Internship Report: P1

Imaginarium India Pvt. Ltd.

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Acknowledgments

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This internship would not have been possible without them.

Thank you.

Declaration

The research and academic work incorporated in this report is genuine work carried out by the undersigned students as a part of year 2 (2016-17) project 1 of Masters in Design program at IDC School of Design, Indian Institute of Technology, Bombay.

The undersigned hereby declares that this is their original work and has not been plagiarized in part or full form from any source. And that this work has not been submitted for any degree in this or any other university.

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1| learning about how 3D printing works

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all about imaginarium

Why Imaginarium?

A world in which manufacturing on-demand is a reality might not be that far away, as the price of 3D printers is dramatically falling. With costs for lower end plastics-printing machines having plummeted in the last few years, the technology is now on the cusp of becoming mainstream. At this rate any designer could have a table top 3D printer and Rapid prototype without wasting time making handmade prototypes, time which can be spent productively.

Product design, Automobile design or any design in general along with machine parts industry, Healthcare, Retail, Food are some of the examples and predictions of how 3D printing will intersect with modern manufacturing. This will be an influential technology in the coming years. While a number of industries will see positive change, few will undergo as many drastic shifts and evolutions as manufacturing.

We wanted to be a part of this revolution. We wanted to learn about the technology, processes and the future of Product designing. With that said ***Imaginarium*** is India's largest Rapid Prototyping and Rapid Manufacturing Centre. There's no better place to start this journey than Imaginarium. With Imaginarium at the doorsteps of our college, there was no second thought.

imaginarium

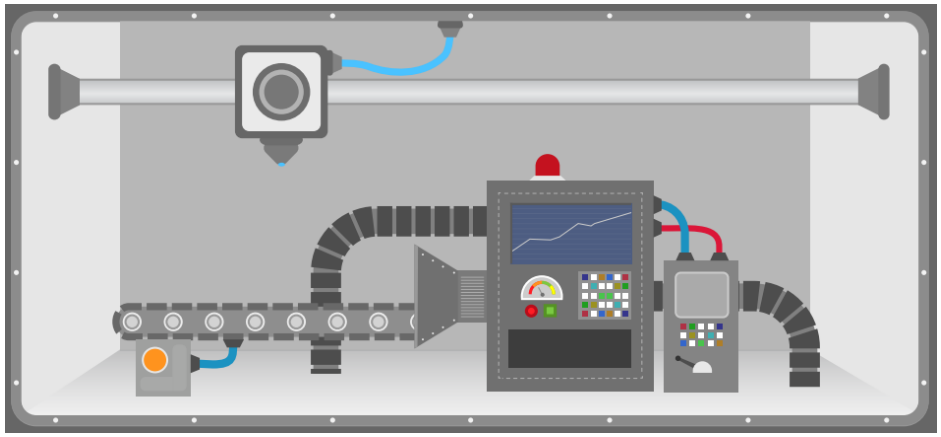
Expectations from the Internship

There was no Job Description or any Internship brief before the interview. As a 3D printing/Rapid prototyping company, we naturally thought we're going to work in the 3D printing field. But to our surprise it was much more than that. Imaginarium has been there for about 12 years and is rapidly growing and they wanted to begin a new journey, start a completely new company that combines 3D printing and Gifts.

The Initial brief to us was very vague and we were supposed to work on the title. The initial aim of the internship is to study about gifts and gift giving. Why do people like a particular set of gifts, what types of gifts are mostly preferred, how can 3D printing and gift giving experience work together and so on.

3D Printing in a nutshell

A process for making a physical object from a three-dimensional digital model, typically by laying down many successive thin layers of a material.



How does it work?

A method of manufacturing known as 'Additive manufacturing', due to the fact that instead of removing material to create a part, the process adds material in successive patterns to create the desired shape. 3D Printing uses software that slices the 3D model into layers (0.01mm thick or less in most cases). Each layer is then traced onto the build plate by the printer, once the pattern is completed, the build plate is lowered and the next layer is added on top of the previous one.

Main areas of use: Prototyping Specialized parts – aerospace, military, biomedical engineering, dental Hobbies and home use Future applications– medical (body parts), buildings and cars.

Advantages and Limitations:

Layer by layer production allows for much greater flexibility and creativity in the design process. No longer do designers have to design for manufacture, but instead they can create a part that is lighter and stronger by means of better design. Parts can be completely re-designed so that they are stronger in the areas that they need to be and lighter overall. 3D Printing significantly speeds up the design and prototyping process. Parts can be created within hours. Bringing the design cycle down to a matter of days or weeks compared to months.

The limitations of 3D printing in general include expensive hardware and expensive materials. This leads to expensive parts, thus making it hard if you were to compete with mass production. But the price of 3D printers has decreased over the years, some 3D printers are now within financial reach of the ordinary consumer or small company. It also requires a CAD designer to create what the customer has in mind, and can be expensive if the part is very intricate. 3D Printing is not the answer to every type of production method; however its advancement is helping accelerate design and engineering more than ever before.

We are beginning to see the impact of 3D printing many industries. There have been articles saying that 3D printing will bring about the next industrial revolution, by returning a means of production back within reach of the designer or the consumer.

Types of 3D printers at Imaginarium

Types of 3D printers		
Type	Technology	Material
Extrusion	Fused Deposition Modelling (FDM)	Thermoplastics (e.g. PLA, ABS), eutectic metals, edible materials.
Granular	Direct metal laser sintering (DMLS)	Amost any metal alloy
	Electron beam melting (EBM)	Titanium alloys
	Selective heat sintering (SHS)	Thermoplastic powder
	Selective laser sintering (SLS)	Thermoplastics, metal powders, ceramic powders.
Laminated	Powder bed and inkjet head 3D printing, Plaster-based 3D printing (PP)	Plaster
	Laminated object Manufacturing (LOM)	Paper, metal foil, plastic film
Light polymerise	Steriolithogeaphy (SLA)	Photopolymer
	Digital Light Processing (DLP)	Liquid resin

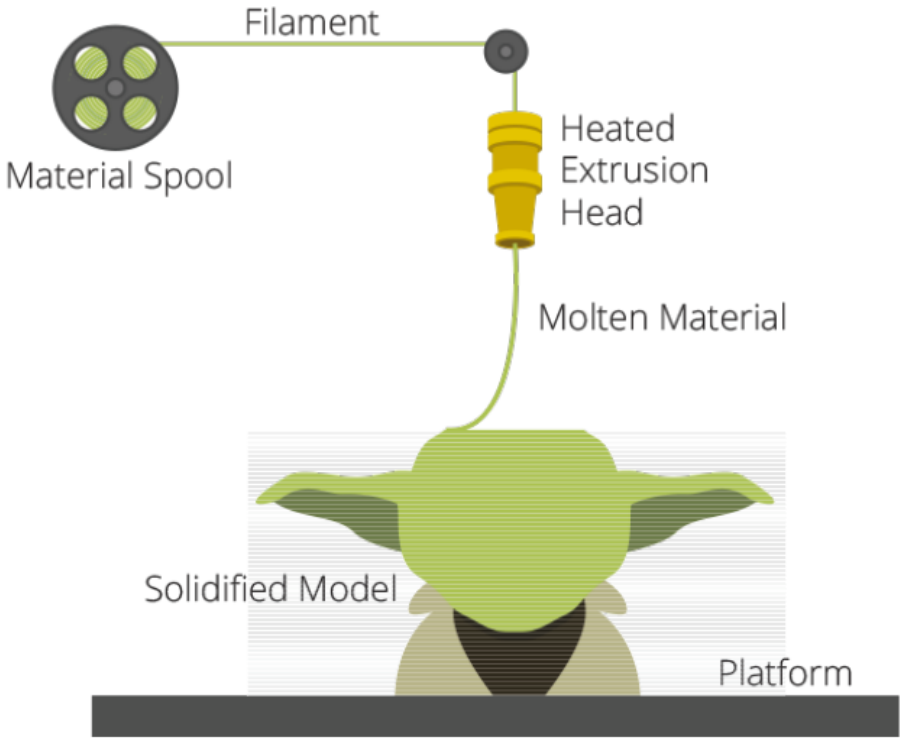
3d printing processes

FDM – Fused Deposition Modelling

Fused Deposition Modelling, is an additive manufacturing technology commonly used for modelling, prototyping, and production applications. FDM works on an "additive" principle by laying down material in layers. A plastic filament or metal wire is unwound from a coil and supplies material to an extrusion nozzle which can turn the flow on and off. The nozzle is heated to melt the material and can be moved in both horizontal and vertical directions by a numerically controlled mechanism, directly controlled by a computer-aided manufacturing software package. The model or part is produced by extruding small beads of thermoplastic material to form layers as the material hardens immediately after extrusion from the nozzle. Stepper motors or servo motors are typically employed to move the extrusion head. FDM, a prominent form of rapid prototyping, is used for prototyping and rapid manufacturing. Rapid prototyping facilitates iterative testing, and for very short runs, rapid manufacturing can be a relatively inexpensive alternative.

Advantages: Cheaper since uses plastic, more expensive models use a different (water soluble) material to remove supports completely. Even cheap 3D printers have enough resolution for many applications.

Disadvantages: Supports leave marks that require removing and sanding. Warping, limited testing allowed due to Thermoplastic material.

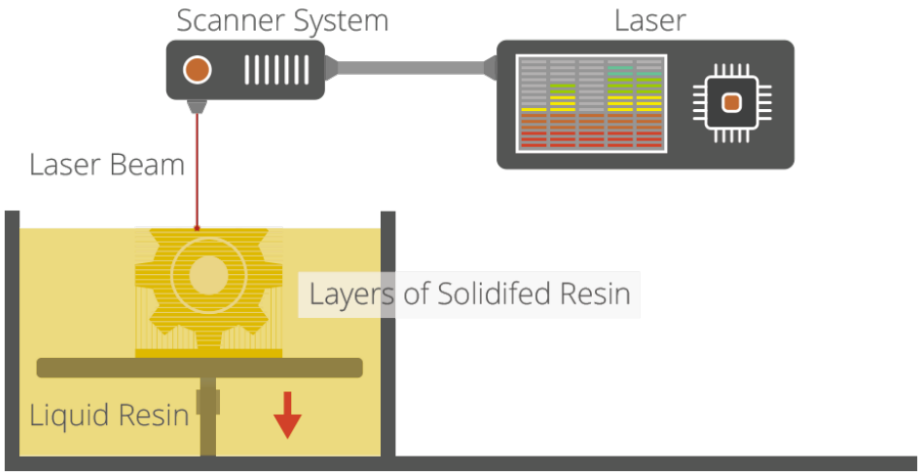


SLA – Stereo lithography

Stereo lithography is an additive manufacturing process which employs a vat of liquid ultraviolet curable photopolymer "resin" and an ultraviolet laser to build parts' layers one at a time. For each layer, the laser beam traces a cross-section of the part pattern on the surface of the liquid resin. Exposure to the ultraviolet laser light cures and solidifies the pattern traced on the resin and joins it to the layer below. After the pattern has been traced, the SLA's elevator platform descends by a distance equal to the thickness of a single layer, typically 0.05 mm to 0.15 mm. Then, a resin filled blade sweeps across the cross section of the part, re-coating it with fresh material. On this new liquid surface, the subsequent layer pattern is traced, joining the previous layer. A complete 3-D part is formed by this process. After being built, parts are immersed in a chemical bath in order to be cleaned of excess resin and are subsequently cured in an ultraviolet oven. Stereo lithography requires the use of supporting structures which serve to attach the part to the elevator platform, prevent deflection due to gravity and hold the cross sections in place so that they resist lateral pressure from the re-coater blade. Supports are generated automatically during the preparation of 3D Computer Aided Design models for use on the stereo lithography machine, although they may be manipulated manually. Supports must be removed from the finished product manually, unlike in other, less costly, rapid prototyping technologies.

One of the advantages of stereo lithography is its speed; functional parts can be manufactured within a day. The length of time it takes to produce one particular part depends on the size and complexity of the project and can last from a few hours to more than a day.

Although stereo lithography can produce a wide variety of shapes, it has often been expensive; the cost of photo-curable resin has long ranged from $80 to $210 per litre, and the cost of stereo lithography machines has ranged from $100,000 to more than $500,000.

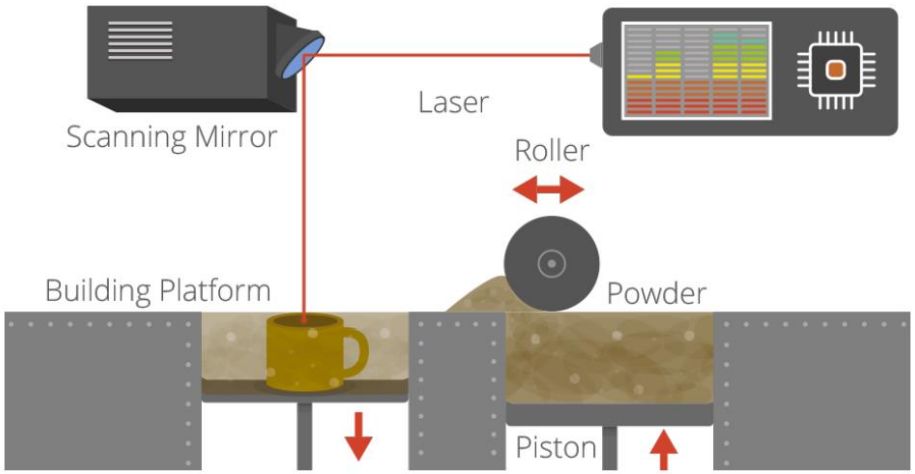


SLS - Selective laser sintering

Selective laser sintering is an additive manufacturing technique that uses a high power laser to fuse small particles of plastic, metal, ceramic, or glass powders into a mass that has a desired three-dimensional shape. The laser selectively fuses powdered material by scanning cross-sections generated from a 3-D digital description of the part on the surface of a powder bed. After each cross-section is scanned, the powder bed is lowered by one layer thickness, a new layer of material is applied on top, and the process is repeated until the part is completed. The SLS machine preheats the bulk powder material in the powder bed somewhat below its melting point.

Benefits SLS has many benefits over traditional manufacturing techniques. Speed is the most obvious because no special tooling is required and parts can be built in a matter of hours. Additionally, SLS allows for more rigorous testing of prototypes. Since SLS can use most alloys, prototypes can now be functional hardware made out of the same material as production components.

Constraints The aspects of size, feature details and surface finish, as well as print through error in the Z axis may be factors that should be considered prior to the use of the technology. However, by planning the build in the machine where most features are built in the x and y axis as the material is laid down, the feature tolerances can be managed well. Surfaces usually have to be polished to achieve mirror or extremely smooth finishes.



What all projects does Imaginarium do?

Imaginarium focuses mainly on Jewellery as the times when 3D printed jewellery sounded like an idea from a sci-fi movie are over. 3D printed jewellery is on the verge of becoming mainstream and Imaginarium is revolutionising the industry.

Product Prototyping

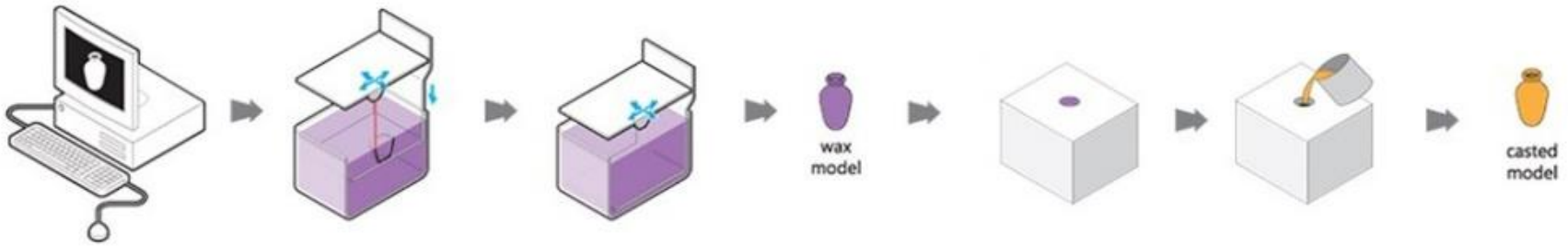
Imaginarium has pioneered 3D printing not just in making small scale parts but also in many other fields such as Product parts as big as car's bumpers, Medical, Architecture and so on. Generally in design the creation of a new product always involves many iterations. 3D Printing revolutionized the industry by allowing designers to create, see and touch their design the very next day. No longer did it take several meetings for everyone to agree on one design to create, and then wait months for the actual part to arrive. Nowadays a version of each idea is created and the next day, all are reviewed together, thus giving the ability to compare and contrast each one's features. Plastic parts for example require moulds and tooling to be created, these custom parts are expensive to create, therefore one must be certain the part designed meets the requirements. In Imaginarium with 3D printing one can create a part that will look and feel exactly like the finished product. Some parts can also be tested just as the real injection moulded part would.

How are 3D printed jewelleries made?

For creating jewellery in gold, silver, bronze, copper and brass, imaginarium use Wax Printing and Casting. This technology builds upon modern 3D printing technology as well as traditional metal casting, Investment casting to be specific.

Which are the latest 3D printing technologies used at Imaginarium?

It all starts with 3D printing a 3D model in wax. The 3D printer uses a wax-like resin as printing material. Next, one or more wax sprues will be attached to your model. Then the model will be attached by the sprue to a wax 'tree', together with several other models. The tree is then placed in a flask and covered in a fine plaster. When the plaster solidifies, it forms the mould for casting the metal. The plaster mould is then put in an oven and heated for several hours to the point where the wax is completely burned out.



What all materials & finishes does imaginarium use for 3D printing?

The most common materials for jewellery designers in general are metals. Following are some of the Metals and finishes that imaginarium does.

Brass: Gold-plating, colour-plating, PU coating

Silver: Gloss, high gloss, satin, sandblasted, antique

Gold: 14k, 18k, 24k

Bronze: PU coating, polishing

Besides metals, jewellery designers also use other 3D printing materials such as polyamide (nylon plastic, see image below), alumide (a mix of polyamide with aluminium powder), rubber-like (flexible plastic) and even ceramics.

Product Prototyping - Vacuum Casting

The method uses cast silicone moulds made as follows: a master model (that typically originates from stereo lithography or selective laser sintering) is prepared to ensure a high quality finish Silicone is cast around the master, partially under vacuum in order to avoid air bubbles being trapped in between the master and silicone. After curing, the mould is cut according to the parting planes and the master is removed, leaving a cavity to make copies.

The reason for using silicon is that the flexibility of the silicone allows undercuts.

Investment casting process in detail

The first step in investment casting is to 3D print the wax pattern for the process. The pattern for this process may also be made from plastic; however it is often made of wax since it will melt out easily. When producing parts in any quantity, a mould from which to manufacture patterns will be desired. The size of this master die must be carefully calculated.

Since the mould does not need to be opened, castings of very complex geometry can be manufactured. Several wax patterns may be combined for a single casting. Or as often the case, many wax patterns may be connected and poured together producing many castings in a single process. This is done by attaching the wax patterns to a wax bar, the bar serves as a central sprue. A ceramic pouring cup is attached to the end of the bar. This arrangement is called a tree, denoting the similarity of casting patterns on the central runner beam to branches on a tree.

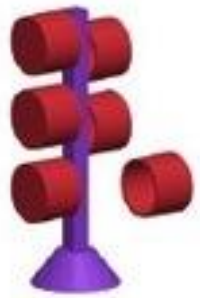
The metal casting pattern is then dipped in a refractory slurry whose composition includes extremely fine grained silica, water and binders. A ceramic layer is obtained over the surface of the pattern. The pattern is then repeatedly dipped into the slurry to increase the thickness of the ceramic coat. In some cases the pattern may be placed in a flask and the ceramic slurry poured over it. Once the refractory coat over the pattern is thick enough, it is allowed to dry in air in order to harden.

The next step in this manufacturing process is the key to investment casting. The hardened ceramic mould is turned upside down and heated to a temperature of around 90C-175C. This causes the wax to flow out of the mould, leaving the cavity for the metal casting.

The ceramic mould is then heated to around 550C-1100C. This will further strengthen the mould, eliminate any leftover wax or contaminants and drive out water from the mould material. The metal casting is then poured while the mould is still hot. Pouring the casting while the mould is hot allows the liquid metal to flow easily through the mould cavity, filling detailed and thin sections. Pouring the metal casting in a hot mould also gives better dimensional accuracy, since the mould and casting will shrink together as they cool. After pouring of the molten metal into the mould, the casting is allowed to set as the solidification process takes place. The final step in this manufacturing process involves breaking the ceramic mould from the investment casting and cutting the parts from the tree.

Injecting Wax

Ejecting Pattern



Pattern Assembly

Slurry Coating

Sand Coating

Dewaxed

Shell Mold Fired

Pouring

Shakeout

Finished Casting

Is there a risk of losing the human element?

Even though we talk a lot about 3D printers and cutting-edge technology, the human touch still plays a very dominant role in the entire jewellery-making process.

The jewellery designer uses 3D modelling software for creating the design – this ensures that the inspiration and style of the jewellery is as personal as it can be. An eye for design and talent to turn ideas into reality can't be replaced.

During the printing and production process as well as post-processing, the manual labour steps are still present. This means that the human element is still a major success factor in creating stunning jewellery. Our skilled personnel will take care of this.

3D printing allows for more people to start editing and creating their own, personalized jewellery. The jewellery designs that are created in softwares are then sent to them for high-quality 3D printing. So in a sense, 3D printing has opened up the world of jewellery design to more people.

Our Experiences and Experiments with the M3D table top printer

We were given a small table top printer to experiment for ourselves. Before touching any of the machines they have we had to go through training of how to use the machines properly and study the principles and basics of it for almost 3 days. We started experimenting by making few basic shapes like cubes and spheres and see how the support material works. We found out that the filament shouldn’t cool down easily for it to dry in a certain amount of time. It should neither dry too quickly nor too late. Since we were in an AC room the filament dried too quickly and started making issues.

We printed about eight test objects with the printer. Most were at low or medium resolution, and one was at high. Print quality was fair in our tests; we didn't see much of a difference in quality among the three resolutions. The test prints tended to look slightly rough-hewn, and some fine detail was lost. A couple of the objects showed a fine porousness in spots, which can be eliminated by switching the fill density setting from hollow to low infill.

After printing about five objects without incident with the Micro, it stopped extruding plastic in the middle of the sixth print job, though the extruder continued to move in its programmed pattern. We aborted the print and tried to launch a new job, but the printer wouldn't extrude. This turned out to be an apparent filament jam, which led us to try (unsuccessfully) to unload the filament. Our other misprint happened when the print bed became uncalibrated. After we ran the calibration routine, the machine was able to print correctly again.

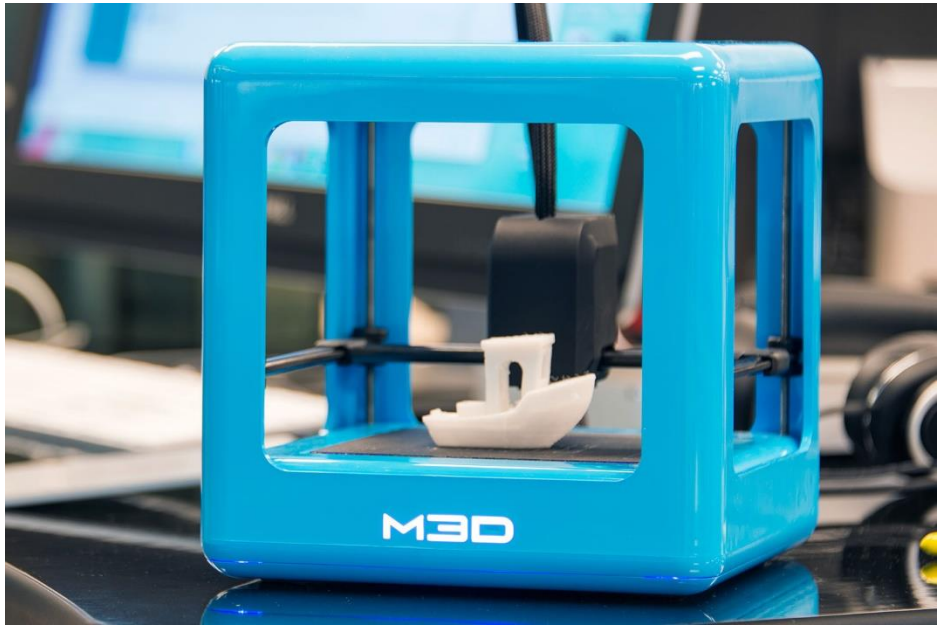
One big downside that we found to the Printer is that it's slow, even at its low-quality setting. It took about 5 hours to print an object that we tried printing. We found this printer the quietest 3D printer among the other printers that imaginarium have. Having said that, to be quite honest the machines they have were never free, they operate almost 24/7. So there was nothing much that we could’ve done. However we took part in 3D printing for the office works.

How to Use M3D printer's Software

The machine's 3D printing software is one of the simplest among all the other softwares that Imaginarium have. At the top of the main screen are three icons: the filament spool labelled 3D Ink; a file folder labelled Open Model; and a gear icon, from which you can calibrate the print bed.

If you have previously loaded any 3D models with the Micro, you will see thumbnails of them below the icons. You can click on a thumbnail to load the model, or choose Open Model and navigate your file directories to select a 3D file to load. Once loaded, the object will appear on screen within a representation of the printer. You can rescale, rotate, or reposition the object with the aid of several buttons at the left edge of the screen, or centre the object with a button at the bottom of the screen.

When the object is scaled and positioned to your satisfaction, you then press the Print button. This opens a dialog box that identifies the printer and the filament. It also lets you choose one of five print-quality settings, with resolutions ranging from 350 microns at Ultra Low to 50 microns at Expert from a pull-down menu. The higher the resolution, the longer the print time is for a given object. A second pull-down menu lets you choose among six settings for fill density (the thickness of infill, the material extruded within the print's interior): two hollow settings, with the walls of different thicknesses, and four settings with increasing percentages of infill. The thicker the infill, the longer it takes to print an object. Below these selections are checkboxes for more options, such as adding supports or a raft (a flat surface made of layers of plastic at the object's base, which can be removed after printing).

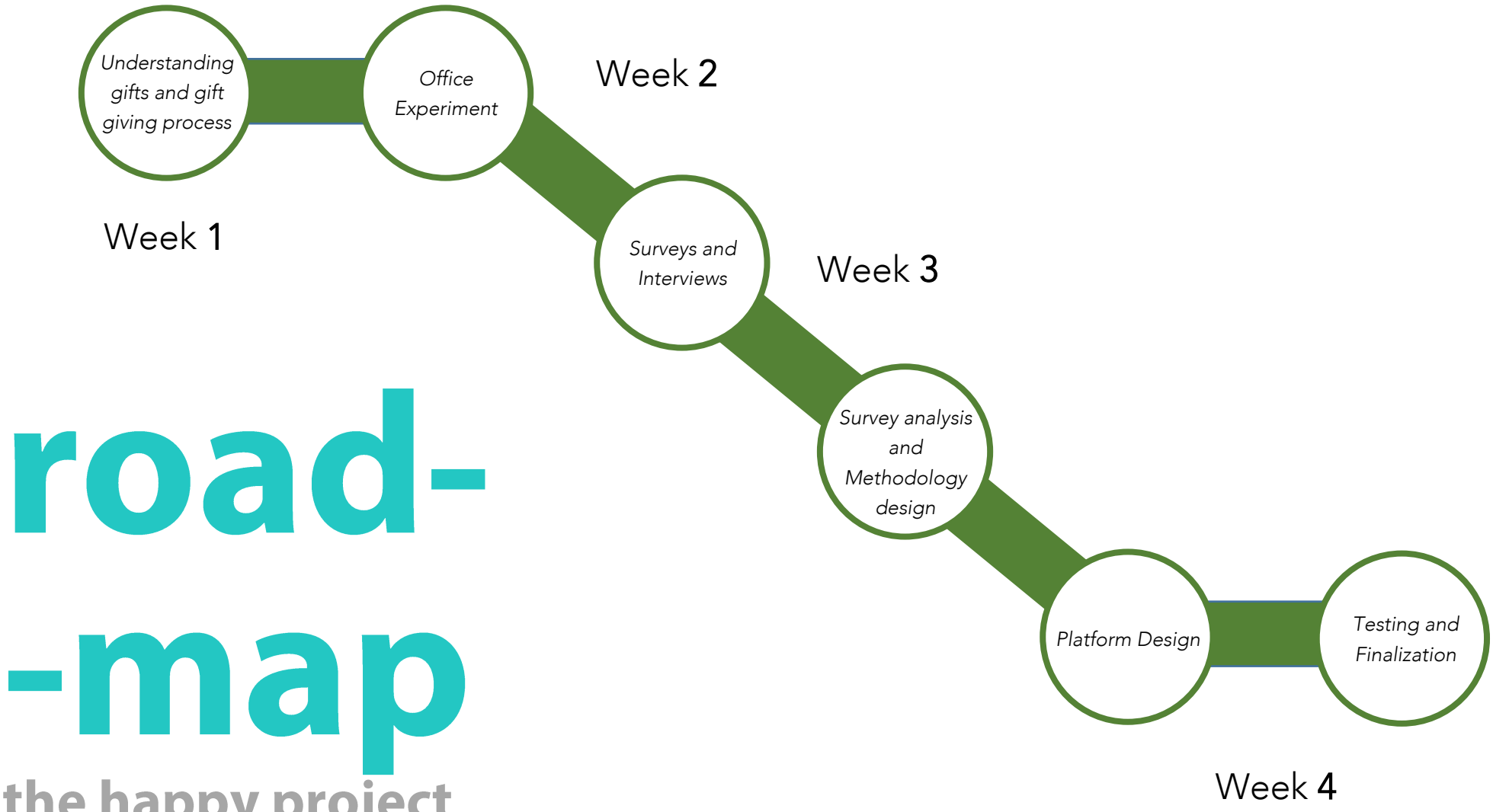


the happy project

The Happy Project: Brief

Gifts! That's all the project is about. The initial brief was actually a few lines about gifts and gift giving which were discussed during the initial discussions with *Mr. Guruprasad and Mr. Tanmay* at Imaginarium.

According to the initial idea, we were supposed to study behaviours of gifts and gift giving in Indian context, while studying scenarios in Mumbai as live examples. Intention was to study human behaviours and trends regarding gifts and try to come up with ideas where Imaginarium could push themselves up in this industry. Goals were not only to study but also suggest ways in which Imaginarium would be able incorporate its existing infrastructure of 3d printing in this industry, whilst trying to eradicate flaws in the system and provide an enhanced platform for gift giving, which is highly personalised for the user.

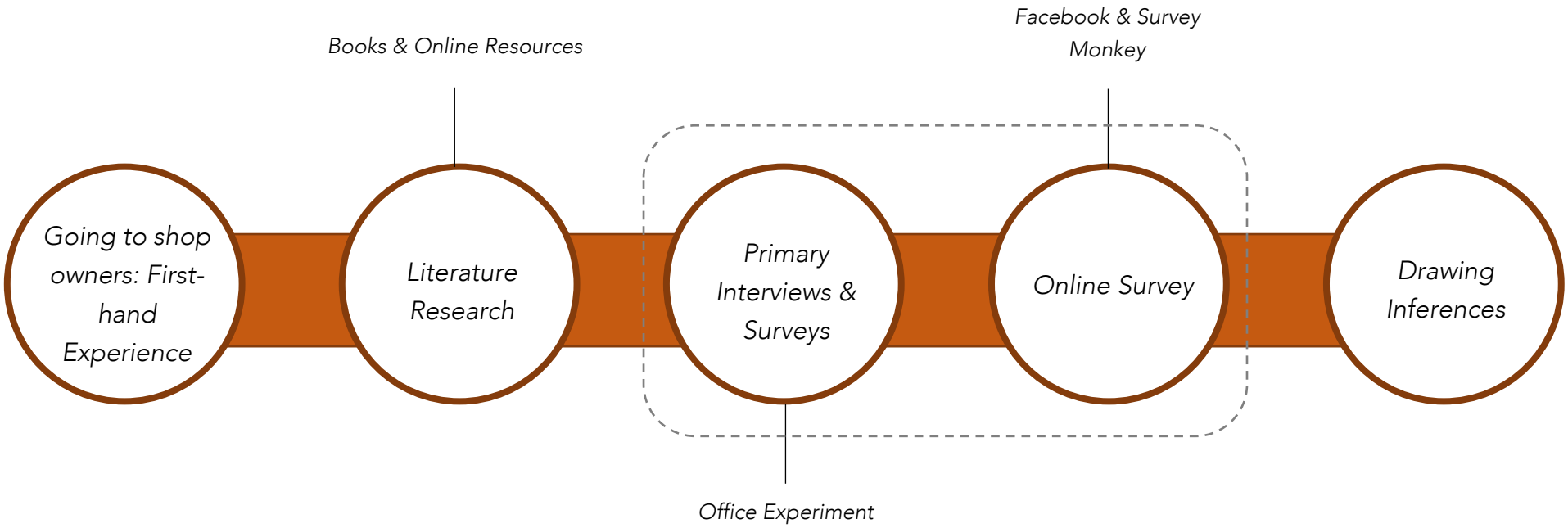


road--map

the happy project

1. **Understanding** Gifts and Gift Giving

We started with learning gifting and the gifting process, by first going to the shop owners itself and talking to know the psychology of people who gift and prefer to receive gifts. The broad roadmap that we adopted in understanding gifts is given below.



a. **Shop Visiting** Experience

To understand and know more about gift giving we visited various gift shops and bought gifts for few of the office employees. The aim was to take a first-hand of choosing gifts and understand the various constraints involved in the process. The shops which we visited ranged from low end street gift shops to high end outlets like '*Archies*' & '*Mango*'.

The difficulties we faced when we bought gifts:

- Budget
- What to buy?
- Appropriateness
- List of products

Why did we buy what we bought?

- Handmade
- Handy
- Desktop Products
- Appropriate?

The picture on the left shows the product which were bought during the exercise. The gifts which were bought were given anonymously. The idea behind this part of exercise was to understand how much the material quality of a gift matter to a person when he/she doesn't know the person who has gifted it to them.

Along with the gifts, a small questionnaire was also attached. The questionnaire included following questions:

1. Do you like this gift?
2. What do you like/dislike in this gift? And why?
3. What would you do if it's not useful to you?
4. Would you consider gifting it to somebody else, if it's not useful to you?

Inferences

- People will like whatever you give them if it' anonymous
- Even if the gifts have no meaning, no soul, no story
- Hence, it's difficult for people to relate to it.
- 50% people didn't mind re-gifting
- People try to find the use for the gift

b. Literature Research

Gift giving is a social, cultural and economic experience; a material and social communication exchange that is inherent across human societies and instrumental in maintaining social relationships and expressing feelings (Camerer, 1988, Joy 2001). Research within different disciplines to gain insight of gift giving behaviour has continued for over forty years. Gifts are bestowed in celebration of key life events, a medium for nurturing personal relationships, to encourage economic exchange and to socialise children into appropriate behaviour patterns (Belk, 1979). Obligations within a community require that individuals are required to give, receive and to reciprocate (Mauss, 1954). In his essay the French anthropologist-sociologist Marcel Mauss (1954), presented a theoretical analysis of the gift-giving process, which was based on his examination of gift giving amongst various primitive, secluded, or ancient societies. He concluded that gift giving is a self-perpetuating system of reciprocity and summarised three types of obligations which preserve gift-giving:

1. The obligation to give.
2. The obligation to receive.
3. The obligation to repay.

The requirement to give may be ingrained in religious or moral necessities, with a strong need to recognise and maintain a status hierarchy and to establish or maintain peaceful relations, or merely the expectation of reciprocal giving. These motives, which do not acknowledge purely selfless giving, become embedded into the fabric of a society so that under appropriate conditions an individual is socially obligated to give. Receiving gifts is seen as equally mandatory and evading or refusing gifts is interpreted as an unsociable or even hostile act.

The four major elements which constitutes almost all of the gift giving process includes:

Giver
Recipient
Occasion
Gift

Givers' presentations are frequently adjudicated and influenced by: the relationship, the context within which the gift was given, the value of the gift and the appropriateness of the gift.

The Relationship

There needs to be a connection between the giver and the receiver for the exchange to take place and all gift giving must be explored within this relationship. "Gifts cannot occur outside of a relationship"; (Larson and Watson, 2001). The nature of the relationship can influence the givers inspirations and the receiver's interpretations of the gift

Context

Gifts can generally be divided into two categories; gifts given at formal occasions or ceremonies such as festivals, weddings and birthdays are ritual gifts, while those given at other times might be spontaneous gifts.

Value

Gifts may hold several types of values including economic, functional, social, expressive and sentimental. A part of the givers individuality can be reflected in the gift and passed on to the receiver (Sherry, 1983) and therefore holds an expressive value that is an indication of depth of relationship that the giver has for the receiver and this value is difficult to measure, as it is personal and subjective.

Appropriateness

The appropriateness of a gift refers to choosing a gift that is suitable for the receiver or that the receiver will appreciate. Appropriateness is perceived as being the key quality of a perfect gift and is based on a number of factors including, the symbol of the relationship, stage of life, occasion and history.

c. Surveys

The next step after having understood the gift giving experience through literature and first hand examples was to understand the people's take on gifts and gift giving process.

After various brainstorming sessions amongst ourselves we came up with a set of questions which could be used in a form of questionnaire while taking interviews.

The questions include:

Q1: How often do you receive/give gifts?

Q2: Do you think money plays a big role in gifts?

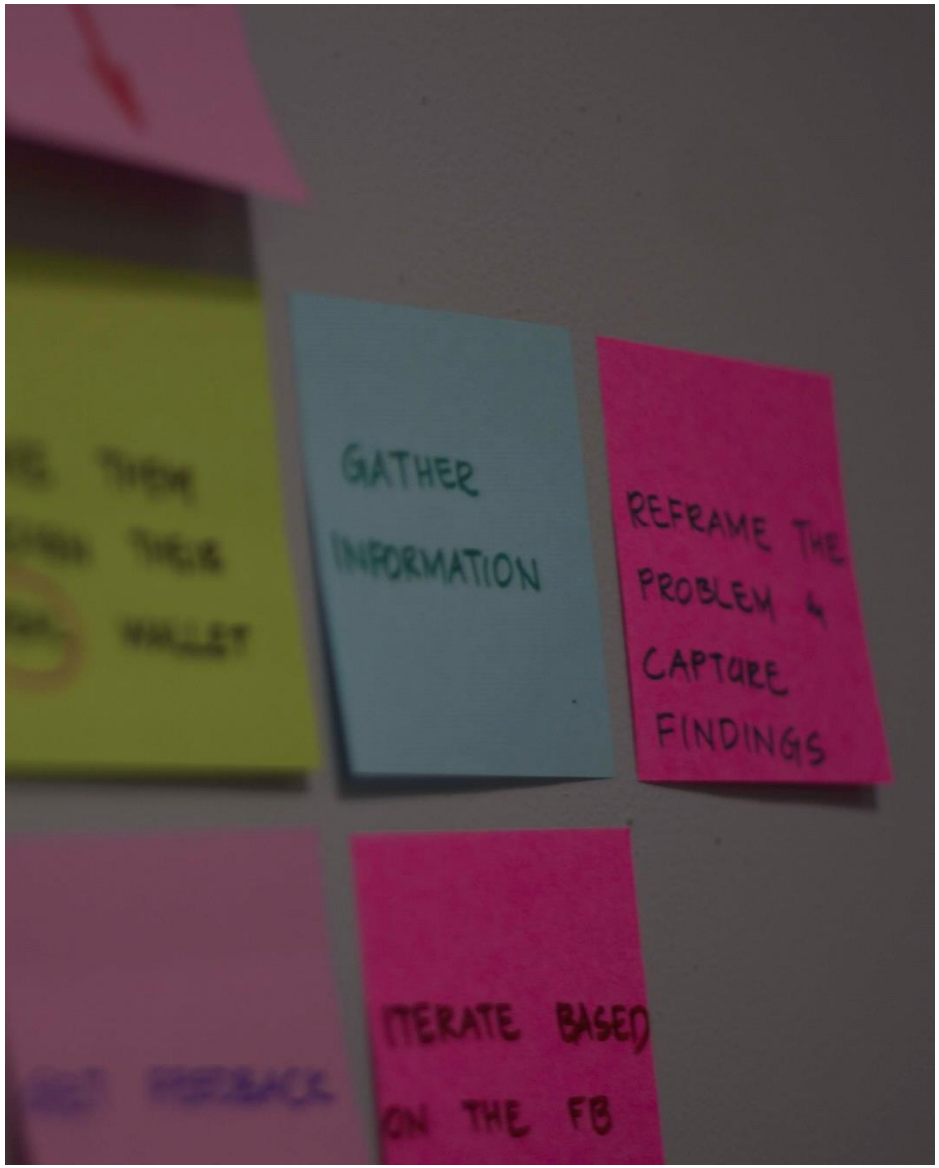
Q3: What kind of gifts would you prefer to receive?

Q4: Does the value of gift increases with your name/identity on it?

Q5: Would you prefer experiential gifts (Movie tickets, Dinner, Match tickets, Hiking, Travel Trip etc.) over tangible gifts?

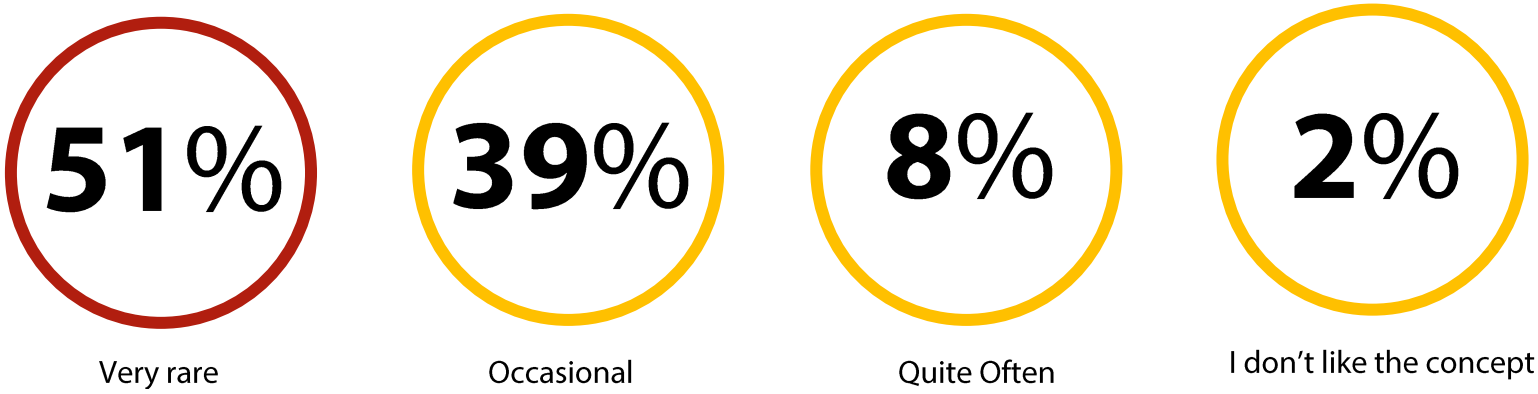
Q6: What do you think about re-gifting?

Q7: You think the gifts should be made/designed by the presenter?



survey results

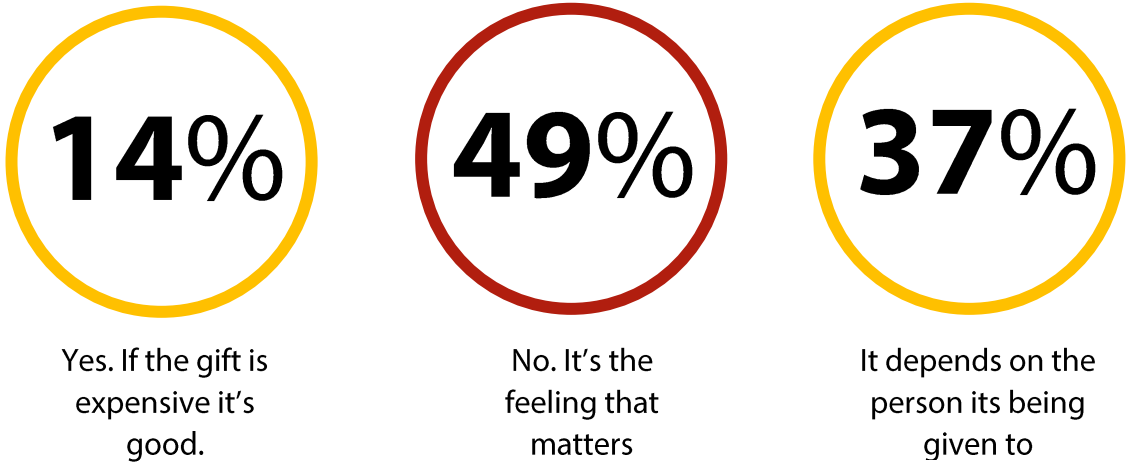
1. How often do you receive/give gifts?



Inference

The results shows that half of the people gift extremely rarely. There could be a lot of reasons that gifting is not so prevalent in this scenario. After our discussions with people, we found out that one of the major reason that people don't find any meaning in these readymade gift. It's like another picked up product. And also people who want to gift something to someone special they'd prefer something beyond products. Hence, the bigger challenge is that how to get these people gift more and how to make gifting more meaningful to them. And to bring them gifts beyond products.

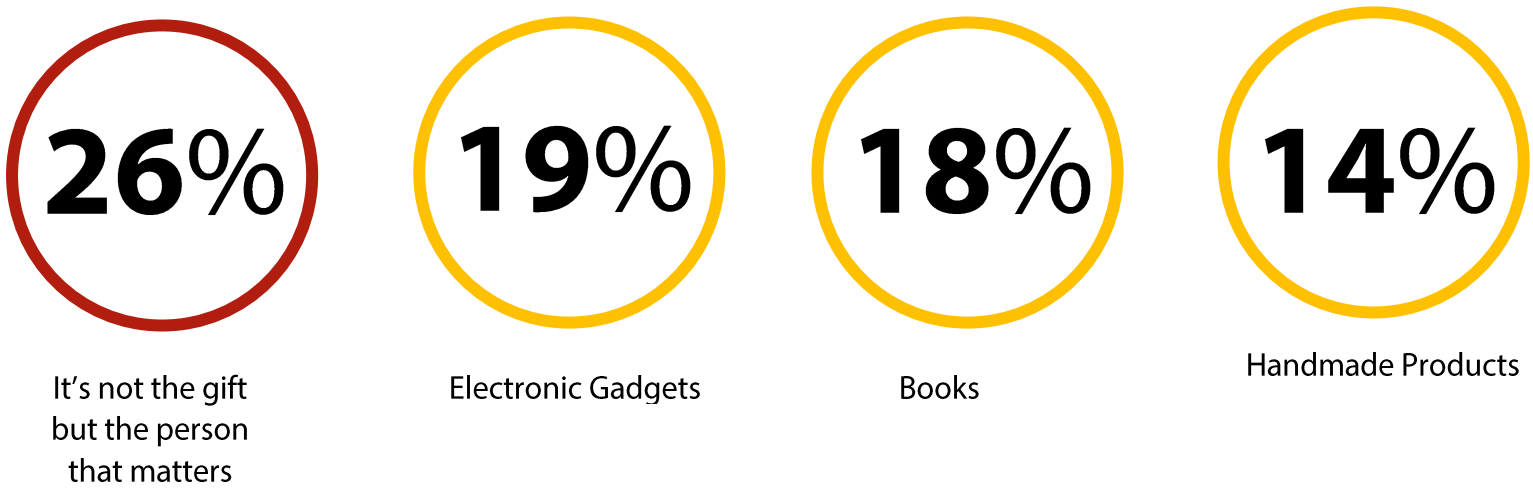
2. Do you think money plays a big role in gifts?



Inference

The monetary value of the gift has a very little part in making a good gift. However, it's very essential. Most people believe that it's that hidden emotion that matters in gifting. The current mass manufactured gifts that are available in market are unable to provide this to the gift giver and receiver hence do not enable people to gift more.

3. What kind of gifts would you prefer to receive?



Inference

Again, as expected the emotional part of a gift is quite an important part. Thus, a lot of people agree to that it's the person that matters and the feeling that makes a gift important. Other than that, gift giving is also dependent on the needs and interests of the receiver, hence a lot of people would like to have something as present that they aspire to have. But if you look it that way, a person would only give another a gift of his interest when he knows his/her interest, hence that emotional part is present here as well.

4. Does the value of gift increases with your name/identity on it?

Inference

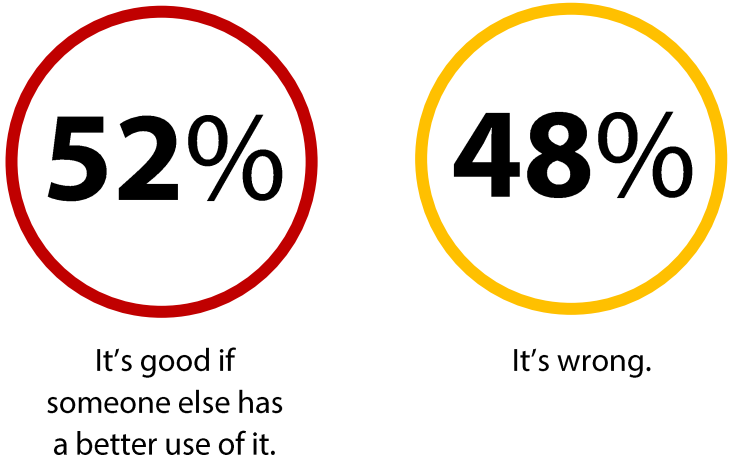
This is quite debatable because it differs drastically from person to person and from gift to gift. And that's what the survey shows, a major part of people say that it depends on the gift whether the name or identity should be present or not.

5. Would you prefer experiential gifts over tangible gifts?

Inference

It was interesting to see that a lot of people prefer intangible and experiential gifts over tangible conventional gift. This particular question shows how mundane and soul-less gift loose as compared to presents which gives a rather important landmark of memory to a person.

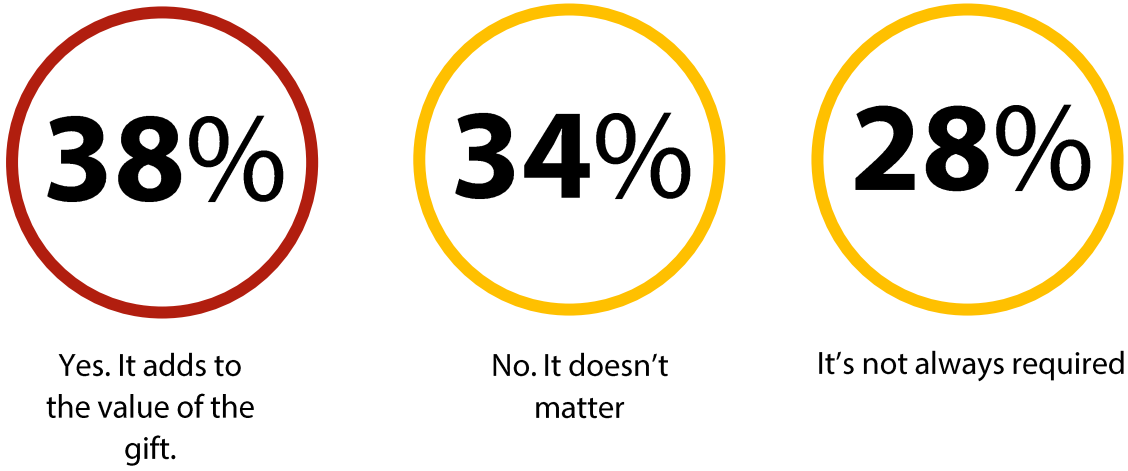
6. What do you think about re-gifting?



Inference

The almost half–half opinion of people about re-gifting is quite strange. However, looking practically re-gifting should not be discouraged but still it's considered unethically wildly among the masses especially in our context.

7. You think the gifts should be made/designed by the presenter?



Inference

However, the mixed reviews of people on this one shows that it doesn't really matter if one makes a gift or not. But its sure that making a gift implies that one had put extra effort for someone, making him/her special than just picking up something from a gift shop.

plat-
-form
design

Brainstorming

After having understood gifts and gift giving process, it was time to analyse data and come up with ideas which could help us further take the project to a level where it is useful enough for *Imaginarium* to be incorporated in their industry.

Brainstorming went into understanding the concept and coming up with the platform. We came across a lot of questions while going about it. Few of them were:

- *How to make people gift more? Since, almost 51% of them receive gifts very rarely?*

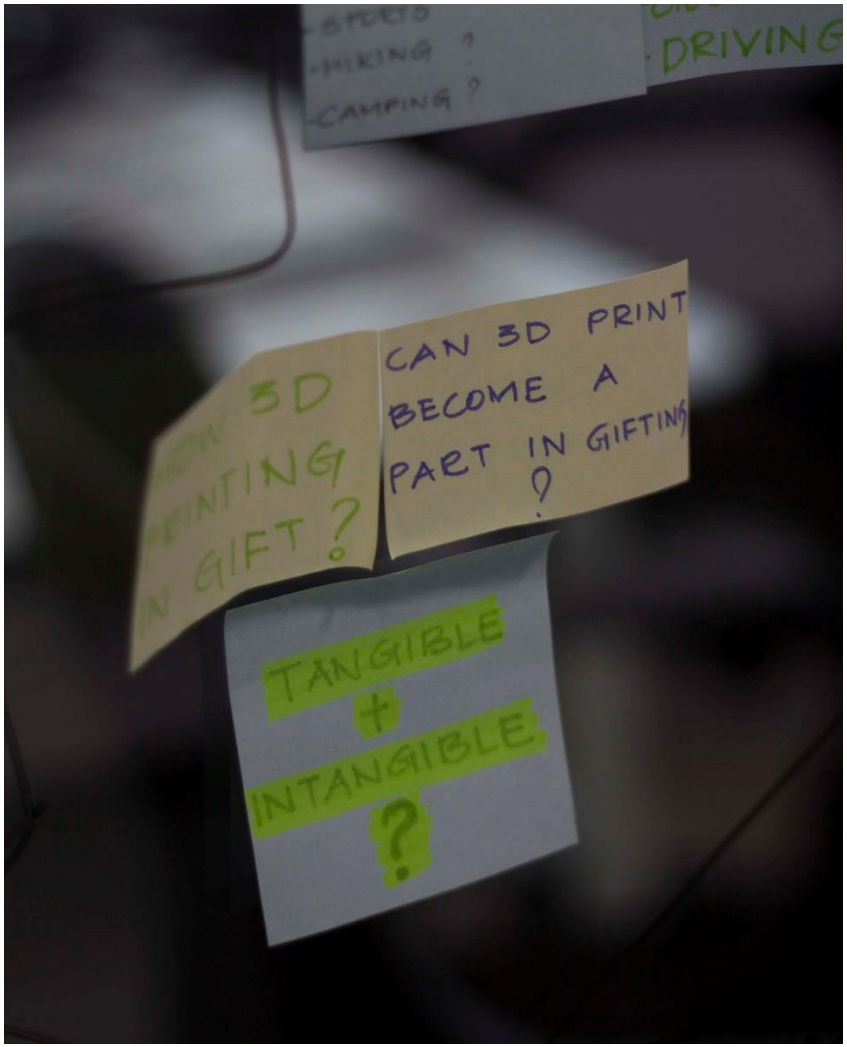
- *What are the different ways to personalize a gift?*

- *Can a tangible gift and experiential gift be combined? How?*

- *Can there be a platform for re-gifting?*

- *How to make everyone a designer?*

These questions made the base of the platform. A platform which could answer these questions while which is also able to solve present day issues in gifting industry and come up with an innovative way of gifting.



Final Design: the happy project

The platform design came mostly from the survey analysis and self-experience throughout the project. The major part aims of the project turned out to be:

- Need of enhancing the gifting experience of the giver as well as recipient.

- Reduction in difficulties while choosing/making gift for someone special.

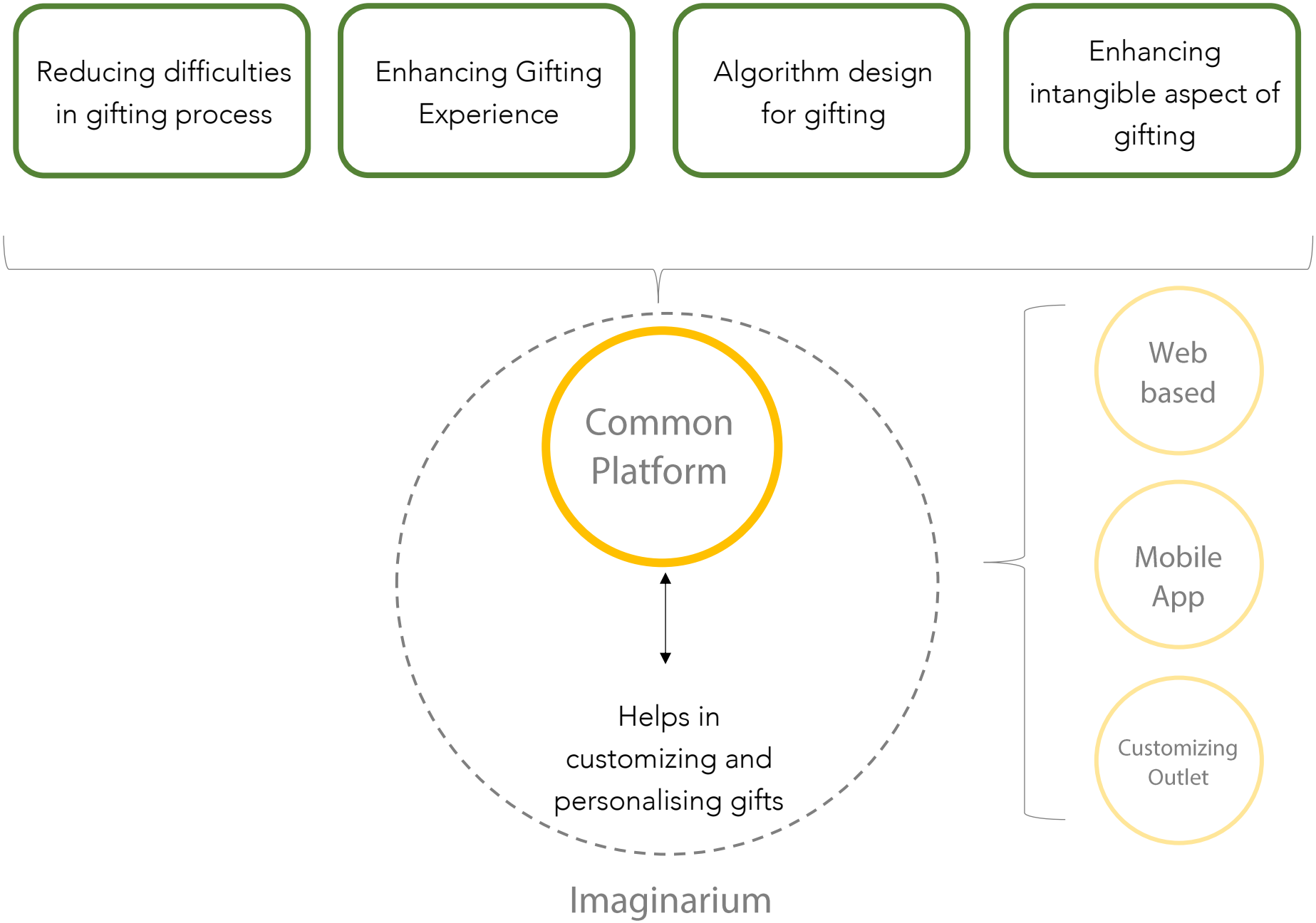
- Algorithm design which could be followed when choosing gifts.

- Enhancing the intangible aspect of tangible gifts.

The understanding that all this would be able to enable people to gift more and with more appropriate outcomes. The nature of such project makes room for innovative approach towards it, hence a lot of ways were thought which is flexible enough to cater to hundreds of priorities of users. A platform which could enable you to see beyond the obvious. A platform which relook gifting as an expression, an emotion, token of love, landmark of memory, way to show affection, an experience etc.

All this is to bring happiness to people's lives and hence this name.

The Happy Project!


Reducing difficulties in gifting process
Enhancing Gifting Experience
Algorithm design for gifting
Enhancing intangible aspect of gifting
Common Platform
Helps in customizing and personalising gifts
Web based
Mobile App
Customizing Outlet
Imaginarium

Implementation: customizability

The platform as yet is at concept stage, the challenging job was to actually take it to implementation stage. The platform actually tells that everyone should be a designer. So the more critical question was that, *How to make everyone a designer?*

The thought of customizability seems legit and promising but until carried out properly can't be trusted. The next step was to test the feasibility of the platform. In order to do that, we designed an exercise which could help us get an idea how practical idea would be if given to people. And so we came up with the 'wallet exercise'.

Wallet Exercise

Aim: *How people look at the concept of gifting and how personalization could happen in gifting on a larger scale.*

This exercise is inspired from Stanford design school's iconic 'Wallet Project' which is an immersive activity meant to give participants a full cycle through the design process of the gift they expect to come up with in shortest a time as possible.

how to make everyone a designer?

Intriguing part about this exercise is that it gives an opportunity to facilitators to touch on the fundamentals of human centered design. Hence, enabling them to be able to look for a better solution for a gift.

The 8 STEP Exercise

The exercise goes as follows:

STEP 1: The participant is given a mentor who helps him designing the entire gift as per his own experience with the recipient.

STEP 2: The participant is supposed to design a trial gift for the person with sketches. The gift could have anything that he thinks would be suitable for the recipient. This should take around 10 min.

STEP 3: This is the critical part, this involves discussion with the mentor about the person, about your relation with the person and what is the motive behind the gift etc. This helps mentor to empathize the giver so that he could help him better in designing this gift.

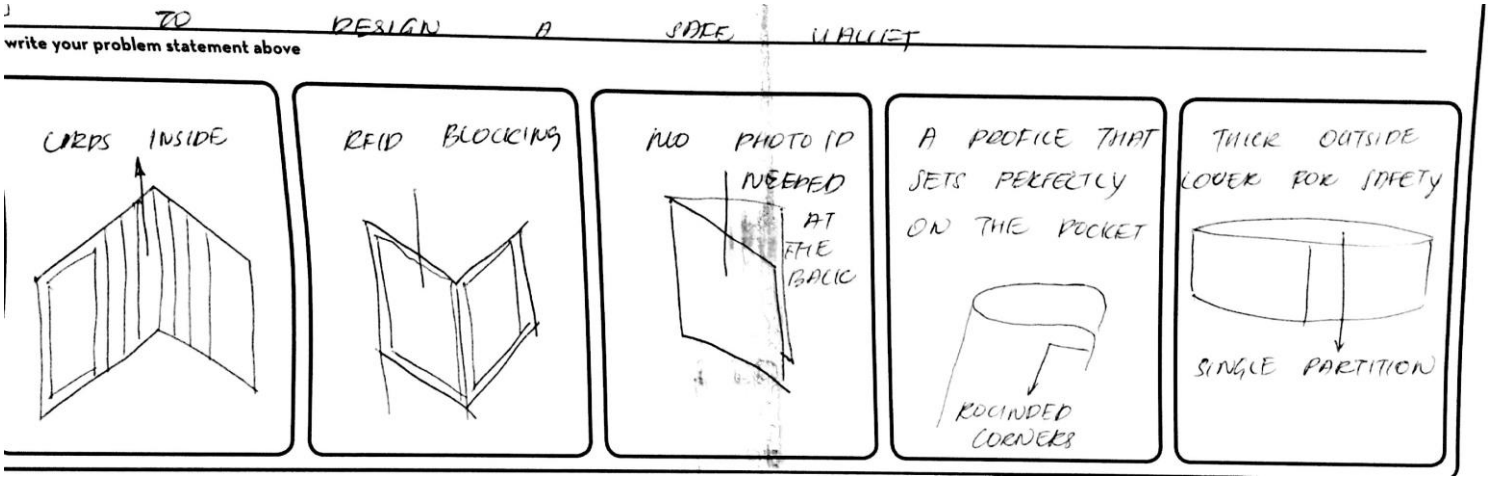
STEP 4: This is one common step, where the giver and mentor sit together and think about the possibilities of design.

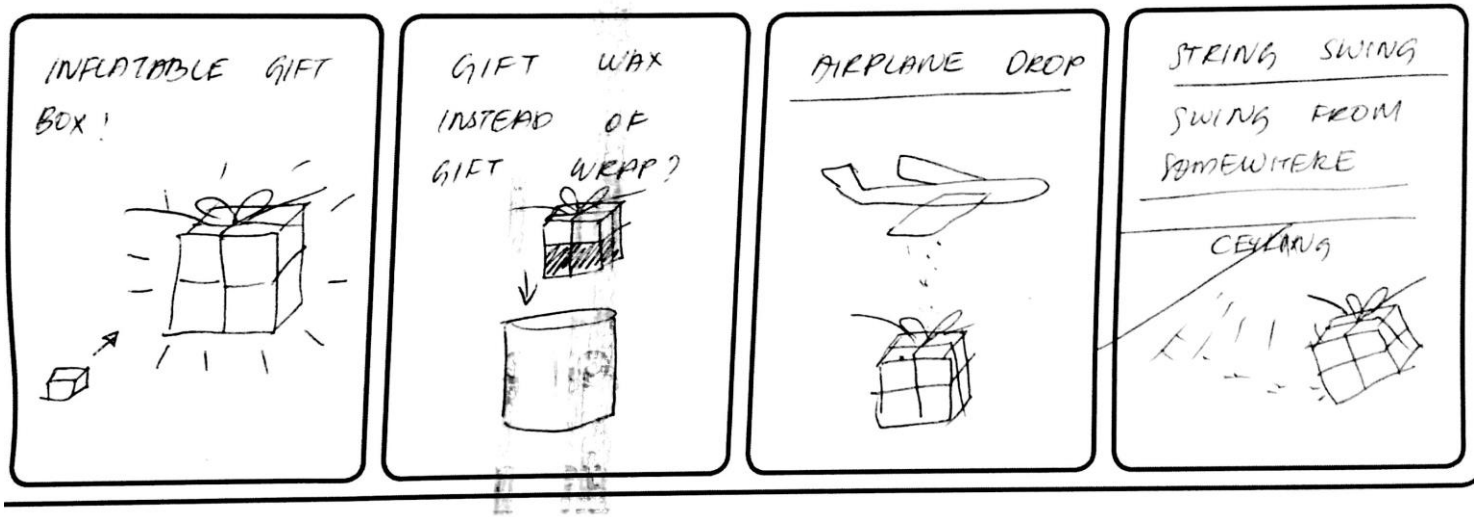
STEP 5: Finalize findings and thinking about practicality of it through design. This step is where the mentor helps the person in looking the recipient's experience with him in a newer manner, may be the way he/she doesn't see it.

STEP 6: This step where the user is allowed to take a stand on the preference of gift, and the way the gift would be made and delivered to the recipient.

STEP 7: After taking a stand, and approval of the mentor the prototype of the gift is to be made. This would be the longest step as the industry would come into picture at this step.

STEP 8: The final design in form of a prototype is also ready now. The step is to finally take a last look at the gift before final making. If however, the participant is not happy with the gift he/she can go back to any step before and repeat the steps to get better results that time.





Samples from the exercise carried out

How did this help?

This helped the project in quite effective way. We found out that if people have assistance/mentors they can come up with creative ideas.

This could be an opportunity for the people to push themselves to think beyond the obvious.

After going through this journey of understanding gifts, we could realize that it's not just the gift but the feeling and emotions embed in it!

And by this project if we could enhance that feeling by even a little bit would be a success in bringing happiness in people's lives.

Conclusion

The aim of doing an internship at a firm which deals with 3D printing was not just to understand 3D printing but also to look beyond the possibilities of 3D printing as an industry. Imaginarium helped us in that quite well. We had a basic idea of what 3D printing is before the Internship. But we learnt much more than that from the internship. From what all can 3D printing do to what does the future hold for 3d printing, How does the technology work and the processes behind it, how to operate the machines, how to build and calibrate one and so on.

Talking about the project, we faced many challenges during the happy project. At some point we were clueless about what to do. The learning from IDC from last year helped us a lot during the project. The surveys, analysis of surveys, interviews, drawing conclusion all this would have been difficult without our previous understanding from IDC. The happy project was a critical part in our internship which could let us think more than just products, and mostly about the intangible aspects which we generally miss out while designing. The criticality was not just to understand gift and gift giving process but to design a system which could enhance this experience. This could let us learn a bit of interaction design as well in a live example.

In the end, we are happy that could do such a versatile internship where we could explore aspects of design beyond products and workshops.

Faizan Zahid
Irshath Ahamed K.

4th May 2016 - 3rd June 2016

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	04 @ Office	5 @ Office	6 @ Office	7 @ Office/Gift Shop
Nil	Nil	Nil	Orientation	Introduction and Understanding Gifts	Designing Gifts	Choosing and Buying Gifts
8 @ Office/Gift Shop	9 @ Office	10 @ Office	11 @ Office	12 @ Outside	13 @ Office	14 @ Outside
Nil	Surveys on Gifting and receiving	Surveying Students (100)	Surveying Employees (10)	Surveying Commoners (100)	Building Statistics from the surveys	Suveying Commoners (200)
15 @ Office	16 @ Office	17 @ Office	18 @ Office	19 @ Office	20 @ Office	21 @ Office
Nil	Building Statistics from the surveys	Evaluating the Survey Statistics	Fing Different ways to Customize Gifts	Concepts Generation	Finding product possibilities from the Concepts	Nil
22 @ Office	23 @ Office	24 @ Office	25 @ Office	26 @ Office	27 @ IIT	28 @ IIT
Nil	Evaluation of the Concepts	Designing with People	Designing with People	Introduction to Design Thinking	Conducting Experiments with people	Conducting Experiments with people
29 @ Office	30 @ Office	31 @ Office	1 @ office	2 @ office	3 @ office	4
Nil	Documentation	Presentation	Presentation	Presentation	Documentation	Nil

survey sheets

Study of Gifts

* 1. How often do you receive/give gifts?

- ◯ Quite often
- ◯ Occasional
- ◯ Very rare
- ◯ I don't like the concept

* 2. Do you think money plays a big role in gifts?

- ◯ Oh yes! If gift is expensive, it's good.
- ◯ No. It's the feeling that matters.
- ◯ It depends on person it is being given to.

* 3. What kind of gifts would you prefer to receive?

- ☐ Gift Cards
- ☐ Lifestyle Products (Perfumes, Styling products etc.)
- ☐ Electronic Gadgets
- ☐ Home Decor (Furniture etc.)
- ☐ Ornaments (Jewellery etc.)
- ☐ Stationery (Diaries, Pens etc.)
- ☐ Desktop Products
- ☐ Books
- ☐ Flowers
- ☐ Something that you desire to have.
- ☐ Anything made by hand (Handmade products, accessories)
- ☐ It's not the gift but the person that matters.
- ☐ No, just wishing is enough.

* 4. Does the value of gift increases with your name on it?

- ◯ Yes. It does.
- ◯ No. It's always better without it.
- ◯ Sometimes, on some gifts.

* 5. Would you prefer experiential gifts (Movie tickets, Dinner, Match tickets, Hiking, Travel Trip etc.) over tangible gifts?

- ◯ Yes
- ◯ No
- ◯ It doesn't matter as long as it's a gift.

* 6. Suggest some of the gifts that you'd give to your:

Mom/Dad

Friends

Spouse/Boyfriend/Girlfriend

Siblings

Grandma/Grandpa

Son/Daughter

Boss/Colleagues

* 7. How much would you spend on gifting your :

Mom/Dad

Friend

Spouse/Boyfriend/Girlf
riend

Siblings

Grandpa/Grandma

Son/Daughter

Boss/Colleagues

* 8. What do you think about re-gifting (Gifting an unwanted gift to someone else)?

- ◯ It's good if someone else has a better use of it.
- ◯ It's Wrong! I don't like to re-gift or be re-gifted.

* 9. You think the gifts should be made/designed by the presenter?

- ◯ Yes, It adds to the value of the gift.
- ◯ No, It doesn't matter.
- ◯ It's not always required if the gift is useful.

Done. Thank you.