



wemagine[★]

A business exploration on the
viability of dynamic office art

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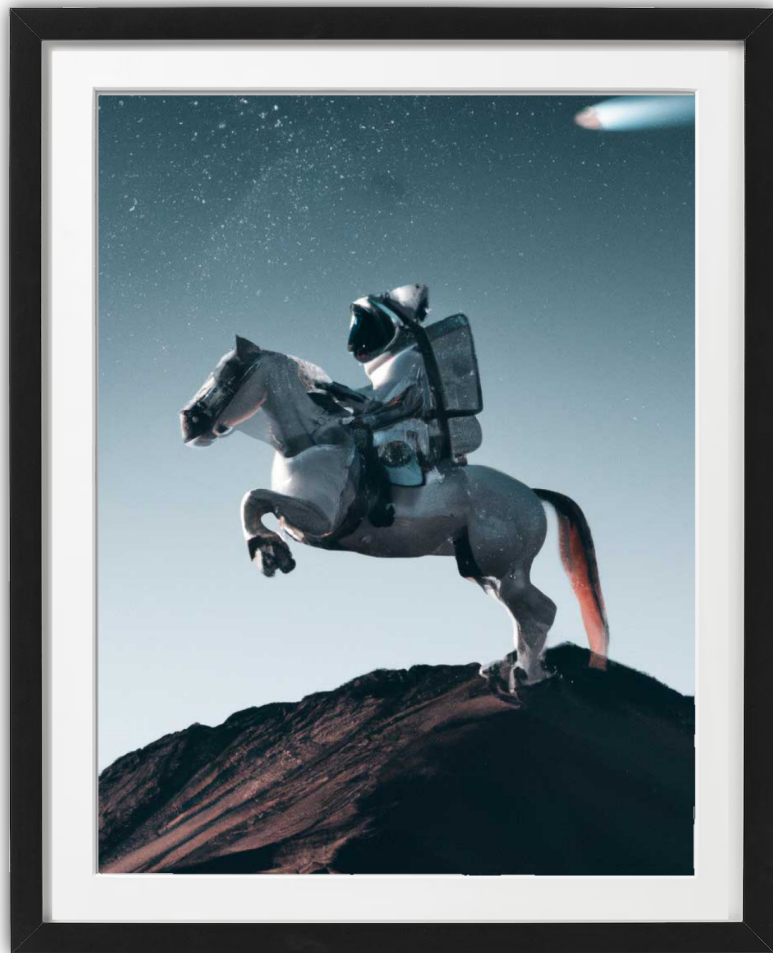


Executive Summary

Over the last few years, the technical capabilities of artificial intelligence have exploded. One of the newest paradigms within artificial intelligence research has been text-to-image conversion. The technology is powered by neural networks that can auto-generate an image based on natural language inputs. DALLÉ-2 API uses OpenAI's text-to-image neural network and creates realistic images and art from a description in natural language. The pic on the right is generated by the phrase "An astronaut riding a horse as a pencil drawing". In fact, all pictures in this report are generated by the DALLÉ-2 system.

Wemagine uses the powerful DALLÉ-2 system as our backend and empowers office employees to co-create the wall art by interacting wemagine system through speech. Through the collaborative interaction with the wemagine system, we hope to create a fun and social working environment for office workers and increase the productivity for the company.





*"An astronaut riding a horse
in a photorealistic style"*



We started with testing the feasibility of the idea. With the technology being less than three months old, there was uncertainty with the new technology. We adopted the technical spike method from Scrum, which is used to research various technical approaches in the solution domain (Scrum Alliance, 2018). By spiking out the DALL-E-2 system ourselves, we validated the feasibility quickly at the very start.

Throughout the hypothesis-driven design process, the following assumption was tested, in an effort to maximise the accuracy of the estimation of the desirability:

How desirable is an interactive art work in the office from a business owner or employees?

The hypothesis was tested through various methods, including interviews, a landing page test, and a wizard of Oz.

Through our Go-to-Market plan, financial model, business strategy and future plan, we managed to test the viability of the idea. More details will be shown in the rest of the report. For a quick overview of our business concept, our Business Model Canvas can be found in Appendix A.

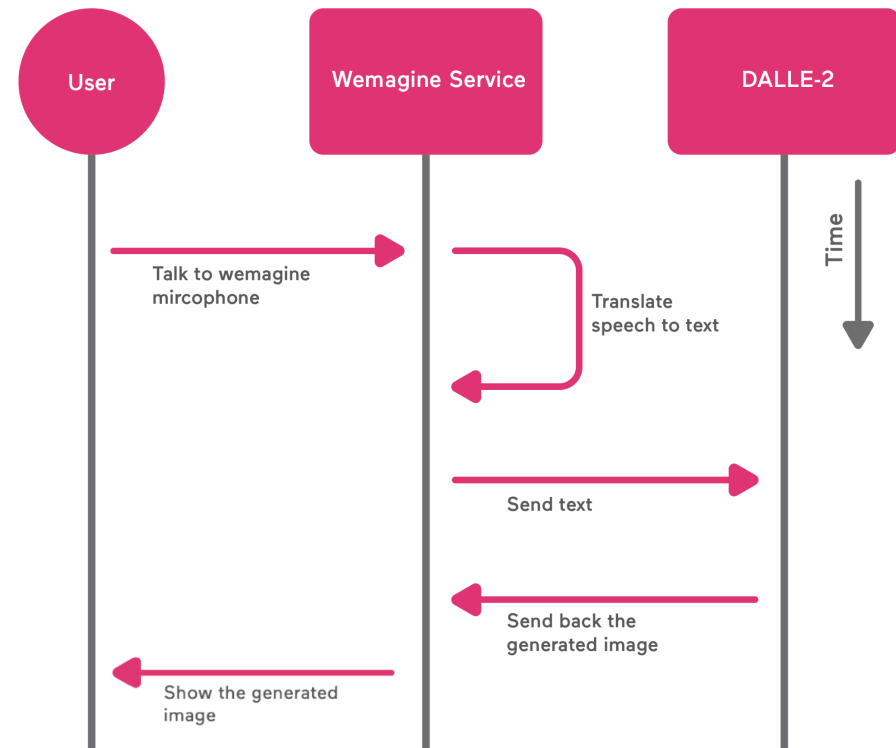
Problem Description of Your Final Concept

Office environment is important for employees, which keeps the employees happy, connected and productive. One of the famous office examples is Apple Park, the corporate headquarters of Apple Inc., in Cupertino, which was estimated to cost US\$5 billion. The office has definitely become a perk for people to work for Apple. It is not expected for every corporation to invest a similar amount of effort into their office environment like Apple does. However, Wemagine offers a cost-efficient solution that quickly turns the office space which is usually decorated with static wall art into a collaborative office space where employees can co-create the office artwork.

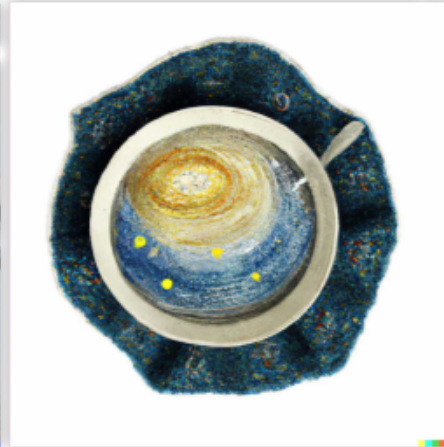
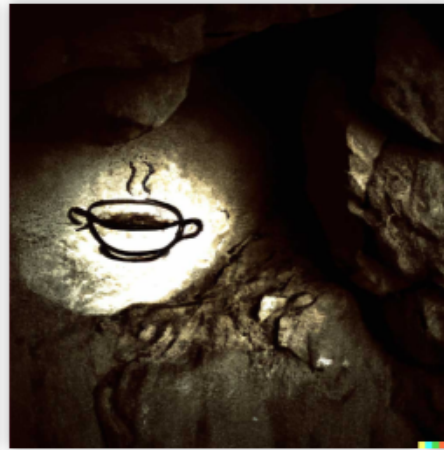
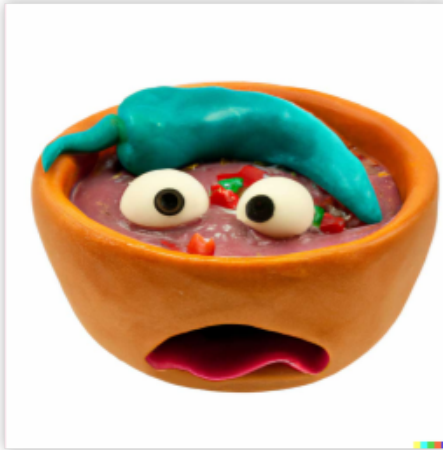
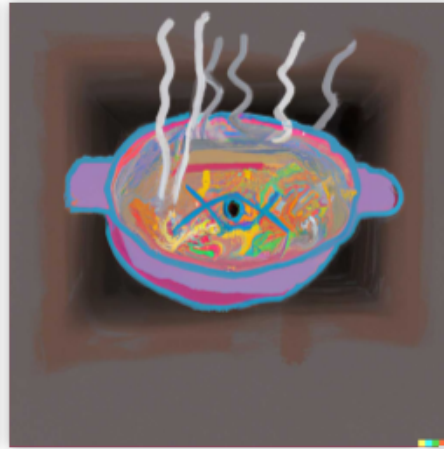
The available market will be enterprises in the Netherlands, which is home to a total of 1.9 million enterprises (CBS, 2021). Based on our research and the interviews with business owners, enterprises that have potential in purchasing our service are medium to large companies with offices where people sit for long times. It scopes down our target sectors to information and technology, financial services, specialised business service, trade, public administration and public services, manufacturing, healthcare and welfare, and education. The total number of companies that have more than 5 employees within the above mentioned sectors sum up to around 80,000 in the Netherlands, which is our target market size.

Wemagine service utilises DALLE-2, which is a new AI system that can create realistic images and art from a description in natural language, where the description is from translating the speech input from users to text (OpenAi, n.d.). The system interaction among users, wemagine

service and DALLE-2 are shown below. A demo usage is illustrated below. wemagine service is activated by picking up the wemagine microphone, embedded with sensors, from the table. When the employee says “A dog” to the microphone, the canvas generates a dog image. Then another employee takes the microphone and says “playing violin” so the canvas responds with an image of a dog playing violin. The microphone is thrown to another employee, who stands far away. He speaks “in a cartoon style” and puts the microphone back to the table. The microphone detects it touching the table surface again and ends the collaboration session. The canvas eventually displays a picture of a dog playing violin in a cartoon style.







Themed Presets

Wemagine also provides customised services for business. So the images generated by the service are persistently highly related to the business theme. For example, the NONGSHIM CO.LTD, which is famous for their various ranges of instant noodles. Wemagine can generate images that are always about instant noodles, but in different styles by customising a limitation of the image themes into our system.

Value Proposition

The target customers of wemagine are medium to large companies with offices where people sit for long times. Based on 24 interviews, we created a Value Proposition Canvas for the person who is responsible for decorating these offices. We noticed that our customers value more than just aesthetic art in their office spaces. They described that apart from the aesthetic properties, the art should be connected to the business and employees

"It is important that the artwork communicates the products that I sell."
~Hospitality business owner

Wemagine focuses on two gains for the customer; better social cohesion in the office and business related art to increase effectiveness (Osterwald et. al., n.d.). We achieve the goals by creating business-related art themes and empowering employees to co-create the canvases. Wemagine offers a social experience for employees, where they can iteratively work together on art pieces that match their personal preferences.

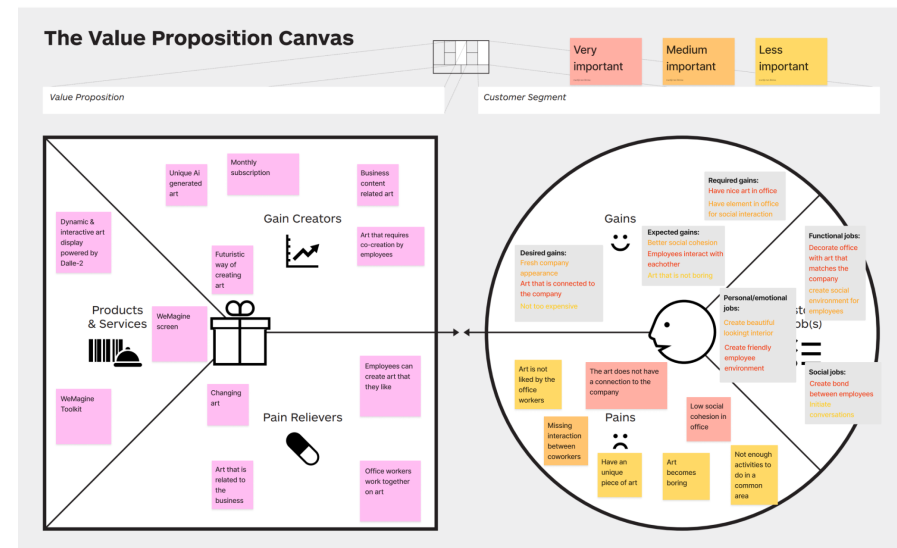
"Customizability is important since my employees have different tastes in art." ~Employee responsible for office decoration

The customisable canvas allows employees to socialise and co-create aesthetic art works whilst our software ensures that the canvases contain business relevant content. Each canvas is updated on a regular basis by our customer support team, which eliminates the

problems of boredom and opens up new opportunities for employees to recreate the canvas based on their preference.

"I can imagine me and my coworkers having fun creating these artworks" ~Communication employee

By creating a social co-creation platform with business related art, wemagine aims to create aesthetic art favoured by most people in the office whilst promoting social behaviour and employee bonding.



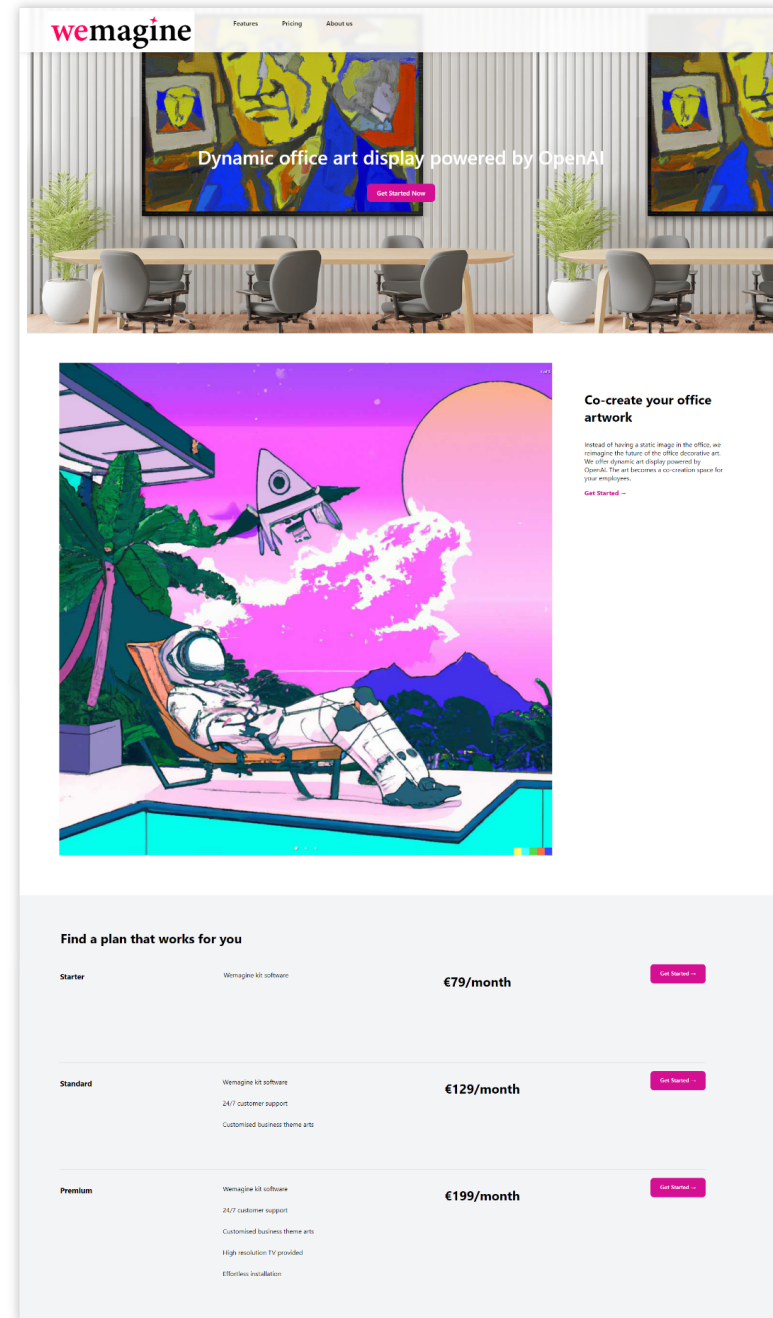
Problem-Solution Fit

The following section describes two major user tests that verify and adapt aspects of the problem-solution fit. Through a landing page test, quantitative data about the potential interest of the target audience was collected. Furthermore, a wizard of Oz test was conducted to qualitatively verify the desirability.

User Testing: Landing Page

For the first experiment we conducted a landing page experiment. We wanted to find out if customers would be willing to pay more for extra perks and gain insights as to which packages of our products customers would be most interested in. We created a landing page <https://wemagine.niekmuijs.nl> and presented the user with three different monthly subscription packages:

- **Starter kit:** €79,- per month
 - *Wemagine software*
 - *Wemagine controller*
- **Standard kit:** €129,- per month
 - *Previous perks*
 - *24/7 support*
 - *Customised business theme art*
- **Premium kit:** €199,- per month
 - *Previous perks*
 - *High-res Screen*
 - *Effortless installation*



Before we directed potential buyers to this website we made sure to inform them about what our product is. In order to find out what potential users would prefer we created dummy buttons. Every time the button was clicked by a user, it got logged. From this we can conclude what package users are most interested in buying. We found out that the distribution of interest between the different packages is **27%**, **37%** and **38%** respectively. From this we estimated that users are willing to pay more for extra functionality. This also coincides with user tests we have done in the past, where we found out business owners think it is important that art displayed relates to the business. In addition, we found that business owners preferred a smoother experience, from ordering to installation. One downside of the landing page approach is that the "Get Started" buttons did not actually redirect the user to a purchase screen. For this reason, users may press a different button to check whether another button works.

	 id	 buttonid
1	108	1
2	109	3
3	110	2
4	111	3
5	112	2
6	113	2
7	114	2
8	115	1
9	116	3
10	117	3
11	118	3
12	119	2
13	120	2
14	121	2
15	122	2
16	123	2

User Testing: Wizard of Oz

To verify user interest in using the product, a Wizard of Oz test was conducted. Within this test, users interacted with a prototype version of the text-to-image software. The main goal of this test was to back up our assumptions about how the user would experience the prototype. Furthermore, by testing on office managers, we were able to verify interest from potential buyers.

Test Setup

As a minimum viable product, dalle-mini was used. This AI model is built on the same principles as DALLÉ-2, but with a smaller network size. Unfortunately at the time of testing, DALLÉ-2 access was not yet open to the public because it was released only 3 months ago. Users were able to say what they wanted, after which dallemini would generate it for them. Users were subsequently taken through how the social interactions might happen in the office.

Employees

For the users that potentially would be employees, we mainly aimed to validate how they experienced the prototype, and if they were interested in the interaction. Out of the 8 users, 100% of them showed general interest in the capabilities of the product; most of them never experienced similar products. Users overall seemed highly interested and were surprised by the capabilities of artificial intelligence. Although the initial interest is great, it is difficult for us to know whether the interest would sustain.

We also assumed that the user's initial curiosity of AI will be replaced by interest in the social aspects of the product over the time; The AI technology will fall to the background, while the canvas becomes more of a fun social collaboration tool. Long term user tests are needed to verify this hypothesis.

Office Managers

The results of the experiments with the office managers were comparable to the others. However, the office managers gave us some key insights into their needs for our product. They stated that they highly value business related content on the canvases. Additionally, one stated that they would like to see this kind of art in their office. They also valued the dynamic and social aspects of the art. Besides the positive feedback, they expressed a concern for the aesthetic qualities of the canvases (supported by the Dalle-mini). However, once they were shown the DALLÉ-2 canvases, this concern disappeared.

The Rise of #dallemini

While the test was being conducted, usage of text-to-image generation software blew up on social media. #dallemini has suddenly seen an influx of over 100.000 posts. Furthermore, social media pages focused on DALLÉ-2 generations started to explode, with some¹ having close to a million followers at the moment. This explosion in text-to-image generation interest further solidifies the results found

¹ <https://twitter.com/weirddalle>

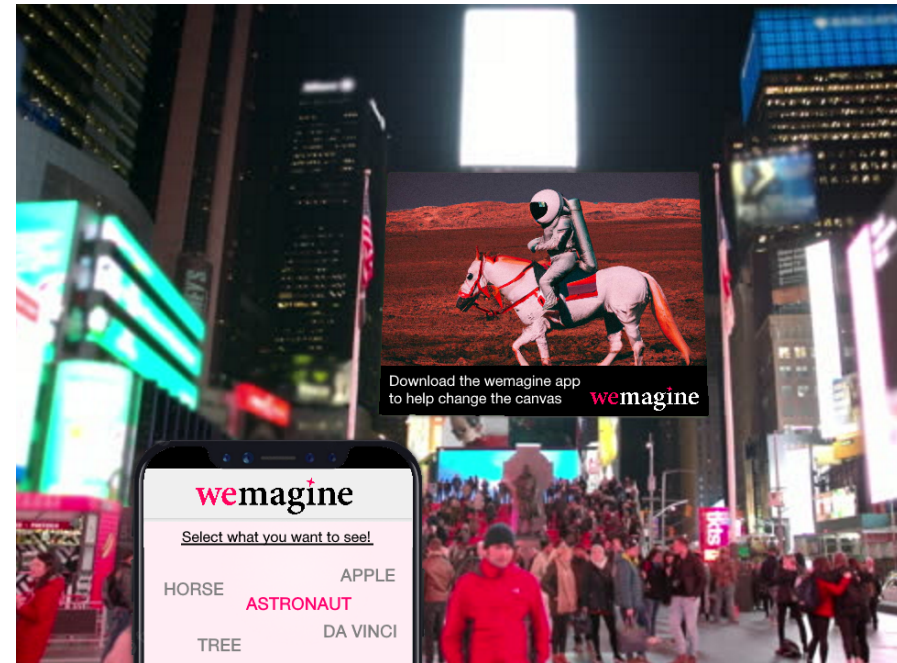
with our user test. One discussion is about the sustainability of our concept. Since the text-to-image generation is new, there is hardly any way of knowing if the technology will still be appreciated in the future.

Go-to-Market Plan

To effectively attract clients and grow our customer base, wemagine uses multiple strategies, categorised by the customer stages by Steve Blank (n.d.) & Alexandre Azevedo (2019).

GET

One of the main strategies to create awareness is by attending conferences like Consumer Electronics Show, Dutch Design Week and Makerfaire. Exposure is also created by demonstrating our aesthetic canvases via social media accounts where our canvases are posted. Additionally, we co-advertise with other brands on billboards, where content of these brands will be displayed, whilst viewers can vote for the content, by scanning the QR-code on the billboard. The bypassers are offered a selection of keywords, which have been selected by us and the brand that is advertised. We offer our partnered brand company an unique way of advertising, whilst we demonstrate the unique strengths of our product and pay a lower fee for the billboard. Additionally, canvases contain a watermark, people can immediately see that they were generated using our toolkit.



Once they are interested, potential customers can find us on our website and youtube videos, where a more elaborate explanation of our concept strengths can be found. Additionally, #wemagine is created, under which multiple canvases are shared. People can also visit our stands at the conferences for live demonstrations.

When they start to consider buying our product, they can find our product at local interior design agencies. Besides this, they can also gain more knowledge about the wemagine toolkit through newsletters and reviews. Our product can be purchased through our website or

the interior design agencies. To create more incentive, newsletter subscribers also receive promotional emails with discounts.

KEEP

To keep a close connection to our customers, we use a feedback channel that allows us to continuously improve our product and the quality of the canvases. This feedback loop aims to increase customer satisfaction and thus aids customer retention.(Azevedo, 2019)

GROW

To grow our customer base, wemagine introduces a referral program that encourages existing customers to refer us to new clients. Each customer receives a 10% discount on their monthly fee when they refer us to a new client. Wemagine makes use of two tactics for increasing their revenue; cross-selling, where we offer a high quality screen for displaying the canvases. Next to this, we also use up-selling, where we offer multiple packages of the toolkit, with different levels of customizability and customer service. To create more awareness for new customers, the canvases shared on social media have a wemagine watermark, so everyone can recognise the quality of our product online. By creating this watermark, our work can quickly be distinguished from competitors and we can join the current AI-art generation hype that is happening across multiple social media platforms.

Financial Model

The following section describes the financial model created for the first 24 months. The setup of the model was taken from (Constable & Rimalovski, 2018) and adapted to fit our product.

Months 1-3

We will be running advertisements on large, crowded squares like Times Square in New York. Users will be able to scan a qr code or go to a website and cast out their vote for what word should be added to the artwork next, giving the user the collaborative feeling we are trying to give them. The price for this is approximately €5000 for a day. Running this for 5 working days would cost us €25000,-. Around 360.000 people will be able to see our advertisement per day according to the official Times Square website. Let us be conservative and say that 60% of the people that visit the Times square within those 5 days come back on a different day. That would result in around 1.080.000 unique individuals that see our advertisement. If we get a 0.001% success rate among those individuals sales would in theory be 11. Based on the Landing Page experiment, the average revenue per subscription is €145,-. We expect our one-time costs per user to be about €372 euros including a screen of €300,- a controller of €60,- and €12,- for shipping. If we also scale the tv price with the average amount of people selecting the package that included the screen we come to average one-time costs of $€72 + 0.38 \cdot €300 = €174,-$. In addition, we expect recurring user costs to be around €5,- for Dalle-2 requests and €15,- for customer support, adding up to €20,- per subscription.

This will net a relative profit of €125,- in recurring costs. One time costs are expected to be €174,- as mentioned before. This results in a break even for a per-customer basis of 2 months of payment.

$11 \text{ customers} * €125 = €1375,-$

If we now deduct $11 * €174,0 = €1914,-$ we would be in debt for €539,- the first month based on just user costs and excluding costs like salary, rent and hosting costs.

The third month, we would have made a profit of €3586,- on just user revenue and user-costs.

The funding for this part of the project will be done by approaching angel investors. This way we can pay for things like salaries, rent and hosting costs. These will be further explained in the next paragraph.

Months 4-12

For this period of time we will be focusing on "big-fish" acquisitions. For this we will have a dedicated sales team. In addition we will advertise our product at interior design fairs, networking events and design fairs. We hope to sell at least 100 more subscriptions over this course of time. This would result in $11+100 * €125 * 9 - 100*€174 = 124875 - 17400 = €107.475,-$ of profit based on just user revenue and user-costs. This, together with the first three months would total €111061,-

In addition, at this point we will have at least €200.000 in salaries and expect to have around €40.000,- of yearly rent in addition to hosting

costs we expect to be around €25000 each year. This totals to €465.000 of yearly costs. This means that at this point in time the company will be in debt for around €153.939,-.

As we have a year of lock in time for our customers, all of these customers will pay for at least a year.

Months 13 - 24

By the second year we hope to find more investors so we can spend more on marketing. We would like to scale our business and invest in getting our own data centres. Hosting our own services in our own data centres will give us a cost reduction of about 20% once we gain more customers. We hope to grow 250% over this year. This will be possible by focussing on marketing. With a 20% reduction in hosting costs and 2.5x the overall hosting costs this results in $2.5 * 25000 * 0.8 = €50000,-$.

If we have a customer retention rate of 80% this would result in a revenue of $12*0.80*(11+100) = €99.900,-$ from the first year's customers. In addition, the 250% increase would result in a revenue of €249750,- of revenue minus €174,- * 2,5*111 = €48.285 in one time costs for those users, resulting in a revenue of $\sim €249.750 - €48.285 = €200.000,-$ in profit based on just customer costs.

In addition, at this point we will have at least €200.000 in salaries if we consider 5 employees and expect to have around €40.000,- of yearly rent in addition to hosting costs we expect to be around €50.000,- each year. This totals to €290.000 of yearly costs. The hardware for hosting our service ourselves is expected to cost around €100.000,-

This means that after 24 months, the company is €190.000,- in debt but has reduced part of its yearly costs.. For the next few years we will continue to grow our market and start to decrease our debts. We will still require investments in order to pay our employees and grow our business during this time.

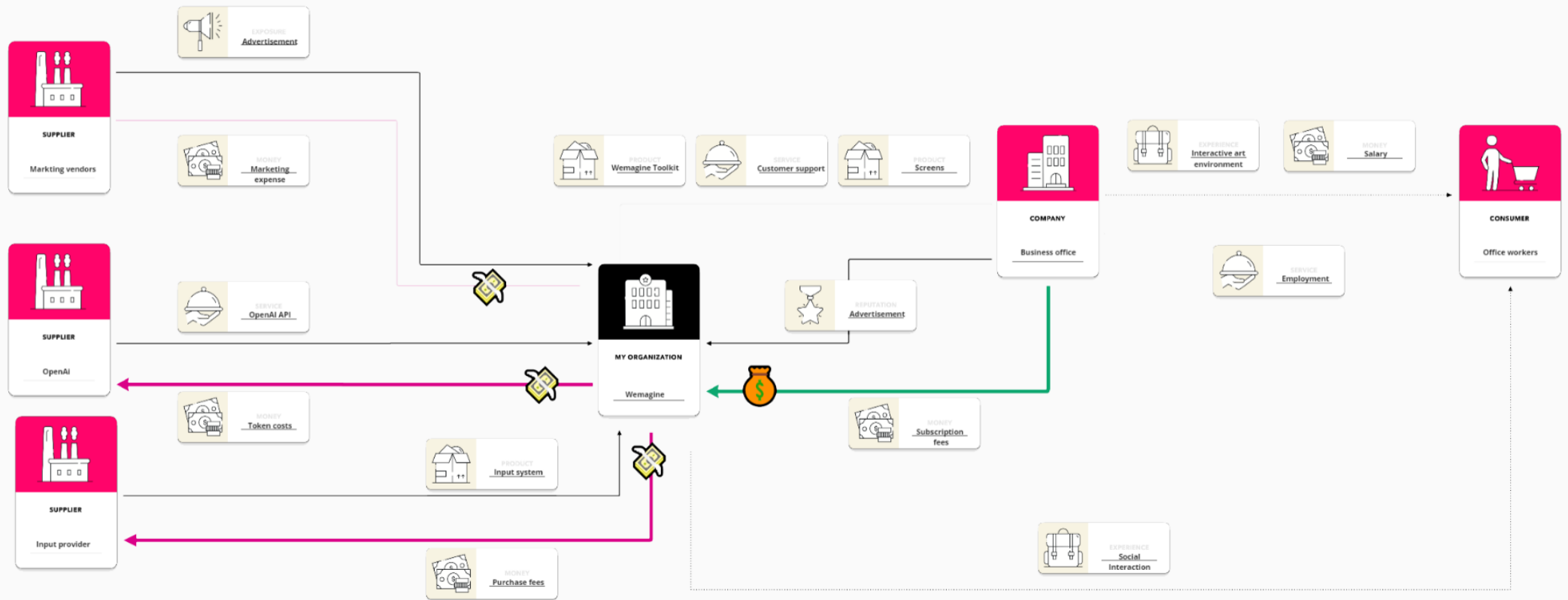
Business Strategy

Our key suppliers are marketing vendors, OpenAI and appliances providers. Since we are a startup, we need to partner up with marketing consultancies to advertise our service, and help us acquire customers and get them interested. OpenAi is the third party service that provides the generated image by artificial intelligence. Our service needs to talk to their API to generate the image on our canvas. It is also unrealistic to produce our own screen and microphone as a startup. We will purchase high-resolution screens and microphones from respective suppliers and brand it with our company name on it.

Our customers are enterprises. We provide a monthly subscription model because as a startup, acquiring customers are important to us and they are more inclined to try out our service if the trial and error cost is not too high. We also get free exposure and advertisement by customers using our service at their companies as an extra benefit of acquiring customers. We also offer different levels of subscription to customers to give them the freedom of using our service on their existing company screens. We also approached some business owners to test our hypothesis, they are generally highly positive and

highly interested. Besides this, we contacted software developers, who indicated their interest

Through using our service, the company provides employees a more fun and collaborative office environment, and the productivity of employees is increased in turn.



Wemagine Alpha (0-3 months)

The first iteration, wemagine alpha, will be developed for testing of our concept. During and after the development of this iteration, multiple tests will be conducted to check our problem-solution fit. The difference from the tests that have been executed in this course, is the fidelity level of the prototype. During those earlier tests, we discovered a concern whether the results of the wemagine canvases would be aesthetic. By using the actual DALL-E-2 AI, we can create high fidelity canvases. The types of tests will be interviews, combined with letting people experience the prototype. Additionally, our landing page will be upgraded to get stronger evidence on the product-market fit.

Wemagine Beta (3-4 months)

Based on the feedback on our alpha version, the beta is developed to continuously test our problem-solution fit. Besides the testing and development of our beta version, more awareness on wemagine is needed to attract more potential customers. This is done via the following channels:

Social media & website promotion

By promoting self-generated canvases on social media, wemagine demonstrates the quality and creative aspects of the wemagine toolkit by joining the current AI art hype, through which we create more awareness and demonstrate our strengths. Each time one of our canvases is shared, a wemagine watermark is attached to the corner, so customers will know that the good looking art is from our software.

Big fish acquisition

To get a larger customer base, wemagine will contact so-called “big fish” companies, and try to sell our product to them via calls or office visits. By doing so, we try to reel in a few big companies that want multiple artworks, that help us become profitable more quickly.

Attending conferences

By attending conferences like Makerfaire, Dutch Design Week and CES we hope to create more awareness of our products and also attract more attention from the people who buy the art for offices.

Since the beta variant is then still not for sale, people will be put on a waiting list, for wemagine 1.0, which would be our first product that is launched into the market.

Wemagine 1.0 & future iterations

To make sure that our product matches the customers needs, we provide a platform for them to provide feedback, which will be incorporated in future product updates. Besides this, a referral program is initiated to encourage customers to spread the positive word on our product. By doing so, we try to create a larger customer base. To increase the sale chances, interior design and art agencies are contacted to sell our product via their stores. At last, to create more awareness for the general public, we plan to collaborate with other brands, where we display content related to their brand, using the wemagine billboard.

Wemagine Risks

One clear risk is that currently inflation rates and interest rates are rising. As a result, companies are less likely to take loans and have less money to spare. If we head into a recession, artwork may be one of the first costs that companies shy away from. This, because artwork is not something that is essential within a workspace. It is reasonable that companies end our subscription before sending away employees or terminating their IT-support subscription.

Conclusion

In this report we described the hypothesis-driven design process of wemagine. Through various tests such as a landing page test and a wizard of Oz test, business assumptions were verified. Through these tests, we ended up with a pivoted concept that has a bigger emphasis on the social aspects of the design. The hypothesis-driven design approach has played a pivotal role in shaping this new direction.

Furthermore, a financial plan and marketing strategy has been created, in line with the product-market fit.

Individual Contributions and Group Reflection

Individual contributions

Mats Erdkamp

During the project, most of my individual contributions came in the form of the Wizard of Oz testing and interviewing, as well as creating the visual identity for most of the content. Furthermore, I think my initial knowledge of the status quo in text-to-image generation played a pivotal role in the ideation phase of the project.

Niek Muijs

For this project, my main focus was thinking about the technical setup of our product and figuring out what parts our product would consist of. Additionally, I worked on the landing page project, the value proposition and the financial model. I also interviewed potential customers and a potential employee (software developer) for our company.

Kuangyi Xing

For this project, I was responsible for the design, research and marketing. I designed our current concept, participated and communicated in every team meeting, and actively contributed my ideas to the process. I designed and coded the landing page website. I also researched our market size and came up Go-to-Market plans and business strategy together with other team members.

Martijn ten Brinke

My main activities during this project revolved around the testing of our hypotheses. By interviewing employees and business owners I tried to create a better picture of the needs of our potential customers. Additionally, I worked on the development and execution of our Wizard of Oz experiments, which gave us insights in the desirability and the overall interactions with the wemagine canvases. Besides these tasks, I also worked on the Value Proposition Canvases, Business Model Canvases and the Get, Keep and Grow strategies.

Group Reflection

Our group is composed of students with different backgrounds. This came to our advantage in this startup. Instead of having to recruit external experts, we already had them. However, these different backgrounds also came with their challenges, since we all had limited availability at different times. Therefore we decided to give everyone individual responsibilities. By dividing the roles. We could efficiently make progress whilst not slowing each other down. For each week, we discussed everyone's individual tasks that should be done within one week. To check upon our progress and incorporate feedback, we also had a meeting scheduled in the middle of the week, to make sure we all were on one line. If we look back at this, we think that it was a very effective way of working together in a hypothetical startup, and that this also reflects the way that it is done in a real-life setting.

Overall, we think that Hypothesis Driven Entrepreneurship is a powerful way to create a startup. By continuously testing our business hypothesis, we can efficiently test whether our product and

business model are fit for the market. This is especially the case compared to traditional business startups, where a large cash flow is needed to launch their first iteration. Another important aspect of Hypothesis Driven Entrepreneurship is that besides Desirability, other business aspects like Viability and Feasibility are tested. By analysing your business model on these three aspects, you can more effectively eliminate possible risks that you might encounter at product launch. This course has taught us many powerful tools, like Business Model Canvas, Get Keep Grow Strategies etc, that prove to be of value to us for future projects.

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Appendix A

