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GAMFICATION OF A SUSTAINABILITY STRATEGY

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ABSTRACT

Sustainability has increased its meaning in businesses in recent years and based on that, many companies have started to consider their impact on climate. Gamification has also gained attention, as it can be used as a tool for marketing and education.

The objective of the thesis was to study sustainability and gamification. The information was utilized in the development of a board game that is based on the commissioner's sustainability strategy.

The qualitative methods were used to analyse cases where gamification was utilized either for marketing or education and to compare how sustainable it is to develop a video game or a board game. Practice-based studies were used in the development of the game.

The process started with studies regarding sustainability and gamification. The information was then used to produce a prototype that was playtested and based on the feedback, the board game was designed, including game mechanics and graphics. The board game contained cards with questions and tasks that were based on the commissioner's sustainability strategy.

The study showed that gamified strategy can be used for educational purposes that could help the company's personnel to learn more regarding sustainability, as well as a tool to raise brand awareness. For business-to-business companies, gamification could be used to educate personnel regarding certain subjects or in the process of building long term engagement with customers. When comparing video game industry and printing industry, the major emissions would be produced from material and energy usage.

Keywords: gamification, sustainability, board game, game design

CONTENTS

1 INTRODUCTION

The purpose of this thesis is to produce a sustainability themed board game that will be used for marketing and educational purposes by the commissioner. The thesis will explore how to gamify a company's strategy and how sustainability can be taught and marketed with it.

The idea of the thesis came from discussions with PunaMusta Media's marketing and sustainability director while exploring different subjects and ideas that would benefit the company. Since sustainability is one of the major subjects of the company's overall strategy, gamification of sustainability strategy was chosen.

The chosen format for the game was a board game, since the company has a printing department, and the game can be printed in one of its own facilities. The company has a goal to educate its employees regarding sustainability and message its customers and partners that sustainability is taken seriously. PunaMusta Media has a printed guide that illustrates in detail the whole sustainability strategy and topics behind it and that guide has given inspiration for this thesis.

The board game regarding sustainability can be used alongside the guide to educate PunaMusta Media's employees. It can be used for learning as well. The game can also be a fun activity to play with co-workers during coffee breaks and learn the company's sustainability while bonding with others. In addition, the board game is for marketing. PunaMusta Media can use it as a prize for its competitions and raffles that it occasionally hosts. It can also be brought to exhibition stands and presented there as an activity that the guests can try.

The thesis consists of the process of designing of the board game, its mechanics and visuals for the board, cards, and game pieces. The process also included studies regarding gamification and sustainability. The research methods for the thesis include case study, comparative research, and project-based research.

2 RESEARCH QUESTIONS AND METHODS

The main research question for the thesis is how to gamify a sustainability strategy and the side problems consist of questions how to use gamification for a B2B company and how to compare sustainable video games to board games. In order to answer these questions, the thesis implements three different research methods.

Case study examines similar games that are related to gamification and sustainability. Case studies produce detailed information regarding selected cases. It allows gaining of deeper understanding of the subject by narrowing the focus and helps to make detailed interpretations of the chosen subject. There can be single or multiple subjects to be researched and the cases can be similar or diverse. Case studies help to gain in-depth understanding of the research subject and it can contain, for example, studies regarding processes or structures. (Jyväskylän Yliopisto 2010.)

Comparative research helps to identify and examine differences and similarities of the chosen subject. With this research method, it is possible to study different processes, events and cases that are comparable to other similar subjects. (Jyväskylän Yliopisto 2017.) Comparative research method also enables better understanding of the subject and it emphasizes explanation of differences and similarities and is conducted to explain processes that are involved in the creation of the chosen subject. (Adiyia & Ashton 2017, 5.)

Design process and practice-based study methods aim to gain practical benefit; and persons in working life are usually interested in this method. For example, the goal can be examining finer working methods or improved services for customers. In culture studies, design process can explore materials that are required to produce the desired outcome, the nature of creative design process or the history of the subject. (Vilkka 2015, 19.)

In the thesis, case study examines different sustainability games and gamified games that are used for educational purposes and marketing purposes.

Comparative research method is implemented in comparison between video game industry and printing industry and how sustainable they are. The production of the final board game implements design process and practice-based studies, as the project process from beginning to the final product.

3 GAMIFICATION

Gamification is engagement of customers, partners, and employees. It can also include motivation, education, and leadership with elements from games. Gamification can deepen relationship between a company's brand and its customers. Interactive games can also be used for data collection about customers preferences and purchasing behaviours. The main advantage of gamification is related to customers, interactivity, participation, increase of sales and turning marketing towards entertainment over commercialism. (Mainostoimisto 4D n.d.)

Detering et al. (2011 cited in Huotari & Hamari 2016) proposed a definition for gamification as a set of game design elements where a gamification of a system is defined based on existence of characteristic game elements in that specific system. This definition of gamification focuses on psychological states that are invoked by motivational affordances. It implies that instead of focusing on design specifics, gamification is related to the psychological outcomes of gamification. The affordances of the system can invoke emotions and psychological states, which can mediate value creation and behavioural outcomes. These definitions does not assert that the gamification process is always successful. It can only attempt to support the individual's creation of gameful experiences that can promote overall value creation for them. (Huotari & Hamari 2016.)

Games can be described as opposition of voluntary control systems, which are then confined by rules and procedure in order to produce a disequilibrium outcome (Sutton-Smith 1978 cited in Huotari & Hamari 2016). Salen and Zimmerman (2004, 96 cited in Huotari & Hamari 2016) describe games as a system in which players are engaging in an artificial conflict that is defined by rules that will lead to quantifiable outcome. A definition for games by Juul (2003,

35 cited in Huotari & Hamari 2016) describe games as systems that are rule-based with variable and quantifiable outcomes that are assigned by different values. The players exert effort and try to influence the outcome while they feel attached to it. The consequences of the activity should also be negotiable and optional. The definitions for games vary, but they usually include systemic component that refers how the game is constructed. Definitions also include experiential component that describe the human involvement in the game. (Huotari & Hamari 2016.)

Games are systems that require active involvement from the player. The use of game mechanics in a context that was not meant to be a game, can help to engage the user in solving problems and motivating them. The usage of gamification has increased in the past decade and its potential is to increase marketing and sales as well as add value to the customer. Often when gamification is used, the main goal is to gain profit. In addition, gamification has the potential of increasing the engagement and inclusion of customers. Gamification can also be used for marketing a new brand and increasing customers visiting a store. (Hänninen & Kinnunen 2020.)

Gamification has been used in several different ways in multiple fields. For example, shops can use gamification in their bonus point systems, it can be used in journalism as well as in promotion of well-being. In education, gamification appears to promote active and problem-solving attitude, though there are differences between individuals. One method that works for one induvial might appear as unpleasant to another. Gamification requires comprehensive researching and understanding regarding game design in order it to work. When it is applied into an educational purpose it requires also pedagogical skills. Gamification is using conscious and goal-oriented action and it is usually precisely defined inside a certain frame of reference, for example, educational games. Gamification can also be seen as a sub concept of ludification which is a concept that includes adding playing and playfulness into everyday life. It can be seen as a positive subject that releases individuals to express oneself and act freely. (Friman et al. 2022, 250−253.)

Gamification aims to create positive skills, mechanics and processes that are familiar from games. In general, any product, organisation, service, or action can be gamified. The difference between games and gamification is that game's goal in general is to entertain the player, when gamification has a certain goal that it is trying to achieve. Usually, the goal is to teach and engage and it is interactive. Gamification uses rewards and makes person's process and growth visible. It can motive for example, employees on their career path or everyday work tasks. Gamification also leaves different memory trace than normal lecture, for example regarding company's strategy. (Jaakkola 2022.)

Though gamification has been defined as use of game design elements, those sets of game elements are not clearly defined. For example, some elements that are unique to games do not automatically create gameful experiences. Gamification is not performed through any specific elements alone. This means gamification can be defined as a process that is attempting to increase the possibility of the emergence of gameful experiences by including affordances into the service for that purpose. Affordances refer to elements that are enabling activities specific for certain affordance in the environment in which it appears. Affordances can also be defined as actionable properties between an actor and an object. They open possibilities for emergence of experiences or behaviours and motivational affordances can be described as stimuli that is designed for provoking individual's motivational needs and affecting their psychological states. (Huotari & Hamari 2016.)

Interest in gamification has increased in 2010's both in industry and in research. It has become one dimension of service design, since development of social media, data analysis, sensors, user interfaces and mobility has enabled it and nearly everything is possible to gamify. In educational purposes, gamification can be used as a tool for tasks that require repetition, for example, in process of learning multiplication tables. In marketing, the requirements for fast commercial goals have increased the use of gamification, though it is mostly used in educational purposes or promotion of well-being. According to gamification

professor Juho Hamari (2022 cited in Ritvanen 2022), gamification can be used as a potential tool for sustainable development and to achieve of goals that require persistence from society.

3.1 Board games and mechanics

Board games are a diverse and comprehensive field of games and have developed through time, but not as fast as video games. One of the oldest known board games is an ancient Egyptian game called *Senet*. It is considered to be a game that uses roll-a-dice and move-game mechanic, even though its rules have been lost to history. (Saari 2018, 7−10.)

Roll-a-dice and move-mechanic is also used in *African tähti* (1951), one of the best-known Finnish games designed by Kari Mannerlan. In the game, the players roll a six-sided dice and move around the game board trying to find the Star of Africa before other players. The roll-a-dice and move-game mechanic appeals to the players because it is easy to understand and the randomness of the dice rolls increases the game's appeal, because every game session will be different. (Saari 2018, 10−12.)

Simple roll-a-dice and move-mechanics are possible to modify towards more diverse mechanics, which relies on more skill and less on luck-based dice rolls. For example, in some versions of *Backgammon*, there are multiple dices, and the numbers can be divided between different game pieces. The way that the dice are rolled, as well as the type of the dice will influence the game. For example, game *Formula Dé* (1991) uses dice with four sides with numbers 1 and 2 in the first step of the game. The second step will use a six-sided dice with numbers 2, 3, 4, 4, 4 and 4. The same formula continues until the last step where the game uses a 30-sided dice with numbers 21−30 on its sides. (Saari 2018, 13−14.)

Roll-a-dice and move-mechanics does not offer replay value for the players and does not produce a long-term engagement to the game. The gameplay mechanics can be extended by adding the elements of strategy, skill, and chance. The game can be hard to master with wide strategy elements that

require studying and mastering the gameplay. The games that are based on chance can become boring for the players since they do not offer possibilities for improvement. Usually, casual gamers prefer games that are in the middle of these two extremes. (Harris et al. 2009, 9−10.)

By setting player experience goals, it is possible to bring the player into the design process at the early stages of development of the game. Player experience goals are not necessary features in the game, but instead descriptions of interesting and unique situations in the game that the players can experience when they are playing the game. These can be for example, a situation where players must co-operate in order to advance in the game, but at the same time, they have to compete against each other in some way. (Fullerton 2018.)

Many roll a dice and move type of games suffer the problem where there is no interaction between players. The players must wait their turn and have nothing do to during the waiting time. The game becomes more interesting when there are interactions added to the gameplay mechanics, which present action for players that are waiting their turn to roll a dice. (Saari 2018, 20.)

Creating a conflict into the game challenges players, creates tension, and encourages players to work to achieve the outcome they pursue. It can create either a sense of accomplishment or cause frustration depending on the amount of challenge. If the challenge in the game is too low, players may think that they have mastered the game and move on. By balancing the emotional responses and the amount of challenge it is possible to keep players engaged with the game. (Fullerton 2018.)

The end score of the games can be defined by eliminating other players on the race. The other option to define the winner is victory points that are gained during playing the game. These points can be achieved for example, by gathering resources or completing goals. (Harris et al. 2009, 11.)

Board games that include cards can be called card-driven games. For example, *Twilight Struggle* (2005) (Figure 1) by GMT Games is a game where the players take a role of United States and Soviet Union during the Cold War and try to conquer the world with their own ideology. The game uses gameplay mechanics where the cards can contain historical events or anchor points that can control the player's army. (Saari 2018, 45.)

Figure 1. Twilight Struggle board game (GTM Games 2005)

Other type of board games is party games that are rooted in Victorian era, where these kinds of games started to develop when people started to have more free time. Party games can be for example, based on acting, logic or word puzzles. One of the oldest word puzzles is from 1700's France. It is an early version of *Charades,* and it started as a game where the players tried to explain words using mysterious descriptions. Similar idea can also be found from *Alias* (1989), by Mikko Koivusalo, and it has become the most popular word puzzle game in Finland. (Saari 2018, 76.)

Trivia games are also one type of a board game. Online resource and community Boardgame Geek's earliest records of trivia games are from 1822's game called *Travellers' Tour Through the United States*. In the game, players move on the board and when they land on a town, they need to name the town and tell how many occupants are living in there. A breakthrough for trivia games was *Trivial Pursuit* that was published in 1981. It is still one of the most popular trivia games and its formula has been used for other trivia games. (Saari 2018, 79−80.)

3.2 Gamification and education

Digital games have been used in education for several decades, and educational games in general have been used through ages. In Finland, digital educational games are not part of the main methods used for education. For example, in Pelaajabarometri, implemented in 2010, circa 27 % of the respondents under the age of 40 answered that they have played educational games. There has been a change after the beginning of Covid-19 pandemic, which increased teaching through online and Pelaajabarometri implemented in 2020 revealed that educational games were becoming more popular. (Friman et al. 2022, 254.)

Games created for purposes of education (Figure 2) are used to promote learning and behavior changes. They can be called serious games. The benefit for using serious games is that they are immersive, entertaining, and engaging. These types of games can combine learning, knowledge, and structures with elements from games to teach specific subject, skill or attitude. (Grendel Games n.d.) Serious games can be defined as games that do not have to have entertaining and fun as their first priority. Serious games can also include sub-concepts regarding gaming, that can include persuasive technologies and games with a purpose. Persuasive technologies in gaming refers to game design that aims to create an experience in game world that will result a behavior change in real world. Games with purpose refer to a concept where it is applied in scientific crowdsourcing and human-assisted computational purposes. (Mandujano et al. 2021.)

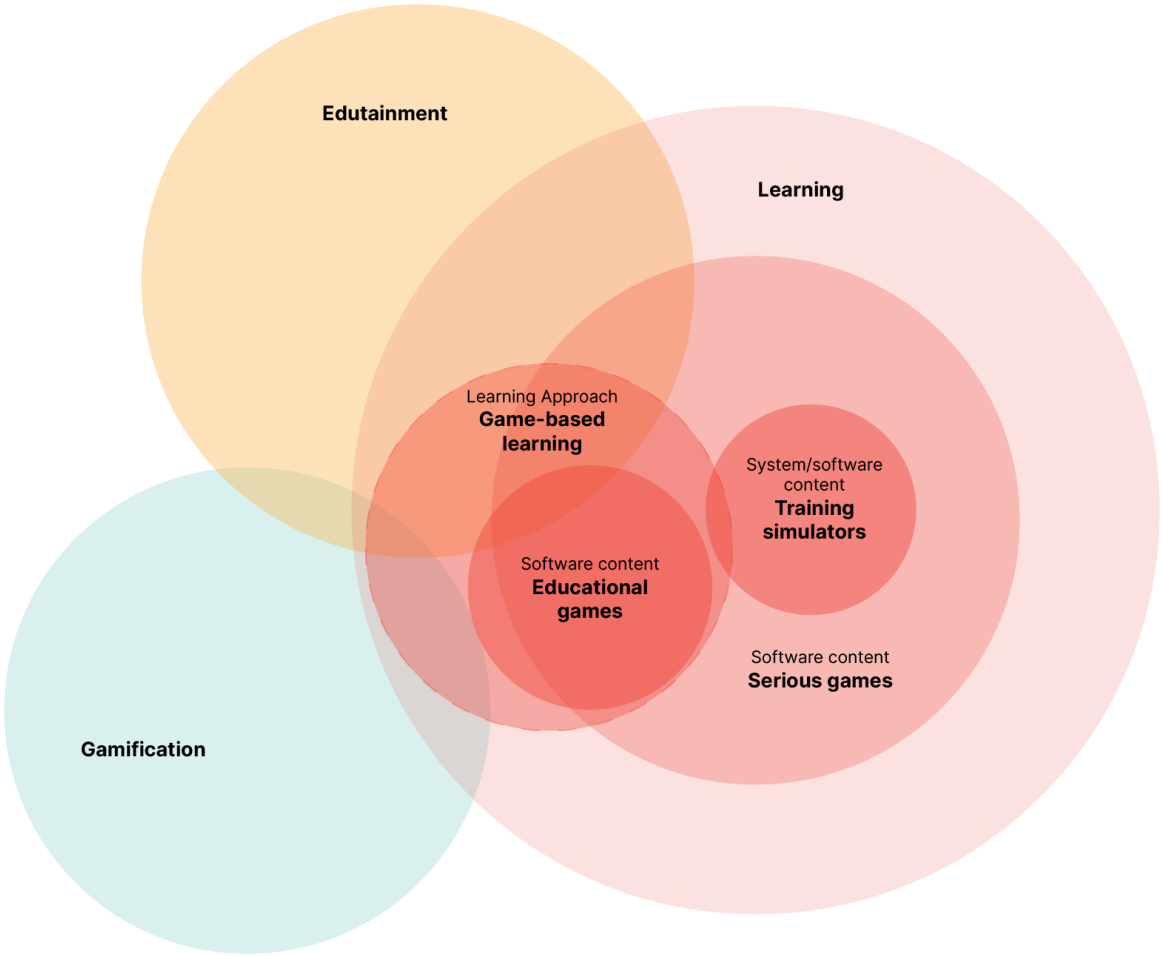

Figure 2. Relation between edutainment, gamification, and game-based learning (Madsen 2018)

Grendel Game's *Wijk & Water Battle* (2015) is a game where households compete against each other and see who can save the most water. The commissioner of the game was Vitens, a water company based in the Netherlands. They wanted to save costs and energy by educating their customers to spread their consumption more evenly. The Wijk & Water Battle (Figure 3) was designed to help to change customer behavior. In the game, the players help the game character, whose houses are flooded, learn about energy and water. The residents then help the players by spreading their water usage and then measure it with a smart meter and the app. When the change with water usage was made, the game characters faced less flooding in the game. (Grendel Games n.d.)

Figure 3. Wijk & Water battle game (Grendel Games 2015)

Gamification has also received criticism, and one of the major subjects for criticism is that gamified elements are not used in diverse ways, and it is only focusing on point and reward collection and creating competition between individuals. It can be seen as a superficial way to create motivation through rewards. Those rewards and competition around them are seen as a main aspect of the game and does not promote the educational aspect of the game. Competing against other players is also a motivational factor for only some individuals. (Friman et al. 2022, 257.)

Motivation is one aspect that is utilized in gamification. Intrinsic motivation is where the process itself motivates the player compared to being motivated by external outcomes. Intrinsic motivation can be achieved when individual experiences mastery and sense of achievement that encourages them to continue the activity. Gamification with design elements can address certain psychological needs and provide opportunities for individuals to understand their surrounding environment better and support their learning regarding sustainable

lifestyle. (Guillen et al. 2021.) Motivation can be enhanced and facilitated when a person is free from degrading evaluations, effectance-promoting feedback and optimal challenges. The feeling of competence can enhance intrinsic motivation when it is accompanied with by sense of autonomy. Negative feedback from the performance can instead diminishes it. Deadlines, threads, and pressured evaluations can also diminish intrinsic motivation. Social environments can prevent or facilitate intrinsic motivation by supporting or inhibiting people's phycological needs. (Ryan & Deci 2002, 3−4.)

3.3 Gamified education regarding sustainability

For educational purposes regarding climate change, gamification has been used almost forty years. Games that are themed around climate change can result engagement with climate change when at the same time, providing enjoyable experiences. Climate change-based games can provide learning through experience, motivation, social safe spaces and visually supported engagement with the topic. (Galeote et al. 2021.)

According to Douglas and Brauer (2021), gamification throughout is in general an effective tool to educate people regarding sustainability and biodiversity. It is theorized by researchers that board games can visualize the effect that the players will have on each other and the environment. For example, the game *Factory Heroes* increased the knowledge regarding sustainable manufacturing practices, which was its main theme.

Games can be used to educate individuals to adapt pro-environmental behaviors that they were not aware of before. Games can then reduce ignorance barriers regarding sustainability for those individuals who do not know what behaviors they should adopt or change. By practicing pro-environmental behavior in the game, the players can adopt the same concepts and turn the behavior in the game into a habit. Since the impacts of the climate change are not immediately perceptible, individuals might not necessarily feel the need to alter their behavior. Games can reduce this barrier by giving immediate rewards for competing desired behaviors. (Douglas & Brauer 2021.)

3.4 Gamification and marketing

Gamification is one way for a company to market its products and services. Games that are made for marketing purposes can be used to enhance the relationship between the brand and customers. They can deliver the brand's message and visions to possible customers. Their goal is to stand out from others and create interactions between the company and customers while creating positive customer experience. Games can be used to present the best sides of the brand. (Karjaluoto 2010, 147−149.)

Gamification can incentivize customers to perform different actions by appealing to humans' competitive nature. Brands must use gamification in a way that participation is seamless and fun, which creates positive user experience for customers. They can also be rewarded for certain behaviors that aligns with brand's business objectives, for example by giving bonus points or free sample of a product. Customers need to know what is the goal that they are pursuing and what they need to do in order to earn the reward. The gamification techniques cannot be too easy, because customers should feel a sense of achievement. (Snipp 2017.)

Maslow's pyramid (Figure 4) is a model for human needs. It fits all basic human needs into a pyramid that shows their hierarchy. The most basic needs of humans are at the bottom and the more complex ones are at the top. The Maslow's pyramid can be applied to the real world and how the basic needs at the bottom must be fulfilled before moving up. The building blocks of the pyramid can be used for developing game mechanics that will appeal to those needs presented in the block.

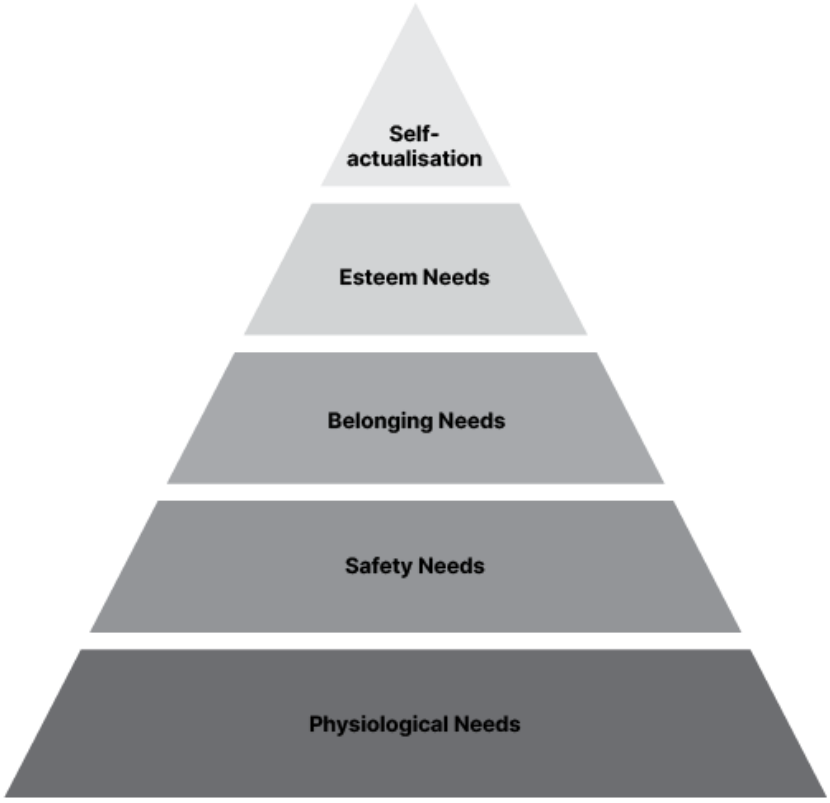

Figure 4. Maslow's pyramid (Griffin 2020)

The pyramid is separated in five different blocks:

- **Physiological needs** can be presented as health bars, lose conditions and resource loss to represent basic human needs. In the case of gamifying marketing, this does not add much value, but it builds understanding for basic needs that drive humans forward.
- **Safety needs** can be gamified in a similar way as physiological needs. It is easy to create obsessive systems by targeting safety needs, but with more indirect approach, that can be avoided.
- **Belonging needs** are a strong motivator, since humans tend to seek companion from groups and communities. People wish to be part of something they think they would fit into or which they see value in.
- **Esteem needs** represent the need to be respected. This includes both external respect that can be gained from other people as well as internal respect that in the form of self-respect. In gamification, these needs can be addressed by giving rewards for accomplishments and creating a feeling for mastery and skill.
- **Self-actualisation** is on the top of the pyramid and can be accomplished when all the lower needs are fulfilled. It is a need that each individual will define themselves for what they want and what they want to fulfil.

Even though, the floors of the pyramid are not gated, it is hard to climb it up without fulfilling the needs. Upper floors will become draining, and they will be harder to keep up both physically and mentally. (Griffin 2020, 64−69.)

According to Karjaluoto (2010, 36), marketing means messages that are placed to certain space or time in mass media in order to inform and influence the potential target group. Effective marketing communication is integrated. It is design process where the goal is to assure, that brand's products, services, and organization are relevant to the potential customers. Successful communication is able to produce their message on the perspective of their customers and offer them a clear view to the brand. The goal is to stand out compared to other similar services, companies, or products. (Karjaluoto 2010, 10−11.) Customers process messages that they receive through their memory and successful marketing messages will awake emotional memories regarding the brand. Their reactions related to those memories will affect how the customers will process the advertisement they receive. (Karjaluoto 2010, 30−31.)

According to the DAGMAR-model (Defining Advertising Goals for Measured Advertising Results), communication that appeals to certain strong needs leads to the increase of awareness of the brand. The customer who receives these messages notice and remember the brand better. (Karjaluoto 2010, 28.) Different games, raffles and competitions are some ways how the company is able to gain attention of their potential customers (Karjaluoto 2010, 65).

3.5 Gamification for B2B companies

Marketing from business-to-business, abbreviated as B2B, is marketing where one business sells their products or services to other businesses. Nowadays, business-to-business buyers expect more partnership and personalized sales than being treated as a simple customer. By gathering data from possible partners, the company engaging with B2B sales can provide solutions at the early stages of the partnership. When comparing B2B businesses marketing to traditional business-to-customers marketing, abbreviated as B2C, business to

business marketing aims towards more long-term engagement with the partners and customers. (Koli 2020.)

According to the report by SNIPP (2017), gamification increased brand's engagement with its customers by 47 %, brand loyalty was increased by 22 % and brand awareness by 15 %. Gamification is quite useful in B2C marketing too but can be harder to implement in B2B marketing. There are still several different and successful marketing cases where B2B companies used gamification as part of their marketing. For example, Stemcell Technologies, which is a biotech company, created a simple quiz called Which Immune Cell Are You (2022). The quiz was part of a virtual conference, and the attendees answered questions to reveal which immune cell they fitted with their personality. This quiz brought much attention to the company. (Vance 2022.)

With gamification, it is possible to build community experience and raise engagement. The members of the community can help each other and share important community threads as well as solve problems together and comment certain problems. It can reward the members by fulfilling the need for autonomy, reliability, and competence. This helps to build long-term engagement. (Biswas 2021.)

Gamification can also be used for collecting lead information for marketing. By collecting information, the B2B company can segment their target audience and sell them more effectively. Gamifying the content that the customers are facing can help to attract more customers and generate long-term engagement by creating experiences. For example, Intuit Inc., a company that provides financial management solutions used a simple quiz-typed game to mine future leads (Figure 5). The game was intended for high-school students and it asked questions regarding personal finances in a real-world context. Even though the target audience were not their consumers at that time, Intuit Inc. used the game to engage with the demographic that in the future would be their target personas. (Biswas 2021.)

Figure 5. Quest for Money quiz-game (Intuit Inc. 2011)

Training processes are also one possibility to use gamification in B2B companies. For example, IMB with their Innov8 platform gamified their training process in 2009. Innov8 is part of an academic initiative by IMB and explains business process management to university students in America. The objective of Innov8's game was to level up players' skills and discover how they can make the planet smarter, how to revolutionize industries and solve real-life environmental, business, and logistical problems. Within five months from the game's release, it resulted 100 times the investment put into it. It resulted massive sales for IMB. The Innov8 itself is free-to-play type of game, but the players need to sign up before they can play the game. (Biswas 2021.)

Gamification can also be used for enhancing sales and customer experience. Sales team can for example, use a leader board or create a system, where salespersons work together towards shared goal and compete against other dealerships. They can also receive feedback for their desired behaviours. To be effective, sales performance management must combine data and interactive

design as well as motivation. Combining these elements, it is possible to drive more revenue for the business. For customer experience, companies can either gamify single touchpoint of their customer's journey or entire sections from it. Gamification simplifies interaction with company's brand, and it can be for example interactive problem solving or product exploration. Personalised offers can inspire customers to buy more and engage with the brand. Quizzes and trivia can help them to learn more about the product or the service that the company is offering. The rules need to be kept simple, since hard to understand rules can cause customers to lose interest into the brand. (Biswas 2021.)

4 SUSTAINABILITY

According to Portney (2015, 2−4), understanding the definition of sustainability starts with statement given by World Commission on Environment and Development in 1987. The commission stated that sustainability means ecologic-development activity and it should meet the needs of the present generations without compromising the ability of the future generations to meet their needs. It is a concept that focuses on Earth's biophysical environment and its condition and the ways how the natural resources are used. The concept of sustainability can also consist of finding a state where economics and human population can grow without threatening the ecosystem.

For companies, sustainability has become one central motivators for their brand, customer, and sales management. It means, that nowadays, customers are expecting companies to make decisions that are right in the aspect of the future. By making sustainable choices, companies generate value to their customers, owners and financiers and help to create positive mental images regarding the future in the aspect of the society. For example, if the company's strategy includes reduction of carbon emissions, their actions, material usage and energy consumption must meet the current sustainability requirements. It can help the company to make their operations more beneficial in both economical and sustainable way. (Hellström & Parkkonen 2022, 37.)

According to the Global Footprint network, humankind would need one and a half Earths in order to cover humans' usage of natural resources. Consumption has been increasing significantly in past 40 years. People consume more meat products, drive cars twice more and produce more waste than in the 1970's. (Laakso & Lettenmeier 2014.)

Material footprint is one practice to measure the natural resources that are required in producing different products. Material footprint can tell how much renewable natural resources and non-renewable natural resources are used to maintain current lifestyle, production, and services in the society. For example, an average Finnish person's material footprint is 40 000 kilograms per year. In order to achieve sustainable lifestyle, Finnish people need to reduce their consumption 80 %. The choices that single person can make are simple. For example, they can favour plant-based products and minimize food waste and using public transportation over private driving. (Laakso & Lettenmeier 2014.)

4.1 Sustainability in printing industry

In 2016, pulp and paper industry used 324 TWh direct energy, which 60 % was produced from bio energy. That results that 32 MT out of total 100 MT of carbon dioxide were fossil. Most of the fossil emissions are coming from production of steam and low to medium heat. Several companies are investigating different solutions to reduce the remaining fossil emissions, for example direct heating and hybrid boilers. The difficulty in these solutions is to determine how to make them commercially profitable and how to operate higher operation costs. (Material economics 2020, 2−3.)

To achieve effective growth on the market, it is important to remove obstacles that restrict the commercialisation of new technologies and processes and search for new more sustainable operating models and competencies (Frost & Sullivan, 2015, 95). Materials and resources should also be decided at the early stages of the production since they cannot be easily changed. Disturbances in material deliveries can greatly damage the production and profits. Recycling is one of the

solutions for obtaining materials for production and it decreases productions environmental impact. (Ginley & Cahen 2011, 594.)

In Finland, a printing company can be granted the Nordic Swan Ecolabel. The printing company that has acquired the ecolabel, has been reducing environmental and climate impact throughout company's lifecycle by reducing energy consumption and through procurement of sustainable paper. They also have reduced the use of chemicals and does not prevent the usage of recycled materials. For example, at least 60 % of the annual paper consumption in the printing company must be inspected of ecolabelled paper. Nordic Swan Ecolabelled printed products contain 100 % ecolabelled or inspected paper matter and they meet the environmental and energy requirements and also do not use any chemicals that would prevent recycling of the paper. (Joutsenmerkki 2022.)

In year 2019, Finland's media and graphic industry produced 473 000 tons of carbon dioxide, which equals near one percent of Finland's total annual carbon dioxide emissions. Printing, usage of printing colours, printing plates, printing machinery and usage of purchased services, for example, logistic transportations covered 384 000 tons of carbon dioxide emissions of media and graphic industry. (Kontiokari et al. 2021.)

Compensation of emissions is one part of the media and graphic industries resorts to becoming carbon neutral in the future. The companies must research and gather data regarding their carbon footprint, reduce emissions and compensate the rest of the emissions. Calculations for the reduce of the carbon emissions, methods that are developed by are international and recognized compensation standards are used and the results are then reported, and they can be viewed by indented third parties. (Kontiokari et al. 2021.)

4.2 Sustainability in PunaMusta Media

The main goal of PunaMusta Media's sustainability strategy is to be a carbon negative company at the end of the year 2029. The goals for reducing CO_2

emissions are based on the Paris climate agreement. The carbon emissions are compensated to reliable environmental projects. (PunaMusta Media 2022, 67.)

The greatest impact for reducing emissions is gained from reducing printing department's carbon footprint. Between years 2019−2020 the carbon footprint was reduced by 16 %, but in 2020−2021 it grew 0,5 % due changes that were made for PunaMusta Joensuu's productions that raised use of propane and impacted the carbon footprint. PunaMusta Media's solutions for reducing carbon footprint consists of, for example, using redeemable energy, reducing usage of chemicals and wastepaper, recycling printing plates and plastics. (PunaMusta Media 2022, 68.)

PunaMusta Media's printing and visibility department has different environmental management systems and certificates (Figure 6) and is basing its actions on ISO 14001 environmental system and all targets and goals for environmental impact are based on that (PunaMusta Media 2022, 70). ISO 14001 is a family of standards that are developed by ISO Technical Committee, and it guides and provides requirements for environmental management systems (ISO n.d).

	ISO 9001	ISO 14001	GT	PEFC	FSC	The Nordic Swan Ecolabel	Carbon neutral printing product	Key flag
	Quality and environmental systems			Wood oringin certificate				
PunaMusta, Joensuu	x	x		x		x	x	x
PunaMusta, Tampere, Myllypuro	x	x		x		x	x	x
PunaMusta, Vantaa	x	x		x		x	x	x
PunaMusta, Oulu	x	x		x		x	x	x
PunaMusta, Forssa	x	x		x		x	x	x
PunaMusta, Tampere, Vehmainen	*	*	x	x	x	x	x	x
PunaMusta PixMill	*	*						
* Coming in 2022								

Figure 6. PunaMusta's environmental certificates in 2021 (PunaMusta Media 2022)

Paper produced majority of carbon footprint, being 63 % in PunaMusta in 2021. 88,1 % of used paper used for printing was from Finland in 2021, when in year 2020 it was 92,2 %. PunaMusta is offering its clients paper qualities that are PEFC and FSC certified, and their use were 95,6 % of all paper used in printing production. (PunaMusta Media 2022, 70.) PEFC and FSC are two certification systems used in Finland, which both promote sustainable, economical, and social forest management (Metsä Group n.d).

Other solutions for reducing carbon footprint are reducing energy usage and concentration using redeemable energy sources. In year 2021, 99 % printing department's electricity usage was from green energy sources. Electricy usage was 24 261 MWh, district heating usage was 5 161 MWh and usage of liquefied petroleum gas was 1 470 tons in year 2021. (PunaMusta Media 2022, 70−71.)

PunaMusta Media's printing department and media department are both providing their products as 100% carbon neutral. This includes, for example, posters, business cards, catalogs, and magazines. 100 % carbon neutral printing product is produced when emissions from printing are calculated from production, cargo and employees ride to work. Emissions are reduced in every step and the remaining emissions are compensated into Verified Carbon Standard certified climate project. (PunaMusta Media 2022, 73.)

4.3 Sustainability in video game industry

Sony's energy policy analyst Joshua Aslan conducted a study on PlayStation 4's European install base and he estimated (2020 cited in Epps 2022) the energy usage in every locally sold PlayStation 4 console and the study conducted that id the consoles are used 4,4 hours per a day, the lifetime energy usage could be high as 27 terawatt-hours for all PlayStation 4 units in Europe. (Epps 2022.)

Research conducted by Ben Abraham (2020 cited in Epps 2022) reveals that in game industry CO_2 emissions per employee are from 1 to 5 tons per year. All the data he collected from companies, developers, and studios, including for example Nintendo, Ubisoft and Sketch House were at that range 1 to 5 tons at their

generating CO_2 per employee per year (Figure 7). According to Abraham (2020 in Epps 2022), including all developers around the world, both working from home and office, the CO_2 emissions per year would rise to between three million and 15 million tons in the process of making video games. This number only includes the carbon emissions coming from the energy usage in game development offices, including for example computer usage and running servers. (Epps 2022.)

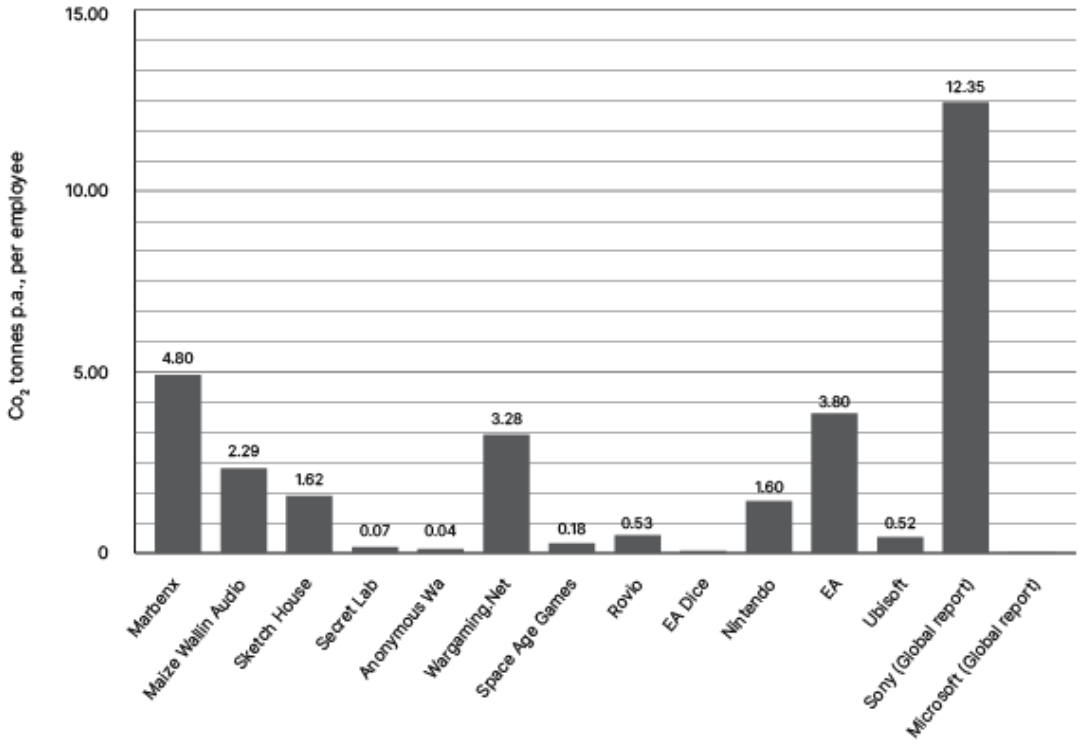

Figure 7. CO_2 production at game companies (Abraham 2020 cited in Epps 2022)

There are possibilities to reduce CO_2 production at game companies by studying if the energy renewable. For example, EA is making more environmentally conscious office decisions and encouraging players to buy digital copies over physical ones to reduce their carbon footprint. Multiple companies are already working towards carbon neutrality and carbon negativity. (Epps 2022.)

The greatest environmental impacts caused by video game industry are linked into the energy usage of development of the games and playing them as well as the manufacturing the gaming equipment, such as gaming consoles. The environmental impact of mobile games is lesser than impact caused by console

and computer gaming. For example, Rovio has maintained their cloud services by using renewable energy and by compensating their carbon dioxide emissions. Rovio's environmental impact is indirect, and the capacity of the cloud services is the greatest cause of their environmental impact. Mobile gaming uses approximately tenth of the energy compared to the similar time played with computer. (Rovio 2019, 4, 11.)

Finnish game company Remedy declares that majority of its environmental impacts are from its offices, computer hardware energy consumption and product distribution. 85 % energy used in Remedy's office is from renewable energy sources and the location provides personnel possibility to use public transportation and company bicycles to travel to office from home. They also provide their games as digital downloads which reduces material consumption and carbon emissions that the production and distribution of a physical copy would require. (Remedy Entertainment Plc, n.d.)

The Finnish Game Developer's Association and Neogames Finland Association built a model in 2022 for game developers that they can use to estimate their carbon footprint. The model combines methodologies from different game companies from Finland that are currently calculating their emissions and third-party resources from online, for example Ilmastolaskuri. The model combines emissions from players playing the games, YouTube audience viewing the games, office electricity and energy used for heating and cooling the offices. It also includes water usage, travelling and emissions generated working from home. (Neogames 2022.)

In 2021 Neogames joined Playing for the Planet- alliance which was launched in 2019. It aims to unite game developers against climate change. Neogames has committed to reduce emissions by travelling only when it is necessary and to compensate those emissions that may be produced during the travels. Neogames is also helping other companies to calculate their emissions and reduce them as well as promoting Pelimetsä initiative. (Neogames 2021.)

Finnish game developer community supports Pelimetsä, which is a project for the protection of old forests in Finland and their biodiversity. Currently the project consists of two locations in Finland: Utterinvuori Forest near Hämeenlinna and Tsiuttajoki Old Growth in the Inari region. Over 330 acres of forest have been permanently preserved in support of the work of the Finnish Natural Heritage foundation. (Pelimetsä n.d.)

5 GAMIFICATION OF A STRATEGY

Strategy can be described in many ways by different companies and even inside the same organization. The scope and the definition of the strategy depends on the context. Usually, strategy a has status and political context, and it can be viewed as a mission or a vision. Vision statement of the strategy should also include the methods how it can be achieved. Creating strategy requires planning, research and information gathering from markets, environment, and competitors. It also requires studying company's internal strengths and weaknesses as well as different opportunities and threats. Developing a strategy provides tools that can be adopted into company's management, working methods and guides operational decisions in a strategic context. (Mills et al. 2002, 8−10.)

Entertaining employees at work by providing them games, sports and time for celebrations is directing towards teamwork and well-being at work. It is argued to increase confidence to make initiatives and creativity. It also promotes longer hours that are spent at work and attracts new employees. Games at work can be used to build emotional ties between employees. Games can also reduce constraints, and few boring or demanding aspects of working tasks. They represent a solution that is adopted in a way that the work can be done, and employees would not refuse to do the tasks. (Savignac 2017, 14−15, 62.)

When using gamification for a project or other work-related activities, the motivations, high-level goals and context should be defined first. Dynamics of the game can provide motivation for social interactions and the mechanics of the game drive player involvement and can include rewards. High-level features can include points or different goods for the players. (Werbach & Hunter 2015, 16.)

Board games that implement the mechanics of Trivial Pursuit allow learning and creation of new didactic methods. They also, like other social games encourage competition and cooperation to reach the objectives the game is supposed to present. These games can also be hybrids that combine challenge, change and simulation. They can be altered to suit the company's businesses and structure. (Savignac 2017, 88.)

6 PRODUCTION OF THE SUSTAINABILITY BOARD GAME

The project started with reading through the PunaMusta Media's sustainability guide, which included the sustainability strategy. The guide provided the essentials which the board game was built on. It needed to be educative and fun to play.

PunaMusta Media's marketing and sustainability director supervised the project and gave feedback regarding the visuals, game mechanics and the sustainability theme of the game. The materials for the game were explored with the personnel of PunaMusta content and design department as well as the printing department. The materials for the final product were selected based on how sustainable they are. For example, there was an option to use plastic for the game pieces, but with the game encouraging sustainability, advertising cardboard was considered to be a more sustainable material.

The production of the game would be concluded in PunaMusta Media's own units. At the time of the writing, the final physical board game was not in the production yet, but for example, PunaMusta Joensuu's digital printing unit would be considered as an option to print the cards and rules. The board and possible packaging for the game would be printed in PunaMusta Pixmill.

6.1 Game idea and mechanics

The planning for game mechanics started with research regarding sustainability and different board games and their mechanics. The mechanics for the game

would be simple and easy to understand, but at the same time they should offer challenge, so the game would not become boring and that would increase replay value.

Different board game mechanics were analyzed from the point of views of aspect that would fit the theme of the game. The game would have similarities with games like *Trivial Pursuit* (1981), *Alias* (1989) and *Afrikan Tähti* (1951), with mechanics combined from both games. Since the game would be educational, the question mechanics from Trivial Pursuit would serve the purpose of learning sustainability. The simple path to follow inspired by Alias was considered alongside with branching paths from *Afrikan Tähti*.

Based on the general idea of the mechanics and the theme of the game a game design document was assembled. The target group would be PunaMusta Media's personnel. Since the company employs over 700 persons, the age group would be wide. The main target would be employees aged between 20 and 50.

When designing the game mechanics, the author assembled a range of questions using *Vastuullisuus PunaMusta Mediassa* -leaflet and Vastuullisuusraportti 2021 report. The questions would be based on information that can be found on the leaflet and the E-book and all the personnel of the company has access to it. Questions regarding sustainability would also be included if the game would be used in marketing, and for the people outside the company that have most likely not read the report and have less knowledge regarding PunaMusta Media's sustainability.

Alongside question cards, action cards were also considered. Action cards would include word puzzles, mimicking, drawing and other similar activities found from party games. The action cards would serve as more lighthearted approach to the sustainability theme than the question cards. The actions that the cards would include would also be themed on sustainability. For example, the player would need to explain a sustainability related word in similar style of Alias and the other players would have to try to guess what the word is. The player explaining the

word would gain points marked on the card and the players guessing the word right, would gain one point.

6.2 Paper prototypes and testing

When designing a game, game designers can build prototypes and use them for playtests at the early stages of the development. The goal of prototyping is to test the game before implementing anything advanced into the game, for example, graphics. Prototypes can be built using paper, pen, or index cards, or it can be acted. Quick prototyping and playtesting offer the designer instant feedback and see immediately if testers are achieving their player experience goals. (Fullerton 2018.)

The first testing was implemented with the personnel of Ylä-Karjala newspapers which is part of the PunaMusta Media. The players played the board game during the coffee break and moved game pieces made from 3 mm cardboard on a paper-built prototype of the game board. The first paper prototype was to test how big the game board would need to be if the game pieces would be around 5 cm tall and 2,5 cm wide. The game board was drawn on four A3 sized paper and taped together to create a 47 x 47 cm game board (Figure 8). The game path was created with 3,5 x 3,5 cm squares and the question and action tiles were marked with ? -symbol. X presented penalty, where the player had to wait one turn to roll the dice again.

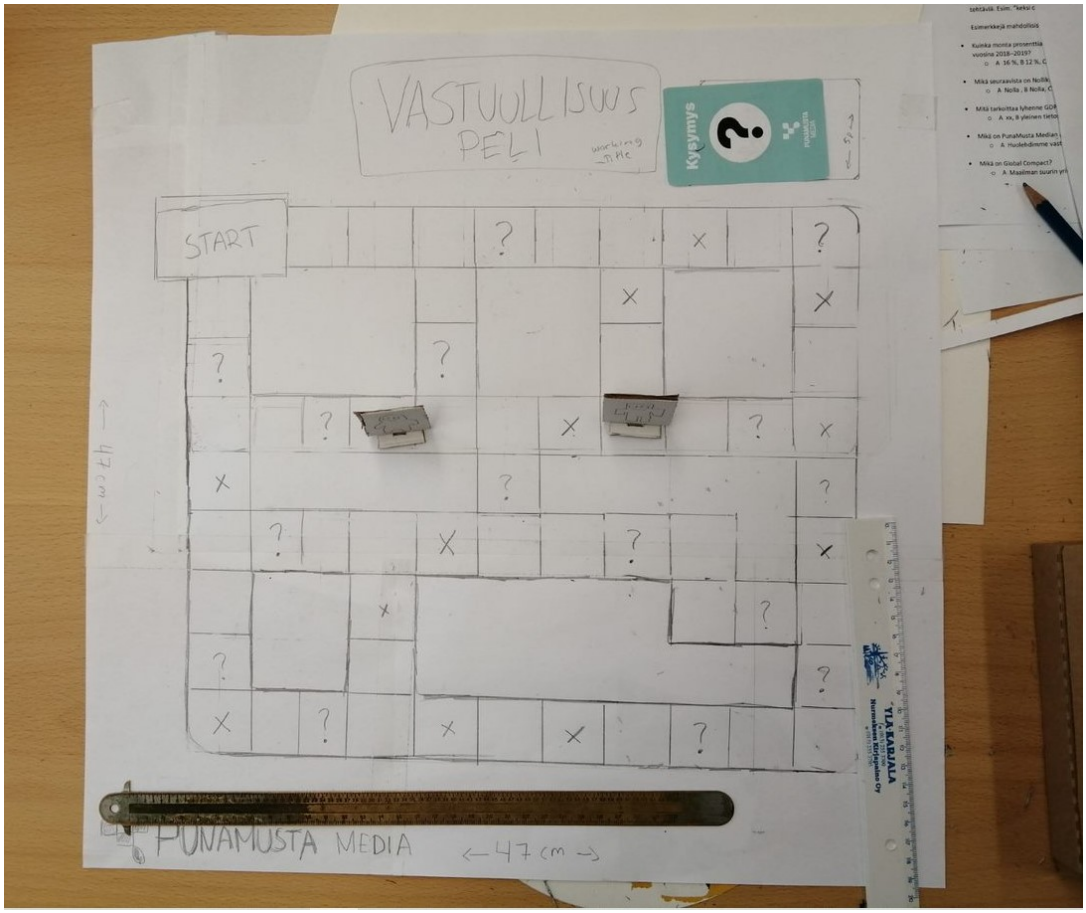

Figure 8. First paper prototype of the game board and game pieces

During the playtesting, two members of the Ylä-Karjala's personnel were playing the game and the author was asking the questions when the players landed on ?-tile, since there was no card yet and the questions were printed on paper. The goal was to gain five sustainability points before the other player. The other personnel who were not taking part in the game itself also made their own guesses when following the game.

The first prototype received positive feedback and the players preferred a game mechanic where there was no single path to follow, and they could plan their moves and choose freely where they would want to go. The second prototype with single path did not appeal as much to the players as the first one. The playtest also concluded that the personnel was not highly familiar with the sustainability strategy and found the game informative. The prototype also contained questions regarding sustainability in general and the testers found those questions as good reminder of knowledge they have already forgotten.

The second playtesting with almost finished board game also contained action cards that the players could use when they landed on corresponding tile on the game board. When playing the game, the players tried to strategize their movement towards action tiles, since they found them more entertaining than questions. They were also given a simple rulebook to read before the game started to see, if they understood the rules without the author explaining them. The second playtesting also releveled that some of the question cards needed corrections to the phrasing, since the questions could be understood in multiple ways. The players also found colorful game board pleasant, and they enjoyed the visuals. They also found the characters funny and instantly found their favorites to play with.

6.3 Visuals for the game board, cards, and game pieces

The visual style of the game follows the same style that is used for PunaMusta Media's illustrated visuals. These include for example, company's overall strategy and illustration used in *Vastuullisuus PunaMusta Mediassa* -leaflet (Figure 9). The style is cartoony and comic book-like with usage of bright colors alongside with the company's main colors of black, red, and white.

Figure 9. PunaMusta Media’s sustainability illustration

The planning for visuals begun with assembling a mood board. The mood board included inspiration for game board, cards and game pieces. The mood board contained both physical and digital board games with bright and colourful designs. When the mood board was ready, the game board base was assembled in Adobe InDesign with grey squares to mark the path for game tiles. The PunaMusta Media logo and game tittle were also placed into the board.
The game tiles were illustrated in Adobe Illustrator with few different variations. Vector graphics were used for game tiles, in case that the game board would require scaling larger. With use of vector graphics, the quality would not reduce.

The game tiles contained four different tiles: basic tile, with no functions, question tile, action tile and penalty tile as seen on figure 10.

Figure 10. Game board tiles

Neutral colours were used for basic tiles without text. There would be no actions for the players if they land on the basic tile, excluding the possibility that they would have to ask a question from another player that have landed on question tile. The question tiles contained a question mark sign accompanying with text “Kysymys”. The question tiles were coloured light green with grass resembling graphics. The action tiles included dark green with mossy graphics and contained exclamation mark with “Tehtävä” text accompanying it. The penalty tiles were coloured black and resembled coal. The penalty was displayed as a text on top of them.

The characters on the game pieces also follows the same comic book style as the game tiles. The characters were designed to resemble different personnel

that works in PunaMusta Media. The design started with blocking different shapes for the characters on a rough base for the game piece. After the blocking, the characters were sketched on the base and personnel of PunaMusta were asked if they know what the characters are supposed to resemble. Once the sketches were approved, the final designs were drawn in Adobe Photoshop and then placed on Adobe InDesign with through cut lines drawn for the printing and cutting.

The characters include prepress worker, journalist, IT support person and salesperson/customer service (Figure 11). The characters carry items that link them to the occupation they represent. The prepress worker has paper on their hands and are wearing the basic black PunaMusta T-shirt used among prepress personnel. The journalist holds a notebook and a pen and wears a journalist hat. The IT support person holds a laptop, and the salesperson/customer service has a headphone and microphone.

Figure 11. Characters for the game pieces

The game pieces were designed to be printed on 3 mm cardboard on both sides with simple through cut shape with same image on both sides. The leg that the characters stand on was a basic rectangle with a hole in it where the game piece would be placed on. Before final illustrations, personnel from PunaMusta were asked if they could recognize which professions the game pieces present to

declare if they could be recognizable instantly withing the employees of the company.

Card deck consists of two different cards: question and action cards (Figure 12). The frontside of the card displays same colours and marks as the corresponding tile on the game board. The backside of the card displays either a question with answers or an action that the player must take in order to gain points. The question cards also display the correct answers. The second side is mainly coloured white in order to keep the text clearly readable.

Figure 12. Question and action cards

The majority of the cards are question cards since the board contains more question tiles. If the players use all the cards, the deck can be shuffled, and the cards used again for another round. Action cards contain for example, tasks where the player must explain a sustainability related word using indirect expressions or they must think a way to promote sustainability and create a short poem from the subject. Similar action cards can be used for expression tasks with changing the words that the cards contain.

6.4 Final board game

The final board game design (Figure 13) includes a colorful illustration behind the tiles. The illustration follows the style that PunaMusta Media has used for other illustrations. The illustration features a path on a green meadow and hills with

small pond and birch trees. In the middle there is a building with PunaMusta Media's logo as a sign on top of it.

Figure 13. The game board

There was also an inquiry held for the name of the board game, but it did not receive any suggestions and the working title "Vastuullisuuspeli" remained as the final name for the game. The logo for the game remained similar from the early stages to the final game. It included the word "Vastuullisuuspeli" accompanied with the PunaMusta Media's logo on top of it.

The board would be accompanied with V-cut lines, that allows the board to be folded and packaged into a smaller space. When opened, the board would be 47 cm x 47 cm size as mentioned before in prototype and playtesting chapter. The V-cut lines would be placed on the middle of the board, where it could be folded in half or in four parts.

The rulebook design was designed on A5 sized paper, and the visuals were combinations from the board and the cards. The illustration created for the game board was used as a background and elements, fonts and colors from the question cards were used for other visuals. The rulebook contains the basic rules and description how the game is played. It also describes the different tiles that the board contains and what their functions are. The rulebook also contains list of items that the game contains: the gameboard, game pieces, number of question and action cards and dice.

In the final game, the players will first decide the score that they are trying to receive in order to win the game. It can be for example, 5, 10 or 15 depending on how much time they are planning to spend to play the game. When the score is decided, the players throw the dice and the player who receives the highest number will start the game, and the player with the second highest number will follow and then the next. All the players will start the game from the red start tile. Players will roll the dice and move on the board according to the number displayed on the dice.

When they land on a regular tile, nothing will happen, and the turn moves to the next player. If the player lands on a question tile, one of the other players will pick up a card from question card deck and ask a question written on the card from the player who landed on the question tile. If the player answers correctly, they will gain “sustainability points” that are displayed on the card. The number of points depends on, how difficult the question is. The player can receive one, two or three points. If the player’s answer is incorrect, the card is discarded, and the player will not receive any points. After answering the question, the turn will move to the next player.

If the player lands on an action tile, they will themselves pick up a card from action card deck and describe the action on the card to other players. If the card contains a word, that the player must explain in a certain way, they will choose one word and then perform the action. If one of the other players guess the word right, they will receive one point and the player performing the action will receive the number of points displayed on the card. The number of points will depend on how difficult the task is, in the same way as the questions. When the action is completed, the next player will continue by rolling the dice.

When player lands on a black penalty tile, they can see from the tile, what the penalty is. Penalties can decrease the number of points that the player has gained, make them wait one turn or return back to the start. The black tiles also include information regarding actions that will prevent sustainability, for example massive carbon dioxide emissions, data breach or an accident.

When the player has collected enough sustainability points, they can start to move towards the red finish tile. If they land on action or question tiles on their way, they can exceed the score that was determined at the beginning of the game and use those gained extra points if they land on penalty tile, that will decrease their score. The player who has reached the decided score and reaches the finish tile first will win the game. Players must land on the finish tile on exact number when they roll the dice. If the number is too large, they must move over the finish tile and try again on their next turn. The other players can also try to reach the finish tile after the first one, or they can quit the game after one player reaches the goal.

The game symbolizes the path towards carbon negative company and a sign next to the finish tile points towards that goal. On the way towards the carbon negativity the players “take steps” that must be done in order to reach. They do it by answering the questions and performing actions. The black penalty tiles are barriers that can slow the development towards carbon negativity. Since sustainability includes also data protection and occupational well-being,

questions and actions regarding those topics were also included, even though the final goal of the game is carbon negativity. One question card also includes a question regarding when PunaMusta Media is planning to achieve carbon negativity in their company.

7 CONCLUSION

The main results of the process revealed that gamifying a sustainability strategy requires extensive understanding regarding sustainability. The author discovered that when implementing a sustainability strategy into a form of a board game; it required understating of the strategy itself, but also understanding sustainability in general. Themes from general sustainability subjects could be implemented as a way to enhance the learning experience, when the majority of the game's questions and tasks are centered around the strategy. For example, there can be a question: "How much is the company is using green electricity?" and a follow up question can be: "What does green electricity means?". The author also found out that for question cards, it was easier for the players to answer to the sustainability questions if they had multiple options to choose from, since they were not completely familiar with all the themes of the sustainability strategy.

Motivation, cooperation, and competition can help the players to internalize the themes of the sustainability as well as help them to build relationships between themselves. It can also help the personnel playing the game feel amused or help them learn new subjects. When gamifying sustainability strategy, the personnel would find it the most useful, since they should be familiar with the strategy already at some level, while a person outside the company would find some of the questions difficult to answer since they are strongly tied to the company. The solution for this could be using more questions that are related into sustainability in more general or creating questions that are based on information that can be easily discovered by people outside the company, for example, from the company's website.

When comparing sustainability between printing industry and video game industry, it appears that in video game industry majority of environmental impacts

and carbon emissions are from energy usage in their offices, cloud and hardware maintenance, while in printing industry the impact is caused by energy usage in production and material consumption.

Companies in both printing and video game industries sustainability strategies include reduce of carbon dioxide emissions, monitored, and reduces usage of water and energy as means to reduce their environmental impact. Compensation of carbon dioxide was also described as one mean to reduce environmental impact in both industries. When creating a board game, the main impact would be caused from material and energy usage for the production, and when creating a video game, the impact would be caused from energy used for equipment, for example hardware and also maintaining the game, for example a cloud services. If the game would be published as physical version alongside digital version, then it would also produce emission from production of the physical copies. Both distributing the board game and physical copies of the video game would also generate indirect emissions.

Benefits of gamification for a B2B company would seem to be gained from educational purposes. Gamification can be used as a tool to educate personnel for example, regarding company's strategies or to enhance motivation and build social engagement between employees. Training processes can also be gamified where company can enhance its personnel's skills and help them learn new ones.

Company's sales and customer experiences can be gamified for example, by creating leaderboards and healthy competition between sales teams. It can enhance sales and generate revenue. For customers, gamification can create benefits for learning more regarding the brand or the product that they are associating with. Gamification can also be used for creating personalized offers for customers that will help the company to gain more revenue and generate engagement.

B2B companies can gamification to raise awareness of their brand and build long-term engagement with their partners and customers. Gamification is also one mean to gather information and data and invest towards potential future customers. By studying different cases where business to business companies were using gamification, the most beneficial way to use gamification for the client of the thesis would be using the game as education material for personnel or as a way for customers who wants to learn more regarding the brand. As mentioned before, then it should include more topics regarding sustainability in general, or information that can be easily found.

The results of this rely on information found in sustainability reports produced by video game companies and printing industries, and thus, these form the base to assess the validity and reliability of this study. This study also includes information from Sitra's reports that study innovating sustainable solutions for the future. Sustainability reports from the companies reflected similar goals that were also defines by different associations from both video game and printing industries. Gamification studies contain information from game-design-oriented study books, articles, and cases where gamification was used in different instances. Playtesting conducted in this study reflected the results found from sources that cover gamification and education what motivates players.

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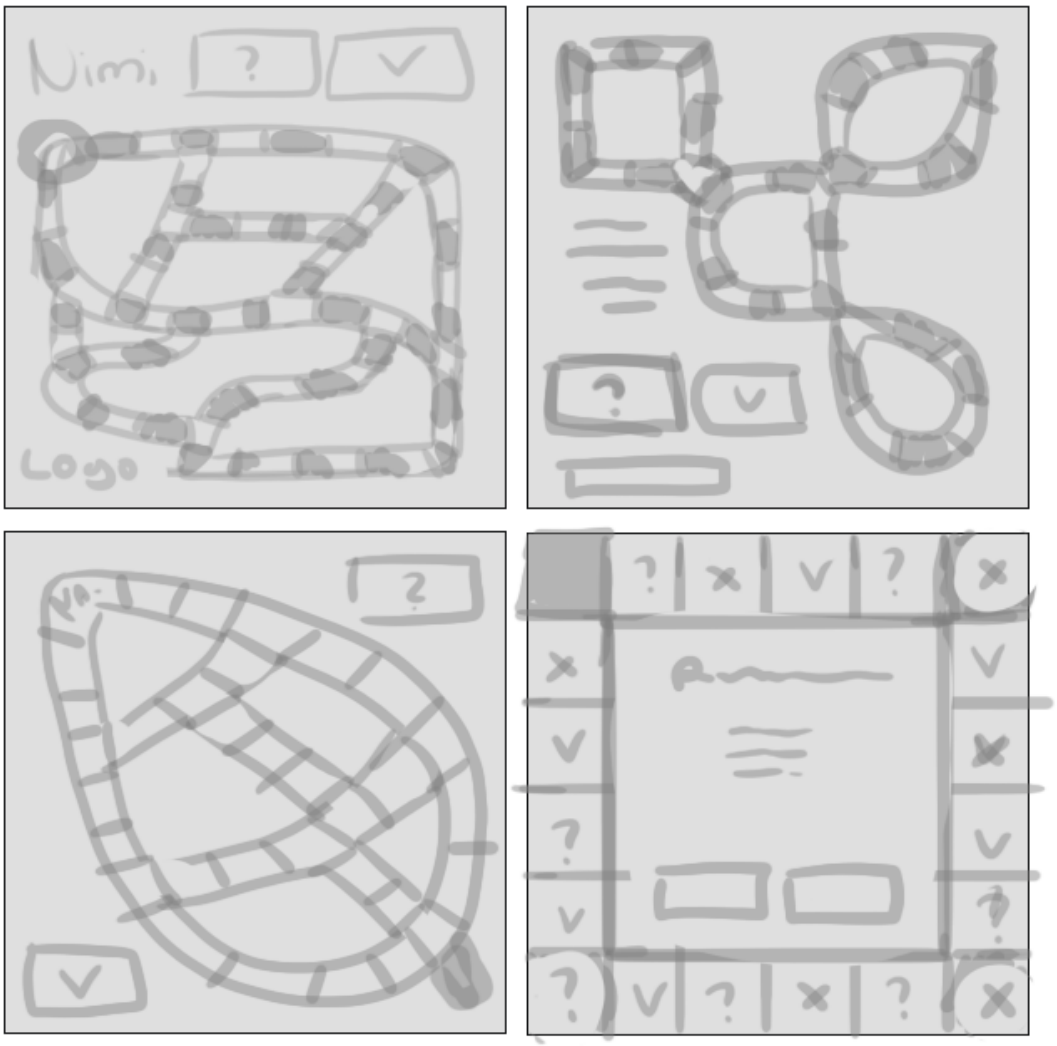
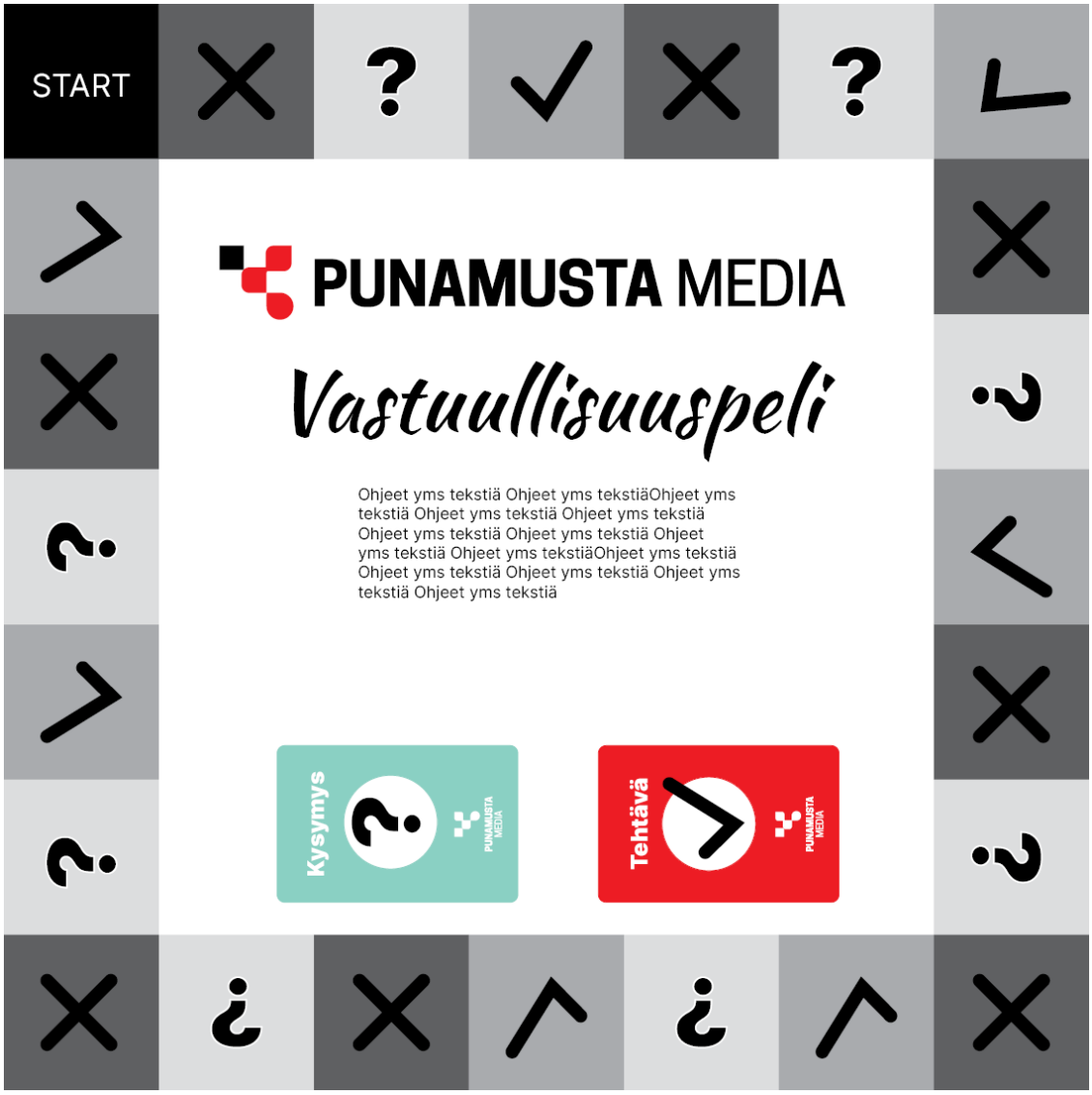
LIST OF FIGURES

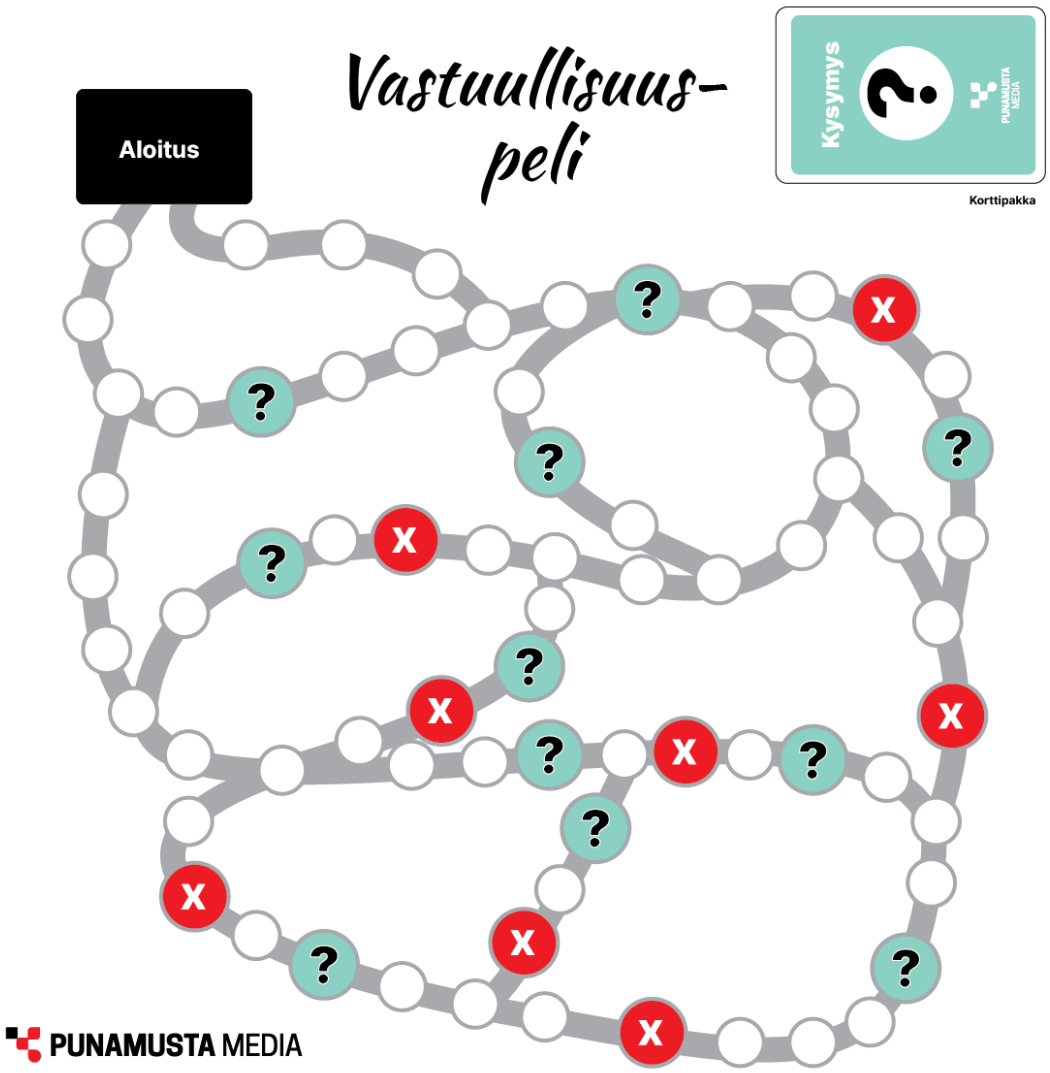
Appendix 1

EARLY SKETCHES FOR THE GAME BOARD AND GAME PIECES



SKETCHES FOR THE GAME BOARD




Vastuullisuus-peli
Aloitus
Kysymys
PUNAMUSTA MEDIA
Korttipakka
PUNAMUSTA MEDIA


PUNAMUSTA MEDIA
Vastuullisuuspeli
(työnimi)
Aloitus
Kysymys
Tehtävä
CO2
Kompensoi päästöjä yhden vuoron ajan
Työ-tapaturma
Odota lääkäri-in pääsyä yhden vuoron ajan
Pudotit roskan
Palaa kaksi askelta taaksepäin ja poimi se
xxxx
Menetät kaksi vastuullisuus-pistettä
Hiiline-gatiivisuus
Tieto-murto
Menetät yhden vastuullisuus-pisteen

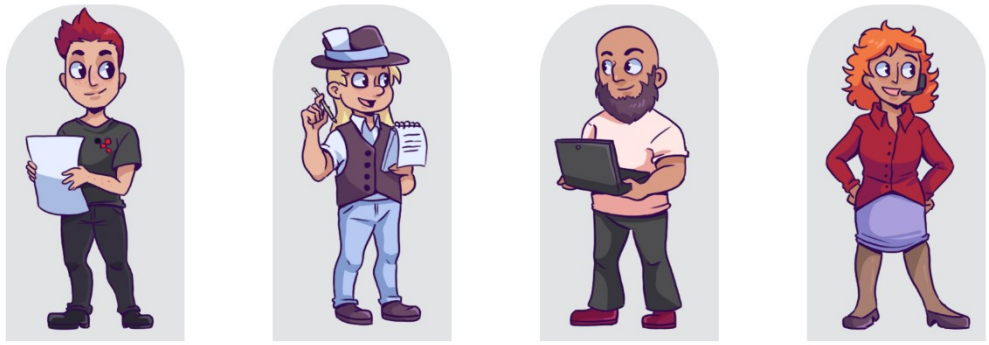
GAME BOARD TILE VARIATIONS

CARD VARIATIONS

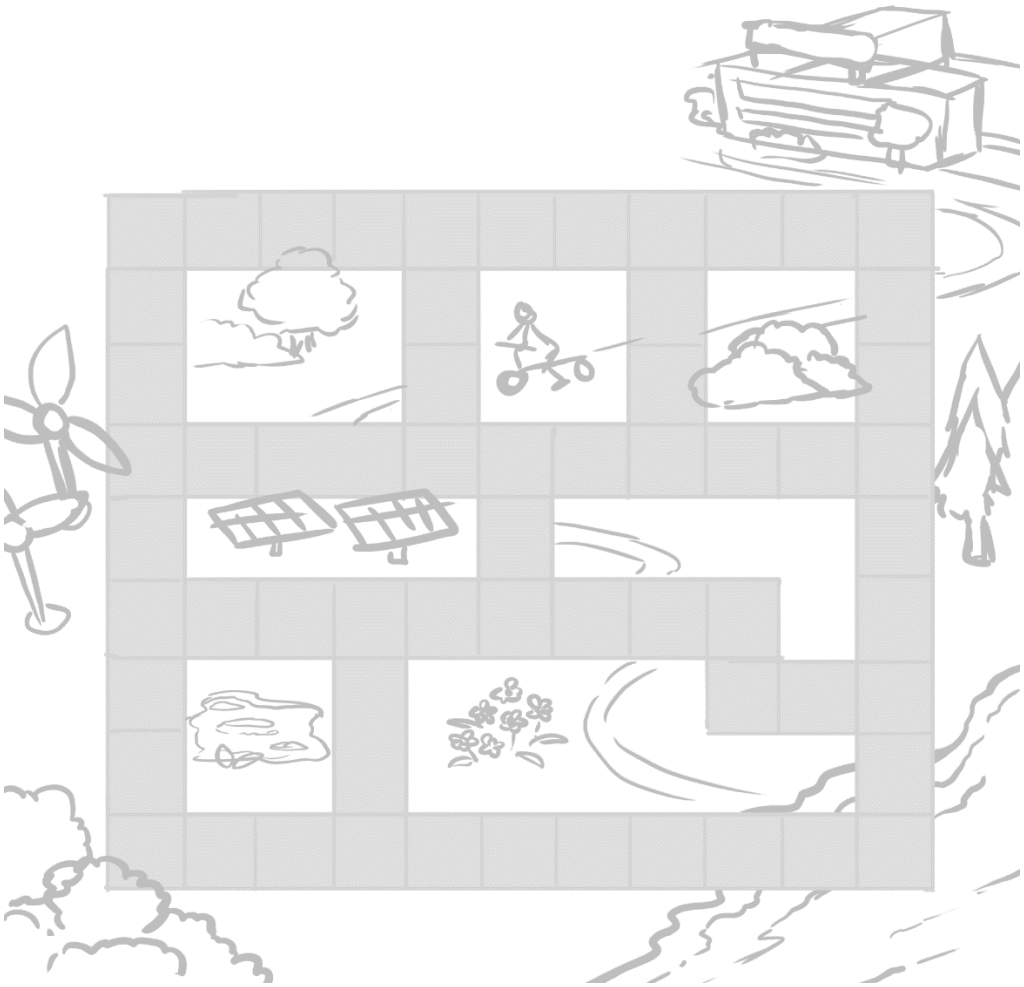
QUESTION AND ACTION CARDS


Tehtävä
Keksi oma arjen ympäristötekosi ja kerro se muille pelaajille runon muodossa.
Pisteet 3
Tehtävä
Valitse yksi alla olevista sanoista ja selitä se muille pelaajille kiertoilmauksilla ja vihjeillä
A Hiilijalanjälki
B Asiakaslupaus
C Vastuullisuus
Oikein vastannut pelaaja saa yhden pisteen.
Pisteet 3
Tehtävä
Anna oma ympäristölupauksesi.
Pisteet 3
Tehtävä
Valitse yksi alla olevista sanoista ja yritä selittää se muille pelaajille pantomiimilla.
A Hiilijalanjälki
B Sanomalehti
C Energia
Oikein vastannut pelaaja saa yhden pisteen.
Pisteet 3
Tehtävä
Keksi tapa, miten voisit edistää kestävää kehitystä.
Pisteet 3
Tehtävä
Keksi kolme eri tapaa vähentää päästöjä ja kerro ne muille pelaajille.
Pisteet 3

CHARACTER SKETCHES AND MOCK-UP OF A GAME PIECE



SKETCHES OF THE GAME BOARD ILLUSTRATION




PUNJAMISTA

FINAL ILLUSTRATION FOR THE GAME BOARD