in tools. Google Meet is the tool of choice in the company which is the subject of this thesis.

Since COVID-19 and the global shift of work to the remote settings, virtual meeting environment, the effectiveness of online meetings, and participants' engagement in such meetings, including online learning settings, have increasingly become a subject of research. Hancheng Cao from Stanford University looked at the multitasking behavior during online meetings (2021). The study showed that specific characteristics of a meeting such as its type, purpose, number of participants, even the time of a day, all correlate with people's multitasking behavior (Cao et al. 2021). They found also, that multitasking during meetings can have both positive and negative outcomes. On the positive side, online meetings' participants were taking notes and searched the Internet for more information related to the discussed topic (Cao et al. 2021). On the negative side, respondents reported that they were doing their own work while participating in a meeting which was not very useful for them. Another downside was that multitasking led to losing attention and engagement, made people more distracted and feeling tired (Cao et al. 2021).

Providing effective and inclusive environment is another aspect of online meetings. A team from Microsoft conducted a large survey study on the topic (Cutler et al. 2021) and found that improving meeting inclusiveness also positively correlates with improving meeting effectiveness. Factors, that increase participants' comfort include for example sharing pre-readings before the meeting, sending the agenda and a summary after it, quality of the audio and video call, more people using the video, and the meeting size (Cutler et al. 2021).

Using camera during an online meeting is a subject of debate related to “Zoom fatigue”. The term “Zoom fatigue” hit the media and has become a symbol of its times (Fosslien & West Duffy 2020). “Zoom fatigue” refers to feeling exhausted and overwhelmed from overusing videoconferencing platforms because of cognitive load from staring at one’s own face, being constantly watched by other participants, and reduced mobility (Bailenson 2021). One of the solutions to “Zoom fatigue” can be turning off self-view, as suggested by Bailenson and another research (Shockley et al. 2021). Shockley and her team have found that keeping camera open during online meetings was positively correlated to feeling of exhaustion and fatigue. On the other hand, the number of hours spent in online meeting was not. Being exhausted also caused less engagement and decreased activity in the meetings.

A study on e-learning activities among Indonesian students during COVID-19 (Marisa et al. 2020) found that while the motivation to learn stayed strong among surveyed students, the results from the Octalysis gamification framework (Chou No date), which looks at the core drives for people motivations, showed only medium scores (6,5 out of 10). Introducing gamification techniques in the e-learning environments could lead to better outcomes and to enhance students’ motivation to learn (Marisa et al. 2020). Introducing game-based elements into company’s workshops brought the behavioral change of people involved, bringing more efficiency in using time and positive feedback about the effectiveness of the gamification (Dulskaia et al. 2017). Better engagement can be also achieved by providing students with feedback (Ayouni et al. 2021). The study showed that the more often students got feedback the more engaged and motivated to learn they were.

2.3 Participants’ engagement

User engagement, as defined by O’Brien (2018), is a form of user experience which leads to positive cognitive and behavioral outcomes like enhanced participation. O’Brien also states that it is difficult to define engagement in different human-computer interactions as every context is different (O'Brien et al. 2018). We can also define different forms of engagement, like emotional, cognitive, and behavioral engagement, as referred by O’Brien to a study on student engagement by Fredricks in 2004. Emotional engagement is related to both positive and negative reactions to other people in the context of doing common work and interactions. Cognitive engagement tells us how much effort someone puts to achieve mastery, while behavioral refers to active participation (Fredricks et al. 2004, cited by O’Brien et al. 2018).

Participants engagement can be measured by manual methods like conducting surveys and questionaries; it refers to self-reporting. On the plus side, they are easy to conduct. The limitation here is, that participants may not answer honestly and may not report their emotions accurately (Dewan et al. 2019). Other type of data is external and based on factors

observed and detected by others or by machines. Ayouni, Hajjej, Maddeh, and Al-Otaibi (2021) study included machine-learning algorithms that recorded students' activities and based on the data could predict their engagement level. The data was then used by the teachers and evaluators. The external type also includes observations of human behavior like eye movements, facial expressions, voice, or body movements, and the data can be gathered by manual methods, semi-automatic, and automatic (Dewan et al. 2019). Automatic methods are using video recordings and computers as a medium to detect and register sensor data. It can be achieved for example using eye trackers to detect users' gaze and facial features. Data is then analyzed using statistical methods and models (Dewan et al. 2019). Easier to perform are manual methods in a form of observational checklists, but they rely on observers' opinion. Also, another limitation mentioned by Devan lies in the questions asked or participants' behavior that can or cannot indicate engagement. For example, if the participant comes to the meeting on time and sits quietly, does it indicate engagement or being bored (Dewan et al. 2019).

The challenge of measuring user engagement is to understand what kind of actions indicate engagement and which frustration; how to measure motivation, satisfaction, or intrinsic interest. O'Brien (2008, 2018) built a User Engagement Scale (UES) with a questionnaire to evaluate users of digital technologies and human-computer interactions. The questionnaire contains four factors: focused attention (FA), perceived usability (PU), aesthetic appeal (AE) and reward (RW). The long form includes 30 questions (UES) and the short form 12 (UES-SF) (O'Brien et al. 2018). In the thesis, we adapted the UES-SF to use it as a questionnaire to measure participants' engagement in the online meetings environment.

2.4 From ancient games to gamification

Games are with humans from the dawn of the civilization. The earliest artifacts, the astragalus bones (also called knucklebones) used as dice were discovered in ancient Babylonians and Egyptians, ancient civilizations of Mexico, ancient Greece and Rome, and many other places around the world (Koerper & Whitney-Desautels 1999). The earliest games were probably two persons dice games. For example, The Royal game of Ur was a board game with a goal to cross the board of 20 squares by throwing the dice and the faster player won. Another early example is Senet played in ancient Egypt (Park 2021).

Koerper and Whitney-Desautels (1999) provide a game definition in contrast to "amusements". A game is an organized play with two or more players or opponents who compete against each other with a goal to win. "Amusements" on the other hand can be spending free time on activities like "spinning tops, forming cat's cradles, or twirling buzzes" (Koerper & Whitney-Desautels 1999), where being amused plays an important part and not to compete to win.

Dave Grey, Sunni Brown, and James Macanufo (2010) give another distinction between game and play. Play is an activity without clear beginning and end, it is spontaneous and involves some body movement, engaging in interaction with some objects, like a ball, but does not have a goal and rules. On the other hand, a game starts when the players first establish a set of rules, a game scene: a space, environment where the specific rules abide. There are some artifacts and a goal to meet (Grey et al. 2010, 1-2). Another definition of game given by Roger Caillois (2001) characterizes it as a voluntary activity which is fun (not serious but entertaining character), separate, meaning setting up a scene and time boundaries, uncertain, so that the players cannot foresee the result, and governed by rules. He also adds the fictionality character of a game, which means the participants are aware of being in an imaginative state for the time of playing the game. People play games because it brings them joy and amusement (Caillois 2001).

If humans play games voluntarily based on intrinsic motivations, what if we would borrow some of the game's characteristics and utilize them in a non-game environment, like business? This kind of question arose at the beginning of the XXI century with the outburst of video games, online games, and software applications. With that there came a new term: "gamification", used for the first time around 2008 in the digital media industry (Deterding et al. 2011). Deterding et al. (2011) has proposed a definition of the term as using of "game design elements in non-game context". It is important to distinguish game design from gamification design. When we talk about games, the focus is on entertainment, while in gamification the goal is to enhance engagement and motivation in the given context (Mora et al. 2017). Yu-Kai Chou, who developed the Octalysis gamification framework, proposes yet another definition of gamification. It is "the craft of deriving all the fun and engaging elements found in games and applying them to real-world or productive activities" (Chou No date). Research has found that by adding some game mechanics to software applications increases adoption of the systems and effectiveness of employees, as well as gives the intrinsic motivation (Mattallaoui et al. 2016). The core purpose of gamification is to increase humans' engagement and motivation, which as a result brings more effectiveness to the outcomes.

2.5 Gamification frameworks

Mechanics, Dynamics, and Aesthetics (MDA) is a gamification framework proposed by Hunicke, LeBlanc, and Zubek, in 2004 (Mattallaoui et al. 2016). Mechanics describe game components and can include points, leaderboards, levels, and achievements. The purpose is to enhance participant's motivation and engagement. Dynamics is about the run-time behavior, the desire of the participant to engage in the activity. It can be achieved by giving rewards, higher status, or self-expression. Finally, aesthetics talks about emotional responses that

arise while being engaged in the activity. It represents the hedonic aspects of games (Mattallaoui et al. 2016).

Octalysis framework (Chou No date) looks at what motivates humans to undertake certain activities. It distinguishes eight core drives: Epic Meaning, Accomplishment, Empowerment, Ownership, Social Influence, Scarcity, Unpredictability, and Avoidance. According to Chou, those drives cover all the human motivations (Chou No date). By applying this framework to certain gamified activity, application, or service, it can be measured which of the drives are strong and which are not addressed at all or only partially. For that the Octalysis Score from 0 to 10 can be used. Literature review done by Weber et al. (2022) showed that the most common practices of using the Octalysis framework are for designing new ideas and applications, and to assign game elements used in the applications to the core drives. It is often utilized as a base for developing new models, as well as to analyze existing applications (Weber et al. 2022). The framework is often criticized for not being objective. It depends on the researcher's experience which core drives will be selected as dominant and hence it is difficult to compare the results. Another concern is that the user perspective is not highlighted and the whole framework lacks scientific background, it is mostly anecdotal (Weber et al. 2022).

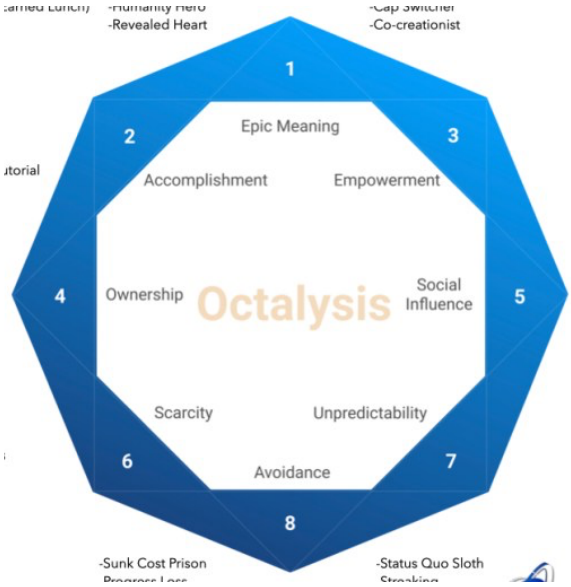


Figure 1: Octalysis Framework. Courtesy of Yu-Kai Chou (Chou, No date)

Another commonly used gamification tool is Marczewski's Gamification Framework (Marczewski 2014). It begins with asking questions of what is being gamified, why is it being gamified, and who are the users. Those questions belong to the planning phase. Next, he describes design and development phase, starting with a question how it is being gamified. It refers to how the users will be motivated. Would it be by some rewards like badges, points (extrinsic motivation) or intrinsic motivation like having satisfaction. This phase is followed by

analytics to measure the success and find pain points, testing with users, acting, and iterating on feedback, and finally releasing the solution. To elaborate on the first phase, the core point here is to define the problem by asking what the problem is, what are you trying to solve, why using gamification, and who is the target audience, to get to know the users. Marczewski (2014) defines six user types. They are Disruptor, Philanthropist, Free Spirit, Socializer, Achiever, and Player. They are motivated by different drives like change, purpose, autonomy, relatedness, mastery, and reward respectively.

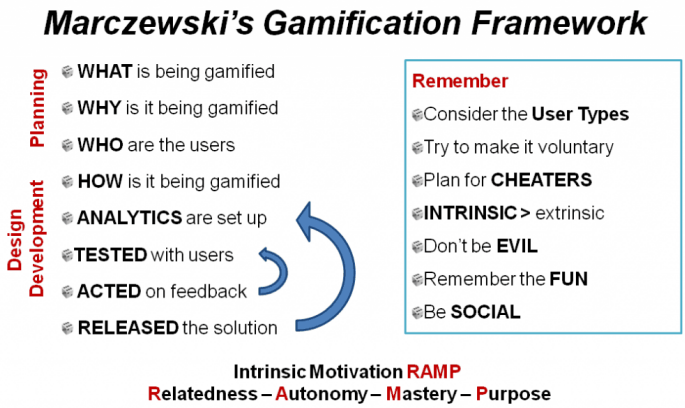


Figure 2: Marczewski's Gamification Framework. Courtesy of Andrzej Marczewski (2014)

Kumar and Herger (2013) proposed yet another gamification approach, they called it Player Centered Design, which derives from User Centered Design philosophy and human-centered design principles. While in User Centered Design we put the user in the center and aim to satisfy their needs and create the product or service efficient and effective, in the Player Centered Design there is yet another element added: increased engagement. The methodology combines five steps: understand the player; identify the mission; understand human motivation; apply game mechanics; and manage, monitor, and measure.

The work starts with creating the player persona based on observations and interviews. Next comes the mission, where the key is to understand and analyze the current scenario and identify what is the ideal or target scenario. Based on that, the mission, or the goal of the gamification activity, can be defined (Kumar & Herger 2013, 56). After learning who are the players, what are their motivations and what is the goal, the game mechanics can be applied. The Player Centered Design framework lists a lot of examples, like points, badges, leaderboards, progress, narrative, emotion and more. The next step is to set up game rules and feedback loops to keep the players engaged. The last point of monitoring and measuring means, the introduced gamification must be monitored, if it is still engaging, by gathering feedback from the players.

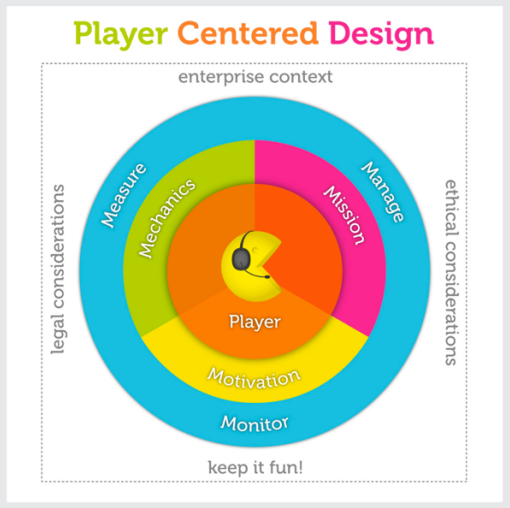


Figure 3: Player Centered Design process by Kumar and Herger. Courtesy of Janaki Kumar and Mario Herger (2013)

For creating the player persona, the player-centered design framework proposes using The Bartle Player Types based on research by Richard Bartle who created a psychology test to classify players into categories: achievers, explorers, socializers, and killers (Kumar & Herger 2013, 44). According to Bartle's research, about 10 percent of people are achievers and about the same percentage are explorers. The largest group are socializers, with about 80 percent belonging to this category. The last one, killers, are only marginal number of people, with less than 1 percent of players of this type. Including this aspect helps creating specific gamified activities.

3 Research methodology

In this chapter, we describe what human-centered design is (Norman 2013) and the double-diamond design methodology introduced by British Design Council in 2005. We go through all the phases of the service design process, which are research, ideation, prototyping, and implementation, and its iterative nature (Stickdorn et al. 2018). We explain in details data collecting and data analysis methodologies.

3.1 Service design process

As Don Norman states (2013, xi), good design is hard to notice, as it serves people's needs in an almost invisible way. People are much more aware of bad design, when something feels uncomfortable, difficult to use, and does not meet the needs. In other words, good design is human-centered, which means that human needs are served based on understanding human

psychology and human way of interacting with things, being it everyday items, technology, or services (Norman 2013, 8-9). One of the main principles of human-centered design (HCD) mentioned by Norman, is not to define a solution to a problem at the beginning, but in a process of iterations. With each iteration, the idea is further modified and improved based on feedback, and as a result it will eventually meet human needs. All this process of digging the real problem and looking at the wide range of potential solutions to meet human needs is called design thinking (Norman 2013, 219).

The two described components of design: finding the right problem and meeting human needs are defined in the double-diamond design methodology introduced by British Design Council (Ball 2019). The double-diamond model contains four stages: discover, define, develop, and deliver. They go through divergence and convergence phases. The first phase is expanding, looking for more opportunities, and exploring. The latter one is about narrowing it, seeking solutions, and making decisions. In the double-diamond the two phases are repeated. During the research part, the ideas are discovered (divergent thinking) and defined (convergent thinking), next during the solution part, the prototypes are designed and developed (divergent thinking), and as a result tested and delivered (convergent thinking) (Ball 2019).

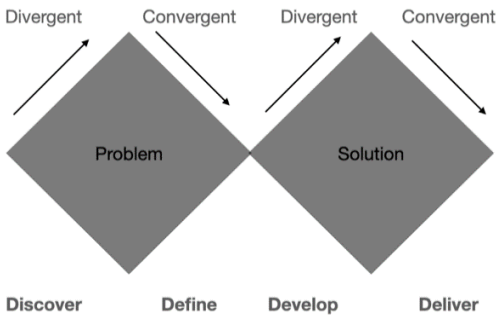


Figure 4: Double Diamond adapted from British Design Council

In accordance with the human-centered design, within the double-diamond phases there is an iteration process. It means, while being in a certain phase, one can always go back to the previous phase. It does not mean that one goes back and starts from the beginning. With every iteration the researcher gains new knowledge, experience, and with those tools can further ideate and develop the idea (Stickdorn et al. 2018, 95). The iterative actions as defined in service design are research, ideation, prototyping, and implementation (Stickdorn et al. 2018, 97). Norman (2013, 222) describes the iterative actions as observation, idea generation (ideation), prototyping, and testing.

In the thesis, we applied the service design process. Research: field studies with ethnographic approach including observations and interviews; ideation: brainstorming ideas for the meeting scenario; prototyping: creating the scenario; implementation: using it in a meeting.

3.1.1 Research: field studies

The research or observation phase is to understand the problem, to see the problem, to meet people who experience it. The crucial thing is not to go to assumptions and immediate solutions, but to carefully watch the people in their natural environment and listen to them and their views and how they see and experience the problem (Stickdorn et al. 2018, 100). It can be done by various research, like field studies that use ethnographic approach, where the researcher observes the research subjects in their surroundings and interviews them. For best outcomes the interviews should be in-depth and semi-structured conducted in the environment of the research problem. At this stage, it is important to define, who are the research participants and select them. Based on the interviews and research, a persona can be created. Persona is an archetype of the user; it represents a particular group that is of the research interest and has the characteristics, needs, and behavior of the research participants (Blomkvist 2002). Persona helps to empathize with the research group.

3.1.2 Ideation: brainstorming ideas

The goal of ideation phase is to generate several ideas, to brainstorm without any constrains, as wide and freely as possible. As “even crazy ideas, often obviously wrong, can contain creative insights that can later be extracted and put to good use” (Norman 2013, 226). To help generating ideas, several techniques can be applied. For example, the 5 Ws + H which means asking questions who, where, what, why, when, and how or the Five Whys, that is simply asking “Why?” five times and each time going deeper into the idea (Stickdorn et al. 2018, 161). The techniques encourage creative thinking. After many ideas are generated, the researcher should decide, which one to keep for further development.

3.1.3 Prototyping and implementation

The next phase is called prototyping. This is the time when the idea is turned into a simple prototype of a product or service which can be tested with a selected group of participants or users to learn about how it is experienced and evaluated by them. The important part of prototyping is to ask the right questions about value, look and feel, feasibility, and integration. (Stickdorn et al. 2018, 193-195.)

The prototype is then tested in the implementation phase and based on participants feedback iterated and tested again. This process can be repeated several times until the refined product or service reaches the desired needs.

We also used elements of the player-centered design gamification framework, specifically for creating the player persona, and choosing game mechanics (Kumar & Herger 2013).

3.2 Data collecting methodology

While conducting the research, we used the covert research method (Stickdorn et al. 2018, 105), which means, that the researcher does not reveal their intentions. This method allows to observe the participants how they naturally behave in the meetings. The opposite way of conducting the research is overt research, which means the research subjects are aware of taking part in the research. It can lead to undesired behavior, like the participants behaving according to the expectations. The thesis author, as being herself a team member and a regular participant of the meetings, was not suspected to be conducting any observational research during the meetings.

For the interviews, we used the convenience sampling method described by service design. It means, number of people are chosen by the researcher from the whole group based on the researcher's preferences. There is a potential bias to this approach, as people are not randomly chosen but based on the researcher's subjective decisions. Next question is what the sample size of the research subjects should be. According to usability researchers Nielson and Landauer, it is enough to interview only 5 users to be able to find 85 percent of all usability problems. In service design it is recommended to start with a small group with diverse participants and stop to get new people when the similar patterns start to be seen (Stickdorn et al. 2018, 104).

The interviews were done in a semi-structured way, which means that participants are asked a set of questions prepared earlier by the researcher, but with the flow of the conversation, there may come some additional and unplanned questions and comments, which deepen the answers.

For creating the player persona, it is important to know, what player types are the research subjects. For this, the player-centered design framework proposes using The Bartle Player Types, described in the previous chapter.

The last point of collecting data about the research subjects is understanding participants' motivations. By learning, what motivates the participants, it is possible to design the gamification activities which would fulfill those motivations. To find out what drives people, elements of another gamification framework, Octalysis by Yu-kai Chou (No date) can be applied. The framework describes 8 Core Drives that motivate humans to undergo or engage in certain activities. Based on the description of the 8 Core Drives, we created a Motivation Test where each of the questions covered one of the core drives. Possible responses were in a scale from 1 (Not at all) to 5 (Very much so).

3.3 Data analysis methodology

Data analysis was done using a Research Wall (Stickdorn et al. 2018, 127), that is by gathering all important data collected during interviews and other research on a large piece of paper, and grouping them based on similarities, common themes, and relationships.

As a result of the interviews and the Bartle Player types, a persona was created. Persona is an archetype of a meeting participant, describing the characteristics of the participants, their motivations, problems, and needs. At this point, the player-centered design gamification framework was applied and followed the player persona definition and template provided by Kumar and Herger (2013, 38-46). To create the player persona, some specific characteristics must be described: demographics, job title, work style and work culture of the company, their hobbies, the Bartle Player Types, and as the most important part the pain points and aspirations.

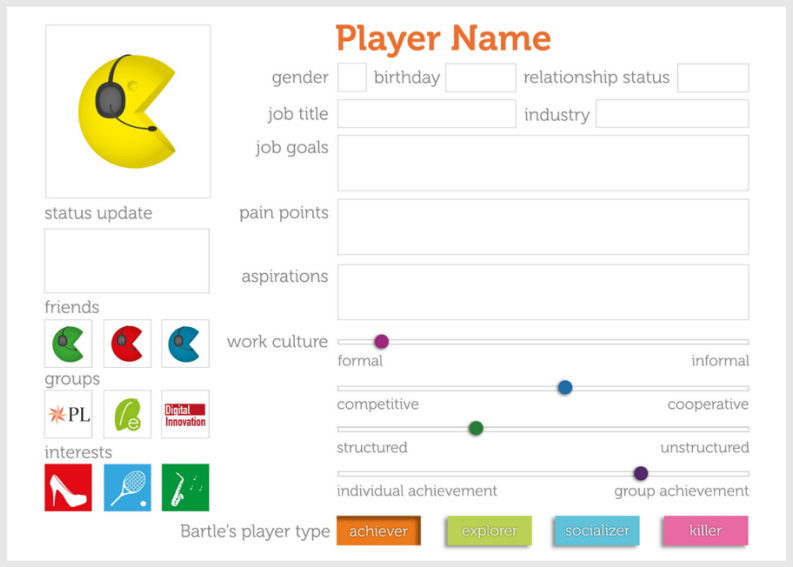


Figure 5: A Player persona template by Kumar and Herger. Courtesy of Janaki Kumar and Mario Herger (2013)

For visualizing the current state and future state of the persona, a Journey Map (Stickdorn et al. 2018, 129) was created. In a Journey Map, first, the analysis of a current situation is made, by gathering all the pain points and current experiences of the persona. Next, the future scenario is visualized, by collecting information on how the situation could be improved, what could be done, what are the wishes.

3.3.1 Measuring Engagement tool

Based on the literature review, we decided to adapt O'Brien's (2008, 2018) User Engagement Scale (UES) as an engagement measurement methodology. It is a questionnaire to evaluate users of digital technologies and human-computer interactions. We decided, it would meet our needs, as we dealt with users interacting with online software tools, like Google Meet for the online meetings, plus often additional digital collaborating tools such as Miro boards, online surveys, and such.

The questionnaire considers four factors: focused attention (FA), perceived usability (PU), aesthetic appeal (AE), and reward (RW). The long form includes 30 questions (UES) and the short form 12 (UES-SF) (O'Brien et al. 2018). In the thesis, we adapted the UES-SF to measure participants' engagement in the online meetings. The adaptation was made in accordance with the O'Brien's suggestions given in the research paper about how the questions can be re-formulated to meet the specific needs and instructions how to calculate the results (O'Brien et al. 2018). The results must be calculated for everyone separately by adding points for all 12 questions and dividing the sum by 12. The scale is from 1 to 5, with 1 for strongly disagree and 5 for strongly agree. Questions from perceived usability (PU) part of the survey are reversed scored, according to instructions. To get the average score of the whole sample group, all the individual final scores are added and then divided by the number of respondents. In the User Engagement Scale, the higher overall score the better the user engagement. The set of original and adapted questions can be found in Appendix 1.

3.3.2 Game mechanics

Game mechanics (Kumar & Herger 2013, 69-84) are concrete tools or building blocks used in gamification projects. Game mechanics address human motivations and can get a form of simply points, badges, or leaderboards, but also a form of narrative, limited time, or resources to complete a task, or building relationships. Humans are motivated by the need of being connected, taking challenges, and being motivated to act for the higher purpose, by constrains with extreme self-motivation, by being part of a narrative, a story, by uncertainties, and by emotions.

In summary, data analysis was done by reviewing the interviews and finding commonalities, by counting results from the Bartle Player Type test and Motivation Test and finding what are the characteristics of the player persona. We also gathered data from the User Engagement Scale questionnaires and analyzed which of the game mechanics would work best in our case.

4 Conducting research

During the field research phase, we took part in the team meetings observing the settings, the way of presenting topics, and participants' behavior. We prepared for one of the meetings some form of gamification to test, if introducing such elements to a meeting could make a difference. Our next step was to observe a meeting without any gamification added. After each of the sessions, we asked participants for feedback in a form of a survey. Next, we conducted in-depth interviews in a semi-structured way. They were done online in the Google Meet sessions, with subjects being in their usual work environment (home office), with one exception of a face-to-face meeting in the office premises. As a final part, we created the gamified meeting scenario and applied it in the planned online meeting. We followed service design stages of research, ideation, prototyping, and implementation.

4.1 Research stage

4.1.1 Test meeting with gamification – collecting data

At this stage, we didn't conduct any interviews to learn, what are the real problems of the participants. The gamification used for the test was based on preparatory desk research.

After the facilitated meeting, we asked for feedback in a form of a simple survey with only two questions. We used Mentimeter for that (Mentimeter No date). It is an online tool to create quizzes, surveys, and presentations, where the user can create slides with different kinds of questions, for example multiple choice, open ended, or quiz competition, where there is one correct answer. Below is presented an example of the Mentimeter survey question.

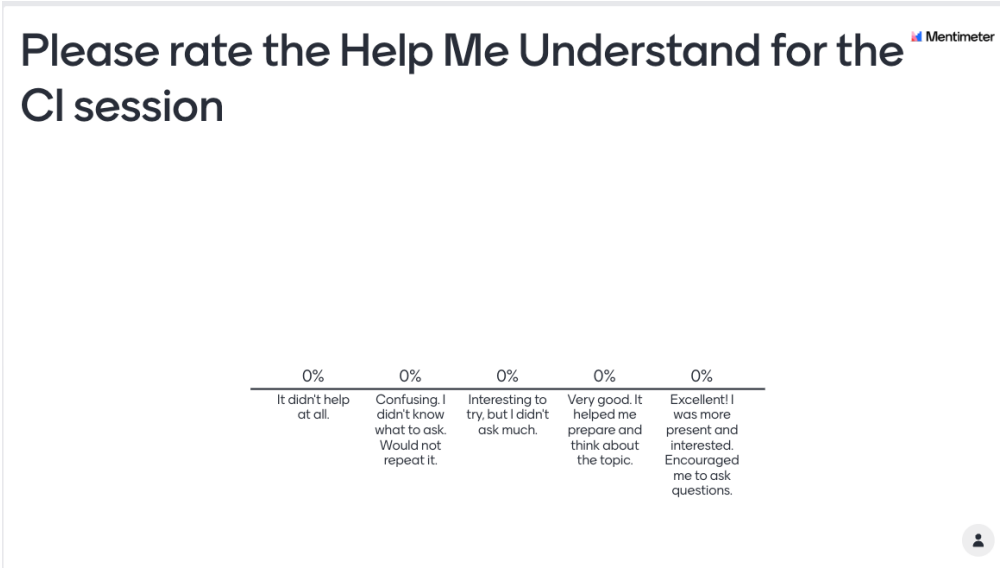


Figure 6: Survey question in the Mentimeter presented after a meeting

The gamification we used was adapted from the book “Gamestorming” (Gray et al. 2010, 181) and was called “Help Me Understand”. It is a well-known tool used in service design, taken from journalism (a basic structure of a news story) of asking five questions: who, what, when, where, why, and how. For the gamification, we used a Miro board (Miro No date). Miro board is an interactive online tool which works like a white board, where meetings’ participants can write, add sticky notes, pictures and emojis, can create templates, and cooperate as a team creating a common outcome. It is used by the client company for meetings, especially of a retrospective type. For the session, we created a simple template. We wrote a title of the meeting, below that we wrote the questions, and below each of them we placed a bunch of sticky notes. On the side, we also wrote instructions on how to use the board.

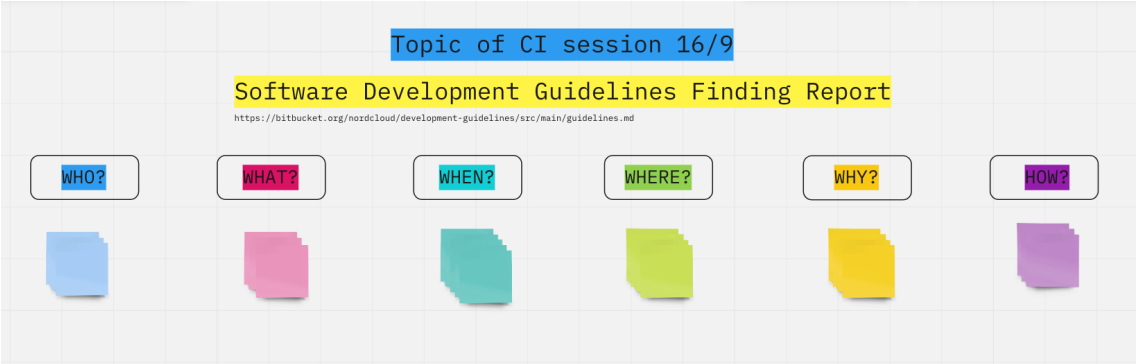


Figure 7: Gamification ”Help Me Understand” created on the Miro board

The idea was to encourage participants to ask questions before, during, and after the meeting. It was also a tool for the presenter, who could get some of the initial questions before he even started the presentation and this could give him an idea, what are the expectations, or what is not understood and would need more attention. Then, during the session, participants were free to write their questions without having to raise their hands, unmute microphone, and say it out loud. Also, all the questions had good visibility on the board, could prompt to ask follow-up questions, or give written comments. This was a clear structure comparing to posting questions in a meeting chat, which get lost after the meeting ends.

After the session ended, we asked the participants to take part in a two-question survey about the meeting experience. The first question was: “Please rate the Help Me Understand for the CI session”. There were five possible answers to choose from:

- It didn’t help at all.
- Confusing. I didn't know what to ask. Would not repeat it.
- Interesting to try, but I didn't ask much.
- Very good. It helped me prepare and think about the topic.

- Excellent! I was more present and interested. Encouraged me to ask questions.

The second question was open-ended: “In a few words, how the Help Me Understand influenced your active participation?” Participants were free to answer to it in their own words.

4.1.2 Meeting without gamification – collecting data

Neither participants nor presenters were aware that they are observed, and they will be asked for feedback. After the meeting, we gave again a simple two question survey from Mentimeter. First question asked: “How effective was the session for you?” There were 4 answers to choose from:

- I got distracted, couldn't focus, did some other things in between.
- I was focused at the beginning, but lost interest after some time.
- I was interested in the topics, but the way of presenting was dull.
- I was interested in the topics and got a lot out of them. Good session.

The second question was open ended, and we asked for answering using own words: “Have you learned something? Did you get a chance to interact? What could be done differently to get your full attention?”

We also asked afterwards to respond to the User Engagement Scale UES-SF (O'Brien et al. 2018) questionnaire to have a baseline for comparison with a planned meeting with gamification. We got 4 responses.

4.1.3 Collecting data via interviews

The team that was a subject of our research comprises of 22 people, among whom there are two team managers, four squad leads, one application specialist, and the rest are the cloud architects and software developers. We focused on the technical roles first because those people are the majority; second, the Continuous Improvement meetings are especially important for them; third, they are not very active in the meetings. In the end, we chose four developers and one squad lead. We chose people who based on observations of their behavior, were usually quiet in the meetings, not asking questions, and kept their cameras off. We decided not to include in the interviews people, who are always talkative and active, no matter if the meeting is engaging or not. The aim was to get to know the pain points and needs of those, who do not participate actively and what to do to change their behavior.

Each of the interviews followed the same pattern, with the same questions that we split into four categories. We started with introductory questions easy to answer, that is demographics, work facts, and interests, to create a relaxed atmosphere. Next, we asked questions about

their workstyle, to get to know them better. The answers revealed a bit of person's personality, interacting with others, and special preferences. After that, we had a set of questions about current state, in our case about how they perceive the meetings now, which of them they like, dislike, what is good, bad, and why. The last part was about the future state, the "dream meeting" scenario, how they imagine a good meeting, what does it mean for them. In the end of each interview, we thanked the interviewee for their time and effort. The list of questions can be found in Appendix 3.

The interviews were recorded using the phone application for voice recordings. There was no need to record the whole video meeting, as registering and describing the interviewees behavior, body language, mimics, was out of the research scope. The voice recording was needed to transcribe all the answers.

4.1.4 Analyzing data from the interviews and tests

Based on the input from the interviews and tests, we created a research wall using Miro board. We did it by synthesizing data, writing down on the sticky notes single words and phrases that were said by the interviewees, focusing on the pain points, wishes, their characteristics and work style. Next, we grouped the common problems to looked for patterns and similarities. It helped us to create a persona and design the meeting gamification.

Figure 8: Research wall with clusters of common problems (from Miro)

To create the persona, that is an archetype of the meeting participant, we used the player persona template described in "Gamification at Work: Designing Engaging Business Software" (Kumar & Herger 2013). To complete the description, we needed to get Bartle's Player Type.

The original Bartle Test is available online (The Bartle Test of Gamer Psychology No date), but we decided not to ask the research subjects to fill it in, as this is a long and time-consuming test. Instead, we prepared a one question survey we sent on Slack in direct messages, asking: “What type of player are you?” We provided four options with a) to d) answers, based on Bartle categories, describing them according to description provided by Kumar and Herger (2013).

a) Achiever – I play to gain points and status.

b) Explorer – I love to discover new aspects of a game, even if I have to do repetitive tasks to unlock new levels.

c) Socializer – I play for joy of interacting with others rather than for the game itself.

d) Killer – I like to win points and I find joy in seeing others lose.

We sent the question to all interviewed people plus a few more randomly chosen. We got six responses in total. Based on them, we formed a player type of our persona.

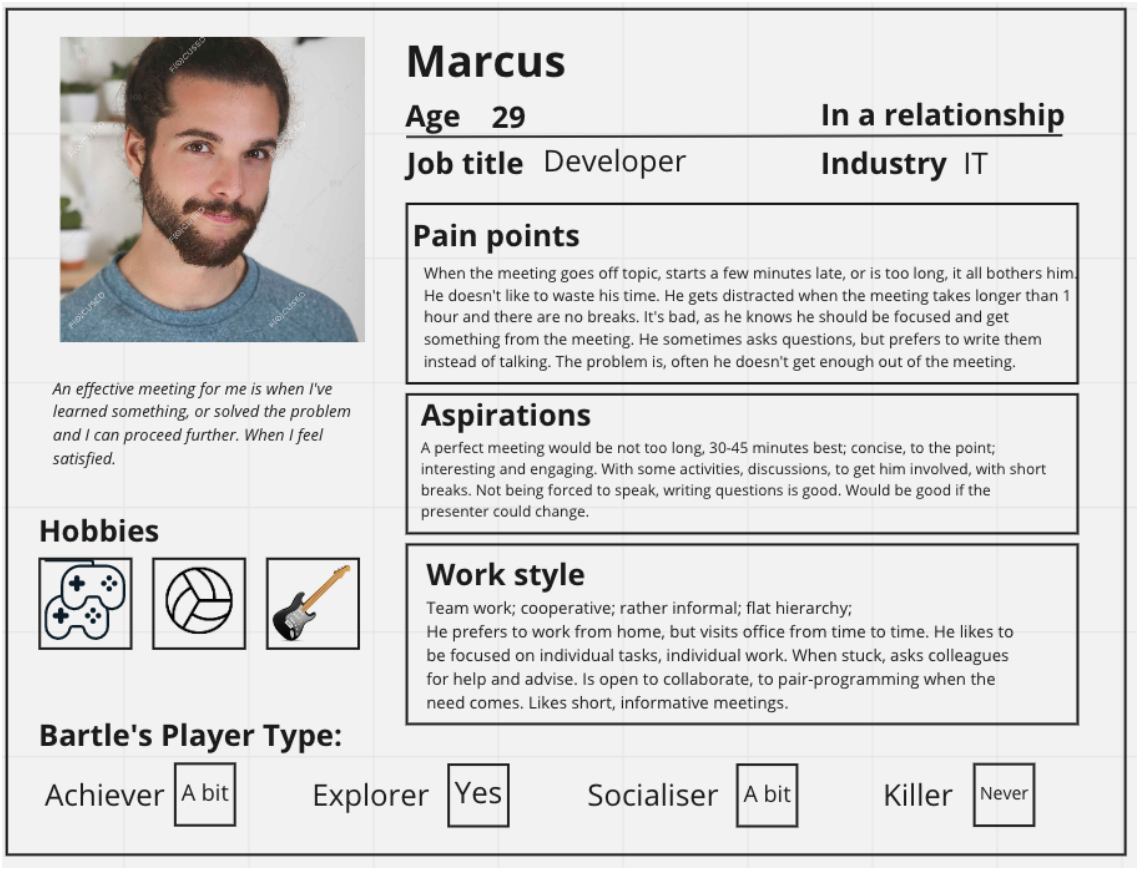


Figure 9: Player persona created based on interviews and player types test

To understand the research subjects, it was important to learn about their motivations. If we know what motivates people, we can create tools that will fulfill those motivations resulting with greater satisfaction. We prepared a Motivation Test with eight questions based on the

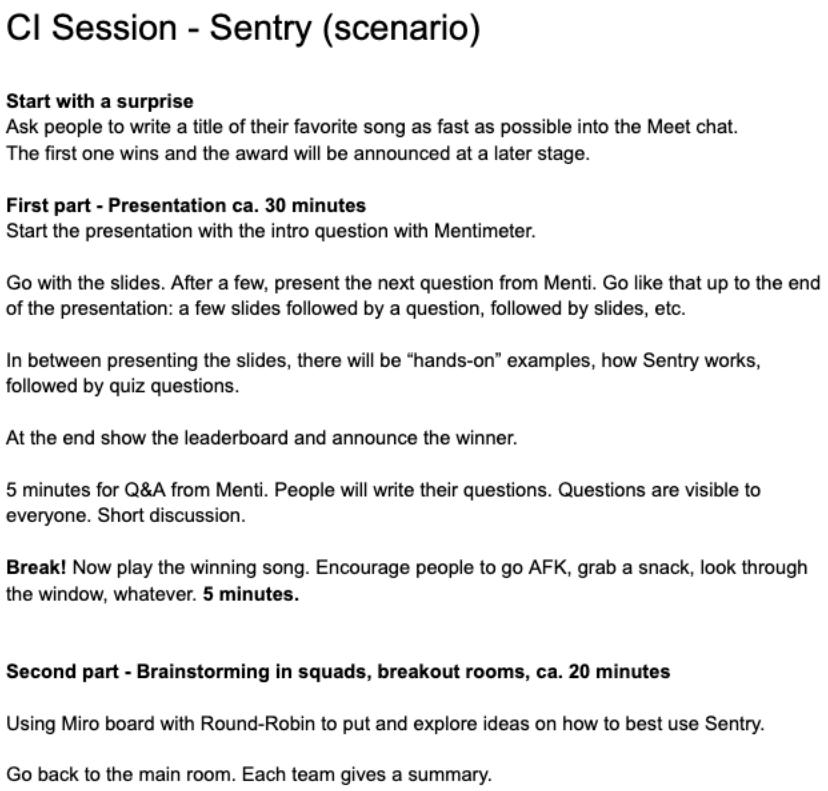
Octalysis framework by Chou (No date). We created each of the questions based on the descriptions and examples provided by Chou. The test was conducted during one of the team meetings of a more relaxed type. We gave participants as much time as they needed to quietly answer all the questions. After that, we presented the results and gave a short explanation about the Octalysis core drives. The whole online exercise took about 20 minutes, and we got eight responses (the total number of that meeting participants). Based on the motivation test results, we decided what were the biggest drivers of the participants. The test questions can be found in Appendix 5.

4.2 Ideation. What game mechanics would work

After collecting and analyzing all data from the interviews and tests, we listed pain points and wishes, as well as the strongest motivations and how they are translated into game mechanics. Tools that would work with our participants were: points and badges, some sort of unpredictability, something creative, and count-down timer. Addressing the pains, the meeting should include short breaks and some activities to keep people's attention. We also decided to leave the camera on/off option open to the participants and not explicitly asking them for turning it on at the beginning of the meeting. It was based on our findings that for some people being visible to others during an online meeting was stressful and gave them an uncomfortable feeling.

4.3 Prototyping. The gamified meeting scenario

We created a preliminary scenario for the Continuous Improvement session and presented it to the team of four people (three developers and one squad lead), who was organizing and hosting the meeting. In the scenario, we proposed starting with a question to write a title of your favorite song as fast as possible. The first one would be the winner, and the reward would be announced later. Next, we proposed starting the presentation with a simple question formulated in a funny and surprising way about the topic. After that, the presentation would proceed. After about 5-10 minutes, the presenter would go back to the quiz and ask a few questions related to what was explained. And he would follow with the presentation and repeat the process: a few slides and a few questions. At the end, the presenter would show the leaderboard with participants results.



CI Session - Sentry (scenario)

Start with a surprise
Ask people to write a title of their favorite song as fast as possible into the Meet chat.
The first one wins and the award will be announced at a later stage.

First part - Presentation ca. 30 minutes
Start the presentation with the intro question with Mentimeter.

Go with the slides. After a few, present the next question from Menti. Go like that up to the end of the presentation: a few slides followed by a question, followed by slides, etc.

In between presenting the slides, there will be “hands-on” examples, how Sentry works, followed by quiz questions.

At the end show the leaderboard and announce the winner.

5 minutes for Q&A from Menti. People will write their questions. Questions are visible to everyone. Short discussion.

Break! Now play the winning song. Encourage people to go AFK, grab a snack, look through the window, whatever. **5 minutes.**

Second part - Brainstorming in squads, breakout rooms, ca. 20 minutes

Using Miro board with Round-Robin to put and explore ideas on how to best use Sentry.

Go back to the main room. Each team gives a summary.

Figure 10: A prototype of the meeting scenario how it was presented to the team

After the presentation, there would be a short break with playing the winning song. Next, the workshop in small teams would begin, with each team in a separate breakout room. For the workshop discussion, we suggested using a Miro board with a Round-Robin technique by writing down ideas. The rules are as follows: each participant writes down the first idea and passes the card to the next person. The next one can enhance the existing idea, add something, and pass again to the next in row. This way everyone gets the voice, and the ideas can develop. At the end, everyone votes on best ideas. After finishing the workshop, each team would go back to the main meeting and present their outcomes.

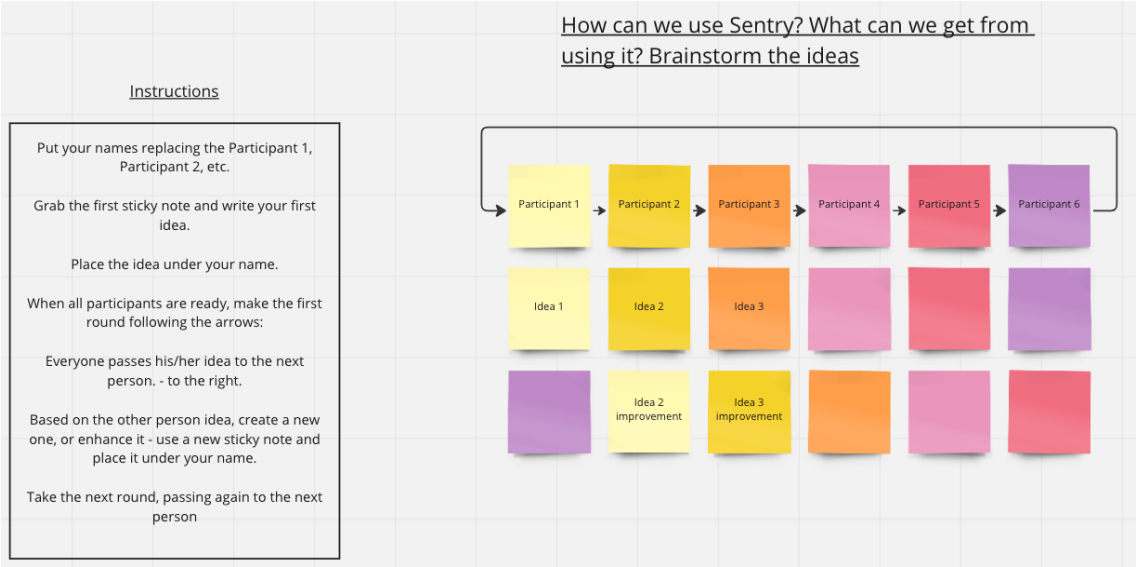


Figure 11: A template with the Round-Robin activity for brainstorming ideas (from Miro)

After introducing the scenario to the hosting team during a preparation meeting, we gathered feedback. Not all the ideas were applauded, and we had a discussion what would work better. Based on the feedback, we did an iteration to the initial designs. We resigned from the first task with the song contest, as this idea was met with confusion, as being strange and out of topic. The other change was for the workshop. Instead of using the Miro board with the Round-Robin, three simple questions would be displayed on the slide: who, when, and what. In every breakout room we planned to have one person from the hosting team, to moderate the workshop. The reason for this change was, that the workshop was too short for the Round-Robin, and the aim was to address those basic questions, and not brainstorm advanced ideas.

4.4 Implementation. Running the gamified meeting

The gamified meeting took place on Friday 16th of December 2022 during the planned, recurring monthly Continuous Improvement online session on Google Meet. There were 19 participants, including four who prepared the meeting. One of them was the main host. The author of the thesis was in the meeting but took a passive role of an observant, intervening only when there were some technical difficulties with displaying the Mentimeter quiz and results. The passive role was taken deliberately. We wanted to check, how the gamification tools work in the meeting and what will be the results of introducing them, no matter who is facilitating the session. We did not want to get the biased results based on the fact, that the thesis author was known of conducting the research. We wanted to test, if the tools can be given in a form of instructions to a meeting host and easily used by them.

The presentation was cut into three parts with quiz questions after each part. After the presentation and announcing the winner, there was a 5-minute break, encouraging people to stand up and go away from the computer. It was after about 40 minutes from the session start. The meeting resumed afterwards with breakout rooms, where teams were going to discuss a given topic. The risk with breakout rooms, as mentioned by some of the research subjects, was that often the most talkative people take over the discussion or if there are only quiet people in the room, no one speaks. We tried to avoid this scenario by having a moderator in each of the breakout rooms to help with questions and encourage the quiet ones to comment on the topic. To make it easier, there were three simple questions that needed to be addressed: who, when, and what.

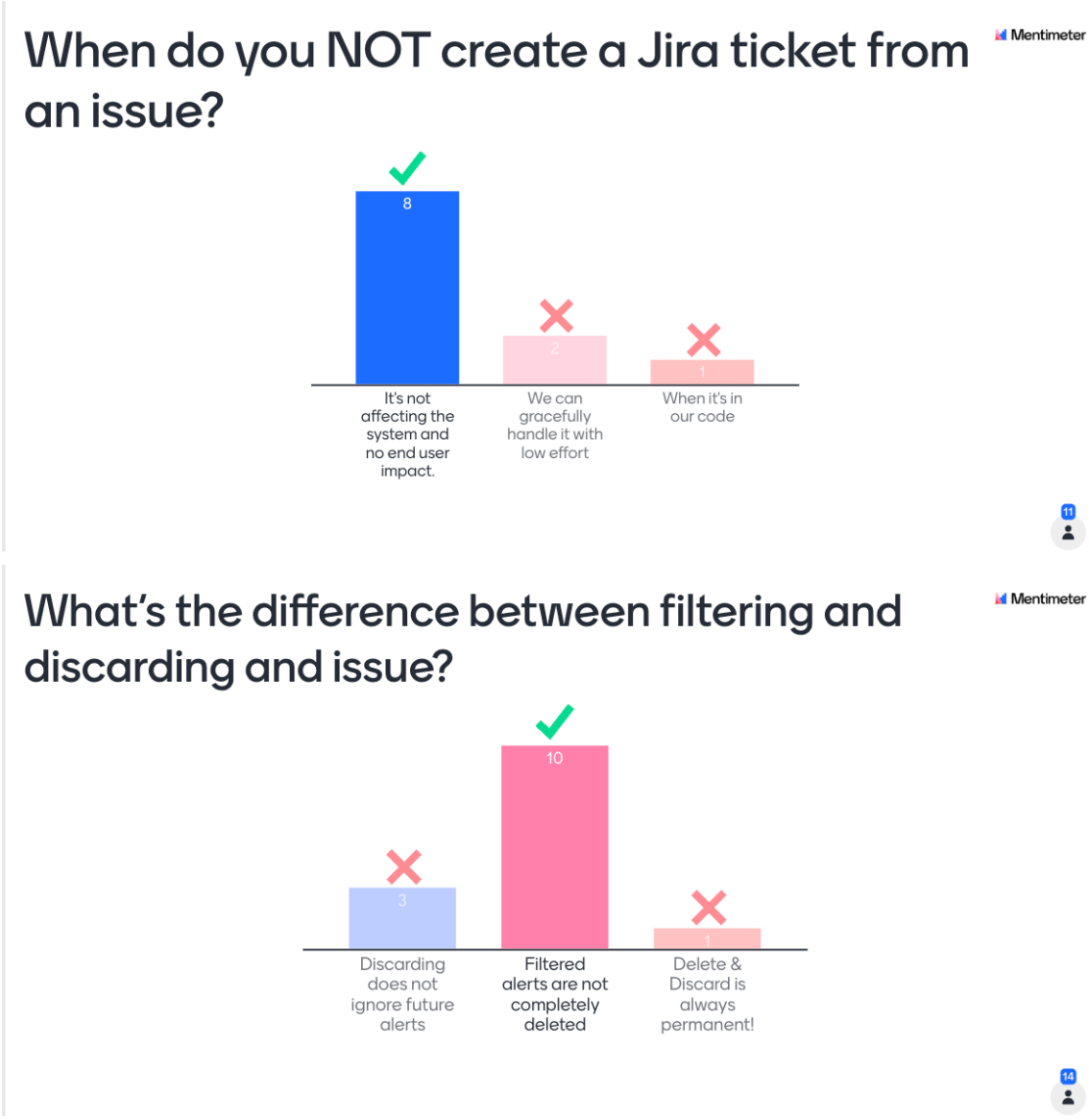


Figure 12: Selected questions from the quiz given to the participants of the gamified meeting (from Mentimeter)

By the end of the session, we asked the participants to respond to the questionnaire and we provided the link both in the meeting chat and in the team's Slack channel. It was the User Engagement Scale UES-SF (O'Brien et al. 2018) adapted form. It was created using Google Form templates. We got 8 responses. Based on them, we calculated the results. A screenshot of a questionnaire can be found in Appendix 2.

5 Results

In this chapter we present the findings from the meetings where gamification was applied: a test meeting and a meeting with a prepared scenario, and one meeting without any facilitation. We analyze results from the interviews and Bartle Player and Motivation tests. In the end, we present and compare the results from the User Engagement Scale (UES-SF) questionnaire provided after a session with and without gamification.

5.1 Findings from the test meeting with gamification

During the meeting, participants wrote several questions and were posting comments to them, when they knew the answers. As the session proceeded, the host got encouraged and added yet another category and asked for more comments. The meeting was interactive and engaging.

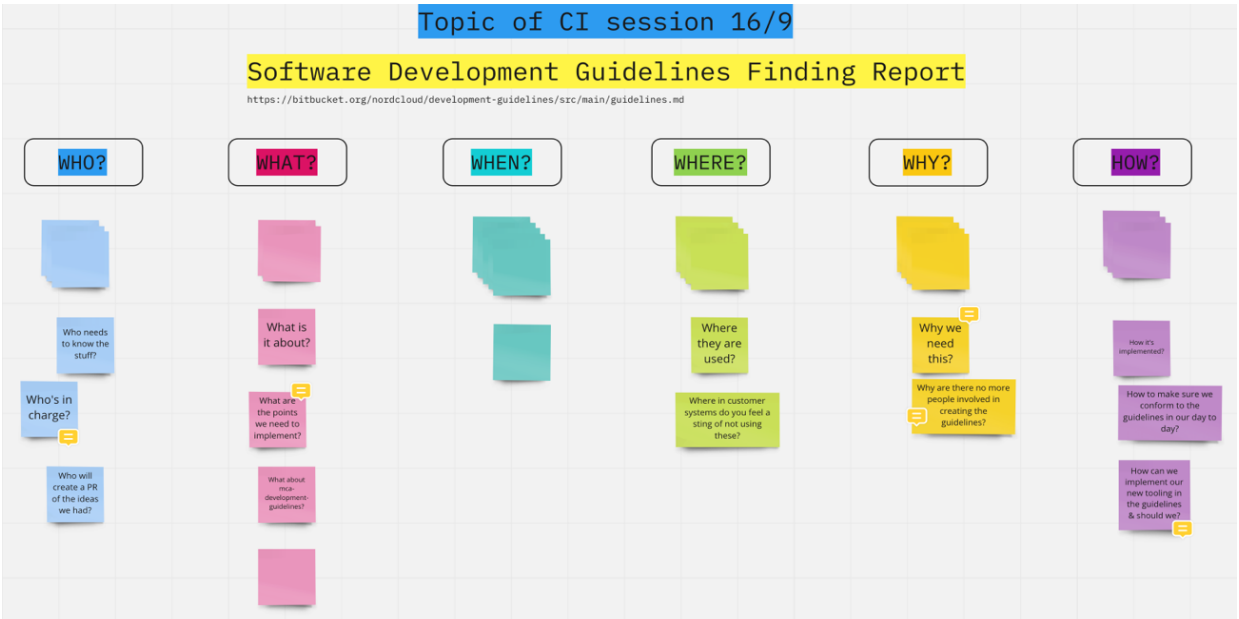


Figure 13: View of the Miro board after Continuous Improvement session with a test gamification Help Me Understand (from Miro)

Before the end of the meeting, we asked the participants to answer to the two-questions survey. The results were promising. Out of 15 participants, we got 13 responses. Majority of respondents (84 %) had positive reaction to the gamified form of the meeting. Out of it, 69 percent chose the answer: “Very good. It helped me prepare and think about the topic.” Additionally, 15 percent answered: “Excellent! I was more present and interested. Encouraged me to ask questions.” Only 16 percent of participants were not impressed by the facilitation method, with answers: “Confusing. I didn't know what to ask. Would not repeat it” and “Interesting to try, but I didn't ask much”, 8 percent for each of the questions. No one chose the most negative answer of: “It didn’t help at all”.

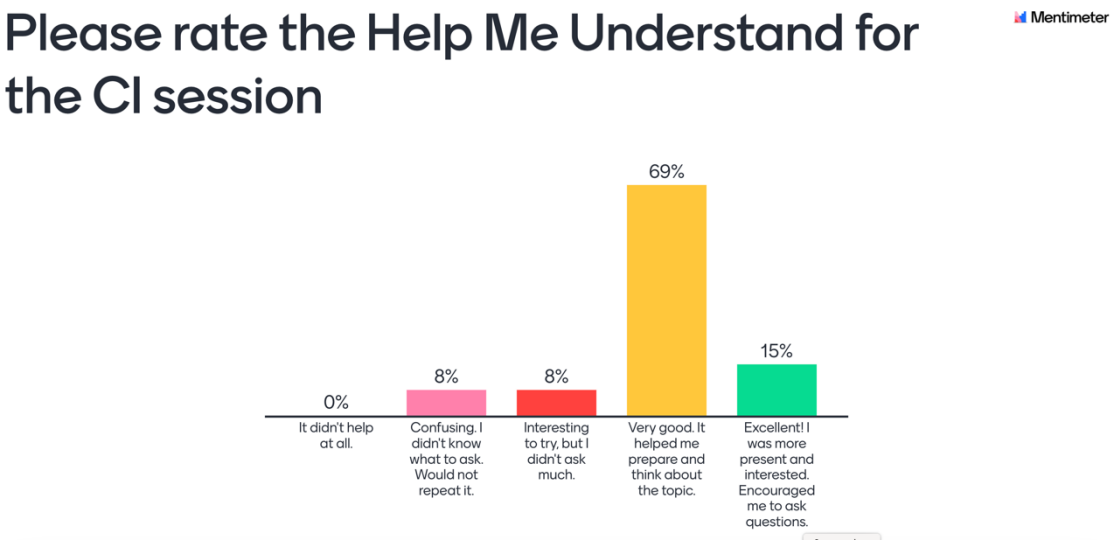


Figure 14: Results from the survey after the Continuous Improvement session with a test gamification Help Me Understand (from Mentimeter)

To the second question that was open-ended, we got eight comments. Participants were mostly positive with their feedback, saying the ready-made template made it easier to ask questions, they didn’t have to stop the presentation to ask something, they had to be more alerted, everyone could contribute. Positive comments came also from the presenter’s side.

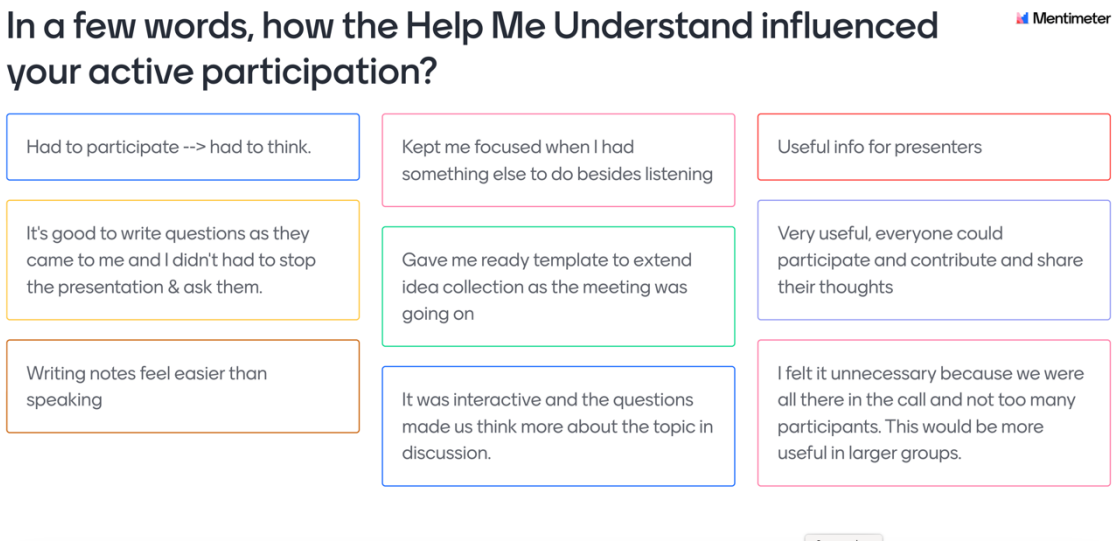


Figure 15: Responses from the open-ended question after the Continuous Improvement session with a test gamification Help Me Understand (from Mentimeter)

5.2 Results from non-gamified session

From the survey after the non-gamified meeting, we got 6 responses to the first question, and just 3 to the second, with 15 participants of the meeting. The small number of responses could be due to the fact, that the survey we provided already after the session ended. The Mentimeter survey is a live survey, so that to go to the next question, the survey host must press a key. It was hard to conduct without having all participants together at the meeting and not knowing, how many are active and waiting for the next question.

The responses about the session effectiveness were mostly negative, with getting distracted and losing interest. The few comments from the open-ended question also showed, that the session did not meet the expectations, was not engaging but instead overloaded with information and as a result it was hard to get something out of it.

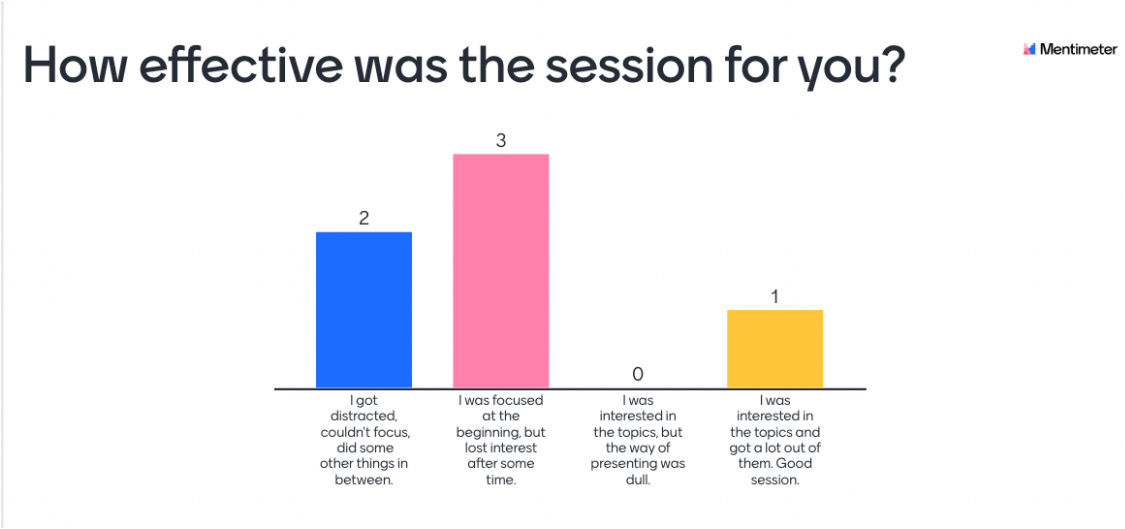


Figure 16: Participants' responses after a non-gamified online Continuous Improvement session (from Mentimeter)

5.3 Findings from the interviews

From the interviews we learned that the most draining thing is the length of a meeting. For each of the interviewees, meetings longer then 45-60 minutes were tiring. They said, they were losing focus already after 30 minutes, getting distracted and starting to do some other tasks, like checking Slack messages, news, of social media feeds. They also said, that after being distracted, it was hard to get back to the presentation and focus again, because you got lost by not listening. Another common pain was holding presentations in a monotonous and not engaging way. Starting the meeting late, waiting for participants to join was considered a very annoying thing and it was related to the feeling of losing time.

As a counterexample, they talked about sessions, where there are plenty of practical cases described, so that participants could relate, as they encountered similar issues at work. Workshop or interactive style of meetings were preferred over plain presentation. If the meeting must take longer, they asked for breaks. The interviewees did not like meetings that do not add much to their work, they liked those where one could clearly learn something useful, broaden their knowledge, solve a problem. They emphasized they liked when the meetings were "to the point". For each of the people we interviewed, out of all meetings they had at work, dailies were their favorites. A daily is a short 15–30-minute morning meeting within a small team (or squad), where everyone talks about their tasks for the day. The agenda is clear, everyone has a say, everyone can get a quick answer if they have any problems. In larger meetings, they preferred to write down their questions instead of voicing them out.

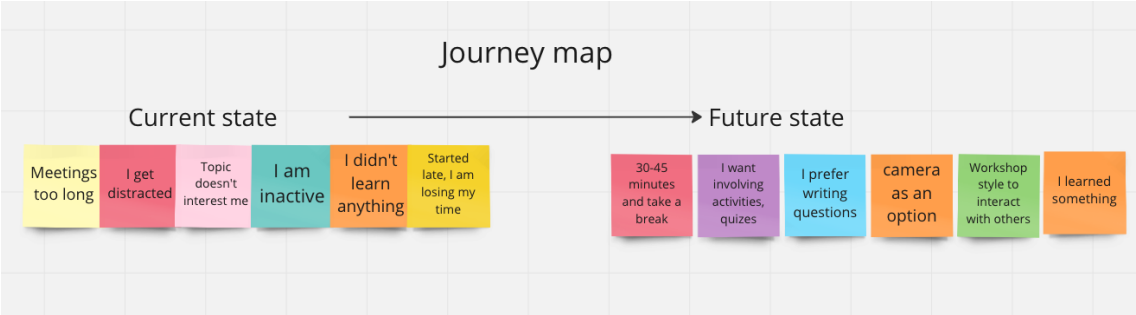


Figure 17: Journey map with a current state and future state, based on interviews, created on Miro board

We also learned about who were the participants, their personalities and workstyle. Among the team members, most were introverts, liked to concentrate on own tasks, which were programming, code management and incident management mostly. They liked solving the problems, finding better solutions. At times, they liked pair-programming as this was a good way to solve issues, they were not able to solve themselves and to learn something new. They asked their colleagues for help if there was a clear need. They communicated via Slack channels, exchanging messages and during Google Meet online meetings. They did not like wasting time on off topic discussions and pointless meetings.

We learned that the research subjects liked to work remotely, as they saved the time needed for commuting. For many, remote work and collaborating with colleagues from other countries, became a norm and part of work life. We also learned that keeping focus during online meetings was a challenge and losing attention and interest, and multitasking were common among the research subjects. It was in accordance with previous research findings about multitasking during online meetings (Cao et al. 2021).

The interviewees preferred to keep their cameras off, but the reasons differed. Some said, they felt more conscious showing their face, for some the reason was more of showing their own room, which could not be tidy at times, for yet other ones it was overall the comfort of not having to dress up and keep the hair neat; without cameras they felt more relaxed.

Some quotes from the interviews about what an effective meeting would mean to the interviewees.

> “Workshop style, active participation makes the meeting more effective but not more pleasurable. I suppose more engagement means more active work and that you are actually focused on the things, so of course it would be better to have those.”

> “If I get to learn something informational, something new, I did not know before the meeting, or if I am facing a problem and we have a meeting with some colleagues and if you can solve the problem, or you find something related to the issue, something informational.”

> “Continuous Improvement [session] is effective if we get to explore the idea presented and everyone gets what it’s about. There are clear benefits to the team, and everyone is somehow enriched by the experience.”

> “An effective meeting for me is to focus on one thing at a time. When we talk, we talk about one problem and try to get a solution to that, and then we go to the next one.”

5.4 Results from Bartle’s and Motivation Tests

We gathered results from the one-question Bartle’s Test of player’s characteristics. We got six responses in total. Based on them, we formed a player type of our persona. The player type was mostly an explorer with an achiever and socializer subtypes.

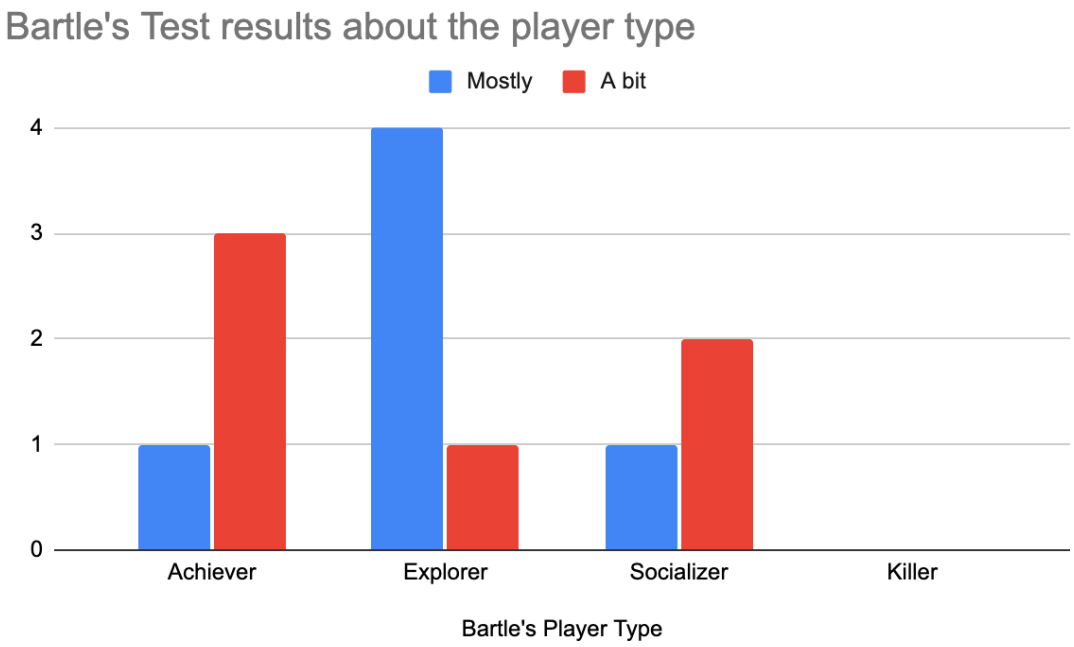


Figure 18: Results from the Bartle’s Test about the player type

Next, we analyzed the results of the Motivation Test. Our research subjects scored highest on Development and Accomplishment, Empowerment of Creativity and Feedback, Unpredictability and Curiosity. They scored medium to medium high on Ownership and

Possession, Scarcity and Impatience, and Loss and Avoidance. They scored low on Epic Meaning and Calling.

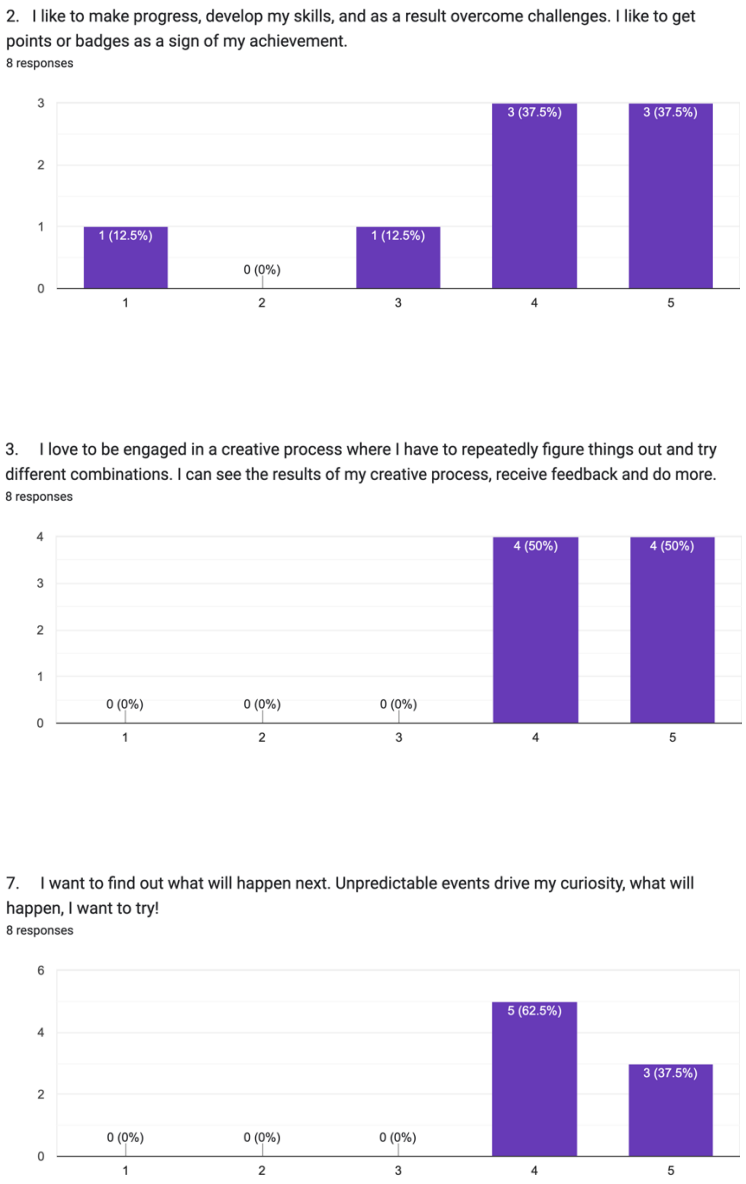


Figure 19: Questions and responses from the Motivation Test where the respondents showed highest motivations

Based on the tests' results, we decided what kind of gamification would be most efficient and in-tune with the subjects' characteristics, motivations, and pains. We opted for something surprising, unexpected, something they could explore themselves, and something showing their achievements.

5.5 Results of the gamified session

For the gamified session, we prepared a quiz starting with a surprising question: “In maximum 3 words, explain to your grandma what is Sentry?” This question invoked smiling or grinning on the participants faces (those, whose cameras were on), and many creative responses.

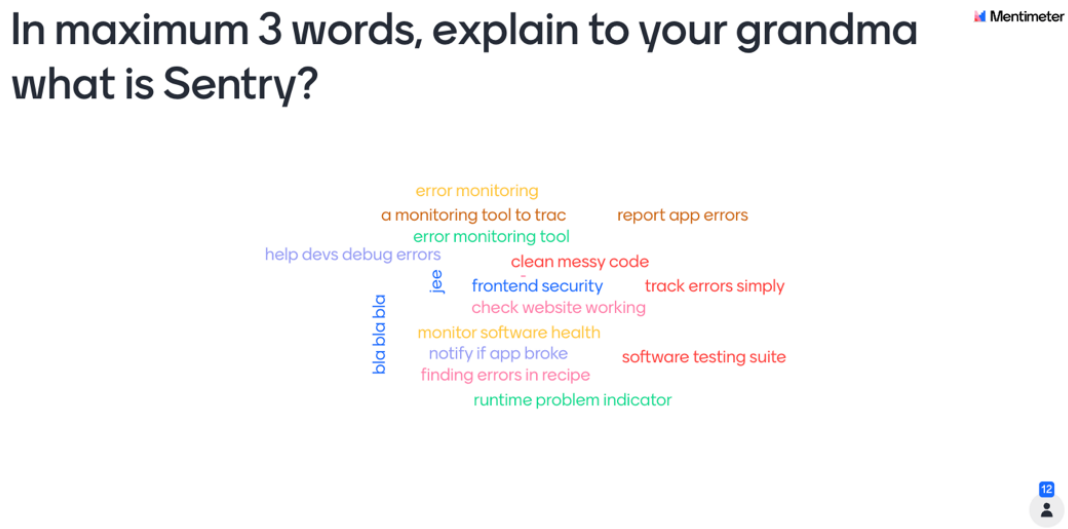


Figure 20: Quiz results: first question with answers (from Mentimeter)

Introducing the quiz to the presentation was an unexpected event, as in most cases there are no quizzes or other interactive tools in this kind of meetings. The quiz fulfilled the drives of accomplishment as the fastest ones gained more points; creativity and feedback, as some of the questions were open-ended and demanded some exploration of the topic and creative responses; scarcity and impatience, as the time to response was limited. All that also met the player type of explorer with some achiever and socializer traits. All the quiz questions and answers can be found in Appendix 6.

We got positive results from the breakout rooms having hosts and helping questions. We already knew from our test gamified session, that such questions are good starting points and inspire people to ask and explore the topic. Based on the feedback from each of the team, we learned, that the method worked and most of the participants were active.

5.6 Comparing results from User Engagement Scale questionnaire

The User Engagement Scale (UES-SF) questionnaire was used after a meeting without gamification and after the prepared gamified session. This way it was possible to compare the results and check, if adding gamification enhances participants’ engagement.

In the gamified session there were 19 participants and we got 8 responses. We scored the responses according to instructions given by O'Brien. All the calculations were done using Google Sheet. We calculated in the same manner the results from the session without any gamification added. From the 15 participants, we got 4 responses.

The average score of the non-gamified session was 3,1 and of the gamified one was 4. This was a substantial increase of almost 1 point (0,9) in a scale from 1 to 5. This marginally met our initial aim of the thesis to get an increase of 1 point in the User Engagement Scale test. The standard deviation across the persons of the non-gamified session was 0,31 and of gamified session was 0,41.

Looking at the individual results, the lowest score (3,4) of a person in the gamified session was equal to the highest score of a person in the non-gamified session. The lowest score in the non-gamified session was 2,7 and the highest score in the gamified session was 4,7.

When analyzing average scores per question, we have found significant improvement in engagement in the gamified session. The largest differences were in the following questions:

- From the focused attention (FA) group, the question with the largest difference was:
    - The time I spent participating in the meeting just slipped away. – Difference of 1,3 points (2,5 -> 3,8)
- From the perceived usability (PU) group, where the reversed scoring was done, the questions with the largest difference were:
    - I found participation in the meeting confusing. – Difference of 1,1 points (3,5 -> 4,6)
    - Participating in the meeting was taxing. – Difference of 1,3 points (2,8 -> 4,1)
- From the aesthetic appeal (AE) group, the question with the largest difference was:
    - The meeting experience appealed to my senses. – Difference of 1 point (2,8 -> 3,8)
- From the reward (RW) group, the questions with the largest difference of 1 point were:
    - My experience (of the meeting overall) was rewarding. (3,3 -> 4,3)
    - I felt interested in this experience. (3,0 -> 4,0)

Standard deviation per question was on average lower for the non-gamified session than for the gamified one.

CI session	Non-gamified session						Gamified session									
	P1	P2	P3	P4	Ave per Q	SD per Q	P1	P2	P3	P4	P5	P6	P7	P8	Ave per Q	SD per Q
User Engagement Scale questions																
FA-S.1 I lost myself in this experience (of the meeting overall)	2	3	3	2	2.5	0.58	3	2	4	2	5	3	3	4	3.3	1.04
FA-S.2 The time I spent participating in the meeting just slipped away.	3	2	3	2	2.5	0.58	4	2	4	3	4	4	5	4	3.8	0.89
FA-S.3 I was absorbed in this experience.	2	3	3	2	2.5	0.58	4	2	4	2	4	4	4	4	3.5	0.93
PU-S.1 I felt frustrated while participating in the meeting	4	4	3	4	3.8	0.50	4	4	4	5	5	4	4	5	4.4	0.52
PU-S.2 I found participation in the meeting confusing.	3	4	3	4	3.5	0.58	4	5	4	5	5	5	4	5	4.6	0.52
PU-S.3 Participating in the meeting was taxing	2	3	3	3	2.8	0.50	3	4	4	5	3	4	5	5	4.1	0.83
AE-S.1 The meeting was attractive	3	4	4	3	3.5	0.58	4	4	4	3	4	4	4	5	4.0	0.53
AE-S.2 The way the meeting was done was aesthetically appealing.	3	3	3	4	3.3	0.50	4	4	4	3	4	3	4	4	3.8	0.46
AE-S.3 The meeting experience appealed to my senses.	2	3	3	3	2.8	0.50	4	3	4	3	4	4	3	5	3.8	0.71
RW-S.1 Participating in the meeting was worthwhile.	3	4	3	4	3.5	0.58	4	4	4	4	5	4	5	5	4.4	0.52
RW-S.2 My experience (of the meeting overall) was rewarding	3	4	3	3	3.3	0.50	4	4	4	4	4	4	5	5	4.3	0.46
RW-S.3 I felt interested in this experience.	2	4	3	3	3.0	0.82	4	3	4	3	4	5	4	5	4.0	0.76
Total score per person	**32**	**41**	**37**	**37**			**46**	**41**	**48**	**42**	**51**	**48**	**50**	**56**		
Average score per person	**2.67**	**3.42**	**3.08**	**3.08**			**3.83**	**3.42**	**4.00**	**3.50**	**4.25**	**4.00**	**4.17**	**4.67**		
Total average					**3.1**										**4.0**	
Standard deviation per person	0.65	0.67	0.29	0.79			0.39	1.00	0.00	1.09	0.62	0.60	0.72	0.49		
Standard deviation across persons					**0.31**										**0.41**	

Table 1: User Engagement Scale results from non-gamified and gamified sessions

6 Conclusions

We proposed introducing gamification into meetings to enhance involvement and motivation of the participants which would result in better outcomes. Through interviews and observations, we learned about the research subjects' characteristics and pain points, and based on the findings we proposed using gamification elements and facilitation for an online meeting. We used quiz with leaderboard and count-down tool, introduced breaks, and encouraged a discussion by providing simple questions: who, when, and what. We provided tools and instructions to the hosting team and observed the gamified online session. In the end, we asked for responding to a questionnaire to measure the participants' engagement.

We suggested a new approach to meetings' facilitation, starting from asking the question: who our participants are and utilizing the human-centered design principles. We argued that a meeting was a form of service, which could be designed to engage participants in a best possible way, hence we followed the service design process. Only after learning for whom we design the meeting, we started to brainstorm ideas.

6.1 Summary of the results

The results of the gamified online meeting showed that introducing game elements and facilitation when knowing the audience's characteristics and motivations can bring an increase in engagement and overall participants' satisfaction. The Bartle Player Type test showed, we had mostly explorers with some achievers' and a bit of socializers' traits. From the Motivation Test results we learned that the team members were mostly driven by unpredictability, creativity, and a feeling of achievement. Both tests' results were very consistent, so we could say, we found personality traits of the typical team member.

Having the results, we were able to choose suitable game mechanics and activities for the meeting. It turned out that introducing a quiz with surprising and unexpected questions and a leaderboard plus a workshop that allowed people to freely explore the topic brought positive outcomes. Breaking up the presentation with light-weighted quiz questions let participants keep attention and not to feel overloaded. The User Engagement Scale (UES-SF) questionnaire scores showed that adding gamification changed the meeting from being taxing and confusing into being rewarding and interesting to the extend people felt that “the time just slipped away”.

Research on gamification shows that this method brings more engagement to the users because it is based on both intrinsic and extrinsic motivations. Adding some game mechanics to software applications increases adoption of the systems and effectiveness of employees, as well as gives the intrinsic motivation (Mattallaoui et al. 2016). Additionally, by adding gamification to the context of learning or meeting environment, engagement and motivation is enhanced (Mora et al. 2017).

Our case study added to the existing knowledge by showing, how introducing even minor changes to the online meetings can positively correlate with the outcomes. This supported our hypothesis that if people were more engaged and motivated in the meeting, they would get more out of it. In the quiz that was provided during the presentation in the gamified meeting, participants gave mostly correct answers, which meant they carefully listened to the presentation and learned new things (Appendix 6). It was not tested though, if they would learn less or the same if the session would not be gamified.

It is worth emphasizing, that among the team members, those who always led the discussions, were more active than others, when the only mode of communication was verbal. This was the case with the breakout rooms. This is also something to consider with next gamified meetings for this team to introduce a written mode of raising questions, brainstorming, or exploring the topic.

After learning about the reasons behind keeping the cameras off during online meetings, we concluded that this should stay an option and participants should not be forced to show their faces. The results were in accordance with much larger research on “Zoom fatigue”, which showed that sitting in online meetings and keeping the camera on, could be draining, as it takes a lot of energy from our brain (Bailenson 2021, Fosslien & West Duffy 2020). It was also positively correlated to feeling of exhaustion and fatigue (Shockley et al. 2021).

The results can encourage the team to continue this approach of meeting facilitation and experiment with other gamification elements. The meeting scenario can be easily utilized in other meetings by modifying only the content of the quiz questions.

6.2 Research limitations

We acknowledged some limitations of the research. The time constrain, a limited number of meetings being part of the observational studies (3 in total), uniqueness of every meeting, and small sample of participants.

The scope of the thesis project was time framed and scheduled for three months. During this time, we observed and participated in three meetings. This was not enough to make reliable conclusions about the participants engagement and how it changed with or without gamification and facilitation. To get a bigger picture, we should conduct the research over a long period of time, even one year, considering the meetings were held once a month. Having more than 10 observations, one could see the patterns of how the form of the meeting's presentation and presenter's skills influence participants' engagement and motivation.

The time constrain caused also a very limited possibility for iterations. According to human-centered design process, every action in every phase of the process can be iterated to get the best outcomes. In our research process, the small iteration was done during presenting the meeting scenario to the hosting team, discussing the ideas, and getting feedback. It would be reasonable to gather feedback after every meeting and based on that iterate and improve the scenario for the next meeting.

Secondly, each of the researched meetings was unique and the uniqueness is inevitable, as each time another topic is presented, and by another presenter. Some topics can be more interesting to the audience than others, hence the same way of presenting can still bring different outcomes in the participants' engagement and satisfaction. On the other hand, meetings held by presenters with better presenting and facilitation skills, can be received with greater satisfaction. To control for those factors, a longitude observational study would be needed.

Thirdly, we based our results and conclusions on the small number of received responses to the questionnaire. The reason for the small number was that the whole team, i.e., research subjects, comprised only of 22 participants (including the author of the thesis). In the meetings, there were usually less attendees, varying from 12-19. We couldn't force people to respond to the questionnaire and only used nudging telling we needed it for the thesis purpose. Having four responses after the non-gamified meeting and eight after the gamified one, made comparing the results questionable. We did not know, if the results would bring different outcomes if we would get more responses after the first meeting.

This small project nevertheless opens the door to further research on how gamification can enhance participants engagement in the online meetings. Considering the current way of work, especially in the tech and IT industry, with employees scattered around the globe and

working in the online environment, the knowledge about gamification techniques in online meetings is not only useful but also very much needed.

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Figures

Tables

Appendices

Appendix 1: User Engagement Scale Short Form (UES-SF) adapted from the original by O'Brian et al. (2018)

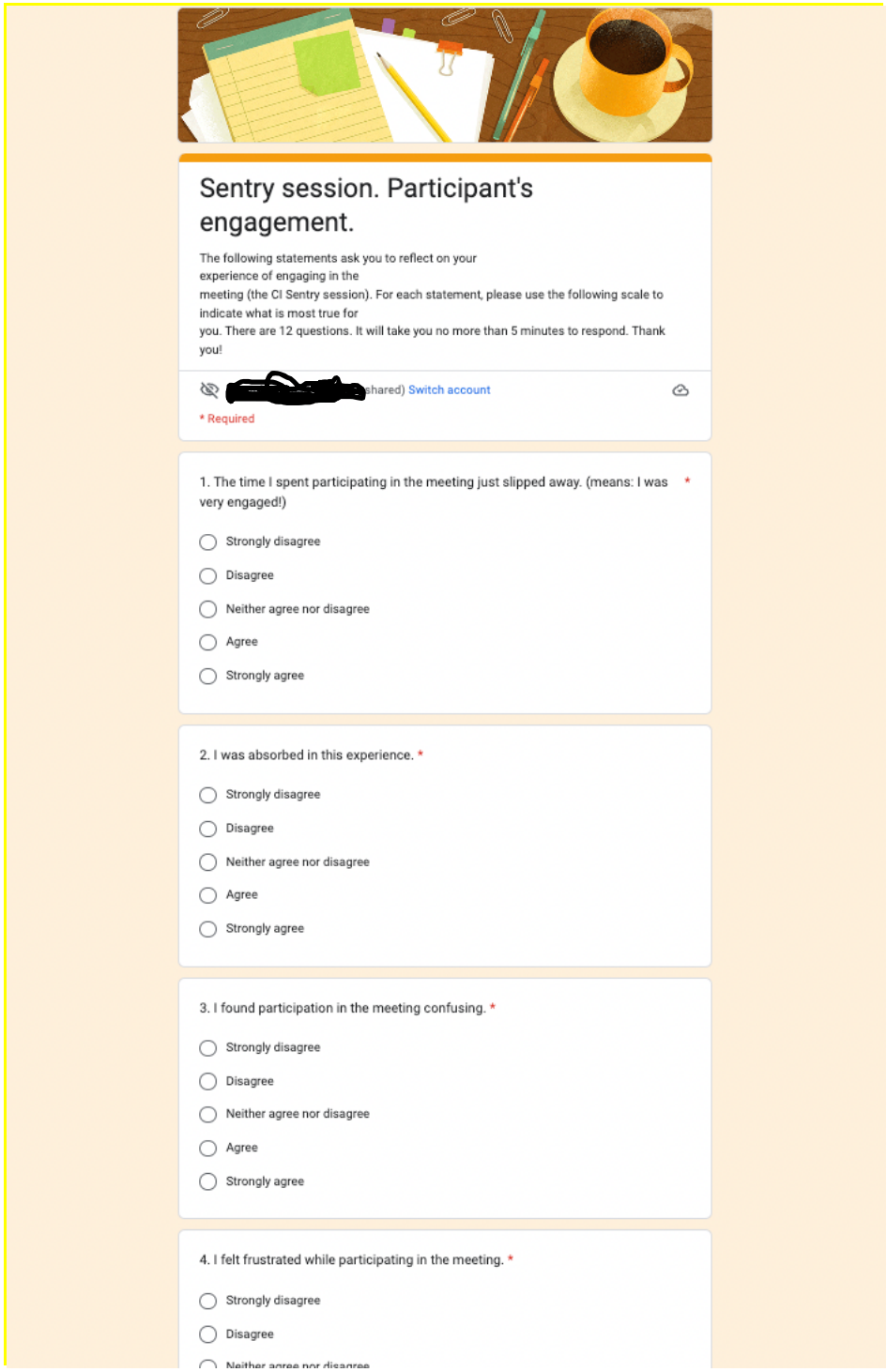
List of original questions by O'Brian:

FA-S.1 I lost myself in this experience.
FA-S.2 The time I spent using Application X just slipped away.
FA-S.3 I was absorbed in this experience.
PU-S.1 I felt frustrated while using this Application X.
PU-S.2 I found this Application X confusing to use.
PU-S.3 Using this Application X was taxing.
AE-S.1 This Application X was attractive.
AE-S.2 This Application X was aesthetically appealing.
AE-S.3 This Application X appealed to my senses.
RW-S.1 Using Application X was worthwhile.
RW-S.2 My experience was rewarding.
RW-S.3 I felt interested in this experience.

List of adapted questions:

FA-S.1 I lost myself in this experience (of the meeting overall).
FA-S.2 The time I spent participating in the meeting just slipped away.
FA-S.3 I was absorbed in this experience.
PU-S.1 I felt frustrated while participating in the meeting.
PU-S.2 I found participation in the meeting confusing.
PU-S.3 Participating in the meeting was taxing.
AE-S.1 The meeting was attractive.
AE-S.2 The way the meeting was done was aesthetically appealing.
AE-S.3 The meeting experience appealed to my senses.
RW-S.1 Participating in the meeting was worthwhile.
RW-S.2 My experience (of the meeting overall) was rewarding.
RW-S.3 I felt interested in this experience.

Appendix 2: User Engagement Scale Short Form (UES-SF) in a form of a questionnaire created in Google Forms that was sent to participants via a link. The screenshot of the first 4 questions.



Sentry session. Participant's engagement.

The following statements ask you to reflect on your experience of engaging in the meeting (the CI Sentry session). For each statement, please use the following scale to indicate what is most true for you. There are 12 questions. It will take you no more than 5 minutes to respond. Thank you!

[redacted] shared) Switch account

* Required

1. The time I spent participating in the meeting just slipped away. (means: I was very engaged!) *

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

2. I was absorbed in this experience. *

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

3. I found participation in the meeting confusing. *

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

4. I felt frustrated while participating in the meeting. *

- Strongly disagree
- Disagree
- Neither agree nor disagree

Appendix 3: Interview questions

Introductory questions

1. Introduce yourself. What is your role in [redacted], how long have you worked here?
2. Where do you live?
3. How old are you? Are you single, in relation?
4. How do you spend your free time? What's your hobby?

Work style questions – more general to learn about the person

1. What is your work style: quiet work on your own, collaboration with your colleagues, communication via Slack or online meetings? In person?
2. Working remotely, how often do you go to the office? Why?
3. How do you feel asking your colleagues for help? When you get stuck with something, are you immediately reaching for help? What is your approach?

Current state analysis - questions about online meetings

1. Which of the meetings we have in MCA do you like most? Why? Give me an example of a recent meeting that was engaging for you.
2. Which meetings you don't like? Why? What is missing in them? What bothers you? Why? Are they useless? Not for you? Give me an example of a bad meeting you recently participated in.
3. How do you feel having your camera on in a meeting? Why?
4. How do you feel asking a question and speaking during a meeting? How often are you doing this?

Future state analysis - questions about a wished online meeting

1. How would a great meeting look like for you? Imagine.
2. What kind of interaction in a meeting, engagement, would feel most comfortable to you? (Speaking up, writing in chat, having another tool for posting questions, breakout rooms, activities)
3. What makes you be alerted, active?
4. What is an effective meeting in your opinion? (Engagement, active participation, workshop style, activities, getting lots out of the meeting)

Appendix 4: Question based on the Bartle's Player Test

The question was posted in the direct Slack messages to the team members.

What kind of player are you?

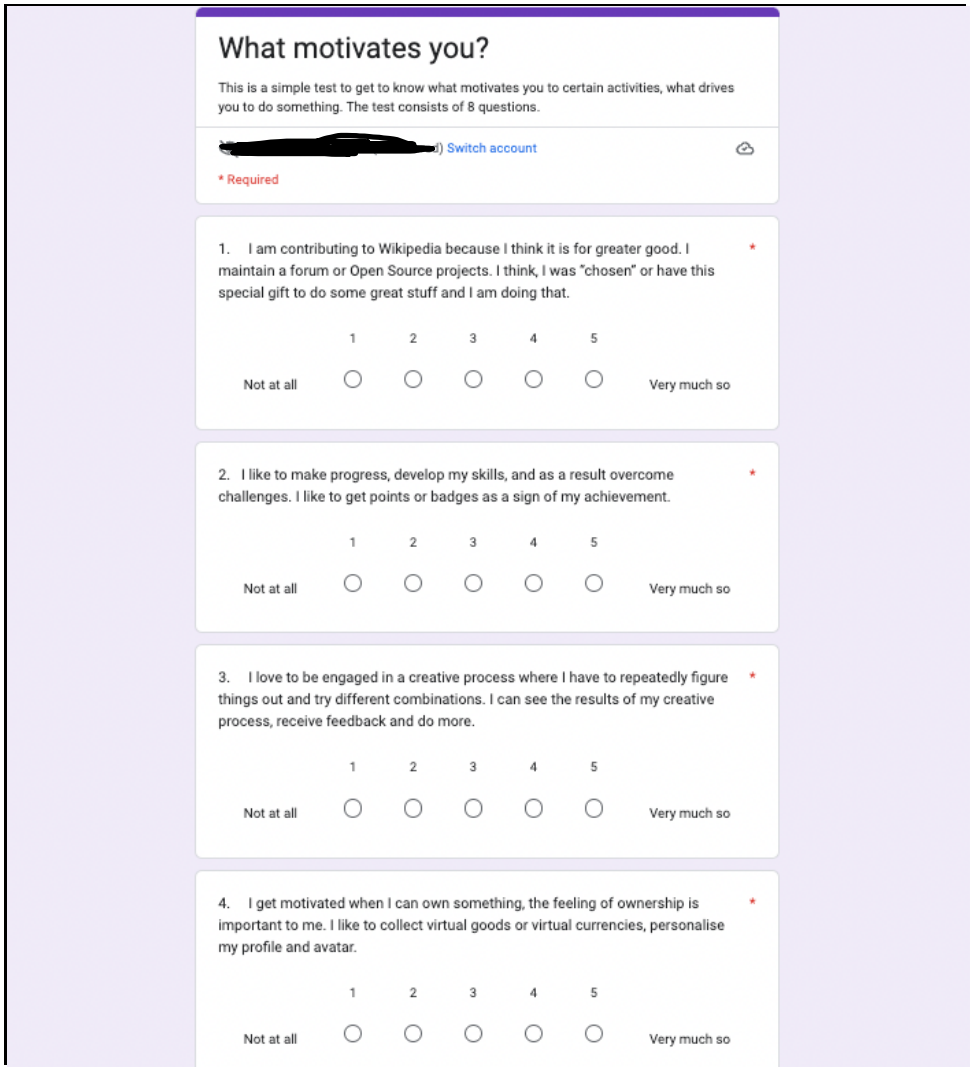
a) Achiever – I play to gain points and status.
b) Explorer – I love to discover new aspects of a game, even if I have to do repetitive tasks to unlock new levels.
c) Socializer – I play for joy if interacting with others rather than for the game itself.
d) Killer – I like to win points and I find joy in seeing others lose.

Answer honestly. Choose all the answers that apply to you. Put the most relevant first. If others apply just a little bit, describe that. For example: I am mostly b, with some c, never d.

Appendix 5: Motivation Test, based on the Octalysis gamification framework. Questions and a screenshot (on the next page) of how the test was presented to the participants.

What motivates you?

1. I am contributing to Wikipedia because I think it is for greater good. I maintain a forum or Open-Source projects. I think, I was “chosen” or have this special gift to do some great stuff and I am doing that.
2. I like to make progress, develop my skills, and as a result overcome challenges. I like to get points or badges as a sign of my achievement.
3. I love to be engaged in a creative process where I have to repeatedly figure things out and try different combinations. I can see the results of my creative process, receive feedback and do more.
4. I get motivated when I can own something, the feeling of ownership is important to me. I like to collect virtual goods or virtual currencies, personalize my profile and avatar.
5. Social influence is important to me. When my friend masters some skills, it drives me to get to the same level. I like to be close to people, events, or places that I can relate to.
6. I often want something more because I can’t have it, it makes me think about it more.
7. I want to find out what will happen next. Unpredictable events drive my curiosity, what will happen, I want to try!
8. I try to avoid losing something, like losing points that I already gathered in a game, losing opportunities to win or get something that were so close. Sometimes I feel like acting now because if I wait, I can lose the chance.



What motivates you?

This is a simple test to get to know what motivates you to certain activities, what drives you to do something. The test consists of 8 questions.

[redacted]) Switch account

* Required

1. I am contributing to Wikipedia because I think it is for greater good. I maintain a forum or Open Source projects. I think, I was "chosen" or have this special gift to do some great stuff and I am doing that. *

	1	2	3	4	5	
Not at all	○	○	○	○	○	Very much so

2. I like to make progress, develop my skills, and as a result overcome challenges. I like to get points or badges as a sign of my achievement. *

	1	2	3	4	5	
Not at all	○	○	○	○	○	Very much so

3. I love to be engaged in a creative process where I have to repeatedly figure things out and try different combinations. I can see the results of my creative process, receive feedback and do more. *

	1	2	3	4	5	
Not at all	○	○	○	○	○	Very much so

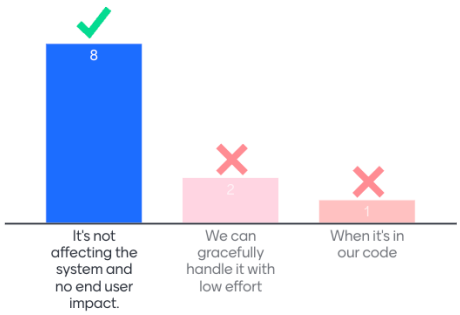
4. I get motivated when I can own something, the feeling of ownership is important to me. I like to collect virtual goods or virtual currencies, personalise my profile and avatar. *

	1	2	3	4	5	
Not at all	○	○	○	○	○	Very much so

Appendix 6: Quiz questions with answers plus the leaderboard given by participants in the gamified session.

When do you NOT create a Jira ticket from an issue?

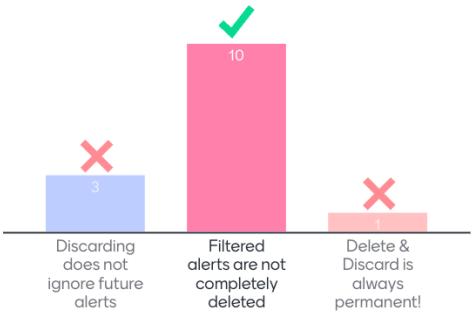
Mentimeter



11

What's the difference between filtering and discarding and issue?

Mentimeter



14

What is a recent investigation where a replay or profiling would have been helpful?

Mentimeter

🤔

User has and issue or being unable to use a feature, we could see how they are using it, and reproducing would be easier.

no ideas yet...

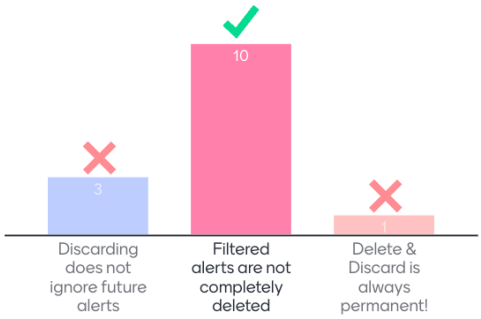
Most of the issues/errors we get are reproducible, it is useful when we need to find root cause of the issue. And some frontend errors caused by user actions are easily trackable with replay and profiling

¯\(ツ)/¯

5

What's the difference between filtering and discarding and issue?

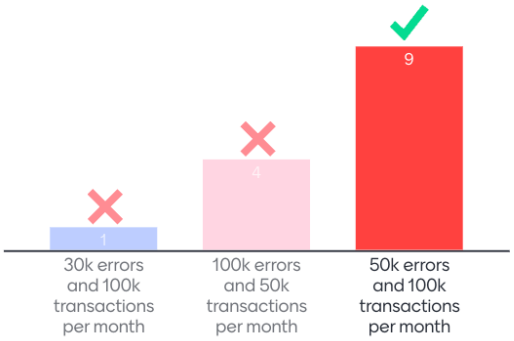
Mentimeter



14

What are the quota limits for [redacted] in Sentry?

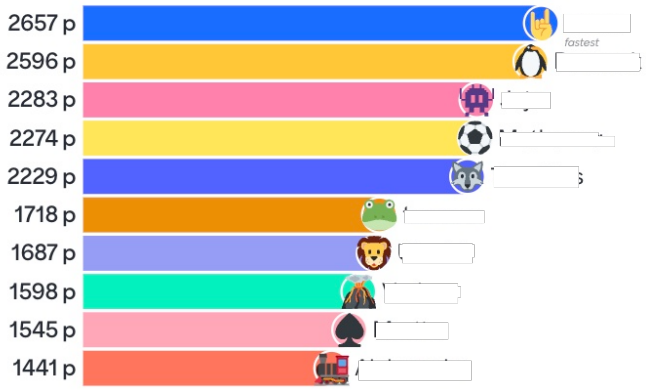
Mentimeter



14

Leaderboard

Mentimeter



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