
easel
desktop add-on

about

easel

desktop add-on

OUR PURPOSE

Easel aims to empower graphic designers by allowing them to unleash their creative abilities comfortably.

OUR STORY

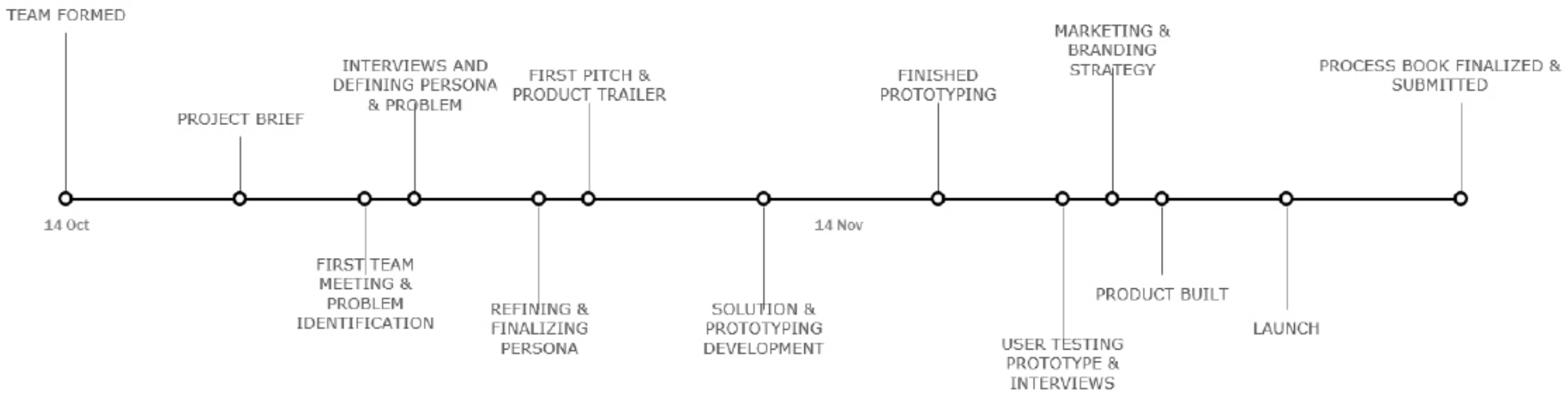
Our team came together because we all have experienced and have been frustrated with body pains and disorganization at work desks. We all had similar ideas of creating some sort of add-on component to existing desks to make work more comfortable and efficient.

OUR PHILOSOPHY

Our three keys to our success are:

- **Aesthetics** - without appeal, there is no desire in trying or testing
- **Comfortability** - without the head of the key, there is no understanding of functionality
- **Functionality** - without the cuts of the key, there's no point as it solves nothing

timeline



PROJECT DETAILS

DATE	MILESTONE
14-Oct	Team Formed
21-Oct	Project Brief
26-Oct	First Team Meeting & Problem Identificatio
28-Oct	Interviews and Defining Persona & Problem
2-Nov	Refining & Finalizing Persona
4-Nov	First Pitch & Product Trailer
11-Nov	Solution & Prototyping Development
18-Nov	Finished Prototyping
23-Nov	User Testing Prototype & Interviews
25-Nov	Marketing & Branding Strategy
27-Nov	Product Built
2-Dec	Launch
9-Dec	Process Book Finalized & Submitted

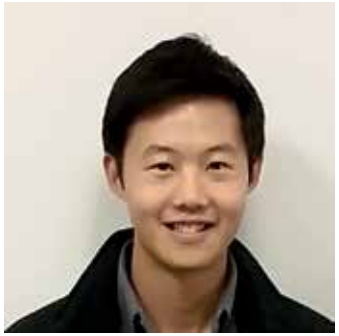
meet the team

LINDA TSAI

Marketing
Creative Design

JESSICA CHANG

Marketing
Creative Design



JACKSON TONG

Marketing & MIS
Content Creator

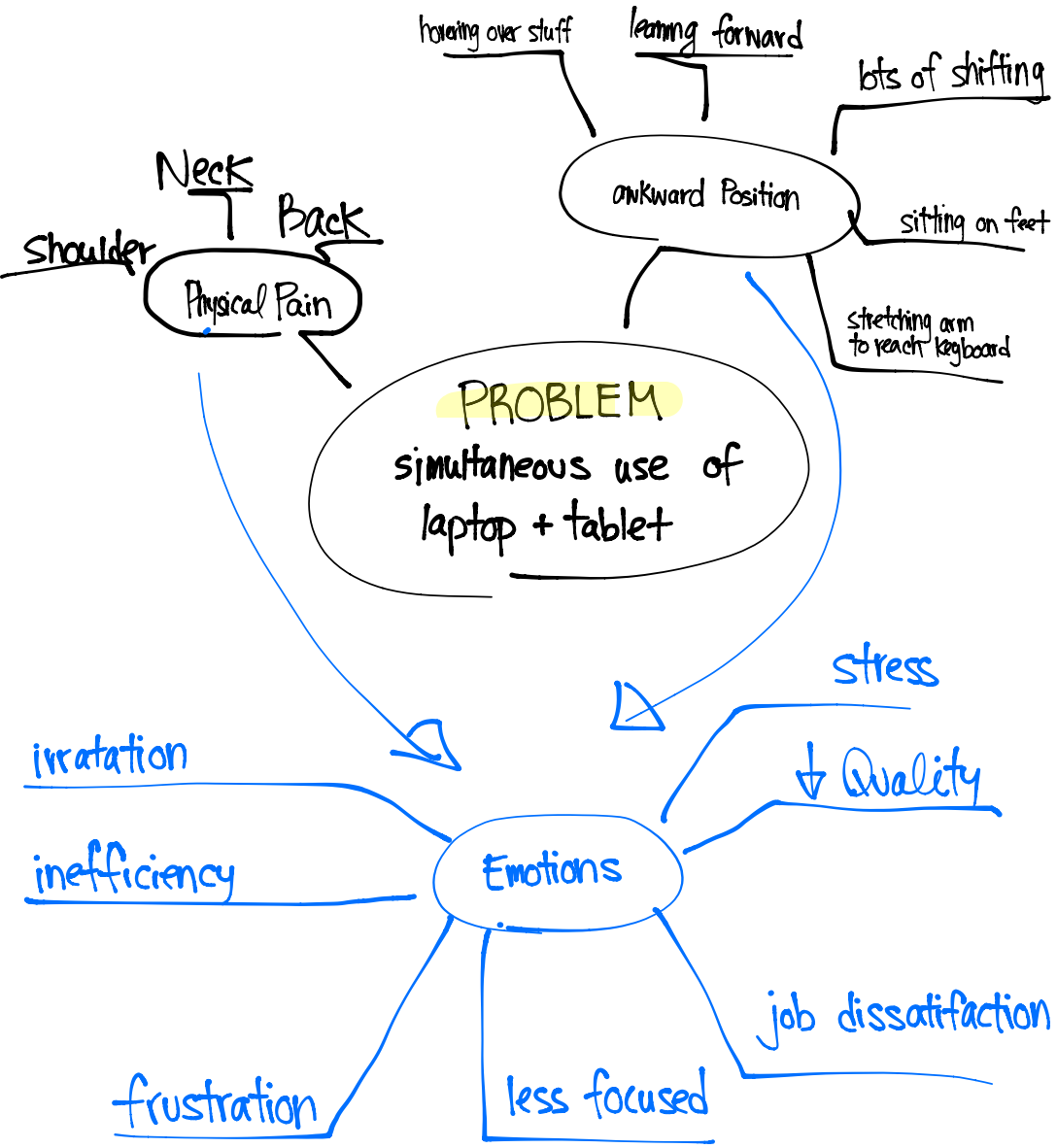
JENNIFER ILLNER

Marketing & Entrepreneurship
Content Creator

EMMA CHEN

Marketing & Finance
Financial & Logistics

problem identification



problem

Graphic Designers use both a laptop and drawing tablet simultaneously. While this does allow them to use keyboard shortcuts and therefore work faster, this ends up resulting in neck and back pain. This physical pain leads to stress and job dissatisfaction.

opportunity

There are a large number of graphic designers who use both a laptop and a drawing tablet simultaneously in order to do their work. These workers experience physical pain, which ultimately leads to emotional pain such as stress and job dissatisfaction. With the Easel, we can solve this problem.

problem identification

research

Our research is divided into two broad categories: primary research and secondary research. Primary research consists of interviews, observations, first-hand experience, and user testing. Secondary research consists of articles discussing the possible causes of physical pain, and blogs about people who work as graphic designers.

potential stakeholders

This includes stakeholders include the user, the user's clients, competitors, and Easel.

project scope

Our focus is on providing users with a sustainable, aesthetically pleasing solution to back, neck, and shoulder pain caused by using a laptop and drawing tablet simultaneously.

insights from *The Lean Startup*

Our goal was to learn what was unknown to us at the time. And to do so, we needed rigorous testing and interaction with users--we also accepted failures and learned upon them along the way. Like the "circular economy," the lean startup model follows a circular model itself: launch, learn, adapt, and repeat. Eric Ries calls this the "Build-Measure-Learn Feedback Loop." It's also not about how fast we could build our prototypes, but rather how fast we were able to go through the Build-Measure-Learn feedback loop that generated valuable insights and learning.

problem identification

design objectives

There are a large number of graphic designers who use both a laptop and a drawing tablet simultaneously in order to do their work. These workers experience physical pain, which ultimately leads to emotional pain such as stress and job dissatisfaction. We have the opportunity to solve this problem with our product, the Easel.

design criteria

- ☐ beautiful design
- ☐ affordable price
- ☐ compact design
- ☐ simple to use
- ☐ easy setup
- ☐ recycled material & sustainable

feedback

Feedback came from a variety of sources, including our instructor Lisa Papania, fellow teammates, graphic designers, family members, and a guest during our final pitch Jeanie Morton.

research

human-centered design process

-The Design of Everday Things by Don Norman p. 221-220

1| Observation

2| Ideation

3| Prototyping

4| Testing

> Before they even drew their first sketches, Stumpf and Chadwick visited many offices and spoke to the people who sat in chairs all day. They learned how complex sitting really is, how many different tasks people perform while they are in their chairs, and how the chairs work for or against them as they move. They observed the subtle signs of discomfort, the shifts of position as sitters grew stiff or the seat got too warm. They drew on their experience in materials and engineering to imagine elegant solutions to problems of weight, shape, and contour. And by reasoning what a chair ideally suited might be, they arrived at the unprecedented Aeron chair.

-The Design of Business by Roger Martin p. 109

research

We went through a thorough research process before we were able to have a clearer idea of both our persona and solution. Our research consisted of primary and secondary research, competitive analysis, and user interviews and observations.

research

> We must learn what customers really want, not what they say they want or what we think they should want.
>
> *- The Lean Startup by Eric Ries, p.38*

initial research

Our task was to identify problem revolving around desk-work and find a way to solve this problem.

We started this task by brainstorming a list of possible problems that we could solve. Jessica identified a problem she had encountered while working for a graphic design firm: she had to use a drawing tablet and laptop simultaneously. While this increased her efficiency by allowing her to use keyboard shortcuts while drawing, it also caused neck and back pain. Ultimately this pain ended up making her frustrated and dissatisfied with her job.

We began our research by trying to understand more about graphic designers, as only two members of our group were intimately familiar with what graphic designers had to do.

This allowed us to narrow down our target market to graphic designers who use both a drawing tablet and a laptop simultaneously. These users use these devices for long periods of time, and they must use both of these devices simultaneously to do their job efficiently.

We originally thought that the problem was due to the clutter on a designer's desk, which caused them to work in awkward and uncomfortable positions. After observing users and interviewing them, realized that this was not the core problem; rather, it was the way that the laptop and drawing tablet were positioned, and the fact that those with shorter arms had trouble reaching their laptop as a result. This was the core problem.

research

primary research

Primary research consisted of interviews and observing user behaviours. It also involved us trying to use a laptop and drawing tablet for ourselves. Most of the observations were from designers we knew, personal experiences, and SIAT students at Surrey SFU (specifically those who both use a drawing tablet)

part one: observations

We started off all our interviews by giving users a laptop, a mouse, and a drawing tablet; they were to position their the equipment as they normally would while working. Some chose to place their drawing tablet in front of their laptop, while others chose to place their drawing tablet beside their laptops. Some requested a mouse and an external keyboard, which we kept on standby.

We then asked them to draw multiple pictures for us. Half of the pictures drawn were pictures of their choosing, while the other half were pictures chosen by us. This allowed us to see how they used the equipment. We watched as interviewees erased or modified parts of their drawings; some used the keyboard controls, while others preferred to use a mouse.

We noticed that those who used a mouse or chose to have their drawing tablets beside their laptop did not lean, bend, stretch, or slouch over as much as those who chose to have their laptops behind their drawing tablet.

research

part two: interviews

Once interviewees demonstrated how they typically use their drawing tablet and laptop, we then asked them general questions about themselves and their job:

> [Doug Dietz] observed and talked to users of existing products and services to better understand consumer needs
>
> *- Creative Confidence by Tom Kelley, David M. Kelley, p.15*

questions:

general

- Tell us about yourself.
- Hobbies? What do you usually in your free time (e.g. YouTube, Netflix, gaming, etc.)?
- How tall are you?
- Tell us about a day on the job.
- What does your job consist of?
- What do you enjoy the most about your job?
- What don't you enjoy?
- What makes your job easier? Harder?
- What would you eliminate/change about your job to make it better?

behaviour

- How often do you take breaks while working?
- Why do you take these breaks?
    - Depending on their answers, we continued asking why to identify the root cause.

workspace

- Describe your workspace for us.
- How big is your desk? (approx. dimensions)
- Describe how your desk looks like on a typical day.
- What do you typically have on your desk?
- How do you organize your workspace?
- How does your laptop and drawing tablet move during the course of a day?
- What other things do you keep on your desk?
- How often do you use these things?
- What items do you use the most while working?
    - How do you store these items?

equipment use

- What sort of equipment do you use on the job?
- How often do you use these equipment(s)?
- What is the most challenging parts about using these?
- What is the easiest parts about using these?
- Tell us what you enjoy the most about the equipment you use.
- Tell us what you enjoy the least about the equipment you use

research

part two continued

> Empathy means challenging your preconceived ideas and setting aside your sense of what you think is true in order to learn what actually is true. [...] the non-obvious [needs] that people aren't conscious of.
>
> *- Creative Confidence by Tom Kelley, David M. Kelley, p.90-91*

These questions led to more questions about their work and, more specifically, about their workspace, the equipment that had to use, how often they had to use it, and other aspects that affected their work process. For those who said they had to use both a drawing tablet and a laptop simultaneously for the majority of their workday, we asked even more questions about their tablet and computer use in order to gain more insight. We found that we had to keep on asking interviewees more questions in order to get them to further elaborate on their answers. This ensured that we were getting enough information to identify the root cause of the problem.

Most admitted to feeling neck, shoulder, and back pain. When we asked why, interviewees blamed it on sitting too long or on their long work hours; none mentioned the tablet and laptop initially. However, as we observed how they worked, we noticed odd sitting postures (e.g. hunching back, leaning against table, hovering over items on the desk). Based on this observation, we removed back pain as the way they position their body trigger most pain in the neck and shoulder area. Another thing we noticed was that user's height influenced their view point on the screen.

We then asked interviewees if the pain could be because of the clutter on their desk, which forced them to position their laptop and drawing tablet one in front of the other. Through these in-depth interviews, we discovered that whether or not a desk was cluttered, it did not affect how they positioned their drawing tablet and laptop. As a result, we were able to eliminate clutter as being the core problem, and instead focused on laptop and tablet positioning.

These interviews helped us narrow down our target market and ultimately allowed us find three interviewees we thought were perfect persona candidates. All of these users experience back, neck, and shoulder pain as a result of their work; we wanted to solve their problem.

research

needs | interviewee #1 | lindsey

Lindsey is a 21 year old intern at a graphic design firm. The firm she is interning at has asked her to use both a drawing tablet and a laptop to do her work.

She is fun and quirky, and when she is not working or in school she can be found hanging out with friends. While she follows the latest trends, she does not invest in them due to money constraints. She enjoys eating out alone or with friends, yet she finds herself cooking more because of her financial situation.

She enjoys her work, and works hard in order to make a good impression. She rates her job based on what she can get out of it -- such as work experience and potential future employment -- rather than on her personal comfort. In other words, even if she does not enjoy her work environment, she will not complain because the rewards outweigh the negatives.

She has admitted to feeling some shoulder pain due to her small desk and limited workspace; this keeps her from positioning the equipment in a more comfortable way. However, because this is an internship, she does not see the need in trying to solve this issue. Furthermore, even if there were a physical object designed to help relieve her from this pain, she would likely not use it because she would not want to draw attention to herself or disrupt her co-workers and supervisor.

research

needs | interviewee #2 | mimi

Mimi is a 23 year old graphic designer. She recently graduated from a local university, and owns her own business. Part of her job involves working with both a drawing tablet and a computer.

While she tries to be financially independent, she can always rely on her [wealthy] family for financial support when needed. She enjoys personalizing her space, and her style can be considered as fashionable or chic. She considers herself to be a foodie, but does not cook. She also enjoys yoga and lattes. Although she is aware of environmental sustainability, it isn't a priority for her, and thus environmentally sustainable products don't play much of a factor in her purchasing decisions.

She feels neck, shoulder, and back pain, especially after working for long periods of time. She has invested in chairs and desks in the past in order to solve this problem, but has not found a solution so far.

research

needs | interviewee #3 | nicole

Nicole is a 22 year old graphic designer. She is a recent graduate from a local university, and is self-employed. She started her business while in school, and has continued to do it because she enjoys her work. She simultaneously uses drawing tablet and laptop. Her workspace is small, but she is okay with it.

Nicole is creative; her workspace reflects her personality and enjoys adding personal touches around her home. She enjoys animation, and admires Hayao Miyazaki. She cares about her well-being, and does yoga to maintain a healthy lifestyle. While she cares about the environment, she finds it difficult to sustain an environmentally friendly lifestyle due to her financial constraint.

Nicole experiences back, shoulder and neck pain while working. In order to try to minimize this, she takes frequent breaks. This leads to her work day being longer and causes her to sometimes rush in order to meet deadlines. She has not yet found a solution to her problems (money constraints don't allow her to try whatever solution tries her way), but if she had a product that she could test and knew it would help ease the pain, she would be willing to pay for it.

research

choosing our final persona

Each of these personas has traits and aspects that we valued. We found Lindsey to be most relatable because we were all students. However, we also liked Mimi and Nicole because they were self-employed and independent. To help us choose just one persona, our instructor advised us to choose the person we liked and wanted to help the most, as building a product for someone we did not care about as much would make it harder for us and ultimately lead to us disliking our tasks.

We ultimately decided to select Nicole as our chosen persona for a number of reasons. We admired the fact that she was self-employed and independent. We also really liked her personality, and members of the team found that they had a lot in common. We also felt that persuading Nicole to buy and use our product would be easier because it doesn't require a major change in behaviour. Furthermore, Nicole would use and be willing to purchase a product if it meant that her pain would decrease and it made her office look nice. Finally, since Nicole works at home and is her own boss, we would not have to convince another party (company or boss) to agree with the use/purchase of the product.

> What if we found ourselves building something that nobody wanted? In that case what did it matter if we did it on time and on budget?
>
> *- The Lean Startup by Eric Ries*

research

further research | final persona | nicole

After choosing our persona, we decided to do more interviews and observe Nicole to see if we could identify another source for her pain. We sat behind Nicole and observed Nicole's behaviours throughout the day. We noticed that at times she would prop the drawing tablet on her knees and use the drawing tablet at an incline. When someone asked later on why she switched between having a drawing tablet on the desk and on her knees, she said that it was a way for her to readjust herself due to the physical pain and frustration she had. We noticed that even when her drawing tablet was placed at an incline on her knees, she would still pause to rub her neck (her neck was tilted less when she had it on her knees compared to when it was on the desk).

Towards the end of the day, Nicole was asked to position her drawing tablet and laptop in a different position to see if this would help the pain; we asked her to place her laptop beside her drawing tablet and try drawing that way. We had her try working in that position for a couple hours, acknowledging that pain from bad posture happens over a long period of time. After some time, she did notice some discomfort from leaning towards her tablet on one side. While she admitted to feeling less pain in her neck and shoulders, she still stated that she did not like working in this position, and would likely never work in that way again since this was not what she was accustomed to. This allowed us to confirm what we thought was the core problem; laptop and drawing tablet positioning.

research

gaining empathy

To further understand what Nicole and Graphic Designers had to work with, we also spent time drawing using both a drawing tablet and a laptop. This allowed us to gain empathy as we began to understand and feel the pain that designers felt after only a few of hours of drawing.

> New opportunities for innovation open up when you start the creative problem-solving process with empathy toward your target audience
>
> *- Creative Confidence by Tom Kelley, David M. Kelley, p.19*

some of our experiences

jennifer

"At first, I was more concerned about my peers judging my drawings than I was about actually using the drawing tablet for the first time (I'm not the best artist). But as the hours flew by, I found myself having a lot of fun; I ended up drawing around six different pictures.

It was only when I stopped that I realized that my shoulders and neck were sore. I didn't notice it while drawing, but the pain hit me the moment I stopped. I then realized that the pain that I felt after only a few hours of drawing was the pain that these designers felt every day while they were doing their jobs. I wanted to help them."

jessica

"As someone who sometimes does similar work to our user, I do experience shoulder and neck pain. Like our users, I often find myself leaning and hunching over my desk when I'm drawing. It makes me fidget in my chair a lot. If I'm feeling especially uncomfortable or in pain, I will end up avoiding my work. I find this pain from drawing also affects me when I sit down to do my school work. It would be late at night, my neck and shoulders would ache like crazy...and I would get nothing done. At least, not at a pace that was reasonable"

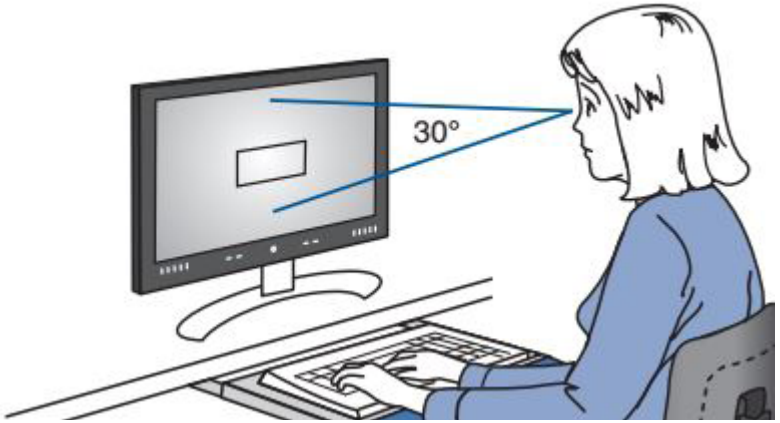
research

secondary research

Through secondary research, we found that how a laptop and other devices are positioned contributes to how safe a workspace is. We discovered that a laptop should be placed at eye level, and other devices (such as drawing tablets) should be placed high enough so that users do not have to bend their necks so much in order to use it (according to WorksafeBC). This position also allows users to still access their keyboards, which is essential in our case.

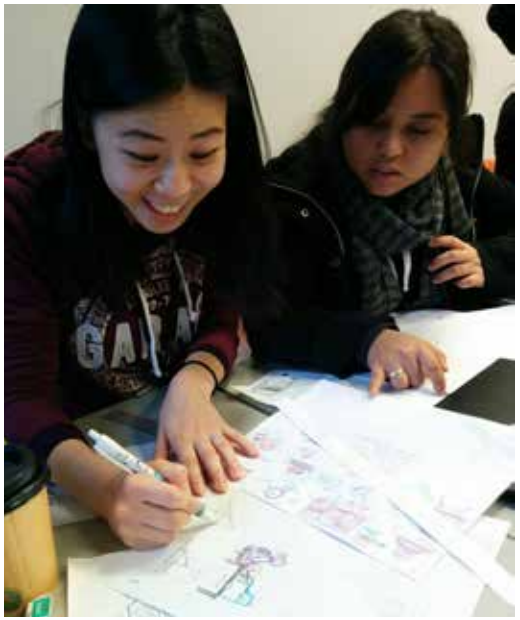
after finishing research

After going through the research process, we were able to grasp a clearer picture of the persona and her core problem. This allowed us to formulate our objective and our mission.



We continually asked ourselves:

> Do consumers recognize that they have the problem you are trying to solve? 2. If there was a solution, would they buy it? 3. Would they buy it from us? 4. Can we build a solution for that problem?
>
> *- The Lean Startup by Eric Ries, p.64*



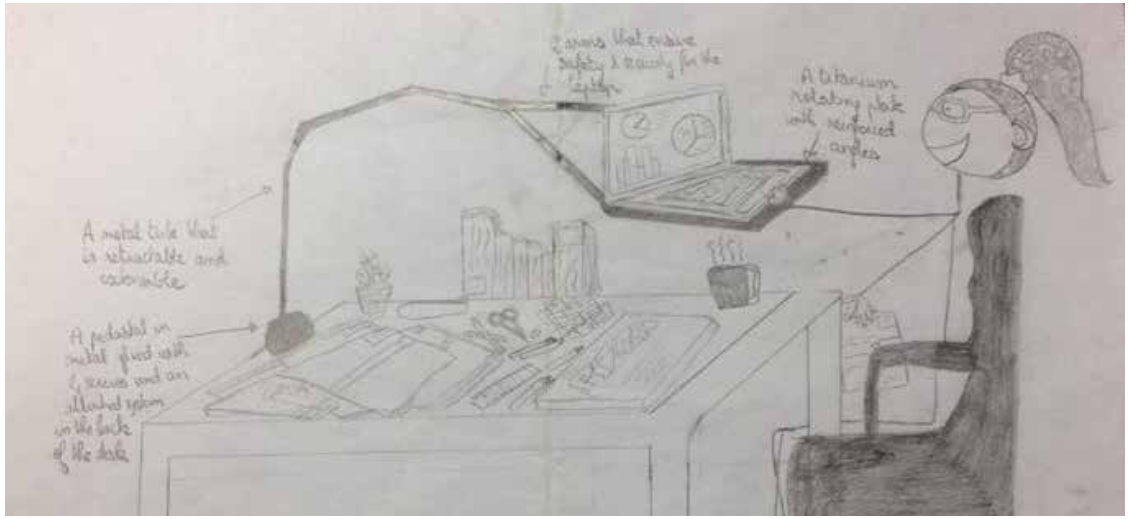
ideation

features

Based on the research we have done, the following features were identified:

- ☐ Must be able to use a drawing tablet and laptop simultaneously with ease
- ☐ Height of laptop must be adjustable to an ergonomic height for user
- ☐ Keyboard must be accessible when drawing tablet is in use with limited slouching, leaning, etc.
- ☐ Must be able to fit on a desk and allow for enough room to do other projects
- ☐ Must be environmentable sustainable

The first three needs are required to solve our user's needs. The fourth need is a requirement for our group, as well as a course requirement. The product would not be a success unless all of these needs are met.

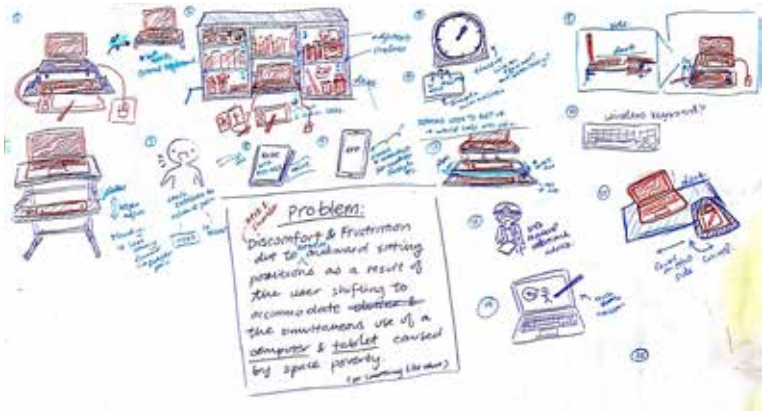


ideation

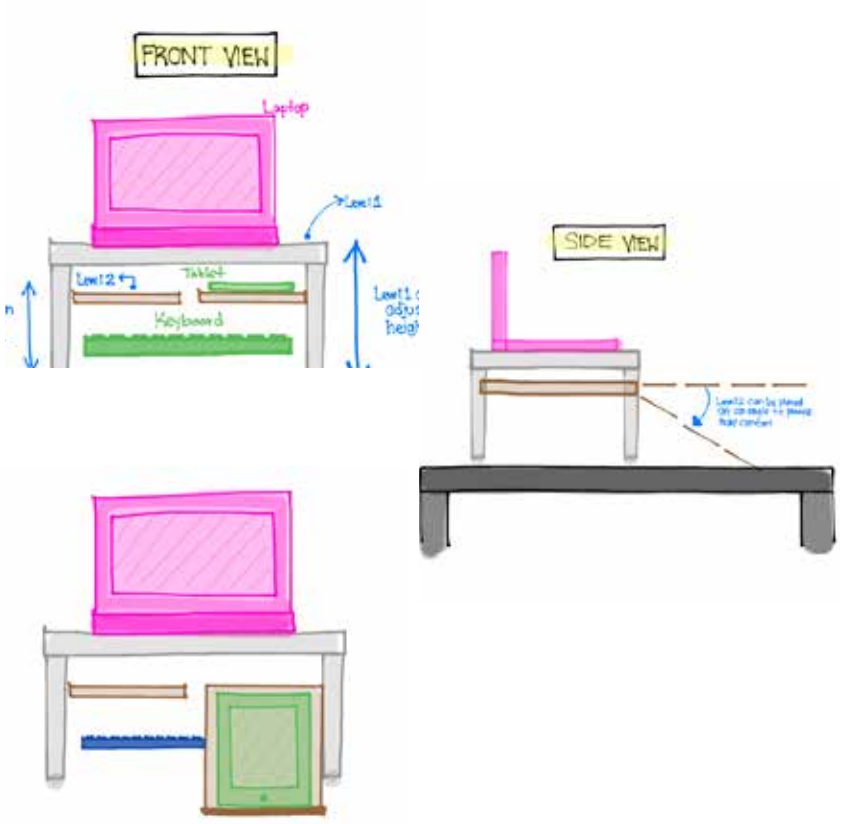
> It's not about just coming up with the one genius idea that solves the problem, but trying and failing at a hundred other solutions before arriving at the best one.
>
> *-Ankit Gupta, Creative Confidence by Tom Kelley, David M. Kelley, p.114*

alternative solutions

Each member was required to come up with 20 solutions (both products and services) that could potentially fulfill these requirements. This allowed us to think individually about how this desktop add-on would work, really think about if certain features were necessary, and see if we could think of better solutions. We discussed each of our solutions to determine feasibility and features that work best to solve our user's needs.We took the best features from each of these solutions, and combined them to come up with one solution; a desktop add-on. We choose a desktop add-on rather than a full desk, because through our discussions and user research we found that they would not want to invest in a new desk. Additionally, having a smaller desktop structure would use less materials and cost less for our user, who is financially limited. This also ensures that users will not be throwing out their old desk to accommodate a new one, thus eliminating waste. Initially we had the habit of trying to only use words to explain our ideas. However, we started drawing more and more throughout the process. This proved to be very helpful as some of the ideas in our head were able to expand through drawings, while others that seemed to make sense in our minds turned out to make no sense at all. We presented this drawing during our initial pitch on November 4th, 2015.



ideation



feedback

We showed a picture of our solution to our persona. She liked the concept, but did recommend a few changes before we started prototyping. For instance, while she thought that the wheels were a nice touch, she did not see them as necessary since she would not actually put in the effort to move the add-on from side to side. She also stated that as long as she had enough space for her other projects, this was not a concern.

We also pitched it to our instructor, who also gave us some feedback:

Time: Is this project achievable in the time you have?
Feasibility: Do you have the skills needed to actually achieve this project?
Materials: What materials do you need? How will you ensure that it is sustainable, yet is aesthetically pleasing and not too costly?
Mechanisms: Will this work?

The feedback from our persona and our instructor forced us to think a little bit more about how our product was going to work, and we incorporated this feedback during our second stage of prototyping.

prototyping

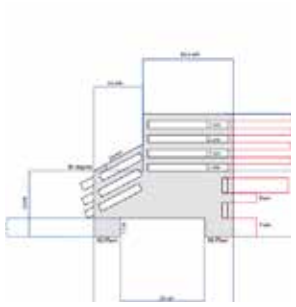
stage one: initial prototyping

We began the prototyping process a few days after the initial pitch . Over the course of a week, we experimented individually and in pairs using paper and cardboard to build various prototypes, hoping to find one that works and meets our needs. This gave us a chance to fully understand the mechanism, as well as understand the sizes, for our project. With every completed prototype, we presented each other and discussed what worked and what did not.

It was interesting how each person/pair came up with different interpretations of the final drawing we came up with as a group. We had different ideas about how each part and mechanism would work and be put together.






> The key is to be quick and dirty—exploring a range of ideas without becoming too invested in only one.
>
> *-Creative Confidence by Tom Kelley, David M. Kelley, p.23*

prototyping

> Fail often, fail fast...each failure teaches them a lot about what to do right.
>
> *-Design of Everyday Things by Don Norman, p.64*

> Flashes of insight often come when your mind is relaxed and not focused on completing a specific task, allowing the mind to make new connections between seemingly unrelated ideas.
>
> *-Creative Confidence by Tom Kelley, David M. Kelley, p.74*

stage two: group prototyping

Here, all of us sat down together and built a prototype together. During this stage, there was a lot of discussion on how the mechanics of the project should be built, especially in regards to how the table for the drawing tablet should work so that it is comfortable to use and it is easy to reach the keyboard, and how to adjust the desktop add-on for height. Using the different ideas each individual/pair came up with from the previous stage, we discussed as a group about the most appropriate ideas to include for our solution.

- To address the height challenge, Jennifer, Emma, and Jackson suggested that the desktop add-on could have multiple slots; this would allow users to easily choose the appropriate height for their laptop and drawing tablet, without the use of screws or other excess materials.
- While listening, discussing and seeing the team's ideas, and many sketches, a thought popped into Jessica's head: we could make the inclined board foldable. The idea was that making the board foldable would give the user more room to work when they were not using their tablet.
- When we realized that ergonomically that it would be better if the drawing tablet were on a slant. However, we were concerned because we were not sure if our user would like it. Linda re-read the notes we took during our interviews, and noticed that when we were observing Nicole, she had her drawing tablet slanted at times. We then went back to Nicole and asked her more questions. Through this, we found that she did prefer to work on a slant.

  Nicole: *"I prefer drawing on a slant because I'm used to using an easel. When I went to art class at Emily Carr and for some art competitions, that's what we use."*

prototyping

stage two continued

During both the second and third stages, we used cardboard and paper to build our prototypes. This allowed quick and easy construction. Also, we found it quite difficult to communicate different ideas for mechanisms with words; building it out quickly with the cardboard or drawing it out was frequently the only way to communicate our design ideas.

To accommodate these features, we considered having two separate components; a separate shelf to hold the laptop, and another shelf for the drawing tablet that could be pulled out when needed. However, after discussing this idea further, we decided that it would be better to have one component for both the drawing tablet and the laptop, rather than two. This is because we found that the prototype was more stable when it was one unit rather than two (since the weight of the laptop helped counter the weight of the drawing tablet, making the system sturdier), and it resulted in less materials being used.

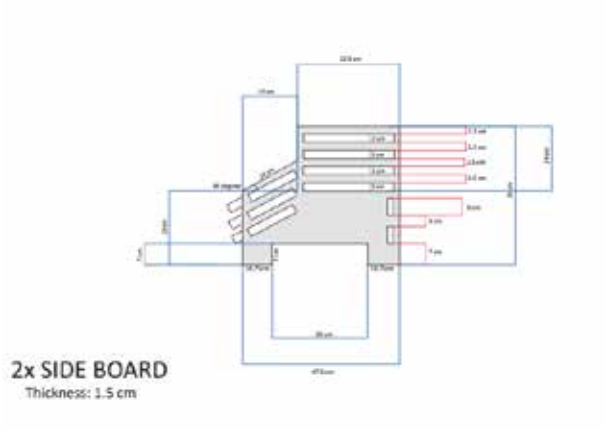
> Embracing experimentation can help fuel the fires of innovation.
>
> *-Creative Confidence by Tom Kelley, David M. Kelley, p.145*

prototyping

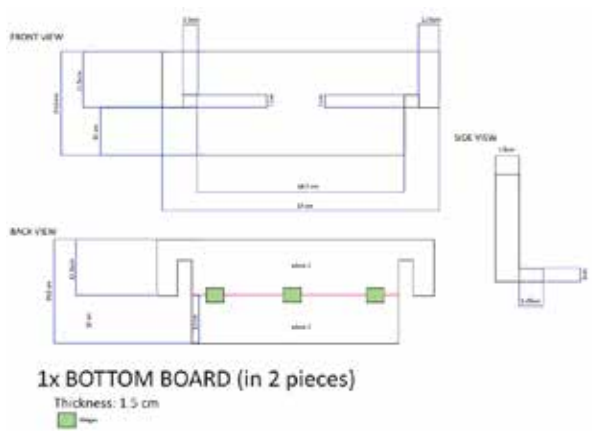
stage three: prototyping to scale

At the end of the second stage, we drafted a final drawing of our solution using our combined ideas from the cardboard prototypes. In the third stage, we created a final prototype of our solution, this time to scale.

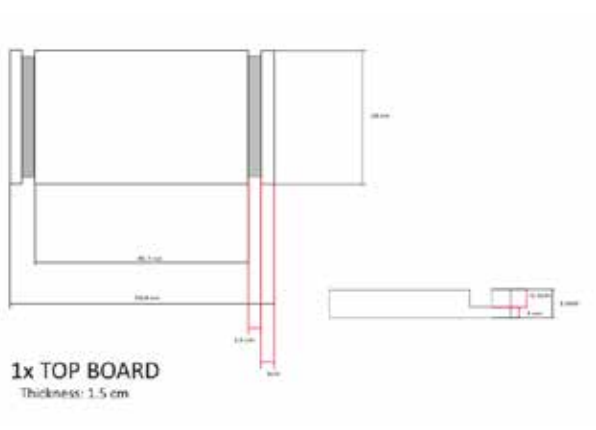
This final prototype was made of sturdier cardboard. Again, we carried out more user testing and interviews using this prototype version.



2x SIDE BOARD
Thickness: 1.5 cm



1x BOTTOM BOARD (in 2 pieces)
Thickness: 1.5 cm



1x TOP BOARD
Thickness: 1.5 cm

prototyping

stage three continued

user testing:

> No matter how brilliant the product, if people cannot use it, it will receive poor reviews.
>
> *-Design of Everyday Things by Don Norman, p.23*

Jessica:
22 years old. Left hand user. SFU Business major student. She was previously in charge of graphic design for the SFU Student Marketing Association. She is familiar with the Adobe Creative Suite and enjoys drawing with both a drawing tablet and on paper.

She noticed herself sitting up straighter and hunching over less because of the way the prototype raised height of the screen. However, she did not like the way the walls and back of the prototype came up over the top of her computer as it feel very boxed-in and cubicle like. She also noted that she kept hitting the side wall with her elbow. After this part of the wall was removed, she enjoyed using the prototyping much better. She really liked the added benefit of being able to hide items inside the structure, under the top board. This kept the rest of her desk clear.

Nicole:
22 years old. Recent university graduate. She does a lot of freelance graphic design work and runs her own business.

She thought it looks really nice, and is great to use. She was surprised how much she loved the slant. She liked how easily she use her drawing tablet and keyboard together. She felt that posture was better when she was using it. Also, she had not seen any products previously that allowed her to use her tablet with her laptop like this. She really enjoyed having a design that was meant for designers.

prototyping

stage three continued

user testing:

Sydney:
21 years old. Left hand user. SFU IAT major student. She is also the designing executive of SFU Taiwanese Association. She usually works with several drawing software and the drawing tablet as well. She finished majority of school submissions and the club's assigned work home. With a small working station, she usually has the spacing problem.

Sydney use the word "Cool" to describe the prototype when she saw it. She think it looks special and attractive.She found the incline on the tablet shelf to be very ergonomic whereas normally drawing on her tablet on a flat surface would have caused her neck pain. The adjustable height of the shelves was another feature she was very happy with as she mentions sometimes chairs are not adjustable. Although she did mention that she wished the product could be adjusted one level lower than the lowest available on the prototype. And lastly, as a left-handed person, she appreciated the fact that the product was symmetrical which allowed it to be used the same way whether one was left or right-handed. Overall she had a very positive experience testing the product. She was impressed with how the product solved the problem of using both a laptop and drawing tablet at the same time on a small desk.

prototyping

stage three continued

updating our prototype

After further user testing we gathered a lot of insightful feedback that helped us adjust our solution.

We changed the backboard from a full board to only two narrow planks of wood. This allowed more light to stream through, less material, and easier management of power cables. The side boards were made shorter as we found they did not need to be so high. This also reduced material, increased light, and improved cable management. We found that users who used the prototype after we cut down the walls, made no negative remarks about it creating a boxed-in feeling. Additionally, we made the inclined board stick out halfway past the side walls. This allowed for the user to move more freely and not have to worry about their elbows hitting the sides. After testing users of various heights, we decided on two slots for the inclined shelf as we discovered that two levels of height options was sufficient for most users' height.

> It's hard to be "best" right away, so commit to rapid and continuous improvements.
>
> *-Creative Confidence by Tom Kelley, David M. Kelley, p.122*

prototyping

stage four: materials

To gather our wood material for our final solution, Jennifer and Jackson went to Home Depot in order to see if they had any recycled wood. They were able to find old pallet wood at the back of Home Depot. It appeared to be good quality, so we decided to take it. Jackson brought the board home and stored it. The next day, Emma brought the board of wood to MakerLabs, who said the wood was good enough for the CNC (Computer Numerical Control) process. However, upon beginning the CNC, we discovered that there were air pockets within the board, and some parts of the board began to disintegrate from the process. MakerLabs was able to provide us with spare leftover wood they had lying around. The quality of that wood was much better and we were able to continue building the final product.

During the production, Emma went to MakerLabs several times to check out the process and clarify some confusions with the design. Aside from the wood, the only two other materials used for the product are the metal hinge and the foam grip shelf liner. The hinge was taken from an old chest box from a local thrift store, and the foam grip shelf liner was sourced from Craigslist.

solution

final persona | user profile revision

Nicole is a 22 year old graphic designer. She is a recent graduate from a local university, and is self-employed. She started her business while in school, and has continued to do it because she enjoys her work. She simultaneously uses drawing tablet and laptop. Her workspace is small, but she is okay with it.

Nicole is creative; her workspace reflects her personality and she enjoys adding personal touches around her home. She enjoys animation, and admires Hayao Miyazaki. She cares about her well-being, and does yoga to maintain a healthy lifestyle. While she does care about the environment, she finds it difficult to sustain an environmentally friendly lifestyle due to her financial constraints.

When she works, she prefers to place her drawing tablet directly in front of her laptop. Sometimes, she places her drawing tablet on her knees in order to draw on an incline. She enjoys drawing this way, as it allows her to feel like a true artist. Sometimes Nicole experiences back, neck, and shoulder pain while working, but thanks for Easel, this pain has been significantly reduced. This has allowed her to work for longer periods of time, and continue doing what she loves.

> Design is concerned with how things work, how they are controlled, and the nature of the interaction between people and technology. When done well, the results are brilliant, pleasurable products. When done badly, the products are unusable, leading to great frustration and irritations. Or they might be usable, but force us to behave the way the product wishes rather than as we wish.
>
> *-The Design of Everyday Things by Don Norman, p.5*

solution

> ...the innovation must make business sense.
>
> *-The Design of Business by Roger Martin, p.65*

final product

Our product is a desktop add-on designed for graphic designers who prefer to have their drawing tablets placed directly in front of their drawing tablets while working. This add-on allows users to position their laptop, drawing tablet, and keyboard in a comfortable way, without drastically changing current habits.

It is designed to be simple, yet elegant and modern.

insights from *The Design of Business, p.67*

Applying this to our process: something is "doomed" to fail if it does not solve a problem or create value. In our case, if our product did not create value (in the sense that it was better than the alternatives and reduced the pain while still making their workspace attractive), our idea would not have made business sense and it would fail.

solution

final product | materials

easel is made from:

- ☐ leftover wood from other projects at MakerLabs
- ☐ upcycled shelf-liner sourced from Craigslist
- ☐ hinges from an old box found at a local thrift store

Originally, we wanted to use 100% recycled wood, which we were given from the Home Depot. However, when we brought the wood to MakerLabs and it was cut, it was discovered that there were air pockets inside of the wood. This would not hold, and could not be used in our final product. Instead of throwing the wood away, one of our team members took it home to use as firewood in the summer so that it would not go to waste.

MakerLabs had spare wood from other projects available, so we decided to use these pieces for our product instead. Since it is high-quality wood, it is strong enough to hold a laptop and drawing tablet, without the risk of breaking.

Originally, we wanted to paint the product in either black or white paint because we thought that it would make our product more visually appealing. However, upon further interviews with users, we discovered that they actually like the look of wood. In addition, while researching paint, we discovered that certain paints are not as environmentally friendly. We also realized that by choosing not to use paint, we would be using less materials, which was both a cost and environmental advantage. Therefore, we decided not to paint our product.

We wanted to upcycle used and old materials. This would divert waste and such materials away from landfills and waterways. When choosing the type of wood, we wanted to make sure that it is recyclable at the end of the product life and that the wood is not directly sourced from a tree. We had to balance this with making sure that the wood was of high enough quality for it to last a good number of years thus creating less waste.

solution

design

Our product was designed to look clean, yet elegant and modern. The design of the product was important because we found through our interviews that graphic designers who would use this product would only purchase it if it were visually appealing. In other words, aesthetics was a must for our users to use the product--functionality was not sufficient. Hence, we went through several drafts (and later on many versions of prototypes) of the design before we came to our final design of the product. It was a challenge balancing functionality and aesthetics in addition to being a product we could realistically build a prototype for.

- ☐ Designed to be easily built (no tools, screws, and bolts required/ one person could easily build it on their own)
- ☐ Easy to push back/fold when not in use
- ☐ Easy to disassemble and store (for whatever reason)

ergonomics

- ☐ Monitor/laptop in right spot (according to worksafeBC: …)
- ☐ Allows users to easily reach both tablet and external keyboard
- ☐ Allows users to position their hands comfortably while using a drawing tablet (because of height and incline)

solution

user feedback

“Easel is beautiful! It fits perfectly on my desk, and it makes drawing much more enjoyable!”

“I liked being able to fold the front panel away. This gave me some extra room to still do other things at my desk.”

“The first thing I notice about [Easel] is that it looks really good.”

“This product is really aesthetic appealing that it makes me want to try and buy the product.”

“I have something that allows me to store my drawing board away, which makes my workplace look clean. But what happens is that I forget that I have a drawing board so, when I want to draw my ideas down I often end up looking for paper instead of my drawing board. This product makes my drawing board present and not forget about it. And for some reason makes me want to draw.”

“I never seen a laptop stand that also supports a drawing tablet which is really cool.”

“I have a surface and I love using it, but one of the major things that bothers and scares me the most is the back stand snapping/breaking. After using Easel, I can see that the structures really supports stability. I was able to rest my arm on the drawing board without fearing it breaking”

“This is a really appealing alternative to Wacom-Pen Display Cintiq Companion which cost more than $1000 dollars.”

“I usually prefer to draw on a flat surface but using this drawing board very comfortable. Like for my wrist and elbow. I don’t have to rest my elbow on the table in an awkward position.”

“It’s also easier on my neck since i didn’t have to look down nor does my face have to hover over anything to look at the screen.”

solution

challenges

materials

One of our biggest challenges was finding materials that would be both environmentally friendly, yet sturdy and aesthetically pleasing. It was not a challenge to find materials that had some of these qualities. However, we found it very

putting the pieces together

We went through a lengthy process (over weeks) of changing and coming up with new ways to connect all the boards together and how the mechanisms of hinges and attachments would work. Initially our design was held together by screws and bolts and also included wheels for the legs. The second shelf went through being a single piece of wood that can slide in and out, to a two pieces of woods that can be pulled out independently, and eventually to the current design with an incline. Throughout the changes, we continued to ask ourselves what our persona would like and want to use. This led to the "no screws & bolts or tools needed" idea of product assembly as well as the incline shelf for comfortable use of laptop and drawing tablet. We also specifically made sure there was sufficient room below the inclined shelf to allow our user to operate an external keyboard at the same time. We also had some design issues ourselves, as some of our earlier prototypes ended up being too complicated for us to actually build (ex. the shelf that first pulls out then inclines).

solution

> One way of overcoming the fear of the new is to make it look like the old. This practice is decried by design purists, but in fact, it has its benefits in easing the transition from the old to the new. It gives comfort and makes learning easier.
>
> *-The Design of Everyday Things by Don Norman, p.169*

challenges continued

empathy

During the interviews and team meetings, we had a hard time sympathize with the user's problems since not all of our team members were designers. Another thing we noticed is that every designers has different behaviours/ habits. For example, when we were looking for designers to test out our prototype, one of the users told us that she would not use this because she prefers to draw on a flat surface.

balancing persona

When looking and choosing a persona, we had trouble picking one user that we like to work with. One of personas we found was a student who goes to the office to work. We wanted to work with this persona because it would be easier for us to relate to this user as we are students who've also done coop. However, we didn't know how to convince employers to buy this product and not all designers would like to use our product, and etc (like no space, equipment). So after discussions we decided that a self-employed user would fit better for us.

solution

challenges continued

adjustability

Early on in our design, we were struggling to figure out how we would like to allow our product to be adjusted--what mechanisms, how easy, how many levels of adjustability, etc. We continued this "problem" solving until one of our group members asked whether our user would need to adjust it frequently. After discussion and user testing and questioning we came to the conclusion that our persona is going to set up the product to the correct height during assembly and afterwards unlikely to re-adjust the product's shelf height. This allowed us to stop trying to figure out a method to adjust the assembled product very easily. This decision also benefited our idea of allowing our product to be assembled without tools or screws.

observations

Getting people to act naturally while trying to observe them was challenging because it caused them to become more conscious of certain behaviours and as a result alter them.

business plan

launch

On December 2nd, 2015, the Easel desktop add-on was launched. At the launch, we incorporated the following details:

- ☐ mission
- ☐ branding
- ☐ marketing

business plan

mission

Easel’s mission is to make working at home a more enjoyable experience for graphic designers by offering a solution that allows them to perform their work with ease and comfort.

business plan

branding

message

A healthy work environment can be both affordable and aesthetically pleasing.

symbol

An easel is used to support a canvas while an artist is working. Like an artist easel, Easel is designed to support a drawing tablet while a graphic designer is working.

colour scheme and font

When choosing our font and colour scheme, we had to keep in mind what our target market looked for; they prefer pieces that are minimalistic, yet elegant and modern.

Our colour scheme are: black, white, and wood coloured neutrals. Wood-tones are reminiscent of our product. Black and white help create a clean and simplistic look. Originally we also used a forest green as an accent colour because it adds a pop of colour and reminds the user of being sustainable and "green". However, we discover that green did not match the design aesthetic we wanted to have. Removing green from our colour scheme allowed us to maintain a clean and modern design.

We chose the font Montserrat Ultra Light because it was clean, yet elegant and modern.

business plan

packaging

Easel's mission is to make working at home a more enjoyable experience for graphic designers by offering a solution that allows them to perform their work with ease and comfort.

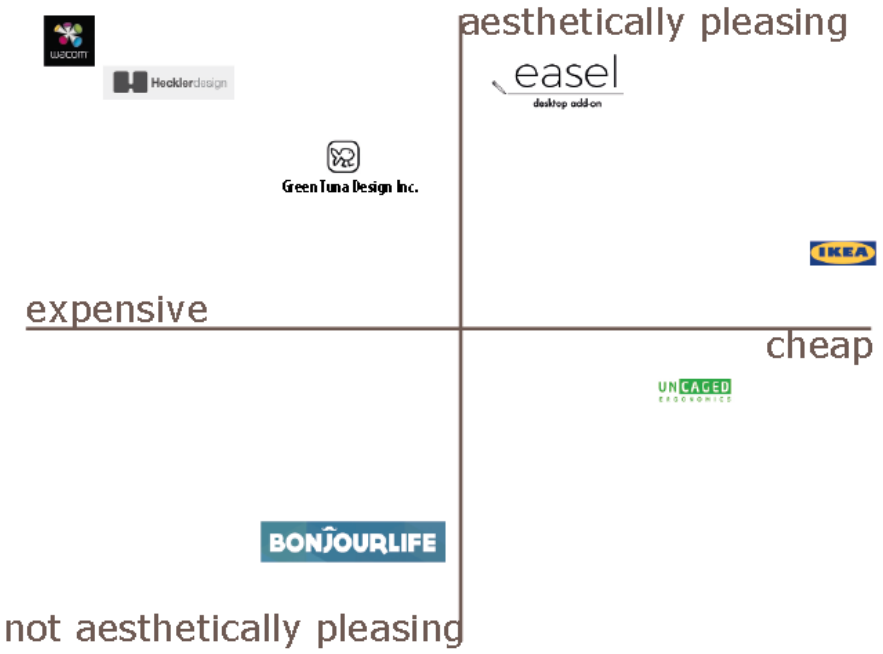
Easel comes packaged in a beautiful gift bag handcrafted from recycled gift boxes. This allows the Easel to be easily purchased and shipped. SInce the Easel is designed in the shape of a giftbag, it can be reused as a giftbag, or it can be used by purchasers as extra storage if needed.

We originally thought about inserting a physical instruction sheet with our product. However, Jennifer brought up the fact that this instruction manual would likely be used only once, and it would likely be either thrown out or lost amongst other papers. It would also be a waste of ink and paper. Our biggest concern was that this would end up in the landfill, instead of being recycled or reused; this is because while our persona cares about the environment to an extent, she rarely recycles her leftover papers out of habit (she is used to just throwing her papers out). Therefore, we considered the idea of attaching to the package a QR code, which leads users to our instruction manual and our website. We then talked to our persona in order to hear her thoughts; she said that she would prefer to have instructions online since she would not have to deal with leftover papers once she was done. She also stated that she is often on her smartphone anyways, so an online instruction manual would actually be easier to access. Therefore, instead of having printed instructions and wasted paper, we decided to have a QR code attached to our package.

business plan

positioning

For our competitive analysis, we compared with three main competitors: A basic laptop shelf, a desk mount with two adjustable arms to hold two items, and a height adjustable laptop shelf with a secondary shelf that swivels out to the side (meant for a mouse or notebook). We ranked these competitors using two important factors: aesthetics and ergonomics/comfort. We found that none of the competition offered high performance in both these factors; they all performed well in of the factors and poorly or only average on the other factor. We saw this as an opportunity to position our product to perform exceptionally in both comfort and aesthetics. As a result, we also believed our price warranted to play in the upper end of the price range compared with competitors.



business plan

pricing strategy

cost breakdown of final product

reused wood	20
recycled hinges	0
cnc operation fee	120
total cost	140

After went through the cost breakdown and thought about our long-term business plan. Emma came up with this reveuse/cost distribution. In order to achieve around 30% of profit margin and price attract to our persona, we think $79 CAD is a reasonable price to fulfill the profitability and the affordability.

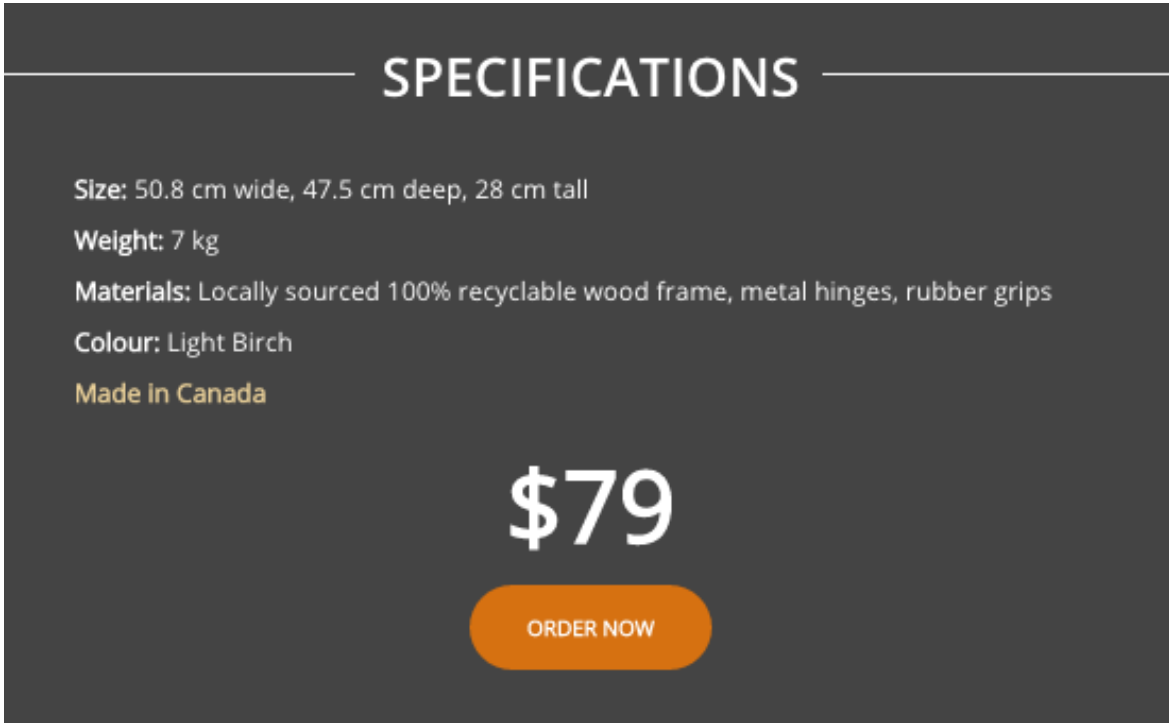
cost/revenue breakdown

	per product	qty	total
revenue	79	50	3950
recycled wood	20	50	1000
hinges	2	50	100
cnc cost	18	50	900
total variable cost			2000
design fee			400
sales and administration			350
total cost of good sold			2750
gross profit			1200
profit margin			30%

business plan

distribution channel

We plan to initially sell online only through our website and later on we will consider selling on Amazon. Our target users also do a lot of product research online prior to making purchases, so we have decided that this is a suitable distribution channel.



business plan

marketing communications

video

We understand that potential buyers will likely want to try the product first. To compensate them for this, we will be producing a number of videos showing the product in use to help reduce uncertainty. These videos will be posted on both our website and on YouTube.

social media

Instagram | Facebook | Twitter

Online platforms are a great way to connect with our users because they are young and tech-savvy. We chose Instagram as one of our social media platforms because of the visual nature of the platform. Our users often check Instagram in order to find sources of inspiration for their work. We decided that this would be the perfect opportunity for Easel to showcase our product. Posting images of our customers using our product in their own personalized workspace will not only provide a way to connect with customers but also inspire others to use our product as well. Including artwork and graphic design pieces created while using Easel will further allow us to reach our target market. Similarly a Facebook page would allow us to post such images, as well as update our customers on promotions, etc.

@easel.desktops /easel.desktops #easel.products

business plan

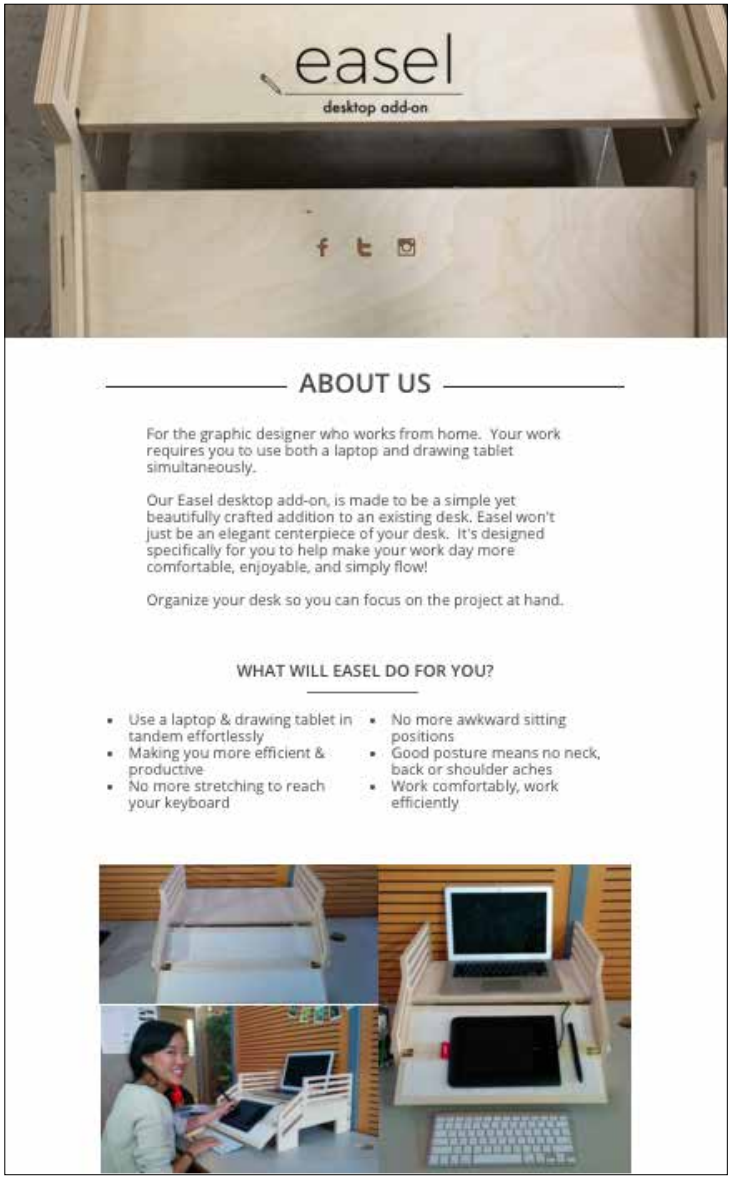
marketing communications

website & online marketing

url: easel.my-free.website

Jackson created a website where customers can order our product, contact us with questions, read blog posts, and access our product assembly instruction manual. The rest of the team also helped develop and finalize the website. A QR code will be provided with the packaging that links to a product assembly instruction manual.

- ☐ SEO
- ☐ PPC (Facebook Ads, Google AdWords, Instagram Ads)
- ☐ Sending review products to influencers, bloggers, magazines, and authoritative websites in the graphic design industry



business plan

post-product life

We built Easel to be of high quality and study so that it would last for a number of years. However, there is a chance that during the life of the product, parts of the product may wear out or get damaged. In order to ensure that users do not simply throw out the Easel when this happens, we will offer to repair the product. Customers can ship the product back to us at any time, and we will repair what is reparable. In order to ensure that customers will not be paying more for shipping than they would if they were to simply purchase a new product, we will be splitting the shipping costs 50-50.

if easel cannot be repaired

Hinges: we will dismantle the hinges and reuse what can be reused (such as screws, possibly the hinge itself). If a part of the hinge cannot be reused, we will save it for when we prototype our next product. If it is metal and we have no way of reusing it, we will recycle it at a local recycling center.

Shelf Lining: If the shelf lining does wear, we will replace it with recycled shelf lining that we will continue to source from craigslist or other second-hand stores. The worn shelf lining will be used for other projects, or we will put them up on craigslist to see if anyone needs their for their own projects.

Wood: we will reuse parts of the wood by using it for another product. If it cannot be reused (ex. the wood is too damaged), it will be given to a local wood-recycling plant, where it will be used for other purposes, such as for landscaping mulch or composting.

acknowledgements

thank you!

We would like to thank our instructor, Lisa Papania for giving us the opportunity to work on this product, and for teaching us the importance of a circular economy and how sustainability can be profitable. We would also like to thank all of our interviewees and testers for their feedback and help during this process. In addition, we like to thank MakerLabs for helping us turn our design into a polished final product. Without your help, Easel would not be the product that it is today.

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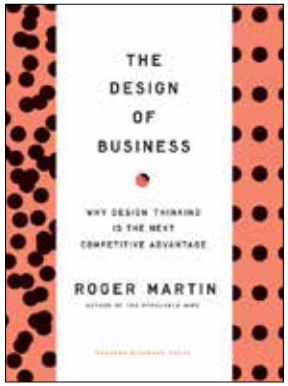

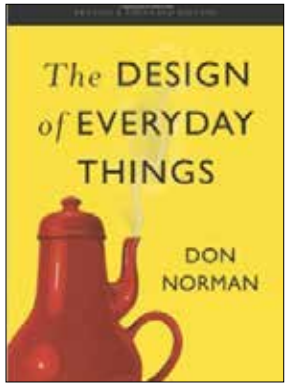

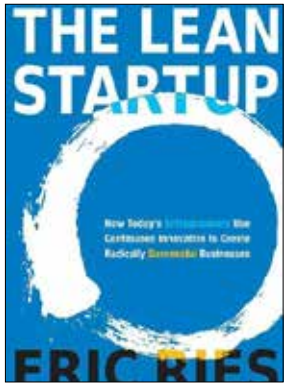

All the cardboard and paper from our prototypes were recycled or reused during later parts of the project.
No materials were thrown in the garbage.