

Conversation incentivising serious card game

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Abstract

This report covers the development of a card game framework capable of incentivising conversation about living in a modern middle European "smart city". It was conceived to answer the struggle of raising citizen participation among citizens with a migration background that municipalities and organisations face.

Based on the findings detailed in Chapter 2: Empathize, the development pivoted from creating a specialised game experience to an adaptive tool as described below.

"Researchers and other stakeholders struggle to discuss complex topics, Smart Cities for example, with their respective target audiences. An adaptive card game framework is intended to allow them to fill it with content befitting their thematic interest without the need for game design knowledge. To find wide use, such framework would have to be accessible, easy to understand & adapt."

Development then focused on answering questions regarding what requirements a card game framework would need to meet to allow the flexible creation of a consistent game experience. The prototype iterations ended with form fillable pdfs for both the game itself and a content creation guide, as well as a mock-up of a website that would house a more intuitive method of content creation. Usability testing revealed that the prototypes were accommodating of both a fun and vocally interactive experience, for which content creation takes little more than the idea of a theme and a bit of time.

In conclusion, the developed card game framework exhibits certain traits that were found to be desirable and could likely be used by municipalities, organisations and other stakeholders alike. For future improvements it would be recommended to apply visual styling, as well as develop a functioning software to assist with content creation.

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1. Introduction

1.1 Company

Hogeschool Saxion's "Smart Cities" research group in Enschede became what it currently is after leading professor Mettina Veentsra changed its name in 2016. Before then it existed as "Media, Technology & Design" and had a less specific focus (M. Veenstra, personal communication, 2023). The term "Smart City" refers to the use of technologies within urban design with the goal of improving its various facets: Efficiency; Mobility; Energy use; Sustainability; Quality of Life.

The research group's aim is to contribute to sustainability, which the 16 employees work towards through two concurrent Research lanes:

1. Guiding government policies based on data
2. Improving quality of life with smart city applications

The Project covered in this report belongs to the second research lane as one of the initiatives to support and encourage citizen participation to improve city living (Saxion, n.d.)

1.2 The Project

Originally it was Researchers of University Siegen who ideated playing cards with the goal of gamifying and incentivising the discussion about living in a modern German city environment among the citizens with a migration background that they worked with. Through this game experience, the players would roleplay through hypothetical situations involving technologies of modern city living, ideally opening conversation. The first play sessions that they conducted yielded promising results, leading to the eventual cooperation with the Smart Cities Research Group. Further iterations were developed together, which however still lacked a solid structure and rules. (K. Aal et al., personal communication, March 13th, 2023) This, the overarching and joint effort to develop the game, is from now on referred to as the card game project. Figure 1 below shows one of the older iterations during a playtest.

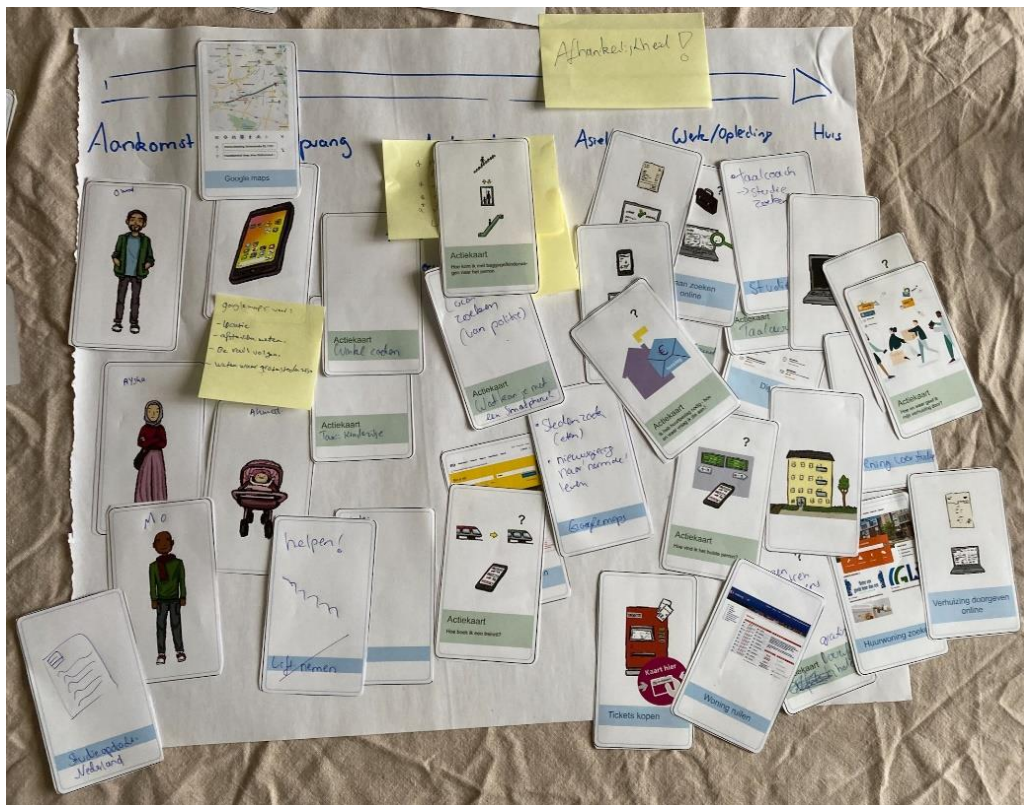


Figure 1: Old playtest (photograph). Smart Cities (n.d.)

It was decided to hire a game designer to let him / her develop the idea further. This is what is mainly covered in this report, being the graduation assignment during which I worked individually on the project.

Both the project and report follow the Design Thinking model. Design Thinking (visualised below in figure 2) is a human-centred process used to split development into five, non-linear stages and largely thought to be popularized by the company IDEO (Dam & Siang, 2023) and elaborated on below.

The Five Design Thinking Steps



Figure 2: Design thinking steps (graphic). Anoriega (2021)

Empathize: Researching the target audience and the problem to gain insight.

Define: Clarifying what the problem is and how it could be solved.

Ideate: Generating ideas based on the Empathize and Define stages.

Prototype: Experimenting with the aforementioned ideas through prototypes.

Test: Trying and evaluating the prototypes.

Depending on the results of any stage, one will revisit other stages to try or rule out possible solutions.

1.2.1 Preliminary Problem Statement

Middle European municipalities and organisations struggle to involve citizens with a migration background, especially refugees and asylum seekers, in the discussions and decision-making regarding the environment and technology, or “smart cities”. A thematic card game experience is intended to provide a fun and approachable way of broaching the subject. To find wide use, such concept would have to be developed into a proper game with concise rules.

1.3 Stakeholders

Parties listed as stakeholders do not all necessarily have direct involvement in the card game project, they would assumedly however benefit from it.

University Siegen is a medium-sized interdisciplinary research university in Siegen, Germany. It was researchers from here who originally started the project before it became a collaboration with the Smart Cities research group.

Municipalities are considered a stakeholder, although none is currently aware, let alone involved in the project. Still, they are considered as a potential and ideal end user along with the target audience due to the government's role in the topic of citizen participation.

Any and all Organisations that deal with the integration of migrants, refugees or otherwise marginalised groups are also considered stakeholders. Connexa for example is employed by the Dutch government to help and support asylum seekers and would thusly be another user of the finished card game.

1.3.1 Target Audience

The main target audience for the card game are citizens with a migration background, more specifically the more marginalised demographics like asylum seekers, Refugees. They are closely followed however by any of the stakeholders themselves, who would most likely be the party to initiate and organize a play session.

2. Empathize

2.1 Market

A variety of sources were explored to gain an overview of the market, including research papers, personally conducted interviews and an independent search for existent board / card games.

Serious board / card games exist, however their contents are most always very specialised and based on a deep knowledge on their topic. Therefore, these games are only used among the researchers who conceived them or other individuals who are already highly educated in the topic (K. Aal, personal communication, March 13th, 2023). This card game project differs in that it specifically aims to accessibly introduce people to a topic that they may be unfamiliar with.

It was also found by other researchers that the use of card / board games for serious purposes can provide considerable value and opportunities. However the adaption of an existing one or even creating a new one can be very difficult. (Castronova & Knowles, 2015)

The studio Raccoon Serious Games was found to have developed conceptually similar games and consequently reached out to for insight. The use of the Design thinking model was confirmed in the studio, and the game “play for good” was specifically recommended for reference. (K. Fraijman, personal communication, March 17th, 2023) This free game is to be played by any team working on a digital project and has its players determine the priorities and possible first steps of making their digital solution more accessible. (*Klaar Voor De Toekomst Met Play for Good*, n.d.)



Figure 3: Box of the card game play for good (photograph) play for good (n.d.)

“Play for Good” is relevant because of its focus on accessibility in all its facets, to the extent that a hard copy of it could be ordered freely online. Alternatively, it could be

downloaded as a pdf and printed out – Which is something that had already been considered for this card game project (L. Scheepmaker, personal communication, 2023). Furthermore, “Play for Good” is heavily dependent on and encouraging solution-oriented discussion. As part of market research, it was tested and compared with other card & board games known for requiring or encouraging conversations.

The following table displays some key data for the different games found and compared during market research. All shown data is used as reference and considered during the ideate, prototype and test stages of development. The information for the games that were not personally tested was found on *boardgamegeek.com*.

Table 1: Game data comparison (table). F. Welp (2023)

Game Name	Player Count	Play duration	Winner / Ending	Win Condition	Personally tested
Play for Good	3-5	30m	No winner	-	Yes
Binding Of Isaac	2-4	30-60m	One Winner	Collecting a resource	Yes
Orgasme	2-6	20-30m	One Loser	Collecting a resource	Yes
Diplomacy	2-7	up to 6h	One Winner	-	No
The Resistance	5-10	30m	One Team Winner	First to win three	No
Say Anything	3-8	30m	One Winner	Collecting a resource	No
Dixit	3-8	30m	One Winner	Collecting a resource	No
Cockroach Poker	2-6	15-25m	One Loser	If one player has no cards or too many of the same	No
Two Rooms and a Boom	6-30	7-20m	One Team Winner	Player positions at time end	No
Werewolves of Miller's Hollow	8-18	30m	One Team Winner	Removing the opponent from the game	No
Game of Life	2-4	30m	One Winner	Collecting a resource	No

The following table shows a generalised list of card types found in games, referring to their use and functionality. Like the first table, it shows comparable information for the listed games at a glance, and was considered when it came to ideating the different card types and interactions.

Table 2: Card type table (table). F. Welp (2023)

Game Name	Player Character Cards	Team Cards	Event Cards	Action / Response Cards	Voting Cards / Pieces
Play for Good			X		X
Binding Of Isaac	X		X	X	
Orgasme	X		X	X	
Diplomacy					
The Resistance	X	X	X	X	X
Say Anything			X	X	
Dixit			X		
Cockroach Poker				X	
Two Rooms and a Boom	X	X	X		
Werewolves of Miller's Hollow	X				
Game of Life			X	X	

Comparing different games shows likely good parameters to aim for and test, such as player count and gameplay duration. More importantly however, it highlights that there are multiple gameplay approaches through which designers encouraged and or forced discussion among players. Prototyping and testing these approaches is assumed to allow the ruling out of suboptimal gameplay elements.

2.2 User

In line with the original problem that this card game project aims to deal with, it proved difficult to get in contact with asylum seekers and refugees. Instead, both researchers and social workers closely working with migrants and asylum seekers were consulted. While these alternatives do not provide insights on a basis as personal as an interview with the target audience itself could, they proved valuable nonetheless.

Engaging citizens in activities and or decision-making to improve the quality of life within their surroundings (Citizen participation) is a struggle for municipalities in the Netherlands and Germany. The reasons for this are numerous and can vary, as citizens may: Not trust the government; Not consider themselves knowledgeable enough; Be unwilling to engage with different perspectives / opinions. (A. van Twist et al., personal communication, 2023)

People with a migration background (more so the commonly marginalized members of society like asylum seekers and refugees, rather than expatriates) may exhibit these reasons to a greater extent than natives. This can be due to prior experiences and their unfamiliarity with the new environment – specifically technology in the context of smart cities. (K. Aal et al., personal communication, March 13th, 2023)

The extent to which technologies are used in central Europe might be unfamiliar or stressful for people who for example might have previously been used to only have one phone or social media account shared across an entire family. (A. Weibert, personal communication, March 20th, 2023)

A gamified approach to discussions and education has value for members of the target audience as it may ease feelings of inadequacy or incompetence. This applies even more so to the use of roleplay, in which the players see and interact through a lense. (K. Aal, personal communication, March 13th, 2023)

A language barrier can be a real problem even for asylum seekers who are being integrated and given aid. (M. van der Heide, personal communication, April 3rd, 2023)

These findings lead to the argument that it is not feasible to cater to a target audience as vague as previously aimed for in a single card game due to the variety in cultural background, media literacy, knowledge of language etc. the players might exhibit.

2.3 Smart City Technologies

Technological and economic developments impose challenges on Cities. (Saxion, o. D.) On top of technological advancements come the diverging interests of any involved stakeholder. (Angelidou, 2015) Because of these continuous changes, it argued that an accurate portrayal of the topic in the form of a game would not only prove difficult, but that it could become outdated quickly even then.

2.4 Empathise conclusion

As per the findings outlined above, both the target audience of citizens with a migration background and the topic of smart city technologies are more vast and multi-faceted than this report and a simple card game could properly convey.

Due to this It was decided to divert the focus of the graduation assignment. Thusly, its part in the card game project outlined in this report is not an attempt to create a game thematically encompassing the entirety of modern / "smart" city living from the perspectives of a vast and varied target audience. Instead, together with my supervision at Smart Cities, I decided to create the framework for a suitable game. To elaborate, this framework would be technically playable, as both rules and interactions are provided. Any thematic content however, including any direct reference to the topic of smart cities, would be purely "dressing", meaning conveyed through images and text that do not change the way the game plays.

This change is reflected in all following work and the chapters below, starting in the define Stage with a rewritten problem statement.

3. Define

3.1 Final Problem Statement

Researchers and other stakeholders struggle to discuss complex topics, Smart Cities for example, with their respective target audiences. An adaptive card game framework is intended to allow them to fill it with content befitting their thematic interest without the need for game design knowledge. To find wide use, such framework would have to be accessible, easy to understand & adapt.

3.2 Measures of Success

- A card game framework that is capable of encouraging conversation / discussion about the smart city subject among refugees and asylum seekers.
- It is easy for the Smart Cities research group to create and adapt content for this card game framework.

3.3 Main Question

What requirements would a card game framework need to meet so that it could be used by organisations working with refugees or asylum seekers to set up a consistent game experience about smart city living which encourages citizen participation?

3.3.1 Sub Questions

Sub Question 1: What are the fundamental building blocks of a card game framework?

Sub Question 2: To what extent can a card game framework provide freedom for content creation (for people without game design knowledge)?

Sub Question 3: How could consistency be achieved in a flexible card game framework?

3.3.2 Methodology

Sub Question 1 Methods: To answer this question, Market analysis will be conducted; Existing card / board games will be evaluated and compared, both serious and entertainment based ones. Furthermore, the development of earlier iterations within this card game project will be analysed.

Sub Question 2 Methods: The to-be-developed prototypes will be tested with personas, agendas and information provided to testers who then are tasked to create content.

Sub Question 3 Methods: Basing on user (tester) created content, repeated playtest sessions will be held to determine the consistency of gameplay.

Besides of the aforementioned tests will be a series of usability tests, mostly focusing on the ease of use (*Usability 101: Introduction to Usability*, n.d.).

3.4 Scope

3.4.1 Deliverable

- Card game framework prototype.
- Content creator guide.
- Content creator prototype.

3.4.2 Inclusion

Card game framework prototype: A pdf/odt containing the gameplay rules and instructions as well as the cards themselves, which could be printed out and cut for a ready gameplay experience.

Content creator guide: A pdf/odt containing the instructions and guidelines to create one's own content dressing for the card game.

Content creator prototype: An Invision or Figma based proof of concept prototype of a web application for content creation.

3.4.3 Exclusion

The card game will not receive a polished content dressing themed after smart city living.

3.4.4 Assumption

Following correspondence with a game development studio it is assumed that there will be a professional team to continue the card game project shortly after the thesis will be finished (L. Scheepmaker, personal communication, 2023). Therefore it is assumed that providing a good basis future development will at least partially negate the current constraints.

4. Ideate

Ideation was started with a brainstorming session focused on card game aspects of interest. More specifically, a short discussion on the topic was followed by a method based on brainwriting (*MindTools*, n.d.). Together with Nicolle Louiza, another designer employed by Smart Cities, Ideas were based on prompts and written individually, drawing from the shared professional knowledge of game design.

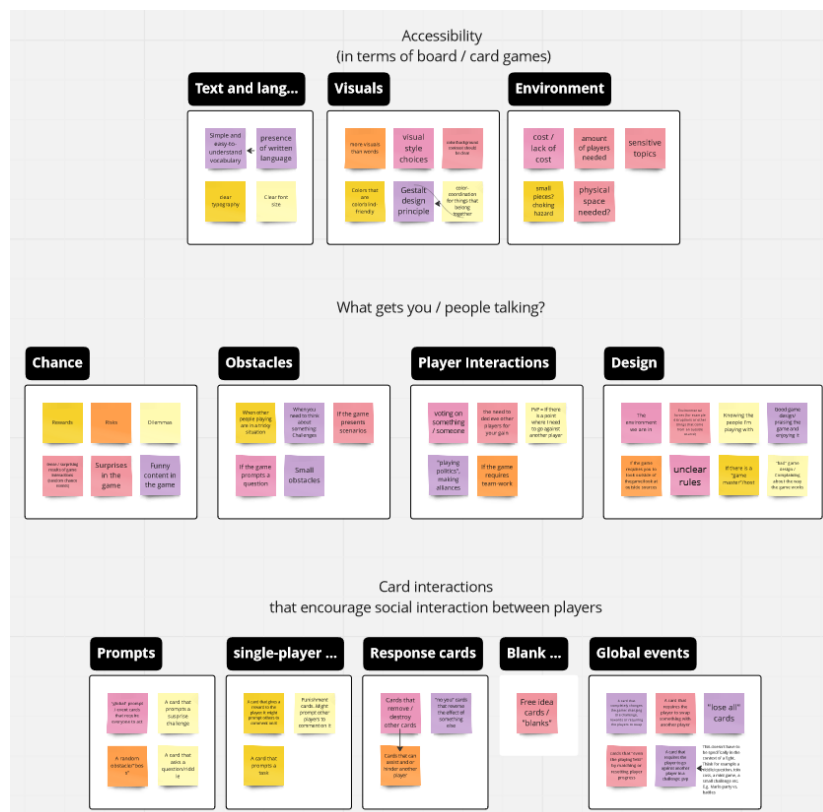


Figure 4: 1st Ideation Brainstorm results (image). F.Welp (2023)

The results of this first brainstorm, shown above, were collected and sorted on a Miro board that can be viewed with this [**link**](#). Note that this Miro board was used as a tool and was not kept up to date with developments.

The results were compared with both the games found during the market research and what was known about previous iterations of the card game project. This provided the basis for a second brainstorming session with two other designers – Nicolle Louiza as well as Lianne Picker, another designer peer who was entirely unacquainted with the project and could provide professional yet unbiased input. This brainstorming took the form of a more direct discussion, leading to the first conceptualisation and determination of to-be-tested gameplay elements.

As the product was predetermined to be a card game, idea generation was not aimed to generate full game concepts. Instead, individual game elements and their alternatives were thought of and considered, taking into account desirable aspects and how well they would work together when combined to form a full game. For example, roleplay was found to be a desirable and effective part of the original prototypes (K. Aal et al., personal communication, 2023). It was therefore compared how much of a part roleplay usually is among the found card games and how guided / restrictive it is. When any further conclusion could only be based on assumption, it was decided to prototype a selection of alternative solutions. Such a process was repeated for the different gameplay elements that would together form a complete game.

5. Development (Prototyping & Testing)

This chapter consolidates the Prototyping and Testing steps of Design Thinking for the convenience of the reader.

5.1 First card prototypes

The first prototype that was developed following the Ideation phase was a selection of simple and low-fi cards cut out of blank A4 paper and drawn / written on to represent playing cards containing imagery and themes of “everyday problems” like falling sick or public transport being unavailable, similar to previously developed iterations of the card game. These cards would only function as a reference for their sizing and layout for future iterations and would not be tested with.



Figure 5: Photograph of the 1st card prototype (photograph. F.Welp (2023))

To specify interactions and gameplay, the next prototypes were simply word documents explaining the rules and game mechanics. The game contained three kinds of cards, being the problems, actions and characters. Character cards would be randomly assigned to every player at the beginning of the game and provide them with a role to play as, as well as a unique ability. Problems were at the core of the game, the goal being to solve all problems. The action cards are what players used to interact with another and solve their problems. These rule documents were used in the first tests, along with a new and complete set of playing cards like the aforementioned first prototype, this time lacking any theme however and focusing on the gameplay interactions entirely, seen below.



Figure 6: Photograph of the 2nd card prototype (photograph). F.Welp (2023)

5.2 First (Usability) tests:

Goals: Information needed to reiterate / improve the gameplay experience; Discovering possible mistakes or undesirable interactions stemming from rules.

Requirements: Card game framework prototype, including rules; Prepared Survey;

Methods: Observed and unassisted qualitative usability tests with varying amounts of players. Following the play session, involved players are given the opportunity to ask and answer questions, as well as fill in a prepared digital survey.

Process: The Test was conducted first with a group of six players playing two full rounds of the game, followed by two rounds held with just two players. The reasons for this were both the availability of testers, as well as the want to try what were temporarily determined as the two ends (highest and lowest) of possible player counts.

Takeaways: These test rounds showed promising results in that there already was a large amount of player interaction and discussion, primarily centred around strategy. It is assumed that applying a thematic content to these cards, including writing and imagery, will only increase the amount and quality of interactions between players. The main areas of criticism were balancing of gameplay and clarity of rules, which will be addressed in the next card prototypes. Below is a photograph taken during the playtest.



Figure 7: Photograph of first usability test session (photograph).
F.Welp (2023)

5.3 First content creation prototype

Following the first playtest, development focused on the content creation side of the project. A Figma mock-up of a website “companion” was created, which would provide information, a functionality to download the game in the form of a pdf, and a digital content creator. This mock-up, a back-end view of which is shown below, can be visited through this [link](#).

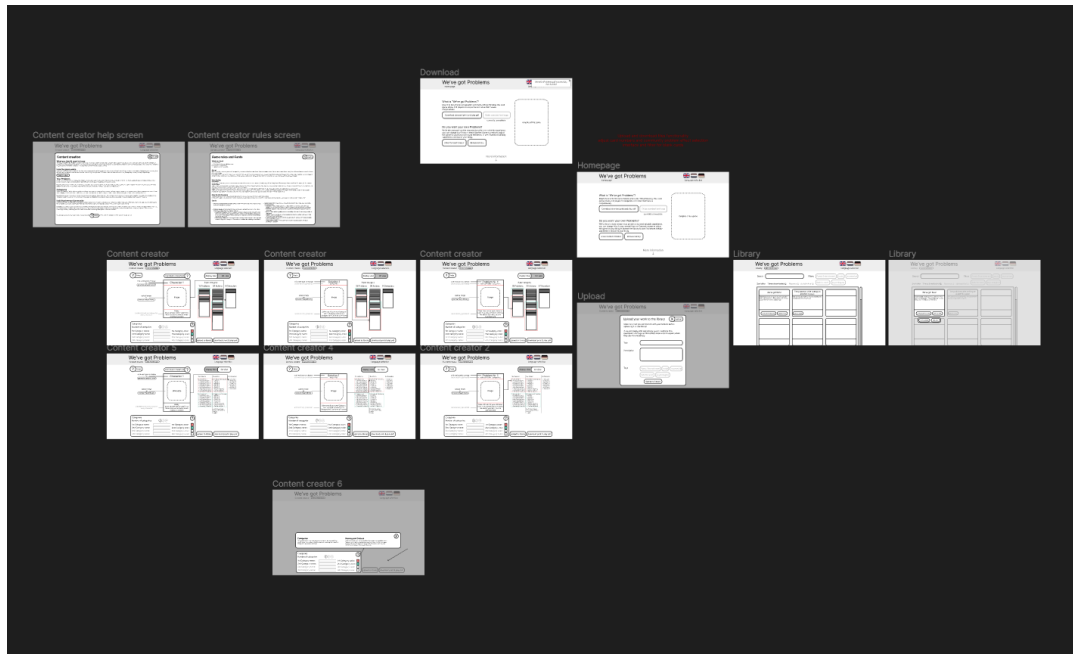


Figure 8: Editor view of the Figma prototype (image). F.Welp (2023)

5.4 First Content creation test

Goals: To determine the ease-of-use and ease-of-understanding of the hypothetical companion website for the card game and by extension the creation of content.

Requirements: Content creator website prototype; Laptop; Instructions for tester.

Methods: The tester will be sat down in front of the prototype and will be given instructions to follow. While following the instructions, they are asked to think-aloud (Van Someren et al., 1994), describing what their thought process is and any remarks / confusions / complains they may have.

Process: Two testers, individually and after another, were given variously complex instructions to follow with the prototype while they were recorded. Both during and after their tasks they were allowed to ask questions, as long as the answer wouldn't tell them the solution to their task.

Takeaways: Both testers provided largely similar feedback, in that the content of the prototype is good, but that the user experience of navigating it can be confusing and or overwhelming. Future iterations would improve upon this by introducing less information at a time and simplifying the layout of some of the pages, specifically the content creator.

5.5 Second Content creation prototype

To test tangible content creation, which the website prototype was unable to accommodate, word documents were created. These contained a written guide, game rules and pages with empty spaces for testers to fill in (shown below). The rules were revised after the first playtest, the major addition to the game being categories, which would allow for a higher level of specificity within the thematic content, as well as a more interesting gameplay experience. With flexibility in mind, it would be optional to create content split into two, three or four categories, affecting both the problems and actions.

"We've got Problems"
Content Creation Guide

This paper is meant to help with the creation of assets, both written and visual, to use with the "We've got Problems" card game framework.

What you (don't) need to know

"We've got Problems" is intended to provide a gameplay experience capable of broaching a problem based subject to its players. The mechanical gameplay and the interactions between cards are designed and tested for this purpose and will ideally not require any changes to accommodate whatever thematic content you might want to dress it in. Thusly, no game design knowledge is required – You only need to know what you want to convey.

How the game works

It is heavily recommended to read both the Rules and card explanations before going forward, as they will teach everything you need to know about playing the game. Knowing that will make any attempt to work with it much easier. In short: A group of players (2-6) tries to solve all their problems to win, strategizing and cooperating along the way.

Categories

"We've got Problems" works with categories of problems and solutions, meaning that a solution you have might not work for the problem you are facing because they are not in the same category. This doesn't have to be arbitrary but can make sense in the context of your chosen theme and even help you to come up with a fitting solution. Think about your theme and consider how many and what categories would make sense. The process will be easier if you already know exactly what your theme is and what categories you may want to split it into. (There can be 2-4 categories)

Your Problems

At the core of the game as a whole are the Problems, both big or small in scale, which the players have to solve in order to win. The Problems dictate the theme and tone of the game and are another reasonable point to start with when thinking about applying a theme to the game.

Hypothetical Example: I want to theme "We've got Problems" after the construction of a house. What potential problems do I need to keep in mind and/or solve? One of the many problems could be that the location is very hard to access by construction vehicles. Lets call it "Limited access".

Now lets think back to the topic of categories.

Hypothetical Example: In my theme of construction, I have the problem "Limited access". This problem can be put into a category called "Logistics". A solution for a problem in the "Logistics" category could be "Good Planning". This is open to interpretation enough so that it could also be applied to other problems in the "Logistics" category.

Individual versus Community

Individual problems, as explained by the Cards and Rules pages, only concern a single player at a time. Depending on the scale of the topic, this can be seen as a personal issue or that person's responsibility. Community Problems however are of such scale that they concern everyone and have drastic effects.

Hypothetical Example: In the collective effort of building a house, limited access for vehicles does not only concern one person, but it may be one person's responsibility. That way, the "Limited Access" Problem can be an individual problem. Another problem could be that you lose permission to construct the house, halting all progress. This could be a community-problem, specifically one that needs to be solved before any other problem can be addressed.

1st Category name: _____

Problem Cards

Names give your Problems names befitting the Category that they're in and think about what could be depicted for an image. Individual problems have no special effect, but they will overwhelm you if you have three or more at the end of your turn. If you can't think of enough different problems, a card could be duplicated.

- Individual Problem Nr. 1 Name: _____
Image: _____
- Individual Problem Nr. 2 Name: _____
Image: _____
- Individual Problem Nr. 3 Name: _____
Image: _____
- Individual Problem Nr. 4 Name: _____
Image: _____
- Individual Problem Nr. 5 Name: _____
Image: _____

With four categories, you have 1 Community problem per category. These have a special effect that you can pick from. Think about which effect makes most sense and which effects are maybe already used in the other categories – for most interesting gameplay, avoid two community problems with the same effect.

- Community Problem Nr. 1 Name: _____
Image: _____
 - o Everyone is overwhelmed with one fewer problem.
 - o Players can only use one action per turn.
 - o No other problem than this can be solved.
 - o Players can't solve or take other's problems.
 - o Character Abilities have no effect.
 - o Players can only interact with their seat neighbour.

Solution Cards

Part of the Action cards, the Solutions and Solution-Support cards are what directly solve problems. Ideally, these also have names that fit the category and problems they belong to. Much like the problems, there could be duplicate solutions.

- Solution Nr. 1 Name: _____
- Solution Nr. 2 Name: _____
- Solution Nr. 3 Name: _____
- Solution Nr. 4 Name: _____
- Solution-Support Nr. 1 Name: _____
- Solution-Support Nr. 2 Name: _____

Figure 9: Content creation test document (image). F.Welp (2023)

5.6 Second Content creation test

Goals: To determine the ease of understanding of the written content creator guide; To determine the flexibility of the card game framework in regards to custom created content

Requirements: Game rules and card explanations; content creator guide; Papers to fill in custom content; Pen / pencils; User personas; At least four testers; Prepared survey; Camera; Tripod

Methods: Four testers will be sat down around a table and provided with the user personas & content creator. They will be tasked to create content for the card game framework according to their persona's interest. They will not be assisted, but they will be observed & recorded, provided they give consent. Afterwards they are asked to fill a survey

Process: The testers were given their personas, each belonging to a team but having an individual interest, which are mobility, social life, finances and sustainability. These interests were chosen because they align with the interests of the Smart City research group, and any created content might not be dissimilar from what will be made by the researchers.

Takeaways: There was a notable initial struggle with the content creation because the information on the persona's interests were lacking, however after a short while the testers

cooperated and ideated together, filling in most of the content without much issue. It was commented by the testers that although the cooperation helped them overcome a lack of information, even a single person would likely be able to easily create content, given they have a sufficient level of understanding of their intended theme. Also notable was that although the fillable pages were originally created specifically for this test, the overview they provided was valuable enough to incorporate them into the final content creation deliverable.

5.7 Second card prototypes

As another step towards a final deliverable, editable pages were created in Adobe Photoshop that would allow the manual addition of content. Photoshop was chosen for the level of control and its ability to create multi-page pdf documents, which in turn could be made into editable forms with Adobe Acrobat. An iteration of one such template is shown below.

Card name Problem •	Card name Problem •	Card name Problem •	Card name Problem •
Card description	Card description	Card description	Card description
Card name Problem •	Card name Problem •	Card name Problem •	Card name Problem •
Card description	Card description	Card description	Card description

Figure 10: Pdf template prototype (image). F.Welp (2023)

In preparation for the second playtest, these Photoshop files were filled with content based on *the second content creation test*, containing the card names and image suggestions made by the testers.

5.8 Second (Usability) playtest

Goals: Knowledge about the ease of understanding of the card game, its rules and cards; Knowledge about the Consistency within custom created content.

Requirements: Card Game prototype; Content (created by previous content creation test); Camera; Tripod

Methods: Unassisted, qualitative usability test based on custom content created during the previous Content creation tests. Afterward the testers are asked to fill a survey.

Process: A group of seven players played two rounds of the game. After the observed difficulty of the game during the first round, the second round was played with altered rules. Below is a photograph taken during the test.



Figure 11: Second playtest photograph (photograph). F.Welp (2023)

Takeaways: Due to an in retrospective fortunate miscommunication, seven testers came, although only six were requested. This lead to the test being conducted with one more person than intended, which however did not prove a problem , but instead showed that the game is still well playable with assumedly up to eight players.

Both the observation during the test as well as feedback provided through the surveys show that the overall game experience was greatly improved by the addition of categories and the presence of thematic content. It was also clear however that the categories drastically increase the difficulty of the game, as although the amount of problem cards and the respective action cards that allow players to solve them didn't change, there was a much lower chance that players actually get cards of the matching category. It is argued that this difficulty scales with the amount of categories, making the use of two categories result in the easiest gameplay experience. The increase in difficulty was anticipated however, and the second round was played with changes to address this: Firstly, the amount of problem cards that would cause a player to lose was increased, effectively providing more turns to potentially get an action card that is able to solve a problem.

Additionally, the so called "rule of reason" was enforced. This rule meant that an action card that thematically could be argued to solve a problem could do so even if the categories didn't match. In turn, players could speak up and disallow an action card from solving a problem in its own category if it didn't fit. This made interactions harder in some cases, but easier in more situations. The "rule of reason" was created during the rule adjustments prior to the test, as it would alleviate, if not solve, some limitations of the content creation.

Further steps that are taken in the following card game prototype will be a change in card designs to more easily distinguish different types of cards, as well as card backs. The

total amount of action cards will be decreased by taking away some of the cards that are unable to solve problems entirely, effectively raising the chance of drawing cards that can – this is also done to reduce the difficulty, next to the implementation of aforementioned steps that were tested during the second round of play.

The content creation guide will include clear advice regarding the change in difficulty that is dependant on both the amount of categories as well as the amount of players.

5.9 Final prototypes

The final game framework, titled “We've got Problems” due to its problem-solving focused gameplay, comes in multiple prototypes to provide options to the person setting up the game. Namely, three versions with a different amount of categories, each with an option for fillable or blank character cards. These files are ready to be played with and have changed from previous iterations to address the biggest issues that surfaced during testing – Such as a clearer distinction between action and problem cards, card backs and further clarification on certain gameplay rules and interactions. Content creator templates based on what was used for the testing, including a written guide, are also provided – picture shown below.



Figure 12: Final game prototype iteration (image). F.Welp (2023)

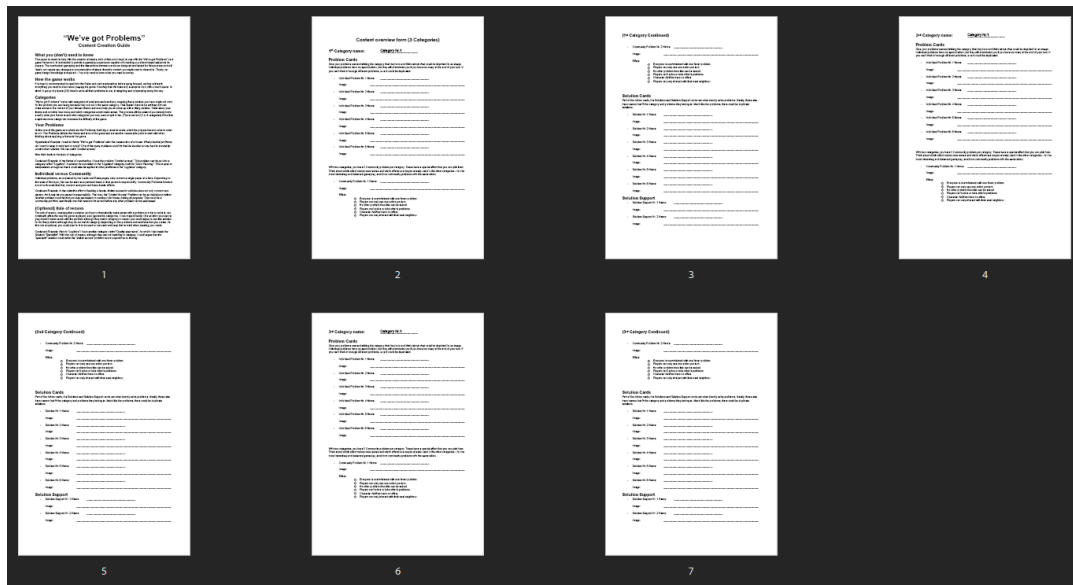


Figure 13: Final content creator prototype iteration (image). F.Welp (2023)

The website prototype received little changes due to the prioritisation of the tangible content creator, but intended improvements are mentioned in the recommendations chapter.

6. Conclusion

The information gained through the development and testing of the card game framework could be extrapolated to desirable traits and aspects for a tool intended to be used by researchers and other stakeholders alike:

- Accessibility
- Simplicity
- Flexibility
- Consistency

While it has to be noted that no testing could be done with the main target audience, the existing test results and additional considerations based on the research done lead to the assumption that the card game framework and the accompanying content creator address and exhibit these aforementioned desirable traits. Therefore it could likely be used by organisations working with refugees or asylum seekers to set up a consistent game experience about smart city living which encourages citizen participation.

Comparing different games shows that there is little that can be tangibly specified as a “building block” or fundamental component of a game, beyond a written set of rules. How the goal of a game and the possible player actions are communicated varies drastically, as does the amount and function of cards in a card game.

The flexibility and consistency of content creation are accommodated by the gameplay's independence from user created content – Besides designed variation in the gameplay experience through varying amounts of categories and the “rule of reason”, user created content does not mechanically affect the gameplay. The only limitation of the framework's flexibility lies within the problem orientation, requiring the user to think of “problems” and “solutions” for their theme.

7. Recommendations

The first notable recommendation is the application of an art style. Such an improvement could affect the recognizability of the game, as well as raise the perceived quality and gameplay experience. To a lesser extent, specialised fonts could also be applied. Care would have to be taken, however, to not diminish any accessibility in the form of worsened readability or a styling that might clash with user created content. Furthermore, an extensive use of colour, especially vibrant ones, could significantly increase the cost of printing.

The assumedly biggest increase to usage by outside parties would come from the creation of a fully working website to accompany the game framework. Similar to the mock-up created during development, such website could house a built-in tool to create and adapt content for the game, as well as provide a library of previously created content – possibly including a selection of graphics befitting the hypothetical art style of the game, if the previous recommendation was realised. Based on conducted tests, such website would have to be carefully designed not to overwhelm a new user, but introduce the information and steps of content creation in easily graspable amounts.

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Appendices

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