

INTERACTION DESIGN IN WASTE LAND

A REPORT

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1 INTRODUCTION

In this report I detail the interaction design practices I utilised during the design process of Waste Land, a dynamic trading and area-control board game.

This game was developed as a part of my thesis work, and as per the goals of the thesis, it's not a fully finished game but a prototype aimed at illustrating the concepts I explored in the thesis.

The ultimate aim of the thesis was to explore how games are able to act as vehicles for players to learn capabilities that are becoming increasingly important in the 21st century. Things such as perseverance and adaptability, but also things like ability to interact with complex systems, negotiation ability etc.

Waste Land was part of a series of prototypes where I explored these topics more broadly, but in this report I will focus mostly on Waste Land for the sake of clarity.

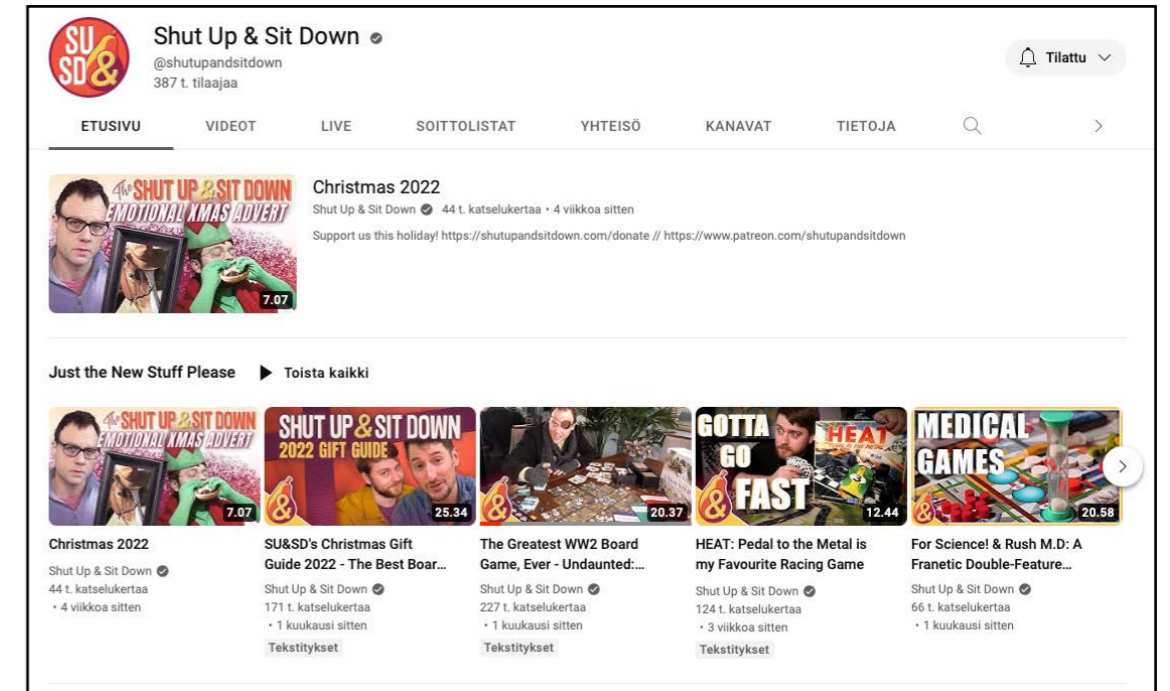
2 USER RESEARCH

For Waste Land I approached research from two distinct angles: from the perspective of making learning possible through games, and making games systemic. Game development is not similarly problem-solving of actual problems as traditional design is, but the attempt to teach through games can be framed as a problem of transferring knowledge through different means.

To this end, I studied extensively various learning methods, both game and non-game, as well as both digital and non-digital. This was mainly done through a literature review. All signs indicated that teaching through games imbues players with experience in the subject matter, rather than just mere knowledge.

In terms of systemic game design I utilised various means. This was done throughout the project, not only in the beginning. In the start of the project a lot of reference material was gathered. I watched a lot of Let's Play videos of various board games on YouTube, that exhibited similar dynamics and ideas I was planning for my games. I also watched a lot of expert board game reviews, that turned out to be a surprisingly deep resource, as the reviewers delved deep into the reasons why particular combination of mechanics work in this game and not in a slightly different game.

To learn explicitly about the user perspectives regarding these games and to not bias my research with only expert opinions, I hosted a multiple play sessions of some of the games that were similar to my intended game. I explicitly invited people not well versed in board game lingo and conventions. This part actually turned out to be quite beneficial as people with little experience with board games could not identify the used conventions, such as engine building, and this lack of knowledge stopped their progression through the game completely until we had gone over the basic concepts of the various subsystems. As my intended audience would preferably include children who also do not possess this frame of reference, I decided to go very easy on the conventions that are present in the more complex modern board games and instead bring conventions from the real world, thus making it hopefully more accessible. These conventions included for example the act of trading. More over, on the systemic side of things I tried to model the game systems in such a way that they are clearly recognisable and similar to real-world systems such as a simplified pollution system.



Shut Up and Sit Down is an excellent resource in the way they analyse board games and the dynamics they create.



Dominion game in progress.

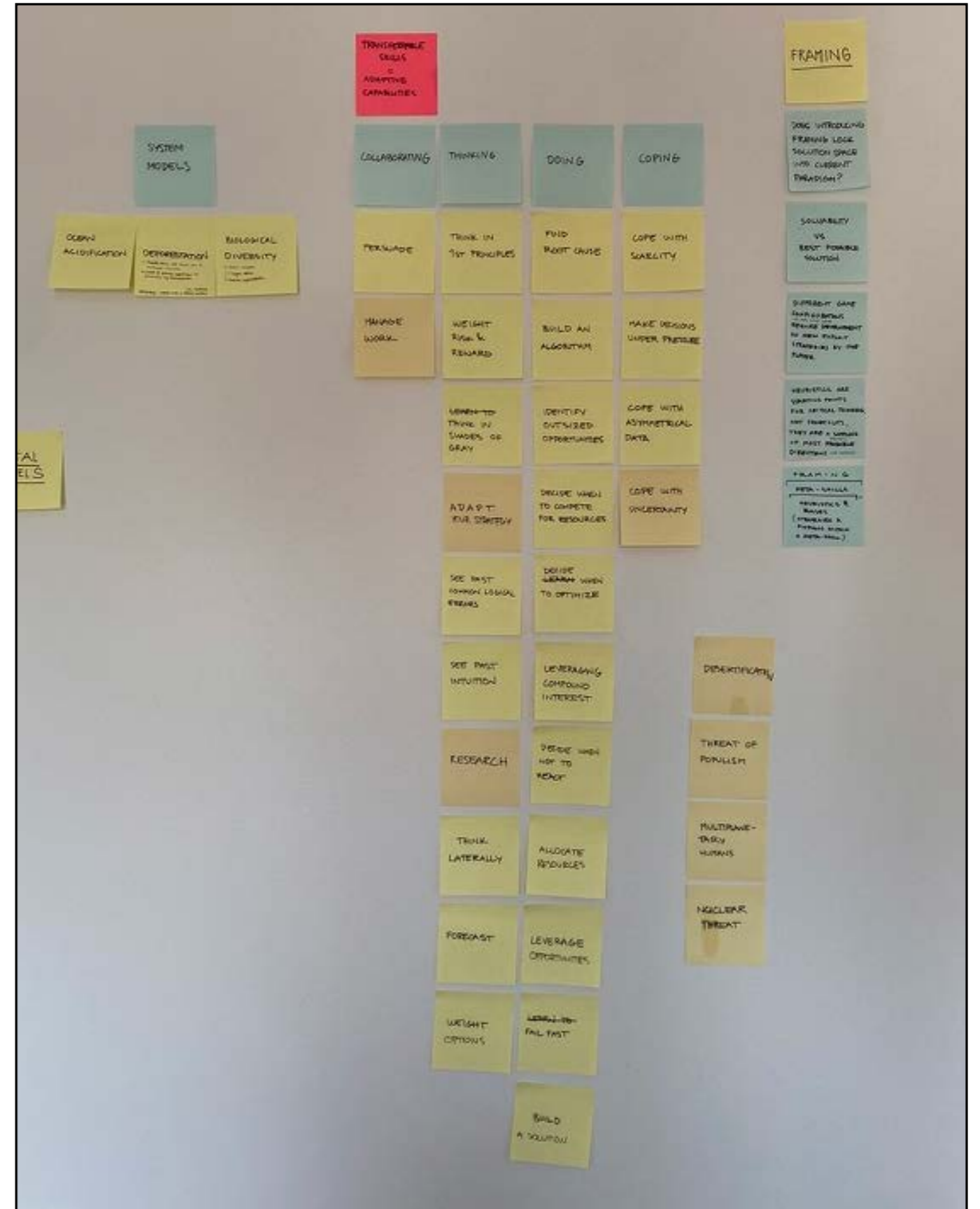
3 DATA-DRIVEN PRODUCT DEVELOPMENT

Through my research I slowly started to formulate what would be the particulars of design principles behind the scenes from which everything else would rise from. From the literature review a great many important "21st century skills" rose that would demand attention but I could only select a few to focus on. I created a sorted list of skills with criteria such as "transferability" and "ease of comprehension" as well as "suitability to a game setting". These were completely within my head, but they aided me to sort the skills and capabilities.

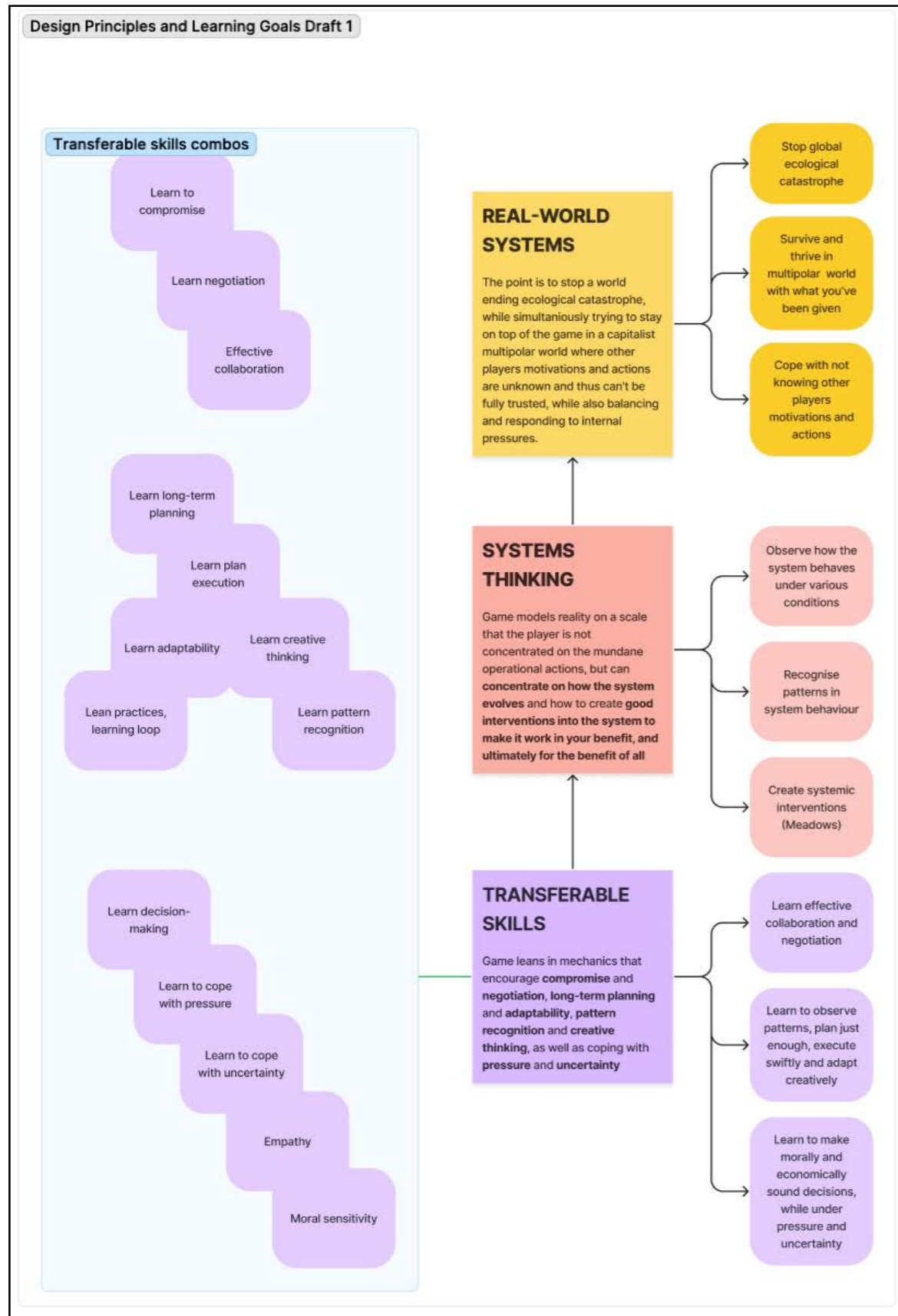
I then listed and sorted relevant variables according to their weight based on the literature and on my own experiences.



Critical thinking skills

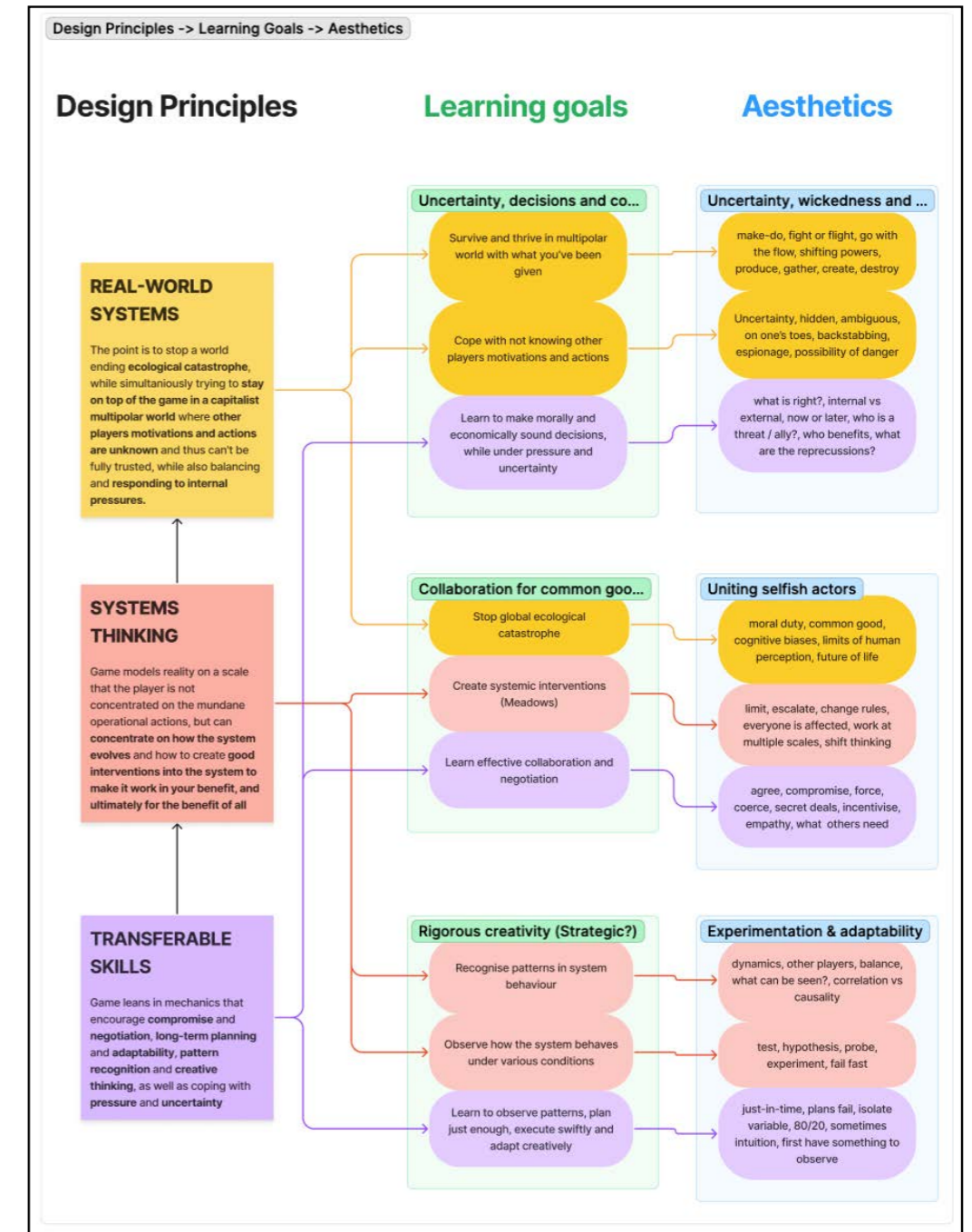


Sorted lists of capabilities I found meaningful.



Design principles and their constituents

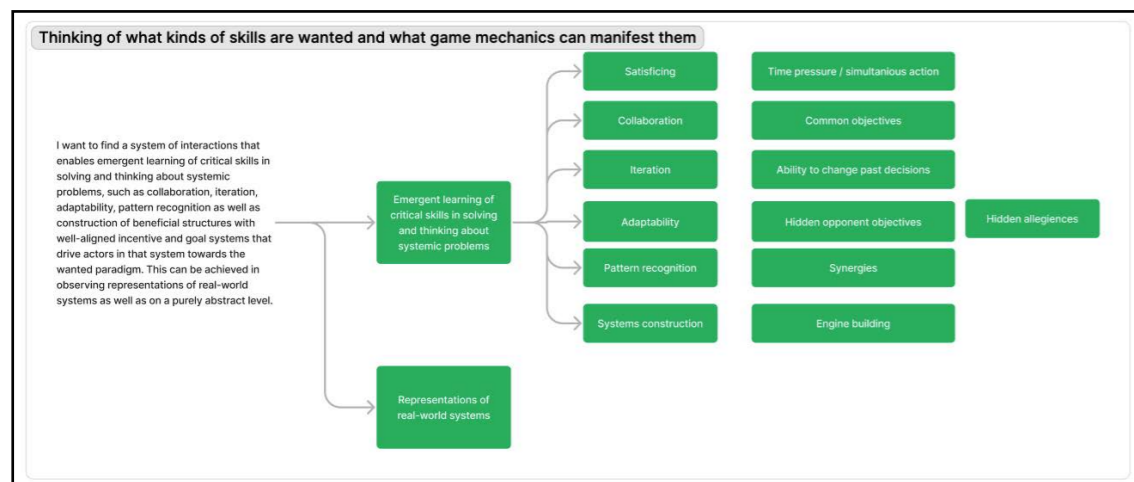
After locking down the design principles I needed some way of plugging it into game design decisions in a meaningful way. Although there is no universal game design framework that would aid in this, The Mechanics-Dynamics-Aesthetics (MDA) framework by Hunicke (2004) is very popular and assures that both the perspective of the user as well as the perspective of the designer/developer is maintained and taken into account in design. Thus I took the Design Principles or Learning goals and broke them into Aesthetics, things the player would experience during their play. The game design problem then becomes, how to make



From design principles to learning goals and aesthetics.

these experiences come into reality by using game mechanics. Mechanics then create dynamics during the play session that the player will experience in the wanted way.

After creating the design principles I consciously went into a hibernation mode, letting the ideas sit with me. I didn't want to pressure myself into finding a game idea, although I was constantly working on finding the right one. But the allow for free association and the influence of the surroundings ferment new ideas, I needed space and other things to think about. So I took a a month-long break while working on other things and occasionally wrote down ideas that would fit the mold. While not really doable in many corporate settings, the approach suited this project well.

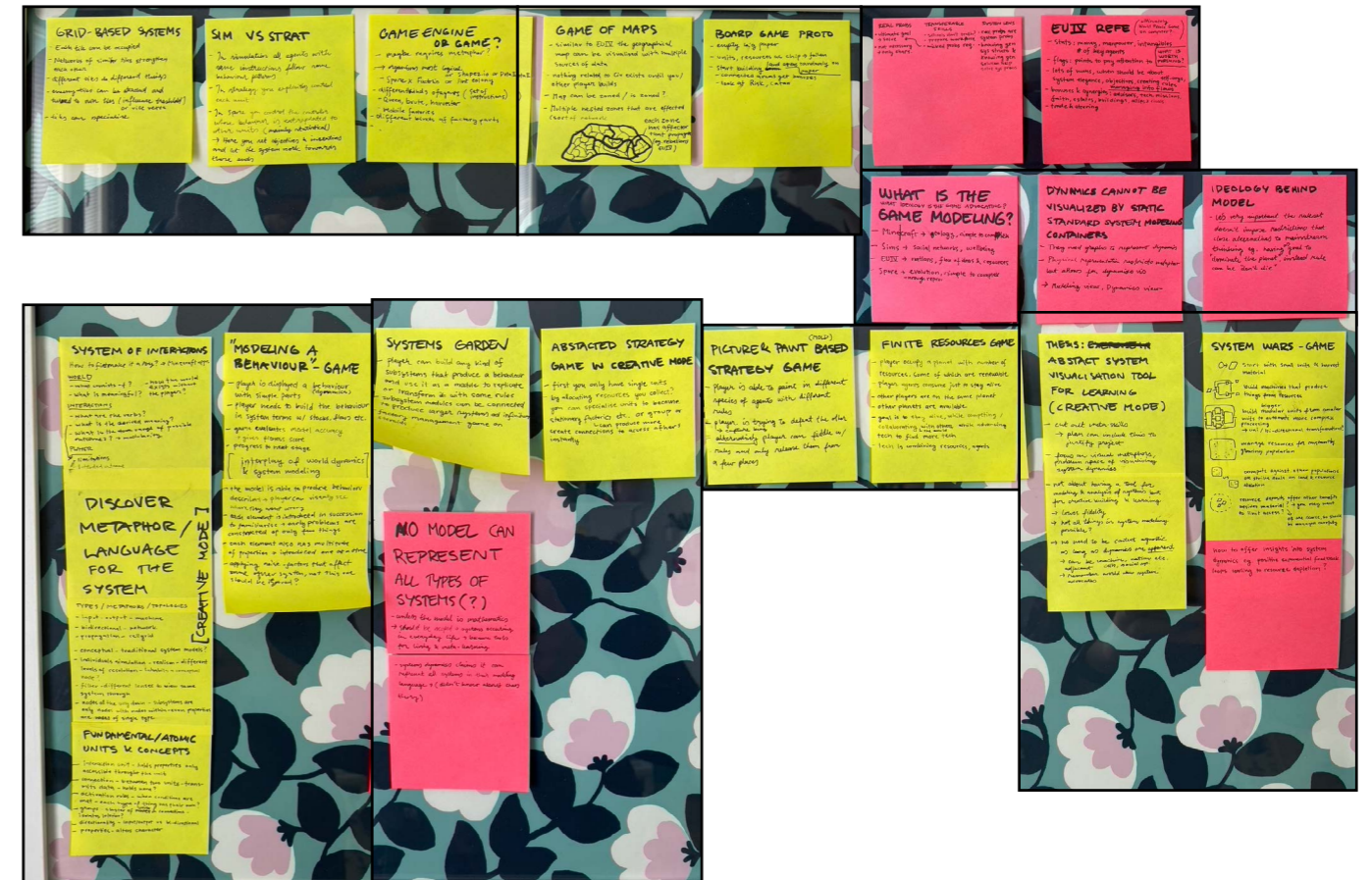


Ideating game mechanics and dynamics that would promote various learning goals.

I also consciously analysed various 21st century skill to come up with game dynamic counterparts to them. I then combined these with some select few game mechanical conventions as well as real-world system parallels to try and force myself to ideate game ideas.

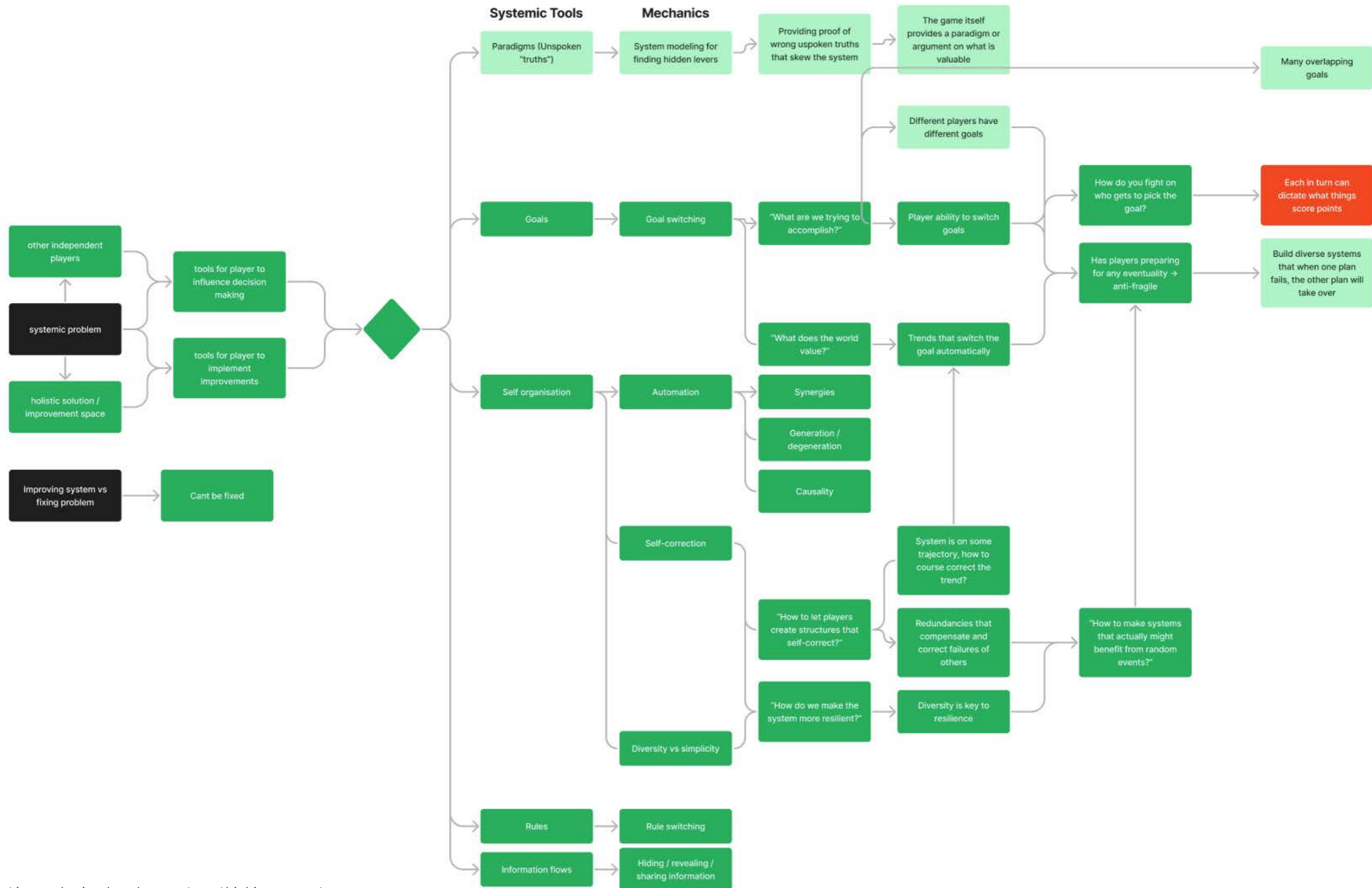
For the game ideas I also had a set of criteria, mainly the number of learning goals an idea was able to easily encompass, but also technological feasibility and time to develop, as I was doing this solo. It's also pertinent to mention that at this point in development I was still planning on creating a video game rather than a board game, which biased the ideation process quite a lot. Not before I started paper prototyping I decided to fully transition into a board game format. Would have I known this earlier, this part of the process would have been more fruitful. I also repeated this exercise multiple time during the development, since I created 10 fully playable prototypes.

Early ideas in this stage of the process revolved around abstracting the concept of a system to its base-level, allowing players to interact with pure systems without any context. Players would be given tasks or goals to make the systems into a certain state. A parallel to this would be modern construction games such as Factorio or Satisfactory, where the point of the games is to manage ever expanding web of factory lines producing ever more complex items. But as I started to develop my ideas about the importance of interpersonal skills simultaneously with the idea of transferring to a board game format,



Game ideas based on my research that tried to encapsulate fulfilling wanted learning goals.

the ideas started to revolve around how to pit players against each other and looking for ways to induce dynamic loyalties systems etc.



Ideating mechanics based on systems thinking concepts.

4 APPLICATION OF DESIGN CONVENTIONS

4.1 COGNITION

A lot of the design challenges with Waste Land were associated with making real-world systems into a format that were not only representative of the real-world counterparts but also created opportunities for meaningful decisions for the players. As I argue in the thesis, the act of distillation is one path in creating meaningful decisions.

As I already stated earlier, already the act of choosing a system that is known from the real world creates an association between the modelled system and the mental model players may have in their head of the actual system. These mental models or heuristics can be used as shortcuts in making player understand what is important in playing the game effectively, what are the potential pitfalls in gameplay, helping players get into even complex topics easier.

Another point about distillation is reducing cognitive load of players so they can focus on the most important elements the game is trying to illustrate. Games can nowadays model real-world systems in high detail, but that doesn't necessarily create interesting play. Humans can only utilise a certain number of elements in combination, before they are overwhelmed, unless they train in a particular setting for extended periods of time. As these games are designed to be played out of the box by most anybody, instead of being games that require dedication in even learning, I necessarily needed to cut detail and preserve only the system interactions that created the most opportunity for broad play spaces. What I mean by this that any certain one game could take many directions depending on the choices of the players. If I would have preserved only elements in real-world systems that are independent of any agents and their actions within the systems, the gameplay would be highly deterministic and not interesting. This was indeed the balance I had to struck with every decision. This all needed a lot of play testing and analysis beforehand.

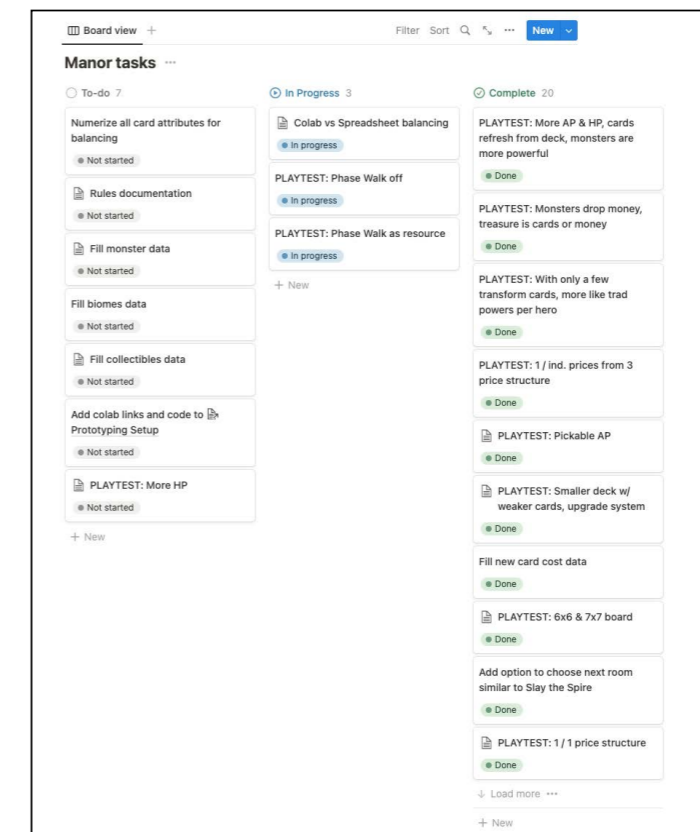
In interaction design in general you'd expect to design systems and interactions that do not fall prey to cognitive biases of humans. In games however they could be used as obstacles for players to overcome. But I also wanted to explicitly highlight these biases by building certain features in the game that curbed them in a way that also shed light on them. One feature of all my games was that they took place on a very abstracted, high level. With this I also made it so that every turn would advance the time in the game world by approximately ten years. With a game that has six turns, players would see progress

worth sixty years in only a few hours of gameplay. With this I could illustrate the powerful effect of proximity heuristic, for example in the accumulation of waste, that might be almost invisible in the real-world because human get accustomed to almost anything.

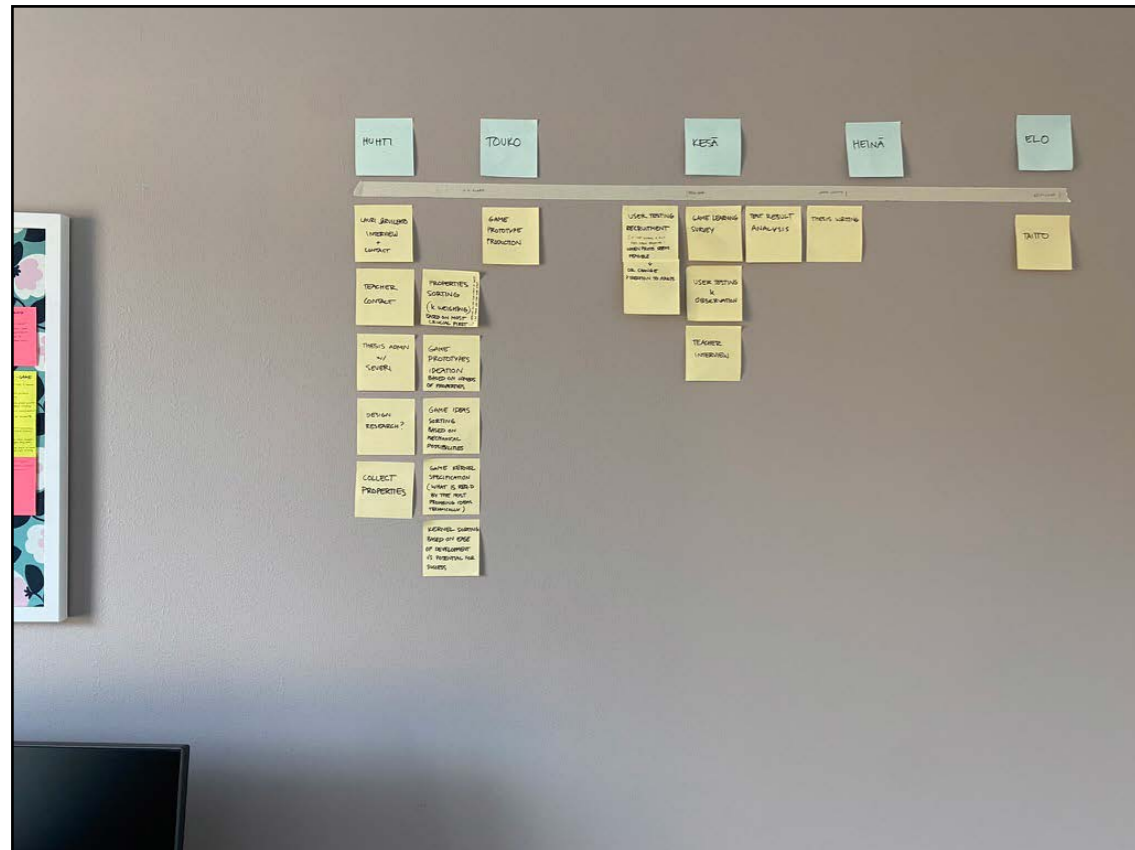
4.2 COLLABORATION

For collaboration online tools were indispensable. When creating the prototypes COVID was still a thing and access to codesigners and playtesters was difficult. I used Figma and Tabletop Simulator extensively to facilitate this. For example when facilitating playtesting sessions, I would build a virtual tabletop in Tabletop Simulator, build play decks in Multideck, and draw a quick gaming board in Figma. While its very janky, it got the job done.

In previous game projects and at Nightingale we have used user story mapping, kanban, scrum etc. to track work and keep communications compatible for both designers and developers. For all project management stuff I tend to use Notion as it is the most versatile and can handle data from lots of sources. For any whiteboarding that needs to happen I tend to use Figma FigJam rather than Miro, as it is within my main design tool and is a lot cleaner than Miro.



Kanban view of my current project, Moving Manor.



Regular timeline (that was quite useless after the beginning stages, as they tend to deprecate quickly) from the thesis project.

4.3 DESIGN PATTERNS

Game development is filled with conventional ways in which to do certain things. For board game mechanics design there is an excellent resource at boardgamegeek.com which lists most all mechanics used in board games. For example if one needs a card distribution system, they can go and look up all the different ways cards can be dealt and their pros and cons. I used this list constantly when trying to figure out how particular real-world systems and subsystems should be converted into game mechanics. This of course has the added benefit that a) the mechanics listed have been tested in many games, giving evidence that they work at least in those contexts and b) players who are familiar with these mechanics can utilise them out of the box. However, here too I was careful not to pick a mechanic that was too cumbersome to learn. These mechanics would ultimately produce the wanted dynamics and player behaviour that would guide them to learn from their experiences. If the experience was that of a multiplayer solitaire instead of a heated trading game, the learnings would be different even if the same system was depicted.

Board Game Mechanics	
Acting	Action Drafting
Action Points	Action Queue
Action Retrieval	Action Timer
Action/Event	Advantage Token
Alliances	Area Majority / Influence
Area Movement	Area-Impulse
Auction Compensation	Auction/Bidding
Auction: Dexterity	Auction: Dutch
Auction: Dutch Priority	Auction: English
Auction: Fixed Placement	Auction: Multiple Lot
Auction: Once Around	Auction: Sealed Bid
Auction: Turn Order Until Pass	Automatic Resource Growth
Betting and Bluffing	Bias
Bids As Wagers	Bingo
Bribery	Campaign / Battle Card Driven
Card Play Conflict Resolution	Catch the Leader
Chaining	Chit-Pull System
Closed Drafting	Closed Economy Auction
Command Cards	Commodity Speculation
Communication Limits	Connections
Constrained Bidding	Contracts
Cooperative Game	Crayon Rail System
Critical Hits and Failures	Cube Tower
Deck Construction	Deck, Bag, and Pool Building
Deduction	Delayed Purchase
Dice Rolling	Die Icon Resolution
Different Dice Movement	Drawing
Elapsed Real Time Ending	Enclosure
End Game Bonuses	Events
Finale Ending	Flicking
Follow	Force Commitment
Grid Coverage	Grid Movement
Hand Management	Hexagon Grid
Hidden Movement	Hidden Roles
Hidden Victory Points	Highest-Lowest Scoring
Hot Potato	I Cut, You Choose
Impulse Movement	Income
Increase Value of Unchosen Resources	Induction
Interrupts	Investment
Kill Steal	King of the Hill
Ladder Climbing	Layering
Legacy Game	Line Drawing
Line of Sight	Loans
Loss a Turn	Mancala

Excerpt from the mechanics list from boardgamegeek.com

One generally used pattern in board game design is Victory Points. But in the context of my games it felt more like an anti-pattern: it would have weakened the aims the game was made for. For a long time I tried to fight against their inclusion, since they make visible a lot of ambiguity that is present in the real world in terms of winning and progress in general. One of the core competencies to be included in the learning goals of the games was the ability to cope with uncertainty. The inclusion of VPs would undercut the training of that ability. Eventually I decided to add them anyway just to cut the development of alternative systems to determine winners at the end, but also since the existence of an opponent is already a major source of ambiguity and unexpected turns of events.

Generally I wanted to follow set design patterns for board games wherever they reinforced the themes of the game, or at least didn't come in the way. Every unit in the game is a token. Turns were tracked with small material pieces, turn order was tracked as well as resource accumulation. (poker chips in this case) Game board followed established practices such as a grid-based system and it has a "Victory Point"-esque track on the edges of the board. I also followed generally known behaviours such as layering game pieces on top of each other added attributes to all the pieces underneath.

I also took entire games and modified them to test ideas for mechanics. This way I had an entire balanced game were I could see how changing a few things would effect that balance or gameplay. It got rid of the fear of the blank canvas and cut development time significantly.

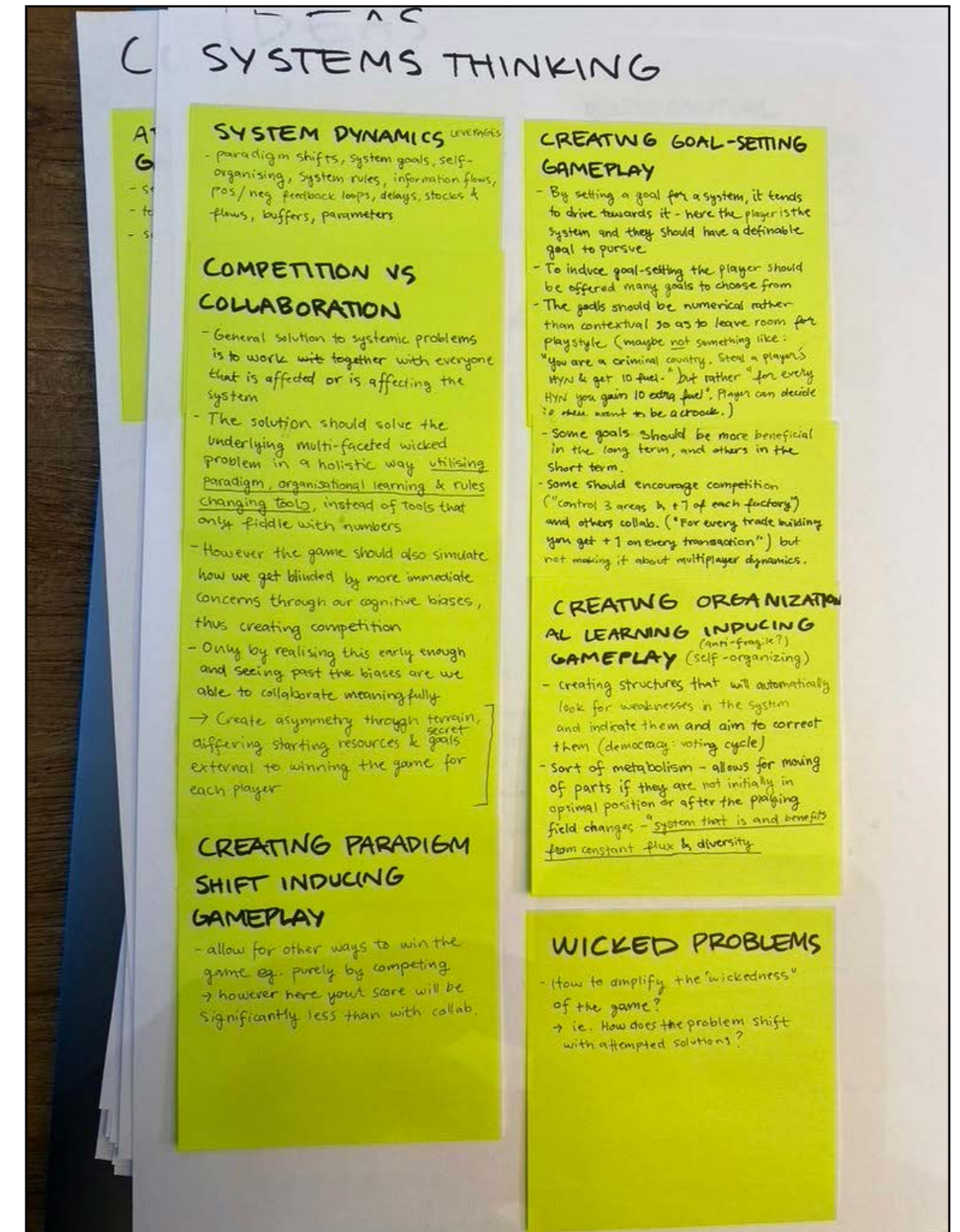
Other games can also be used as a springboard. I did this with all my games. I adapted a common resource management system from Reigns and King's Dilemma for Crisis (another game prototype). I also initially took inspiration from it's voting mechanism, but ended up reworking it completely to more fit my needs.

With Waste Land 2.0 I took Chinatown and turned it into a global energy market simulator. However as I already had a bunch of mechanics ready to go on top of the borrowed elements, the Chinatownness quickly got buried. However the trading mechanism is still a remnant from that adaptation.

With Coalitions I adapted Oceans, in which there are certain effects that flow from one player down to the neighbouring players board. In my version it was waste that could flow freely with no regard to neighbouring players borders.

4.4 OTHER DESIGN CONVENTIONS

During design I kept multiple types of logs of the various design activities and user data. Firstly, whenever I was actively designing, it usually happened through play. In games it's difficult to create valid assumptions without testing them to some degree immediately. This process is mentally taxing, so I didn't have the capacity to stop if some tangent came to my mind from some design decision. In games each idea must be validated and played through in terms of how it affects the dynamics of the rest of the game or how it affects the balance of opposing forces etc. So I just kept a pile of post-its next to me, jotted down any ideas, and moved forward. These notes would also include gaps in my knowledge that I discovered during play, and that needed to be filled before continuing those avenues. Any ideas and questions created during a session, would then be evaluated at the end, and the next design session would most probably be based on those



List of notes jotted down during a design session.

notes. Usually my most valuable insights or most revealing questions came during play as the play situation would reveal the true reason for asking a specific question. Any time I was not playing and just



A version of Coalitions. This game eventually ended up getting completely scrapped.

doing research or designing “in my head”, I would notice that I was getting sucked into a rabbit hole and I would have no guarantees this information or avenues of thought would help me in making a better game.

I would usually try to get someone to at least be present in the same space as me when prototyping. Usually it was my brother who fortunately is very interested in game development and has a keen, analytical mind. This balanced out my scattered lateral thinking. It also helped in that I could talk out loud to validate ideas. When talking, the idea needs to be formulated to a higher degree than when just thinking about it. This acted as a natural editing process.

At the end of the day, or once I had a playable build of each iteration with enough balance and interesting decisions in the game, I would playtest it extensively with a wider network of people. This process would yield yet more notes. The playtesting session would usually be with people who knew nothing of the game. Also if I discovered a weakness in the game’s logic or balance in the middle of playtesting, I would still continue, because those moments created opportunities to test out the mechanic over a longer period of time and validate if they actually affected the gameplay and to what degree.

Eventually after the testing sessions, I would sit down and do a more formal analysis of the game, this time focusing more on the bigger picture dynamics the design and playtesting sessions revealed. This type of thinking is nearly impossible in the middle of all of this, so I reserved a sort of iteration postmortem time after each. These sessions enabled a more objective perspective on the iteration that I had tried to make work so hard. These ponderings usually resulted in the iteration either getting scrapped or it getting to live another day. Some times the entire concept of the game turned out to be flawed in these analysis sessions, and then I had to throw the entire game away, as happened with Coalitions. It turned out that when I tried to push that game into a more abstracted and numbers-heavy game, it made the game dynamics into something that often just grinded to a halt instead of there being active interaction between players, which was one criteria I had set for myself.

With all this data I tried to at least take photos of the post-its for posterity, as I found out myself coming back to some ideas I had thought of previously that didn’t fit the previous iteration but would work in the current one perfectly. I also kept a visual version history of all the iterations of the game. In Figma I had a huge FigJam board that would have sections with dates and the iterations listed chronologically.

In terms of timelines, I tried to keep the development of each iteration lean and within a week, with couple of days of research after. Within a 2 month period I created about 10 different prototypes, of which 3 had 3 iterations each and one standalone prototype. Some were alterations of previous iterations, some were completely new designs.

To guide my design work I kept a loose list of design principles in mind. These were based on my research and based on my hypotheses in my thesis. For any decision when it came to my game I asked, in this order of importance:

- Does this help the game to be more fun?
- Does this help the game to be a better learning tool?
- Does this make the system more representative of the real-world counterpart?

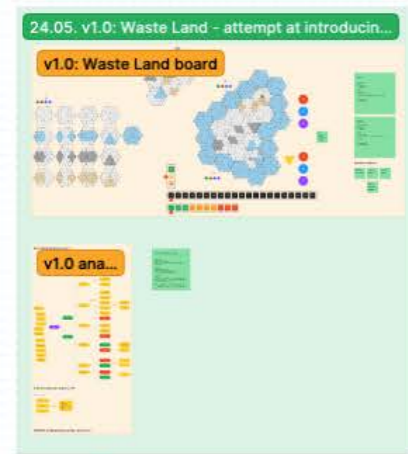
After a while these transformed into the more nuanced design principles that informed my learning goals and aesthetics, picture earlier.

GLOBAL

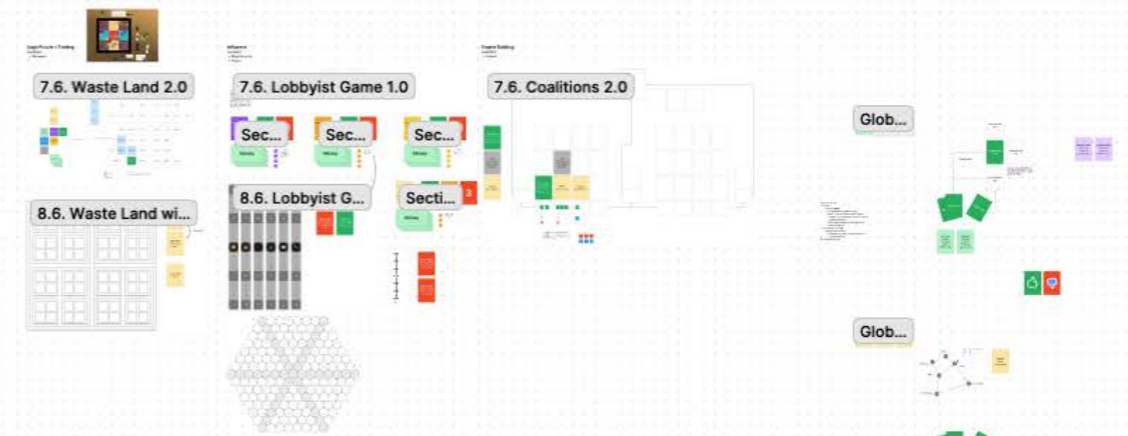
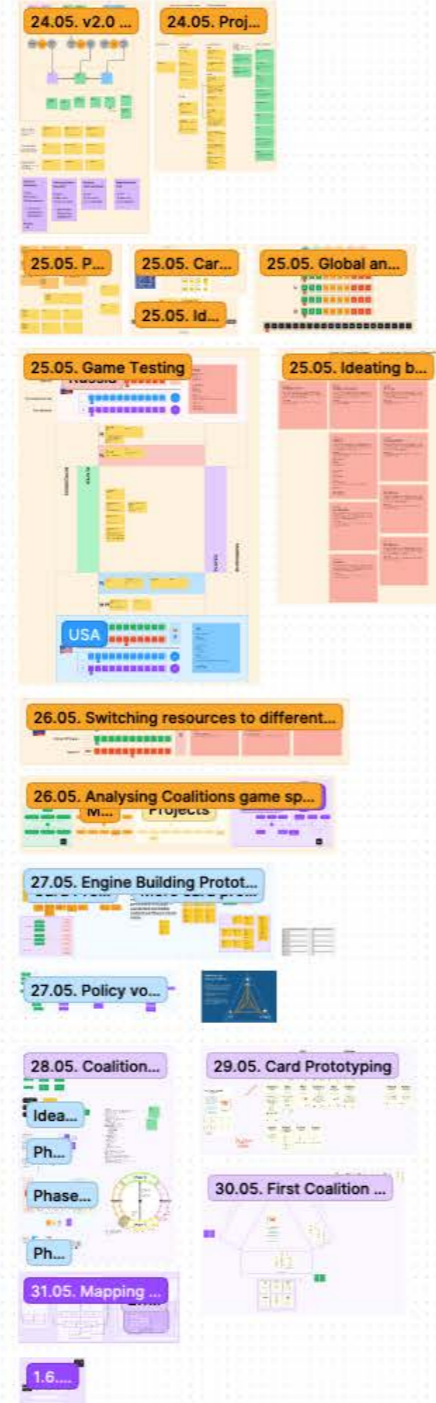
Global archive



WASTELAND



COALITIONS



This FigJam board acted as the primary design space and simultaneously worked as a visual version history of all the games. Some of these boards were also used for remote playtesting.

5 PROTOTYPING AND FIDELITY

To prove feasibility I quickly paper prototyped the most promising concepts and developed them far enough where they could be playtested as soon as possible.

Once the concepts solidified I developed more high-fidelity prototypes that focused more on usability and game balancing than the general game concept and mechanics.

5.1 EFFECTIVE PROTOTYPING

When prototyping, I found it useful to have multiple potential game prototypes in the works simultaneously. While working on the other prototype, it gave me a different perspective on the problems I was facing with the other game and vice versa. This can even go so far that you scavenge good parts from other prototypes.

For the longest time I tried to make a game that would benefit from a trading system. However it always felt a bit too simplistic and players wouldn't utilise it because they already had what they needed, or had some better way of acquiring those things. In Coalitions I had a trading system where you could offer in trade two cards, one of which was hidden. The trading partner would do the same, and you could decide which to pick, the visible or the hidden one. In theory this is a cool mechanic, but in the context of the rest of the game, there wasn't really incentive to offer the opposing player anything of value with the trade, so they would either refuse it or offer garbage in return.

It wasn't until I completely redesigned Waste Land, where the whole premise of game rests on the fact that you need to make compelling trade offers in order to get what you want, that the trading mechanics locked into place.

I also like to start very low tech. Even with documentation I wanted to stick with Post-Its and photos of the process as they were the easiest to discard. At least for me I've noticed that whenever I commit to a more process heavy documentation or commit time to create a more high fidelity prototype, I unconsciously find it difficult to let go if it doesn't work.

One technique to restrain from making too much at once is to use pieces from other board games. The high quality of the pieces from other games keeps me focused on the main purpose of prototyping. Without them there is a danger I procrastinate by creating aesthetically pleasing paper prototypes, that will be discarded in minutes after starting playtesting, as every mechanic is bound to change in the first few iterations of the game. They also nudge me in certain directions. If I deny myself from creating any new pieces, it forces me to come up with creative ways to produce wanted effects with only the available pieces. These mechanics will be optimised later if they survive further into the design process. When in early prototyping phase, by not creating anything by hand, even a little bit (drawings on paper etc.) frees me from the effect of sunk cost fallacy. Prototypes can easily be discarded with no remorse, and the design process itself becomes more like a play session than a design session. There is no investment so anything is possible.

Once you start to introduce hand-made items into the game it's hard to let go. I created a modular gameboard for Waste Land 1.0 in Illustrator and printed it, and the board survived in the mix way longer than it should have. But because I had invested time into it, it felt like it was a legitimate piece of the game. I eventually ended up scrapping it. Even though it might have added something to the iteration it was originally created for, the game had evolved past that into something completely different.

5.2 PROTOTYPING PROCESS

Here is a development log of the first week of development to illustrate the process further.

TRANSITIONING FROM A VIDEO GAME TO A BOARD GAME CONCEPT

Early in development when the game existed in my mind as a video game, I imagined the resources having many more properties they currently have in the board game format. This was due to computers being able to process and track many more variables and creating emerging behaviour, while in board games this processing and tracking needs to be done on the part of the players. As with other facets of the game first being thought of as video game, they fell out due to being too complicated.

The transition happened by accident. As I started to paper prototype the game, I had to intentionally leave out features that would require computer simulation for calculations while simultaneously keeping the core of the game intact. The more I discarded however, the more it became obvious that the objectives I want the game to fulfil could be reached also with a board game, cutting down development time significantly.

As the game is now a semi-casual multiplayer board game, instead of a single player computer simulation, the intended play time is also defined accordingly to roughly 1,5 to 2 hours, instead of multiple tens of hours, as many complex simulation strategy games tend to be, the simplification also was warranted.

The game is now better as it has cut down inessential features to a feature set that presents the problem statement in a multi-faceted and complex problem with less moving parts.

In this concept the resources were not fully defined, but the idea was that there would be multiple types of resources that could be used for a multitude of different actions. This again added complexity. My idea of this was traditional tech trees from strategy games.

03.05.2022 - STILL VIDEO GAME

As my first idea for the game was as a video game, the mental models I employed were those of Civilization series and Factorio-like games.

As I had the Civ mentality, I also had the idea of having harvesters, that would act as your scouts and harvesters would pick the resources



I scavenged various other board games to get a prototype going. The papers in the middle simulate fog of war.

and bring to a factory. On top of this you would be able to produce more moving units and specialise them into other roles such as military etc. This all got thrown out as soon as the idea that this would

be an actual board game became clear. It would have been impossible to manage all this complicatedness in board game format. Also it became clear at this point that this is not a unit management game or necessarily even a resource management game. The player needed room in their mental capacity to think about the dynamics of production and waste in a more deeper level and coming up with unique strategies to their predicament instead of getting bogged down into minuteae of transporting units etc.

Each unit of fuel processed would cost 3 fuel and gain 10 fuel. This cost benefit ratio became very cumbersome to track and was discarded quickly. This was the story of many early features. I had ideated many similar features around the dynamics of resources and deposits in terms of renewal rates, cost-benefit ratios depending on extraction location and technology, as well as amount of waste in that cell. Waste didn't actually come into play until the next day after a night of sleepless pondering.

Initially the idea was that the resources would be in pretermimed places across the map. In a video game this would be trivial to accomplish with some sort of fog of war. This got reduced into picking random tiles from a pouch, if you wanted to search for resources.

04.05.2022 - PURPOSEFULLY BOARD GAME

Once I had realised this will be a board game the phasing of the game fell into place quite quickly. Initially the phases were Expansion, Production and Living Costs, but in this iteration we dropped the living costs quite soon, as it was draining the player Fuel reserves very quickly, as each factory and agent cost 1 fuel each round just to exist. Even though this would be more in line with reality, we decided to scrap it as it took focus away from the core issue of the game, namely the relationship between production and waste. One could make an argument that energy costs of living are the driving forces behind production, and thus production cannot be stopped, lest everyone dies. Thus pollution keeps on piling up until there are more resource efficient energy technologies.

On the second day of designing I fortunately got my brother, a long-time gamer of all sorts of games, to support me in playtesting and ideating. Doing simulations of a multiplayer game alone can become tedious, and won't represent reality. These sessions wouldn't have as fruitful without him.

The idea of the randomized playing field took power here. There were many ideas on how to manage the randomisation and should it be deterministic or not. The idea of calamities also came in this phase, to create unforeseen consequences in Expansion Phase. If the number of



Even with this little detail we were able to get interesting dynamics going. After all, a lot of (most?) of the playing in any game happens in the players head in the form of anticipatory play.

turnable tiles was determined in the beginning and the game would end when the tile would run out, the ratio of resources to empty tiles to calamities would in a constant flux, and a skilled player would be able to determine if they should pick a tile or not during end game, if the possibility of raising a calamity tile was too high, like counting cards in poker. I wanted to counteract this as if the game model represents reality, one could not foresee this type of event. It should always be an equally sized surprise. Thus the method this concept utilised was a basket of tiles nobody could see in and that held more tiles that could be used during a single playthrough. Even though the ratio of resources was determined, no one could predict what would be picked up next. Also the fact that you could literally pick any tile, instead of being dictated to pick the topmost on a pile of tiles changed the optics of fate being determined for you instead of you making your own luck. Waste initially started as a very local phenomenon. Each factory would produce waste according to their efficiencies. This waste would have been represented as a stacking of chips underneath the factory, until the carrying capacity of that node would be surpassed, thus generating negative consequences for players in that node and surrounding areas. This was another example of thinking of the game as a computer driven simulation. Also reflecting back on the feature, waste may not accumulate hyper-locally but travel depending on the form of waste. Pollution affects a vastly larger area

than the specific instance producing it. Even material waste travels with air and water currents as well as with animals.

In this concept there were 3 actions in the expansion phase and 2 in the production phase. This meant that you could produce with maximum of two factories each round. This felt too limited and we ended up scrapping it and opt for a per-area production phase. Also thematically you wouldn't restrict production to only 2 per for example year. The maximum number of production should be allowed, while also maintaining some tools to manage waste accumulation.

As the concept of waste started to become more clear, it was also clear that we needed some measures to fight its accumulation. We tried to create waste management facilities that when activated would clean a certain number of waste away from a factory network. This however became redundant as I moved into the waste-per-area model where you'd use fuel to get rid of the waste instead of separate phase in the game system. This again reduced needless complicatedness.

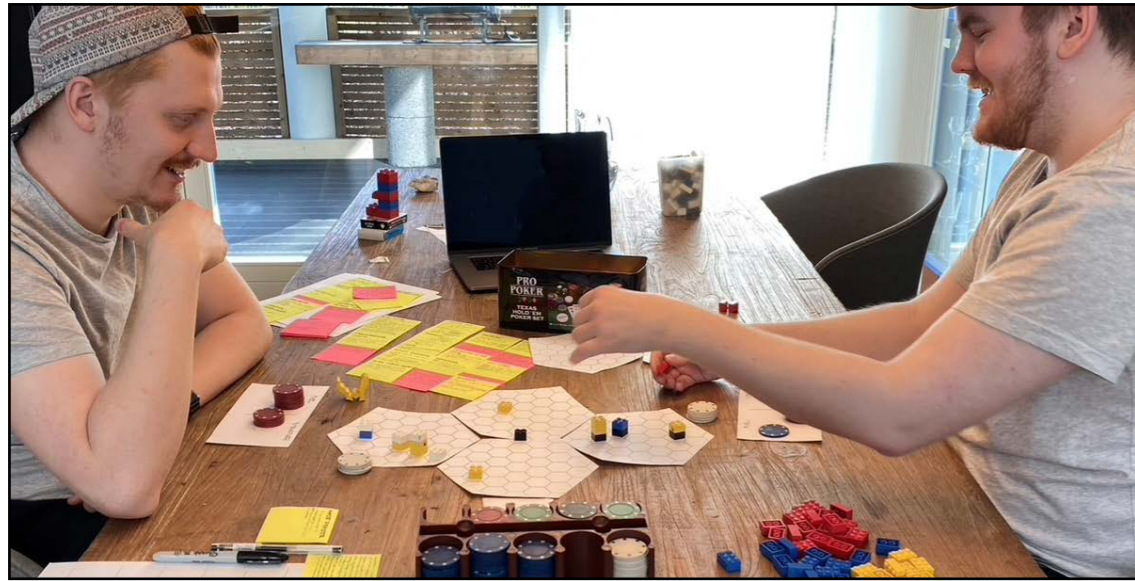
The prototyping process: I drew a grid on paper to simulate moving across space. We used poker chips to represent both factories and resources. We would play a round, and after think about the economy, how are the resources looking on both players etc. We changed rules on the fly if necessary and invented new ones for unforeseen situations. We would identify redundancies and propose simpler ways of solving the problem during play. After the game had ended, we discussed the implications of the rules for endgame, game modularity and emergent behaviour etc.

05.05.2022 - WASTE LAND

In this concept the earlier ideas from the squarebased grid game were implemented into a more refined hex-based game, that presented its own challenges, such as how to resolve the cells that lie on the border between two areas.

Here we implemented a factory network idea, in which you would gain bonus points for every adjacent factory.

As the board was now constructed of bigger modular areas, it occurred to me that we could track the accumulation of waste on a per-area basis. This would make waste a shared problem instead of localised problem that each individual player needs to deal on their own. This is also more in line with dynamics of reality.

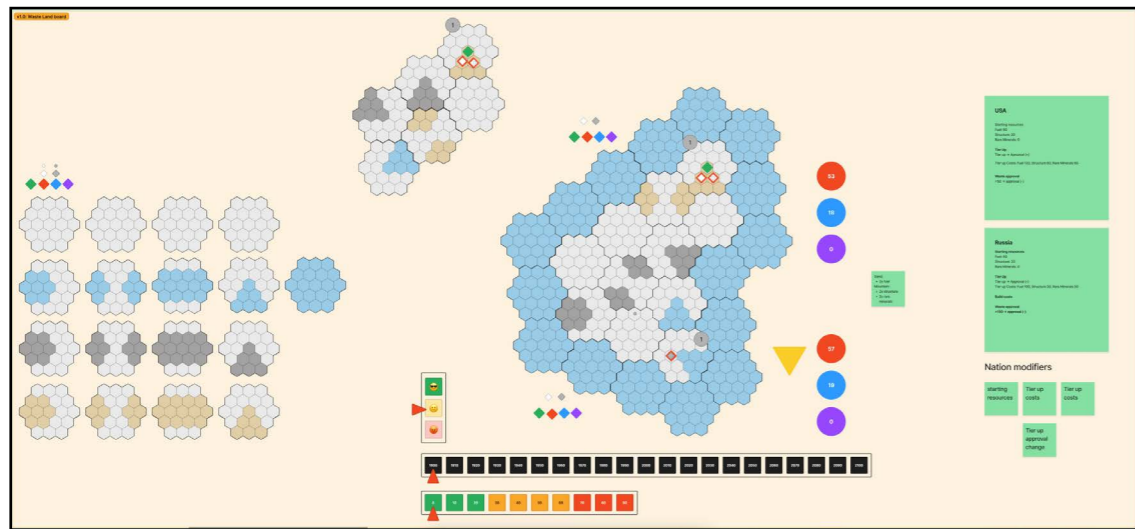


Here a lot of things locked into place.

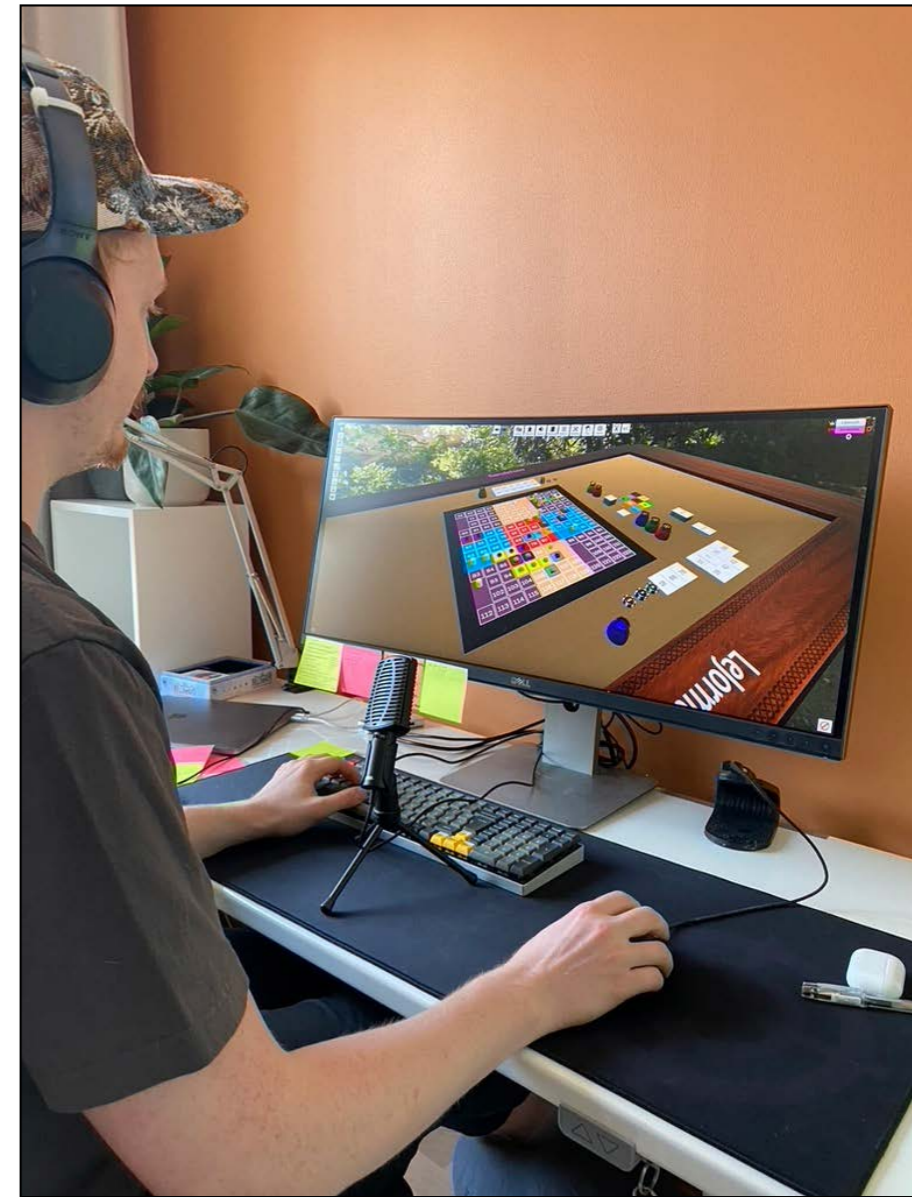
5.3 LATER ITERATIONS OF WASTE LAND

WASTE LAND 1.1

As I tried to push this version of the game forward, it occurred to me that while it was simpler than what I had anticipated with a computer game, it was still too cumbersome. And even worse, during the play-testing we had discovered that the game was way too deterministic. The combination of the waste accumulation system and the factory system were in such harmony that if you discovered the ratio to which you needed to produce fuel to what amount you needed to remove waste, you



I tried to add things I was really hoping to push for, such as sea level rise etc. into the game, but as a board game it just couldn't work. It would still make an interesting video game in my opinion.



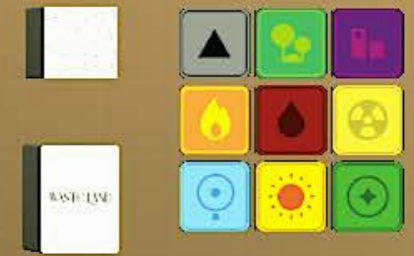
Playing an early version of the Waste Land 2.0 in Tabletop Simulator.

would have effectively "solved" the game. This realisation basically killed the game. There is no interesting play left if the optimal strategy to every situation can be solved, and relatively easily I might add.

So while I had started to make a more refined version of this game, hoping that the additions would solve these underlying issues, they didn't and I ended up scrapping the entire game.

WASTE LAND 2.1 AND CURRENT VERSION

In the latest version of Waste Land I wanted to push the fidelity of the game a bit further, and bring a bit more thematisation into the game. This was mainly done by transforming the abstract game board into a stylised version of the world map. I also focused a little bit more on the usability of the game. For example the waste accumulation per area is tracked with a conventional tracker on the outside of the gameboard instead of a stack of poker chips wherever they fit.



Current version of the Waste Land.

6 EVALUATION

I evaluated the game prototypes by playtesting and subsequent informal discussions.

I also evaluated the technical aspects of game design with game design colleagues and experts such as Touko Tahkokallio, the renowned designer of the strategy boardgame Eclipse.

A lot of the testing for this game was done over Figma or Tabletop Simulator due to COVID restrictions. The tests followed a simple formula: I would prepare a rules document for each session and have someone else than me explain the rules. Only if they completely misinterpreted the rules, would I intervene, but with this setup I also wanted to test if the rules made sense in written format and also if they were easy to follow from the aspect of simplicity of actions.



Final state of the game with three players.

I always aimed at playing a full game, as the dynamics of games are completely different depending on the state of the game. I would ask the players sometime to talk through their thinking process to gain clarity into what kinds of mental models the players were creating in relation to the game.

6.1 PLAYTESTING

When testing my games, I played them with hardcore gamers, but also with my spouse and my mom. They in fact had much better insights into



Yet another game prototype in the middle of playtesting.

the game. When playing with my brother, we only focused on how the mechanics would create this ever-changing beautiful whole that created emergent gameplay, but with my spouse and my mom they couldn't understand it because there was no clear objective for the game! It was just a system of moving things around, but no clear purpose.

When playtesting, most likely what I had planned would not go according to that plan. Instead players would find ways to break the game in a matter of minutes. As a designer I had to be ready to switch things up based on my instincts, but also based on my research. Often at least in systemic games there are causal loops that have been built in a delicate balance. If I changed one element of the game, there would be a cascading effect to other parts of the game. But if the game is not working and the playtesters are there waiting for the game to continue, something must be done. Preferably I would have had multiple iterations or at least ideas on how to resolve any particular issue, but its not feasible to expect every single issue that might happen. It actually reminds me a lot of acting as a game master during a role playing game.

Other times some meachnics are just too cumbersome and cause "work" play instead of intersting decisions. I noticed that in my games some

mechanics were completely redundant, and once the realisation hit me, they could be stripped out of the game mid test. They were in fact remnants of the translation process from a real-world system to a game system and didn't actually connect to anything meaningful. An example of this was the different types of units I had when starting working with Waste Land 1.0. I had scouts and harvesters, much like in Civilization. Scouts would find mineral deposits, and harvesters would be able to collect them by building factories on top of them. But since I had transitioned from a video game concept to a board game one, this idea didn't make any sense anymore. So scouts became the all-encompassing agent that performed all the tasks in the game.

When doing playtesting, bringing in two people who know each other at the same time will open up a discussion naturally, instead of asking a single participant to voice their thinking out loud, since the usual outcome of this is that they don't talk as much as would be preferable. (I also noticed this during user testing at Nightingale: having couples perform home-testing kits side-by-side during the testing would result in interesting conversations where they can be frank with each other if not necessarily me. Obviously this approach has its drawbacks, for example participants helping each other, increased mental load for the tester etc.)

06.05.2022 - EXAMPLE OF A PLAYTESTING LOG

Excerpt from dev log, exemplifying one of the playtesting sessions:

Once the core mechanics concerning different verbs the player can utilise were relatively stable I experimented with the different layouts of the modular map to see if the gameplay would hold with different number of players. Also here I had a chance to test the game with a bit more casual players. This was an excellent opportunity to test if the rules were at the right level of complexity that even a more inexperienced player could derive meaning and enjoyment out of the game.

Both players were able to understand the game mechanics in a relatively similar time it would take to explain them a commercial game of similar complexity. In addition to the lack of polish, the clear absence of a game objective bothered them and stood in the way of making purpose-driven actions in the game. Even though they felt the game mechanics and pace of gameplay was enjoyable and the ratio of skill to luck in determining progression created a nice tension, they never felt they were doing these things to progress towards something. This was something I had been missing the whole time, since I first needed to nail down the core mechanics to create something that would be in line with those mechanics. But the gameplay ultimately got its meaning from this progression that was missing.



Variant of the Waste Land 1.0 played with three people. The game board was modular and expanded to fit needed amount of players.