



Metropolia

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Agile AR Design Processes

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Abstract

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This research utilises a case study approach commissioned by Mediavision and Flamingo Filter, creative industry agencies based in Paris, France. In their attempt to increase their effectiveness, the companies currently lack a structured approach to maintaining rapid-paced AR projects. Therefore, this study aims to create a robust design toolbox that can be used across different teams and fasten the design process. Moreover, both companies have to adjust according to their legacy practices.

This literature review is mainly based on design thinking tools, namely brainstorming, mind maps, benchmarking, affinity maps, voting, and others. In addition, the study reveals a complete design toolkit that is consistent in its approach.

The case study approach was selected as it is a relevant method that provides answers to the questions of “how” and “why.” It also allows combining different types of information sources. This study is based on primary sources: interviews and internal co-creation workshops. The findings were based on the focus group's feedback and revised by the commissioning company in internal workshops. The efficiency of the final design toolbox model will be judged according to the findings from interviews and co-creation workshops.

Keywords:

Agile, augmented reality, Social AR, Design Thinking, Ideation

The originality of this thesis has been checked using Turnitin Originality Check service.

1 Introduction

This thesis is written about the implementation of augmented reality in the context of social media, which will be referred to as social AR. In case the reader is not familiar with a spectrum of Extended Reality or XR technologies, sometimes referred to as Mixed Reality or MR, Augmented Reality or AR refers to digital 2D or 3D objects, images, or data overlaying the vision of the natural world that can be interacted with using either a smartphone or a head-mounted display (HMD). (Milgram P, 1995.)

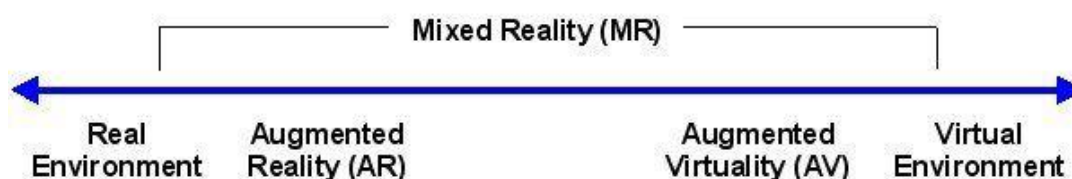


Figure 1. Spectrum of Mixed Reality (MR) (Milgram P, 1995).

Social AR is AR features embedded within existing social media platforms. In this thesis, I will first discuss the role of Social AR from the perspective of users, why users would use filters in the first place, who are the leading Social AR Players, and what their content creation tools for online presence on social media are. Then, I will describe the AR project creation design process and assess its productivity.

1.1 Social AR Playgrounds

Many people use Social AR extensively without knowing they are using Augmented Reality. Users often refer to social AR as a "filter", a "mask", a "lense" or an " effect." Indeed, the majority of people are muddling through the AR concept. "72% of people successfully identify AR when they see it, but when talking about it, they have a hard time defining or describing what it is." (Deloitte 2021)

Figure 2 offers an in-depth understanding of where people use AR daily. These statistics allow a designer to plan a more accurate user journey and help the reader understand the context where it is used.

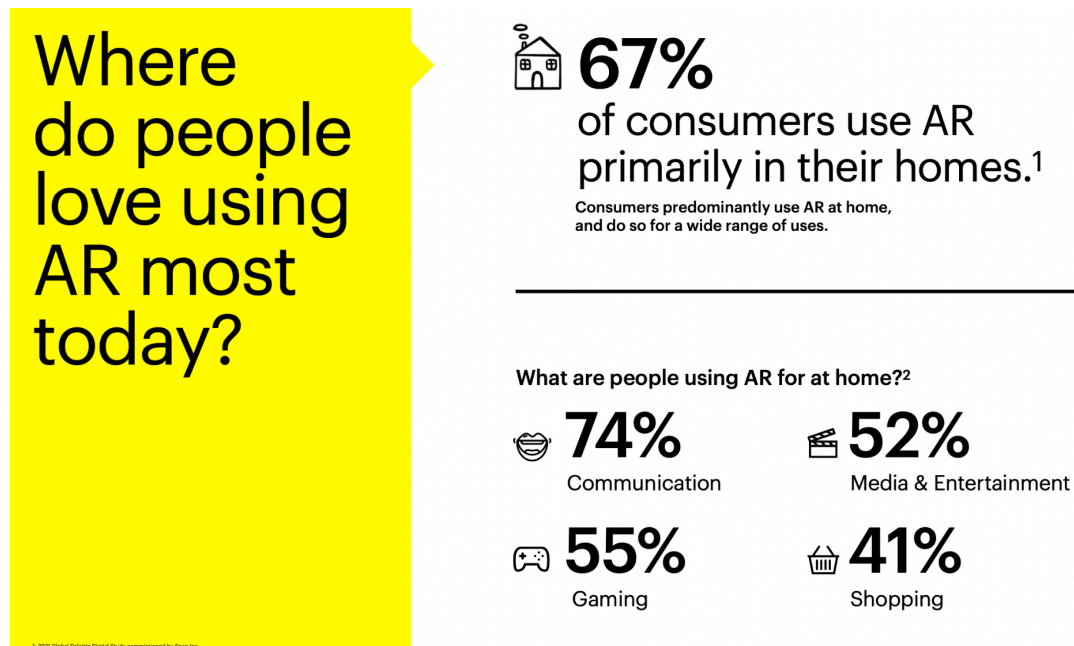


Figure 2. Statistics on where people physically use AR (Deloitte 2021, slide 21).

Deloitte's study reveals that a substantial portion of users (67%) use AR within their homes. Furthermore, the data indicates a preference for AR applications in communication (74%), content creation (49%), and media and entertainment (52%). The popularity of AR games (55%) and shopping experiences (41%, including 37% for try-on shopping) further underscores the diverse applications of this technology across various industries (Deloitte 2021).

Social AR has matured enough to be taken seriously, and data supports it. "In tech, there is an inner circle (now-18 months) and an outer circle (18-36 months) of trends to take seriously. AR is properly in the inner circle. Nothing is more powerful than AR; it is the bridge between the 2D and the 3D world, and we've never had that before - we forced ourselves to accept the 2D world that you cannot touch or live" (Deloitte 2021).



Figure 3. AR technology transitions from a toy to a tool (Deloitte 2021, slide 25).

The leading prominent platforms with social AR features include Meta (Instagram et al.), TikTok, and Snapchat. The key feature of these platforms is the camera feed from which augmented reality effects can be overlaid onto a user's view before and while being recorded as a video or photo. It is a new and fun way of storytelling and content creation, whether it is just a selfie post or talks on serious topics. It adds creative looks to content creation and video editing. Moreover, it happens right on social media. The content edited by filters can be posted on Facebook and Instagram as stories, reels, or posts, on Snapchat as stories, and on TikTok as video posts.

These platforms have undoubtedly become visual storytelling playgrounds for personal or business content.

1.2 The brief history of Social AR filters

It might seem like social AR boomed overnight, but the growth happened slowly. Figure 4 shows the timeline of the most prominent events in the history of Social AR.

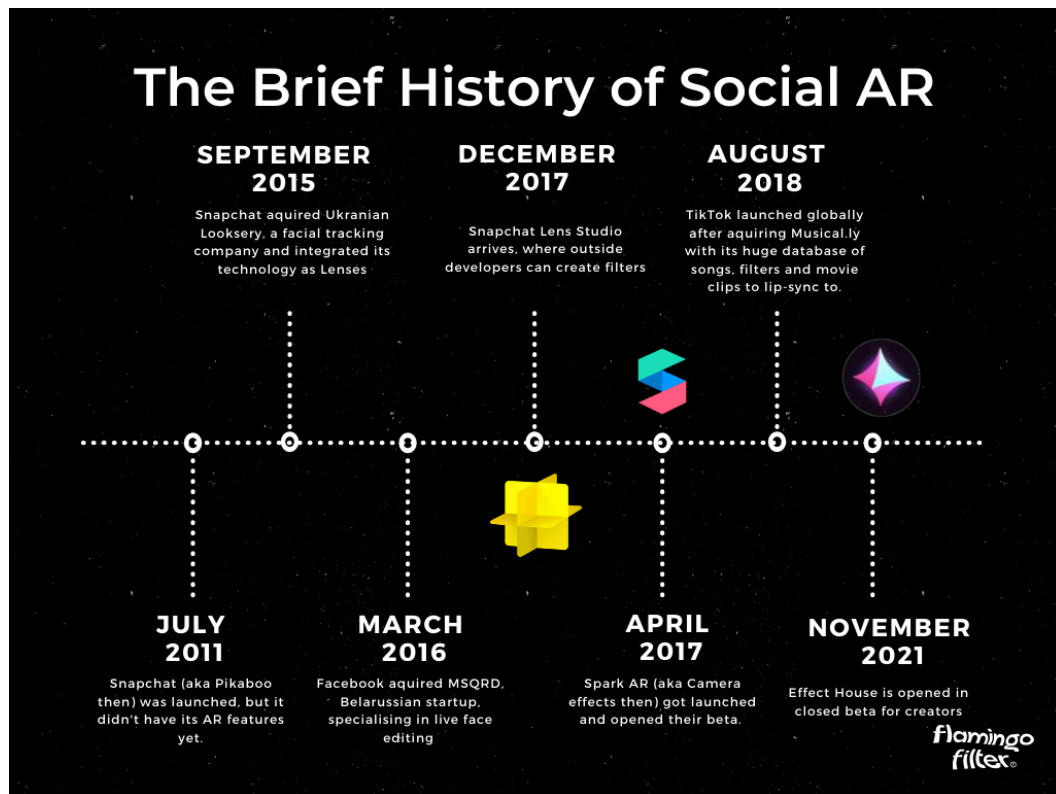


Figure 4. The brief history of Social AR (own work).

Picaboo was released in the App Store in July 2011. The app had tools for drawing doodles, colour correction, and captions. Users create photos or video "Snaps" that live only 24 hours in the stories section. This nature of temporary content made the app very appealing to youngsters. Picaboo was renamed Snapchat later on. The timeline starts with Snapchat because it is considered the OG ("Original Gangster") social media AR platform. However, only after September 2015, Snapchat prided itself on this title when it launched its "Lenses." The technology came from an acquired Ukrainian startup, Lookery, which specialises in facial tracking, face modification, and bandwidth optimisation technologies for real-time videos.

Snapchat's in-house team built over 3000 AR filters to kick off Social AR. The famous dog filter (Knowyourmeme 2016) was released in February 2016, along with six other special effects for selfie cameras. That one filter led to many app downloads and high traction from female audiences.

In the same year, after Snapchat's success, Mark Zuckerberg acquired Msqrd, an image-filtering technology from Belarus (Lunden 2016). Previously, he

attempted to buy Snapchat for 3 billion, but Snapchat CEO Evan Spiegel turned down his offer (Bercovici 2013). To attract a younger audience, Instagram started looking more like Snapchat, now its direct competitor. From the perspective of a designer and a developer, healthy competition only boosts technology growth of the difference in their technological capabilities in the next subchapter.

In December 2017, Snapchat Lens Studio arrived, a free desktop app that lets average designers and advertisers bring their creations to life. Only three months later, Facebook is catching up and releasing Camera Effects (now called Meta Spark AR), where each business can create a viral AR campaign. A few weeks after the software release, they launched a closed beta for AR ads. Here begins the era of "camera marketing."

Social media platforms started investing in AR development when users started engaging with AR tools outside their platforms and posting content on social media. Both businesses saw the potential to retain users who would spend more time on the platform and sell more using social AR.

Whereas Snapchat and Facebook (now Meta) had a tight race, Snapchat had a head start. Now, a third major player in the market uses social AR features - TikTok. In August 2018, ByteDance released the global version of Douyin, TikTok. (The Big 3 Media 2020) In the summer of 2021, the company launched a new creative TikTok Effect Studio. The Effect House is an adapted software for creating filters for the TikTok platform, and it is stripped of many functionalities present in the other two software. In 2022, TikTok hosted roughly 20 challenges with monetary prizes, and in 2023, twice as much. This initiative will grow the AR community to create content and educate more creators to work with their tools. (Effect House 2023)

1.3 Specifications of each platform

At the moment, there are only three distinguished players in social AR: Lens Studio by Snapchat, Meta Spark AR Studio by Meta, and Effect House by TikTok. In this subchapter, I will discuss AR specifications on each platform and its technical capabilities.

1.3.1 Lens Studio

From a Social AR developer's perspective, Snapchat has more technical capabilities and is generally more advanced than other players. After all, Snapchat first set the general trend for the social AR market and has been in the game for a long time. Their software for creating filters is called LensStudio and was released in 2018.

Snapchat keeps its resources for lens creators closer and harder to access. A creator needs to become part of the closed community to start creating filters. Marketing and publicity of social AR are different on Snapchat since it is more about direct messaging on Snapchat. As a platform, Snapchat focuses on discovering new and trendy content. They have a dedicated interface for the filter, which can be reached in two taps, which makes filter engagement a central content creation tool for the messaging experience. Only verified brands can launch a campaign on Snapchat. Snapchat has a library of template projects that makes entry to software easy. They also released more tools in 2024 to make the development experience more accessible than on any other platform; they have built-in AI engine search through their documentation and built-in version control, enabling team members to work simultaneously. However, it is hard to excel at making lenses in LensStudio because it requires knowledge of programming in Javascript and does not have visual scripting.

LensStudio capabilities: person segmentation, render passes, facial tracking, hand tracking 3D, body tracking 3D, feet tracking 3D, plane tracking, lidar, machine learning, pet tracking, hair segmentation, Snap glasses integration (stereographic projection), image tracker, geolocation, building recognition, iris tracking, custom instructions allowed, dept tracking(both lidar and AI)

1.3.2 Meta Spark AR

Meta Spark AR Studio (referred as Spark AR) launched a year later than Snapchat with a closed beta. Now, Spark AR has an in-depth curriculum called Meta Spark Blueprints that helps anyone start with software at any level. Filters in Spark AR Studio can be developed with visual scripting; there is no need to learn programming. Marketing promotion is accessible to anyone and has no restrictions except for content moderation policy (e.g., Alcohol and tobacco promotion is not allowed.)

On the contrary, Spark AR (Meta platforms) has a visual scripting tool called "patch editor". This eases up the learning curve for AR developers. Due to the specificity of the Meta platform, they have been a follower of the Social AR trend. Filters have been integrated into ready-made platforms, which were not necessarily designed to accustom them, and as a result, filters are hard to find for an average user. Due to this fact, organic discoverability is low compared to Snapchat or TikTok. In 2020, Meta launched Spark AR ads, which are open to everyone, but only a few brands are even aware of this Meta product.

SparkAR capabilities: person segmentation, render passes, facial tracking, hand tracking 2D, body tracking 2D, plane tracking, eyeball rotation tracking (cornea) 2D, custom instructions, depth tracking(only lidar), and virtual objects for Meta Quest 3.

1.3.3 Effect House

Effect House is the publicly released studio for all to create effects for TikTok platform. TikTok is the leading Chinese social media app company specialising in creating mobile video-sharing platforms and using short-form videos, mainly from mobile devices and live platforms. TikTok offers a variety of video-based products, including "Discover", a central section of the platform for high-quality

original content from creators worldwide. Compared to the other two, TikTok's nature is to set trends that the community will repeat. Social media is centred around the Discover tab. There is a bigger chance to reach fame than on any other platform. Other messaging platforms such as Meta and Snapchat are centred on staying connected with friends or fan base rather than reaching momentary fame.

TikTok capabilities: person segmentation, head tracking, iris tracking, prebuilt (uneditable) render passes, facial tracking, hand tracking, plane tracking, gestures.

1.4 Design toolbox

The map of AR design processes in Figure 5 includes five steps: planning, ideation, prototyping, development, and finally, measuring success.

The planning stage includes collecting ready materials from a client and communicating specific questions, such as the campaign's goals, target audience, and existing brand guidelines and assets. It is also essential to decide with a client how the campaign's success will be measured.

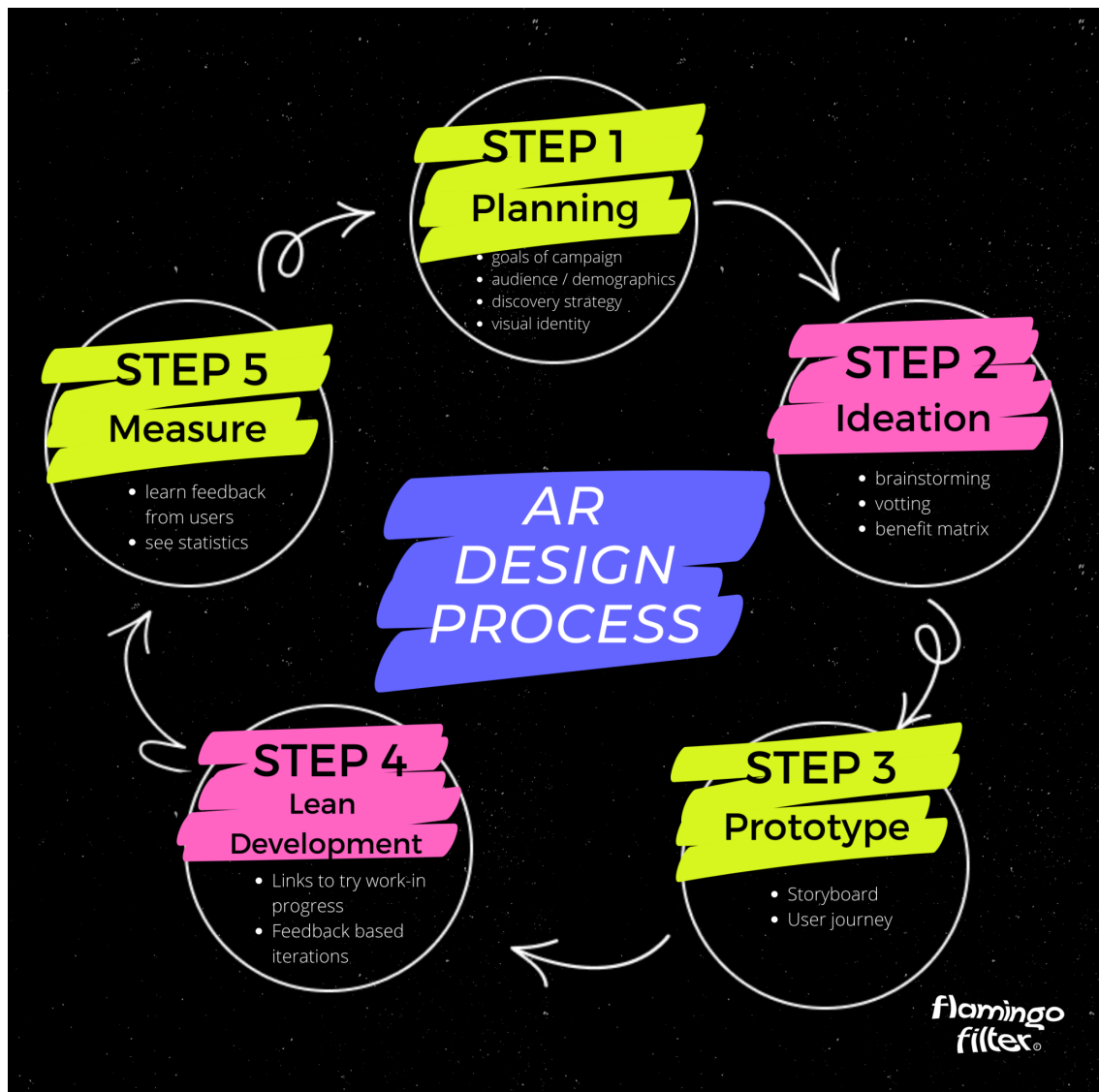


Figure 5. The map of the AR Design Process 5 steps (own work).

The Ideation stage usually involves a group of people taking input from several people and evaluating the best ideas according to matrices. This stage usually ends with selecting the top three ideas, and then the client chooses according to their choice. Sometimes, the client merges two ideas or takes elements from one idea and puts them into another.

The prototype stage assumes a preselected idea with detailed text descriptions is already present. The required assets are then designed, rendered, and placed for a ready mock-up to visually communicate to the client what the experience will look like. This is an essential step to set the right expectations.

Flamingo Filter's team prefers to use Miro boards for these three steps. It is a very convenient online collaboration tool.

The filter's development is iteration-based. At first, filters are composed as close as possible to the mock-up, and then animated elements are added. While working with Spark AR or the LensStudio platform, it is always possible to share a test link with a client so they can test it out. This keeps the feedback loop short.

The measuring step refers to the filter's statistics. Different metrics will be more critical depending on the brand's campaign goals.

1.5 Research method, questions, and objective

The research was mainly done on the Flamingo Filter. The team fully embraced the AR design process described in this thesis. While writing this paper, Flamingo Filter was acquired by Busterwood, which also became a test subject for this study. The other company already had established design practices that differed from Flamingo Filter.

The data for this thesis was collected using qualitative methods. The interviews were conducted with the Flamingo Filter and Busterwood team during co-creation workshops and separately. Those will be reviewed in chapter eight. The findings from the interviews are used to draw conclusions about the efficiency of the proposed design process and judge its adoption success.

This study is supposed to extend knowledge of effectively implementing this design toolkit in practice. It is mainly based on established design processes and methods described by Curedale in his books.

Moreover, the study will explain the connection between those tools and why they are needed for the effective design and stress-free management of Social AR projects. This should make it worthwhile for the company to obtain and use the toolkit daily.

The problem statement can best be formulated thus: "In the company's attempt to increase their effectiveness of the project management related to Social AR, they currently lack a structured process and so-called checkbox list." After the merger of Flamingo Filter and Busterwood, differences between design practices caused communication difficulties for both studios. This research does not show the benefit of using new design practices but at least increases understanding between the two studios and how each works.

Therefore, **the research question** would be, "How and why can the new toolbox be best habituated into the work process?" To answer this, I have broken it down into four smaller research questions that have been asked during interviews:

- Q1. Which stages were the easiest to adopt? The hardest to adopt?
- Q2. How did this toolkit increase the team's productivity?
- Q3. What are the costs of implementing the new toolbox?
- Q4. Did it improve understanding between teams?

These **research objectives** will help in reaching an answer to the formulated research questions.

1. Applying design thinking processes and methods in practice
2. Making an intensive curriculum to teach new teams to use the toolbox
3. Judging the efficiency of the AR design process

The study goal is to create a robust, proven, practical toolset and test it on subjects to see how easy and effective it is to integrate with a given curriculum. Once the curriculum is tested and proven effective, it can be spread across other teams, improving the design workflows of many.

2 Planning stage

The agile AR design processes toolkit is a comprehensive set of guidelines and tools. It is not just a paradigm but a powerful resource for the collaborative design and development of new AR experiences. The five-step map helps break down the process into subtasks and makes it more structured and manageable. In this chapter, I highlight the benefits of using this toolkit, which

can help the team deliver the best value with realistic efforts for the project's timeframe.

Twenty years ago, agile methods were used to manage developers' work. Today, they have evolved into a system that helps teams adapt more to changes based on structured customer feedback. Agile is not a one-size-fits-all approach but a flexible system that can be tailored to the needs of small teams.

Agile software development is based on an incremental, iterative approach with changing requirements over time and user feedback. (Eby K, 2017) In agile methodologies, leadership encourages teamwork, accountability, and face-to-face communication. Business stakeholders must align the product with customer needs and company goals.

As introduced in the previous chapter, the map of AR Design Processes includes five crucial steps: planning, ideation, prototyping, development, and measuring success. The planning stage, in particular, is the foundation of the whole process. The team gathers all the necessary information, sets clear objectives, and aligns the team's efforts. This stage is pivotal, setting the tone for the entire project.

The planning stage includes collecting ready materials from a client and communicating specific questions, such as the campaign goals, target audience, existing brand guidelines, assets, and timeline. Usually, all of this information is packed in a document called a Brief. Smaller brands often cannot compose a brief themselves, and it is up to a creator/team to collect information for better understanding.

Collecting materials at this stage must answer the following questions:

- What is objective? What is the campaign's overall objective, and how can AR contribute? What would the audience do after interacting with the effect?

- Does the brand have any ongoing marketing campaign that can tie to AR filters?
- What is the brand's tone of voice?
- What is the message they want to convey using an AR filter?
- Does the brand have pre-made brand assets that can be used?
- Does the client have brand guidelines?
- Does it tie to some timeline? Or what timeline should it follow?
- Where is it going to be shown? Which platform is Instagram? Facebook Ads? Snapchat? TikTok? Web? Location-based?

Any slides available on brand guidelines, visual identity, or brand guidelines will also be helpful. At this point, composing a mind map to gather all the information on the client's preferences is beneficial. "A mind map is a diagram used to represent the affinities or connections between many ideas or things. Understanding relationships is the starting point for design. Mind maps are a method of analysing information and relationships." (Curedale, Experience Maps 2016)

Here is an example of what a mind map should look like (Figure 6).

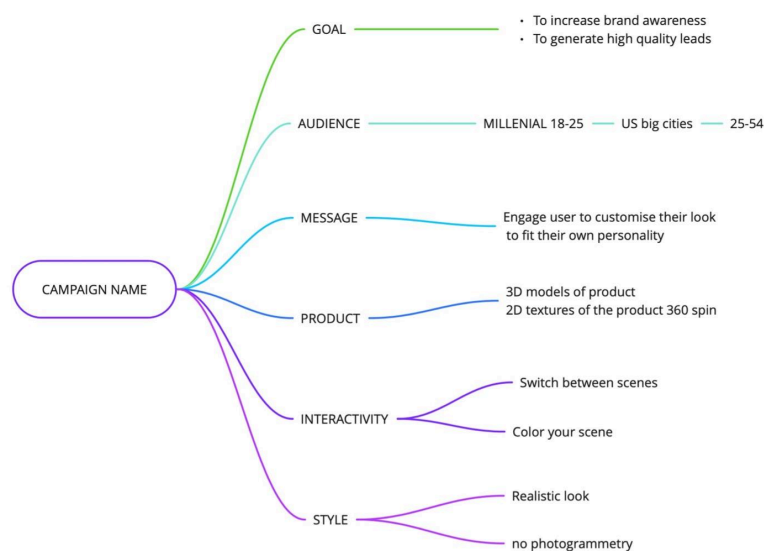


Figure 6. An example of a mind map that collects pre-existing materials from a client (own work).

2.1 Goals of a campaign

It is essential to define the goal of the experience. It helps to generate ideas that can be measured. Here's a list of possible objectives that were identified by professional experience:

- Communicating the brand's values
- Internal communication and celebrations
- Increase in traffic
- Branding / Awareness
- Gamification
- Customer acquisition (to download an app)
- Increase engagement rate
- Events (i.e., Christmas celebration)
- Communicate on a product launch
- Increase the size of the audience

2.2 Target Audience

Defining a target audience means subdividing a market into groups with people who share some commonality or similarity.

Types of target audiences are defined by different factors:

- Geographic segmentation
- Distribution segmentation (when and where the AR journey starts, e.g., it can begin by scanning QR at the bus stop.)
- Price segmentation
- Demographic segmentation
- Time segmentation
- Psychographic or Lifestyle segmentation (value, behaviours, emotions, perceptions, beliefs, and interests, e.g., looking pretty on Social Media is vital to many)

2.3 Existing Brand guidelines

Usually, a brand already has a message it tries to convey through marketing campaigns. The message is told through a specific tone of voice and style. For example, some brands prefer realism over cartoonish style. Others prefer memes over a serious tone of voice. Brands usually have established colour palettes and fonts.

2.4 Assets

At first, the team assesses if any 3D models or 2D images of the product can be reused. Then, the team examines if any branded VFX elements can be optimised for AR. Then, the team plans asset creation or optimization, which can be more time-consuming than building the AR experience. An asset checklist covering format, compression, and naming conventions is helpful for larger teams. It is essential to consider file size limitations for social media platforms: Instagram filters (up to 4 MB) and Snapchat filters (up to 8 MB).

2.5 Timeline

First, the team must know whether the project has a set deadline. If so, the team splits the projects into smaller tasks and assigns them. Flamingo Filter's team uses Notion and Gantt charts to plan projects, which can be easily shared with customers. Sometimes, a customer has its tools for planning and tasks (e.g., Kanban boards), and then the team uses those.

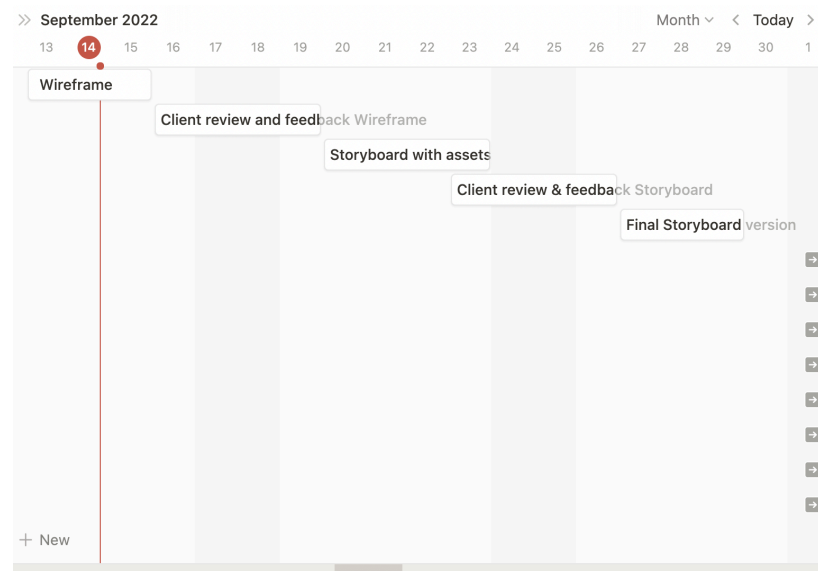


Figure 7. An example of a timeline project planning (own work).

Overall, the planning stage is time-consuming but helps keep the process transparent.

3 Ideation stage

The tools presented below enable designers and others to communicate and build upon each other's ideas in what would otherwise be complex and complex dialog. "Many ideas grow better when transplanted into another mind than the one where they sprang up." (Curedal R 2018)

It happens often when the client needs a solid idea of what they want to do. Offering them ideation services can be a solution. The Ideation stage always starts with a brainstorming session. Brainstorming is not just throwing ideas at each other. It is the process of defining the most promising ideas and refining them.

These tools help at the Ideation stage:

- Moodboard
- Brainstorming
- Benefit map
- Affinity diagrams

- Voting
- Benchmark matrix

The ideation stage is when the whole team—business, tech, and design—gets together. It broadens the pool of ideas but also ensures developers can judge the realism of the concept in the early stages so as not to promise it over.

While traditional brainstorming methods using whiteboards, markers, and sticky notes remain functional, our team has adopted a digital approach utilising a collaborative online platform like the Miro platform. This preference is particularly advantageous in remote work environments, where maintaining the quality of brainstorming sessions can be challenging. Moreover, online brainstorming space is more organised compared to traditional methods.

The top three ideas are selected and presented to the client. The team selects only three ideas. According to a psychological study by Sheena Iyengar and Mark Lepper, "increased choice decreases satisfaction with matters as trivial as ice cream flavours and as significant as jobs." (Schwartz B 2006)

3.1 Moodboard

The purpose of a mood board is to convey complex emotional ideas at an early stage in design projects. It is an inexpensive prototype that allows discussion of aesthetics and perception of the experience.

A moodboard can incorporate visual elements such as colours, forms and shapes, cultural influences, materials, textures, and sources of inspiration. Platforms like Miro and Pinterest are famous for creating and sharing mood boards.

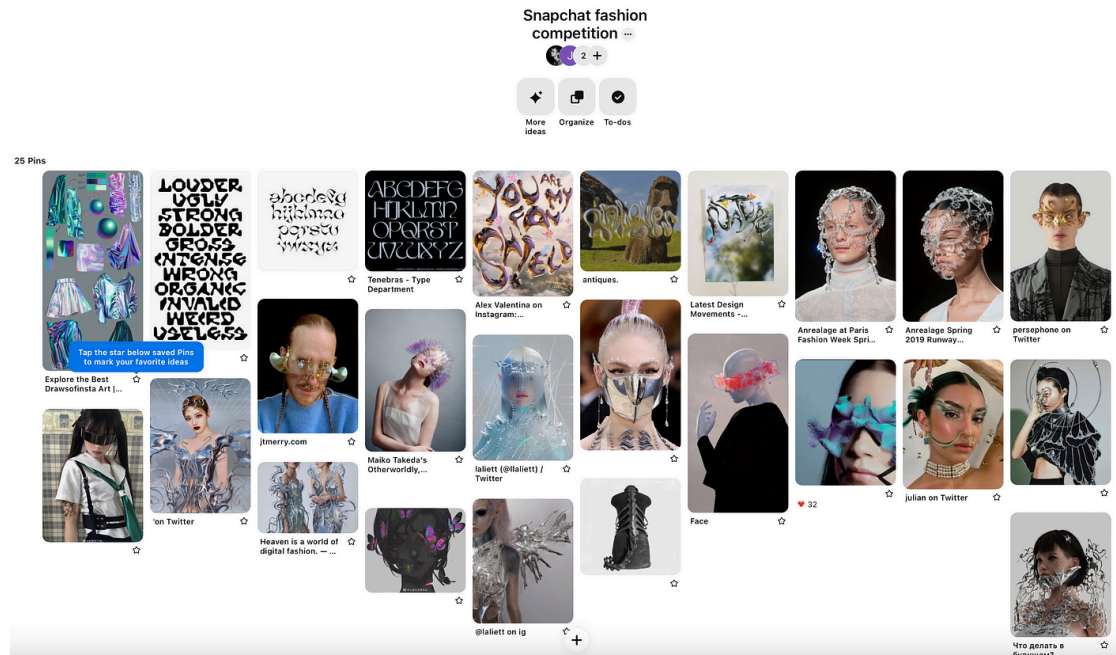


Figure 8. An example of a moodboard (own work).

3.2 Brainstorming

Alex Osborne popularised brainstorming. This method for generating problem-solving ideas has been used for over half a decade and tested with time. It is the base of the ideation process (Curedale, 2018).

There are already different variations of the brainstorming technique. Osborn first presented the original method in 1948 in the book *Your Creative Power*. Using this method enables the team to generate many good ideas. It draws upon the expertise of a group of people and is democratic. It is a fast and efficient way to generate ideas.

The brainstorming session typically starts with a warm-up phase, where team members discuss and share knowledge gathered during the planning stage to ensure everyone understands the project. Then, the time constraint is set. Each team member generates as many ideas as possible individually on sticky notes. Such an exchange of ideas allows for iterative development, where each member builds upon the ideas presented by their colleagues. The brainstorming session finishes once all ideas have been presented and discussed.

The purpose of a brainstorming session is to facilitate a better understanding of each person's problem/challenge. This approach leverages the collective expertise of developers and designers. It is a quick and efficient way to generate ideas and helps prevent unrealistic ideas from being chosen, as developers are involved in the process.

3.3 Affinity diagrams - clustering ideas

An affinity diagram helps to build connections between ideas and find their affinities, ultimately allowing the team to reach a consensus faster.

After a brainstorming session, looking carefully at all the Post-it notes and grouping similar items is beneficial. It is helpful to group ideas by themes and nest them or use arrows or drawings to illustrate their relationships. There is always a central organising idea that sets one theme and nests "smaller" ideas under it. Then, several ideas start merging into clusters. This process often results in the formation of a pitch idea to the client. The brainstorming process takes place on a Miro board.

3.4 Benefit map

Benefit maps help to build competitive ideas that are not the trickiest to implement but produce a significant impact. Hardly ever complex ideas are successful, but developers usually like a little challenge and tend to lean towards ideas that are interesting to them rather than the end users.

Benefit maps help distribute ideas and evaluate them based on two criteria: ease of implementation and impact on the user. Figure 9 illustrates an example. By estimating an idea's implementation cost and user impact, we can identify the feasible ideas that fall within the green zone—ideas that have a high impact and are easy to implement.

Benefit maps can be used on a Miro board.

3.5 Voting

"This method is a collective way of prioritising and converging on a design solution that uses group wisdom" ([Curedale 2013](#))

The process involves mapping all ideas on a benefit map and selecting the top three ideas through voting. Each team member typically has three votes within two minutes to identify the most popular ideas. "Ideas are judged based on personal preference, and the assessment is subjective. This method helps to select favoured ideas by a team rather than individual judgement. It is a fast method that allows a design to progress. It leverages the strengths of diverse team member viewpoints and experiences." (Maria Nova 2023)

"It is a method of selecting favoured ideas by collective rather than individual judgement. It is a speedy method that allows a design to progress. It leverages the strengths of diverse team member viewpoints and experiences." ([Curedale 2013](#))

The ideas are presented on post-it notes or within a defined cluster of similar ideas and explained to the group before voting. They are also spread on benefit maps. The team groups the ideas by similarity or affinity. Using the Miro voting feature, the team anonymously votes on their three favourite ideas, and the system automatically ranks the ideas based on the total votes received. It ensures that choices are not affected by other team members' picks. After the voting session, the top three ideas with the highest number of votes are selected for presentation to the client. This tool allows the team to advance those ideas to the next stage.



Figure 9. An example of ideas laid over benefit map voting happens with Plus action icons (own work).

3.6 Benchmark matrix

A benchmark matrix is a tool designed to identify, establish, and achieve standards of excellence. Sometimes, voting practice does not work, and the team can not decide which idea to select. This usually happens when the brainstorming topic is broad, and the team generates many ideas without a clear winner. A benchmarking matrix can filter and select the best ideas based on specific decision-making criteria.

To use the benchmarking matrix:

- Identify critical criteria for judgement, and those will make the left column.
- Spread selected ideas on top rows.
- Judge ideas by selected criteria, from first to last, where the first place best satisfies that criteria row.
- Ideally, this voting has to happen anonymously so the others do not see what others think while guessing the numbers. This would require each person to have their version of the table and fill it out independently.

4 Prototyping stage

At this stage the designer creates a series of prototypes to test design direction and communicate it to the developers and the client.

Here is a toolbox for this step:

- User flow
- Wireframe (low fidelity prototype with written-in-text scenario)
- Storyboard

4.1 User flow

The user flow chart is a visual diagram representing the user's AR experience navigation. It illustrates the discovery of the experience, the interactions used, and their resulting actions. As AR experiences are often non-linear, these flow charts effectively communicate the details of the user journey.

Using flow charts helps deliver cost-effective iterations to the AR experience framework. It is a cheap and fast way to build the architecture of your experience, particularly for complex game mechanics such as scoring a goal, which may be challenging to conceptualise through traditional storyboarding methods. Platforms such as Miro board or Figma are commonly used to create user flow charts.

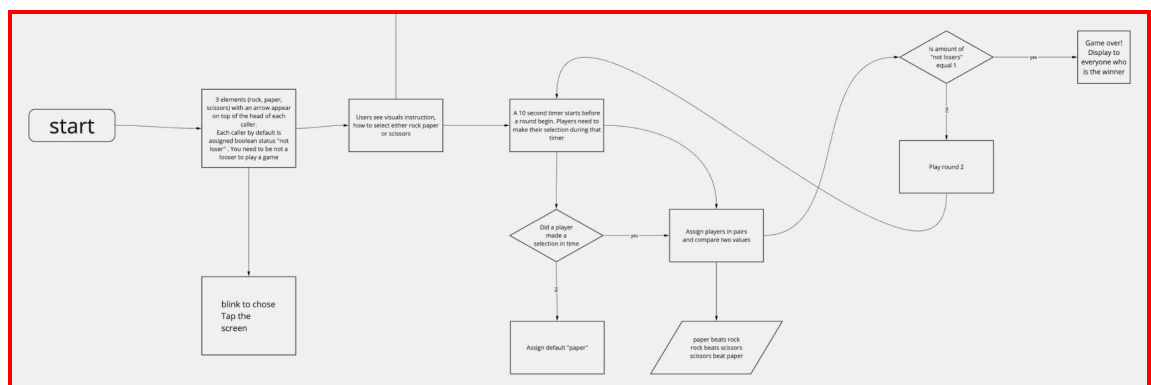


Figure 11. An example of a flow chart (own work).

4.2 Wireframe

A wireframe is a simplified two-dimensional skeletal web page or app outline. Wireframe provides a clear overview of the page structure, layout, information architecture, user flow, functionality, and intended behaviours. It serves as a middle ground between the user flowchart and the storyboard.

When designing the user experience and interface, creating a complete UX and UI design is essential. For example, Web AR lacks pre-built in-app experiences and template UI tools, making wireframes crucial for focusing on the functionality of the AR experience. Tools like Miro board or Figma are suitable for building wireframes. In Figma, a well-designed wireframe can quickly transform into a storyboard. In Figma, if designed correctly, a wireframe can turn into a storyboard easily.

4.3 Storyboard

A storyboard conveys an experience visually without spending too much time on the development. This approach ensures clear communication of complex AR experiences to clients, allowing the proposed activities to be discussed and refined. By utilising mockups and storyboards, designers and developers enable clear communication and accurately represent the intended visual aesthetics and branded assets.

This process involves creating a mockup based on the selected idea and scenario, refining it with the client, and iterating as necessary. It should be visually precise to the AR experience and show cause-and-effect relationships between events in the flow. Storyboards usually consist of six to twelve frames and short descriptive text. They can have several drafts, which can be iterated on request. Tools such as Google Slides, Photoshop, Figma, or Miro can be used for this purpose.

Before moving on to the development stage, it is essential to address some key questions. Establishing the flow by outlining triggers, events, and transitions is crucial. Adjusting the sequence at the storyboard stage is far more efficient than

doing so during the development stage, considering the time and effort involved in making changes at each respective stage of the project. For example, it may take one hour to make changes during the prototyping phase, whereas the same changes could take one day during the development phase.

5 Lean development with a client

5.1 Planning the development phase

When progressing through the development process, it is essential to break it down into smaller chunks to make it manageable. There can be two approaches: linear planning and cyclical planning. Assuming a development timeline allows the completion of all project aspects before client presentation, with sufficient time allocated for client review, the linear workflow can take place. However, acknowledging uncertainties associated with project timelines, a simultaneous review and development strategy may be called cyclical planning. The cyclical approach involves strategically segmenting the project into manageable phases, allowing for client review alongside ongoing development efforts. While this strategy may deviate from a strictly linear workflow, it can accelerate the project delivery timeline.

For example, the team tries to create an AR game on a short timeline. The developer sets all animations, player controls, scoring mechanisms, and user experience (UX) components. This entails a considerable workload. Then, the development process should be divided into manageable segments and sent to the client for iterative reviews.

The manager updates the client on the work completed and still in progress. Clarifying the type of feedback needed and any additional requirements for a successful outcome is crucial to ensuring everything is completed on time.

To distribute efforts evenly among team members, the Kanban tool is suggested. The Kanban method is a visual and organised way to manage tasks across multiple projects. It is a fast, efficient, and effective way to manage workload. The Kanban board is a workflow board with tasks and team

members. Each column represents a status, from not started to in progress to done. The status of the card is upgraded throughout the process. Each card has a team member assigned. There are only a few tasks at the beginning of the development process. As the product gets tested, there will be more bugs. Each of those bugs should clearly describe what needs to be fixed and backed up with a screenshot. The Kanban method encourages collaborative project improvement based on the feedback from both the team and the customer. The Notion app is a popular platform for implementing the Kanban method.

5.2 Starting development phase

Before starting the project, working on the most recent version of Spark AR may not be advisable. The latest versions of Spark AR can always be found on the Spark AR documentation. It is worth remembering that not all Instagram users update their app on the same day. If the AR project is done with the latest version of the studio software, it may not open on most devices, as Instagram users may still need to update their app to run the latest software update. This same principle applies to platforms like Snapchat, TikTok, and WebAR, where browsers must be updated.

The next step is to ensure that the interaction gesture chosen for the AR project works across various devices. It is possible to create an empty project with the chosen capability and send a test link. If it opens without giving an error message, only then start building the AR experience. Be sure to test it on multiple devices, including iOS and Android, to ensure compatibility. For example, the client wanted to implement hand tracking in one of the Flamingo Filter projects. Unfortunately, the capability was incompatible with most Android devices, so the client approved the interaction change. This was discovered at the end of the project, which led to rebuilding the project from scratch and increasing hours spent on development. It is crucial to check for compatibility at the beginning of the project to save time and effort.

It is an excellent practice to assemble the scene before designing the logic of an AR experience, whether using the patch editor or scripting. This involves

importing all 3D and 2D assets into the AR studio of choice, positioning, scaling, and rotating assets according to the storyboards, and ensuring the naming of assets is done correctly and within a 4 MB (can be 8 MB in Lens Studio) size limit. Once this is done, scripting can begin. At Flamingo Filter, the designer prepares the scene in the AR studio to ensure the project stays within the size limit and is optimised. It is best to start by importing all objects: 3D models, textures, animations, and sounds. The AR developer then opens a fully optimised project with all assets in place. Although changes to the assets may occur during the development process, this is a normal part of the workflow.

Version control organises and makes project files easily accessible. Updates are stored in the same place, and it is always possible to revert to a previous version if needed. Unfortunately, there is currently no way to collaborate simultaneously with another person for social AR projects. However, multiple people can work on the same file for web projects. Platforms like GitHub or GitLab provide the implementation of version control for AR projects.

5.3 Feedback phase

While developing a project, the implementation of the variations approach is happening. This involves three iterative communication cycles between the client and the team to identify friction points and gather feedback. Following the initial presentation of the storyboard, the development process incorporates a degree of flexibility to accommodate client-driven modifications, provided such modifications remain within the established scope of the storyboard. However, it is acknowledged that clients may exhibit a propensity to introduce last-minute revisions. To mitigate the potential impact of these late-stage changes, it is essential to implement limitations on the number of iterative communication cycles within the development phase.

6 Launch and measure success

6.1 Campaign goals and how to measure

If it satisfies one of the points mentioned in Chapter 2, the AR campaign will be perceived as valuable to the user. There is a difference between Social AR filters and Social media AR ads and the objective they serve. The filters will be impressed, opened, tried on, and shared. It is an indirect type of marketing that works very well for attracting new audiences and building brand awareness. In contrast, ads always have attention-grabbing clickable links that lead to a landing page. Filters do not lead the user anywhere. They are supposed to feel like gifts to the audience.

Augmented reality (AR) advertisements share a conceptual alignment with the established sales funnel framework, particularly regarding the stages of awareness, consideration, and conversion. This overlap stems from AR ads' inherent capabilities to integrate calls to action (CTAs) that direct users to a brand's website. Furthermore, AR experiences can facilitate a virtual "try-on" functionality, potentially influencing purchasing decisions within catalogue sales.

However, as the current study is not concerned with sales, the focus will be solely on organic metrics associated with user engagement. These metrics can be readily accessed and analysed through the chosen AR platform. Most platforms offer comprehensive onboarding programs to guide users through the process of measuring success of AR experiences. Below I describe how to leverage organic social AR to achieve marketing objectives.

The first objective could be to enhance brand awareness. Social AR filters offer an advantageous approach for expressing a brand's unique identity, particularly when launching new products, entering new markets, or reinforcing brand recognition. These filters have an embedded nature to achieve viral spread due to their inherent playfulness and accessibility. Social AR filters evoke strong resonant responses from younger demographics by leveraging commonly understood cultural references and aesthetics.

While the precise measurement of brand awareness remains a challenge, the effectiveness of the Social AR campaign can be reviewed with specific metrics in the Analytics hub. The Analyst should pay attention to metrics such as impressions and opens. Notably, if a user sees the effect and opens it, it will only count as open and not an impression. If the number of openings is more significant than the number of impressions, it means most people end up opening the filter, which indicates users find the filter engaging enough to interact with it.

The second objective is to grow and maintain thought leadership. Social AR filters provide a unique platform for clients to highlight specific issues or events, solidifying their position as forward-thinking innovators. Leveraging this novel medium can enhance the client's reputation as a thought leader by demonstrating their commitment to industry advancement. "Thought leadership is about consumers recognizing your brand — and the people within your business — as among the best and most trustworthy in the industry" ([HubSpot 2022](#)). Like brand awareness, measuring thought leadership in Social AR campaign results is challenging. The ratio of Impressions to Opens or Saves can indicate success.

The third objective is to increase customer value. This goal focuses on retaining and expanding a company's existing customer base, and plenty of ways exist to achieve it. One such example is Sagayoga Oy, a Helsinki-based yoga studio that uses its Instagram platform to deliver interactive breathing exercises alongside traditional physical yoga practice. This approach increases customer engagement and loyalty.

6.2 Specifications of each platform

Each of the three platforms maintains its own dedicated analytics hub. These hubs offer a variety of metrics that can be tracked to assess campaign performance. A subsequent subchapter will delve deeper into the comparative analysis of these metrics, highlighting both their variations and overlaps.

6.2.1 Meta

Meta platform provides two ways of promoting a filter: organic and AR ads.

Each has a separate hub where metrics live. AR ads can be set up through [Ads Manager](#) (Figure 12).

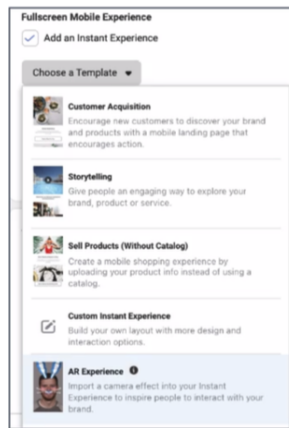


Figure 12. A screenshot of Ad types on the Meta platform (own work).

Organic filters cannot have a CTA, and their success can be measured through the Spark AR hub. Spark AR hub provides two sections that provide insights into social AR campaigns: Engagement and audience. Spark AR provides eight metrics: impressions, opens, captures, saves, shares, gender, age, and top countries.

Impressions are the number of times that stories, posts, and reels containing the effects have been displayed on screen except in the camera. In carousel posts, impressions are only counted for effects when the first item in a carousel has been seen. Opens is the number of times people have opened the effect in Instagram or Facebook cameras. Captures are the number of times someone took a photo or video featuring your effects in the Facebook or Instagram cameras. They do not include live videos. Saves are the number of times people take a photo or video using the effect and save it to their device. Shares are the number of times someone takes a photo or video featuring one of the effects. They are counted in stories, posts, reels, and messages on Instagram and in stories and posts on Facebook. This metric excludes re-shares. All these metrics mentioned above can be viewed in Figure 13. (Insights for Effects.)

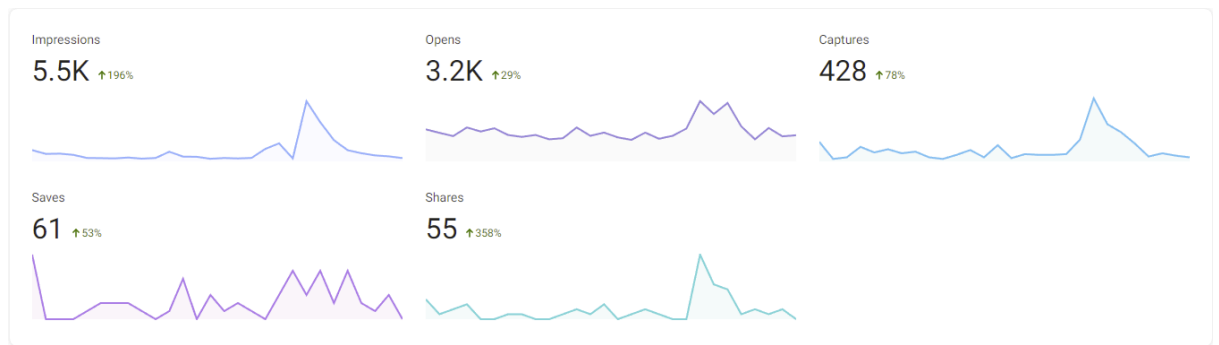


Figure 13. - screenshot from Spark AR hub, an example of metrics (own work).

6.2.2 Snapchat

Similarly, Snapchat has two ways of promotion: organic and Sponsored.

Sponsored ads can be set up through Snapchat ads, and AR lenses are one of the ad types. All metrics for organic AR lenses on Snapchat can be viewed from the My Lenses page. Snap metrics are the most in-depth compared to other platforms. There are three primary tabs: Audience, Engagement, and Event Insights.

Audience Insights helps to learn more about the demographics, locations, and interest areas of users who have played with Lenses. (Lens Analytics)

This data includes:

- Demographics: Approximated age and gender breakdowns of audience.
- Top Countries: Discover where the audience is located.
- Top Interests: Learn about the audience's top interest categories.

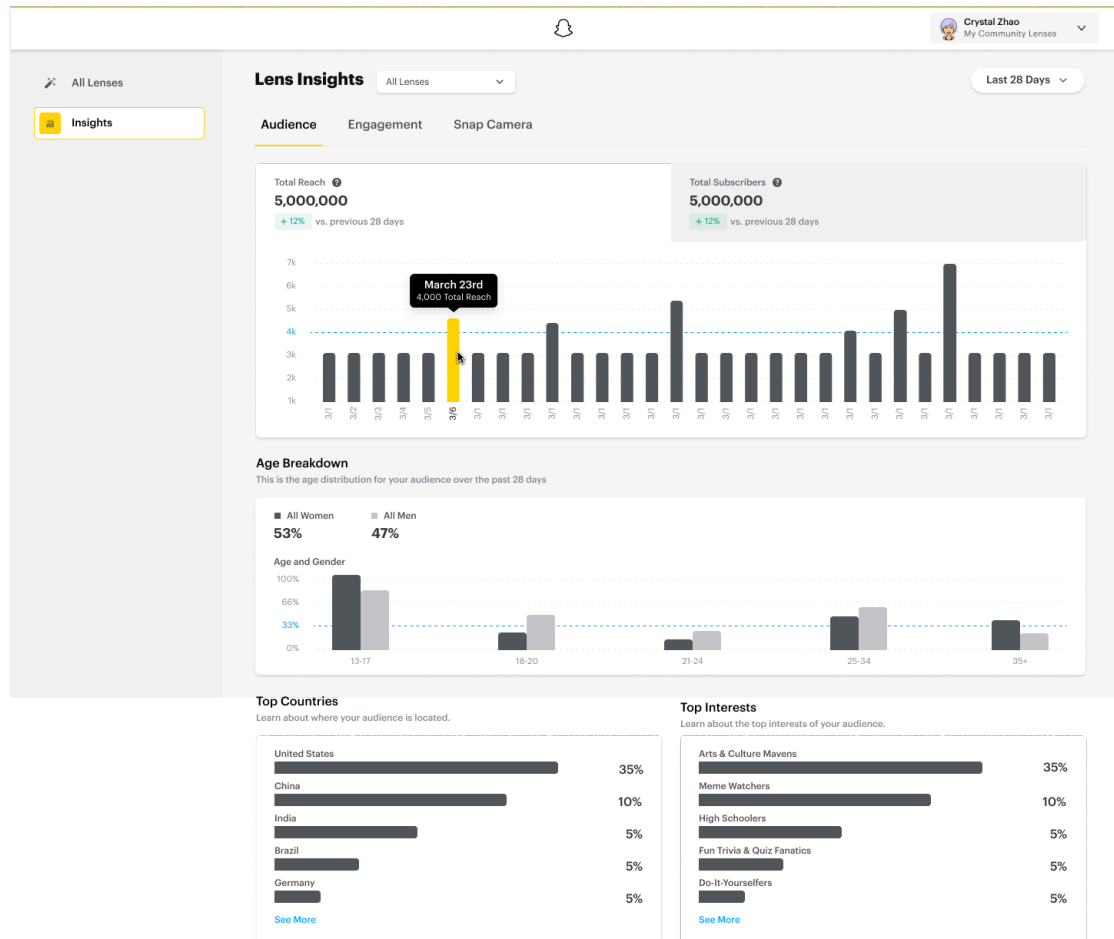


Figure 14. A screenshot from My Lenses page by Snapchat, an example of metrics, Audience page (Lens Analytics).

Engagement Insights helps us learn more about how users engage with Lens(es) in Snapchat and how this engagement changes over time.

The following metrics can be tracked. Total plays are the number of times Lens(es) are activated in Snapchat's camera. Total views is the sum of Lens views from direct snaps, story posts, and plays on Snapchat. Total shares are the number of times the Lens(es) have been shared on Snapchat. Total favourites are the number of times the Lens(es) have been favoured in Snapchat. Sessions per UU is the average number of sessions a unique user has played with the Lens in Snapchat. Play time per session is the average time spent playing with the Lens per session on Snapchat. Play time per UU is the average time a unique user plays with the Lens in Snapchat. DAU / WAU is the proportion of weekly active users who engage with the Lens within one day.

DAU / MAU is the proportion of monthly active users who engage with the Lens within one day. (Lens Analytics.)

Event Insights (Figure 15) enables the analyst to dive into how Snapchatters interact with your Lens, giving clues about how one can deliver higher-quality engagements. Event Insights allows one to view actual data on the number of faces found and lost within a Lens, objects or 3D objects, marker images tracked, screen taps, and the number of multi-user sessions shared and joined. All of this information is available by default. If one uses these features within the Lens one builds, from this tab, one can see how, when, and where the community interacted with them right in the My Lenses dashboard. (Lens Analytics.)

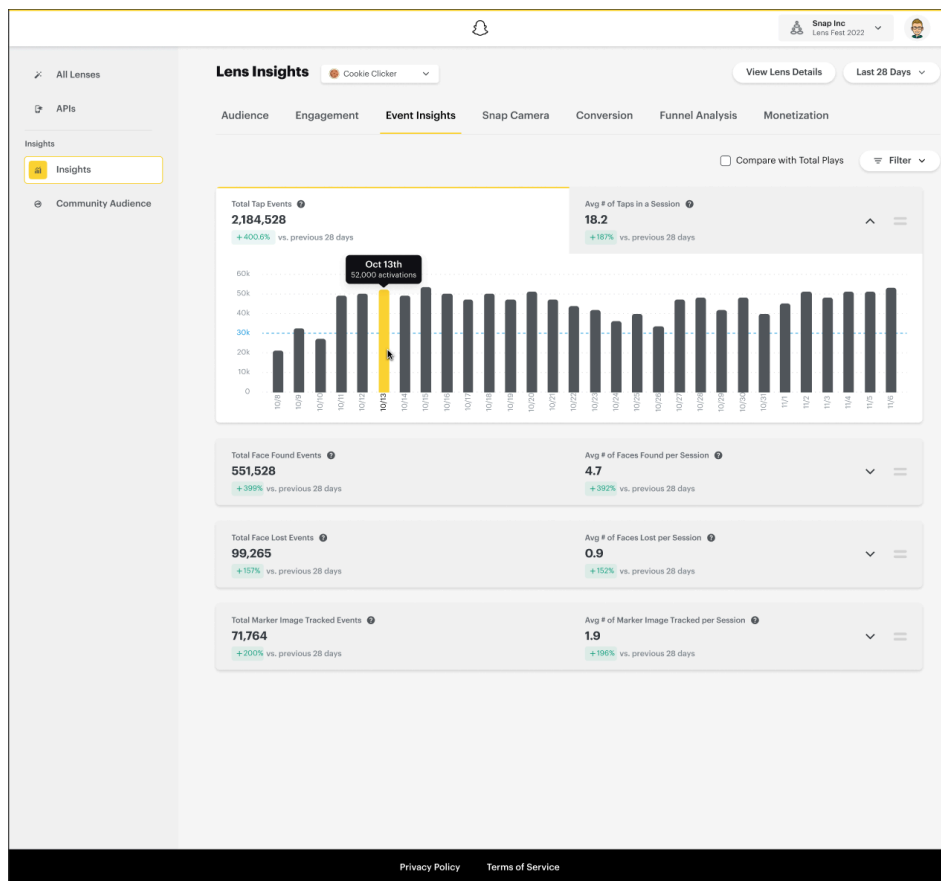


Figure 15. A screenshot from My Lenses Snapchat, an example of metrics, event insights page (Lens Analytics).

6.2.3 TikTok

On TikTok, AR effects can be part of an ad campaign or spread organically. Organic promotion is still preferred because of its orientation towards user-generated content and algorithms centred around trends. The TikTok Manage page is probably one of the most limited among the three, and it has three sections: Audience, Engagement, and Popular Videos.

The first is the Overview page, which has the total number of views for the effect at the top (Figure 16). Post metric reflects the total number of posts on TikTok using this effect. The likes metric indicates the total number of likes across all posts with this effect. Opens metric points to the total number of times creators opened and tried the effect. A total number of times viewers shared a post with this effect lives under the Shares section. (Effect Analytics.)

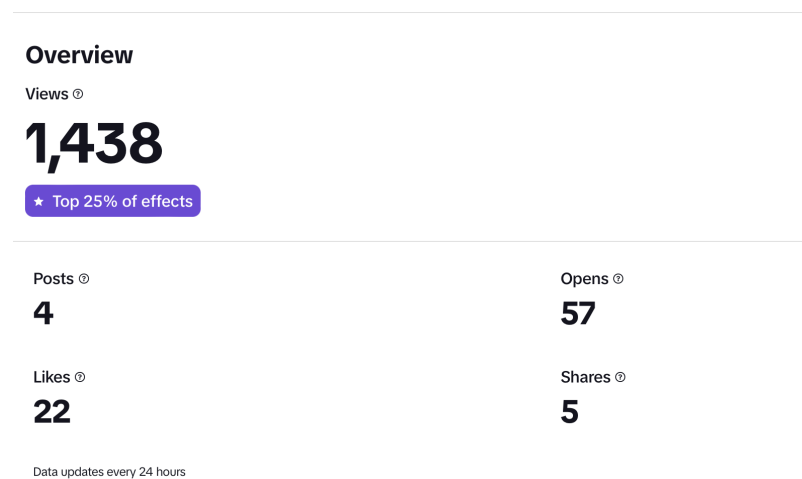


Figure 16. A screenshot from Effect House Analytics, an example of metrics (own work).

The next one is the Audience breakdown by country (Figure 17). Creators tab points to the users who used effect to create content with the effect and viewers - to the users who engaged with the content. (Effect Analytics.)

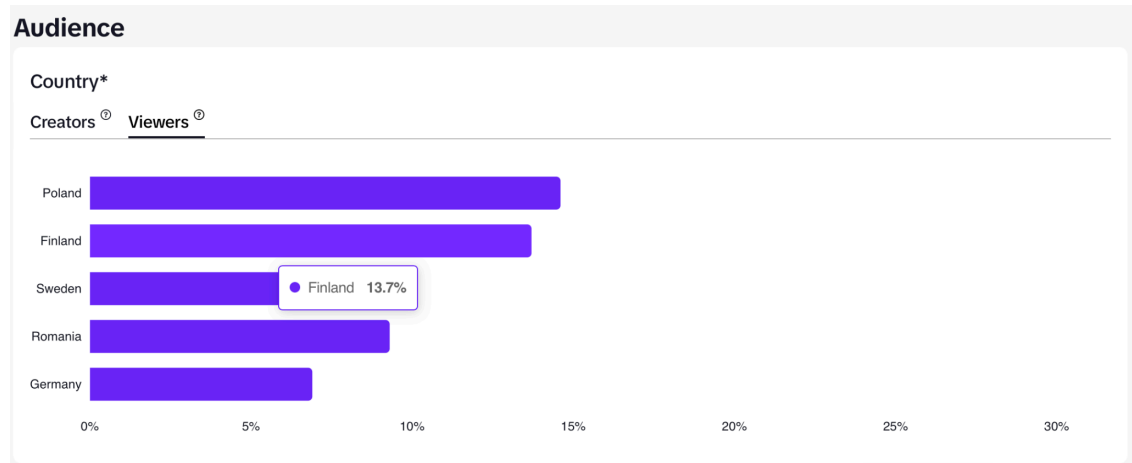


Figure 17. A screenshot from Effect House Analytics, an example of metrics (own work).

Furthermore, a unique analytic feature specific to the TikTok platform is the ability to directly view user-generated content created with the AR effect (Figure 18). This functionality contrasts with other platforms, where observing user-generated content that utilises the effect is only possible if the effect owner is explicitly tagged and the content is subsequently shared. (Effect Analytics.)

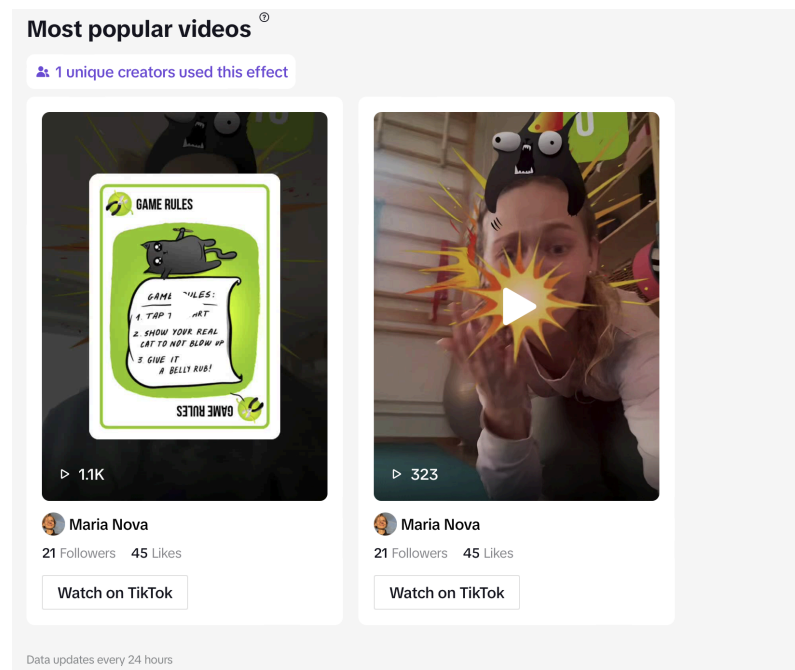


Figure 18. A screenshot from Effect House Analytics, an example of metrics (own work).

7 Research method

This thesis is primarily and qualitatively research-based. It heavily focuses on focus group interviews to measure the success of the chosen design process toolkit.

The study aims to introduce a focus group to a new workflow and new tools (Figure 19) that they were not familiar with before and measure the effectiveness compared to the process that was used before. The methods they will use are the tools that will be reviewed in the later chapters. For this thesis, the focus group will be exposed to a new workflow in the form of a workshop to go through all the stages of the Design Toolbox and be interviewed afterward to note the study results.

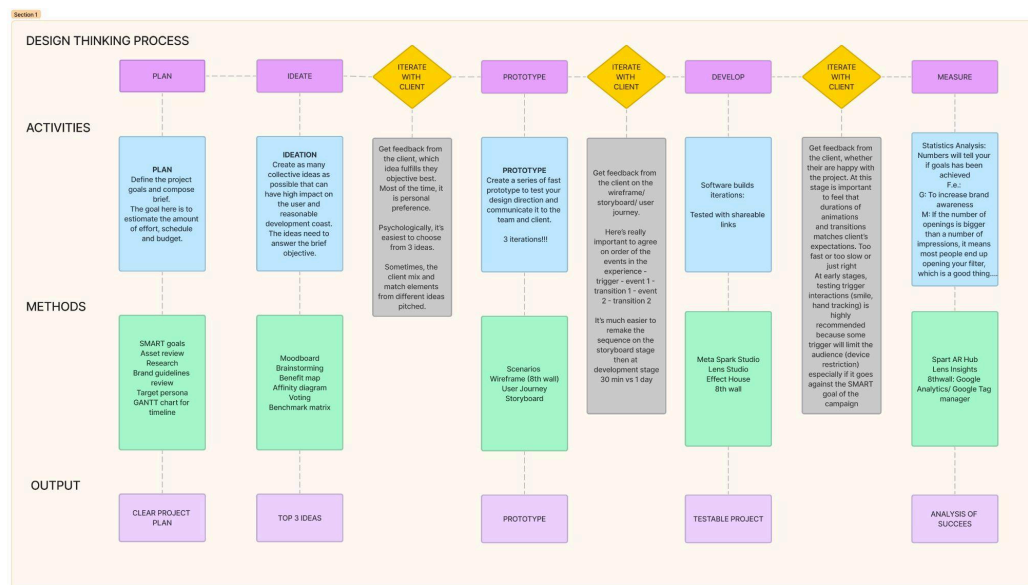


Figure 19. The design thinking process (own work).

8 Research findings

For this phase of the study, I interviewed two groups. Group 1 comprised two participants from Flamingo Filer. The first participant, Vincent Trastour (C1), is the founder of Flamingo Filter. The second participant, Jordan Poirier (C2), is

the Head of Design at Flamingo Filter. Notably, both respondents belong to the Flamingo Filter team. This group (Group 1) strongly responded positively to the proposed AR design. Additionally, they possess a relevant toolkit and integrate it into their daily workflows.

To gain insight into how the proposed toolkit can be embedded into established design processes, Busterwood managers were interviewed (Group 2).

Busterwood already had established design processes. These interviews occurred during a co-creation workshop and subsequently as individual sessions. The participants included Sébastien Wullems, Managing Director at Busterwood (P1); Audrey Niochau, Managing Partner at Busterwood (P2); Eddy Richard, AR Supervisor at Busterwood (P3); Anna Albertini, Project Manager at Busterwood (P4), Rachel Morvan, Project Manager at Busterwood (P5) and Manon FLeury, Project Manager at Busterwood (P6).

The interview was designed to answer a set of questions:

Q1. Which stages were the easiest to adopt? The hardest to adopt?

Q2. How did this toolkit increase the teams' productivity?

Q3. What are the costs of implementing the new toolbox?

Q4. Did it improve the understanding between teams?

Q1. Which stages were the easiest to adopt? The hardest to adopt? Why?

During discussions with all interviewees, the following findings emerged.

The planning stage was one of the most difficult to adopt because there was a temptation to move on to the prototype stage immediately. It is also challenging to organise the whole team and bring structure to yourself and the whole team. However, having a clear checklist and tools dramatically eased the adoption.

(C1,C2) The high enough need for planning stage adoption outweighed the costs when the team started growing. (C2)

The Ideation stage (Brainstorming specifically) was intuitive and easy. (according to C1,P2, P3) The Prototyping stage came naturally as well. Lean development can be tricky as it is strongly connected to planning. This is the most resource-demanding stage of the design process, and it is hard not to overestimate and deliver a project on time. (P1, P2) According to the AR Design process, one can catch bugs or faulty designs early if one tests early. However, there is a big temptation to postpone testing until the last moment. That usually leads to fixing the project last night before the delivery due date. (C2) It requires discipline to stick with the correct way of lean development.

Version Control for Lean Development is useful; however, getting used to new tools like Github is too much work for a designer, requiring separate onboarding training. (C2)

The measurement stage is not always feasible. (C1, P1) This is because a team can only sometimes access the client's page statistics, and it is up to the client to measure the project's success. The practice also shows that clients only sometimes measure the project's success. Sometimes, the client needs to follow the guidelines for promotion, and Social AR effects do not spread on their own. For example, a client may change the gift of the giveaway, which makes the whole promotion less desirable. The Promotion and Measure part is so costly that only several AR creators do it successfully. The ideal scenario is when an agency runs a promotional and augmented reality campaign simultaneously to measure success relative to each other.

Q2. How did this toolkit increase teams' productivity?

Before answering this question, I need to clarify what productivity means and what aspect of work it covers. Productivity mainly covers the ability to focus, improved communication between team members, no-rush work hours (or overworking the last days before the deadline), and time-saving.

During discussions with all interviewees, these findings came out:

The planning stage seemed counterintuitive for many. Quoting C2, "You need to do much work before you get to actual work"; in other words, it requires training. However, almost everyone agreed that even though planning required extra time, it has improved communication and focus dramatically and, therefore, saved total efforts on the project. Moreover, in the case of Busterwood, the Planning stage is essential because teams are big and need to be coordinated efficiently. (P2)

According to C1, C2, and P3, timeline and ticket systems like Kanban help build stress-free expectations of what and when it gets delivered. According to C1 and P1, having the most detailed brief with the correct client's goals and wants helps deliver the product that is just the right fit. However, according to C2, filling out the objective mind map and target audience profile is the least favourite task and often gets dismissed.

The Ideation stage became by far everyone's absolute favourite. Structured tools save time instead of adding to it, enabling everyone to be heard. Moving brainstorming online to Miro also saved time. Going through all the sticky notes after Brainstorming (P1) takes too much time. "Having ideas digital from the start could make the ideation process less messy" (P1).

This insight was highlighted during a discussion with C2: "When we were small, it was okay to work without clear structure, but once we started growing, it was getting messy. There was a need for something new. Now, with the new design process, everyone is part of it. The new structure enables everyone to be part of steps 2 and 3. Now, developers and salespeople bring equal input but unique views to the creation process."

Clear development guidelines can save you time if you test for software-related bugs before development (C1).

So far, the Measure part has not improved productivity, as the tools shared with the client are not easy to use. Even though we spared a fair amount of time composing a presentation on how to promote effects paid organically and how

and where to collect data, those instructions often need to be addressed because they require the client to act independently.

Q3. What are the costs of implementing the new toolbox?

When we talk of the costs of implementing the new toolbox, it mostly means how much time it took and whether there were some adjustments to the proposed tools.

In the case of Busterwood, the implementation costs are impossible to judge because the company established working practices even before the merger. However, some new additions to these practices can be described here. The implementation process at Flamingo Filter was relatively easy because it is a small company. Each stage took two to three weeks to adopt and three months to get used to the new workflow.

The change was gradual. At first, only the ideation stage was fixed. Planning followed Prototyping when the need for it arose. This toolbox would evolve continuously based on the mistakes made and experience gained. A lot of the changes were manifested because the team grew. For example, the ticket system appeared only when more than three people were working on the project, and plain text communication became ineffective. (C1,C2)

Busterwood has added an asset checklist to its design process (P3). It was a recent addition to their toolkit. They developed it together with Flamingo Filter, and it has improved collaboration efficiency. Now, passing assets between teams is not as cumbersome as before. (C1, C2)

At Busterwood, they have established processes, but the proposed toolbox needed more motivation for change. When an organisation is as large as at Busterwood, around 200 people, the tool's benefit must dramatically outweigh the implementation costs. (P1, P2) For Busterwood, the beneficial tools were from the Ideation stage. They immediately saw the potential of moving ideation online and even ran a few test sessions. However, they returned to holding

brainstorming in real life because they had the resources to do so, and it felt more reactive and confident. (P2)

Moreover, a few people on the team do not have equipped home offices or have other distractions(e.g., children) at home to fully engage in the meeting. (P3) To the contrary, holding ideation online is ideal for the Flamingo Filter team that started with remote ideation and has a remote working culture.

According to P1, P2, and P3, the main differences are not in the process but in the tools used for each stage. The process for Ideation uses different tools and structures at Busterwood. Each project gets assigned one manager and creative lead during the planning stage. The creative lead carefully reads the brief during the planning stage and picks the timetable for brainstorming. The creative lead's responsibilities are composing the presentation for the brainstorming team, curating the brainstorming by checking the time, and fixing the notes on the whiteboard. The last one is called creative review. The brainstorming lasts 30 minutes, as in the Flamingo Filter team. Brainstorming starts with a five-minute presentation, and the creative lead starts the timer and stands by the board to bullet point the ideas. Brainstorming happens in free conversation form, unlike Flamingo Filter's process. There is also a copywriter involved in the brainstorming who writes the summary of the ideas instead of each person fixing their ideas in a text.

Compared to Flamingo Filter, all the brainstorming sessions happen in Busterwood in real life. P2 admits that they have never tried using Miro board, but they have done some tests with similar tools from Microsoft Teams. Quoting P2, "For us, it did not work to do it at home. The flow is interrupted if there is a bad connection or I need to show something on my phone." For Busterwood, actual eye contact, spontaneity, and instantaneousness are the critical factors in brainstorming. "When you are used to working one way, it is tough to switch to something new, especially when are 45 people involved. You need to be strict" (P2.)

On the one hand, in-person human communication is at its best; on the other, bringing the entire team to one room and having a copywriter is quite expensive. So, if small teams brainstorm, online is a place to do it. The outcome of the Ideation stage is very similar to Flamingo's way of working because they use references, moodboards, and transcripts to send ideas to the client.

Q4. Did it improve the understanding between teams?

During discussions with all interviewees, the findings were that planning has significantly improved communication between the teams of Flamingo Filter and Busterwood. Before starting the project, clear timelines are being communicated, and deliverables are discussed. According to C2, planning improved considerably than during the first projects when the communication was stressful. Is not without its pressures. However, visual tools help communicate deadlines much more effectively than plain text. One can always refer to the timeline if a project is asked before the deadline.

Prototyping in Miro has improved communication over Prototyping. Feedback collection and iteration became easier since one can leave comments directly on the board where the storyboard lives. (C1, C2) The client often receives a link to a Miro board where they can interact with it. Busterwood continues to use PDF mockups of storyboards; they also deliver visual ideas but are harder to communicate as one cannot leave a comment directly on top of the screen mockup and must communicate via plain text. On the other hand, it is technically easier to interact with PDF as it is familiar to most.

Busterwood teams value reactivity and responsiveness in communication. (P2) Thus, after the merge, the Flamingo Filter team was introduced to a hybrid working method, where Thursday and Friday are remote days. (C2) However, only some people are willing to move to Paris, and some team members have stayed remote. It is also challenging for Flamingo Filter and Busterwood to communicate as one team is used to being proactive online and the other offline.

The main finding of this research is the global similarity of the design processes, but the tools can vary in shape and form. "Our process is not far from your process." (P3). "While working on projects together, Flamingo Filter and Busterwood collaborated successfully because fundamentally our design processes are quite similar; it can be that few tools are skipped or executed differently." (P4)

In Busterwood, P3 is responsible for timelines, testing, and technical limitations. Before production, creative ideas would be tested for technical limitations, or specialists would be consulted to determine if it is possible to realise them, e.g., how to produce a custom ML solution. If an idea has unusual capabilities, it will be tested on several iOS and Android devices. Several features are not supported on Android (e.g., hand tracking on Instagram does not support Android phones). Flamingo Filter's process was implemented later but is being tested the same way. Cross-device OS compatibility testing is frequently neglected. In the absence of a similar process in place, the Flamingo Filter team risked encountering technical limitations during the late development phase that could require revisions to the verified storyboard concept. (P4)

According to P3, in Busterwood, projects have several deadlines—the first internal deadline (only 1st iteration) is released by 4 pm. The project manager and art director tested it on both operating systems. Things they keep in mind include how the experience looks on different screens; they tap quickly to break the experience and switch cameras. By 6 pm, the team can send the version to the client and be aware of all bugs. If bugs are minor, they can be fixed before 6 pm. If they still need to, they notify the client that they are aware of the bugs. There are four back-and-forths between the client and Busterwood, compared to three Flamingo Filter team iterations. The Lean Development stage assumes iteration with a client. When Flamingo Filter works with Busterwood, there is an extra iteration step: delivering the project version to the manager at least one day before it is delivered to the client.

When speaking with P5 and P6, this finding came out:

When working with Flamingo Filter, they appreciate the tools Flamingo Filter operates but for internal use. They would still have remade them into old-fashioned Excel spreadsheets or power points because this is easier for the client. Legacy needs to be followed.

When planning the project, P3 and P5 value the global timeline. Steps 1, 2, and 3 are usually planned broadly, but when it comes to the development stage, the planning becomes much stricter as soon as the storyboard is confirmed. Sometimes, bigger and more complex projects appear, such as backward planning. It is when the team has one final deadline, and the manager chunks work to stage deadlines. P5 admitted the visual timeline was very pleasant, but unfortunately, the client is unfamiliar with Notion. Then, the timeline is converted to legacy formats such as Excel or pdf. P5 also admitted it was beneficial to work on the storyboard in Miro because you can leave comments directly on the storyboard. However, when delivering the storyboard to the clients, they stick to slideshows for the same reason: the client might need to be more familiar with it, which is different from what they are used to. P5 and P6, when working with Flamingo Filter on projects, valued the responsibility and reactivity of the Flamingo Filter team; it was sometimes ahead of deadlines. P5 and P6 are project managers in Busterwood and are involved not only in the production stages but also in the communication with the client from the beginning to the end. They explained that usually, when working with clients, they have some broad idea, and then the team brainstorms 4 to 5 concepts.

The process starts to vary because of Busterwood's and Flamingo Filter's different natures. Since Busterwood is more like a factory producing many easy Snapchat effects, many components can be reused, and the storyboarding usually takes one day. Flamingo Filter tackles more development-wise, more complex projects, and prototyping usually lasts one week.

8.1. Summary

Before the research, I had a misconception that the Flamingo Filter team had designed a perfect "AR design process" that fits all. During the interviews, I

realised that the design process is less about the tools and more about the team and its goals. A design process should have key successful features. It needs to be flexible - easy to manage, maintain and update. It should have a legacy, a learned plan of action that is repeated and familiar to everyone. If a new change arises, it is built upon the legacy. The AR design process undergoes continuous refinement through real-world project implementation. This iterative approach involves evaluating unsuccessful attempts employed by the team and transforming them into valuable insights that inform the development of more effective design strategies. As with every tool, and the AR design process is a set of tools, the team needs to be trained to use it because otherwise, it becomes a blocker.

The effectiveness of the AR design process depends on its scalability in accommodating intricate use cases. Flamingo Filter has shown adaptability, successfully applying the process to diverse AR projects to produce social AR filters, web-based AR experiences, and even immersive websites. This versatility underscores the process's broader applicability.

While the concept of an AR design process is not novel, its practical utility depends on its suitability for a particular team. The process is not universally mandatory; its necessity depends on project requirements and team dynamics. However, its successful implementation, as evidenced by the completion of AR projects, ultimately leads to establishing a defined AR design process within the team.

The design process is not a new phenomenon and is used widely across the creative industry. An AR design process described in this thesis adapts to AR effect creation. It is also explicitly designed to fit small teams, where most work happens online. At first, when Bustetwood and Flamingo Filter were merged, the communication between the teams was tense, and clashes of different design processes happened. After a while, everyone figured out the difference between each other. It became clear that both design processes follow the same dynamic but use different tools or implement the same tools in different ways (e.g., online vs. offline work).

While writing this thesis, I realised the design process is never complete without an agile mindset. This is humorous because agile development is one of the toolkit's steps. So, the AR design process can also improve based on iteration and feedback. It grows on mistakes made. The AR design process is driven by compatibility with the team's needs, such as convenience and efficiency. However, neither is the team's end goal; the goal is to deliver a good AR experience.

An efficient AR design process can be identified through qualitative and quantitative factors. Here, I outline key indicators that suggest potential inefficiencies:

- **Limited Use Case Applicability:** If the process struggles to adapt to diverse AR project types (social AR, web AR, etc.), this is a potential limitation.
- **Repetitive Revisions:** A high frequency of backtracking and revising steps within the process indicates inefficiency.
- **Inconsistent Practices:** Inconsistencies in naming conventions, asset formats, or workflow create confusion and impede smooth execution. Consistency means preset expectations from the team about what is the next step.

While financial metrics may not directly assess process efficiency, other quantitative measures can provide valuable insights:

- **Reduced Development Time:** An efficient process should decrease the overall time spent to complete AR projects.
- **Decreased Iteration Cycles:** A clear process minimises the number of iterations necessary to achieve the desired design outcome.

Beyond quantitative data, user satisfaction plays a crucial role in evaluating process efficiency. A well-designed process facilitates a positive user experience.

Having an AR design process does not mean the team has a perfect service, flawless design process, and first-rate deliverables. It should not be applied blindly for the sake of having it. Instead, the design process should grow naturally or slowly bend the existing. When two teams with different design processes work together on a project, they may need to compromise on whose process to follow. Tools are different, but overall, the phases have similarities.

Moreover, the fact that both teams developed similar AR design processes independently speaks for itself. Accommodating existing ones but staying flexible is the best fit in this condition - a sweet spot between service, business, and team needs.

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