

DEGREE PROJECT

Greenhouse v3.0

Exploring collaborative frameworks and spaces

Sponsor : Quicksand Design Studio

Volume : 1 of 1

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PROGRAMME : Bachelor of Design (B. Des)

GUIDE : PRAVEEN NAHAR

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COMMUNICATION DESIGN FACULTY (EXHIBITION DESIGN)



**National Institute of Design
Ahmedabad**

The Evaluation Jury recommends SALIL PAREKH for the

**Degree of the National Institute of Design
IN COMMUNICATION DESIGN (EXHIBITION DESIGN)**

herewith, for the project titled "GREENHOUSE v3.0"

on fulfilling the further requirements by*

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Synopsis

This is a project of many parts. From the very outset, it should be said that this isn't a regular design project with a problem and a solution. This is perhaps a research project of sorts, which explores the possibilities of the future of design practices. Neither of these individual projects reaches an endpoint or concludes. It does, however, explore the various possibilities, and gives an idea of the potential. New domains are explored, skills learnt, and novel possibilities are investigated. It's not about the end product, but rather what happens along the long winding journey that takes you there. The explorations, and learning along that path is what makes up the bulk of this project. Although the aim is to always make something tangible, something that can be used by others, it wasn't possible to do so in this project. This project was designated to be a research exercise, and by having explored so many options, concrete conclusions can be stated. But having the approach to create something substantial did push the project to at least knock on the door of completion.

First, the domain of toolkits are scrutinised, and the process of their making is broken down and inspected. Along the path of creating a toolkit for helping foster collaboration, the very premise, the very idea of a toolkit is gutted and dissected. New formats of information dissemination

are explored, and the concept of a novel new approach is explored. Although the final product doesn't exist, a prototype is explored.

Following the the collaboration toolkit, the second part of the project explores the possibility of creating a space derived from the insights of the research. The brief does change a few times, and the final outcome may not have been completely faithful to the initial proposal, but new grounds are explored. The unexplored realm of Virtual Reality is traversed, and with it, the process, and the pipeline of creating in this new medium. How does traditional spatial design in the physical world translate to the digital one? Can we use this immersive medium as an augmentation to our reality? These and such other questions are answered. Spaces in VR are built out and used as a test-bed to answer these questions.

It's important to look at this project as speculative, research-based project that gets some resolution and completion. In retrospect, this project is perhaps an instigation to explore the ideas of what the future of collaboration holds, both of the framework, and the spaces it might be practised in. The project also spawned a new source of funding for the studio along it's journey, which goes to show that even hard research makes for a credible output.

Collaboration Toolkit + Greenhouse Spaces

A paved path leads through a dense, lush green forest. The path is flanked by thick greenery, including various trees and bushes. A utility pole stands on the left side of the path, with several wires extending across it. The scene is bathed in bright sunlight, creating strong shadows on the path.

Greenhouse v3.0

Contents

1.0 Introduction	10	2.0 Collaboration Manual	37
1.1 Acknowledgements	12	2.1 Context	39
1.2 National Institute of Design	15	2.2 Greenhouse Structure	41
1.3 Exhibition Design	19	2.3 Collaboration	43
1.4 Graduation Project	19	2.4 Initial Research	45
1.5 Sponsor	25	2.5 What are Toolkits?	46
1.6 Guiding Forces	29	2.6 Narrative Part.01	51
1.7 Project Brief	31	2.7 Hacking Toolkits	52
1.8 Project Timeline	33	2.8 Toolkits	56
		2.9 Re-Brief	58
		2.10 Re-Narrative	61
		2.11 Draft One	62
		2.12 Primary Research	64
		2.13 Toolkit Crisis	68
		2.14 New Direction	71
		2.15 Final Form	75

3.0 Greenhouse Spaces	87	4.0 Conclusion	195
3.1 The Brief	89	4.1 References	198
3.2 What is VR?	90	4.2 Citations	200
3.3 Developing for VR	94	4.3 Colophon	202
3.4 Photogrammetry	101		
3.5 First Sketch	110		
3.6 EyeMyth Festival	113		
3.7 Bambaiyya VR	117		
3.8 Digital Heritage	120		
3.9 Futures Lab Prototype	125		
3.10 Greenhouse v3.0	128		
3.11 Greenhouse Spaces	140		
3.12 Final Build	148		
3.13 Feedback	192		

Part.01

Introduction

Where do I start? When do I end? There's just so much to talk about! I think it'd be best if I explain the whole journey with the help of an anecdote.

It was my first day in Goa. I landed at the airport, and took a taxi to the studio, where Ayaz was waiting for me, to show me the studio and the place I would be staying at. I was excited for the months ahead, and even looking forward to the ambiguous nature of the project. I arrived at the studio, met Ayaz, and had a look at the studio. Then, it was time to head to the place I'd be staying at. Ayaz loaded my bag into his already packed car, handed me the keys to a scooter, and nonchalantly asked me to follow him. I took the keys from him, and walked to the scooter he pointed at. At this point, I should mention that I had never driven a scooter before, and the thought of driving two-wheelers terrified me. I had only ever driven cars till that point, so I had no idea how a scooter worked. Stunned at the prospect of having to drive a scooter, in a place I had never driven at before, I looked back at Ayaz, who had already clambered into his car and started his engine. Consigned to my fate, I pushed the scooter into position, and sat on it, trying to decipher the buttons. I twisted the keys into the slot, held the brakes, and gingerly pressed the ignition. The engine whirred into life with what felt like a frightening rumble. The car ahead was already moving, and had turned into the main narrow road of Socorro. I was not keen on losing my bearings on a vehicle I was unfamiliar with. I threw caution to the wind, held on for dear life, and twisted my right wrist. The scooter leaped ahead, and I just about held it steady. Suddenly I found myself driving a scooter. It was a short drive, but as I

guided the scooter along the narrow road brushing against the foliage on the sides, my confidence grew. I understood what the controls did, how the brakes worked, how to turn, how to indicate. By the end of the journey, I had enough faith in myself to attempt to drive it again. It was stressful, and nerve-wracking without a doubt. But worth every anxious second as I took on something unfamiliar and lived to try it again.

The project in more ways than one, mirrored this experience. I came to the Greenhouse, expecting to learn something new, and to challenge myself. I chose to tackle two subjects I was unfamiliar with, and to work in an environment which was not only new for me, but also for all the partners working in the studio. It was something we were all trying to figure out as we went along. Although the ambiguity was unnerving for me, I soon understood the framework of working in such an environment. **As a predominantly left-brained thinker, I revel in structure and logic. The Greenhouse was anything but, and I felt uncomfortable, even anxious initially.** I took it as a challenge to learn how to work in such a setting, and embrace the serendipity of it all. The moment I stopped trying to fight, all the pieces started falling into place, and I could concentrate on my work, and enjoy the process.

The Greenhouse being a new experimental collaborative studio, the partners wanted someone to come on board and assess the best practices for collaboration, which they could learn from and apply to their practice. I was excited by the idea of method toolkits, hence we decided to work on a toolkit for collaboration. We also wanted to

see if there could be a spatial output from the same, which may sound strange, and it probably is. **But the Greenhouse was set up to explore these strange relations, and as space for experimentation.** The process of making the toolkit evolved through multiple iterations, and the very idea of a toolkit was questioned. The challenge to create a spatial output from this took a very interesting detour into the world of VR. Learning a new medium was challenging, but something I loved exploring.

The Greenhouse is not only a studio but an active space used for workshops and events by the partners. As the intern and one of the only permanent members of the studio, I was involved in all these workshops in various capacities. While some of them may not have contributed to my project, others have had a big impact on the outcome. The advantage of having multiple studios is that I get to interact and participate in various events, which was not only a lot of fun, but a great opportunity for me to meet new people, and to get feedback on my project.

Just as my confidence driving the scooter grew over time, my self-confidence, and quality of output grew over time. It was a lot of work, but I would gladly do it all over again.

Acknowledgements

National Institute of Design for the bittersweet memories. I've learnt a whole lot from the professors and students here. Thankful to everyone I've ever interacted with, juniors and seniors alike.

Exhibition Design for the last three years. It is without doubt one of the leading disciplines of NID, and I'm glad to have been a part of the journey. I remain indebted to the professors, and students for making the studio such an exciting place to work in.

The **Exhibition Design Batch of '13** for one hell of a ride. We've had our ups and downs, but I am forever grateful for the journey we've had together. I would do it all over again in a heartbeat.

Tanishka and **Mayank** for their advice, and for the opportunities that they have given me. Without them, Exhibition Design would not have been what it is now.

Praveen Nahar for helping me tackle the unfamiliar domain of toolkits. His advice gave me confidence and belief in what I was doing, which helped me immensely in this project.

Neha, Rikta, and Kapil for their feedback and guidance at different stages throughout the project. They played an instrumental part in my learning process.

Yuvraj Jha for his unsolicited feedback, colourful vocabulary, and insightful conversations. His mutton curry will be dearly missed.

Hugo for showing me the way forward when I needed it the most, and for being a fellow French rap connoisseur.

The entire team at **Quicksand** for making me feel at home so quickly. I enjoyed every minute of my time working at the Delhi studio. Never have I worked with so many talented people in one place.

Urvashi Aneja for involving me with Tandem, and pointing me in the right direction when needed.

Pluto for being a good listener, and for taking me on long walks in the morning.

Yash and **Yasha** for indulging me, and forcing me to get out of work. I will forever be apprehensive of getting in a vehicle with either of them at the wheel.

Tarangini Jindal for her cutting feedback, and ability to see through my project. She enabled me to see my project through a fresh perspective, which gave me a better understanding of what I was trying to do.

Ayaz Basrai and **Avinash Kumar** for giving me this opportunity. I'm still not quite sure how this project came about to be, but I can only hope I haven't let them down. I've never learnt as much as I have in the last year. I'm very grateful for all the guidance, and the doors they've opened for me.

Meghana, Shambhavi, and Oishee for making the process of documentation a delight. It could not have been a more joyful experience. Time simply flew by.

Gerald Gillium for inspiring a strong work ethic in me through his music, and **Galimatias** for helping me unwind. He also gave me his blessings to use his music for my project, which I'm grateful for.

Mudita for her lovely letters all the way from Israel. They were truly wonderful.

My **Family** for supporting me on this journey, and encouraging me to take the road less travelled.

Thank you.



*Design Panorama,
National Institute of
Design*

GRADUATION PROJECT

National Institute of Design

The National Institute of Design is internationally acclaimed as one of the finest educational and research institutions for Industrial, Communication, Textile and IT Integrated (Experiential) Design. It is an autonomous institution under the aegis of the Ministry of Commerce and Industry, Government of India. NID has been declared '**Institution of National Importance**' by the Act of Parliament, by virtue of the National Institute of Design Act 2014.

The establishment of NID was a result of several forces, both global and local. The late 1950s saw a confluence of these forces, and this time would be a significant one for Indian culture and education. This was a time of reappraisal and reconstruction in a newly independent India. A young nation was confronted with the mammoth task of nation building, of balancing age old traditions with modern technology and ideas. The Modern Movement, the philosophy of Machine Aesthetics, and revolutionary experimentation in the arts, architecture and design were all taking place at the same time. There was a search for the Indian identity across all aspects of life. The mandate for NID is to offer world-class design education and to promote design awareness and application towards raising the quality of life by and through.

NID has taken five decades of pioneering hard work by the academic community at the institute to develop a system of education which lays more emphasis on learning than on mere instruction. Over a span of the last 50 years, **the institution has made it a point to lay emphasis on learning and to pursue innovation led designs through the development of the mind and skills of designers.** This technique has motivated students to perform better and has given them an edge over other design professionals. The institutes's client servicing team facilitates students in getting involved with real life projects, which in turn adds value to the upcoming professionals giving them a taste of actual situations.

It felt like home.

The entrance exam for the admissions didn't go well. I had naively assumed it would be simple. A nice break from the engineering exams I had been giving all month. It was a fun paper to attempt, so no harm done. I remember it being a lovely foggy day in Delhi. I didn't even remember to check the NID website to see if I had been selected for the studio test or not. It was only when my ever hopeful mother looked up my results did I know.

I had been visiting colleges and universities in the last few months of school, and I didn't like any of them. They all felt alien and distinctly uncomfortable. I wasn't expecting much from NID either. But from the moment I walked through the gates, I felt the most familiar of sensations washing over me. It felt like home. The red bricks reminded me of my childhood, and the place just felt right. **It was then that something changed within me.** I was now no longer hoping to want to study here. Now I really did want to come here to study.

The studio tests were a lot of fun to solve, and I enjoyed every minute of solving those challenges. Come the interview, my nerves were calm, I walked into this bright, sunny, yet chilly room, with a mix of equally beaming and cold faces awaiting me. The interview started off well, and interestingly I

was heavily questioned on my robotics work and science projects. The last question put to me was, "*Do you have any questions for us?*" I asked, "*Why me? What do you see in me? I can't draw very well at all, yet I sit here in front of you.*"

The amused reply was, "*We know better.*" I gathered my things to walk out of the room and promptly proceeded to drop everything I was carrying.

Since then, **I have dropped many more things and made a considerable amount of mistakes.** Luckily, I was in the best place to make mistakes. NID has been instrumental in my intellectual and personal growth, affording me the luxury of learning from my mistakes in a safe environment. There have been many lows during my time here, but there's a certain **magic**, a spell that binds me to this place.



The Exhibition Design Studio

Exhibition Design

Exhibition Design is a synthesis of **multiple design disciplines** that come together to communicate objects, information and ideas across a range of three-dimensional environments. Simply understood, it means **communication and storytelling through environmental experiences** that inform, entertain, and inspire. The discipline considers the exhibition from the perspectives of communication, design and fabrication that involve a mastery of spatial planning, image manipulation, narrative, colour, lighting, and multimedia, and working knowledge of structures, typography, combined with an understanding of audience and human factors, to shape storytelling experiences across multiple exhibition venues. This can include staging of representative and experiential spaces; interior-design environments and for festivities; museums, galleries and trade exhibitions; and cultural and theatrical events.

In a country that is becoming rapidly urban and metropolitan, Indians increasingly find themselves having to navigate through vast buildings, concrete cities and massive transport hubs, but there is a distinct lack of communication design (signage / way-finding) guiding them on their way.

Too often, these spaces are designed with little empathy for users, and this is where exhibition designers can contribute to these public spaces by bringing an overall perspective of spatial communication to the table. Exhibition designers create experiences that are physical but also emotional and psychological and this is where they have something extremely unique to offer.

The aim of the discipline is to equip students with an understanding for planning of built or open spaces to provide an appropriate environment for communication, and to create a contextual experience that supports communication interpretation of ideas to audiences by creating a multimodal and multi-sensory experience.

**The decision to opt for
Exhibition Design was
perhaps a calculated
risk, but a one that
has paid off.**

The last four years at the National Institute of Design have played an instrumental role in my life, to say the least. **I have grown in more ways than one, obtained more than just a design education, and made connections that will hopefully last me a lifetime.** Make no mistake, it has been thoroughly challenging and has developed a work ethic in me that I'm confident will do me good in the years to come. I have come to appreciate the value of working hard, and to enjoy challenges. The thrill of tackling a difficult design project is one that I have not yet found a replacement for, and I take great joy in going through the motions of the design process.

My path to engineering had been chalked out, with my love for logic and science. But ever since design made my head turn, I haven't looked back. The chance to work on such a variety of problems is what convinced me to pursue design. I realised that I didn't want to study engineering or science, but I wanted the rigour and the precision that came along with it. My approach toward design has always been functional and calculated.

The decision to opt for Exhibition Design was perhaps a calculated risk, but a one that has paid off as I feel it offers a very well rounded design education and has prepared me for the future. The **cross-disciplinary**

approach of the curriculum has been particularly exciting. The opportunity to work on a wide variety of projects and with people from around the world is something I am thankful for. The three years I spent in the exhibition design studio made me aware of the element of magic that comes with design. That **little bit of magic** that can delight the user, or surprise the audience. It made no sense to my logical minded brain. But it was only a matter of time before I was enamoured by this magic, and sought it out in whatever I worked on. The emotional aspect of design is also crafted with sound rationale, and hard logic, yes. But it's the approach toward design that **has changed from simply creating solutions to crafting experiences and stimulating emotions.**

My outlook toward design will no doubt change over time, but I'm glad to see progress in my approach to work.

**It was imperative that
I work in the right
place, and with the
right people to ensure
that I learn as much I
possibly could.**

Graduation Project

The end of the students' academic tenure at the National Institute of Design is marked by the culmination of a substantial investigation in the field of design on a topic closely allied to their discipline of study. It is through the graduation project and subsequent documentation of the same that this investigation takes place. This is the final academic project for the student. A jury comprising faculty members evaluates the students' performance in the graduation project, after which, students are awarded NID's professional education programme final graduation. The graduation project is an opportunity for students to demonstrate their expertise as independent practitioners of design. However, this project must be done with academic rigour incorporating systematic inquiry and informed design decisions. The phrase 'systematic inquiry' implies the presence of a structure and method by which the student must carry out his/her project.

I had started planning for the graduation project from a long way back. The graduation project is, to put it mildly, a Big Deal. I didn't know whom I wanted to work with, or what I wanted to work on. I had **never before worked in a design studio**, and I didn't know what to look for. All I knew was that I wanted to work on something I hadn't worked on in my last four years of college and to **work outside**

my comfort zone. It had to be the perfect place for me to evolve from a student to a working professional. I wanted to get involved in something that would **push me to work hard** and learn as much as I possibly could

I reached out to studios in the summer of 2016, trying to find opportunities for my graduation project.

One studio which particularly caught my eye was Quicksand Design Studio. One of the projects that they were looking to work on was to make a toolkit to encourage DIY culture in the schools of NCR. I got in touch with them and started a conversation which subsequently didn't go anywhere as the project was eventually cancelled. But the thought of working on method toolkits struck a chord with me, and the more I looked into it, the more it appealed to me. I hadn't worked on toolkits before, and it seemed to like an intriguing prospect.

A few months later, I heard of a new studio in Goa, which The Busride and Quicksand had opened together. I got talking with Ayaz and Avinash, and an opportunity presented itself serendipitously. The Greenhouse is a collaborative studio, one of the first of its kind in India, and the partners wanted

someone to figure out the best practices for collaboration that could help them run the studio better. Not only that, but the studio was looking to explore mixed reality mediums such as Augmented Reality and Virtual Reality. These are the mediums of the future, and to look at them from a spatial design perspective seemed like a particularly interesting challenge.

Eager to get started we quickly agreed that the final outcomes of the project would be a toolkit to help foster collaboration, and a spatial output would follow, perhaps in VR if possible. It was a very exciting offer that I couldn't refuse. **The unknown was foreboding, but fascinating.**

GREEN HOUSE

THE **BUSRIDE** LAB

 | TANDEM
RESEARCH



Sponsor(s)

Perhaps, quite fortunately, I have three sponsors, instead of just the one. The Greenhouse with it's three partners supported my project, which allowed me to get very different viewpoints on my project. It has also put me in touch with many different people and given me access to opportunities I would never have gotten otherwise.

Here are the three partners of the Greenhouse:

Quicksand is an interdisciplinary consultancy. We facilitate the creation of meaningful experiences through design research and innovation. Our practice builds on inspiration and insights from the 'experiential reality' of people - whether they be users, stakeholders or clients. We are investigators - exploring the marvellous complexities of human systems. We are instigators - pushing a collaborative agenda for a vibrant articulation of the same.

Quicksand is globally recognized for it's expertise in user-centered innovations for emerging markets. Our work supports organizations in envisioning programs, products and services that are future facing, disruptive, and yet rooted in principles of user centred design. Led by *Avinash Kumar*.

The **Busride Design Studio** provides spatial solutions ranging from the mildly eccentric to the totally insane. It is an independent design studio specializing in the design and creation of built environments, ranging from Hospitality and Entertainment venues, to Film and Production environments, and from Exhibitions and Temporary installations, to Institutional environments. We are a small team of Architects, Interior, Graphic, Exhibition and Industrial designers, who pride ourselves in looking for solutions from the macro to the micro and across disciplines, allowing us great flexibility in our approach to projects. Led by *Ayaz Basrai*.

Tandem Research is a multi-disciplinary research collective generating policy insights at the interface of technology, sustainability, and society. We believe in finding iterative solutions to real world problems through evidence based enquiry and public engagement. Led by *Urvashi Aneja*.



The Greenhouse, on a sunny day

Greenhouse

A hybrid space at the intersection of new cultural activity, alternative education and market dynamics - this was the vision for Greenhouse, a community space co-founded by Quicksand and generously funded by the Goethe Institut in 2010. Located in the picturesque and culturally apt Hauz Khas Village—it was a space that operated as a catalyst, incubator and showcase for new cultural enterprise; a space for expanded education; and as a social node for new cultural activity. It represented a new, conceptual model for the creation and sustenance of independent, creative enterprise. By connecting education, independence, creative practice, commerce and social networks in India, the space worked as a facilitator or platform for stakeholders representing current and emerging socio-cultural expression.

Unfortunately, the year long experiment that seemingly failed more than it succeeded. In spite of it being partly funded by the Goethe-Institut, it was inefficient, hard to resource, hard to programme, lacked participation and interest from the partner studios and eventually had to be shut down when the term ended.

However, through the few honest experiments that we had the good fortune

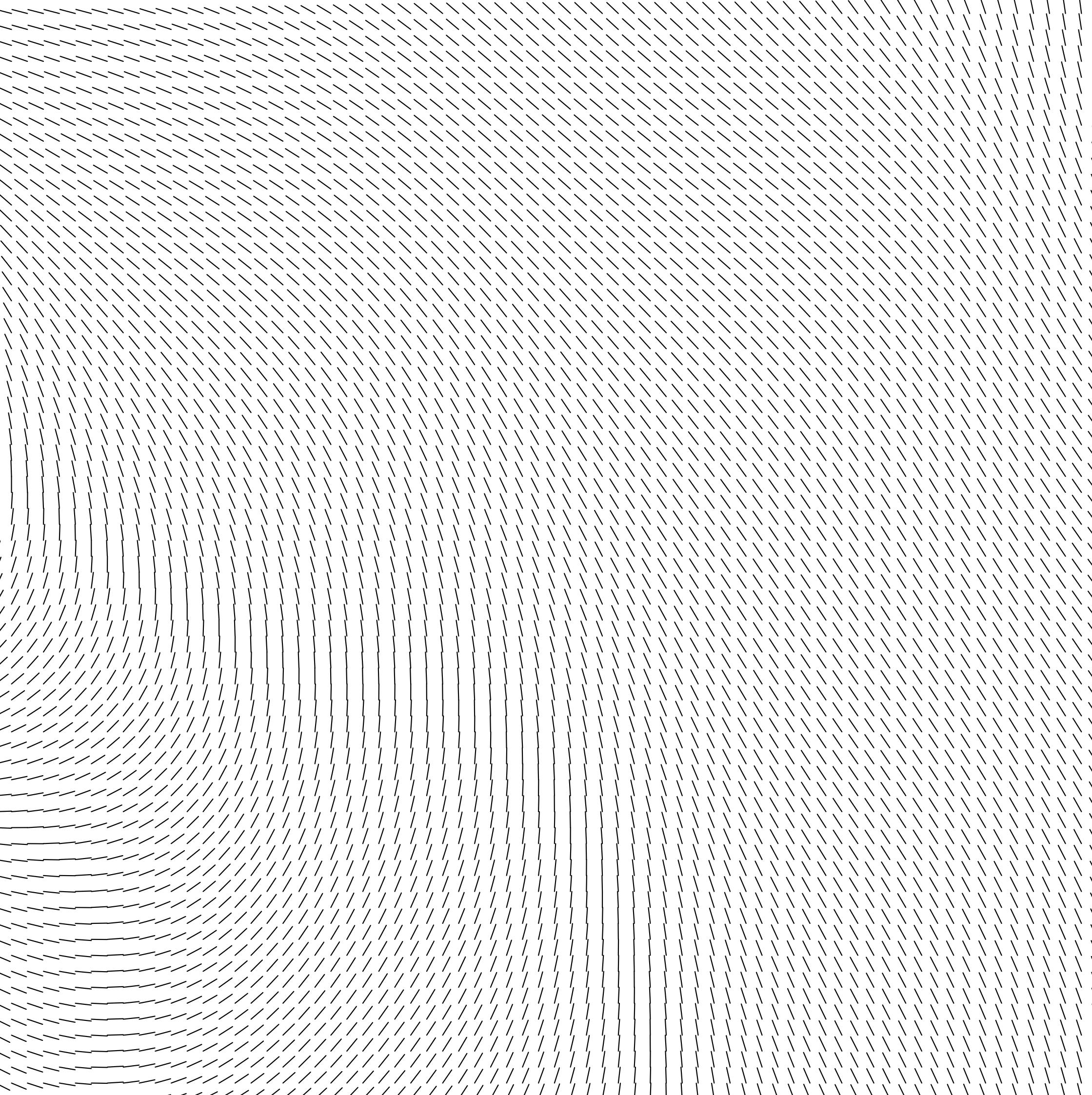
to distil, and untouched by the mess of practicality, grew two magic sprouts - one was UnBox, and we know now how magnificent that tree can become; while the other, was an unheralded, runt of a sapling - barely noticed in the rubble, barely tangible in fact, and somewhat embarrassed. And yet it was the home of a kindred spirit that *facilitates native enquiry and expression*, and brings with it camaraderie, gentleness and wholesomeness.

In 2016, there is a push to try and resurrect this spirit, as make another giant leap towards independence by proposing another bespoke, cooperative framework for creative practice. This time, it will be a different fate. Located in the quiet village in Socorro in the northern part of Goa, the studio is nestled in a hillock, next to a small chapel. The partners involved in this new collaborative setup are **The Busride, Tandem Research, Quicksand**.

The Busride Lab explores work at the intersection of Art, Design and Architecture with a healthy disrespect for sanity. **Quicksand** will be migrating a few of their more tangential projects, like the ongoing Antariksha Sanchar video-game, and other Arts and Humanities inquiries to the new space. This Lab, like the work of both studios and their respective founders,

puts research and experimentation at the centre of its practice. Even though Mumbai and Delhi, two of the biggest metropolitans in the country, stretches ones creative boundaries with the multiple opportunities and inspirations they offer, they also squeeze pockets due to the dearth of affordable spaces to experiment in, therefore cramming up one's creativity. Hence a move to a quieter place that gives one more liberty of space seems wise.

As the Greenhouse goes through its first few months since its birth, work happens with the same zeal and at the same pace as before at the respective studios of Quicksand in Delhi / Bangalore and The Busride in Mumbai.



Guiding Forces

I was very fortunate to have so many people help me along this journey. Without them, I wouldn't have been able to get to where I am now.

My guide at NID, **Praveen Nahar**, the co-ordinator of Product Design graciously agreed to guide me on this project even though he knew I was going to be fighting an uphill battle. Meetings with him were very insightful, and calming. He gave me the confidence I needed to continue working even with my handicap of never having worked in the domain of toolkits before.

Tanishka Kachru, the co-ordinator of Exhibition Design, encouraged me push my own boundaries, and explore new spheres of design. Her guidance on transferring my knowledge and experience of spatial design into the digital realm was especially helpful.

Urvashi Aneja, the co-founder of Tandem Research was always on hand to advise me on how to write better, and structure my thoughts.

Tarangini Jindal, an independent design practitioner, and the creative mind behind the upcoming Museum of Curious Imaginings could see my project for what it was, and her no-nonsense

approach toward design gave me a clear understanding of what I was working on. Those monthly feedback sessions with her were crucial.

Neha, Kapil, Hugo, Rikta, and members of the Quicksand studio in Delhi were very forthcoming in helping me with the collaboration toolkit, and their references went a long way in my comprehension of toolkits.

Ayaz Basrai, co-founder of the Busride, and **Avinash Kumar**, co-founder and partner of Quicksand, without whom none of this would have been possible. There were always available for me to call upon, and their drive and passion has been an instrumental factor in this project. Every feedback session was masterclass in design, and working with them was a revelation. There was never a dull moment, and they were extremely supportive of my extra-curricular activities. Their feedback showed me possibilities I hadn't thought of before, and this was the biggest takeaway from the experience. They worked hard to ensure that I was always learning something everyday, pulled strings to open doors, and gave me more than enough space to function. I could not have asked for a more fulfilling internship.

Graduation Proposal

Salil Parekh :: S1300070 :: B.Des Exhibition Design 2013

Guide

Praveen Nahar

Working Title

Understand the grammar of collaborative creation and create a framework to help set up indie studios in India

Sponsor

Quicksand India

Project

The grammar of collaborative creation is the manner in which people work together to create something. This grammar directly influences the outcome of the collaboration. If this process were to be deconstructed and looked at, the learnings and insights would lead to a more productive collaboration. What would enable fruitful collaboration between a potter and a poet? People from different background think differently and have varied thought processes.

The project is broken down into three parts. The final 6 monthly project is punctuated with monthly and weekly projects which will feed off each other and contribute to the final project. The smaller weekly and monthly projects are not necessarily linked to the final outcome which will serve to get more varied learnings to feed back into the larger project.

The final deliverable of the project will be a toolkit to encourage collaborative creation, and a framework to help set up indie studios in India. A space will also be designed, incorporating the learnings to create an ideal collaborative studio.

Alongside the final outcomes that will be worked on, other responsibilities will also include documenting the work done by the studio, amongst other tasks for the studio and collaborating on projects done by fellow studio mates. There will also be work required towards organising the Unbox festival.

The first four months will go into research, and last two will be demarcated for execution and testing of the final outcome. The timeline is flexible and can be changed according to how the project progresses.

*gmanek
(Praveen Nahar)*

*Copy of the original
proposal submitted at
project registration*

Project Brief

The brief for the project was not set in stone because we were still trying to understand what my role in the studio was, and how I could contribute. The proposal was formulated in the early days of the studio being formed, and the partners were still figuring out what they wanted to do in the new space. However, we did agree with the fact that I was to evaluate the nature of collaboration at the studio. The goal was to research and put together a list of good collaborative practices which could be used by the studio to help make the process of collaboration much smoother. Since I was going to put together a list of best practices, it seemed like a good idea to make a toolkit for collaboration, and create web and print ready versions which could be distributed and used by other indie studios in India looking to set up their own collaborative practices.

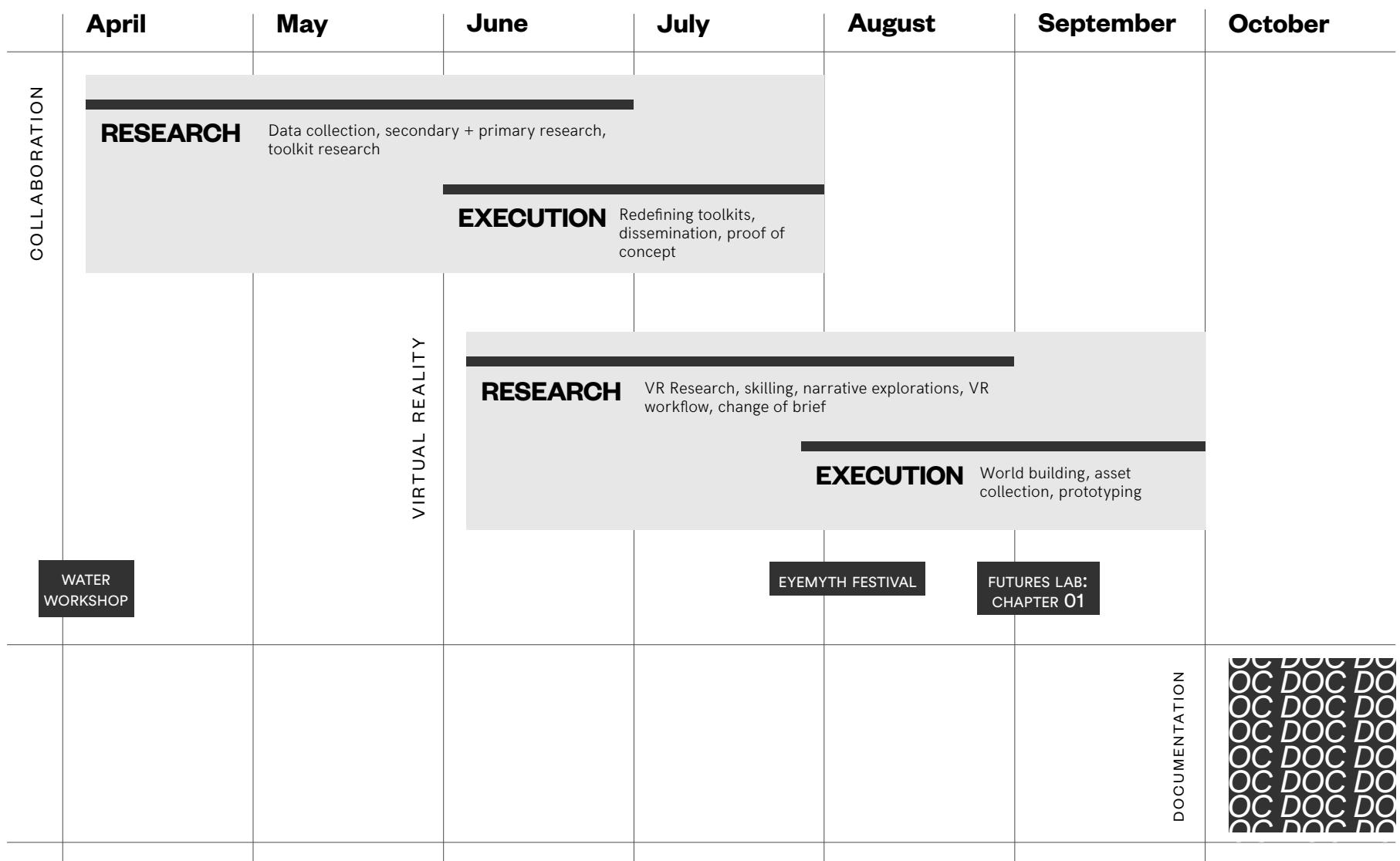
The prospect of working in VR was just a possibility when the brief was discussed, but we saw potential in extrapolating a spatial output from the learnings of the collaboration toolkit, which would be a good outcome of the project. Initial thoughts centred around the idea of designing a collaborative studio that fosters collaboration.

As the studio matured over time, and the partners refocussed their aims of their practice in this studio, the brief was also modified to suit the re-positioned goals. As I was right there, and a part of the maturing process, I too could slowly shift from the original brief to the new one. The studio and I both full well knew that the brief would change over time, but it was important to also acknowledge the fact that I was here to finish a project, so we had to balance the changes in the outcome and the need to fix on something certain so that I could finish a project.

In essence, there were two projects:

The first, make a tool to help facilitate the process of collaboration.

The second, to create an ideal space to collaborate in virtual reality.



Project Timeline

The actual timeline of the project is *quite different* from the one proposed in the project proposal. The project was originally supposed to start in February, but due to a number of reasons, the project actually started off in April. I was due to participate in the final round of the Honeywell Aerospace Design Challenge in February, and it was with much difficulty I found a place to stay in the same remote area as the studio.

Although the project started late, we stuck rigidly to the six-month schedule planned out. I was tackling two whole **new subjects** that I had no experience in, so we couldn't set precise timetables for either of the projects. There was no crossover point for ending one project and starting the other. So there was a period of time where I was juggling both projects at the same time. Combined with the two main events that happened at the studio, EyeMyth Media Festival, and the Futures Lab workshop, a lot of work happened at all points of time, with no clear demarcation.

This was partly because there was no set process available for us to follow. We set out to do something that was unfamiliar to us, and we figured out the process along the way. We followed the basic skeleton of a design process: Research, Iterate, Prototype. We learnt what we could on the fly, and added to our process as we went along.

In retrospect, **the process was haphazard**, and we adapted on the way, taking new directions where we felt was appropriate, based on feedback and discussions. A lot of focus was directed toward research and experimentation, and although we did make some changes mid-execution, the bulk of the work was based in the research stage.

We had planned out a hectic timetable, which would involve me doing smaller community-based projects every week, and take one of those projects to a month-long schedule. Although we were able to follow this busy plan for the first few months, we eventually had to let go of the smaller projects to concentrate on the bigger project at hand. It was a lot of fun starting those smaller projects, but with not enough time to complete them, all I was left with was the basic proof of concept and no execution. In theory, it was a great idea, but in practice, it didn't work for a number of reasons. My unfamiliarity with the remote place and its surroundings meant that I was handicapped when it came to making things. The lack of trust from the community in the village was a bigger hindrance, as I was yet to become a familiar face.

A months time was allotted to the documentation of the project.

what i have done

The first slide for every progress presentation had these words, "*what i have done.*" Often mistakenly read as "*what have i done*", it was a running joke that continued throughout the duration of my project, that it was secretly a plea for help, bemoaning the fact that my project was bogged down and I was going to be stuck in the studio till kingdom come.

It's only apt that I start the story of my project with these words.

*Collaboration is not about gluing
together existing egos. It's about the
ideas that never existed until after
everyone entered the room.*

-unknown

Part.02

Collaboration Toolkit



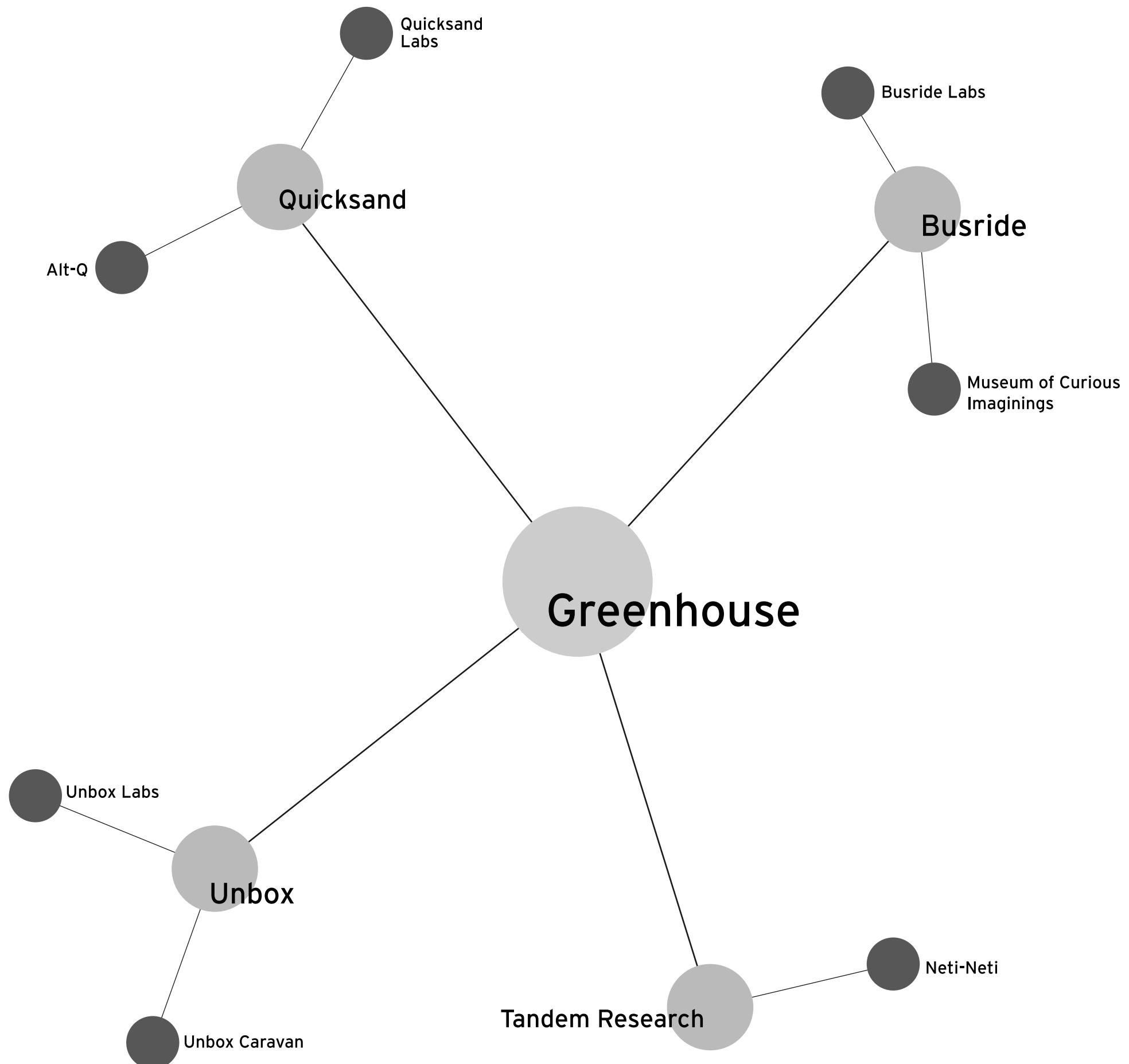
Context

When I first started the project I couldn't quite comprehend just how much I had to cover. What at first felt manageable, and simple, very quickly inflated to something that became difficult to handle. The process of making the toolkit felt convoluted and confusing. There were times at which I felt everything that I was doing was worthless and baseless. We went through three iterations to finally arrive at what we felt was a satisfactory solution. Not only was the validity of toolkits questioned, but also the *very premise* of the toolkit itself.

To put the project in context, it's important to explain why the project was conceptualised. Quicksand and The Busride, two well-known design studios in India, decided to set up a design studio in Goa-together. The reasons for coming to Goa are multi-fold, and compelling. But what is unique about this is that they decided to work in the same space, and aimed to work on projects together. A **collaborative design studio**. This was something new for both of them. Although both these studios have had their fair share of collaborations, and also have worked with each other, this would be the first time that they would be so close together. Both entities still had their main offices in Delhi, Bangalore, and Mumbai. Just like any new venture, it took some

time for the studio to settle down into a rhythm. Both studios were still finishing off work at their main offices, and trying to bring new work down to the new studio in Goa. In the midst of all this, I was brought in as an intern to find out the best practices for collaboration, that they could then adapt and use. Observe, research, and create a framework or a toolkit that the studio could use.

The planned output for this project was to create a toolkit that could be used by the studio, as well as be distributed online and in print. The second part of this project would be to use the learnings from the collaboration manual to conceptualise and design a space.

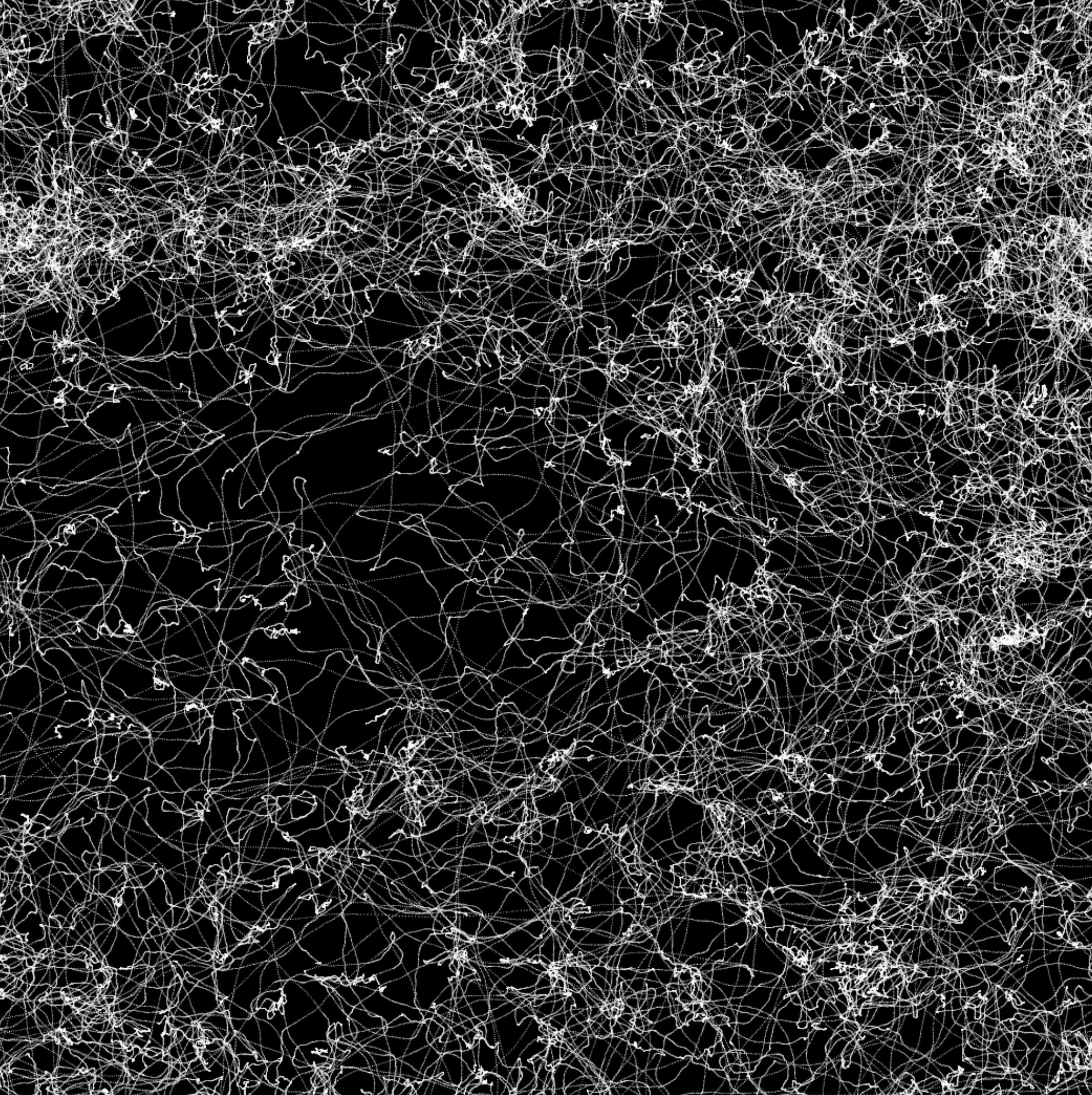


Greenhouse Structure

The Greenhouse is an experimental collaborative venture between three partners, Quicksand, The Busride, and Tandem Research. Each of the partners has chosen to bring over some part of their practice from their main studios in Delhi/Mumbai/Bangalore.

This is the map of the various studios and the parts of the practice they bring to the Greenhouse. The partners hope that interactions between the various factions will bring about serendipitous interventions that will benefit all involved.

To create a toolkit, or a manifesto that will help the partners collaborate with each other, I would be useful to first map out all the entities involved in this collaborative effort.



Collaboration

What is collaboration? **The action of working with someone to produce something.** We, as humans are very familiar with the act of collaboration. We've been collaborating with each other in one way or the other, since the inception of our species. It's becoming increasingly rare to see any sort of activity in isolation. Collaboration is the primary building block of civilisation, and arguably it might be one of the attributes that made us the dominant species of planet Earth. Collaborating with our fellow humans is what enabled us to evolve. It's an ever-present undertone of our society, a given in any venture.

The act of collaborating is not only normalised, but now expected from any activity we partake in. The statistics back this statement up as well. **In the 1980's, only 20% of the work was collaborative. In 2010, that number had gone up to 80%.** The wave of collaboration has since grown into a tsunami, not only embraced by smaller businesses, but by larger corporate setups as well. It's not only collaboration within organisations either, but also across disciplines that go a long way to validate why they make so much sense.

During my time at NID, I've been heavily involved in collaborations, for both academic and co-curricular activities, and during this time I had never paid attention to the very act of collaborating. The grammar of a collaboration directly influences the outcome of the collaboration. If this process were to be de-constructed and looked at, the learnings and insights would lead to a more productive collaboration.

For this project, we decided to combine secondary research, along with activities, and workshops in the studio to form our opinions on the best practices for collaboration. By applying what we learn from secondary research into workshops and experiments within the studio, we would obtain good data on whether certain practices work or not.



what is collaboration?

- what is collaboration diagram
- what is collaboration in hindi
- what is collaboration software
- what is collaboration tool
- what is collaboration agreement
- what is collaboration in software engineering
- what is collaboration in business
- what is collaboration skills
- what is collaboration technology
- what is collaboration in sharepoint

Google Search

I'm Feeling Lucky

Initial Research

Where do I start looking for good collaborative practices? As it turns out, there's plenty of material out there on the internet about collaboration. **Collaboration has become a buzzword**, on the same plane as "*innovation*", "*disruption*", and "*out of the box*". With collaboration becoming ever more vital to an organisation's quality of work and hence the bottom line, it's no surprise that it has become a part of corporate jargon and thus commands considerable real estate online. None of this is to belittle the phenomena of collaboration. In fact, it just goes to show *how potent* collaboration is, and how it is universally accepted as a positive force to any sort of work.

There are many articles across the internet, with information on how to help collaboration within organisations. But there are very few resources available that ties up all sorts of insights together in an easy to access package that helps explain the process of collaboration.

The first problem I faced was to process the vast swathes of data available and how to extract the insights from them.

IDEO, **Harvard Business Review**, and blog posts by veterans of collaboration were rich sources of information and insight. But how could I get the **relevant data** that

I needed from the material available? Instead of refining the data from the research phase, we decided to first work out a narrative for the toolkit that we wished to develop.

Of course, the first issue with this strategy is that I had no idea how toolkits worked, so a crash course in toolkits was necessary first.

What are Toolkits?

Toolkits are exactly what it says on the tin. **A kit of tools, designed to help the user with the task at hand.** A method toolkit is a collection of exercises and activities designed to propagate knowledge and scale impact of the same. Research and experiments conducted in one place are usually packaged into a toolkit in an attempt to replicate impact at scale.

Toolkits are very good at breaking down an activity, or a problem into multiple steps that are easier to comprehend and tackle. By making a seemingly difficult process easy to understand, it simplifies the course of action required. Once the process becomes easier to follow, users are more likely to follow through, and be successful in their task.

All the toolkits listed here follow a certain narrative that helps the user understand the process. For the collaboration toolkit, I too will have to formulate a narrative to present the insights that I gather.

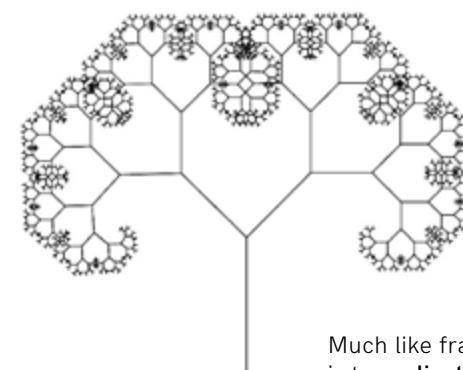
toolkit
noun

a set of tools, especially one kept in a bag or box and used for a particular purpose.
• Computing a set of software tools.
• a personal set of resources, abilities, or skills: intuition developed from past stock market experience becomes a vital part of an investor's toolkit.

I have never before designed a toolkit, so this was a new area of research for me. By first understanding how toolkits work, I can then plug in my learnings from the collaborative practices to the requirements of the toolkit.

The first thing I did was to find impactful and widely used toolkits, and then try break them down to see what makes them tick. I also looked at other toolkits, apart from traditional method toolkits.

Instead of teaching a man how to fish, a toolkit attempts to teach a man **to teach himself how to fish.**



Much like fractals, the aim of a toolkit is to **replicate knowledge**, and **scale its impact**.

The Collective Action Toolkit, by Frog
Design for example, breaks down the process of collaborating and creating solutions for issues affecting a community. The steps are explained with the help of suggested activities, diagrams, and workshop structures.

COLLECTIVE ACTION TOOLKIT

Part of frog's commitment to social impact, the Collective Action Toolkit is a set of activities and methods that enables groups of people anywhere to organize, collaborate, and create solutions for problems affecting their community.

frogdesign.com/CAT

MAKE CHANGE

What is this toolkit?
The Collective Action Toolkit was created to help bring groups together to accomplish a shared goal. It consists of an action map and activities six areas. These areas offer different ways to develop solutions to make change happen in a community or organization.

Why do people use it?
Many groups are looking for a creative process to help them solve challenges. The CAT provides a framework that offers guidance just when you need it. Your team can decide exactly which activities you need on your own terms.

When should I use it?
No matter what size of problem you're looking to solve, the activities here can help your group investigate and generate solutions for community problems. For example, you might use it to help ensure you get access to healthier food, reduce how many people are becoming sick because of an infectious disease, construct a new building, or start a small business.

What do I get?
The CAT gives you an accessible process to help your team make change happen. Whether you use one or all of the activities, you get to build skills, gain knowledge, and generate solutions for your community. You'll learn how to work together, improve your skills—critical thinking, listening to others, asking better questions, generating ideas, creating better stories, and inspiring and sustaining collective action. By bringing together what you know and who you know, you can better support each other in your group and beyond.

Who does it work for?
We've heard from designers, educators, non-profit organizations, governments, businesses, and others across the globe. They are using the CAT to build better teams, learn about people's needs and in turn, create better solutions that make a difference in their communities and organizations.

The Collective Action Toolkit

3

CLARIFY YOUR GOAL

Agree on the problem you're trying to solve and what goals you want to achieve. This activity area is critical to your group's success, as your goals may change depending on what you learn here.

CLARIFY ACTIVITIES

- RIPPLE EFFECT** Develop a shared understanding of what your group has to offer—from improving people's lives in your community to changing your country or the world.
- DEFINE YOUR PROBLEM** Define the problem your group wants to tackle and establish key questions to answer along the way.

SUGGESTED SEQUENCES

- Define your goal when your group meets for the first time:

WHAT'S NEXT?

frogdesign.com/CAT

CLARIFY YOUR GOAL / THINGS TO KEEP IN MIND

Keep a visual record of how your goal evolves. Remind your group of their goal and how they're moving towards it by visually documenting the process. Hang things up on the walls, keep stacks of paper with notes, and take photos of your progress and as inspiration for future work.

STICK UP ON THE RIGHT SPOT

Most activities in this toolkit require no more than paper and pens. However, there are suggestions for extra supplies that may help your group use your time more effectively.

BECOME AWARE OF YOUR SHARED VALUES

Openly discuss with your group what's important to you and how you like to work, as there aren't big surprises when you take on big challenges.

ELIMINATE JUNK

Eliminating a Learning Card can help your group to assess what we've learned or determine next steps after each activity or section of the action map.

STATE WHAT YOU'RE HAVING FUN

Things may become very serious while your group is working, so remember to laugh and celebrate along the way. You're accomplishing great things!

WHAT WE DID

Activity names in the order we completed them

WHAT WE LEARNED

Key insights from the activities

WHAT'S NEXT?

Next activity, clarified goal, shifts in the approach

frogdesign.com/CAT

MAKE SOMETHING REAL

You don't know if an idea will work until you try to make it. This activity area will help your group test ideas in fun ways, such as by telling stories or by building versions to evaluate. Experiment with these activities and see what you discover.

MAKE ACTIVITIES

- LIGHTS, CAMERA, ACTION!** Use cameras to capture meaningful conversations to tell a meaningful tale about your idea.
- FOUR SQUARE STORY** Create a visual story, much like a comic strip, that illustrates how an idea would affect people over time.
- WRITE & BLURB** Craft a simple story that explains to other people why your group's idea is relevant, then practice-sharing it with others.

SUGGESTED SEQUENCES

- To communicate your idea:

WHAT'S NEXT?

frogdesign.com/CAT

MAKE SOMETHING REAL / THINGS TO KEEP IN MIND

Express your ideas in many ways. There is rarely one way to best express your ideas to others. Try these methods when you want to share an idea with your group or community: Tell a story. Perform a drama. Sing a song. Write a story down. Draw your idea. Create a comic strip. Make a collage. Use anything you have at hand with the various materials you use to construct your ideas.

COMMUNE TO TEST, COMMUNICATE FEEDBACK

When group members share their ideas with you, tell them two things that you liked about those ideas, and one thing that you felt could be improved. Practice this so everyone in your group feels comfortable.

START WITH LOWER FIDELITY

You'll learn a lot by starting with simple expressions of your ideas, then developing them into the final solution.

SOLICIT FEEDBACK FROM OUTSIDE YOUR GROUP

If your group feels comfortable with it, find time to share your ideas with friends or community members that would give you valuable feedback. Be sure to clearly tell them what kind of feedback you'd like from them.

TIME

45 min. for a group of 5

ROLES

Participants, 1 facilitator

MATERIALS

Poster paper and pens, optional camera, markers, collage materials/photos, magazines, colored paper, stickers

WHERE TO NEXT?

Try another Make Something Real activity, like "Write a Blurb," to shape the story you drew into clear, crisp statements you can share, or "Lights, Camera, Action!"

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MAKE SOMETHING REAL / FOUR SQUARE STORY

Create a visual story, much like a comic strip, that explains how an idea would affect people over time.

FOUR SQUARE STORY

1. Divide the group. Form teams of two or three people, and ask each team to select an idea from a previous activity. The team then decides how to tell a story in four panels about the idea and its impact on the community. What specific challenge do they face? What steps do they go through to solve the problem?

2. Post a large piece of paper on the wall. Have each group draw four squares on the paper. They should write a few words below each square to describe what should happen they are about to draw or collage. Follow the outline included in Step 3.

3. Imagine each square is a picture frame. • First frame: Introduce the characters • Second frame: Describe what happens in the problem and where it happens • Third frame: Show a close-up of one person in the scene and their idea • Final frame: What happens after the character uses it?

4. Share and discuss the stories. Ask each group to read their frame stories. Identify if things are missing in the frames or if ideas could be expressed in a different way.

WHAT WE DID

Activity names in the order we completed them

WHAT WE LEARNED

Key insights from the activities

WHAT'S NEXT?

Next activity, clarified goal, shifts in the approach

frogdesign.com/CAT

PLAN FOR ACTION

Become organized about what each group member is doing to reach your shared goals. This activity area will help your group generate concrete tasks and understand how those actions will help everyone move towards those goals.

PLAN ACTIVITIES

- SETTING AN AGENDA** Identify the immediate challenges your group addresses, then agree on the next steps to take.
- DIVIDE AND CONQUER** Split your group into smaller teams to plan and complete specific tasks.

SUGGESTED SEQUENCES

- To plan what to do next:

WHAT'S NEXT?

frogdesign.com/CAT

PLAN FOR ACTION / THINGS TO KEEP IN MIND

Mark visible what everyone needs to do. Post everyone's tasks where your group meets. Keep a group schedule that shows which tasks have been completed, so everyone knows what progress has been made.

Celebrate small wins

As part of your meetings, let everyone know when the group has accomplished an important task that contributes to your shared goal.

Build a support network

Gather information with your group about the people or organizations that might be able to help out with tasks, in case group members aren't able to finish.

Be willing to adapt

Sometimes you can't predict what will happen. Have the flexibility to change course if you receive new information or something goes wrong.

TIME

1 hr.

ROLES

Participants, 1 facilitator, multiple receivers

MATERIALS

Printer paper and pens, optional: camera, markers

WHERE TO NEXT?

Try another Plan for Action activity like "Set the Timeline" to establish your future meeting schedules.

frogdesign.com/CAT

PLAN FOR ACTION / DIVIDE & CONQUER

Split your group into smaller teams to plan and complete specific tasks.

WHAT WE DID

Activity names in the order we completed them

WHAT WE LEARNED

Key insights from the activities

WHAT'S NEXT?

Next activity, clarified goal, shifts in the approach

WHAT WE DID

Activity names in the order we completed them

WHAT WE LEARNED

Key insights from the activities

WHAT'S NEXT?

Next activity, clarified goal, shifts in the approach

frogdesign.com/CAT

INTRODUCING THE CREATIVE ENTERPRISE TOOLKIT

01

If you're a creative person and want to start your own business, then this guide can help. The Creative Enterprise Toolkit gives you a framework to develop a business plan by exploring your idea and creating a business model that suits your hopes and motivations.

INTRODUCING



Using this Toolkit
This section sets out:
— Who this guide is for
— Why it's different from other business guides
— How it can help
— What you should expect to get out of the process

What Next?
This section sets out:
— What kind of company to set up
— Links to useful organisations to help you move to the next stage

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Introducing the Creative Enterprise Toolkit

12

What Next?

Once you've worked through the three handbooks with their exercises and worksheets, you will have the building blocks to make your idea happen by developing your business idea into a viable enterprise.

You should be able to clearly describe the 'story' of your business and how your business will work.

INTRODUCING

14

WHERE DO YOU WANT TO TAKE YOUR BUSINESS?

Remember, it's good practice to revise the models and exercises you've gone through. The business and marketing plans should be regularly reviewed and revised to ensure they remain relevant to short and long-term business objectives are addressed.

As your business grows, it will inevitably shift and change. It's well worth going back to the basics and revisiting the business model to take a step direction to make the changes necessary to keep you on track. You might also choose to share the models and exercises with business partners and staff.

WHAT TYPE OF COMPANY TO SET UP?

It is important to consider what type of company to set up. Below is a brief summary of the main types of company status in the UK.

Sole Trader

As a sole trader you are self-employed and independent with all of the profits of the company going to you. It is easy to get your business up and running, but you have less protection. You have unlimited liability and will be personally responsible for any debts run up by your business.

Partnership

Partnerships are where two or more people set up in business together. The business can benefit from the expertise and experience of the partners involved. However, disagreements between partners can cause problems. There is unlimited liability and partners share the costs, profits and any debts of the business.

Limited Liability Partnership (LLP)

A limited liability partnership has the flexibility of a partnership, but with the limited liability, where your personal financial risk is restricted to how much you invest in the business and any guarantees you provide given to obtain financing.

Introducing the Creative Enterprise Toolkit

14

Values are different from beliefs. Alia Yurdinci, Creative Education Specialist and writer explains:

"The difference between a belief and a value (for me) is that a value is something you hold very dear, like something precious that you protect against all odds to keep intact. A belief is something that underpins your actions and your direction in life. Beliefs can change, and when they do you see big shifts in energy, emotion and attitude..."

Use Worksheet 02a: Your Values* to help you identify and prioritise your values and build them into your plans for your business. Using sticks write down the values that are important to you. The table on the next page has a list of possible values to get you started.

Worksheet 02a: Your Values	Always Important	Sometimes Important	Rarely Important	Never Important

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SETTING UP A CREATIVE BUSINESS

02

In setting up your business, it helps to understand your motivations, what's unique about your offering, as well as your hopes and the impact you want to make. In this section of the Creative Enterprise Toolkit, you explore the building blocks that will help shape your business for the future.



In this handbook, you'll cover...

Business Facts

Do you have a good idea or a good business idea

Intellectual Property

How to identify, protect and exploit your IP

Values

Identifying the values that underpin your activities

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01

07

A GREAT IDEA OR A GREAT BUSINESS IDEA?

An idea tends to have your thoughts and desires as its focus. But a business idea needs to have customers, clients or audience as its focus. Three key facts distinguish a business idea from a creative idea:

- 01 There must be a clear need for your product or service (or your new idea), and you should be providing a new or improved solution for that need.
- 02 The need must have sufficient potential to create a demand.
- 03 There should be sufficient reward within your idea to be able to support your immediate business needs, as well as your future business requirements.

Product Example: Dyson

Inventor James Dyson introduced the bagless vacuum cleaner that promised greater suction than conventional vacuums and no cleaner carpets. Enough people were dissatisfied with current vacuum cleaners to create demand for his product. He had to find a way to make his invention not just to break even, but to extend its range of vacuum cleaners and diversify into other products.

Service Example: Easyjet

Easyjet was key to revolutionising air travel by making it affordable. They did this by cutting costs and reducing the cost of flying by providing a core service and charging for extras like hold baggage and food. Consumer demand has fuelled the success of the company. Its reward is that it is now one of the top ten airlines in Europe and was listed on the London Stock Exchange in 2005.

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07

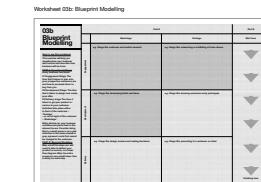
13

BLUEPRINT MODELLING

All of these activities take place engagement of the customer, which we call 'Onstage', or out of sight of the customer, which we call 'Backstage'. The principles in the diagram below show how this process might look for a delivery stage.

Areas shaded in grey are things that can't be directly charged to the customer; you can't bill your client for market research, promotion or the cost of selling to customers. These areas represent the cost of profit margin. This is why businesses that can't get beyond the engagement stage, or that focus too much on backstage areas, are likely to fail.

Use Part A: Operational Stages of Worksheet 02b: Blueprint Modelling and using sticks, show which processes take place backstage and Onstage, and at what parts of the delivery process from engagement to delivery?



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MAKING YOUR BUSINESS WORK

03

04

WHO'S BUYING?

For qualitative research, you can put together a focus group or organise a stakeholder workshop or hackathon involving technologists and customers. You could also do something less formal – as was the case with Innocent Drinks.

Innocent Drinks

Three graduates tested their fruit smoothie drinks at a music festival in London. People were invited to put the empty cartons in bins marked YES and NO depending on whether they liked the product. At the end of the festival the YES bins were full. After getting investment they launched the product and the rest is history.

Use the earlier Evidence Modelling exercise to help you identify the needs and benefits associated with your product or service. In Worksheet 02a: Your Customers is a table for identifying the needs of each customer group. This will help you record and establish viable income streams for each customer group.

Worksheet 02a: Your Customers	
Customer Group	Needs
1st Year Customers	Needs
2nd Year Customers	Needs
3rd Year Customers	Needs
4th Year Customers	Needs
5th Year Customers	Needs

Making Your Business Work

So far you've used Evidence Modelling to help you explore point 01 and Who's Buying to explore point 02. The next sections help you explore point 03.

One way to understand how a business works is to think of your business activity in terms of promises:

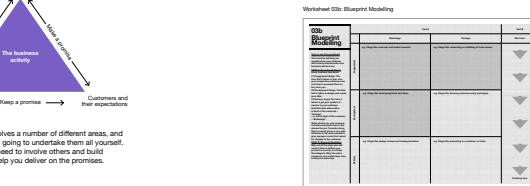
- You promise your customers that you'll deliver either a product or a service.
- Your customers will have an expectation that this promise is going to be kept.
- You work with others to enable that promise to be kept.

These make a 'promise triangle' between you, your customer and the qualities of your product or service.

The Promise Triangle



Any business involves a number of different areas, and it's unlikely you're going to make it work all yourself. Therefore, you'll need to involve other areas and relationships to help you deliver on the promises.



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ENGAGING WITH CUSTOMERS AND STAYING IN BUSINESS

04

04

THE MARKETING MIX

Place refers to where your product or service is sold to customers. Whether the location of your sales is online or in a retail store, you also have to consider how well your product or service is located, which will have an impact on cost. Some retailers offer preferential placement of your product to encourage sales. However, this type of marketing can be seen as manipulative as retailers will charge you a percentage of sales, known as a sales commission.

If you sell intermediaries such as wholesalers, resellers or sales agents, they'll need paying. This is generally included in the mark-up. You will also have to consider how you'll promote the product or service to reach end users. Organisations like Amazon.com and e-Bay have disrupted the market by acting as both a wholesaler and a retailer. If you sell online via an intermediary, you will have to pay a fee that will be deducted from your selling price. With online sales, you will also incur costs in postage and delivery fees. If it's large, then you also need to consider storage costs. Your pricing strategy will therefore be affected by:

- Price of production/delivery
- Online seller fees
- Retailer rebates
- Profit margin
- Storage and stock control.

"My top tips for pricing are know your market, know where you are in that market, be realistic and don't undervalue your product or your time."

Johanna Easton, Designer/Illustrator, UK

08

THE MARKETING MIX

Public Relations

Public Relations press is about creating and maintaining a positive image for your business or product that's essential to its success and longevity.

The impression you make through press coverage is highly influential. If you're trying to gain public interest, you'll need to control the range and content of press stories about your business.

If you choose to communicate with the media through press releases, the information contained in these is necessary. Just because you think something about your company or product is interesting doesn't necessarily mean that the media thinks so. To gain sufficient interest or importance to the public or sections of the public, you'll need to think about the angle, e.g. a new product or person, an investment, or an acquisition.

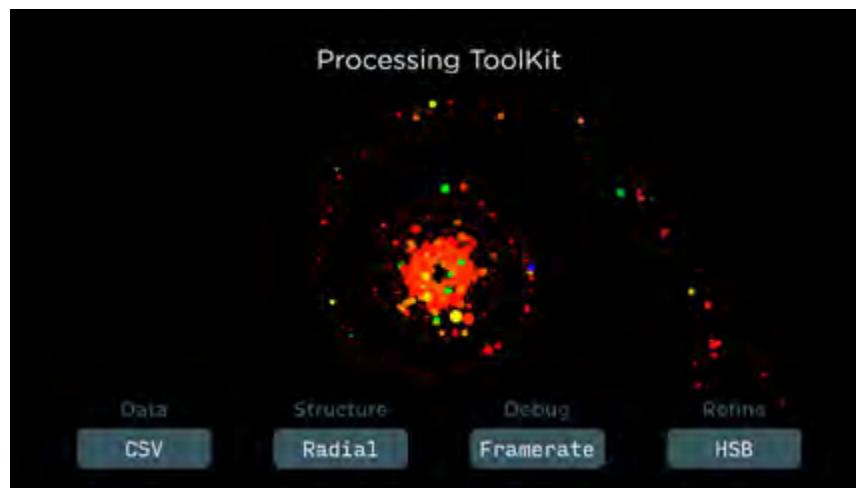
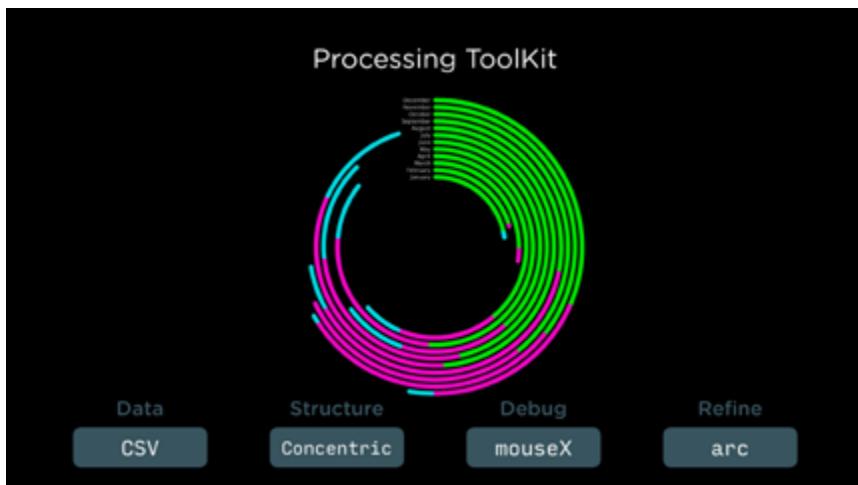
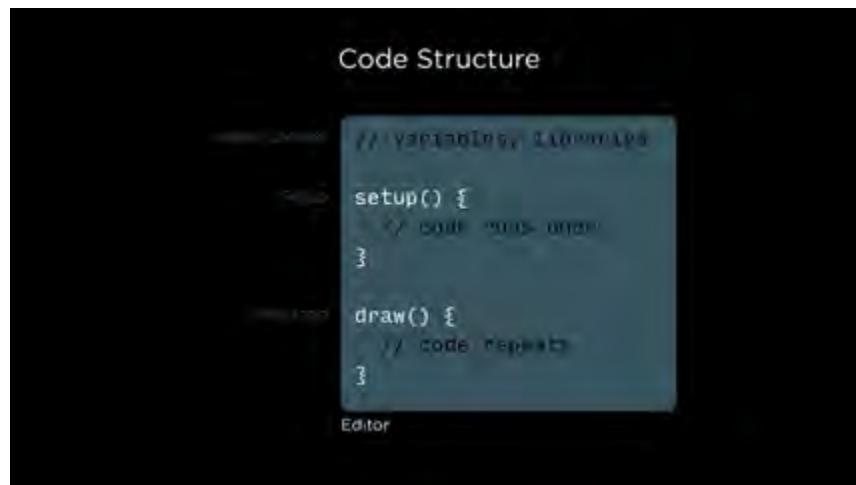
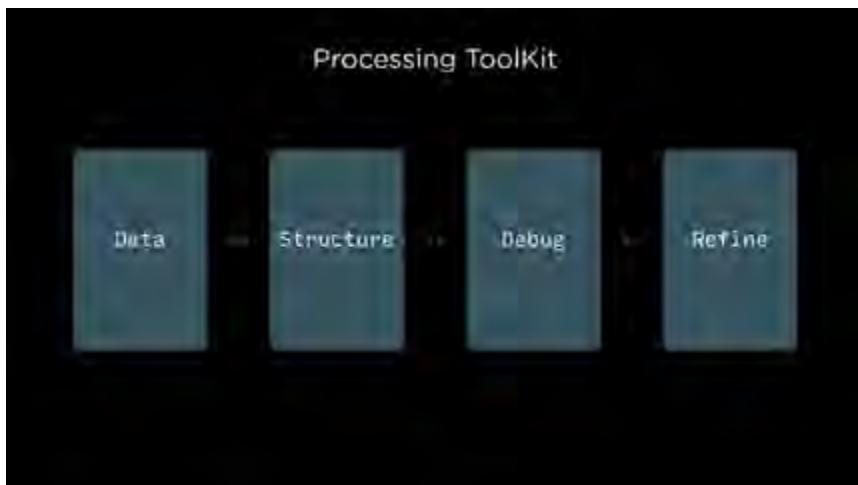
Writing endless press releases and sending them to namesakes editors and journalists on a database of press outlets is not the best way to manage your public relations.

If you sell releases each week simply to keep your profile up, then you are in danger of damaging your reputation.

"IF I WAS DOWNTON MY LAST DOLLAR, I'D SPEND IT ON PUBLIC RELATIONS"
Bill Gates

Engaging With Customers and Staying in Business

Similarly, the Creative Enterprise Toolkit by Nesta helps entrepreneurs get their startups off the ground by advising them on how to create a viable business model.



This toolkit created by **Nicholas Felton**, provides users easy to refer to cards to help them visualise data with Processing.



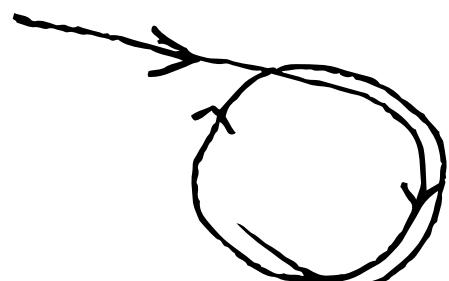
why → how → what ~~what~~

START → FRAMEWORK → FOLLOW

Identify problem → Identify options → Evaluate options → Decide → Review

STEP 1

- > Identify the need for a partnership
- > Identify whom you'd like to partner with
- > Assess compatibility with selected partners
- > Select type of collaboration suitable for all
- > Set common goals / aims of the partnership
- > Categories - Networking / Co-operating / Collaborating / Integrating
- > What are the operating principles of the partnership
- > Dealing with ^{+ guiding} problems & conflict
- > Auditing the partnership



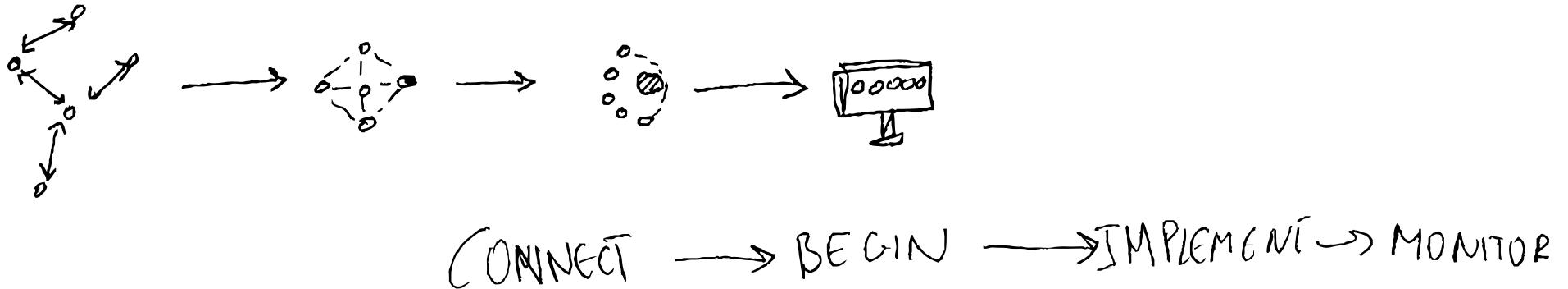
CONNECT → BEGIN → IMPLEMENT → MONITOR

INCEPTION → FRAMEWORK → IMPLEMENTATION

INCEPTION - RESEARCH - FUND RAISING

Explorations of various narrative paths

INCEPTION - VALUES - BRIEF DEV - RESEARCH - IDEATION - PLAN



Narrative Part. 01

Fixing on a narrative was a difficult process, and in hindsight, probably a futile exercise. I looked at multiple ways to break down the process of collaboration, trying to find a one size fits all solution which would still be specific enough to give direction to the users.

From the tried and tested, but basic **Why-What-Whom-How**, to breaking down the process to a very general **Start-Framework-Follow**, we attempted to find a valid narrative.

We finally settled on using a narrative using the breakdown of a collaborative work process, similar to the one followed at the Greenhouse. This narrative can apply to both a standalone project, or a long term collaboration.

Inception

The coming together of the partners to form a common goal to collaborate on.

Brief Development

Forming a brief to work on, planning out the work needed.

Fund Raising

Figure out the financials for the project, and raising funds if needed via proposals, grants, tenders.

Research

The research phase, collecting data and information required.

Co-Creation

Working together collaboratively on the project.

Documentation

Compiling and designing the documentation of the project to share.

Resource Management

A guide on how to manage resources/spending between partners.

Hacking Toolkits

A quick and dirty prototyping method is to put together existing tools to create a toolkit. The easiest way to do this is to print out tools available on the market, segregate them by what they do, and choose the ones that feel are most relevant to the needs of your toolkit. It's not an uncommon method to do so. Most toolkits available use very similar tools, sometimes *re-contextualised* to suit their users needs.

As we started picking out the tools that could potentially be useful for the collaboration toolkit, we also understood how toolkits are structured and the gaps within the structure and narrative that would need to be filled. We followed the initial task based narrative that was decided earlier, and grouped the selected tools within those categories.

Quite by chance, most of the tools that I ended up using were from the **Development Impact and You Toolkit**, otherwise known as the DIY Toolkit. The DIY Toolkit was designed by Quicksand, and includes many powerful tools found in various other toolkits. All the tools in these toolkits are open source, and can be used under the **Creative Commons Attribution License**.

Method: Inspiration Phase

Frame Your Design Challenge

What is the problem you're trying to solve?
Improving the lives of children

1. Take a look at framing it as a design question.
How might we improve the lives of children?

2. Now, state the ultimate impact you're trying to have.
We want every young child to have an education & to thrive.

3. What are some possible solutions to your problem?
Using schools or classes as a potential work environment, but make sure they allow for self-teaching.
Illustrations, possibly mapping with young kids to see if brain development, better education around parenting, early childhood education outcome, better access to medical care and nutrition.

4. Finally, write down some of the context and constraints that you're facing.
They could be geographic, technological, social, economic, or time constraints.
Because children are in a variety of circumstances, we want to address our solutions to diverse parents.
We want a solution that could work across different regions.

5. Does your original question need a twist? Try it again.
How might parents in low-income communities ensure children have a healthy diet for years.



I want to sustain and implement by executing my plan without being overwhelmed

CRITICAL TASKS LIST

ACTIVITY	ASSIGNED TO	BUDGET	DEADLINE	SIGN OFF

INNOVATION FLOWCHART

I want to look ahead in a systematic way I need to do during my toolkit life

RECEIVED

I want to collect input from others by defining my goals and the path to reach them.

Where & When:
LOCATION: _____
DATE: _____
TIME: _____

WHO:
PERSON SHADOWED: _____
INTERVIEWER: _____
GENDER: _____
SEARCH FOR SHADOWING: _____

Key findings

Likes	Dislikes	Habits
Activities	Objects	Space

PRINTING TEMPLATES FOR PERSONAL DEVELOPMENT WORKSHEETS | DOWNLOAD WORKSHEET

**DIY 01
PEOPLE SHADOWING**

02a Your Values

How to use this worksheet
Work alone for this exercise.
Find a quiet place where you can reflect and think.

You are going to capture and organise your personal values. These are the principles and values that make you feel truly alive and passionately committed to what you are doing in your life.
For career, they might be service to others and creativity.
For someone else, they could be honesty, spiritual awareness and leadership.

Using inkblots write down all of the values that are important to you. Write down lots of them even if you think some of them are useful. See examples of values on page 12 in handbook 01 to help you get started. If you have plenty (10 or more), please them in the relevant columns.

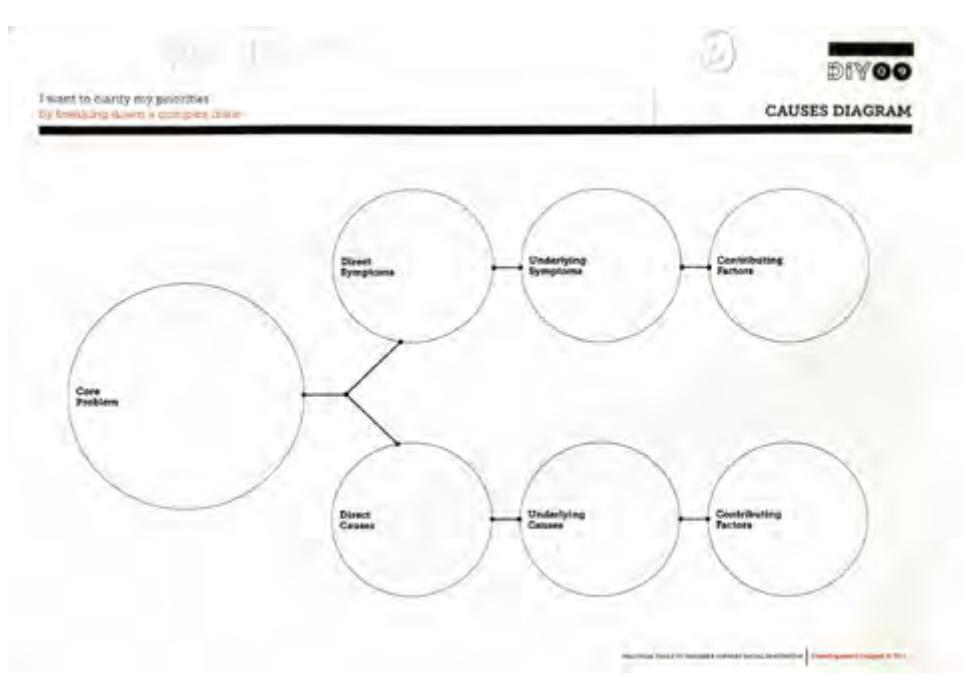
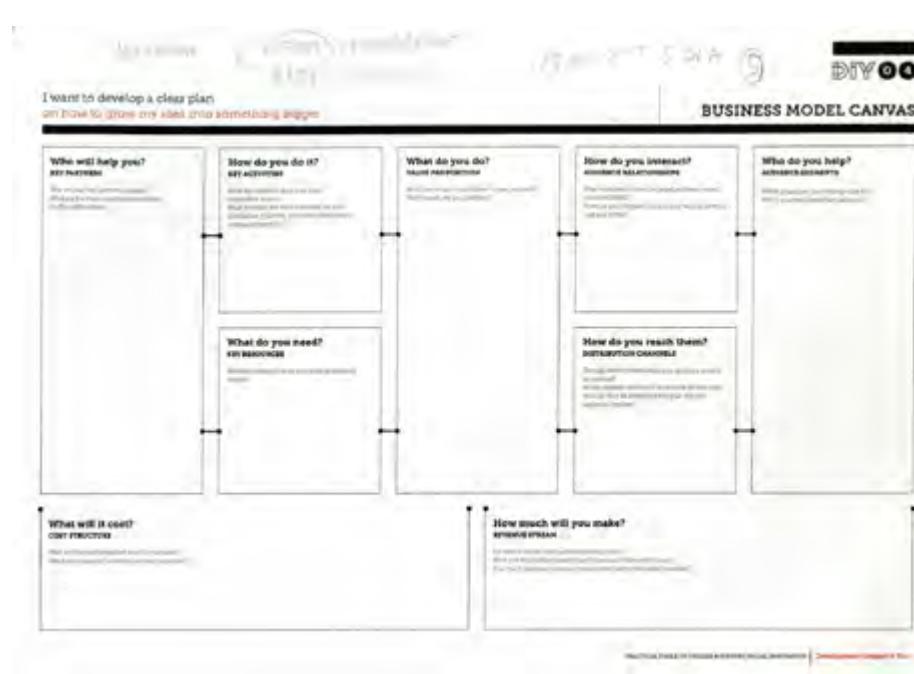
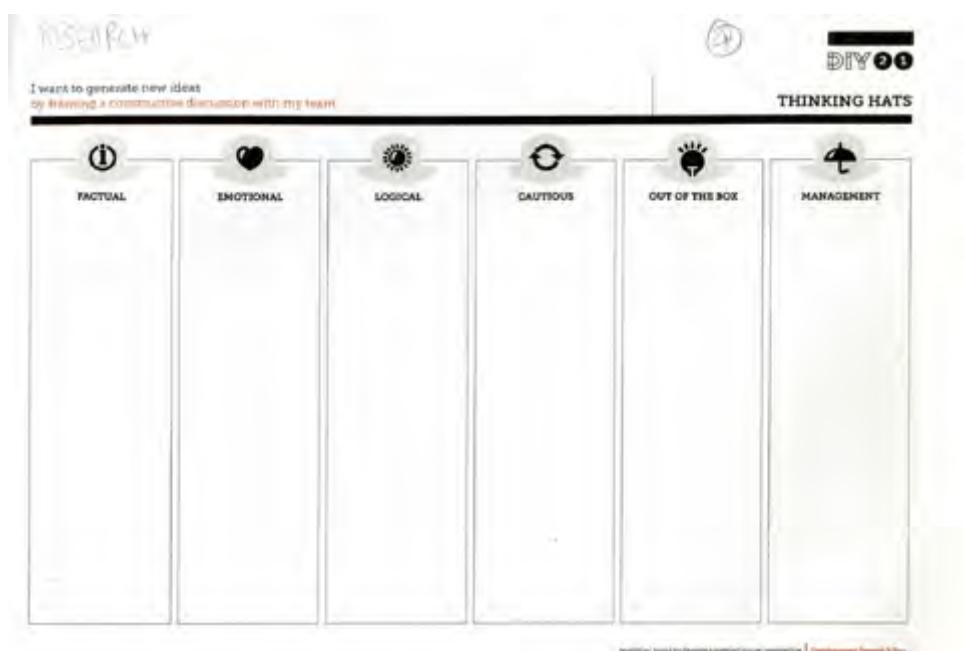
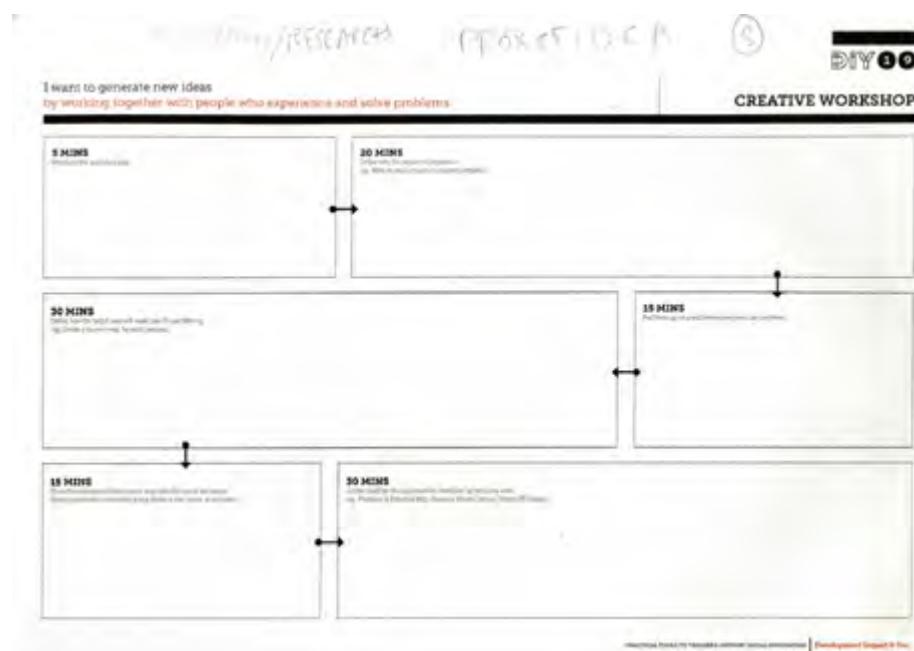
Don't worry about getting it right first time. You can always change it until you have them in the right place. To focus your activities, leave a final column at the end of the 'Most important' column.

Show your completed worksheet to someone who knows you well and ask for their feedback.

Always Important	Sometimes Important	Rarely Important	Never Important
------------------	---------------------	------------------	-----------------

Nesta... VALUES

PRINTING TEMPLATES FOR PERSONAL DEVELOPMENT WORKSHEETS | DOWNLOAD WORKSHEET

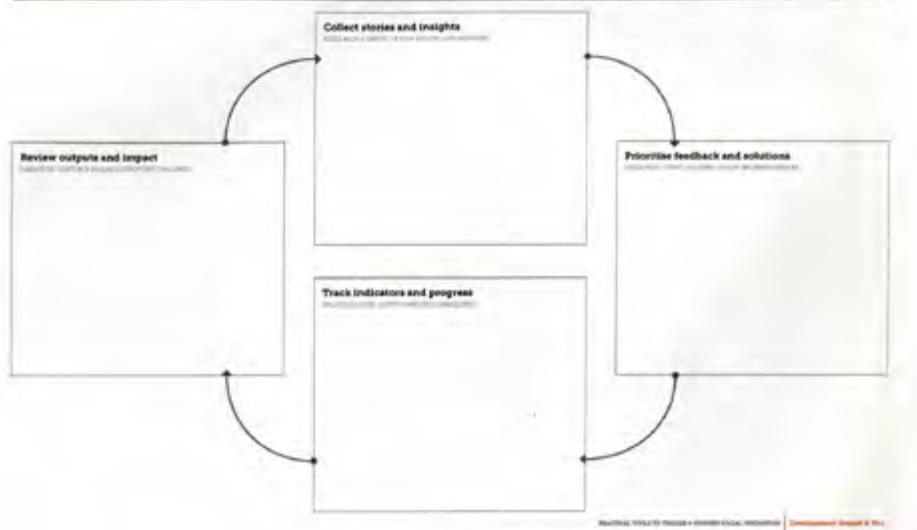


I want to develop a clear plan
by improving upon what I've done before

Project

DIY 05

LEARNING LOOP



I want to develop a clear plan
by working with other groups that have the same vision as me

1

DIY 06

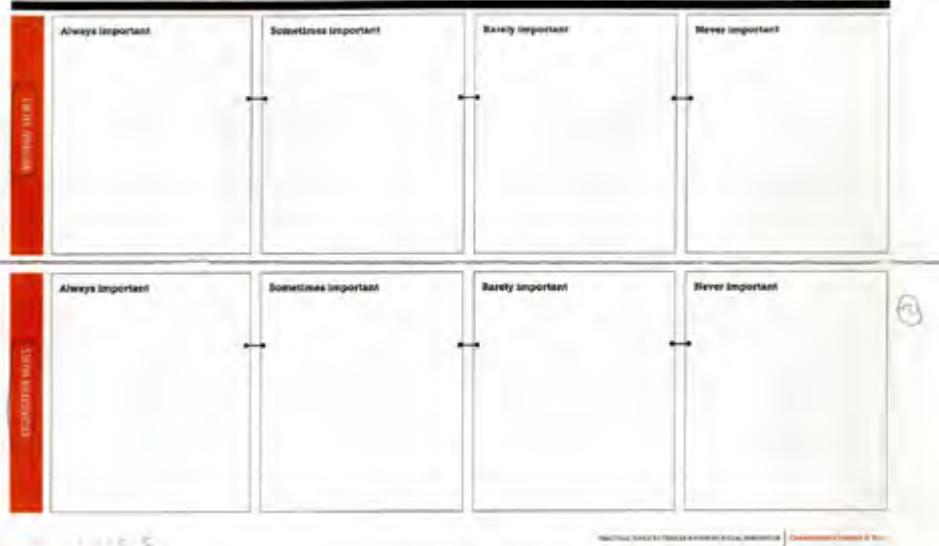
BUILDING PARTNERSHIPS MAP



I want to generate new ideas
by aligning our work based on shared values

DIY 02

VALUE MAPPING

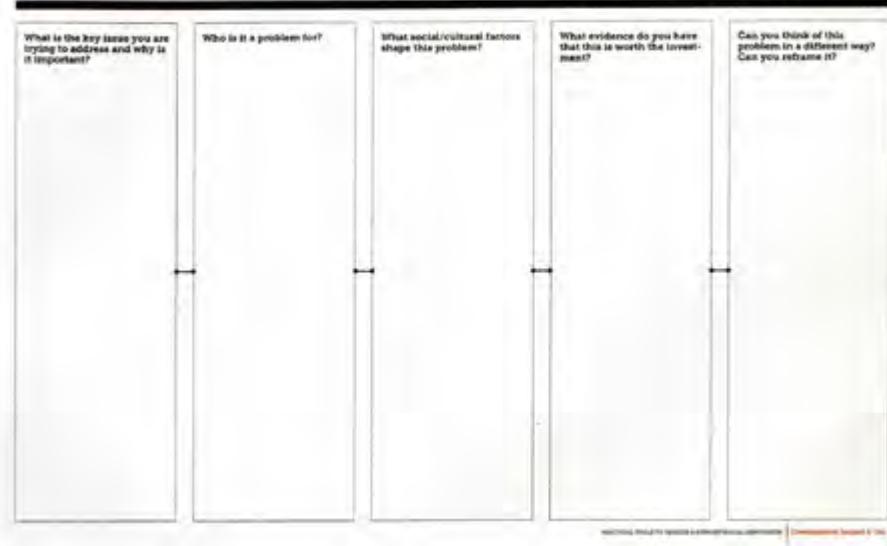


I want to clarify my priorities
by focusing on key critical issues

2

DIY 06

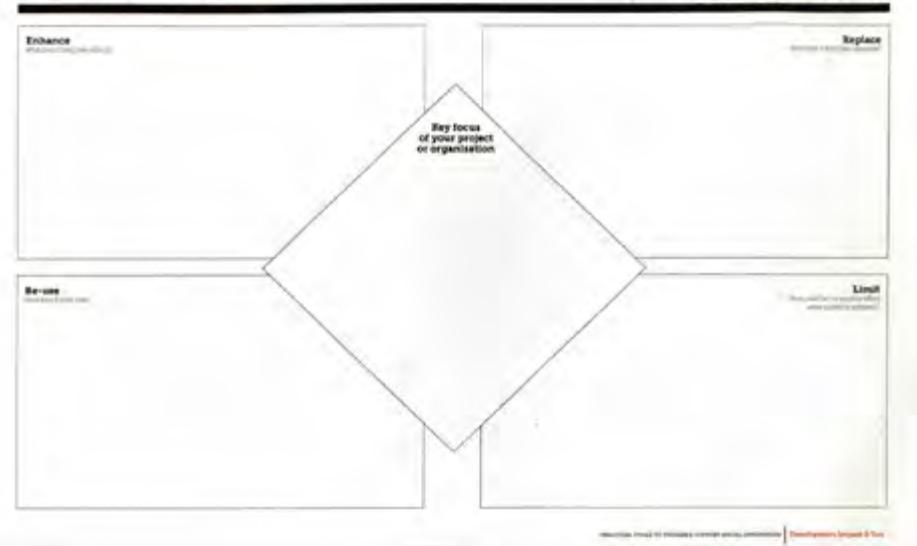
PROBLEM DEFINITION



I want to look ahead
by defining the outcomes from my work

DIY 02

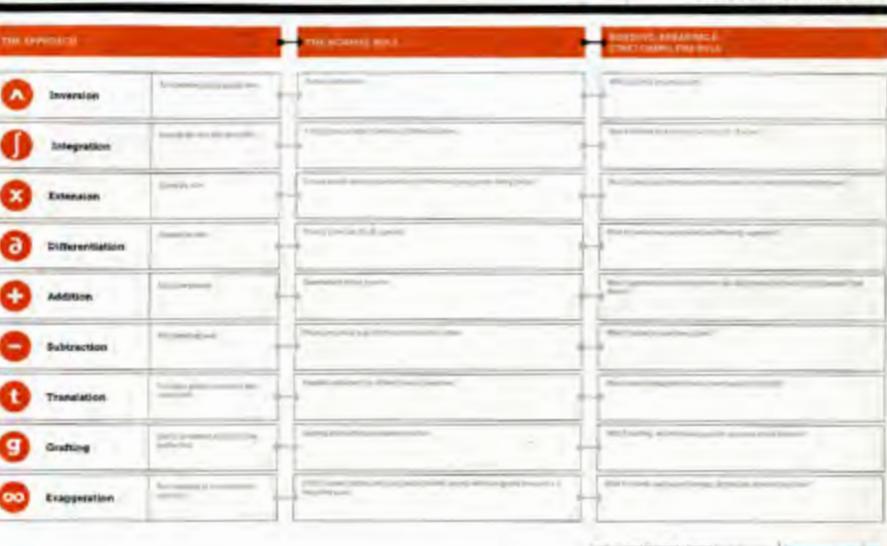
EVIDENCE PLANNING



3

DIY 06

FAST IDEA GENERATOR





Segregating and hacking toolkits to make the first draft

As we put together a rough cut of the collaboration toolkit, we felt something was not quite right. Although we had put together a set of tools that matched the narrative, and made what could be called a first draft, it wasn't serving any purpose, or solving any problems. It felt incomplete, and seemed to miss the entire point of helping people collaborate.

Something didn't seem quite right with the very idea of a toolkit...

PLAINSPK
RELEASEABLE
LANGUAGE

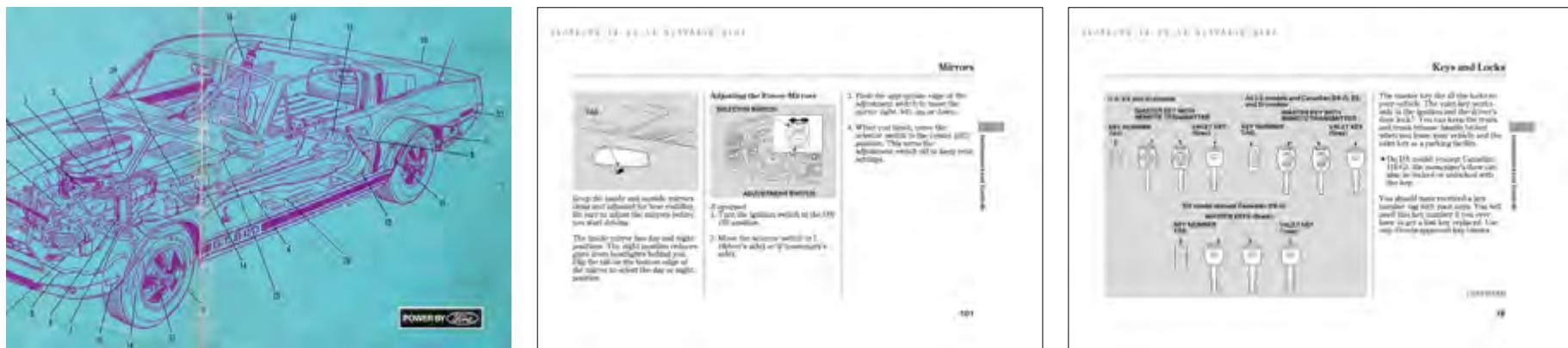
Toolkits

The word toolkit carries with it many connotations, both negative, and positive. Although toolkits are useful and can be used to great effect, there are a few drawbacks. The vast majority of toolkits available are worded in a language that's difficult to read, and this makes accessing the content of a toolkit exhausting and intimidating. I personally feel that **most toolkits employ a very sterile and cold tone, which detracts me from wanting to use them.**

The sentiment was shared by the partners of the studio, and we wanted to change that in our toolkit. **The aim is to make the toolkit as approachable and accessible as possible.** The first step in this process was to remove the word '*toolkit*' from the title entirely. Instead, the word '*manual*', or '*handbook*' made more sense and made it seem more approachable. It also made sense to include tips, and case studies alongside the activities and exercises to create a more rounded end product.

The Greenhouse Collaboration Manual was a better working title, and by shifting our focus from toolkits to something more appropriate for our purposes, it led to sweeping changes in the way we approached the entire project.

...so we decided not to make a toolkit,



Manuals, such as the ones in your car, or the ones that come bundled along with any electronic gadget, are designed to help the user understand everything they need to know in as little time possible, with the least amount of resistance.

The ones that most appealed to me were the illustrated manuals that accompany cars, as they break down the complex task of car ownership into easy to understand steps. The language, and the tone of the book is inviting and accessible for the reader. A car is a complex machine, and these manuals help the user understand what to do when something goes wrong. These are the attributes that we wanted our toolkit to have.

Refueling

Refueling

Switch off the engine before refueling, otherwise no fuel can be filled into the tank and a message is displayed.

When handling fuel, always observe all applicable precautions and measures of fire protection. Never transport flammable fuel containers in the vehicle. These could become leaky and cause an explosion or a fire in an accident.

Fuel filler door

To open and close, press the rear edge of the door.

Observe the following when refueling:

When handling fuel, follow the safety precautions posted at the filling station. Otherwise, there is a danger of personal injury or property damage.

Place the fuel filler cap in the bracket attached to the fuel filler door.

When refueling, insert the filler nozzle completely into the filler pipe. Avoid raising the filler nozzle during refueling, otherwise this leads to:

- premature pump shutdown
- a reduced efficiency of the fuel-vapor

Läs och stöldalarm

Läs och stöldalarm

Dörrar	45
Lås	45
Säcklås #	54
Märkt låsning av takstolsstöd #	49

Telephoning

Example: dialling phone numbers

To start the dialing:
Press the button on the steering wheel.

Service	The word 'dial' means:
Dial number: e.g. 123 456 7890	• Please say the number: 123 456 7890. Continue? • or 123 456 7890. And next? •
Dial:	• Dialing number: •

Setting volume of instructions

You can adjust the volume for the instructions from the system:

Composing phone numbers

After the last spoken sequence of digits has been repeated by the system, you can delete this sequence of digits.
• Correct number:
The digits are deleted.
The command 'Correct number' can be repeated as often as you like.

Deleting phone numbers

• Delete:
All digits entered up to this point are deleted.

Säkerhet

Säkerhet

Bilbilen	11
Stolar	12
Nackskydd	18
Barnsäkerhet	23
Aktion (krockkuddar)	32

but a manual instead.

Re-Brief

Simply researching the best practices for collaboration and slotting it in a toolkit wasn't working. I was struggling to fix upon the brief, the need for the toolkit. The point being, if there is no demand or no use for the toolkit, then it is a hollow exercise. The toolkit has to be used by someone, and for that, it has to fulfil a need for that certain someone. **Right now, it wasn't clear who the toolkit is meant for.**

Although we initially started off with the idea of the toolkit simply being used for internal purposes, we now wanted the toolkit to have a life outside of the studio as well. The Greenhouse Collaboration Manual should have a purpose, and be of value for those who wish to understand collaboration, irrespective of their context.

The problem with the initial plan of the toolkit is that **it's not aimed at anyone specific enough** for it to be marketable or viable. For starters, we can re-contextualise it by saying its meant for India exclusively and that it's meant for creators, and innovators who wish to create change in their communities by producing hyper-local work. It could also possibly be meant for smaller organisations or startups who might want to collaborate with others to reduce their going alone costs. India used to, and

currently does have a lot of co-operative organisations, like banks, and housing societies, with Amul being a good example of that culture.

After a series of long discussions, we finally settled on a brief that we felt was appropriate to the project. We had initially played around with the idea of pitching the toolkit for creative professionals who wished to help the community, but it was aimed at a very specific audience which would have severely limited its appeal. The reason why we had even considered that possibility was because that is the nature of the collaboration between the partners of the Greenhouse.

Although that is whom the project is meant for, the partners wished to widen its appeal and make it applicable to a larger audience. We opted to position **the toolkit to young people who wish to set up collaborative practices of their own.** We chose to target young people because they would be the ones who most need advice and help on starting a collaborative practice.

So whom is this toolkit meant for?

- fresh college graduates looking to work
- small studios / organizations looking to collaborate and expand, do more work
- freelancers looking to work with other people to complete projects

INDIAN

[COMMUNITY / HYPER LOCAL]
[CONTENT CREATION]
INNOVATION

Buddies / young entrepreneurs

SMALL ORGANIZATION

WORKBOOK

CO-OP

EXERCISE

WORKBOOK

SELF TEST

Why do you want to collaborate with others?

- Identify weaknesses/blindsides of your practice that you wish to resolve
- List down your strengths and weaknesses and identify what you bring to the table and the areas in which you lack in
- “An act of shared creation and/or shared discovery; two or more individuals with complimentary skills interacting to create a shared understanding that none had previously possessed or could have come to on their own. Collaboration creates a shared meaning about a process, a product, or an event.”
- A common goal/vision is a strong factor to bring people together.
- Find out what has prevented you from collaborating before.
- Working independently, organisations cannot by themselves make an impact. Therefore co-operation between interested parties is necessary if the problems are to be addressed coherently. Increasing the scope and ambition of issues/efforts require commitment to dialogue and collaboration with a diverse range of stakeholders
- “Collaboration is a mutually beneficial relationship between two or more parties who work toward common goals by sharing responsibility, authority, and accountability for achieving results
- in 1980, 20% of work was team based. In 2010, 80% of work is team based.
- Collaborators see things differently. They can spot gaps in what is known. Have a knack for discovering interesting important problems as well as skill in solving them.
- Many of today's most important challenges are so complex and multifaceted that they can only be tackled by teams of experts from disparate domains. To solve them, professionals must be able to harness ideas, people, and resources from across disciplinary and organisational boundaries.

Whom will you collaborate with?

- Interdisciplinary partners will make the collaboration multi-faceted and give it a better understanding of the problems it is attempting to solve
- Team of ~20 members is an ideal size for a collaboration
- Important to have good interpersonal skills like : 1) Appreciating others 2) Engage others in meaningful conversation 3) Creatively/productively resolve conflicts
- Categorise your partners (by what they offer, their perceptions, professions), and map out relationships between partners and the issue/project at hand
- Clarify all stakeholders interests and roles
- Professional partnership = personal partnership
- Each partner should understand how each others organisation works-including perks and nuances

What are the goals/aims of the partnership?

- Discuss the issues that you wish to tackle in the community with your fellow partners
- Come to a conclusion about the issues that you are not only passionate about, but the ones that will also bring some income/funds to the collaboration

What skills, advantages do you bring to the partnership?

- List down your strengths and weaknesses and see what you bring to the table

What is the nature of the collaboration?

- There are in general four types of partnerships: Networking, Co-operating, Collaborating, Integrating
- It usually progresses in this manner: Co-ordination->Co-operation->Collaboration->Partnership
- In collaborations, professional relationships are just as important to maintain as personal relationships
- It is important to see the collaboration as a team effort, rather than simply a work group. Teams work toward one common conclusion. Work groups usually have different outcomes for the same project
- Collaboration is most effective when the objectives, process, and roles are clearly defined so that those involved know what to expect.

Why do you want to work for/with the community?

- Identify issues within the community around you that resonates with your practice and the ones you feel most passionately about

What are the operating+guiding principles of the collaboration?

- It is important to discuss and put down the operating + guiding principles of the collaboration
- Operating principles are those by which the collaboration runs day to day
- Communication is key. It is vital to have a shared language in order to understand everyone. Partners can come from different backgrounds and have different ways of communicating.

How will you deal with problems/conflicts in the collaboration?

- Good operating principles can usually help diffuse awkward situations and conflicts
- It is imperative that issues not be taken personally and be taken care of with a calm and collected mindset
- Conflict is an important precursor to creativity
- There is a need for open and frank discussions+arguments
- Avoid ‘ugly feelings’ -> irritation, paranoia, anxiety <-scuppers collaborations

How will you ideate project ideas?

- While ideating and researching ideas, leverage the collaboration by taking everyone's point of view
- Always list down all aspects of a certain topic, positive and negative
- Do both SWOT + SOAR analysis
- Define the problem you want to tackle and justify why should you take it up
- Wear different thinking hats and look at the problem with different mindsets
- Justify the investment of resources into your project options
- Plan out the project to as far in the future as you can and try to foresee any hitches that might come up
- All stakeholders involved should be bought on board for ideation and research. Including Primary, Secondary, Opposition, Marginalised
- Structured discussions empowers quiet participants to speak up and give them confidence that their voice is being heard.

How will the finances/logistics of the collaboration be handled?

- Plan out the finances of the collaboration
- Figure out ways to get funding for the collaborative projects
- 1) Clarify objectives 2) Cost/Benefit analysis 3) Review/Manage partnership

What is the governing structure of the collaboration?

- The operating structure of the collaboration can be Open/Closed, and Hierarchical/Flat
- The governing structure can change according to the phase of the project currently in progress
- Collaborative agreements can strengthen mutual accountability and trust enabling groups to maximise resources and work efficiently. Although this needs commitment from members to work.

How will the project ideas be implemented?

- Using a task oriented process, the workload can be divided and planned out to deadlines
- Establish a good feedback loop, which will enable partners to learn from the project and the mistakes and triumphs

How will the collaboration be audited?

- It is important that the progress of the collaboration be reviewed and audited regularly
- The operating and guiding principles should be reviewed and revised as needed to suit the needs of the collaboration

Why will your collaboration fail?

- Fundamental ideological differences
- Power is not evenly spread
- Non participation of key parties
- Stark difference in vision
- Cost of collaboration > Cost of going it alone

Re-Narrative

At first, the narrative seemed to work well. It covered both, the process of collaboration, and a long-term collaborative practice. However, once we started figuring out the content to fit the narrative, we realised that fixing on a narrative first meant that some key research couldn't be included. That's when we came to the conclusion that perhaps this wasn't the best way to tackle the content and narrative.

We went back to basics, to the mantra that **a good toolkit is all about asking the right questions**, we decided to forego a narrative and concentrate on asking and answering the correct questions which would then form a narrative.

By asking the right questions, the narrative would start to materialise as it would highlight the needs and wants of those wanting to collaborate.

So the next step was to simply ask a lot of relevant questions and plug in my research to those questions. From a long list of questions, the final list was vetted after discussions with the partners, as we edited out what they felt weren't relevant to the concerns of collaboration.

Draft One

Eager to create a prototype, we simplified the questions and created a simple narrative. Based on the simplified narrative, we started grouping questions and insights under their respective headings. We created a card-based system, with every card covering each heading. Each card would have insights and tips, along with suggested exercises for the users.

The questions were abstracted into bigger headings of **What, Whom, How, Doing, and Retrospect**.

What covers the topic of choosing what to work on. Having a common goal or aim is very important for the formation of a collaboration. After all, it is the reason why the partners are coming together in the first place.

Whom covers the task of choosing the right partners for the collaboration. There are many parameters to consider when choosing whom to partner with. Do they fit your profile of the ideal worker, or do they have the skills and talent that you need to ensure that your goal is met?

How is the mechanics of the collaboration. There are quite a few things to keep in mind when working with someone. Even if a collaboration happens to form

organically, one can ensure that it remains stable with certain activities and work structures.

Doing covers the actual working together of the partners on the project. This applies to both, smaller projects, and the collaboration in general. It covers various activities to ensure a healthy working atmosphere.

Retrospect is an important part of the process, even if it isn't absolutely crucial to the running of a collaboration. Holding retrospectives can help a collaboration edit its workings, and continue improving after every project.

Even though we chose to continue with this narrative, the problem with this particular narrative made itself instantly visible. The problem was, in what order would the narrative be formed? Would What come before Whom? Or the other way round? The inability to fix upon an order rendered this narrative to be flawed from the start.

By creating an initial prototype, the plan was to take this to the next stage of the research process—the interviews. From the insights of the primary research, I aimed to establish order, or even a new narrative entirely.

[What]
[Whom]
[How]
[Doing]
[Retrospect]

Introduction | Instruction

This Collaboration Manual should be considered a permanent part of the practice, and must remain with the practice at time of resale.

Owner ID

Name
Start Date
E-Mail

This manual is designed to help you collaborate with others and set up a collaborative practice. Broken down into sections this allows you to consult any part that you're stuck at.

This manual contains important information about the safe operation and maintenance of your collaborative practice. It has helpful guides and exercises that will help you understand the sort of collaboration that suits you.

We urge you to read it carefully, become familiar with the controls it describes, and follow its recommendations, to help make your collaboration trouble-free and enjoyable.

Statements or labels on the product preceded by the following words are of special significance:

⚠ WARNING : Pay close attention to this as it may cause rifts in your partnership.

BROWNIE POINTS: Follow these extra steps and you won't regret it.

What is collaboration?

"An act of shared creation and/or shared discovery; two or more individuals with complimentary skills interacting to create a shared understanding that none had previously possessed or could have come to on their own. Collaboration creates a shared meaning about a process, a product, or an event."

Many of today's most important challenges are so complex and multifaceted that they can only be tackled by teams of experts from disparate domains. To solve them, professionals must be able to harness ideas, people, and resources from across disciplinary and organisational boundaries.

But why collaborate in the first place? A stat to look at. In the 1980's, only 20% of work was team-work based. In 2010, 80% of work is team-work based.

What | Choosing what to work on

For any collaborative practice, it is important that it has something to do, a common goal. That can either as disparate as simply sharing a co-working space, or working intensely together for a common goal. This section attempts to understand what your interests are, and pinpoints which areas you want to work on. By establishing what you want to work, you can go ahead and find collaborators, or you can use the WHOM section to first figure out whom you want to work with before coming back to this section. Alternatively you can use both sections together.

Whom | Choosing whom to work with

To start a collaborative practice, it is important to have collaborators to work with, and even more critical to choose collaborators who complement your personality and style of working.

In such situations, professional relations are just as important as personal relations.

Here are a few pointers to get you started.

The easiest teams to work with collaboratively are those with ~20 members. If it gets too large, then it becomes complex to work with.

Collaborative practices are often put to best use when there are interdisciplinary members. Interdisciplinary members will make the collaboration multi-faceted and give it a better understanding of the problems it is trying to solve.

It is important to understand other partners ways of working their quirks and nuances. Important to have good interpersonal skills like : 1) Appreciating others 2) Engage others in meaningful conversation 3) Creatively/productively resolve conflicts. Categorise your partners (by what they offer, their perceptions, professions), and map out relationships between partners and the issue/project at hand. Clarify all stakeholders interests and roles. Each partner should understand how each others organisation works-including perks and nuances

How | Structuring your collaboration

Now that you've decided what to work and whom to work with, its time to structure your collaboration.

There are in general four types of partnerships: Networking, Co-operating, Collaborating, Integrating

It usually progresses in this manner: Co-ordination->Co-operation->Collaboration->Partnership

It is important to see the collaboration as a team effort, rather than simply a work group. Teams work toward one common conclusion. Work groups usually have different outcomes for the same project. This is a key difference.

Collaboration is most effective when the objectives, process, and roles are clearly defined so that those involved know what to expect from it.

Plan out the finances of the collaboration
Figure out ways to get funding for the collaborative projects
1) Clarify objectives 2) Cost/Benefit analysis 3) Review/Manage partnership

The operating structure of the collaboration can be Open/Closed, and Hierarchical/Flat. The governing structure can change according to the phase of the project currently in progress. Collaborative agreements can strengthen mutual accountability and trust enabling groups to maximise resources and work efficiently. Although this needs commitment from members to work.

Doing | Ideating and planning projects

- While ideating and researching ideas, leverage the collaboration by taking everyone's point of view
- Always list down all aspects of a certain topic, positive and negative
- Do both SWOT and SOAR analysis
- Define the problem you want to tackle and justify why should you take it up
- Wear different thinking hats and look at the problem with different mindsets
- Justify the investment of resources into your project options
- Plan out the project to as far in the future as you can and try to foresee any hitches that might come up
- All stakeholders involved should be bought on board for ideation and research. Including Primary, Secondary, Opposition, Marginalised
- Structured discussions empowers quiet participants to speak up and give them confidence that their voice is being heard.
- Using a task oriented process, the workload can be divided and planned out to deadlines
- Establish a good feedback loop, which will enable partners to learn from the project and the mistakes and triumphs

Retrospect | Auditing your collaboration

- Hold regular feedback sessions, discussing the mechanics of the collaboration
- Remember to keep your egos at the door, and not take anything personally in these conversations
- Holding retrospectives will help you understand what is going wrong, and how to fix these issues

Primary Research

Now that we had collected enough secondary research, and decided upon a content-driven narrative direction, it was time to go out and get some data from people who collaborate on a daily basis. Collaboration is different for different people in different professions. Because of the varied demands of different professions, even the grammar of collaboration differs. To try and get as many diverse opinions on collaboration as possible, we drew out a list of people to interview, from various disciplines/professions. Many of these people were located in Delhi, so I shifted to the Quicksand studio in Delhi for a month, leveraging various contacts to get interviews.

I interviewed some people on their collaboration process, and although there were many overlaps with the secondary research, I found some very interesting nuggets of information which I could only have found from people who have had rich experiences of collaborating with others. **From educators to freelancers and musicians to racing drivers, the breadth of insight I gleaned was immensely resourceful.** It was very interesting to see how each profession had their own take on collaboration. The decision to meet a wide variety of people definitely paid off as I gleaned a wealth of insights. It was the

variety of information which was the most surprising. There are so many different ways to approach collaboration, and there is a lot of learning in understanding the different methods in which different disciplines collaborate.

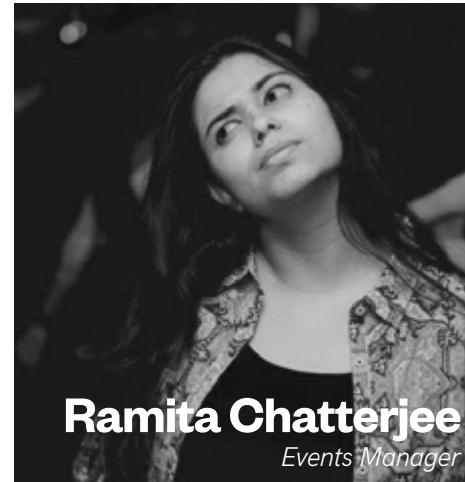
The interviews were a little tricky to conduct, as the act of collaboration is quite organic, and no one consciously thinks of the process they follow. Initially, I struggled to get any valuable information, but I soon learnt to break down the bigger question into smaller, simpler ones, that helped the interviewees dissect their own process of collaboration. The interviews themselves were very interesting for both me and the interviewees. **They found it insightful to reflect on their own process of collaboration.** Some of them were very keen to see the rest of my data so that they could learn from others. This helped validate my project, as it confirmed the fact that people do, in fact learn enough from written literature. Read experiences do make an impact.



Ishita Jain
Freelance Graphic Designer



Mridul Luthra
Musician; Urban Earlymen Guitarist



Ramita Chatterjee
Events Manager



Pupul Bisht
Masters Student at OCAD University



Akshay Roongta
Strategy Designer/Amrutdhara



Akshat Nauriyal
Co-Founder of St+Art India/Film Maker



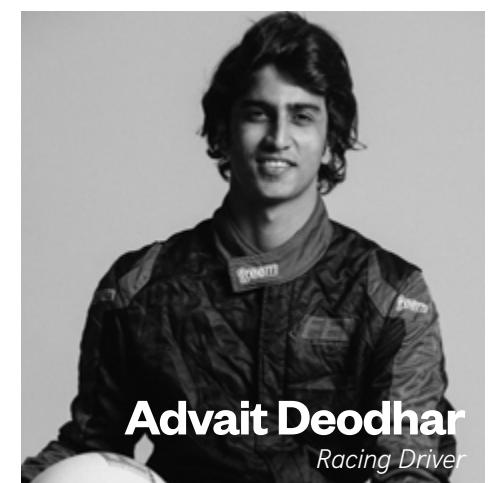
Yuvraj Jha
Concept Artist/Production



Anagha Anand
Film Maker



Jatin Bhatt
Dean of Design at Ambedkar University



Advait Deodhar
Racing Driver

It was important to have a diverse group of interviewees.

give others space to contribute

embrace complexity

find similar values

explore like mindedness

hierarchy, accountability, structure needed

handle multiple roles

the more diverse the partners are, the more unique the output will be

good communication

team > individual

give space for others to contribute

complementary partners

acknowledge that the common goal is bigger than individual wants

build trust

Everyone should be pulling forward in one direction.

embrace complexity

create a safe space to talk about the mechanics of collaboration

common goal

Have to believe in the greater team objective, and put individual needs and wants aside

embrace complexity

friction and conflicts are important as well

learn to compromise

shared vision

find middle ground

understand where your partners are coming from, their context

set up a structure/accountability

Choose people who complement your strengths and weaknesses

find middle ground

ego, irresponsibility lead to negative factors

have good clarity of final goal

MOA to guide conflict

Insights

From the first set of interviews conducted, I found many overlapping insights. Most of them felt **clear communication was a key ingredient** to good collaboration. Problems only arise due to miscommunication and lack of clear articulation when talking to each other. They also felt that **not taking feedback to the heart** is important when in a collaboration. There is a tendency of many to let professional feedback affect them personally when it is never the intention to do so.

Having a **common goal or vision is needed to keep the team working together and pulling in the same direction**. They might be some conflicts along the journey, but that friction is important to continuously re-align the group and course correct when needed. In smaller groups, team members will also have to wear different caps in a collaboration. Members must play different roles in a collaboration to ensure smooth running.

No matter what role you play in a collaboration, **you must be as invested in its future as everyone else** is. Only then will you be able to give your 100% to the cause. In many ways, a collaboration is very similar to a relationship or a marriage. The personal relationships between people are just as important as the professional ones. So you must learn how to work with different

people. Above all, try to understand that everyone is also trying to figure it out, just as you are.

Collaborations can broadly be divided into two divisions—organic and planned. Sometimes, collaborations simply come together, and happen so naturally that no one thinks of structuring it or giving it any form of formal hierarchy. The other is when collaborations are carefully mediated and structured. Although when collaborations come about organically, a structure also naturally falls into place sometimes. If it doesn't, then it is important to have one, as it ensures accountability and thus, productivity.

Left: Cloud of insights from interviews of the primary research

Toolkit Crisis

My mistrust of toolkits started long before the project started. I would never use a toolkit unless I was mandated to, or in a workshop setting. The list of things I detest in toolkits is long, so I'll focus on the big ones. **The sheer inaccessibility of toolkits is the most frustrating.** The language, the way the tools are structured and the tone of the content makes it seem cold, aloof, and almost academic. The lack of context makes them difficult to work with. It broadly works in a few situations, but there will always be exceptions and special cases.

The **merit of any toolkit is judged on how often is it used.** If no one feels like using the tools then it has failed, no matter how technically resolved it may be. There is a caveat to add here: toolkits are always aimed at a very particular target audience, people who are in specific position at a specific time, doing a specific activity. It does work very well in those specific situations. But there are better ways of disseminating information that can also apply to someone who is not a subset of that particular target audience. It's also important to recognise that the **method of dissemination should entirely depend on the target user, and not on the nature of the knowledge itself.** Of course, in an ideal world every specific problem would have its own bespoke solution, but since that not going to happen anytime soon, we have to do the best we can with generalised solutions.

In my slightly inexperienced opinion, I feel that toolkits shouldn't teach a fisherman how to fish, because unless you cover every single type of fishing technique, it's not going to be a very helpful guide to those who aren't in the same situation as described in the toolkit. What they should

do instead is, to teach the principles and concepts of fishing. So that you can learn and develop your own unique fishing technique. So teach a fisherman to teach himself how to fish. Everyone is creative in their own way and will figure out solutions to their own particular problems when taught the basic principles and concepts.

It's a lot like mathematics. Once you learn the basic formulas and learn how to derive them, you can then apply it to any problem. Another lesson to learn from mathematics is that you have to understand the problem very well. Once you understand what the situation needs and requires, you can then use the necessary formula. Of course, real life is nothing like mathematics, there exist many complexities that no toolkit can handle.

I enjoy reading case studies. Harvard Business Review is a magazine that is full of them and I get to learn a lot by just reading their articles. On the face of it, case studies are just another layer of abstraction between the reader and the information. But that **layer of abstraction gives the information context and tells the reader how it was relevant in that context.** So one can separate the context from the story with the additional understanding of knowing how it was used in that setting, hence giving a better understanding of the concept. So I tend to understand concepts a whole lot better when presented in case studies. The power of narratives to explain a concept should never be underestimated.

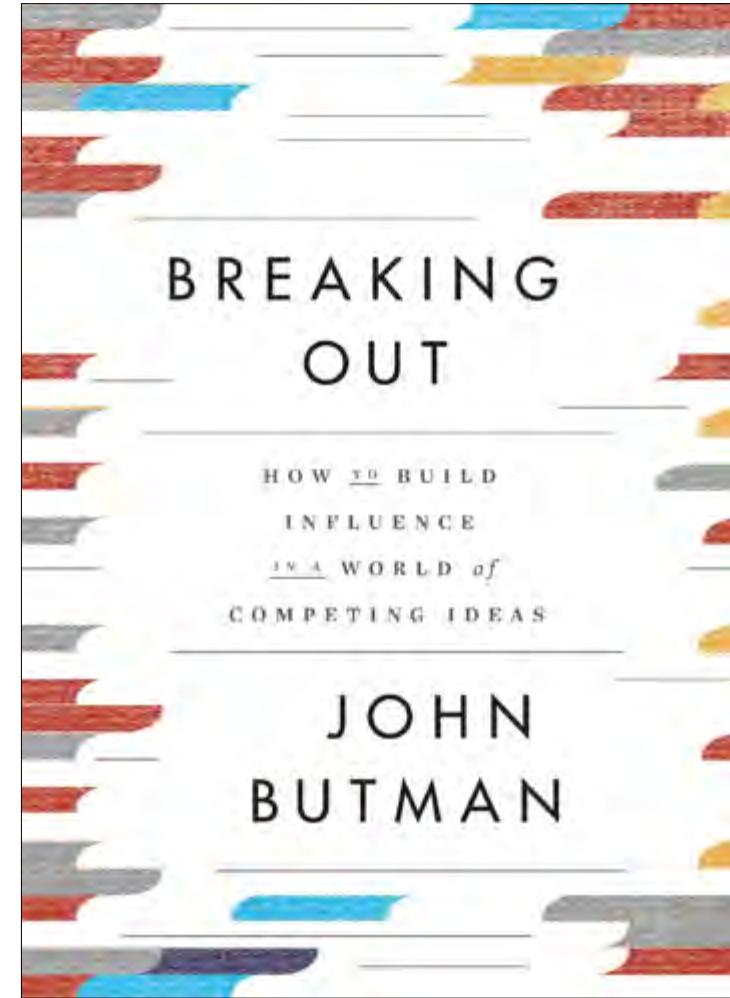
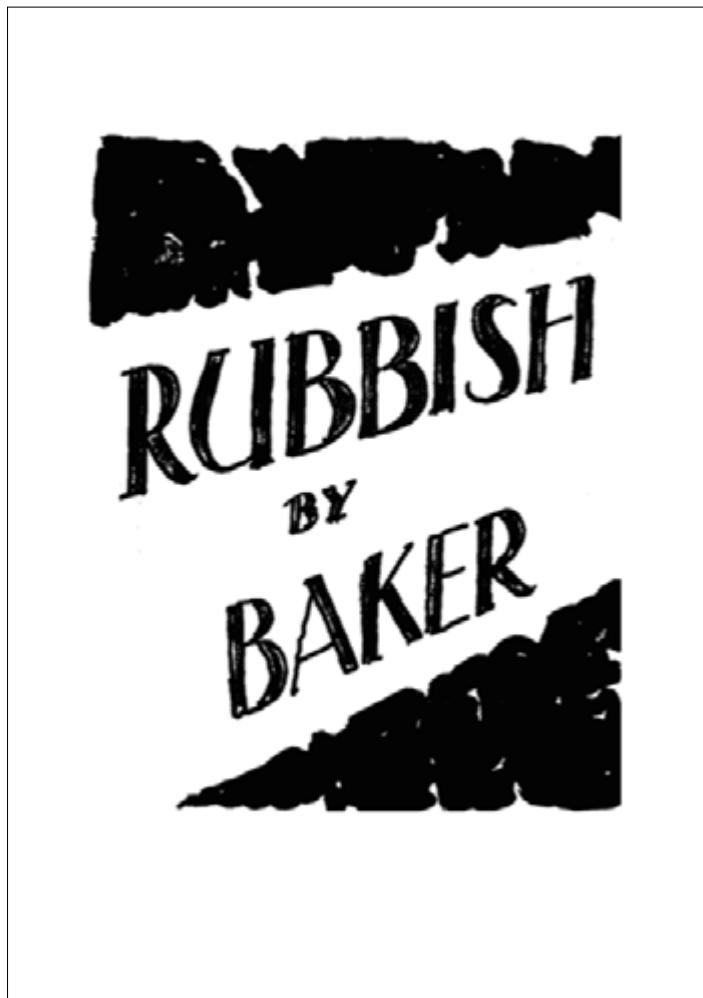
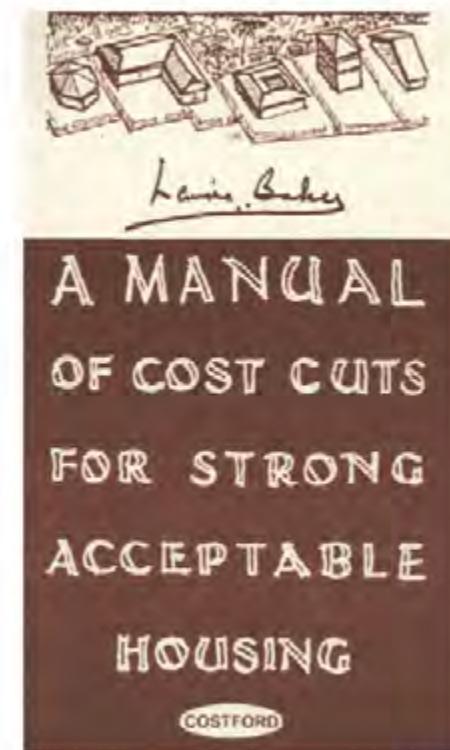
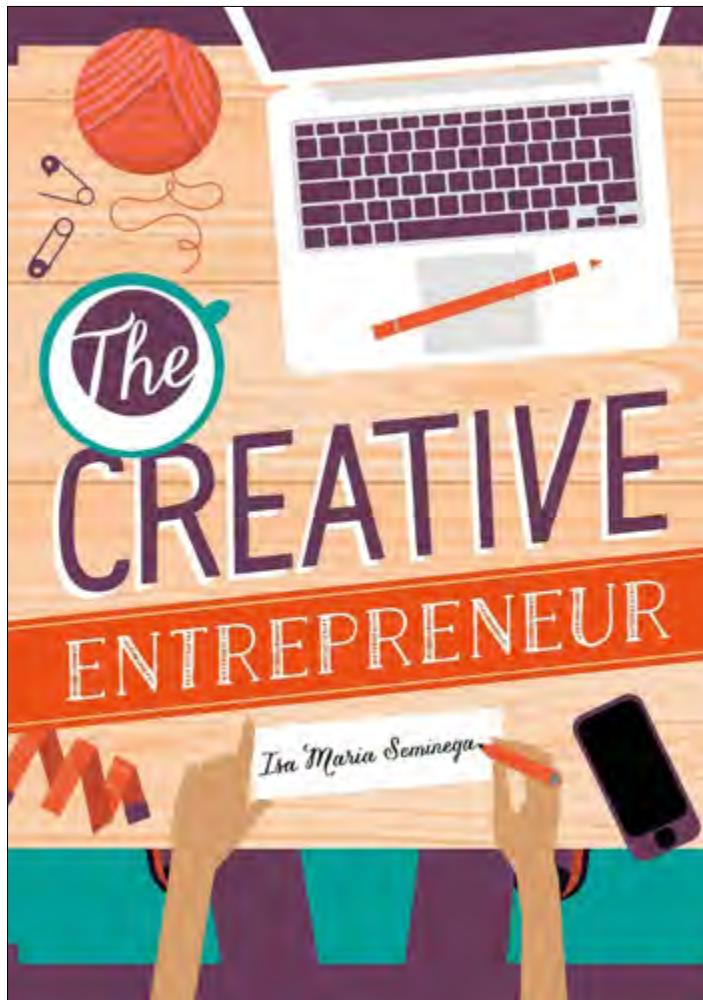
The other alternative is that we look at the other end of the spectrum by making a checklist of sorts, which the user can use as a reference to get through the process.

This would leave the entire process in the creative control of the said user, and would merely direct them in a particular order of things to do. This is suitable for a limited number of tasks/processes and for a certain profile of people.

At the other extreme, is to individually train people for the task that they're trying to tackle and give them the knowledge and the ability to execute that know-how. This, of course, is highly resource intensive but will guarantee results. Also, highly inefficient when trying to disseminate knowledge to scale up impact. The ideal solution lies somewhere at some multi-cross-section of these methods and will change according to the broader context.

A toolkit is not the best way to scale impact, and there are better, more customised solutions available. Toolkits have become a buzzword, and are designed around the information rather than the intended recipient of the information. Users cannot connect with it if it's not contextually applicable.

So what is the solution to this conundrum?



Left Clockwise: Creative Entrepreneur by Maria Seminega, Manual of Cost Cuts for Acceptable Housing by Laurie Baker, Breaking Out by John Butman, and Rubbish by Laurie Baker

New Direction

Both the studio and I were in agreement about toolkits not being the ideal solution in this situation. But what other solution could we pursue to disseminate information and scale impact? One critical issue with traditional method toolkits is that they are designed around the information rather than the intended recipient of the information. Hence users often find toolkits out of context in their use case.

As I pondered over this situation, Avinash left a book on my desk. The book, **Creative Entrepreneur** by Maria Seminega, attempted to educate its readers on how to become entrepreneurs with the help of their craft skills. Although it wasn't a toolkit, the book employed case studies, condensed information into a few simple sentences and recommended simple exercises for the readers to follow along. It was a refreshingly simple take on the dissemination of knowledge, and it did so in a way that empathises with the target audience. The people who will buy that book are the ones who are skilled in what they do but are nervous or afraid of starting a business. The tone of the language used is designed to allay the fears of the readers, and gently encourage them into becoming entrepreneurs. The narrative breaks down the process of entrepreneurship and presents each part of the process in smaller, easy to understand parts. It was not only a joy to read, but immensely resourceful as well.

I discussed this idea with the studio, and we agreed that this was a good direction to follow. A new take on toolkits would be an interesting project in itself, so it was definitely worth seeing where this would lead. In further discussions with Neha, I was shown handbooks and guides written by **Laurie Baker**, a well-known architect. The books he composed were meant for even the most technically illiterate, and so they were designed with simple sketches, rudimentary English, and clear step by step directions. Reading these books further reinforced the fact the concept of designing dissemination methods according to your target audience.



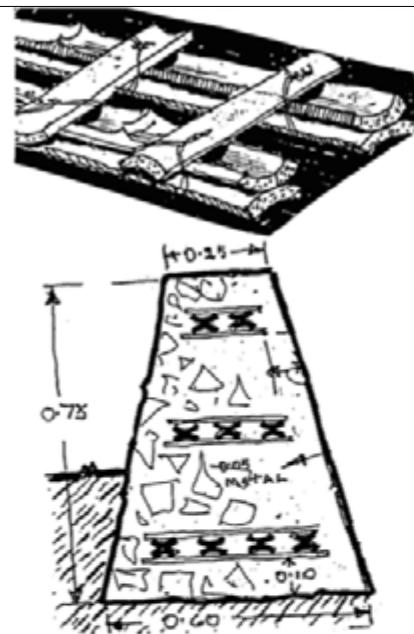
WE ARE WELCOMING THE NEW MILLENNIUM IN MANY WAYS. HIGHWAYS WILL BE LINED WITH FLAGS AND LIGHTS - AND, MORE PROBABLY THAN NOT, PILES AND OF RUBBISH!

AFTER A FEW DAYS OF CELEBRATION THE FLAGS AND LIGHTS WILL BE TAKEN AWAY....

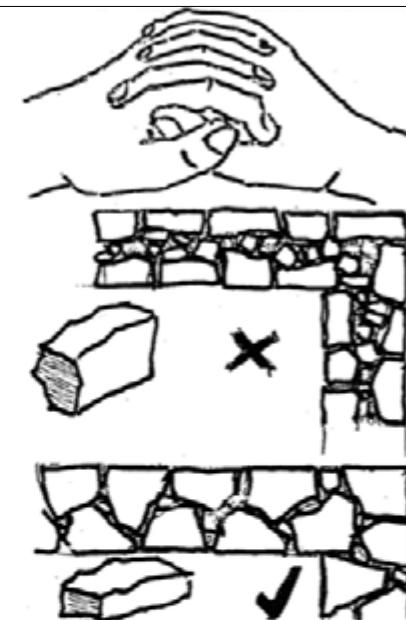
...WHAT IS YOUR PREDICTION ABOUT THE RUBBISH?

ROSEN
UGLY
BROKEN
BEASTLY
INEXCUSABLE
SHAMEFUL
HORRID

Excerpts from *Rubbish* by Laurie Baker



Another use for split building **BAMBOO** in **LIME** concrete is for foundations, especially in sandy areas along the sea coast. Salt and Saline will not affect or destroy either the concrete or the reinforcement. (Ordinary foundations will crack with shifting sands.)



BONDING

is the very essential art of making **BRICKS, BLOCKS & STONES** ON **BOTH** sides of a wall interlock with each other.



Mud walls must be protected from water

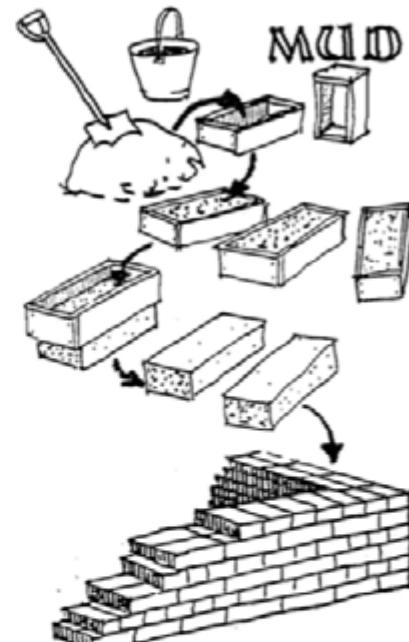


OVERHANGING ROOFS MUST ACT AS AN UMBRELLA.



PROTECT THE BASE OF MUD WALLS FROM ROOF RAIN WATER SPLASHING UP FROM THE GROUND.

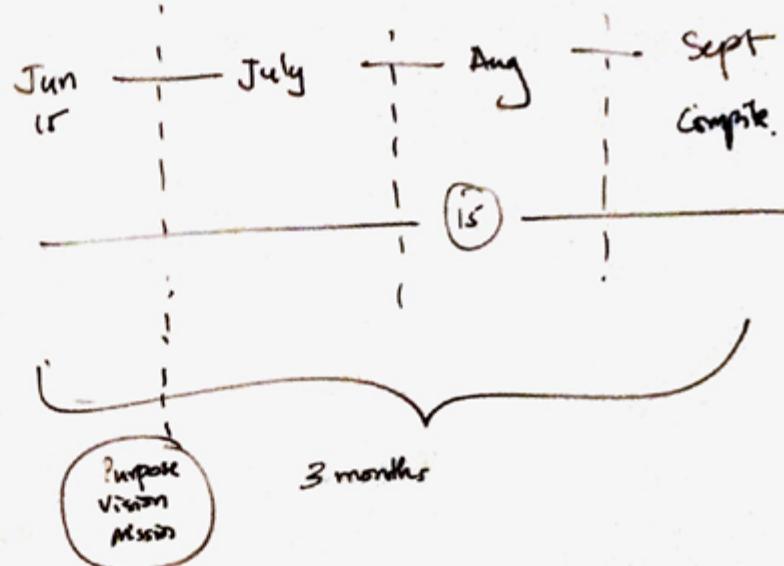
Excerpts from *Manual of Cost Cuts for Acceptable Housing* by Laurie Baker



ADOBÉ OR SUN DRIED BRICKS

THIS IS VERY OLD, WELL TRIED AND TESTED MUD BRICK SYSTEM COMMON IN MANY PARTS OF KERALA. IF PROPERLY MADE, THESE MUD SUN DRIED BRICKS ARE CAPABLE OF BEING USED FOR A TWO STORY HOUSE.





FRAMING TOOLKIT 1.0 + DEFINITION

→ Stimuli

Why? This toolkit
CORE VALUE PROPS.

Who? Are the intended
users? → ex.

How? Are they using it → web
→ publication
→ open source platform

What? • Are the main
challenges to collect.
• Are the diff schools
of thought?



What are good examples of ind/small
- big org's who have 'cracked' it.

2^o

- Mozilla
- StudioD (Radiodemons)
-

1^o Inspiration/
Experiences.

Experts

①

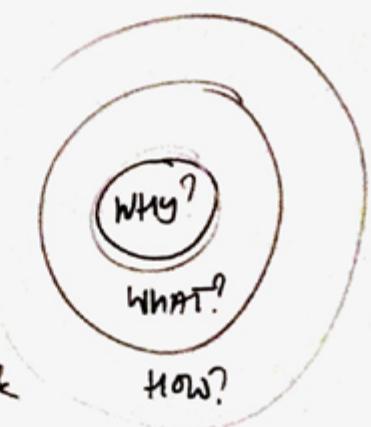
Potential
End user

Challenges/
Barriers/
needs

feedback
on
V1.0.

②

- . What is the ideal collaboration journey?
- . What are diff formats of collaboration?
↳ needs w/ in these unique formats



Creating a gameplan to
create the first draft

Final Form

The target audience for the collaboration toolkit are young people, or organisations looking to collaborate. They are relatively inexperienced with collaboration and are looking for something to give them a heads up on what to expect, and what to be aware of. Based on my interviews with young freelancers and artists who will be heavily collaborating in the future, I understood that they aren't afraid of collaborating, but definitely do want to learn about the nitty gritties of the grammar of collaboration so that they know how to deal with unexpected situations. But not everyone has the same demands from the toolkit either.

The target audience can broadly be divided into three categories:

The ones that **have been asked to refer to the toolkit (non-voluntarily)**. This is a situation where a guided workshop with a traditional toolkit would be the most effective. Traditional toolkits work best when used in a workshop setting, and facilitated by an expert.

The ones that **want to use the toolkit of their own accord (voluntarily)**. This is meant for those who want to understand the process of collaboration, see case studies and interviews for a deep dive. In this situation, a helpful guide, with stories, essays, interview transcripts, and

illustrations would be ideal as it allows the user to explore the grammar of collaboration.

The ones **that have already been through the toolkit (follow up)**. For those who have already been through the guided workshop or read the guide, this would be a useful follow-up, a ready reckoner with the core data and research condensed in a concise format.

Creating a product for each of these three broad target audiences could be a new way to approach the domain of toolkits. Even though it hasn't been done before, it would be exciting to see if it has any merit. So we decided to try this method and see if it could work. Quicksand has also been questioning the validity of toolkits in their current form, and hence they were curious about this method as well. It would be an experiment, but a valuable one.

INTRODUCTION

This Collaboration Manual should be considered a permanent part of the practice, and must remain with the practice at time of resale.

This manual is designed to help you collaborate with others and set up a collaborative practice. Broken down into sections this allows you to consult any part that you're stuck at.

This manual contains important information about the safe operation and maintenance of your collaborative practice. It has helpful guides and exercises that will help you understand the sort of collaboration that suits you.

We urge you to read it carefully, become familiar with the controls it describes, and follow its recommendations, to help make your collaboration trouble-free and enjoyable.

Statements or labels on the product preceded by the following words are of special significance:

WARNING: Pay close attention to this as it may cause rifts in your partnership.

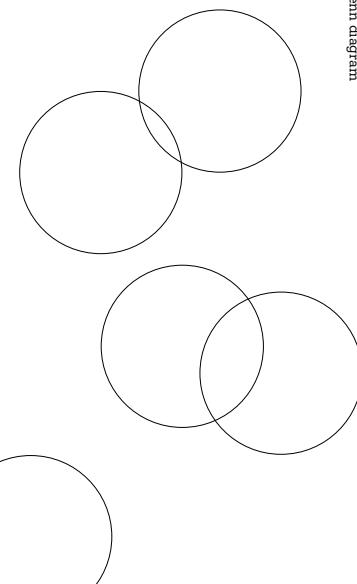
BROWNIE POINTS: Follow these extra steps and you won't regret it.

What is collaboration?

"An act of shared creation and/or shared discovery; two or more individuals with complementary skills interacting to create a shared understanding that none had previously possessed or could have come to on their own. Collaboration creates a shared meaning about a process, a product, or an event."

Many of today's most important challenges are so complex and multifaceted that they can only be tackled by teams of experts from disparate domains. To solve them, professionals must be able to harness ideas, people, and resources from across disciplinary and organisational boundaries.

But why collaborate in the first place? A stat to look at. In the 1980's, only 20% of work was team-work based. In 2010, 80% of work is team-work based.



venn diagram

Whom

Whom will you work with? The most important part of a collaboration is to choose whom you will work with. Your partners are the ones who will define your experience of a collaborative practice.

To start a collaborative practice, it is important to have collaborators to work with, and even more critical to choose collaborators who complement your personality and style of working.

In such situations, professional relations are just as important as personal relations.

Here are a few pointers to get you started.

The easiest teams to work with collaboratively are those with ~20 members. If it gets too large, then it becomes complex to work with.

Collaborative practices are often put to best use when there are interdisciplinary members. Interdisciplinary members will make the collaboration multi-faceted and give it a better understanding of the problems it is trying to solve.

It is important to understand other partners ways of working their quirks and nuances. Important to have good interpersonal skills like: 1) Appreciating others 2) Engage others in meaningful conversation 3) Creatively/productively resolve conflicts. Categorise your partners (by what they offer, their perceptions, professions), and map out relationships between partners and the issue/project at hand. Clarify all stakeholders interests and roles. Each partner should understand how each others organisation works-including perks and nuances.

How

Now that you've got your partners and selected what to work on, it's time to structure your collaboration and lay down a framework to help you run the collaboration. In general there are a few accepted and proven ways of governing a collaboration.

It is important that your collaboration should have a structure of some kind. Any sort of collaboration needs some sort of hierarchy or governance structure.

Now that you've decided what to work and whom to work with, its time to structure your collaboration.

There are in general four types of partnerships: Networking, Co-operating, Collaborating, Integrating.

It usually progresses in this manner of increasing involvement: Co-operation->Co-operation->Collaboration->Partnership

It is important to see the collaboration as a team effort, rather than simply a work group. Teams work toward one common conclusion. Work groups usually have different outcomes for the same project. This is a key difference.

Collaboration is most effective when the objectives, process, and roles are clearly defined so that those involved know what to expect from it.

Plan out the finances of the collaboration

Figure out ways to get funding for the collaborative projects

1) Clarify objectives 2) Cost/Benefit analysis 3) Review/Manage partnership

The operating structure of the collaboration can be Open/Closed, and Hierarchical/Flat.

The governing structure can change according to the phase of the project currently in progress.

Collaborative agreements can strengthen mutual accountability and trust enabling groups to maximise resources and work efficiently. Although this needs commitment from members to work.

WHAT

What will you work on? What is the point of the collaboration? Why bother working together? Usually most collaborative practices often have a common goal that they work towards. Although it's not necessary to have one, and many collaborations can be just partners sharing a common space and nothing more.

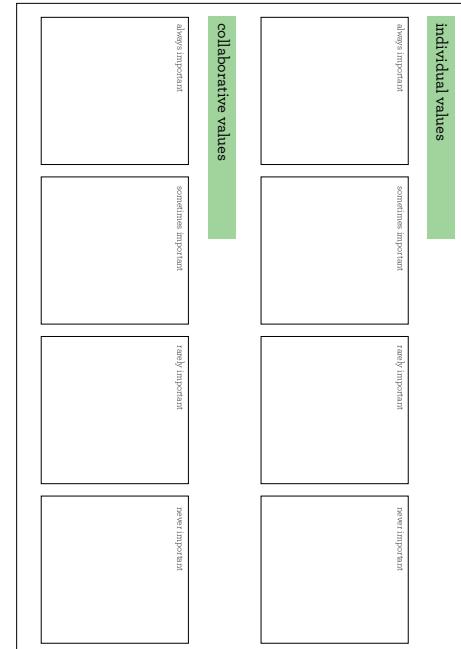
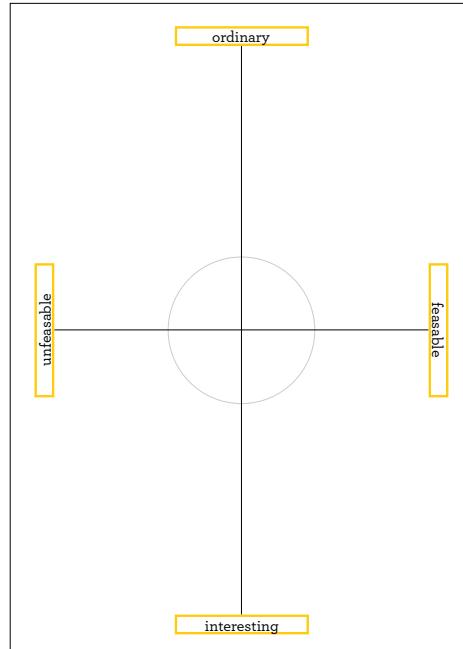
Collaborations are often started on the basis of tackling a common goal, solving a certain issue or working together to form a stronger organisations, amongst many others. Sometimes partners are often chosen on the basis of the pre-decided goal. It can also work the other way round, where the partners come together and choose their common goal collectively.

you	partner 1	partner 2	partner 3	partner 4
what is the key reason you want to work together?	what is a problem left?	what is achievable that can be done?	what value do you add to the team?	Can you think of this being implemented in the future?

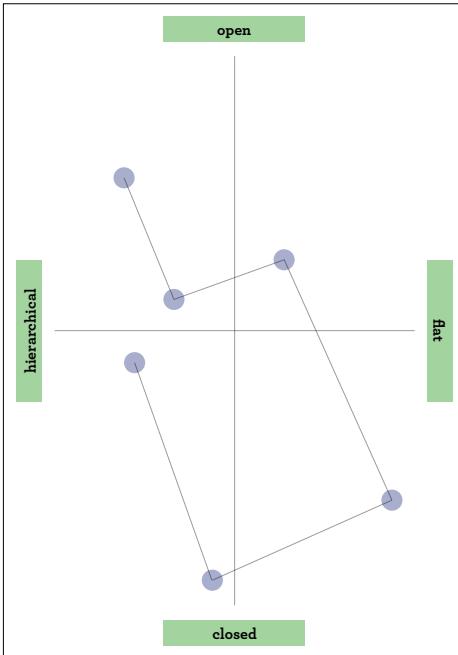
List down attributes of you/your organisation and your partners

what will help you?	how do you do it?	what do you need?	how do you reach them?	who will help you?
what will it cost?	what do you do?	how do you interact?	how do you reach them?	who will help you?

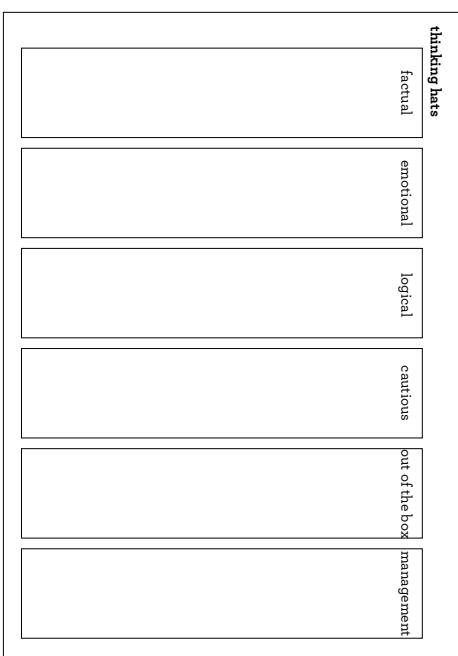
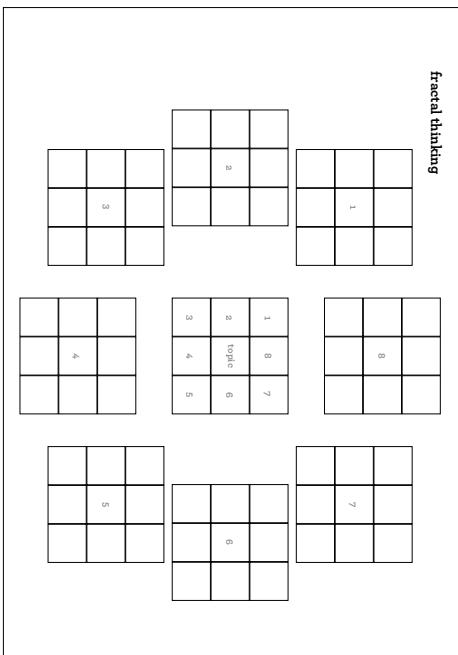
why	
what	
where	
when	
who	
how	



Draft toolkit prepared using the Hack method



Workshop Toolkit

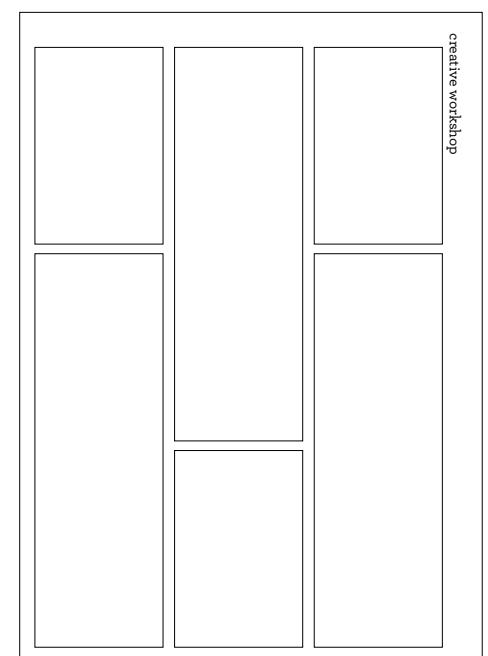
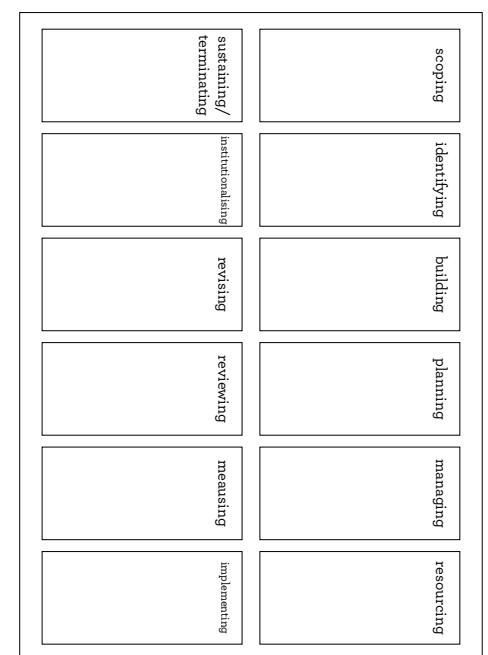
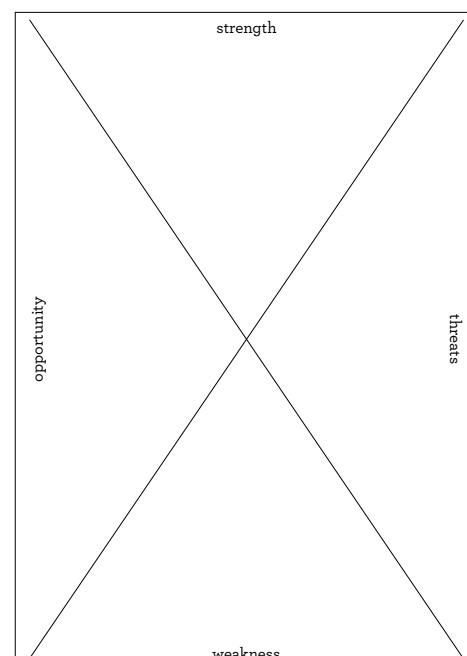


The Workshop Toolkit is a method meant for those who have been told to learn about collaboration. **In this case, the user is not voluntarily wanting to learn.** The classical toolkit is most effective when used in a workshop setting, facilitated by a subject matter expert. The exercises and activities listed in this format are very effective when performed in a group and guided by an expert in the field.

Primarily consisting of tools, and a condensed list of insights, this method of dissemination relies on the facilitator to make this method work.

We created a quick prototype of this toolkit using a narrative from earlier in the process. Using the tool hacking process, a prototype was created, which we felt was okay for a first draft. The tools selected were changed to suit the context of collaboration.

This method serves one of three target audiences, hence is deliberately very specific in its approach toward disseminating the insights of good collaboration.



Final Chapter/Content List

I. Introduction

↳ Explains what the book is about and the context in which it was created, brief overview of how it was made and what it will be covering.

II. Why Collaborate

↳ An introduction to collaboration, why is it relevant, and show the trends pointing to a collaborative world.

A. Whom to collaborate with

↳ Talks about carefully choosing whom to collaborate with, and how different people will go on to have an effect on your work. Working preferences - Bassudur profiles, personal/professional relationships

III. Trust

↳ Trust is the most important factor in any collaborations. It's the reason why collaborations work. Without it, they will fall apart. Case studies where trust has kept the collaboration working, and also where it has failed.

IV. Communication

↳ Communication is the most important element in building trust. Communication is also deceptively tricky, and constantly needs to be worked on. Tips to better communication and case studies.

V. Working Together

↳ Covers the nuances of working in a collaborations and the things one must pay attention to, to ensure a smooth journey.

A. Target

↳ Three similar sounding terms actually refer to three different things altogether which are critical to ensure the aims of an collaboration

1. Goal
2. Vision
3. Perspective

B. Compromise

↳ This is something that all partners must accept will happen every time. It's important to accept that compromises in personal choices isn't something to get offended with.

C. Synchronous/Asynchronous

↳ Work doesn't only happen when partners are together, personal and group work are equally important

D. Collaborative Agreements

↳ or operating and guiding principles are important to set and agree upon before collaborating as it dictates how the group will work and function as agreed upon by the members.

VI. Structure

↳ About the structure and hierarchy of an organisation which is needed to keep the organisation together and working

- A. Types of Collaboration
- B. Structure of Collaboration
- C. Accountability

VII. Conflicts

↳ Conflicts will always occur in any collaboration. There are two ways to look at conflict.

- A. Avoiding/Dealing with conflict
- B. Celebrating conflict

VIII. Negative Factors to be aware of

↳ There are a few things to be aware of, in both actions and soft skills, that should be avoided to make sure collaborations don't break down.

IX. Activities/Exercises

↳ These are some recommended activities and exercise that one can refer to to help out in different chapters above.

Collaboration Manual

The Greenhouse Collaboration Manual is for those who are genuinely eager to learn about the process of collaboration. A target audience that is interested in learning more about something needs a different method of dissemination than the usual. The readers have to be led into the heart of the topic and should be provided with answers to any question they might have, to satiate their curiosity.

This **manual is a book of stories, and essays about collaboration, drawn from my research**. Insights are packaged with the context from which they have been derived from, to give the readers all the information they need to judge the content.

One unique aspect of this manual is that it is written from my point of my view. Instead of writing it from a position of authority which I am not, we thought it would be interesting to see collaboration from my perspective. It is perhaps an unorthodox way of presenting insights and learnings, but this way, the reader will be able to understand the context behind the research. There might be some added value in me editing and writing the content. All of my data and research has been gleaned from credible sources and experts in the field of collaboration. If I did write the guide to good practices of collaborations, it would be very interesting and insightful if I wrote

it from **my inexperienced perspective**. Having been involved in many collaborative projects in design school, now working in a collaborative studio, and having studied the finer details of collaboration, I would have a distinct take on specifics of collaboration.

This sparked a conversation about **lived versus read experiences**. Was there any point in me writing about collaboration if it's simply better for the readers to learn by making the mistakes that the guide warns them about? After all, it's only after you touch a hot vessel do you actually learn not to touch hot vessels, in spite of all the warnings repeatedly telling you not to do so. Without question, lived experiences are immensely more valuable as compared to just having read about them. But perhaps, in this context of collaboration, the guide can augment your experience of collaborating with others. There is no guarantee of the content being 100% correct as collaboration is a subjective phenomenon that varies from individual to individual. During the interviews, the interviewees, the experts on collaboration were especially keen on wanting to know what others had to say on the topic, and they felt that it would definitely help them.

This guide, tentatively titled **The Greenhouse Collaboration Manual**, will have essays, illustrations, interview

transcripts, academic research and activities to help the reader understand the grammar of collaboration. The objective is not to preach to the reader a definitive process of collaboration, but to explain the various factors and parameters that affect the grammar of collaboration. The aim is to give the readers an understanding of how collaboration works, so that they can craft their own approach.

Final Chapter/Content List

I. Introduction

→ Explains what the book is about and the context in which it was created, brief overview of how it was made and what it will be covering.

The Greenhouse Manual of Collaboration.

This is being written in a very specific set of circumstances.

Quicksand and The Busride, two well known design studios in India, decided to set up a design studio in Goa-together. The reasons for coming to Goa are multi-fold, and compelling. But what is unique about this is that they decided to work in the same space, and aimed to work on projects together. A collaborative design studio. This was something new for both of them. Although both studios have had their fair share of collaborations, and also have worked with each other, this would be the first time they would be so close together. This project had been planned in the latter part of 2016, and by January 2017, they had moved into their new studio. Both entities still had their main offices in Delhi, Bangalore, and Mumbai. Just like any new venture, it took some time for the studio to settle down into a rhythm. Both studios were still finishing off work at their main offices, and trying to bring work down to the new studio in Goa. In the midst of this, I was bought in as an intern to find out the best practices for collaboration, that they could then adapt and use. It seemed like an exciting project. Observe, research, and create a framework or a toolkit that the studio could use.

But almost immediately, there was a problem. Who am I, a final year design student to comment on the collaboration between two well known studios run by highly experienced personnel. The argument to this is that I would have an opportunity to look at collaboration from a fresh perspective, and with my position as a fly on the wall in the studio, would be able to provide a clear view of what was actually happening. Then it also struck me that I do have some experience of being in collaborations. My courses in college involved a lot of teamwork, and rarely did I ever work alone. Four years of collaborative work isn't much, but I did have personal experience, and former team-mates to call upon for feedback and introspection. This still probably doesn't make me the ideal person to comment on a collaboration, but it's a start.

Over the last couple of months, I have been conducting interviews, reading research papers, and talking to lots of people to understand what makes for good collaborations and what can be done to ensure collaborations don't derail. Whatever I write in the following pages,

are things that I have either experienced, seen, or had affirmed from people with a lot more experience than me.

Before I start, I should address why I have chosen to disseminate what I have learnt over the last few months, in this format. The initial aim was to create a toolkit, or make a framework that anyone could follow to understand how collaborations work. But the more I thought about it, the more I realised how much I despised using toolkits. But what exactly is a toolkit? More accurately, a method toolkit is a collection of exercises and activities designed to propagate knowledge and scale impact of the same. Successful research and experiments conducted in one place are usually packaged into a toolkit in an attempt to replicate impact at scale. You've heard of the famous teach a man to fish quote right? The quote in its entirety is, "teach a man to fish, and you would have fed him". The toolkit version of the same saying would be, "teach a man to teach himself how to fish." A toolkit is usually comprised of a set of exercises, and activities that help the reader in the task that they are trying to accomplish. As the word suggests, method toolkits can be used in any scenario, and are used for a variety of purposes. A few popular examples of the toolkits, you may have used recently, are the Strength, Weakness, Opportunities, Threats (SWOT) analysis, or the Business Model Canvas, or perhaps any one of the IDEO toolkits. They are often used to help participants perform a task or achieve a goal, or help facilitators with their task of doing so for the participants.

But what I find frustrating about toolkits is the lack of context to the situation in which it's being used. The toolkit was designed with a specific context, and that is not the in the same context as when being used. It's not the creators fault of course, but its a hurdle that definitely comes in the way of the reader using the toolkit. The language, the way the tools are structured and the tone of the content makes it seem cold, aloof, and almost academic. It doesn't lend itself any favours when it comes to accessibility. I would never use a toolkit unless I was mandated to, or in a workshop setting. The merit of any toolkit is judged on how often it is used. If no one feels like using the tools then it has failed, no matter how technically resolved it may be. There is a caveat to add here: toolkits are always aimed at a very particular target audience, people who are in specific position at a specific time, doing a specific activity.

I'm sure toolkits do work very well in some circumstances, but for my purpose, it doesn't work. It's also important to recognise that the method of dissemination should entirely depend on the target user, and not on the nature of the knowledge itself. In an ideal world every specific problem would have its own bespoke solution, but since that not going to happen anytime soon, we have to do the best we can with general solutions. Going back to the fisherman metaphor, toolkits shouldn't teach a man how to fish, because unless you cover every single type of fishing technique, it's not going to be a very helpful guide to those who aren't in the same situation as described in the toolkit. What might be better, would be to teach the man the principles of fishing. Upon learning those he could then form his own method of fishing, and adapt to the situation at hand.

It's a lot like mathematics. Once you learn the basic formulas, and how to derive them, you can then apply it to any problem. Another lesson I learnt from mathematics is that you have to understand the problem very well. Once you understand what the situation needs and requires, you can then use the necessary formula. Of course, real life is nothing like mathematics, there exist many complexities that no toolkit can handle. Math textbooks also have many examples which are used to explain specific methods in which certain formulas are used so that the reader understands the spectrum across which the formula is effective. Similarly, I also like to read case studies. On the face of it, case studies are just another layer of abstraction between the reader and the information. But that layer of abstraction gives the information context and tells the reader how it was relevant only in that context. So one can separate the context from the story with the additional understanding of knowing how it was used in context, hence giving a better understanding of the information. So I tend to understand concepts a whole lot better when presented to me in case studies. The power of stories to explain a concept should never be underestimated. Books such as the Collaboration Book and the Big Impact published by HBR Press appealed to me for this very reason. Easy to read, accessible language that allowed me to understand what they were trying to say.

Perhaps this is why I chose to approach the topic collaboration from a personal lens, as a 22 year old. When I started I did have some reservations about lived versus read experiences. In fact, that was one of the main issues I grappled with as I did my research. How could what I simply read, and heard about compare to if I had actually lived through the same experiences. It was a raging debate in my head as I went about my research. Intuitively I felt that read experience do make an impact, and are useful in any kind of situation. Our education system is based on it. In my interviews, I posed this very question, and most of my interviewees strongly felt that read experiences are very useful. There were of course a few that trusted lived experiences a lot more than read experiences, and I cannot argue against the merit of the points they put forward. I do feel, that in some situations, it's important to live through the experience of making mistakes, which cannot be avoided even if learned about. Any physical activity cannot be improved upon by simple reading about the mistakes made by others. You may be able to anticipate them, but it's highly unlikely that you will be able to avoid them completely. But in this context, when talking about collaboration, and how to get it right, read experience can influence for the better. There are certain aspects of collaboration that one can be aware of, and take steps to ensure that a collaboration goes well. The debate between read and lived experiences still rages on in my head.

II. Why Collaborate

↳ An introduction to collaboration, why is it relevant, and show the trends pointing to a collaborative world.

We're all collaborating with each other, in one way or the other, since the beginning of civilisation. It's becoming increasingly rare to see any sort of activity in isolation.

Collaboration is the primary building block of civilisation, and arguably it might be one of the attributes that made us the dominant species of planet Earth. Collaborating with our fellow humans is what enabled us to evolve. It's an ever-present undertone of our society, a given in any venture. But why do we collaborate? Even asking that question seems like a strange happening. The act of collaborating is not only normalised, but expected from any activity we take part in. The statistics back up this statement up as well. In the 1980's, only 20% of the work was collaborative. In 2010, that number had gone up to 80%. The wave of collaboration has since grown into a tsunami, not only engulfing smaller businesses, but larger corporate setups as well. It's not only collaboration within organisations, but also across disciplines that go a long way to validate why they make so much sense.

A. Whom to collaborate with

↳ Talks about carefully choosing whom to collaborate with, and how different people will go on to have an effect on your work. Working preferences - Bassudur profiles, personal/professional relationships

III. Trust

↳ Trust is the most important factor in any collaborations. It's the reason why collaborations work. Without it, they will fall apart. Case studies where trust has kept the collaboration working, and also where it has failed.

Trust. It's the ingredient that enables a collaboration to work in the first place, the glue that keeps the partners together. It's also the most difficult aspect to build in a relationship. It also depends on many other factors that I cover later on. Most collaborators that I spoke to had known their partners personally before engaging with them professionally. This definitely helped maintain trust in the collaboration. Although trust is a combination of many factors, the understanding between partners is what really allows it to grow.

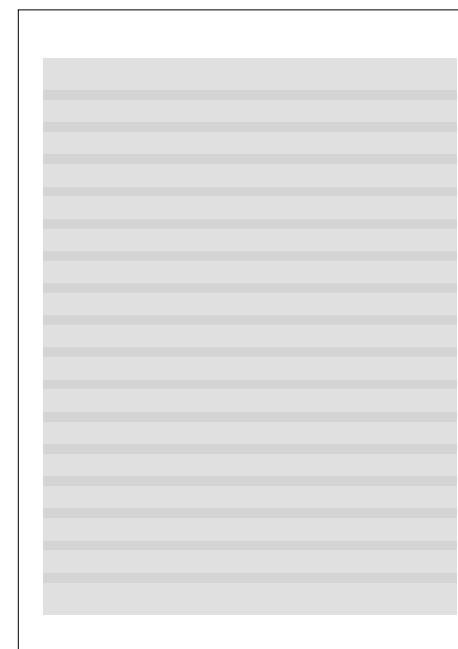
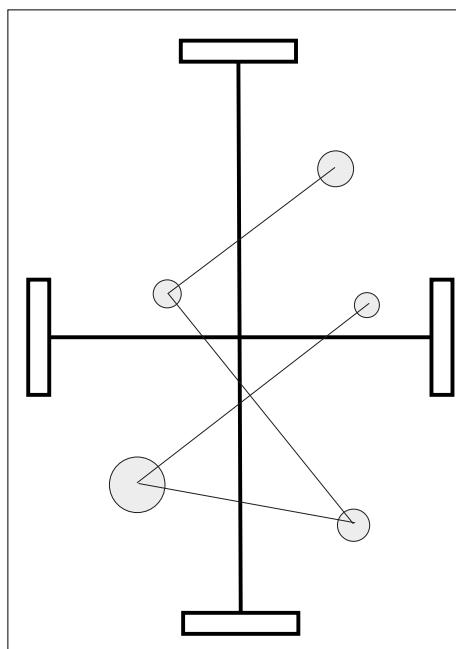
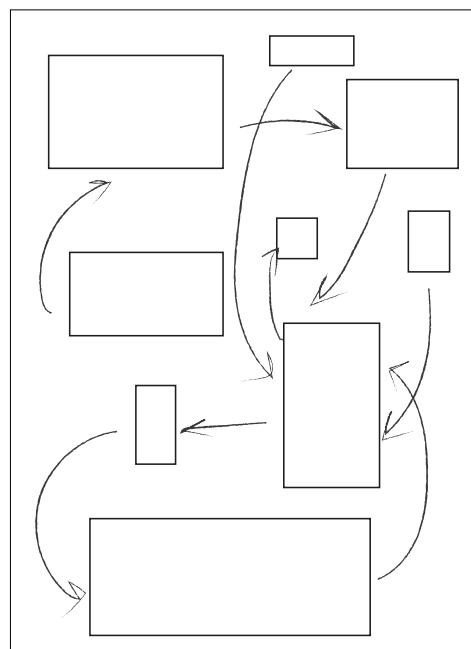
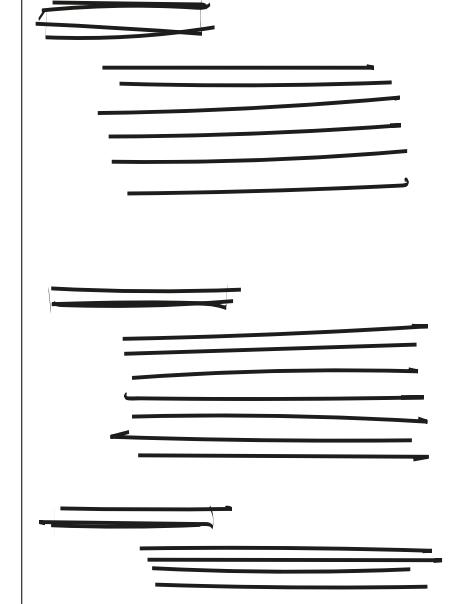
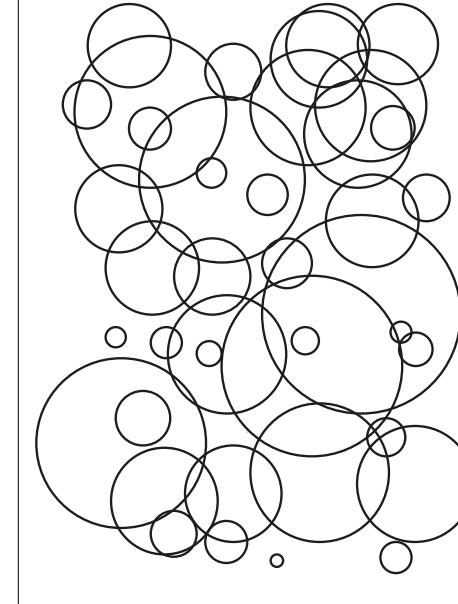
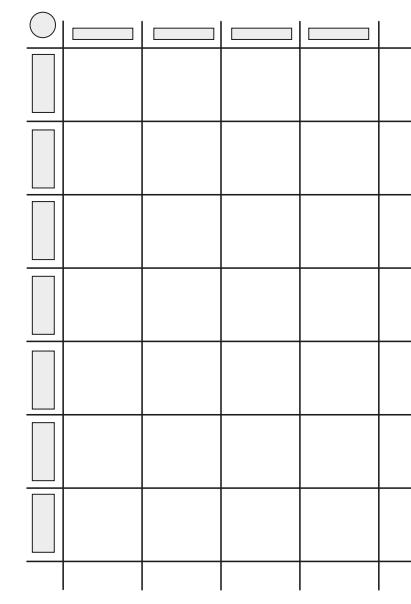
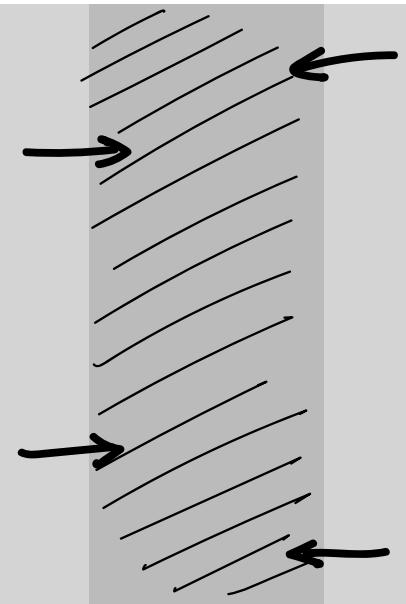
trust is built by working together, figuring out how every person reacts to certain situations, how they work together. Musicians can often build trust a lot more quickly as they tend to understand the people a lot faster via the way they play together, or jam together. The way in which the react to the change in music, or don't react to it, can help them identify if they are ideal partners to work with. The willingness to work with others, and the openness to change their personal working style to accommodate others can go a long way in building trust. Trust is a combination of a lot of factors, yes, and these are just some of the few that can help build trust. Some factors in a persons personality are markers, signs that point to other parts of their personality that can tell you if they can be trusted to work in a collaboration.

WHY

STRUCTURE

CONFLICTS

TARGET



To start a collaborative practice, it is important to have collaborators to work with, and even more critical to choose collaborators who complement your personality and style of working.

In such situations, professional relations are just as important as personal relations.

The easiest teams to work with collaboratively are those with ~20 members. If it gets too large, then it becomes complex to work with.

Collaborative practices are often put to best use when there are interdisciplinary members. Interdisciplinary members will make the collaboration multi-faceted and give it a better understanding of the problems it is trying to solve.

It is important to understand other partners ways of working their quirks and nuances.

Important to have good interpersonal skills like : 1) Appreciating others 2) Engage others in meaningful conversation 3) Creatively/productively resolve conflicts.

Categorise your partners (by what they offer, their perceptions, professions), and map out relationships between partners and the issue/project at hand.

Ready Reckoner

For those who have already been through the guided workshop or read the manual, **this ready reckoner will be very useful for them to brush up on, or have a guide to reference when needed.** It's the distilled condensed version, with only the hard facts written on them.

Compiled in an easy to carry format of printed cards and digital images, this will allow collaborators to ensure that they have followed up on the good practices that they wish to follow that have been listed and explained in the Manual. During the interviews, when I told the interviewees about my project, they were quite keen on wanting to know more about what I had found out. Once they had been through the process of reflecting on their methods of enabling collaboration, they were interested to understand how they could become better at it. These set of cards would be ideal for them, as the condensed information gets to the point. The experts of collaboration will be able to understand the concise points as they already know the framework of collaboration, and why it works the way it does. The information they need is framed exactly how they would want it.

Mockups of Ready Reckoner cards

Part.02

When we first discussed the project, one of the outputs of the project was to be a spatial design exploration of the learnings from the Collaboration Manual. Due to the lack of time, and the need to start work on the second part of the project, I wasn't able to create the final outputs of the collaboration toolkit. However, I have started work on writing the Greenhouse Collaboration Manual and the condensed Ready Reckoner. But the learnings from this are to be used in the next part of the project, and the collaboration project will continue to be worked on to completion.

This was my first look at the world of service design, and I have just about scratched the surface. It is a fascinating domain of design and a one that I will definitely delve into again. There is a lot that I have not yet touched upon, and there is still a lot of exciting work to be done in this area.

We didn't know what to expect or plan for, as it all depended upon the progress of the collaboration project. All we knew was that there might exist a small possibility of working with Virtual Reality. This was an exciting opportunity for me, as I had never worked with this medium before, and was curious to find out for myself what the hype was about. It was also an appealing idea as it would be interesting to see how traditional education in spatial design would translate into the digital realm.

In retrospect, the spatial exploration of collaboration made a lot of sense, as strange as it may sound. The studio was looking to build upon the concept of the Greenhouse, both in the way that it functions, which the collaboration toolkit explores, and the physical spaces in which collaboration is practised. This is where the second part of the project comes into play, providing a wholesome investigation into the realm of collaboration.

This was also the studio's first stab at Virtual Reality, so the entire workflow of working in VR was new for us. As the collaboration project started winding down after we figured out the re-configured toolkit solutions, we began discussing briefs for a spatial design project. By this time, the possibility of working in VR had very much become real, so we directly started working with VR as the medium of the choice.

Part.03

All dreams are but another reality.

-unknown

Part.03

Greenhouse Spaces

VR Experience

- Goa Time Capsule
- Make a new Greenhouse to be used as collaborative online space
- A VR presentation of toolkit - VI - multi-media
- Collaborative work through VR
- Express parts of the collaboration project in individual VR Chapters - provocation
- Since VR is a very collaborative medium apply learnings of toolkit to create a VR project

Some ideas for the brief

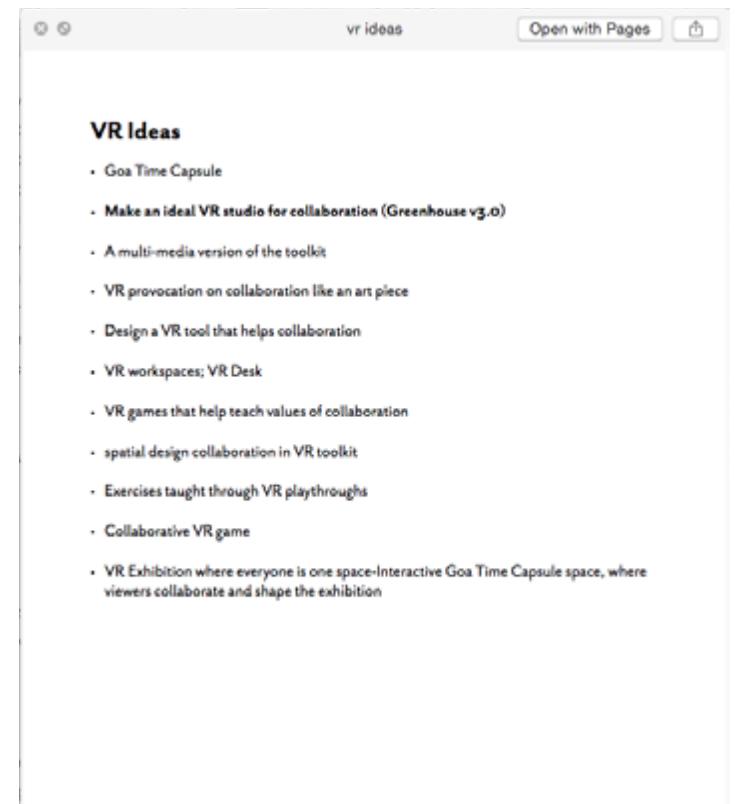
The Brief

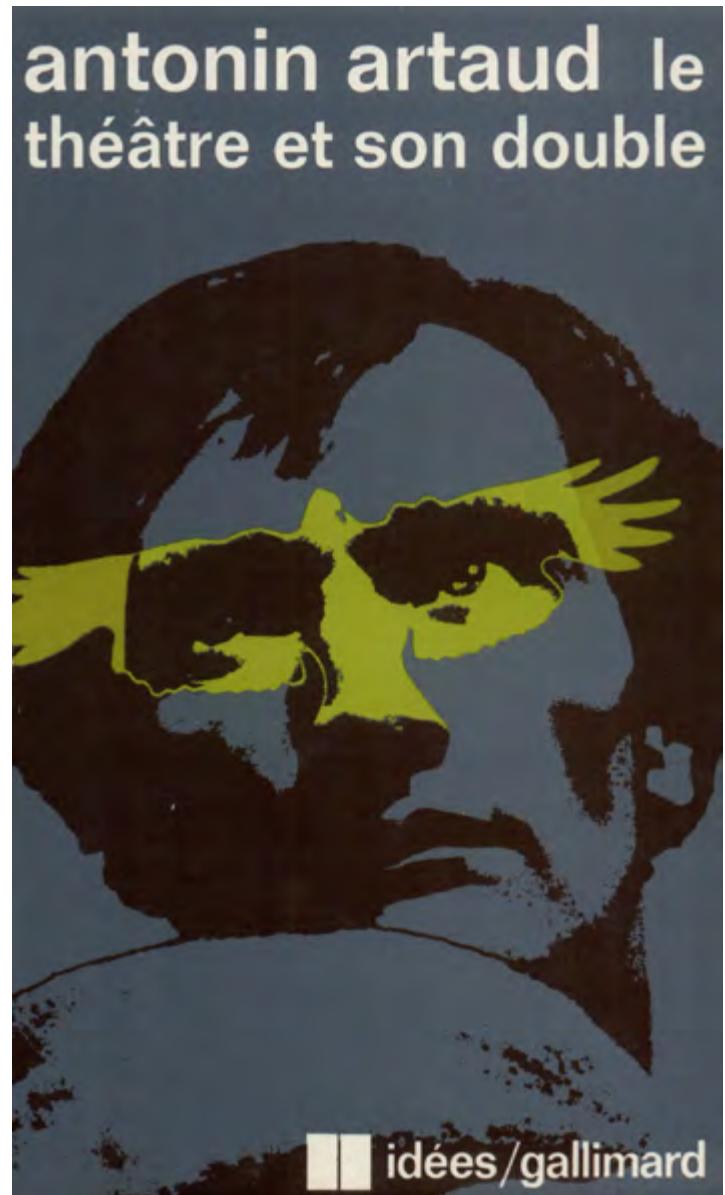
The brief was simple: **Translate the learnings of the collaboration project into a VR space.** Directly converting the data and research from the project into space is a concept that needs plenty of thought. The first idea that we thought long and hard about was a concept for a multi-media research docket that ships along with the collaboration manual, so that users can see the interviews for themselves, and participate in the activities in VR. With this concept in mind, I recorded audio, videos, and captured 3D models of the interviewees with the plan of using these assets later while developing the VR project.

But the more we thought about, the less confident we had in that brief. It wouldn't necessarily turn out to be an exciting project for VR, and the **same purpose could easily be served with traditional digital media.**

One idea that kept sticking through every discussion was the concept of **Greenhouse v3.0.** The first Greenhouse back in 2010 was located in Hauz Khas Village, Delhi as a creative community space for cultural, cross-disciplinary events. That didn't succeed due to a variety of reasons. The second attempt, now based in Goa and is comprised of three studios working together. Taking the learnings from this current Greenhouse, and the collaboration manual I will attempt to design the next

version of the Greenhouse, an ideal collaborative studio which exists in Virtual Reality. VR and AR are becoming ever more popular as the future mediums through which we will see the world. This space will exist in a VR environment and the partners can enter from anywhere in the world. Looking at VR architecture and experience design within this virtual space is fascinating and is something that will definitely be crucial in defining how we interact in Virtual Reality spaces.





Top: Oculus Rift
Developer Kit 1
Bottom: Le Théâtre et
Son Double by Antonin
Artaud

What is VR?

Virtual Reality or VR is a technology we've had a love-hate relationship with for quite some time now. Virtual Reality was first referenced to in the book, **Le Théâtre et son Double**, by Antonin Artaud in 1938. He describes the illusionary nature of objects in theatre as la réalité virtuelle. It could be argued that the **Viewmaster** device, introduced in 1939 was the *first VR headset*, albeit a crude version of the same. These devices allowed the user to view stereoscopic 3D images. A reel held 14 photos in 7 pairs which allowed the viewer to see the images with some perception of depth.

In 1950, Morton Heilig wrote about an Experience Theatre and proceeded to build a prototype in 1962 called the **Sensorama**. It was a mechanical device that *simulated all five senses* to provide an all-round sensory experience. He even conceptualised of a device called the **Telesphere Mask** which was a personal version of the Sensorama. In 1968 Ivan Sutherland came up with the idea of a **Head Mounted Display** and makes a prototype, aptly labelled the **Sword of Damocles** because of its massive size. Progress continued at a very slow rate till the late 1990's, with *advancements in technology not being able to keep up* with what was needed to make Virtual Reality feel truly real.

In 2012, Palmer Luckey launched a Kickstarter campaign for his new device called the **Oculus Rift**. It wasn't a revolutionary product, and in his own words, Palmer describes the product having come about because of **technology maturing and developing to a point where it was finally possible to make a relatively affordable and lightweight VR headset**. It was possible to

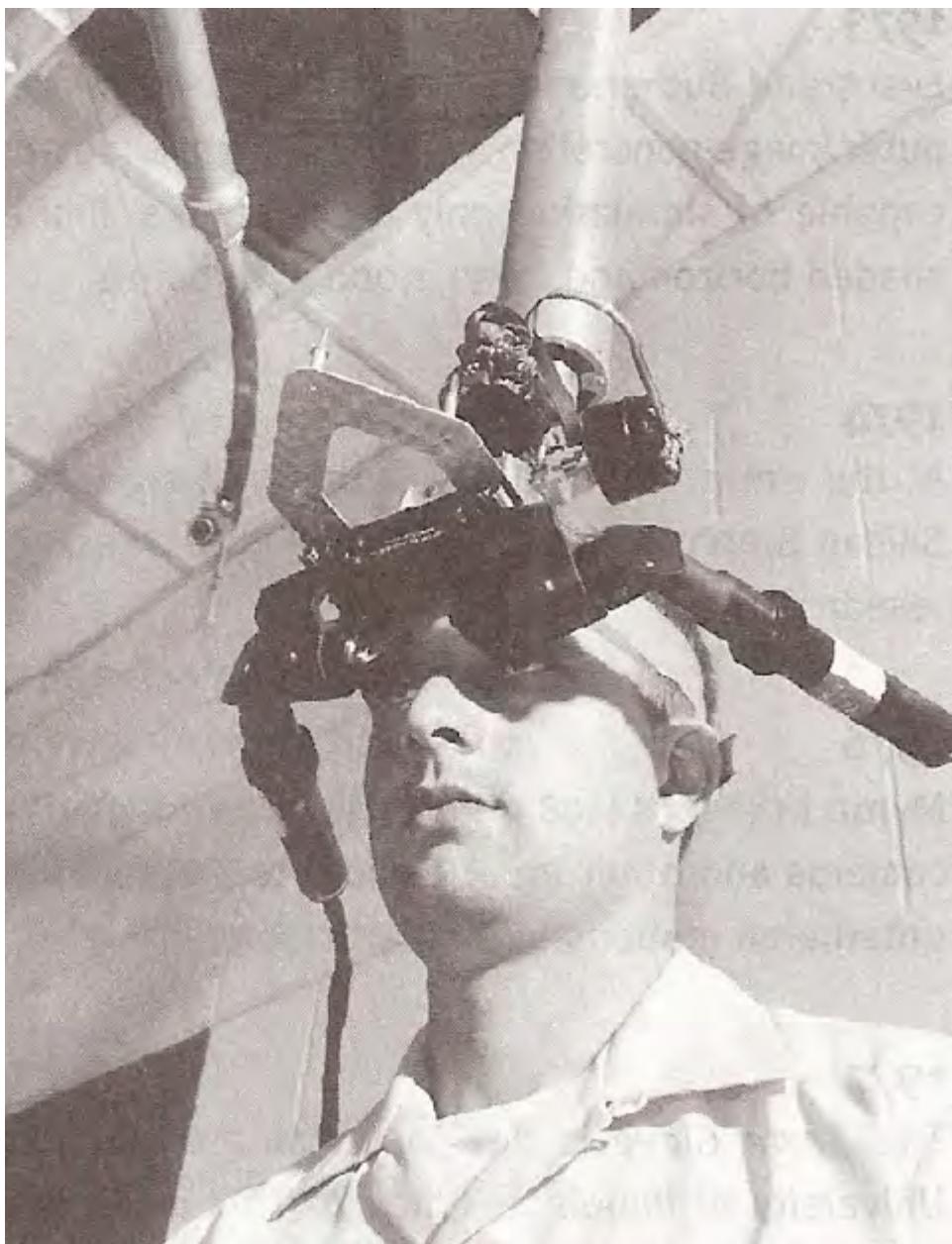
create the Oculus Rift a few years before its launch, but it would've been too expensive then. It was the right product at the right price that once again revived the idea of Virtual Reality. It then sparked off an arms race in the world of VR, with manufacturers and software giants trying to outdo each other in their efforts to create easily accessible, yet high-quality VR.

The first content developed for VR was mostly to do with military and medical applications, often for training purposes. As the medium opened up to more people and started becoming widespread, content creators started making more varied content to serve different needs and wants. The most popular of which have been games and videos. The ability of Virtual Reality to completely immerse oneself in an imaginary world is incredibly powerful and can be used to great effect.

The two main types of VR content are **360-degree videos** which are non-interactive, and **interactive 3D worlds** in full-fledged VR.

The worlds we construct in VR can be *infinitely imaginative*. In many ways, this is as close to **cognitive art** as mediums can get. VR worlds are a lot like dreams, we can imagine anything we like and jump in whenever we wish to.

Right Clockwise: Sword
of Damocles by Ivan
Sutherland, Sensorama
by Morton Heilig, and
an early version of the
Sensorama



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VR FOLDOUT

Developing for VR

The methodology for developing in VR is very different to creating content for standard 3D experiences. It's not only the visuals that have to be designed, but also the sound, touch and additional elements to satisfy the other senses as well. Although it is commonly believed that we only have five senses, modern research has proven this to be false. We have many more senses apart from the accepted five senses. Many neurologists believe **we have 9 senses, and some list as many as 21, and others even 33.**

For example, the sense of touch is actually several "somatic" senses, including the perception of pressure, heat, and pain, and there are also a variety of interoceptive senses, which analyse information that originates from within the body.

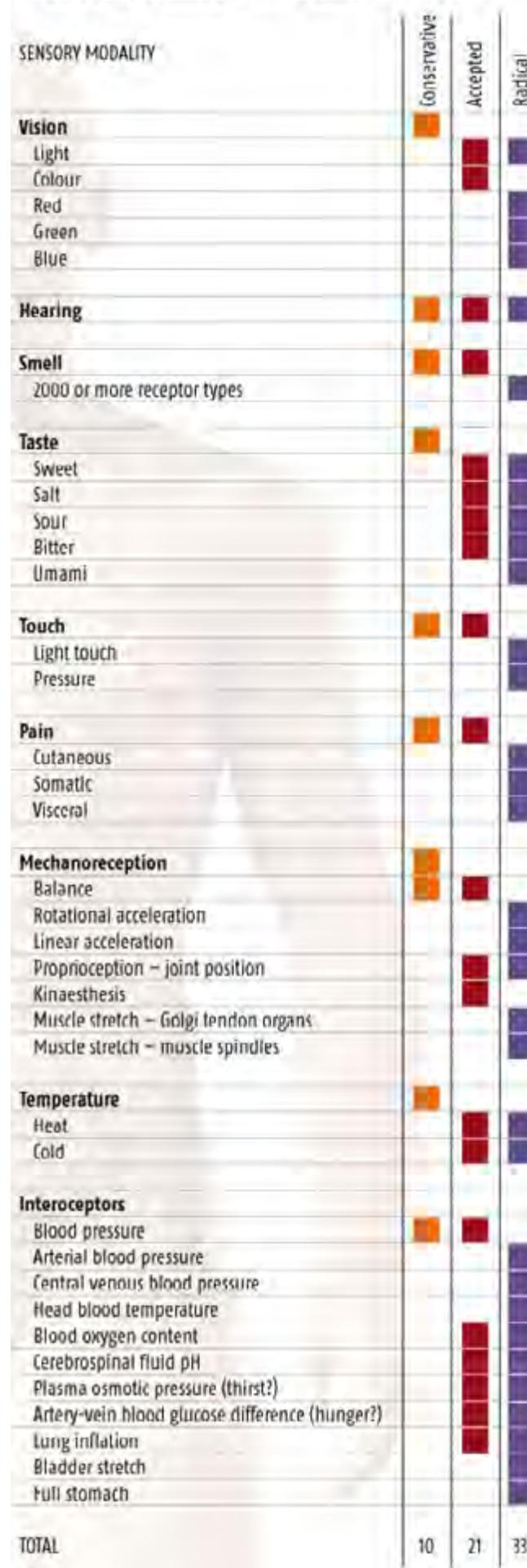
Interoceptive senses include balance (the sense of the body's alignment), the organic sense (the sense of internal condition, such as hunger or thirst), and proprioception (the brain's knowledge of relative positions of body parts). Proprioception is the sense that is actually tested by walk-the-line or finger-to-nose sobriety tests.

Some of these senses need to be taken into consideration when developing for VR. Interactivity and the ability to take inputs from the user also needs to be developed accordingly.

Audioception
Gustaoception
Ophthalmoception
Olfacoception
Thermoception
Nocioception
Tactility
Cutaneous
Reception
Tactioception
Kinaesthetic
Proprioception
Equilibrioception
Synaesthesia
Somatic sense
Chronoception
Chemoreception

MAKING SENSE OF THE SENSES

There are many opinions about how many senses we have



Left: A graph from Scientific America showing the known senses of the human body

The biggest barrier to entering and developing for Virtual Reality is the sheer cost of doing so. **VR requires high end, powerful computers, along with expensive headsets to view VR content with.** There are numerous categories of VR however, broadly divided into three classes.

The cheapest way to get into Virtual Reality is to use the **Google Cardboard** specification of VR. This setup uses a simple, and cheap cardboard structure, which houses a regular smartphone and two Fresnel lenses. Due to smartphones not having enough processing power to run high-quality applications, the experience with this standard of VR is often poor and is only adequate enough to view 360-degree videos. The cost of entry is minimal, all you need is a smartphone, and the Google Cardboard device, which is very cheap to buy, and can even be built at home.

A minor step up from the Cardboard standard is the slightly advanced Mobile VR, which requires high-end smartphones. These smartphones which have inbuilt a wide array of sensors, are to be inserted into a VR headset which further has additional functionality built in. This standard also includes basic levels of interactivity via a remote. Popular devices of this class include the **Google Daydream**, and **Samsung Gear VR**. These headsets include some amount

of padding and are comfortable enough to be worn for short periods of time. These devices are slightly pricey, but are usually bundled along with the expensive smartphones which are required to use them.

The highest level of VR achievable today is via the full-fledged, **tethered VR headsets**. These headsets comprise of two high-quality displays inside the headsets, which are capable of displaying very high-resolution content. To power these displays, the headset needs to be tethered to a computer with high levels of processing power. These computers also need a high-end graphic card, which works out calculations in a unique method that efficiently renders content for the VR headset. Two of the best devices in this segment are the **Oculus Rift CV1**, and the **HTC Vive**. Both include very high levels of interactivity via custom remote controllers, and very high levels of immersion with great build quality, ergonomics, and state of the art materials. These headsets can be worn for long periods of time comfortably. However, they are expensive, and the combined cost of procuring a computer to run these devices makes the cost of entry to this level of VR extremely prohibitive.

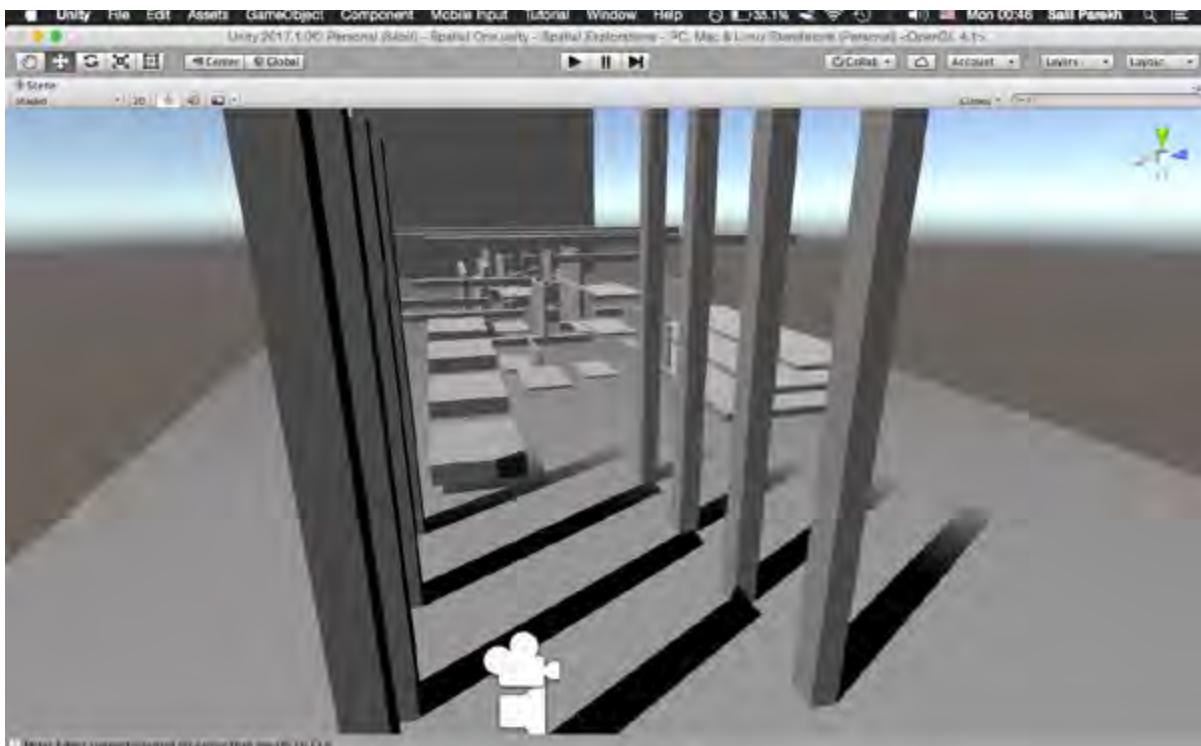


Top to Bottom: Google Cardboard, Google Daydream, Oculus Rift Consumer Version 1, HTC Vive, and the Nvidia GTX 1080 graphic card

Even though the cost of viewing VR is spread across three broad categories, the cost of creating for VR for any of those standards is expensive. Developing for VR requires the use of software, popularly known as **Game Engines**. These applications **require powerful computers, with high-end graphics cards, which are not cheap to buy or build.**

To create wholesome experiences for VR, the software required needs to accommodate all these features. Two of the most popular and powerful game engine software available are **Unity** and **Unreal Engine**. They both have their own strengths and weaknesses, but it is generally acknowledged that Unity is simpler for beginners to learn, and Unreal Engine has more functionality for specific genres of games. Quicksand had developed their game, **Antariksha Sanchar** in Unity, hence it made sense for me to start working with Unity, so I could quickly get up to speed with their experience and store of assets.





*Left: Unreal Engine developer interface
Right: Unity developer interface*

Traditionally, there has always been a clear distinction between games and videos. Games are interactive, and what you see on the screen is a by-product of your actions. Videos are pre-recorded, and what you see is unaffected by your actions. VR experiences can fall in a subset of both these categories, and in a segment that lies in between them. **Some VR experiences aren't games, but they aren't videos either. They lie in a category that is broadly defined as 'experiences'.**

I had never used Unity before, and I was only familiar with a few Macintosh specific 3D applications. The world of 3D and VR was completely alien to me, and due to the lack of time, I had to learn the software as I build the project. **A large part of Unity involves using scripts written in the programming language C#.** Although I am familiar with the basics of programming, and code with a simplified version of Java in Processing, reading and writing C# was a challenge.

Unlike regular 3D software, where the rendered output is a single frame, Unity renders every frame with changing conditions. This places a strenuous load on the computer, so due care has to be taken to ensure that the scene being displayed is rendered well, but not too computationally expensive. This is another layer of complexity that needs to be taken into consideration while developing for VR.

A basic Unity scene consists of 3D objects, lights, sounds, and a camera to see the scene through. But if you add more assets, custom libraries, and scripts, there is no limit to what you can do with Unity. There are some obtuse limitations in some aspects, but workarounds do exist in most cases, making Unity a very powerful tool to create digital experiences.

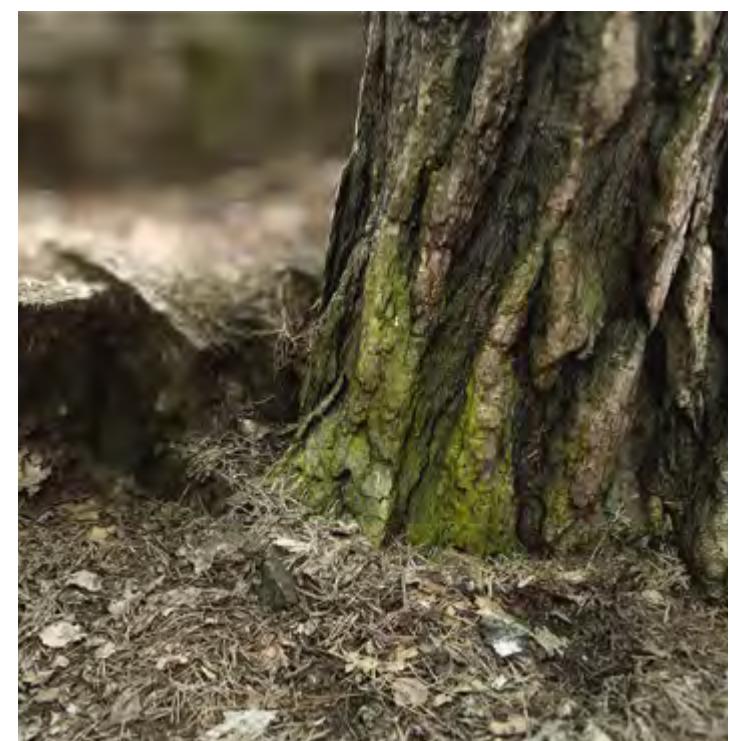
Developing assets for VR is similar to creating assets for traditional digital media, but vastly more detailed and time-consuming. Sound, for example, needs to be tuned to 360-degree surround specification and has to be of very high fidelity to sound authentic in VR. The most important part of VR worlds are the visuals you see and interact with. For creating realistic settings, **traditional 3D modelling and texturing are simply not good enough for VR**. As you can look all around in VR, the models have to be perfect from all angles. Traditional 3D modelling and sculpting usually limit the level of detail in areas where the cameras won't see. **Using the same process to create assets for VR is highly resource intensive, both in terms of time and money.** There is a need for a process to create VR ready 3D assets quickly and cheaply.

Photogrammetry might just be the answer for these demands.



Left Top to Bottom:
Gran Turismo 5, The
Vanishing of Ethan
Carter, Graduation
Project by Danny Ivan Flu,
Photogrammetry Scene
by Rens

Right Top to Bottom:
Photogrammetry Scene
by Rens, Screenshot of
Star Wars Battlefront,
Unity VR Tutorial Assets





Photogrammetry is defined by the American Society of Photogrammetry as "The science or art of obtaining reliable measurements by means of photography." Particularly note that the photography is not confined to an aerial exposure station for mapping purposes. The photograph may be exposed from the land, sea, or air for the purposes of topographic mapping, astronomy, ballistics, medicine, meteorology, geology, hydrography, material testing, timber cruise, evaluation of airborne equipment and missiles, city planning, tax assessments, military intelligence or determining the dimensions of an individual for a tailor made suit. There are many other applications of photogrammetry that appear to originate on the spur of the moment. For instance, while in the employ of the Tennessee Valley Authority, a requisition for aerial photographs was received from a small church in Kentucky. The letter went on to explain that the photographs were to be used as a means to identify every residence within a certain area to insure a complete visitation for a revival campaign. Although photogrammetry may be applied to many fields of science, its current status is attributed to the imaginative minds of those men in the fields of terrestrial and aerial mapping.

The two key words in the definition of photogrammetry are (1) photograph, and (2) measurement. Before a reliable measurement can be obtained, the photographic images must be displaced for the perspective and camera errors; whether the compensation be accomplished by mathematics, graphics, optics, mechanics, or combinations thereof. It is this initial compensation or adjustment phase that consumes the greater portion of the work in photogrammetry.

The "ABC's of Photogrammetry" was prepared with the thought in mind that if the fundamentals of photogrammetry were fully understood by means of elementary graphics and mathematics, then the Junior Photogrammetrist and specialists in related fields could be benefited by:

ix

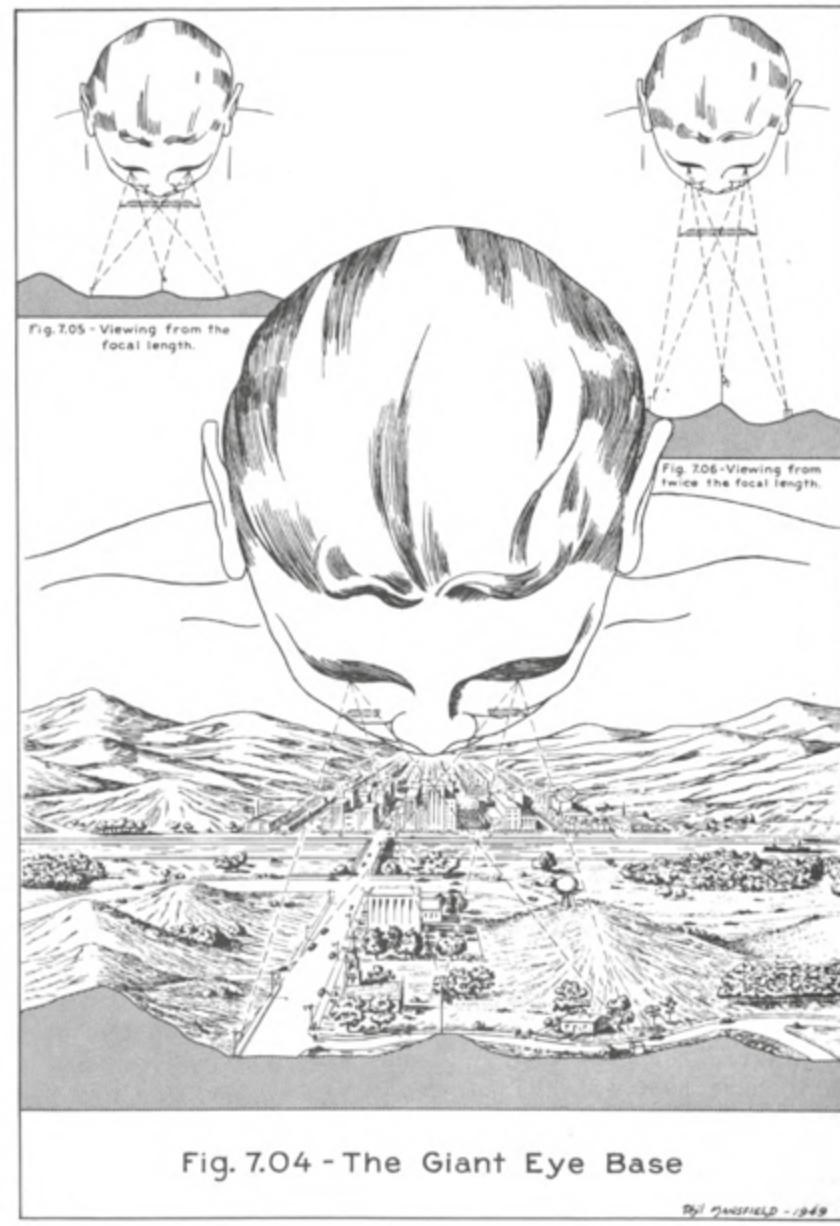
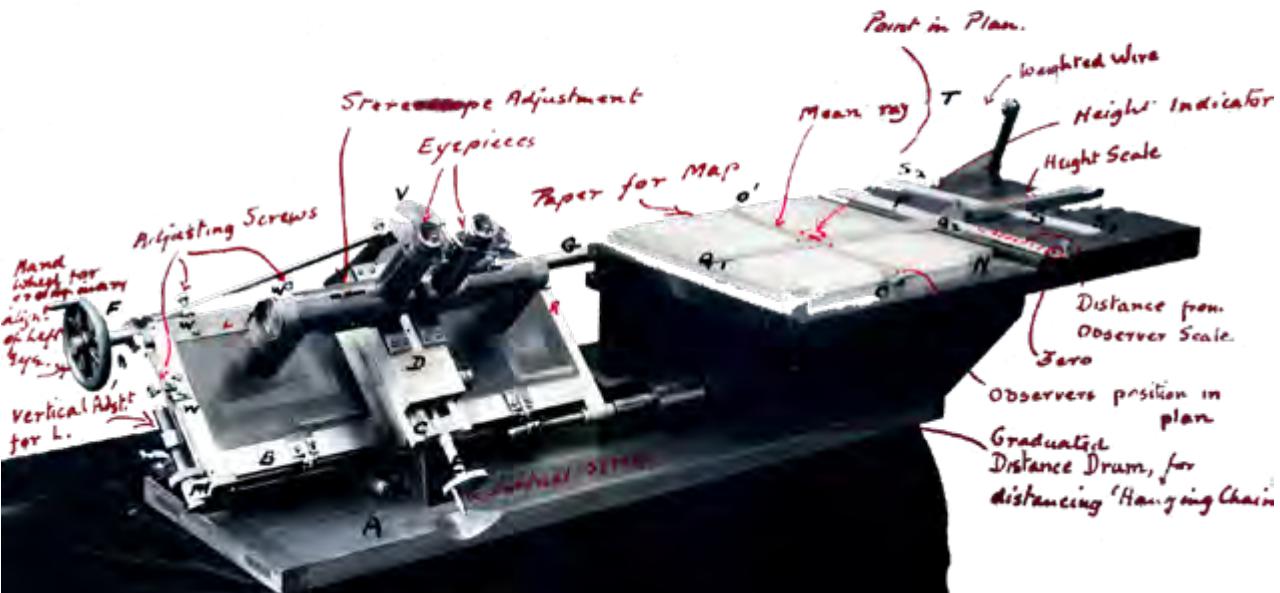


Fig. 7.04 - The Giant Eye Base

By MANSFIELD - 1949

CAPT. F.V. THOMPSON'S "STEREO PLOTTER"
for plotting maps from transparencies



Left: Thompson's
Stereoplotter
Top and Right: Pages
from the book "ABC's
of Photogrammetry
v.1."

photo - gram - metry

light

drawing

measurement

is the use of photography in surveying and mapping to ascertain measurements between objects.

Photogrammetry was a process used during wartime to map out elevations of enemy territory using spy photographs taken from planes. They were calculated using a manual stereoplottor. Nowadays, photogrammetry calculations are performed digitally, usually with powerful computers. Photogrammetry is not only limited to terrain mapping and mensuration. The same logic can be applied to any 3D object. This precise calculation of measurements from photos paves the way for recreating 3D models digitally. So with just regular two-dimensional photographs, accurate 3D models can be obtained. As old as photogrammetry is, the technology to accurately produce textured digital 3D models has just recently attained a level of detail and quality that makes it useful in a development workflow.

Having only heard of this process, we decided to try it out. We first tried photogrammetry on some toys in our studio, and we were pleasantly surprised to see it work, albeit with some glitches. The potential of photogrammetry excited the studio because it could help us create high-quality 3D assets without having to invest a lot of money and time. This would also help me in creating the VR project.

Photogrammetry requires the photos of the object, and a piece of specialised software that then processes the photos,

finds common points, and then spits out a textured 3D model. As simple as it may sound, there are many caveats to the process that determine the quality of the final 3D model. We wanted to understand the process of photogrammetry, and put together a set of good practices that could then be shared. Not too many other people are involved in the process of photogrammetry, hence there was a lack of resources online to which we could potentially refer to. Only a few of the top gaming studios have recently been using it. Game studios are usually careful about the information they share with others, but such is the infancy of this process that the game studios using photogrammetry have been sharing their methods and tools to encourage further development in this field.

The only way to work out an efficient workflow for photogrammetry is to actually go out and do it yourself. By changing parameters in the process, and experimenting with different techniques, we started narrowing down on a reliable workflow. A colleague from Quicksand was doing some photogrammetry in Hampi for a game being developed by Quicksand, while I was photogrammetring artefacts in Goa. We would regularly exchange notes, and share results to refine our process. A blog was maintained to document the progress.

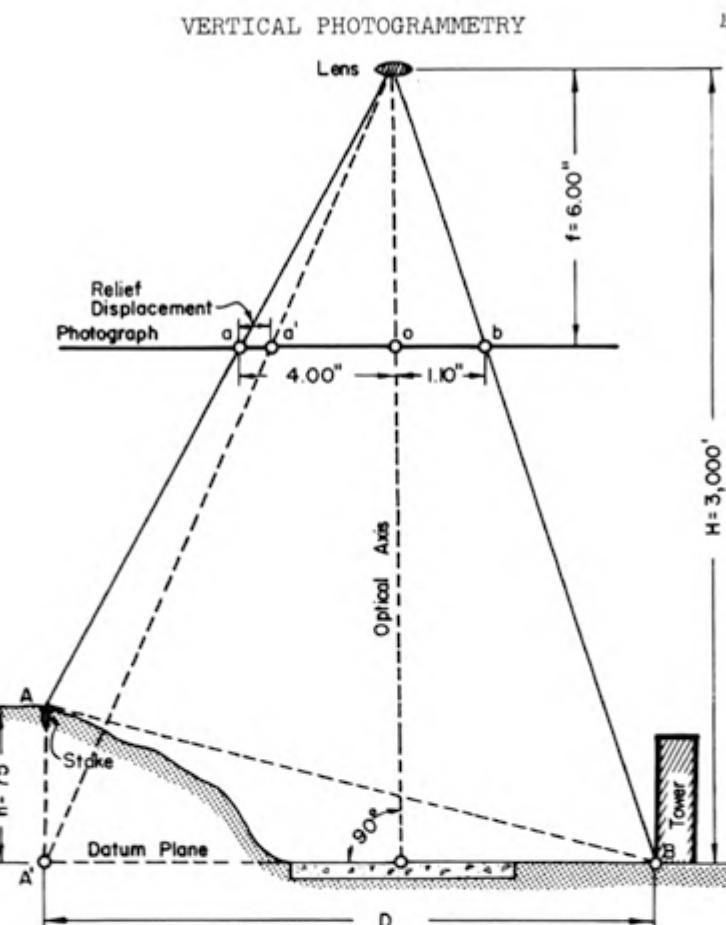


Fig. 4.12 Relief displacement of a point above datum.

drawn from A' to the camera lens it intersects the photograph at a' . Since $\underline{a'b}$ is parallel to $\underline{A'B}$, the similarity of triangle formula can be used:

$$\frac{D}{P_m} = \frac{H}{f}$$

since: $D = A'B$, $P_m = a'b$ and $\frac{H}{f} = S$

then: $A'B = S(a'b)$

The horizontal ground distance $A'B$ can be determined provided the photographic distance $\underline{a'b}$ can be measured

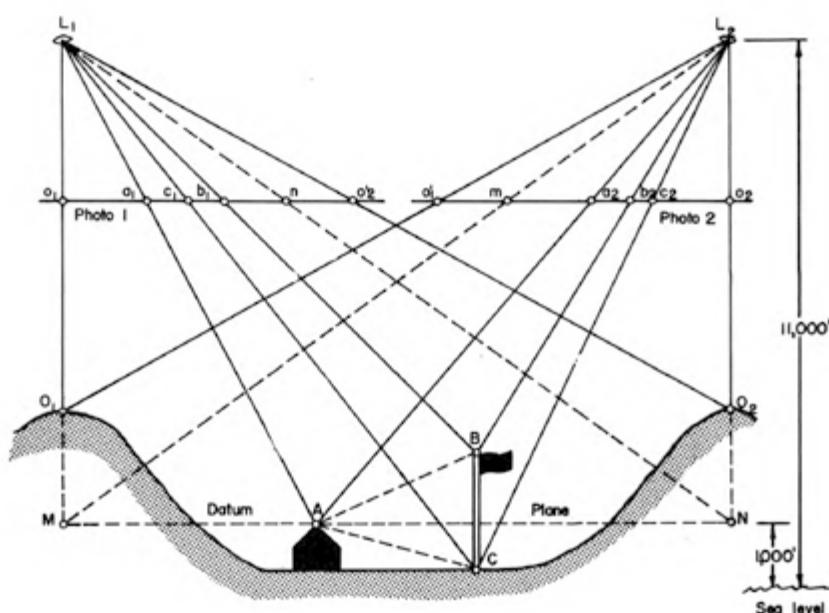
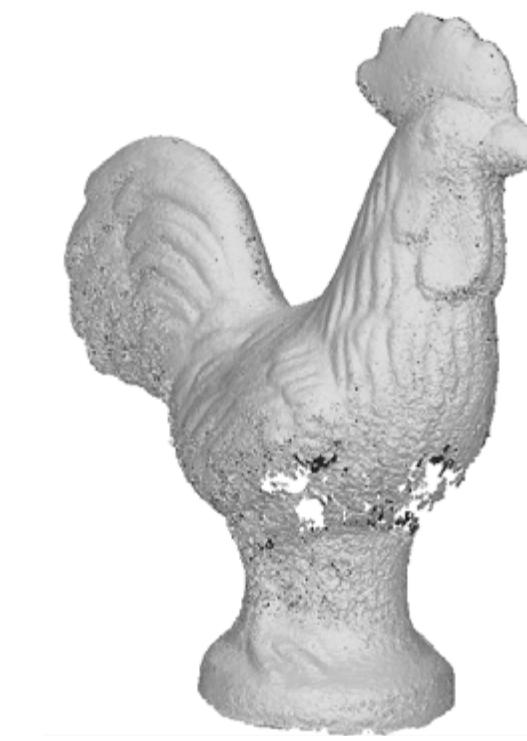


Fig. 4.19 - Height determination.



[PHOTOGRAPHY]



[DENSE CLOUD]

- Capture photos from every angle, and cover every corner you want to replicate.
- Sharp photos are critical, as it allows the software to recognise points and create high quality textures.
- Minimum 60% overlap or more is required, as it allows the software to match common points, the more points the higher the accuracy of the matching.
- even lighting conditions are preferred to obtain neutral textures, avoid highlights and shadows
- Aligning photos is the process of finding common points between every pair of photos; hence the need for 60% overlap or more.
- The software attempts to find pairs with matching points, so to make that process faster, arrange the photos such that every photo has some overlap of the subject to each of the photos before and after it.

- The sparse cloud only finds a few matching points to show you what the model will look like.
- The dense cloud will find every matching point it can find and marks them, preparing for mesh construction.
- This is the most CPU intensive process, and a high quality dense cloud will go a long way to make great meshes.
- The final result of the dense cloud will give you a fairly accurate idea of how the final model will look like.
- If the model does not look good here, go back to the first step, and capture better quality photos.



[MESH]



[TEXTURED MODEL]

- The mesh is constructed using the dense cloud data.
- After the software constructs the mesh, decimate the model to the size and resolution you prefer before the next step.
- Decimating the 3D model is important as it reduces the complexity of the final model, decreasing its weight and CPU processing needed to render it.

- Once you're happy with your model, start the texturing process.
- In this step you can choose the resolution of your texturing for your purposes (4K, 8K, etc).
- After the model has been textured, proceed to export the model in any 3D format of your choice, with the material files.

Photogrammetry Process

Although the process of Photogrammetry is simple enough, with the software handling the bulk of the work, it's important to understand how it works. Understanding the workings of the software can help one take better photos, and edit the output settings to get the desired results. This is a condensed version of the process that explains the basics of Photogrammetry, and what needs to be taken care of at each stage.

Photogrammetried Objects

The images in this section are 3D screenshots of objects, houses photogrammetried in Goa for the studio, and the VR experience. In most situations, the input photos for photogrammetry were taken in far from ideal conditions, which meant that the processing of the photos led to flawed, or glitched 3D models. Although these 3D assets are not of the highest quality, **they have their own unique and interesting look** to them that was appealing to us. **We were more than happy with the way that the meshes distorted around the main object**, which lent a surreal aesthetic to the scene where these objects were used.

Finding objects to capture was a challenge as well. Obtaining permissions was often a challenge, and the process of taking photographs drew a lot of attention. Photogrammetry is a time-intensive process, and it heavily depends on the weather conditions and the time of the day. Add to this the complication of finding good objects to capture, and then to get permissions, suddenly you find yourself spending weeks, even months trying to capture a few good quality objects, which is exactly what happened to us.

The process of taking photos for photogrammetry is especially strange as it involves taking photographs from every angle. With a mobile phone it may seem like

a strange activity from an observers point of view, but equipped with a professional DSLR camera, it becomes an aggressively invasive activity. I often got asked a lot of questions and could sense the hostility levelled toward me as I took the photographs required.

There is also the difficult question of **the ethics of photogrammetry**, which we discussed quite animatedly in the studio. This situation is very similar to the one when photography first started becoming more and more commonplace. If I were to capture a 3D model using photos, am I technically stealing that model? Who has the rights to that 3D model? One can see parallels to the origins of photography, when people were often scared to have their photograph taken, as they believed it captured a part of their soul.

Once the photographs were taken, processing them is a resource-intensive process. Photogrammetry needs a lot of processing power, which is expensive. Even though we had a relatively powerful PC, it would often take days to process a model. On my small laptop, it could take weeks. There are some limitations to using this process, but **it is by far the easiest and cheapest solution to creating VR ready 3D assets**. The alternative to photogrammetry is to use LiDAR scanning, which has its own unique strengths and weaknesses.



3.4.3 GREENHOUSE SPACES

GREENHOUSE v3.0





LiDAR Scans

LiDAR is a surveying method that **measures the distance to a target by illuminating that target with a pulsed laser light and measuring the reflected pulses with a sensor**. Differences in laser return times and wavelengths can then be used to make digital 3D-representations of the target. The name LiDAR is an acronym of *Light Detection And Ranging*. LiDAR is sometimes called laser scanning and 3D scanning, with terrestrial, airborne, and mobile applications.

LiDAR scanning is the alternate method to photogrammetry for accurate and textured 3D assets. The most common LiDAR scanners one can buy are those that use infrared waves to gauge the depth of the target. One of these devices is called the **Microsoft Kinect**. Released worldwide in 2010, it was bundled with the Microsoft Xbox 360 gaming console and used as a skeletal tracking device that could be used as an input to play games. More than 35 million devices were sold, till production was stopped in late 2017.

When developers and hackers got their hands on a Kinect, they found out that it could be used for a variety of other purposes than just gaming. It had a 640x480 pixels dual infrared and RGB camera, hence giving the device the ability to see depth and colour simultaneously.

With its ability to detect human forms, it was a very powerful device in the right hands. Its ability to detect depth also means that it can be used to capture 3D assets. Combining both the infrared and RGB data, it can create textured 3D models.

Unfortunately due to the very low resolution of both the cameras, the quality of these models is average at best, and aren't suitable for use in VR applications. This can be solved by employing higher resolution cameras, but those require better sensors and those devices are very expensive. But this method does have its own advantages that make it better than photogrammetry in some situations.

Photogrammetry does not work well on reflective objects, or with repeating patterns. It also requires a lot of time and computational resources to process the models. **LiDAR scanning can solve those problems. As it uses infrared rays, it can scan reflective surfaces without fail.** The processing of the 3D model takes place real time, so it can produce them instantly. It is also computationally lighter as compared to photogrammetry, and easier to use.

Although it may not be ideal for creating VR ready assets without major post-processing, it can be very useful in various other places where the conditions aren't ideal for photogrammetry.

Various scans taken with the Xbox Kinect using the software Skanect



First Sketch

To understand the basics of Unity and working in space, I created a small scene in which the viewer goes through different spatial configurations. **Tall structures, short structures, large spaces, tight spaces to test the user experience in Virtual Reality.** All these elements are made out of cubes, modified to form these configurations. The aim of this scene is to simply test the effects of space in the digital realm.

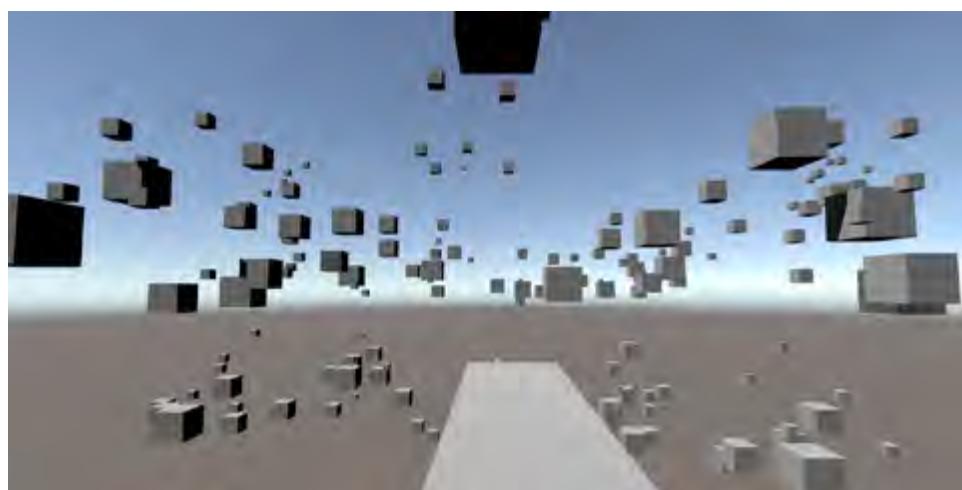
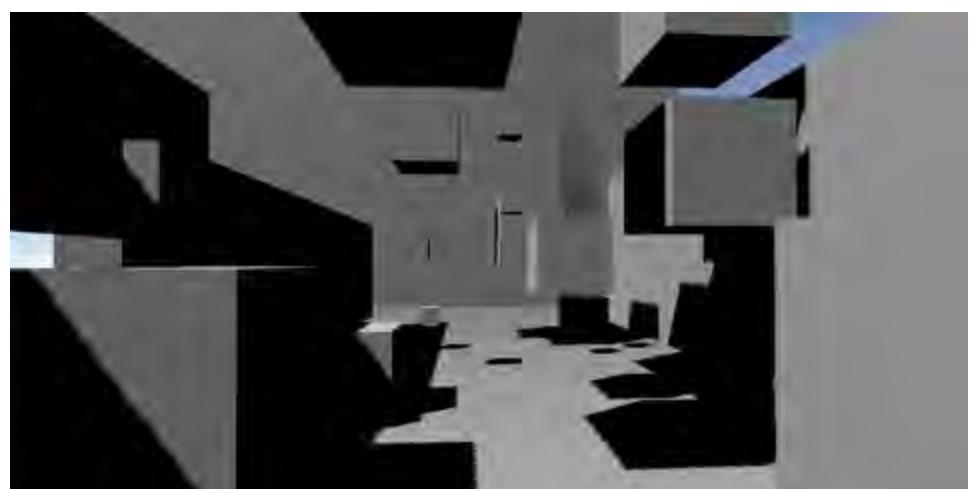
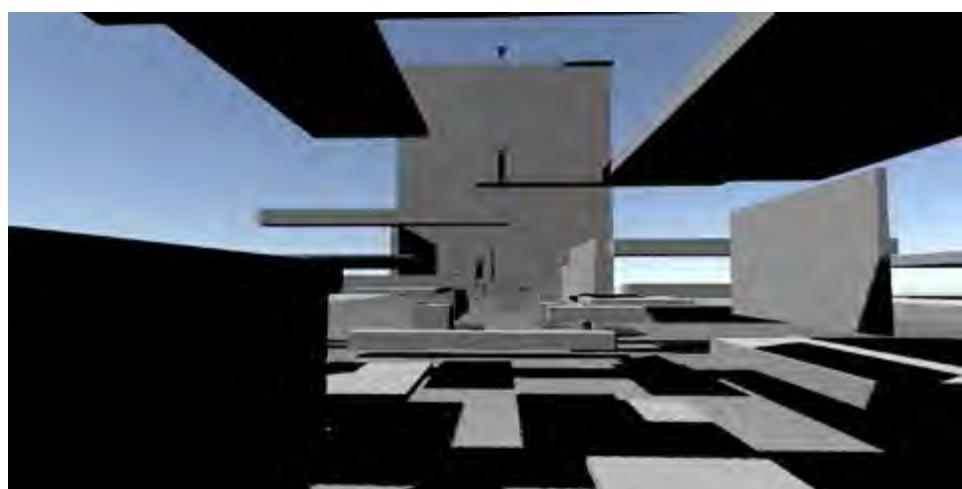
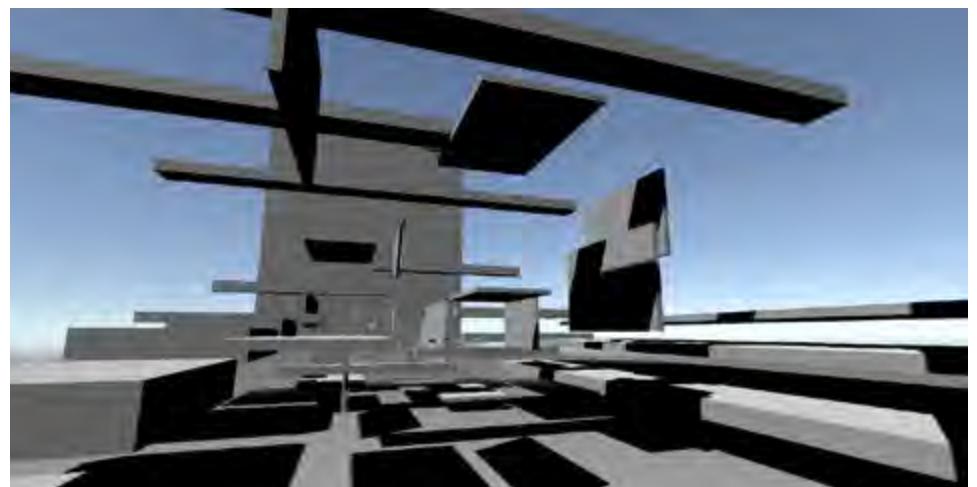
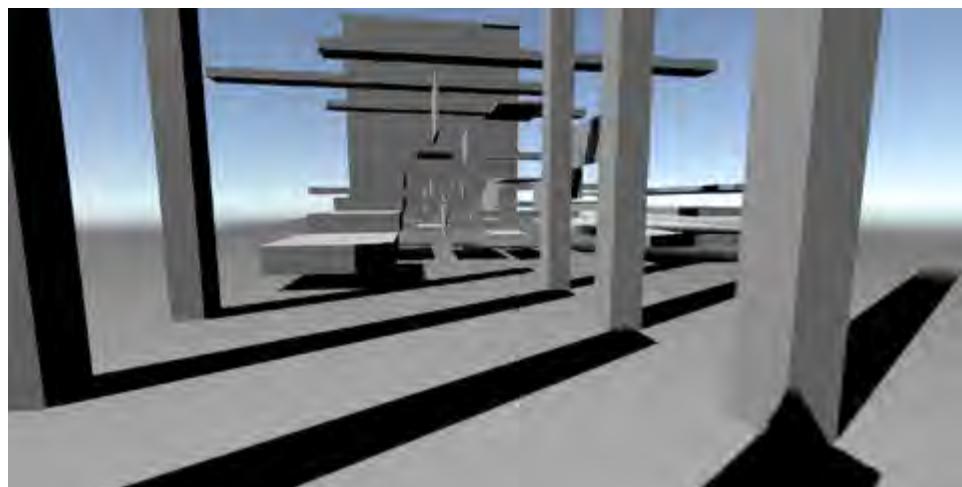
Although it may seem obvious that it would, considering the fact that with Virtual Reality, the aim is to follow the rules of our reality as closely as possible. But there are some elements of reality that we take for granted, such as light and shadow, sound, smell, wind, amongst others. **These other sensations are what augments a space, and by extension, what the viewer experiences.** Even in this blocked out level, it's possible to feel the effects the grammar of the space has on the overall experience. This also highlights the importance of satiating the other senses we've come to expect from certain types of spaces or perhaps do the opposite of what is expected to create an alien, and unreal experience.

This Unity file served as a test-bed for learning the tools on offer, such as lighting, animation, movement, amongst the many more. The potential for creation is almost limitless. Unity has a very different interface

as compared to traditional 3D software, and there are many additional factors to consider other than simply creating the scene. **Unity is a great tool, as it democratises the creation of games and interactive experiences.** It allows creators to make digital applications without having to delve too deeply into the back-end code, and even bypass that step completely in some situations.

However, while creating for Virtual Reality, which is already very computationally taxing in itself, **it's vital to ensure that the code which makes the game work needs to run as efficiently as possible.** My inexperience with code, and the language upon which Unity runs on, C# was a stumbling block at first. But as I started understanding the logic behind the code, and why certain things have to run in a certain way, I started to see the unique limitations of Unity, and how to get around them using different approaches in the code. Working hard to ensure small gains in efficiency may feel like an improper use of time, but these one-percent gains in efficiency all add up in the end. **The lighter the load of the application on the computer system, the more computers that will be able to run it,** hence bigger the audience.

Screenshots of the first Unity experience created





EyeMyth Festival

Exploring present and future cases of immersive storytelling and new media, EyeMyth brings together pioneering artists, performers, and experts at the forefront of these fields.

EyeMyth's 2017 edition, Future As Fiction, traversed multiple locations in Mumbai to create, discover and engage with new elements in the digital space. The festival featured an array of exhibitions, workshops, and performances that explored various forms of expression through new media.

EyeMyth was created in the Indian digital sub-culture scene in 2011, where it started as a celebration of 'Visual Music' at the UnBox Festival in Delhi. **Today, it is a media arts festival, unique in its juxtaposition of Indian and global artists and progressive media.**

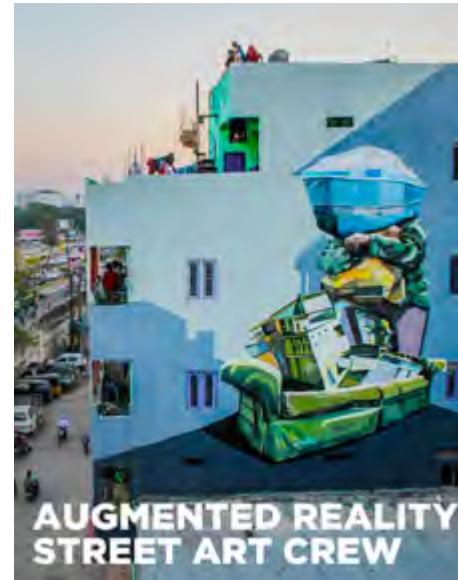
The last edition of EyeMyth saw a host of performances, installations, and screenings under the theme of 'Medium as Somatic Impulse'. In partnership with the Japan Media Arts Festival, it investigated definitions of new media at both a national and global level.

The planning for EyeMyth started way back in April when I had just joined the Greenhouse. With my interest in new media and the arts, I was put on the organising team to provide assistance when needed. I wasn't needed for the initial stages as the festival was being planned and funds were raised, but I was fairly heavily involved in the planning of the workshops and presentations. **The festival took place at the ISDI campus in Lower Parel, Mumbai from the 16th-20th of August.** There were two main workshops to be held, the Augmented Reality, and the Virtual Reality workshop.

These were four day deep dives into creating AR/VR applications. We went to Mumbai a week before the festival was to start, to work on the production and procurement of materials for the workshops.



FUTURE AS FICTION

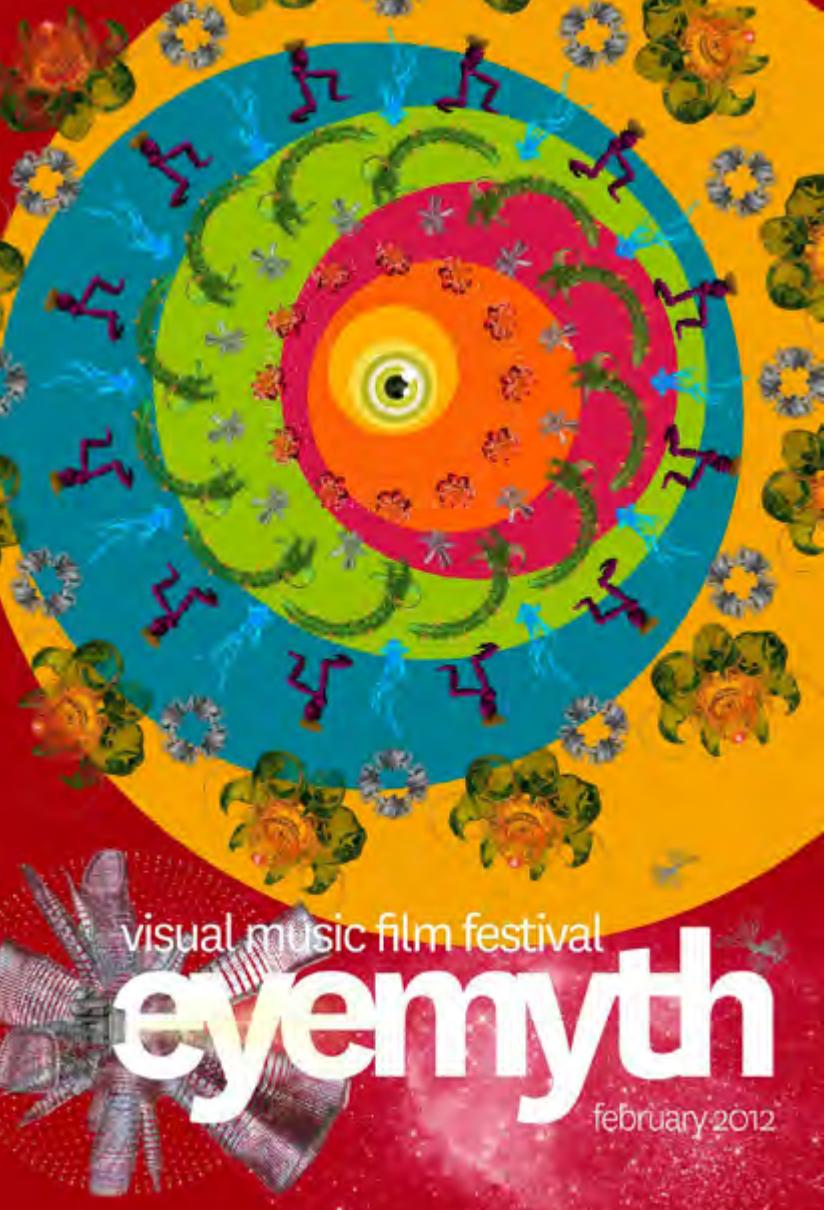


FUTURE AS FICTION
16 - 20 AUGUST



MEDIA ARTS FESTIVAL

ISDI



As one of the only interns of the studio, I was tasked with the designing of the plinths, standees, and also with the procurement of materials. The exhibition designer in me came alive, and it was a nice to get back to something familiar.

My experience with developing basic AR applications in the build-up to the festival meant that I was assigned as a roving mentor for the teams in the AR workshop, helping where I could, both with the narrative, and the technicalities of their projects.



In the build-up to the festival, a few promotional events and talks were organised, for which I was tasked with creating promotional content for social media. These are the frames from the short looping video that was created for Instagram.



Due to my relatively rich experience with photogrammetry, allied to the fact that the team from CrossOver Labs (who were mentoring the VR workshops) wanted to introduce photogrammetry into their workflow for the VR workshop, I gave a presentation on photogrammetry along with a crash course to the workflow.

photo-gram-metry
light drawing measurement
the use of photography in surveying and mapping to ascertain measurements between objects.

stereoplotter
photogrammetry was initially processed with the help of stereoplotters to create elevations of enemy terrain during wartime.

we also tried videometry
yep, we ran video through the software

step 1 click photographs of the subject

- get photos from every angle, and cover every corner you want to replicate
- sharp photos are critical, as it allows the software to recognise points and create high quality textures
- minimum 60% overlap or more is required
- even lighting conditions are preferred to obtain neutral textures, avoid highlights and shadows

step 5 apply texture to mesh

- once you're happy with your model, start the texturing process
- in this step you can choose the resolution of your texturing for your purposes (4K, 8K, etc)

further reading

- <http://steamcommunity.com/sharedfiles/filedetails/?id=111440>
- <http://www.thestreamrds.com/2016/03/visual-revolution-vanishing-ethan-carter/>
- http://steamcommunity.com/sharedfiles/filedetails/?id=111440&t=111440_1112603
- <http://www.videomodeling.com/>
- https://www.youtube.com/watch?v=U_WaCBy7po



Alongside my duties as the part of the organising team, I also participated in the VR workshop so that I could learn about the process of VR development. Until this point, I hadn't yet had any formal introduction to the process of creating for VR, so these four days were important for my project. Balancing my duties as an AR workshop mentor, production assistant, event planning, and taking part in the workshop was difficult, but I had to juggle these tasks to ensure I learned as much as I could.

The VR workshop was immensely useful as the four day crash course helped me understand the process of developing in VR. In interests of time, we were paired up into groups. Our group developed a VR experience, titled Bambaiyya.

Bambaiyya

Bambaiyya VR

Bambaiyya is a VR project from the four day VR workshop at the EyeMyth Festival 2017. **The group behind this project consisted of Nikunj Patel, Pooja Sivaraman, Archit Vaze, Jyoti Narayan, and myself. The groups were formed by the member's desire to work on a brief that tackled the issue of digital heritage.**

The brief was a call for proposals floated by the British Council and the Prince Claus Fund. Titled *Contemporary Take, Beyond Cultural Heritage*, it aims to fund projects that engage young people with their cultural heritage in South Asia through the arts and new media. The proposal is very encouraging of projects using new media such as Augmented Reality and Virtual Reality.

This was a very interesting brief to tackle as it presented us with a wealth of opportunities, and it was only a matter of deciding which path to follow. There are many lenses to look at our culture and heritage through, but for this it was important to pursue something that is ultimately fun and of interest to the viewer. For a while, we explored the possibility of using urban legends as the main narrative of the experience.

Our cities are in some way museums in themselves. But to explore all the points of

interest in such a large museum isn't easy. But with the power of VR, in which time and space can be altered, we can shrink the city down for the viewer, and see all the sights. **Urban legends are fascinating, even gripping stories that are often based on some truth.** For example, there's a mysterious milestone in the middle of Mumbai that displays the distance to the sea. No one knows why it's there, or when was it installed. Taking inspiration from Salman Rushdie's style of mixing fact and fiction as he so often has done, we thought of doing the same. Fill in the gaps of reality with some fiction of our own.

Ultimately, we decided to forgo the narrative of urban legends, and focus on a narrative that would take the viewer through the important touch-points of culture and heritage of Mumbai. In this narrative, **the idea of the smaller often ignored facets of culture appealed to us.** It's the things around us that we take for granted that are lost forever. These are experiences that we wished to preserve with our project. Titled Bambaiyya, the local dialect, a mix of Hindi and Marathi spoken in the city, this VR experience takes the viewer across the city of Mumbai, showing them the often unseen sights and sounds.

Artwork by Nikunj Patel

"Once you put on your headset — picture it — you find yourself in the middle of a busy street in Mumbai. The cars and trucks are racing around you in 360 video. The air is damp and the monsoon rains spatter onto your umbrella. In front of you is a large and bustling bakery, with a sign in bright red letters reading "KYANI & CO.". You are in front of the oldest Irani cafe in Mumbai, also called a Parsi cafe.

You begin to move across the street, dodging rickshaws and men on bicycles. As you near the cafe's entrance, the scene shifts and you find yourself at a table inside covered in red-checkered cloth. There are confectioneries along the counter: Mawa cakes, buttered buns, Shrewsbury biscuits, potato chips, and sponge cakes. Along the wooden panelled walls are old photographs of famous Mumbai buildings, signs instructing you on your code of conduct in the cafe, and a faded M.F. Hussain painting. In fact, you happen to be sitting at the very table he used to sit at as a regular at Kyani cafe.

A waiter walks past and all of a sudden the scene switches to VR and you are transported back in time. An old man who seems quite comfortable in the cafe notices you and walks over. "Khosh aamadi! Ke khoshaamad maraa ze aamadanat. Hezaar jaan e geraami, fedaa ye aan qadamat" he says, Welcome! For your presence has affirmed my being. May a thousand beloved hearts be bestowed at your feet. He begins to chat with you and you find out he is the owner of Kyani, a cafe that has been run by his family for generations. He then tells you the story of how Parsis

first came to India, and the struggles and successes they've faced since then while building a community in Bombay. Before he finishes talking he says "My friend, your Bambaiyya journey has just begun. You can only imagine what's left in store for you".

The scene fades and you find yourself in real time, 360 degree footage, at the back of a cab. The cab driver acknowledges you and turns around. After a couple minutes he begins to talk to you. He tells you about his customers, how sometimes people talk to him, other times they scream at him because they're in a hurry but there's a lot of traffic. He shares a story with you about a time he helped a girl get away from two drunk men who were harassing her down an empty street. Mid-conversation he realizes you've arrived at your destination, "Nice talking to you" he says, "here's your stop."

You find yourself at the Prince of Wales museum, which used to be a military hospital during WWI. As you walk forward through an ornamental gate, it disappears...."

Script for the VR experience

Various photos taken on location for photogrammetry and reference





To create a prototype of the story, we went and visited Kyani Cafe, to shoot and record for the VR experience. We tried to photogrammetry some objects, but the conditions prevalent at the time meant that our 3D models were severely compromised in quality to use in the VR project. **For the prototype, we developed a build for the Google Cardboard to showcase at the EyeMyth Festival.** For a project built in less than 4 days, it was a mighty effort, but all of us agreed that although the concept and story were well developed, the execution of the idea was not very well done. It certainly didn't help that none of us were well versed in using Unity, the software to create VR experiences. We hacked the prototype with a mix of 360-degree videos and 3D scenes built on Unity.

Although the project concluded at the end of EyeMyth, we applied for the British Council and Prince Claus fund to hopefully get some funding, resources, and support to continue this project.

Screengrabs of the 360 degree videos taken on location to be included in the final build



Digital Heritage

FUTURE AS FICTION : HERITAGE

Rise of Digital Heritage within an Indian Context

Author : Salil Parekh



What Lies Beyond Museums?

India has had a long and complex history, traversing the Indus Valley Civilisation, to years leading to the democratic Republic of India. We feel the effects of our turbulent history even today. Where is it possible to see such diversity? Not only in people, but in the objects we see, and the sounds we hear. We live amidst beautiful, and symbiotic chaos; packed with surprises.

Everything around us is a part of our culture and heritage. Not restricted to objects and architecture, but also spanning the sounds, smells and flavours of every locality. These elements are linked to time, and as time forges ahead, technological advancements leave their mark, leading to an evolution of our surroundings. And perhaps, inevitably — we will lose some elements of our culture.

One might ask, isn't this why we have museums, and other institutions dedicated to preserving history? Indeed they are guardians of past knowledge, but they also come with some limitations. Museums require the viewer to be physically present to see objects of the past.

As cliched as it might sound, innovations in digital technology add an extra dimension to heritage conservation — that of interactivity, engagement and storytelling, which is missing in museums.

For some time now, the process of archiving and exhibiting objects has been a tedious and physical process. Advances in technology can change this. By supporting digital heritage, as well as our physical heritage, we can use the full potential of computers to analyse objects and learn more about them than was ever possible before.

An example of an initiative made towards digitally archiving heritage, is a project led by the Government Department of Science and Technology, which supports researchers in technology and humanities, to digitally document the landscape of Hampi, Karnataka. (digitalhampi.in)

Immersive technologies like Virtual Reality, supported by game engines and techniques of photogrammetry push possibilities in heritage conservation, taking it a step ahead of digital archiving.

FUTURE AS FICTION : HERITAGE

A Brief History Of Virtual Reality

Virtual Reality is a technology we've had a love-hate relationship with for some time now. In 1968, Ivan Sutherland made the first prototype of a VR headset. Progress continued at a very slow rate right through the early 2000's, with advancements in technology not being able to keep up with what was needed to make Virtual Reality feel truly immersive. In 2012, Oculus launched the Rift. It was the right product at the right price that revived the excitement of VR. It then proceeded to spark off an arms race in the world of VR, with manufacturers and software giants trying to outdo each other in their efforts to create high quality, yet accessible VR.

The worlds we construct in VR can be infinitely imaginative. In many ways, this is as close to

cognitive art as mediums can get. VR worlds are a lot like dreams, we can imagine anything we like and jump in whenever we wish to.

Earlier, VR needed powerful hardware to ensure high quality immersive experiences. Now, with mobile VR, which can run on smartphones, that is changing.

The Power of Game Engines

Game engines are easy to use software that allow us to create worlds to experience in VR. Previously an exclusive domain of experts, the democratisation of this technology allows even novices to begin creating.

To build these VR worlds, 3D models and supporting assets are needed. Creating 3D models using traditional methods often takes a lot of time and is resource intensive. But a method once used for mapping during wartime, known as 'Photogrammetry' can be used to produce detailed and accurate 3D models. Photogrammetry is the craft of ascertaining measurement information between objects from photos. All you need are pictures of an object and a software that will process the pictures to generate 3D models!

Putting all of the above together, a process is formed — Document artifacts with photogrammetry, create worlds with game engines, experience the same with VR and circulate to anyone with a smartphone. Last I checked, more than 300 million smartphones were sold in India alone. The components for digital heritage are ready; we just have to connect the dots.

What separates digital heritage from traditional methods of heritage conservation, is not just the ability to shift everything into the digital world, but also the creative freedom to craft stories and narratives to the way in which we interact with history. This is what will make interactive VR experiences meaningful and educative in an effective and playful manner. The digital nature of the medium makes it a very fluid one; stories can be adapted for various languages and places to enhance its accessibility.



16

One of the many concepts the studio had been discussing was the one of **digital heritage**. With emerging technologies of Augmented Reality and Virtual Reality becoming ever more popular, there exists an opportunity to not only use these mediums to view culture and heritage, but also to preserve them digitally. To further build on this concept, I wrote an article for the zine at the EyeMyth Festival. This edited essay encapsulates much of what I feel about the topic of digital heritage.

What Lies Beyond Museums?

India has had a long and complex history, traversing the Indus Valley Civilisation, to years leading to the democratic Republic of India. We feel the effects of our turbulent history even today. Where is it possible to see such diversity? Not only in people, but in the objects we see, and the sounds we hear. We live amidst beautiful, and symbiotic chaos; packed with surprises.

Everything around us is a part of our culture and heritage. Not restricted to objects and architecture, but also spanning the sounds, smells and flavours of every locality. These elements are linked to time, and as time forges ahead, technological advancements leave their mark, leading to an evolution of our surroundings. And perhaps, inevitably — we will lose some elements of our culture. One might ask, isn't this why we have museums, and other institutions dedicated to preserving history? Indeed they are guardians of past knowledge, but they also come with some limitations. Museums require the viewer to be physically present to see objects of the past.

As cliched as it might sound, innovations in digital technology add an extra dimension to heritage conservation — that of interactivity, engagement and storytelling, which is missing in museums. For some time now, the process of archiving and exhibiting objects has been a tedious and physical process. Advances in technology can change this. By supporting digital heritage, as well as our physical heritage, we can use the full potential of computers to analyse objects and learn more about them than was ever possible before.

An example of an initiative made towards digitally archiving heritage, is a project led by the Government Department of Science and Technology, which supports researchers in technology and humanities, to digitally document the landscape of Hampi, Karnataka. (digitalhampi.in).

Immersive technologies like Virtual Reality, supported by game engines and techniques of photogrammetry push possibilities in heritage conservation, taking it a step ahead of digital archiving.

A Brief History Of Virtual Reality

Virtual Reality is a technology we've had a love-hate relationship with for some time now. In 1968, Ivan Sutherland made the first prototype of a VR headset. Progress continued at a very slow rate right through the early 2000's, with advancements in technology not being able to keep up with what was needed to make Virtual Reality feel truly immersive. In 2012, Oculus launched the Rift. It was the right product at the right price that revived the excitement of VR. It then proceeded to spark off an arms race in the world of VR, with manufacturers and software giants trying to outdo each other in their efforts to create high quality, yet accessible VR.

The worlds we construct in VR can be infinitely imaginative. In many ways, this is as close to cognitive art as mediums can get. VR worlds are a lot like dreams, we can imagine anything we like and jump in whenever we wish to. Earlier, VR needed powerful hardware to ensure high quality immersive experiences. Now, with mobile VR, which can run on smartphones, that is changing.

The Power of Game Engines

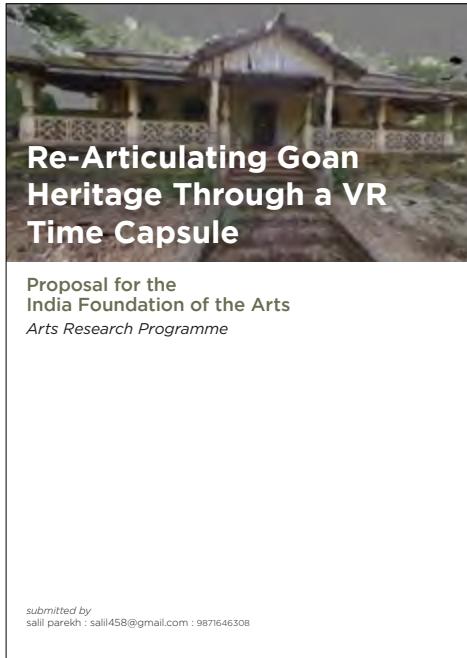
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The article, as taken from the zine, Future as Fiction



Re-Articulating Goan Heritage Through a VR Time Capsule

Proposal for the India Foundation of the Arts Arts Research Programme

submitted by
salil parekh : salil458@gmail.com : 9871646308

Introduction

This project investigates an alternative scenario for Digital Heritage Conservation in India with a practice based research and storytelling enquiry. It proposes the creation of a Virtual Reality "Narrative Artefact" informed by the socio-cultural conditions of Goa, India. The framing of this exercise is borrowed from the lineage and playful curation of Time Capsules.

A "narrative artefact" is an experimental tool for communicating the research through a process of Design Fiction, defined as "the deliberate use of diagetic prototypes to suspend disbelief about changes in the world". A Time Capsule functions as one such diagetic prototype of an alternate Goan reality - suspended between hypothetical and hyperbolical currents - that can then be the container for provocations, questions, musings...

Research Objectives

- Investigate Goan culture and society from the point of view of persistent cultural traditions, long standing rituals and material artefacts
- Explore new ideas and technologies impacting the democratization of Digital Heritage Conservation (such as Game Engine technology, Photogrammetry, Mixed Reality etc)
- Pilot an experimental ethnographic approach for the meaningful virtualisation of the Goan context using Photogrammetry and Game Engine technology
- Create a "VR Time Capsule" as a Narrative Artefact (or Diagetic Prototype) from the research - that can immerse viewers in a artistic, virtual reality experience
- Evaluate the VR experience created in the project with the public at large

Background Survey

India is a minefield of heritage and culture. No matter where you look, there are elements around you that reflect the culture of the place. As time goes on, these elements either erode away or are replaced by new ones. The environment of a place is constantly changing over time due to climate with time. The flora and fauna are also affected. To preserve these pieces of history, we have institutions such as museums and libraries that store and archive these elements. It's only because of these institutions that a lot of history can have been preserved for us to see for ourselves the culture and way of life of previous generations. For the sake of preservation, many of these objects are displayed to the public, and thus cannot be viewed. Due to the fragile nature of these objects, it's also not possible to work with these elements to reconstruct a scene in history to understand how certain elements work together. There's also the issue of these objects changing over time, due to nature or man-made reasons. Many of these objects do not last long enough due to damage in their chemical environment. Although museums do make their collection accessible to many, they still remain out of reach to those who can't physically visit the museums across the world. It's not only the physical environment that is a concern; every element around us that reflects our culture, or is happening around us, and we barely notice it. All the little things we take for granted, or are deserved to be a part of our heritage and culture. Imagine the experience of walking down a street in Goa from the year 2017 in an experience centre thirty five years later. The sights, sounds, and sensations recorded in the present, easily experienced in the future. Everything we see and hear is a part of our past, and the knowledge of our past is a part of our present. A short walk along the road shouting to the houses, to the wandering stray dogs and the makeshift temples by the side of the road. It's all an integral part of the present reality we live in. These things will change in the future, and it's important to document the present.

Please refer to the attached document that provides an overview of the sociocultural landscape of Goa that we are looking towards for research and inspiration in this project.

Primer on Virtual Reality

Virtual Reality was first referenced in the book, *Le Théâtre et son Double*, by Antonin Artaud in 1938. He describes the illusory nature of objects in theatre as *la réalité virtuelle*. It could be argued that the Viewmaster device, introduced in 1939 was the first VR headset, albeit a crude version of what we know today. It contained three lenses and a film reel with 3D images. A reel held 14 photos in 7 pairs which allowed the viewer to see the images with some perception of depth.

In 1952, Morton Heilig wrote about an Experience Theatre, and proceeded to build a prototype in 1954 called the Sensorama. It was a mechanical device that simulated all five senses to provide an all round sensory experience. He even conceptualised of a device called the Telephere Mask which was a personal version of the Sensorama. In 1968 Ivan Sutherland came up with the idea of a Head Mounted Display and makes a prototype, aptly labelled the Sword of Damocles because of its massive size. Programs continued at a very slow rate till the late 1990s when advancements in technology not being able to keep up with what was needed to make Virtual Reality feel truly real.

In 2012, Palmer Luckey launched a Kickstarter campaign for his new device called the Oculus Rift. It was a revolutionary device, and in its own words, Palmer describes the product having come out of a desire for photogrammetry, motion capture and developing a portal where it was possible to make a relatively affordable and lightweight VR headset. It was initially hard to create the Oculus Rift a few years before its launch, but it would've been too expensive then. It was the right product at the right price that once again revived the idea of Virtual Reality. It then sparked off an arms race in the world of VR, with manufacturers and software giants trying to outdo each other in their efforts to create easily accessible, yet high quality VR experiences.

The first content developed for VR was mostly to do with military and medical applications, often for training purposes. As the medium opened up to more people and started becoming widespread, content creators started making more varied content to serve different needs and wants. The most popular of which have been games and videos.

Project Rationale

Museums are still very much an entity of the physical, and real world. They haven't yet made the jump into the digital realm. First, computers were the only way to access the internet, but now even the smallest of phones have the capability to do so. This has opened up content on the internet to everyone with a phone and an internet connection. Slowly and steadily, the content available on the internet has increased, and so has the demand for VR content. As a result, its many sessions are rapidly being taken advantage of, with new technologies being developed. Websites such as the Google Cultural Institute have already started doing this, by creating 360 degree views of the interiors of museums by stitching photographs together. Using a phone, one can pan around the scene with a phone, hence providing for a natural and intuitive experience.

There is a certain disconnect when looking at museum artifacts. Not only are we not allowed to touch it, and interact with it, there is also an atmosphere of reverence that creates detachment to what we're looking at. This detachment is what causes younger audiences to find museums and their objects boring. But when elements of play are introduced, the experience becomes playful, interactive and lots more interesting. Curiosity of the objects is sated with great interest when one can interact and play with what is in front of them. Due to obvious preservation reasons, museum artifacts are protected and kept in glass boxes. But in the digital realm, this won't be a problem.

Owing to the scope of the project, it is imperative that we start small and select an area that is small enough for us to cover, but diverse enough to produce a variety of content. Goa fits the bill perfectly here. With a land area of just 3,702 km² and a population of 1.8 million with a large variety of culture and heritage, this is an ideal place to start. A history of Portuguese colonialism, high prevalence of Christianity and decently large population of Hindus makes this a very interesting and culturally diverse place to document.

Stages, Activities, Outputs and Costs

Key Stage	Description of Activities	Key Output	Tentative Costs
Phase 1 Documentation and Research <i>3 months</i>	Selecting places to document visually and orally. Visual documentation will happen via the process of Photogrammetry . Photogrammetry is the craft of assessing geometric information between object from photos. It used to be done by hand, but now with the help of computers, it can be automated with the help of computers. Although originally used for aerial photography, it can now be used to recreate objects in stunning accuracy and detail. This process will involve capturing the subject from every angle, covering all details that need to be included in the final model. Aural documentation will be done with interviews with local historians, and collection of popular local media. Interviews with the people of Goa are to be undertaken, to collect stories and anecdotes.	Collection and archival of places in the form of 3D models. This will require high amounts of processing and time to process. Collection and archival of sounds, audio interviews and media.	₹ 60,000
Phase 2 Creating Stories Creating Stories and Narratives <i>2 months</i>	Looking at all the collected material, narratives for the final outcome will be prepared. Stories will be the form of rough cuts and edits to the final version. Storyboards, sketches, and scripts will be the outcomes from this phase. All the rough cuts and edits to the final version.	Storyboards, sketches, and scripts will be the outcomes from this phase. All the rough cuts and edits to the final version.	₹ 20,000
Total Estimated Expenses - Rs. 2.1 Lakhs			

The pages from the original proposal submitted to the IFA

IFA Proposal

Back in June of 2017, the **India Foundation for the Arts** announced a call for proposals for their Arts Research Programme for projects *that investigate marginalised or relatively unexplored areas; intend to create spaces for dialogue between theory and practice; offer new readings/frameworks of artistic practices; and use interdisciplinary approaches to break new conceptual ground, among other things*.

We created a proposal for this call and sent it off to them. Our proposal entailed a plan to explore the preservation and dissemination of heritage and culture via emerging mediums of Mixed Reality such as Augmented Reality and Virtual Reality. The project would map out important points of culture and heritage of Goa, capture them digitally, and then create an experience that could potentially be sent to museums, and archiving institutions.

In the last week of October 2017, the IFA got in touch with us, with the news that they are interested in working with us on this concept. Although our proposal won't be part of the Arts Research Programme, it will be a part of their Arts Practice Programme, which means that there are no deadlines to meet, which is great to allow a concept such as ours to develop and grow.

Phase 3 Developing Working Experiences <i>4 months</i>	The final outcome of the projects will be built using the assets in Phase 2 . An VR app will be created using the collected assets. The narration required for the voiceover in the local language will be recorded. Creating the VR app is an iterative process that will go through multiple iterations and user testing rounds. The 3D assets collected will be refined and modified to be used. The audio file will require careful sound engineering to use them in VR effectively. Any missing assets that are needed will have to be documented or captured.	The final VR output will be prepared, as well be recorded for research documentation and multiple publications to support the same.	₹ 1,00,000
Phase 4 Dissemination and Outreach <i>2 months</i>	Initial outreach will be done to figure out the best way to get this project out to the public. Various platforms where it can be placed: Museums, Schools, Universities, etc. This can also be sent to domestic and international festivals which have specific segments of VR content, such as Tribeca, Sundance, Sheffield doc fest, SXSW.	Strategy for scaling and disseminating VR experience to ensure maximum public outreach and publication of the supporting documents.	₹ 30,000

Total Estimated Expenses - Rs. 2.1 Lakhs

Notes on outcomes

To support the VR content, the various assets used in the VR world can be used to make picture book, a collection of short stories and even flipbooks.

These collaterals can be used to generate interest in the VR project and can be used as handy souvenirs and allow the assets to be seen outside the VR space.

The research document will also be designed in a manner suitable for public sharing.

The assets can also be uploaded on digital platforms such as YouTube and Sketchfab, and be used by others to create their own worlds out of this.

All the content is licensed in Creative Commons.

Partners

Quicksand is a design thinking and innovation studio located in Delhi and Bangalore. Quicksand has agreed to play the role of a research and production mentor and support it through the loaning of some required AV equipment for the project.

Greenhouse is a co-working creative space in Goa and have kindly agreed to host this project's workspace at their studio in close contact with other like-minded young professionals.

The Busride Lab is an offshoot of The Busride, a spatial design firm in Mumbai, which has interests in heritage conservation and lived experience having initiated the long standing Bandra Project. Ayat Basar, co-founder of the studio, has agreed to be a mentor for the architectural and spatial aspects of the project.

VR Storytellers Guild is an independent Electronic music composer, sound designer and DJ who has been working in the electronic music field for the last 18 years. He acquired his basic compositional skills in Western Classical music from Hyderabad western music foundation and currently is learning Carnatic music, apart from performing at music festivals.

GRADUATION PROJECT

<p>APPLICATION FORM REQUEST FOR FUNDING</p> <p>Please respond to all the questions listed in the application form. Please do not remove or edit any questions in the application form.</p> <p>1. Contact Information</p> <table border="1"> <tr><td>1.1 Name of Applicant Person</td><td>Salil Parekh</td></tr> <tr><td>1.2 Name of Applicant Organization (if applicable)</td><td>The Greenhouse</td></tr> <tr><td>1.3 Postal Address, City</td><td>403114, Socorro</td></tr> <tr><td>1.4 Country where person/organization is based</td><td>India</td></tr> <tr><td>1.5 Name of Contact Person</td><td>Avinash Kumar</td></tr> <tr><td>1.6 Telephone</td><td>+91 9818955338</td></tr> <tr><td>1.7 E-mail</td><td>avinash@quicksand.co.in</td></tr> <tr><td>1.8 Website/Facebook page</td><td>http://quicksand.co.in</td></tr> </table> <p>2. 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Greenhouse is positioned in principle as a not-for-profit entity, operating across the following three dimensions : 1. as a catalyst, incubator and showcase for new cultural enterprise 2. as a space for expanded education	<p>Prince Claus Fund for Culture and Development</p> <p>3. as a social node for new cultural activity</p> <p>Greenhouse represents a new, conceptual model for the creation and sustenance of independent, creative enterprise. By connecting the dots that represent education, independence, creative practice, commerce and social networks in India - Greenhouse acts as a facilitator or platform for stakeholders that represent the present and emerging state of socio-cultural expression.</p> <p>2.4 Main Activities of the Organization (max. 100 words)</p> <p>2.5 Name of Current Collaborating Individuals/Organizations:</p> <p>Quicksand</p> <p>2.6 Main Members and their Positions in the Organization:</p> <p>Avinash Kumar and Kapil Das (co-founders of Quicksand)</p> <p>3. Project Information Summary</p> <table border="1"> <tr><td>3.1 Project Name</td><td>Re-Aligning Goan Heritage through Mixed Reality</td></tr> <tr><td>3.2 Short description of the activity for which funding is sought (max. 100 words)</td><td>This project aims to make heritage, culture and history more accessible, interactive, and fun. Using emerging modalities of Mixed Reality such as Augmented Reality and Virtual Reality to engage diverse audiences. Initially based in Goa, this project aims to reconnect people to their heritage with interactive, immersive narratives, made using cutting edge techniques such as photogrammetry, motion capture, VR and AR production. 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<p>4. Project Detailed Information</p> <p>4.1 Explain the rationale of the project, why is this project relevant within the given (local) context. (max. 300 words)</p> <p>India is a minefield of heritage and culture. No matter where you look, there are elements around you that reflect this. As a society, we have gotten these elements either end-to-end or replaced by something new. To preserve these pieces of history, we have institutions such as museums and libraries that store and archive these elements. It's only because of these institutions that a large majority of us have been able to see for ourselves the culture and heritage of bygone times. For the sake of preservation, many items are not displayed to the public, and thus cannot be viewed. Although museums do make their collection accessible to many, they still remain to reach to those who can't physically visit the museum across the world. There is certain detachment when looking at museum artifacts. Not only are we not allowed to touch it, and interact with it, there is also an atmosphere of reverence that creates detachment to what we're looking at. This detachment is what causes younger audiences to find museums and their objects boring. But when elements of play are introduced, the experience becomes playful, interactive and lot more interesting. Curiosity of the objects is satisfied with great interest when one can interact and play with what is in front of them. Due to obvious preservation reason, museum artifacts are protected and kept in glass boxes. All this leads to disappointing levels of engagement with one's heritage and history, which eventually leads to heritage being forgotten and lost forever.</p>																												

I'd like to know how your project relates to and is relevant to the call for proposals, especially by explaining how your project enables (max. 400 words):

-a redefining of the traditional take on heritage within your local context

-inclusive and immersive engagement with cultural heritage

-cross-disciplinary initiatives on the intersection between contemporary arts, cultural heritage and new media

-young people to participate

Although I was a part of the Bambaiyya team that sent a proposal for the British Council and Prince Claus Fund, the studio also wanted to send a proposal for a project with a Goan context. Now that I had some experience developing a brief for the Bambaiyya VR project, and of writing for this proposal. Instead of opting for a broad city specific narrative, we focussed on a single thread of culture. **Houses are the focal point around which society revolves. Hence, it is also a central point of culture and heritage.** By exploring houses, we could extrapolate on the many different facets of Goan society, such as food, craft, architecture, amongst numerous others.

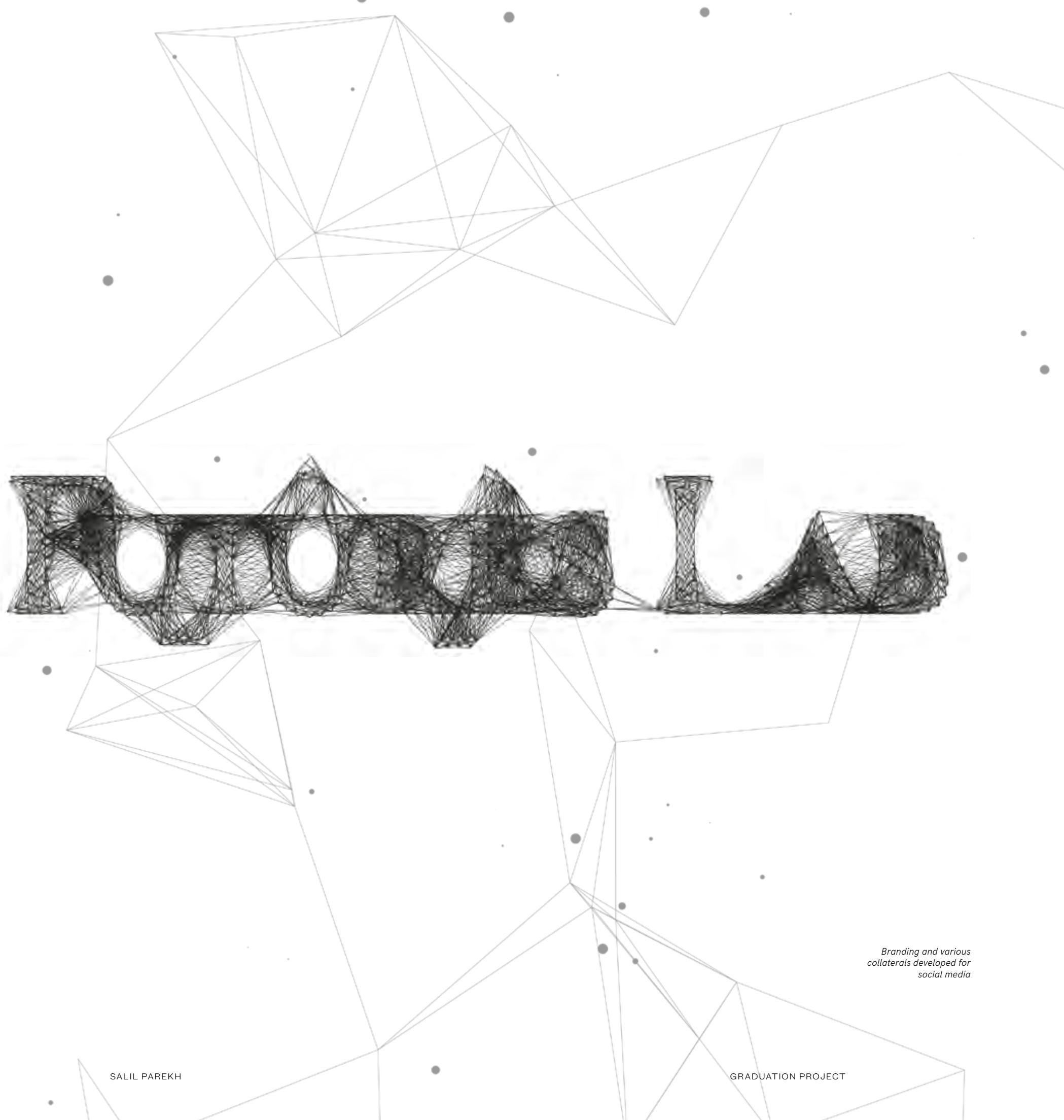
The Goan house provides a central point from which we can explore the various aspects of society, which makes this a focussed, yet wide reaching project. The

proposal requires us to plan out every step of the project right from the first day to the last, along with its financials. This was a rigorous application to fill, but in the process of doing so, we too understood what we were trying to do with this project.

In retrospect, writing these proposals was a very important step in my VR project as it allowed me to plan out at least three projects from the beginning to the end. I learnt the process of development, the funding, and the resources needed to build a project of scale. In a way, writing these proposals has allowed me to experience the life of a VR project, and it was very useful when I was creating my own project.

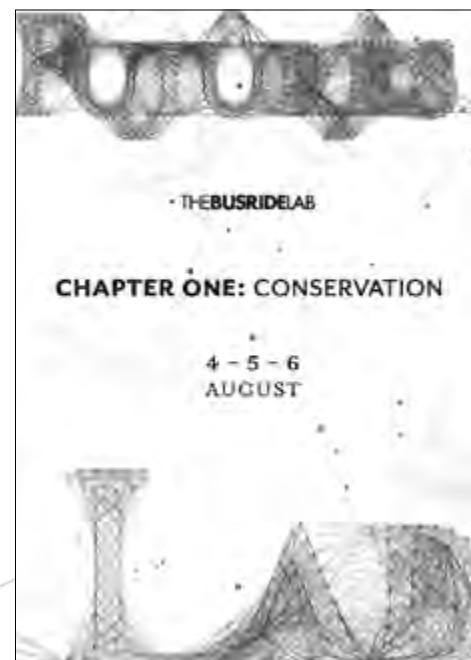
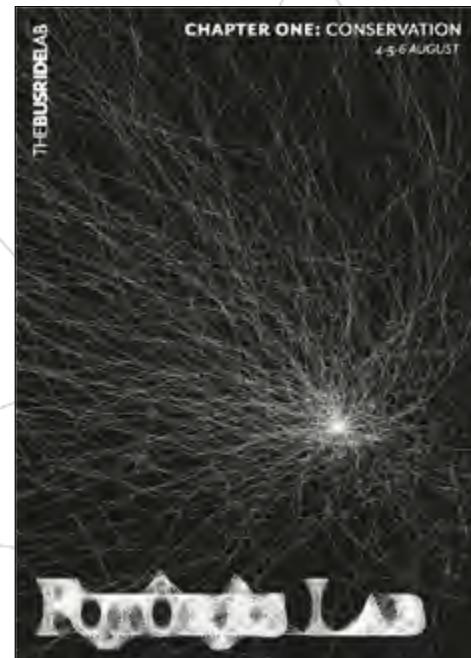
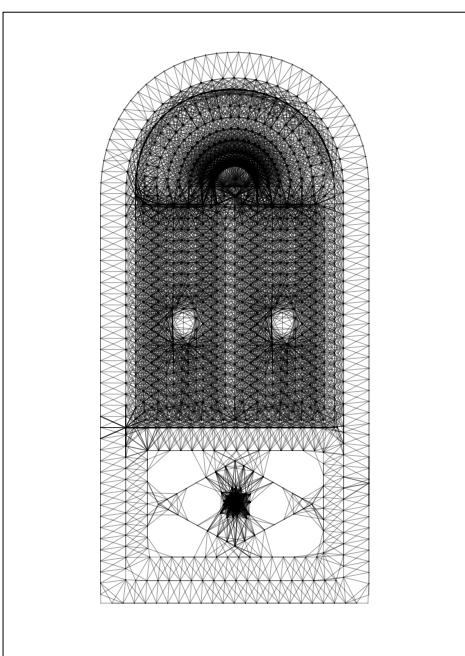
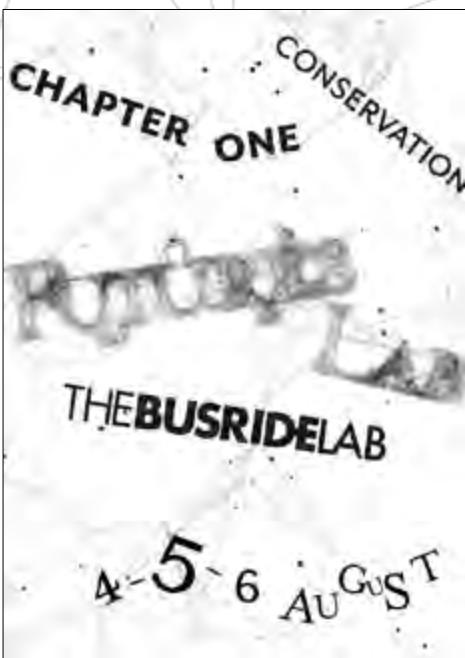
We are scheduled to get a reply by late November.

<p>5.1 Please list 2-4 concrete objectives of the project in bullet points.</p> <p>Explanation to the question: State the specific objectives you hope to achieve through the proposed activities. The objectives should address the specific needs or problems identified in the Section 4. In most cases, two to four objectives are sufficient:</p> <ul style="list-style-type: none"> - Project objectives should be limited in scope and time, and identify specifically what will be achieved with the funds requested for the particular project. Be sure to distinguish objectives from activities. For example, "to hold a workshop" is a proposed activity, not an objective. - Objectives should be measurable, and therefore capable of being evaluated. An objective such as "to enhance the growth of democracy in the country" is too broad and not reasonably measurable. <p>5.2 What is the impact you expect to achieve through the proposed activities? (max. 400 words)</p> <p>This project is an attempt to bring the Goan culture closer to the world, to bring the Goans closer to their own culture and heritage. Globalisation sweeping the world, everything seems to be merging into one homogeneous mass. This is primarily what this project is trying to tackle, the disinterest has to be turned around, using invigorating content.</p> <p>5.3 List the target group(s) of the project? (What is the gender division and estimated age group? (max. 300 words))</p> <p>Please be as specific as possible.</p> <p>Please note that gender representation will be one important criterion upon which the project will be evaluated.</p> <p>5.4 List the target group(s) of the project? (What is the gender division and estimated age group? (max. 300 words))</p> <p>The primary target group for this project are the inhabitants of Goa. Goa has a population of about 1.3 million people. Goa is also one of the few states in India where gender discrimination is not prevalent as such. Women have an equal standing in society with men, and participate in events just as men do. The project will certainly instigate dialogues between generations as it primarily talks about the heritage and culture of Goa within the context of Goan homes. The Goan audience, which includes families will definitely relate to this, and is sure to start a conversation between the children and parents.</p> <p>The second target group for this project are the tourists who visit Goa. From the months of November to April, Goa is visited by as many as 4.9 million people, from all over the world. This is a good target audience who would benefit from learning about Goa's history and culture. The tourists comprise of young people from all over India, and largely from countries such as Russia, the UK, and the US.</p> <p>Now directly looking at the target groups, they can be broadly divided into,</p> <table border="1"> <tr><td>Resident Indian</td><td>Non-resident Indian</td><td>Non-resident Indian</td></tr> <tr><td>Domestic tourists</td><td>International tourists</td><td>International tourists</td></tr> <tr><td>Local tourists</td><td>Domestic tourists</td><td>International tourists</td></tr> <tr><td>Domestic tourists</td><td>Domestic tourists</td><td>International tourists</td></tr> <tr><td>Domestic tourists</td><td>Domestic tourists</td><td>International tourists</td></tr> </table>	Resident Indian	Non-resident Indian	Non-resident Indian	Domestic tourists	International tourists	International tourists	Local tourists	Domestic tourists	International tourists	Domestic tourists	Domestic tourists	International tourists	Domestic tourists	Domestic tourists	International tourists
Resident Indian	Non-resident Indian	Non-resident Indian													
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Domestic tourists	Domestic tourists	International tourists													



*Branding and various
collaterals developed for
social media*

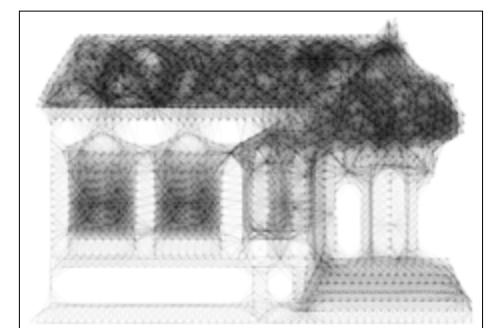
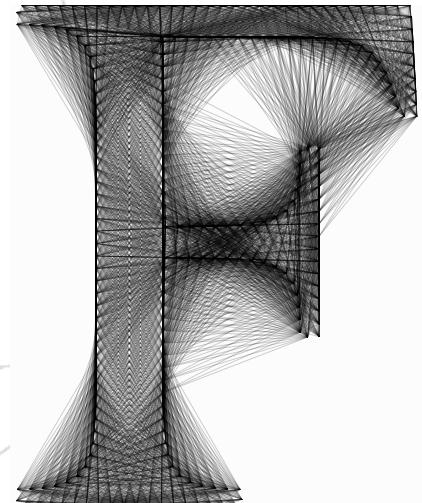
Futures Lab Prototype



The Busride Labs has a keen interest in the Future of Cities wing of the Greenhouse and has done a lot of work in Bandra, Mumbai. But most of their experiments in Bandra ended in failure, or simply didn't work as intended, with spectacularly strange results. Now they wanted to re-think their entire process of approaching heritage conservation and find a new direction. To find this new direction, they first wanted to understand the topic of heritage conservation from different perspectives.

For this, they hosted a workshop, titled **Future Labs: Chapter. 01: Conservation**. Held on the 15th and 16th of September in the studio in Goa, it was a meeting of talented individuals, each well versed in their respective fields. From wildlife conservationists and historians to chefs and designers, the eclectic selection of participants meant that we had a lively discussion on the techniques and ethics of conservation.

In the planning of the workshop, I was tasked with the branding of this workshop. After much deliberation, **we decided to use creative code to create all the branding assets**. For us, everything is connected, everything is held together by a complex web of connections. It was for this reason that traditional techniques weren't adequate to create the look and feel of what we wanted. Using Processing, I created a system that would connect all the points on the logo to form a complex and interconnected web. Multiple poster variations were also created using this generative technique. Images and animations for social media were also made.





We wanted to show the participants the concept of Digital Heritage that we were working on, so I created a small interactive prototype in VR. It's a basic scene with some photogrammetried models on it. The viewer can walk from house to house, item to item, to experience the combination of photogrammetry and Virtual Reality.

This was one of the first scenes I made for Virtual Reality, and it was great to get feedback on it. The biggest complaint I got was that the movement within the experience induced motion sickness, and there were quite a few people who took off the headset not feeling very well. It was a stark reminder that I had a lot of work ahead of me to make experiences in Virtual Reality work well enough for public consumption.

But the overall response to the idea of digital heritage was overwhelmingly positive, and it was an exciting experience for the viewers to see the lifelike models in Virtual Reality.

Left: Screenshots of the prototype
Right: Workshop participants viewing the prototype



Greenhouse v3.0

An ideal collaborative studio in VR.

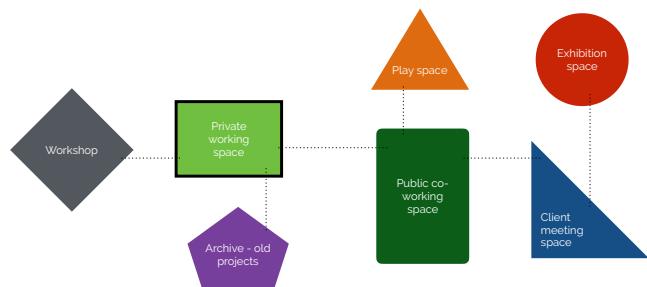
Greenhouse v3.0

What is the Greenhouse?

- In 2010, Quicksand proposed a bespoke, cooperative framework for creative practice. This was Greenhouse - a year long experiment that seemingly failed more than it succeeded.
- The second edition of the Greenhouse, now based in Goa has three partners and regularly hosts workshops and events.
- Version 3, is an ideal, conceptual version of the Greenhouse that could possibly exist in Virtual Reality.



Components of an ideal collaborative working space



Private Working Space

This is your own personal and customisable private working space. The emphasis here is to ensure that the elements used to make the space are functional, and work for VR. (Ensure that the same design doesn't also work just as well on 2D screens)



The idea of Greenhouse v3.0 was one concept that first came up while brainstorming potential VR projects. Although the focus was on creating a Virtual Reality Toolkit companion for the Collaboration Manual, it soon became very clear that it wasn't a very good idea. **Greenhouse v3.0 was the next best idea** as it allowed exploration of the concept of an ideal collaborative studio, in the digital realm of Virtual Reality.

It's important to give some context as to why the Greenhouse v3.0 exists as an idea at all. The very first Greenhouse was a hybrid and open-format community space at the intersection of new cultural activity and alternative education. It served as a gathering space for makers and creators, artists and art-lovers, life-long students, and teachers. Opened in the December of 2010, it hosted a variety of exhibitions, music nights, make-a-thons. In spite of it being partly funded by the Goethe-Institut, it was inefficient, hard to resource, hard to programme, lacked participation and interest from the partner studios and eventually had to be shut down when the term ended, within a year.

In 2016, the idea of the Greenhouse was revived, as Quicksand, The Busride, Tandem Research, and their respective studio partners came together to form a collaborative studio in Goa. In the last year since its inception, the now Greenhouse v2.0 has been functioning in the pink of health, but as is the nature of its inhabitants, questions are being asked about what the next iteration of the Greenhouse be like.

The research for the Future of Cities wing suggests that soon, **the concept of having just one job will become obsolete**. The '*gig economy*' as it has been tentatively titled, will transform the way we work. Every individual will be servicing multiple clients simultaneously. So how will the Greenhouse exist in this new world order?

The Gig Economy has been prevalent in other parts of the world for quite some time now, and to some extent, even in India. **One of the biggest issues clients and freelancers both face is the lack of quality communication.** When trying to explain the needs of the project, the client often faces an issue when trying to communicate the values of the brand and what it stands for. If the freelancer doesn't empathise with the brand, they often aren't as invested in the work and as a result, the quality of work suffers. VR can be a great tool to communicate the values of a brand and for the freelancer to empathise with the client and the project.

Another **issue that is faced by both parties is the lack of human touch.** Remote work opportunities mean that the freelancer and client don't get to meet, and only communicate via video conferencing, text, and productivity applications. Using VR, this gap can be bridged, as social VR gives the experience of the presence of the other person. As the technology matures, even more interactivity will become possible, which will boost the experience of the human touch through a digital medium.

Greenhouse v3.0 is the future of the Greenhouse and explores this idea of a collaborative studio in the future.

Play Space

The play area, the space for entertainment and fun! What would a play area look like in VR? Could be a gaming room, theatre, listening room, etc.



Archive

An archival space to store old projects, media, ideas, amongst other things. How would the space help users access certain projects, or to browse through them in VR? Imagine various architectures to store and access large amounts of data and experiences in VR.



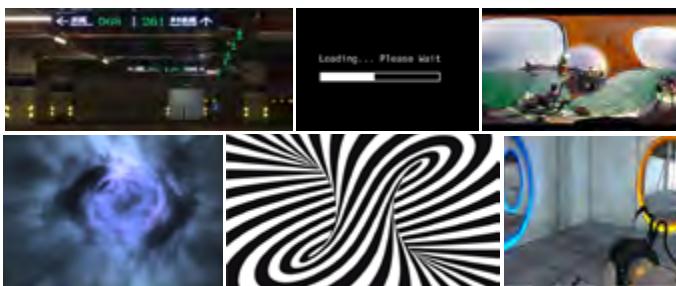
Exhibition Space

Gallery or exhibition space to display complete projects, work-in-progress, and other media from ongoing projects for other users to view, critique, and give feedback. Could also be used to show clients the studio's portfolio.



Transitions

Transitions between spaces have potential to be interesting and fun. What would the transitions look like? Can they add value to the experiences?



Workshop

A place to create and craft things using the digital version of workshop tools. A 3D sculpting space, illustration artboards, video editing suite, music creation, etc. What form would these tools take in VR?

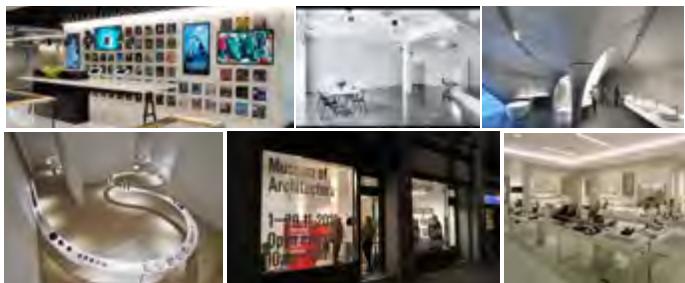


Putting all these spaces together in one cohesive VR experience could make this a framework upon which studios could run on in the future.

Client Meeting Space

Space designated to show clients the work happening on the project, hold meetings, and give presentations. What can be done to introduce higher levels of immersion, and improve meeting experiences?

Slides from a review presentation pitching the idea for the Greenhouse v3.0



The future of work exists in Virtual Reality.

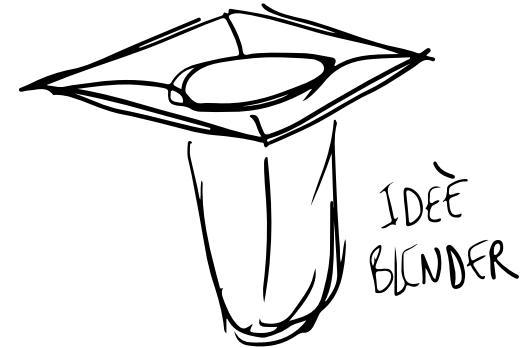
The Greenhouse v3.0 is a studio which exists solely in Virtual Reality. It can be accessed from anywhere, provided you have a VR headset and an internet connection. The ability to access the studio from anywhere is particularly relevant in the future, as the partners of the studio will be able to come to the studio, irrespective of their location, and at any time. Furthermore, as more and more tasks become digitised, any sort of work can be done in VR. Divided into multiple zones, for work, play, creation and archive, the studio has different functionalities built in for each of the spaces. The moodboards on this page illustrate the feel and the functionality each of the spaces will have.

The decision to split a single virtual space into multiple spaces was made to give some order to the experience, **a narrative to ensure that the activities in each space remain separate from each other**. The user's journey through the spaces also lent some direction to the way in which the spaces are used for their respective tasks.

SPACES / ZONES

- ① Private working Space
- ② Public co-working Spaces
- ③ Nap room
- ④ Play Room
- ⑤ Client Room
- ⑥ Meeting Room
- ⑦ Exhibitor Room
- ⑧ Screening / lecture Rooms

- ⑨ Jutting through a black hole room
- ⑩ Multi Media room
theater room
- ⑪ Store Room - Archive
- ⑫ Workshop Space - Creation Space



Studio Spaces

COMMON AREA

nodal point for every place

PEOPLE AREA

A closer look at the people of Greenhouse

WORK AREA - archive + work/work

Collection of work done at GH includes, photos, audio, artefacts, stories

- archive
- work in progress
- active working areas

EXHIBITION AREA

exhibiting the work done at GH

Although the idea of the future Greenhouse, the Greenhouse v3.0 was attractive enough, designing it was proving to be a little difficult. This is when I stumbled across my first hurdle of VR. **One of the greatest strengths of Virtual Reality is that anything is possible. There are no real limits to what is possible in VR, which is a unique problem in itself. If anything can be created out of nothing, then is there any use of creating false barriers to the content in VR?**

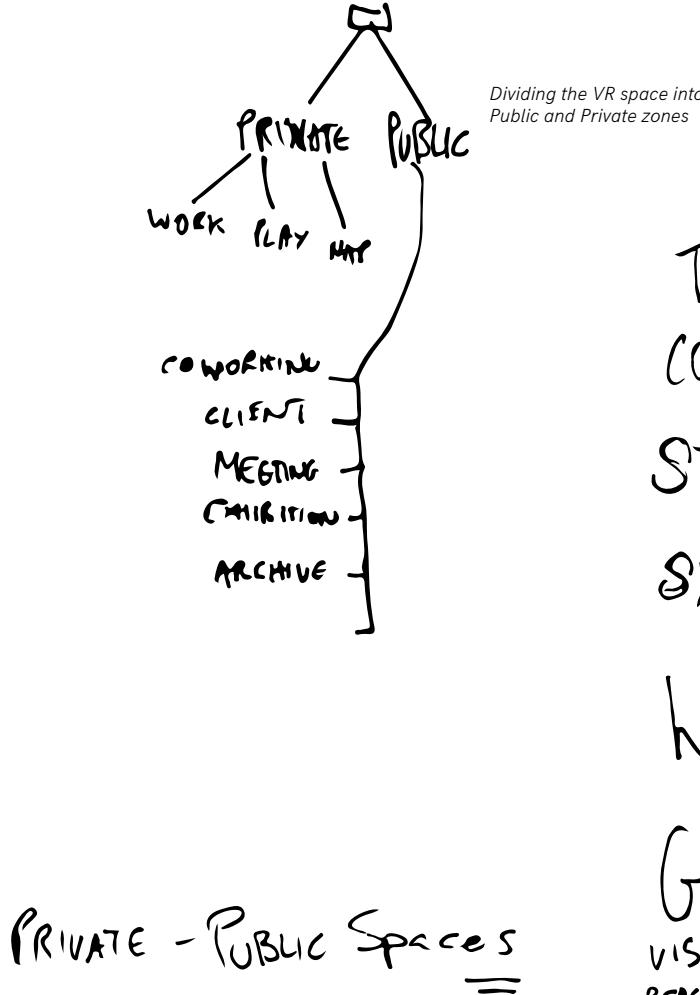
But after watching VR experiences available on the Oculus Store, I quickly learnt that just like any other medium, even VR needs a strong narrative, otherwise the user will not know where to look or what to do. **Not having a strong narrative is dangerous, especially in Virtual Reality, as controlling the user's point of view and decisions is not possible.** The user has full control over the experience, and can only be guided, not forced to look at something, or perform a particular action.

Even for an experience as open ended as a collaborative studio, it is vital that the **experience is divided into zones**, so that every space has a purpose to it, and adapts the space to the function of that zone.

Given that it is a collaborative space, we tried to inculcate the values from the collaboration manual into the spaces we designed.

Initially, I attempted to divide the zones by their respective functions. So, into private and public working spaces, workshop spaces, exhibitions spaces, play spaces, meeting spaces, and archival spaces. Just like a regular studio, it's important **to divide spaces into either of two categories, Public and Private**. By creating this division, it becomes clear to the user that some spaces are social, while others are purely for the user themselves.

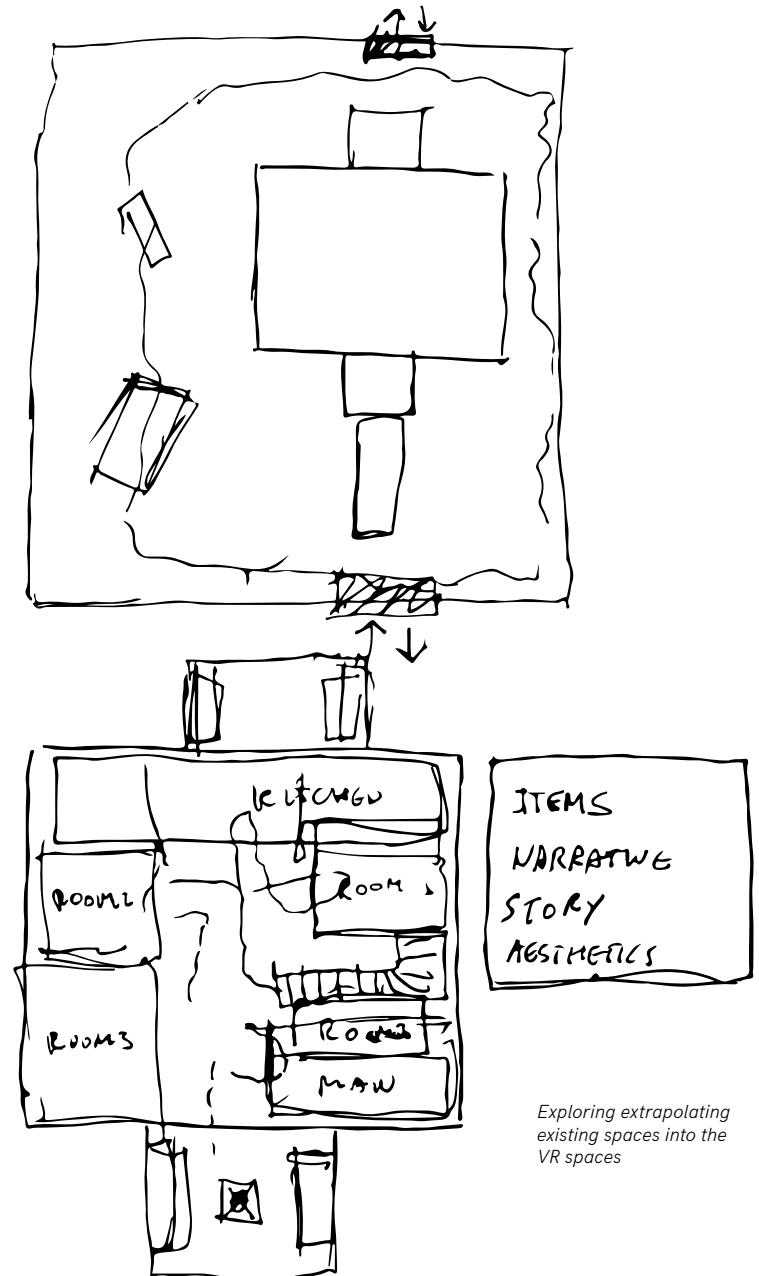
We also explored the idea of extrapolating spaces from the real studio, into the narrative zones. So the common area in the hall becomes the public co-working space, while the dining area becomes the meeting space, and the garden is the play space. It felt too specific to this studio and didn't appeal to the partners. **We were also thinking of the possibilities of advancing this idea to create a framework that could be licensed to other organisations who wished to switch to a cloud based VR work environment.**



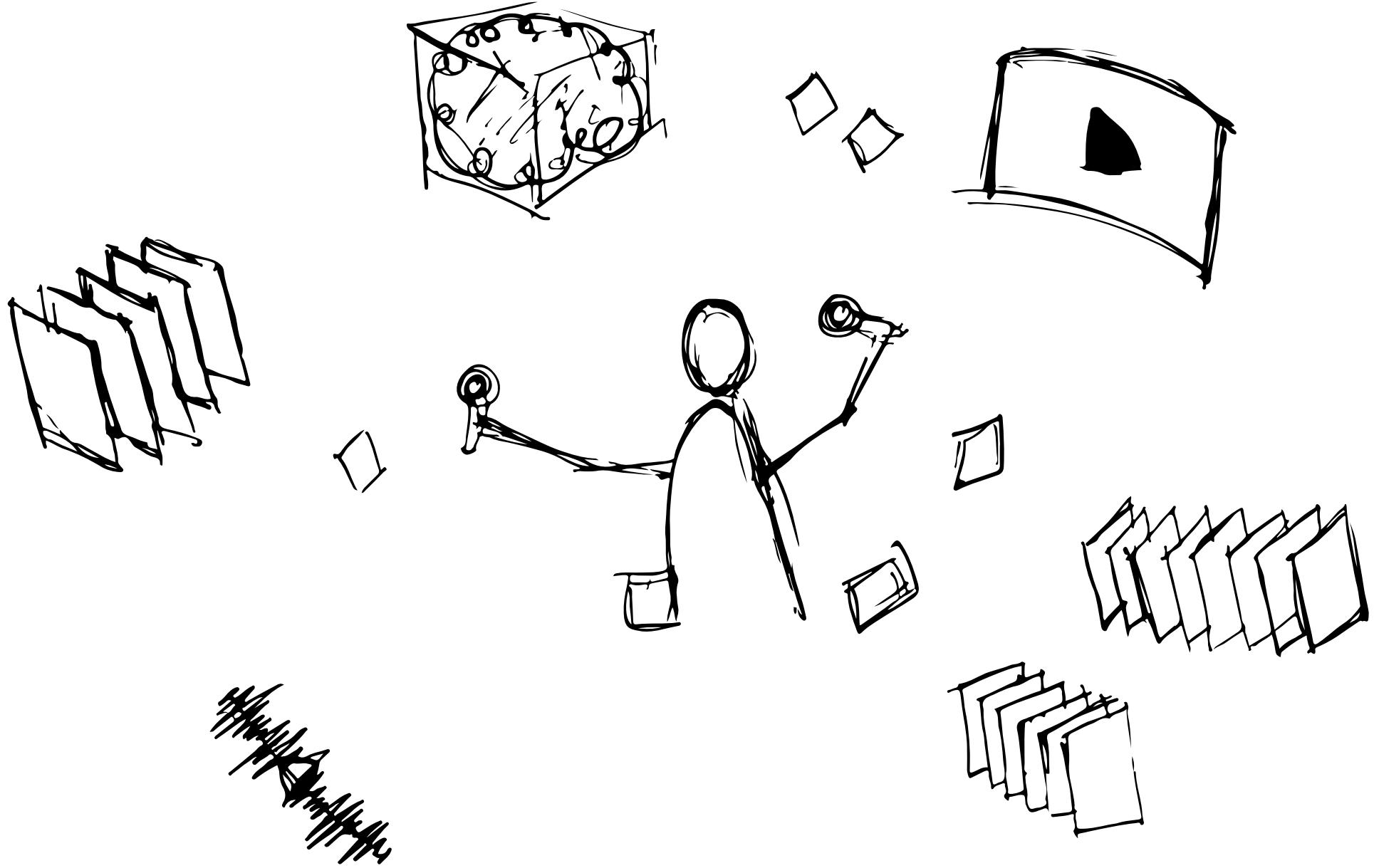
- (Client Rooms (Public Private))
- Meeting Rooms (Public)
- Work Rooms (Public + Private)
- Play Rooms (Public)
- Show Rooms (Public)
- Store Rooms (Private Public)

TRUST
COMMUNICATION
STRUCTURE
SYNCHRONOUS / A /
WORK
GOAL
VISION
PERSPECTIVE
COLLABORATING AGREEMENTS
CONFLICTS
NEGATIVITY

Learnings from the Collaboration Toolkit



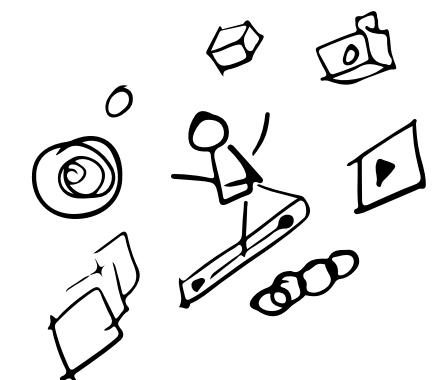
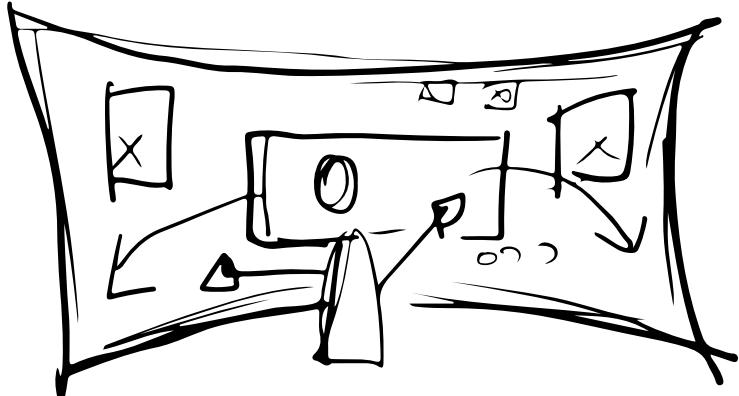
Kitchen - Brainstorming
Internet = Market



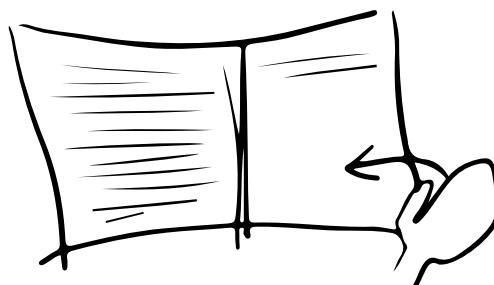
Spatial Explorations

Private Working Spaces are zones for the users that lets them work on their own, with their own content and data. These spaces can be configured to the users liking. In many ways, working in VR is more intuitive and easier to work in than on a traditional laptop computer. Media is limited to the two dimensional display, and the display size itself is relatively small compared to their surroundings. In Virtual Reality, users also have the ability to edit and create with more intuitive input controls, as compared to the mouse and keyboard. **Working with digital files** in a purely digital space also makes it easier to work with them.

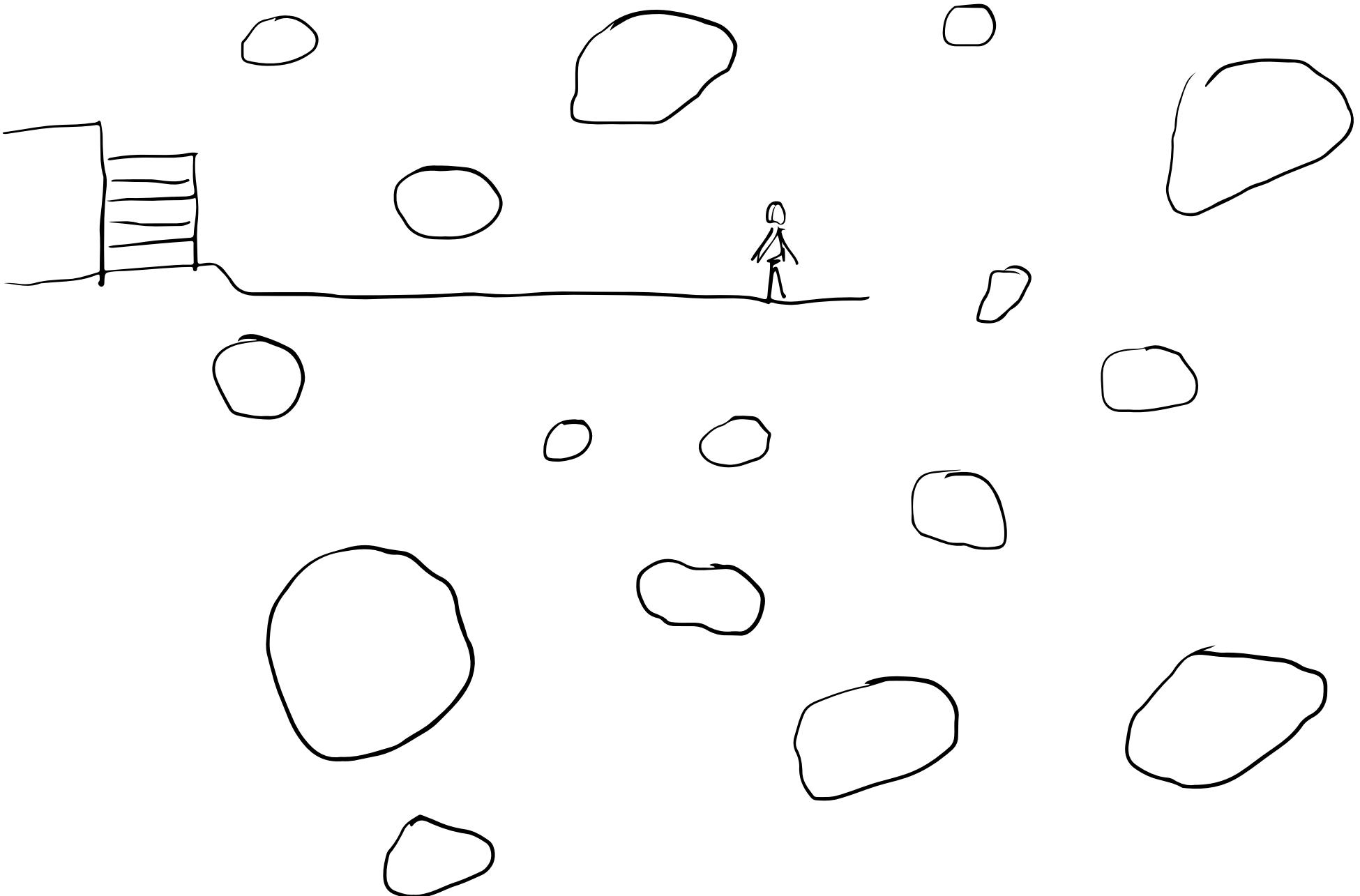
PRIVATE WORKING SPACES



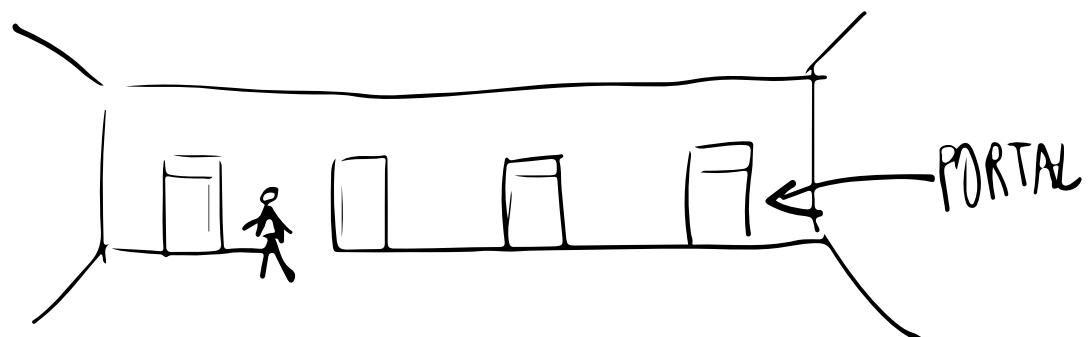
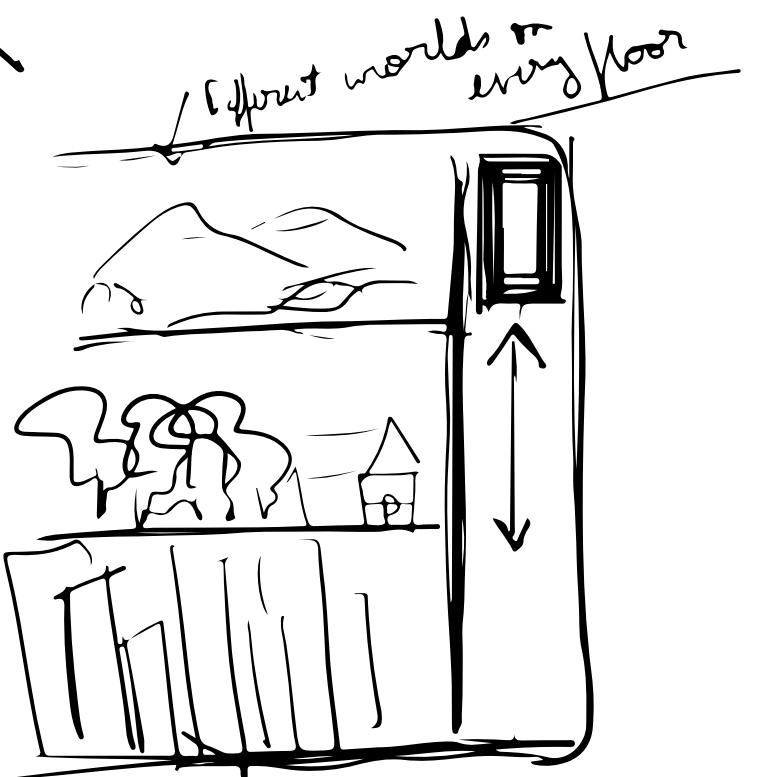
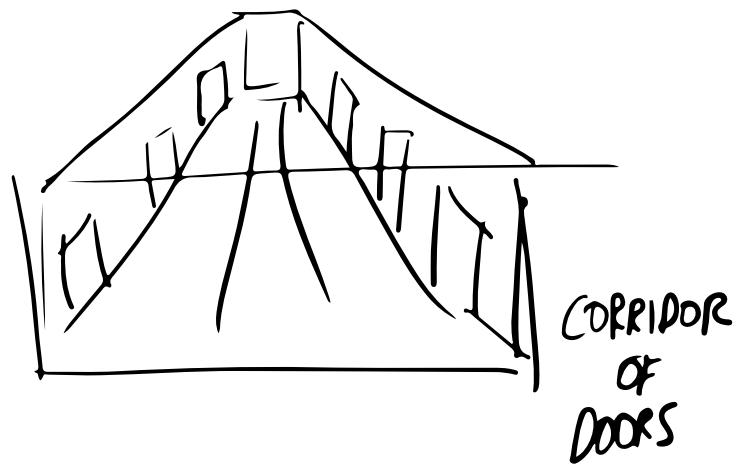
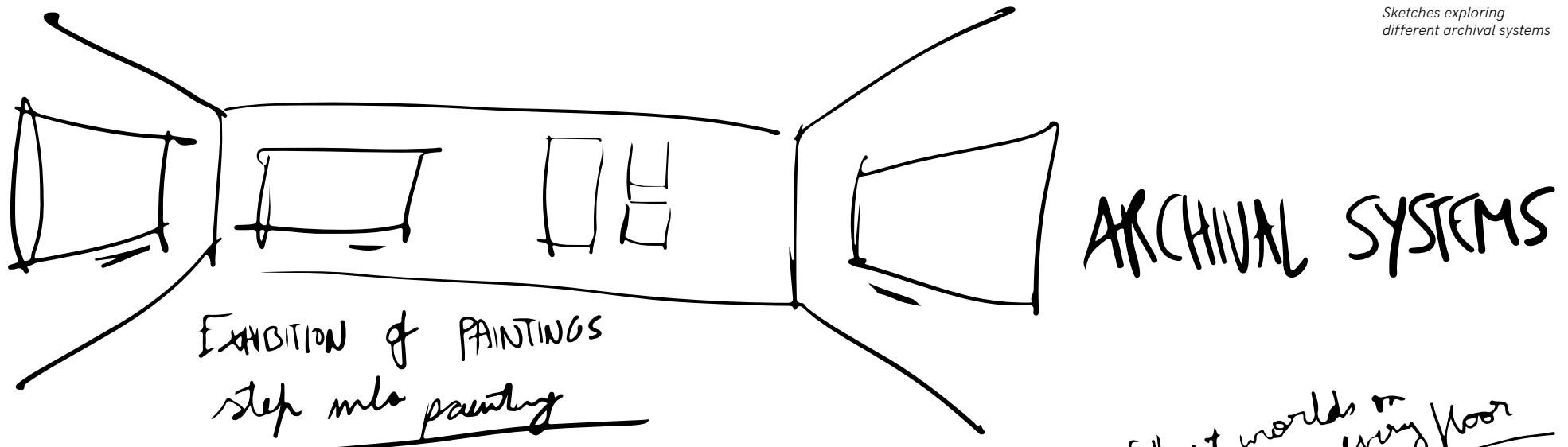
Sketches exploring spatial orientations



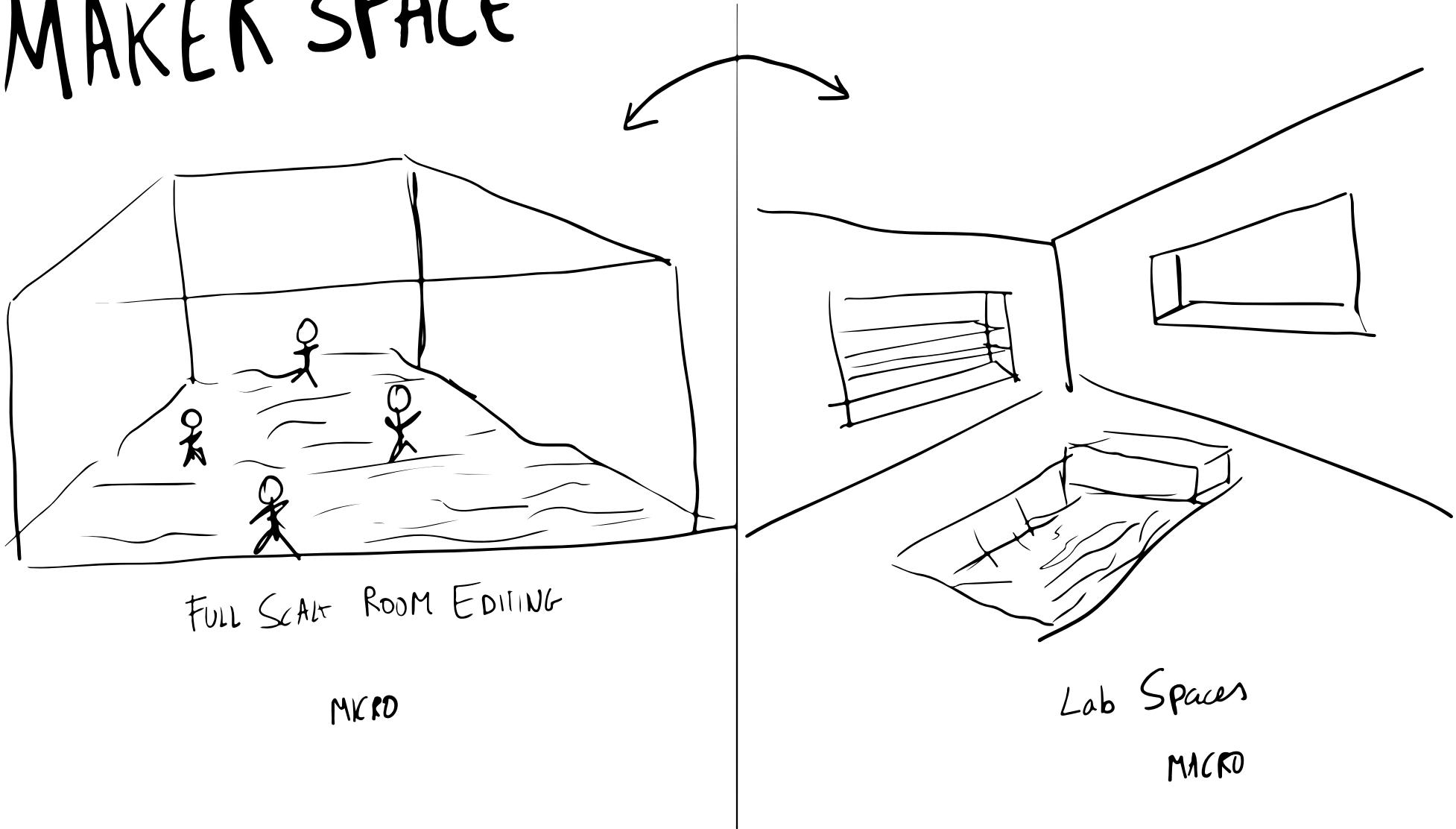
ARCHIVAL SPACE



The **Archival Space** is a zone where all content and data can be accessed. It is a repository of digital assets and is **designed to let the user explore the realms of the archive so that they can simply browse or search for a specific project that they want to view.** As with any space, the spatial design of the space will dictate the experience of the user. With the limitless possibilities of VR, it's interesting to explore the many fascinating methods of archiving and organising data.



MAKER SPACE

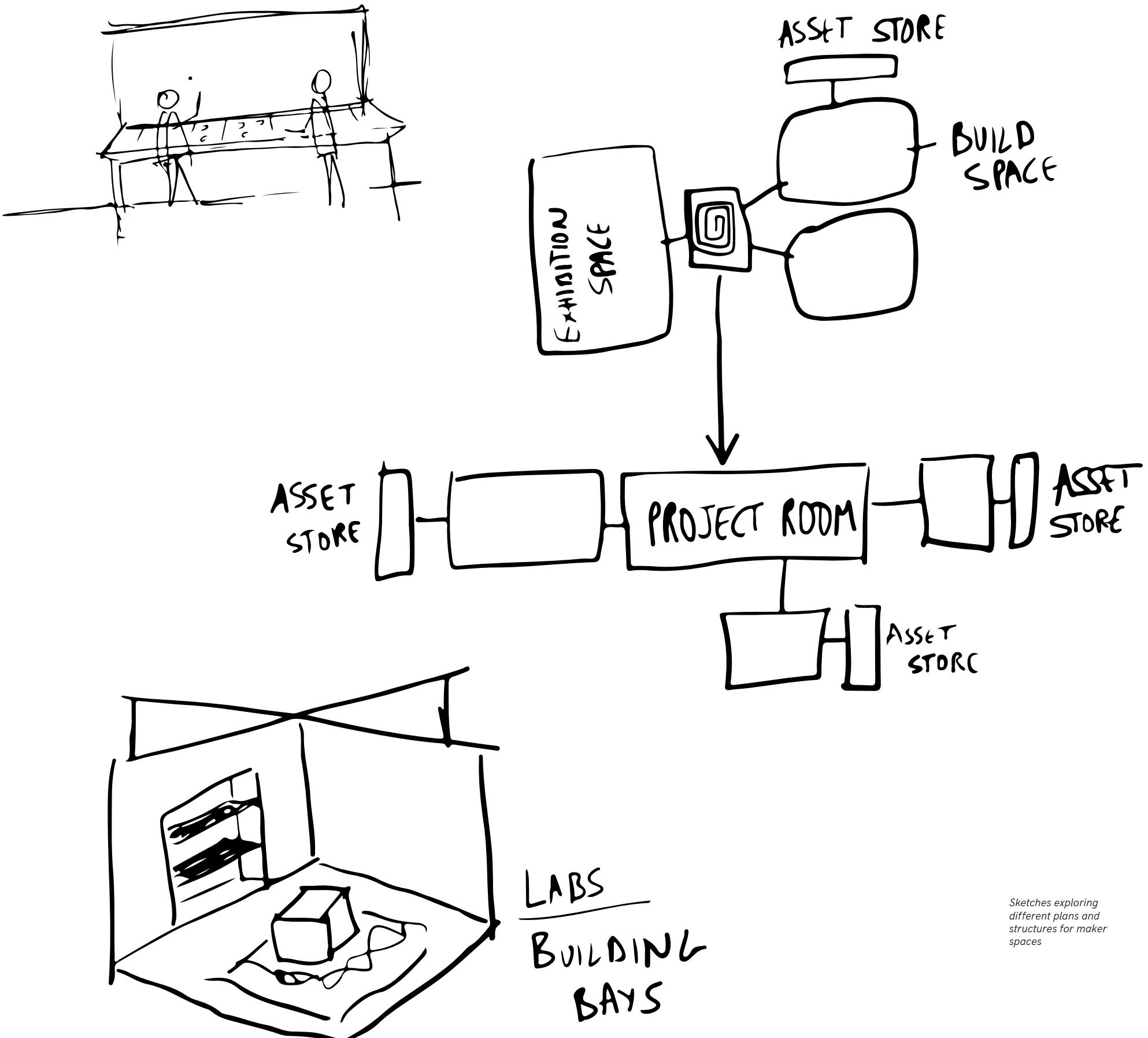


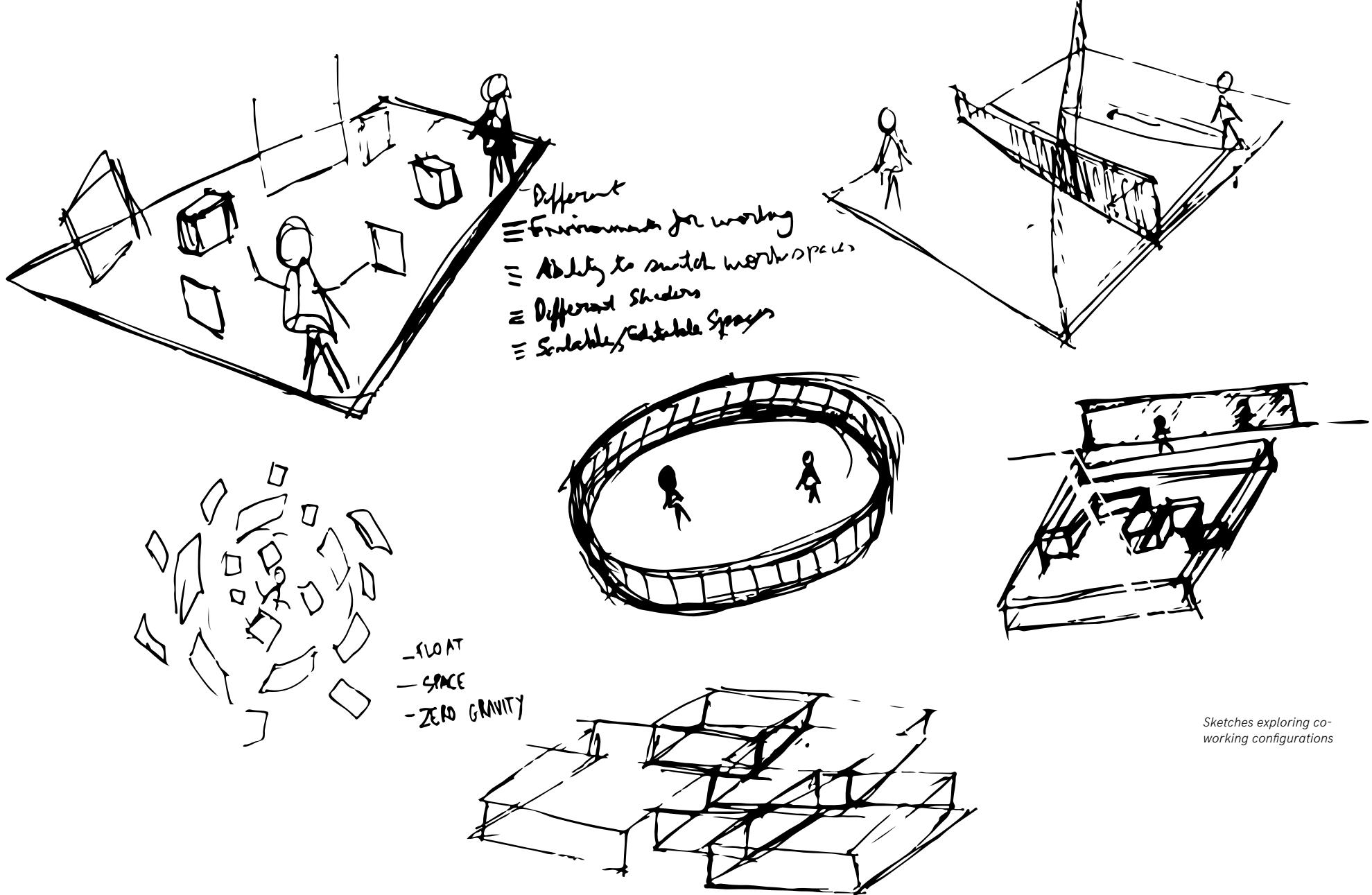
The **Maker Space** is the zone for project building. As Virtual Reality workflows will eventually shift to VR as well, it will become easier to integrate it with existing asset and world building techniques which are already in VR. **Building for VR, in VR, is a lot more intuitive than on a traditional two-dimensional screen.** The studio is planning to ramp up its work on VR projects, hence this space is vital for Greenhouse v3.0.

Both Unity and Unreal Engine are going to be supporting VR world building very soon.

PROJECT BUILDING SPACES

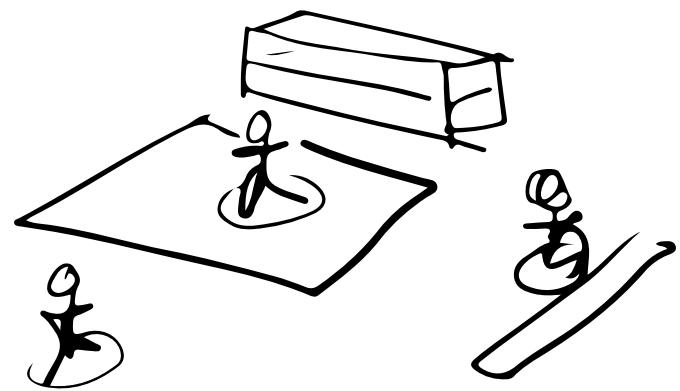




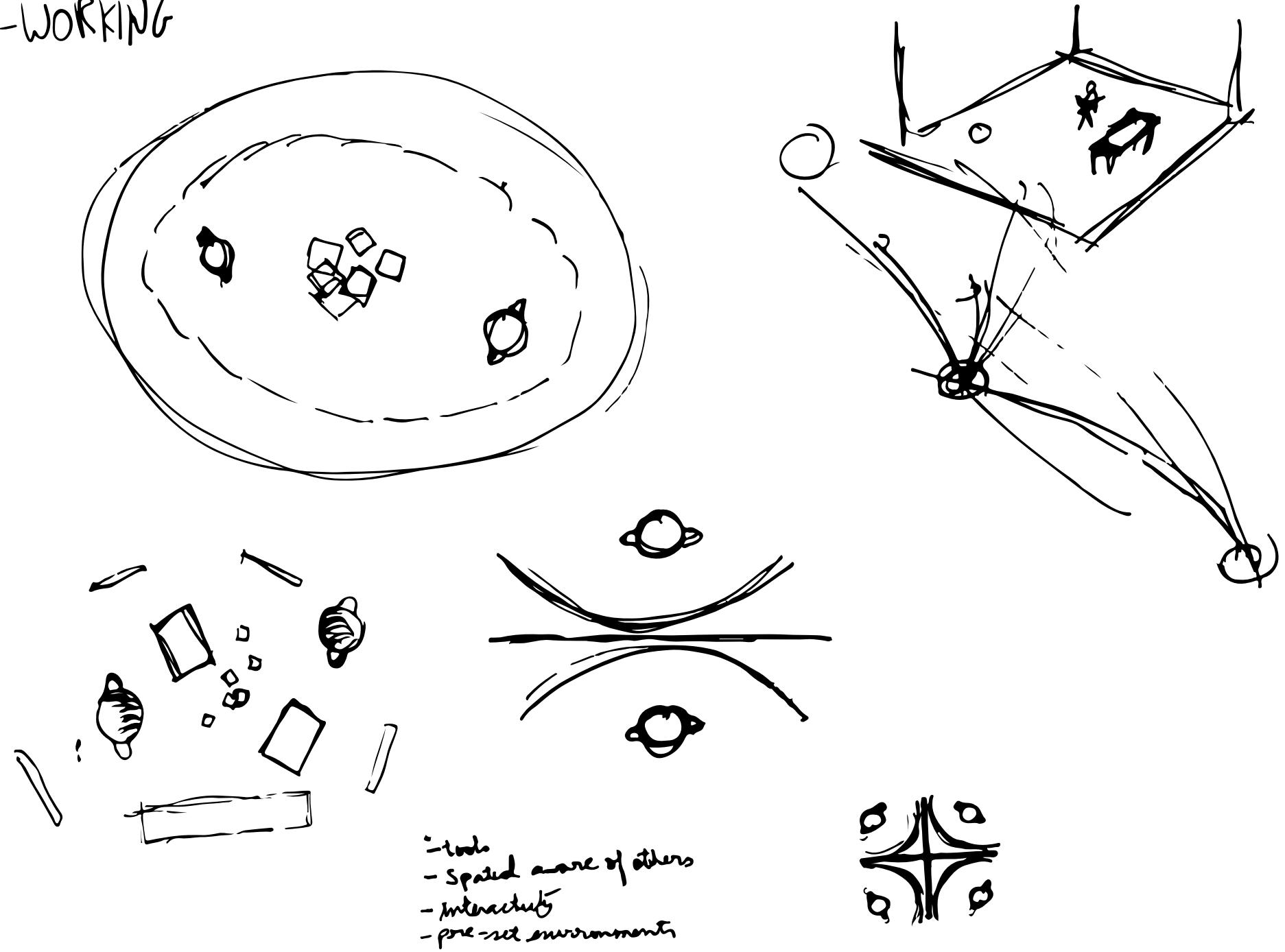


Sketches exploring co-working configurations

The **Co-Working Spaces** are very important for this VR experience, as it is a collaborative studio after all. These **spaces are designed to encourage users to work together to create collaboratively**. This space will change according to the context of the work at hand, and the tools needed. The challenge here is that, because the spaces will have to change according to the task, it's near impossible to '*design*' a space for co-working.



CO-WORKING



This was when we
realised a big problem
with what we were
attempting to do.

Greenhouse Spaces

As we were sketching out the spaces that we wished to inhabit in VR, it quickly became very clear that everyone had different demands from their spaces and **it would impossible to design even a framework for these spaces, let alone a one size fits all solution.** Every user has different demands from their spaces, and the non-existent limits of VR mean that any space can be customised to the hilt. This brief seemed like an impossible task.

It was at this point that we **decided to rethink the brief.** The studio was also looking to create a portfolio of sorts, something that they could show to the visitors to the studio about the work that they have done, and what they want to accomplish in the future. VR was the medium of choice as it not only allows for a much more immersive experience but also serves to tell the viewers about the studio's intent to get into VR development. Up to this point, the studio hadn't worked on any VR projects till now, so my project would be the first. Hence it would serve as a testbed to form the development process for creating in VR.

Taking all this into consideration, we started thinking of a VR version of the current Greenhouse. **A VR showcase of the work being done in the studio, an experience that can be shown to visitors and potential clients.** This was a very appealing idea as it fulfilled both the studios need and my desire to explore VR as a spatial design medium.

To first understand, and structure the work done in the studio, I listed down the various **Pillars of the Greenhouse.** The Pillars of Greenhouse are the main activities, and the work being done at the studio. We narrowed down from the initial list to the final few pillars of **Future of Craft, Future of Cities, and the Arts.** We felt these are the three main subjects that the studio focusses on.

The studio also felt that the Greenhouse v3.0 wasn't an interesting enough idea for VR. It was too functional, and for now, they wanted to do something more entertaining and visually stimulating.

The concept of using Greenhouse v1.0 and v2.0 as a base to extrapolate the pillars of what the Greenhouse stands for is a great way to understand the relevant spaces that need to be built out. I went through the proposals and documents written for the Greenhouse, and looking at the work happening in the studio, I've listed down some pillars which I feel represent the studio.

Futures thinking
Exploring heritage conservation;
FutureRuins
New media digital playspace
Exploring opportunities with craft
Cross-disciplinary work
Unbox/Workshop/Events
Art exploration
MOCI
Experimental work
Unwind, and relax
Anti-urban, close to nature
Collaborative environment

Pillars of GH

- Craft has a lot of intrinsically literary Potential
- Heritage Conservation FUTUROINS
- Ego less partners
- Respect boundaries & other partners
- Encourage cross disciplinary work
- Space for experimentation
- Play & learn / work
- Centre for events / workshops
- Electric / Digital Media Experimentation
- Relax by the pool and around
- proximity to soon beaches
- Talks & knowledge dissemination
- Future Work
-

- > Features
- > Heritage
- > Experimental Work
- > New Media Digital Work
- > MOC1
- > Craft
- > Cross-Disciplinary work
- > Play / Chill / Relax /
- > Unbox / Workshops / Events
- > Nature + No city
- > Art Exploration
- >

Listing down the Greenhouse pillars

Time Axioms of the Green House

↓
Cultivate what had been going on for years
before ↓

Different streams / pillars of work at the studio ↓

Explore the abandoned spaces and surfaces
see what work the studio was up to

The Reworked A VR showcase of the Brief: work being done in the studio, an experience that can be shown to visitors and potential clients.

Narrative Options

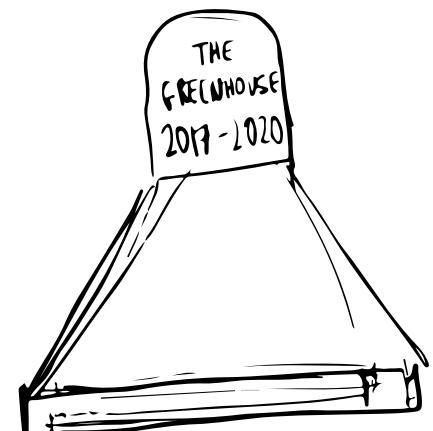
As we were now switching to a non-functional experience, the narrative now had a lot more importance. One of the biggest takeaways from the VR Workshop at the EyeMyth Festival was that **the story is a major factor in any VR experience**. Prior to the festival, I hadn't seen a single VR project, so it was difficult for me to understand what were the important parts of a VR project. While working on the Bambaiyya VR project, we realised that the narrative is probably the most important part of the VR experience. This stems from the issue of not having full control over the user. Because of the fact that VR is a medium which affords plenty of freedom to the viewer, **a strong narrative is needed to keep the viewer following your story**. The level of interactivity gives the viewer the freedom to look around anywhere in the scene and move around as they please. The restrictions creators employed in traditional media don't apply here. Forcefully directing the viewer to see what you want them to see does not make for a good solution for this medium.

The best one can do is to provide a narrative powerful enough that it naturally persuades the viewer to do what you need them to do in order to progress through the story. The zoning of the spaces isn't enough for a VR experience. The premise of the story has to be believable for the user to buy into your experience.

One idea that was appealing to us, and which was used in the successful India Foundation for the Arts proposal was the one of a **time capsule**. A time capsule is a container storing a selection of objects chosen as being typical of the present time, buried for discovery in the future. The concept of a Virtual Reality time capsule is exciting because of it being an immersive medium, that makes the time capsule even more powerful. The ability to see the past from your position in the future gives the viewer the powerful ability of retrospection, which makes for a very interesting experience.

With this in mind, I set about writing a few stories and scripts to showcase Greenhouse Spaces through. While I wrote many scripts, and experimented with multiple storylines, the **general gist of the VR experience revolved around the time capsule of the Greenhouse. Finding the remains of the studio, and discovering a VR experience that takes you back in time and shows you what the studio was like, who worked in it, and what did it do**.

The partners were happy with the idea of a time capsule, and with the deadline looming into sight, we decided to start with creating the spaces in VR.



PREMISE:

You arrive at the scene of the previous Greenhouse, and find that it has been abandoned. Curious to find out what it was and why it was abandoned, you enter and get sucked inside a time capsule. This time capsule tells you the story of what the Greenhouse was, and what happened to it. It's an unguided experience that lets you piece together what happened, and what led to it being abandoned.

ALT SCENE 1

"The year is 2050. Fresh out of college, you get a job at a corporate firm, and you go to work. From your multi story glass and concrete building, you notice a small patch of forested land in the complex, by the edge of the boundary wall. During lunch you decided to go pay it a visit. When you get to the place, you see a small forest of sorts, surrounded by a small stone boundary wall, with a short set of gates locked together with an iron chain. A sign is plastered the wall, "Property under dispute, do not trespass!" You hop over the gate, and walk inside, brushing away the tall bushes and trees. An old Goan villa is shrouded behind the vines and greenery inside. You recognise the architecture from the pictures you've seen in your history books, but this is the first time you've seen it in real life. Your phone pings, lunch break is over. You vow to visit again when you have more time. That very weekend, you come back with your backpack, and enter the place again. You get past the main gates, and this time attempt to enter the house itself. The door gives way to a hard push, and you stumble inside. You're expecting it to be dark, but to your surprise, it's well lit inside. Sunlight streams in through the planned skylights in the roof, and rays of light are illuminated by the dust. You see things that you've never seen before. The colours, materials, even the shapes, look so different from what you grew up with. It's even older than what your grandparents had. You've always had an interest in these matters, but could never find any documentation for these things. You wander around, looking about, wondering where to start looking. A voice startles you, "Hello there[in konkani]" You look around, but there's no one to be seen. Just darkness in the far corners of the house. You start walking back toward the exit, when you hear the musky old voice again, "Wait, don't go. It's been a long time since anyone has been here.[in konkani]" Your konkani is rusty as best, and you haven't spoken or heard the language in a long time. Hearing it after such a long time makes you feel oddly relaxed. You reply, "Who are you? Where are you?" A pause. Then comes a reply, "I'm all around you. I'm the house you stand in. I am the consciousness of the house. It's been a long time since anyone has walked in here." "

SCENE 1

"As you put the headset on and enter virtual reality, all you see is a black room lit by the white light coming through the gaps. You refocus your eyes, getting used to this strange room, and slowly, pixel by pixel, the room changes into a place with a overgrown, abandoned villa. As you look around you, you start to see that you're in the compound of a Goan villa, with a small stone pathway at your feet, a half filled pool to your right, and an overgrown mess of vegetable creepers to your left. Up ahead of you is a pink villa, with those classic Goan mangalorian tiles, with a small porch up front. The place looks like it's been untouched for a few years. The tiled roof has holes in it, with vines punching through. The now deprecated window frames still have a few mother of pearl shells left in them, with only darkness visible through the gaps. A snake emerges from the filthy, algae infested pool, and make its way around the house clearly occupied with something. Lunch I assume. There's a small raised stone platform near the pool, housed with a broken frame. A single chair lies underneath a mess of branches and leaves fallen from the adjacent tree, it's metal frame keeping it from succumbing to time. To the left of the porch, on the outer wall, there's a series of small dots. You walk toward it to see what it's about. There's nine lines of dots and dashes, with each line varying in length. It looks a lot like Morse code, so you try and decipher it. There's a sheet of paper lying to the side on the ground. Picking it up, you see a scribble planning out the mural, and see the text decoded. It reads KINGPLUTO. Surprised at this, you say King Pluto aloud. For a moment, nothing happens, but then you hear a bark from the porch. Curious to see where the noise came from, you go inside the porch and see a clean new box lying there, completely detached from its surroundings. The cover of the box twitches. Whatever is inside wants to get out. Reaching out, you gingerly lift the cover of the box. A powerful light emits from the box, and dissolves the villa, the porch, the pool, everything. The white light overpowers everything, and just as quickly as it came, the light fades away, depositing you in a new place."

SCENE 3A

"The best way to figure out what happened is to talk to the people in the place, so you decided to go and try meet the people and figure out how to talk to them. You approach someone who's sitting at their desk, engrossed in their laptop. His hologram is glitching as well. His hand keeps answering the phone next to him and putting it down, all the while looking at his laptop, in an eerie loop. There's no name, no indication of who he is. A black diary near his laptop is engrossed with the words, "The Busride". Is that something to do with him? Possibly. You further explore his desk, looking around for clues as to who he might be. Then you spot a slightly ajar drawer, and reach out to open it. The moment you touch his desk, you feel the teleportation happening once again. The desk, along with you and the person sitting behind it fly through starfields at hyperspeed. Just as suddenly, the stars disappear and the ground has appeared beneath you. As you once again try to understand what just happened, you hear a voice behind you. "Err, hey, you okay?" You look behind, and see a large man on an even larger horse standing behind you. He appears to be carrying a sword, but looks on to you with some concern on his face. You look back to the man sitting at the desk with his laptop, but he has disappeared. You get up from underneath the desk by the drawer, to meet the man on horseback. And then you notice that the room is full of these creatures. Some of them tiny, some of them larger than life. The horseback man introduces himself, "Hey, my name is Ayaz, and welcome to my crib" He dismounts, and walks ahead, motioning you to follow him. As he walks around this fantastical room, full of things he associates with, he tells you about himself, and the reason why he came to the Greenhouse. He leads you on through a display room full of work he has done at the Greenhouse, and also a room full of junk, he calls "insert something funny". He goes on to talk about the reason why he was an active member of the Greenhouse, and how it has since influenced his work. As we walk further and further down the ever lengthening room, the lights start flickering and dimming out. He stops talking, stops, turns around and says, "but it all had to come to end someday I suppose. That one greedy landlord put an end to our plans. Although we couldn't continue in person, the idea, the thought of the Greenhouse lives on, and we all still work together, even if we are not in the same space."

SCENE 2

"As the light fades away, you find yourself in the middle of a clearing in a forest. Except, it's a very unusual clearing. The greenery is interspersed with oddly placed objects, such as a monitor and a PC, VR headsets, terracotta objects, amongst others. There are also desks, with people working on them. Even the sounds are varied and interspersed. Over the strange medleys of forest sounds, techno music, and mouse taps, you can hear the roar of the sea in the background, and you can just about pinpoint that sound to a small path that leads off into the distance. You spot some people coming into the clearing from that path, talking to each other, and separating off to their desks. But none of them seem to notice your presence. You gesture toward them, trying to get their attention, but to no avail. When you try and touch them, your hand pass through and you see that they are just projections, nothing more. Some projections are stuck in small loops, a symptom of the time capsule system not working properly. You spot some other glitches in the environment, and it appears that some of the real life decay has seeped into the digital one. It's a strange and eerie environment, but it's obvious that something has gone wrong. As you look around the bushes, trying to decipher what the items could indicate, a loud thud is heard behind you, and you see dust settling on a large battered leather bound book which fell into the middle of the clearing. You walk over to see the book. Bending down, you see the book is titled, "The Rise and Fall of The Greenhouse". You open the book, carefully turning over the cover page. The preface reads:

"This book documents the rise and fall of the Greenhouse. Welcome to the Time Capsule, the last remaining comprehensive record of the existence of the Greenhouse. This Time Capsule has the memories of the people, the place, and the learnings of the Greenhouse. To access this data, please view all content around you, and perhaps you will be able to piece together what the Greenhouse stood for, and why it collapsed. This book has the written transcript of all the content in this place. Read on for a detailed report"

Eager to learn more, you turn over to the next page. But the moment you do so, the pages dissolve into ashes, and scatter in the wind. All you're left with is the leather cover and the preface page. You look up at the ashes floating in the wind, and start to see the puzzle around you that you must solve to understand what this place is, and why it was abandoned."

SCENE 3B

"Getting up from the now empty book, you look around and decided to start looking at the objects to look for clues. The most intriguing objects are the clay objects scattered about in one corner of the clearing. You walk toward there, pick up a terracotta chicken, and look around it, hunting for a clue that could help. But, the chicken slips, drops on the floor, shattering into pieces, and in process, sucking out the world beneath your feet. Just as quickly as the ground disappeared, a new world appears beneath your feet, and all your surroundings have changed.

You find yourself standing in the middle of the road. A small Goan road to be precise. With a lot of people walking to and fro around you. A banner up ahead reads "The Future of Craft". You follow the stream of people walking toward the banner at the entrance of what seems like a fair or an exhibition."

Script options for the Greenhouse Spaces VR experience. Of the options listed here, the script titled "Scene 1" was the one we chose to go ahead with.

Visual References

In the months leading up to the start of the VR part of the project, I had been conducting research on games and media that touched upon Virtual Reality or referenced it in some way. As I was unfamiliar with the potential of this medium, this research helped me when I started creating for VR.

Two popular films embrace the concept of virtual reality in a slightly different manner. **Inception**, by Christopher Nolan, and **Paprika**, an anime by Satoshi Kon both address the subject of an alternate reality, set in one's dreams. This is perhaps an apt way to describe the concept of virtual reality. Anything is possible, and anything can happen in both Virtual Reality and our dreams. Both films show impossible architecture, surrealistic visuals, and cross dimensional activities, which are all possible to replicate in Virtual Reality. Films such as **TRON: Legacy** and the **Star Wars** series explore the possibilities of worlds with different rules, different frameworks, which have roots in our own reality.

MC Escher touched upon the possibilities of impossible architecture, with his mathematically precise drawings and showed the potential for structures if the rules of physics could be bent, which it can in Virtual Reality. One of the main attractions in VR for the studio was the

potential to apply a strong art filter to anything I create. The aim is to surprise, and create magic within those spaces, and not to design solely with function in mind.

Surrealism was another rich source of potential, as it explored multiple concepts of breaking reality. **Salvador Dali** and the derivative work from his ideas were an abundant source of inspiration.

VR is very handy in recreating spaces and situations where it is simply not possible to visit or experience. Even though these spaces are based in reality, visceral experiences of floating in deep space, or swimming with the sharks provide hints as to what is exciting to see in VR.

Even the twisting of basic parameters of reality can provide for exciting experiences. One of the biggest reasons why VR is often known as the empathy machine is that the viewer can perceive reality from a different perspective to understand a version of reality that is different from theirs. From the more radical changes such as an ant's eyes view, or a bird's eyes view to something a lot more situational like seeing the world through with autism, or ADHD.

Clockwise from Top Left: Dreams of Dali VR, Inception, Doctor Who, TRON: Legacy, Paprika, MC Escher, Star Wars, Autism TMI VR Experience



Initial Ideation

Now that the zoning and the overall narrative had been taken care of, it was time to get into the exciting part of designing the VR spaces. The partners of the studio had made it very clear from the outset that they were looking for spaces that had a heavy art filter to it. They suggested that I simply get working on VR, play around with the editor on Unity, and start creating. Although this went against everything I knew about the process of designing a space, I soon realised that they had a point. Initially, I did sit down, and try and figure out the narrative to the particular spaces; it was difficult to visualise the final space because of my inexperience with creating spaces in Virtual Reality. Although it may not look like it, designing spaces in Virtual Reality is very different from designing for real life.

There were many factors to take into account when designing for VR. The one thing I had to constantly remind myself was that I didn't have to stick to any rules of real life, or adhere to rules of reality. I had to try and exploit the strengths of VR as much as I could. Another consideration to keep in mind was that this was still 'Virtual' reality. As immersive as it might be, I still had to remember that **the link to this medium was limited to two controllers in the viewer's hand**. I had to design around these rather odd limitations.

The direction for the aesthetic was decided after another long discussion. Based on the assets we had, and the work of the Greenhouse, we settled on the primary attributes of **surrealistic**, **Goan**, and **natural**.

We didn't have a lot of time to refine and move on to a second round of designing as my project was drawing to a close. With this in mind, we tried to experiment as much as possible, so that the learnings from this could be carried forward into a second draft of the VR project. Although we did try and prototype as many ideas as we could, we had to give up on fully detailed prototypes in favour of ideas sketched out in smaller parts in the Unity editor.

Arrive at the landing scene, and find the studio hidden away in the clearing.

|
Once you enter the studio, you're transported to the current greenhouse where you get to see the spaces of the people who work there (collaborative environment)

|
Then you are taken to the Futures space and Craft space to see the work done by the studio.

|
And finally to the digital playground, where all the art is stored and enjoyed.

- Aesthetic -
- **GOAN**
 - **FUTURE**
 - **POST MODERN**
 - **NATURE**
 - **CONTEMPORARY**
 - **REALISTIC**
 - **SURREAL**

LANDING SCENE



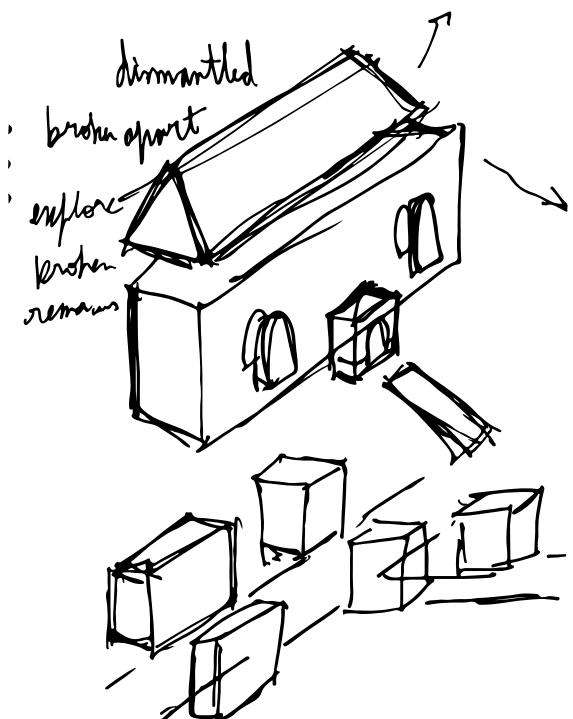
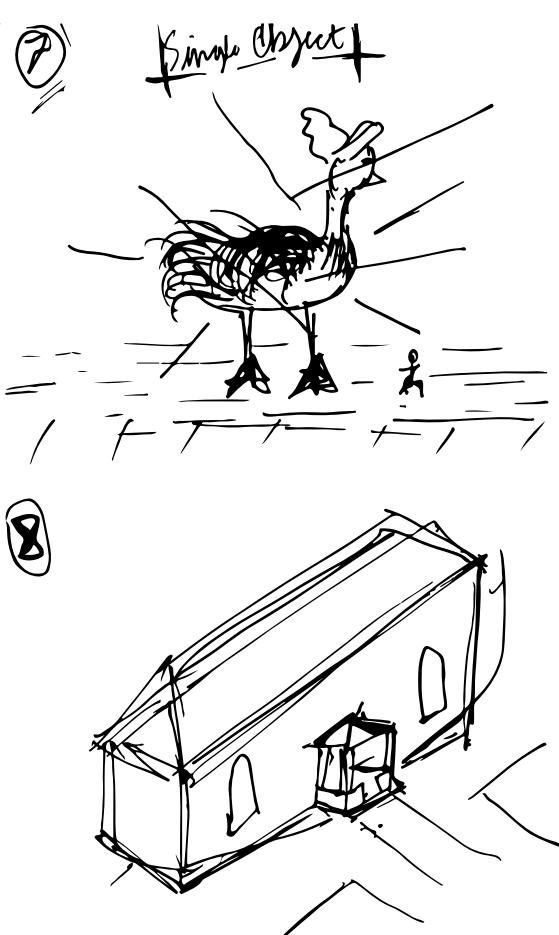
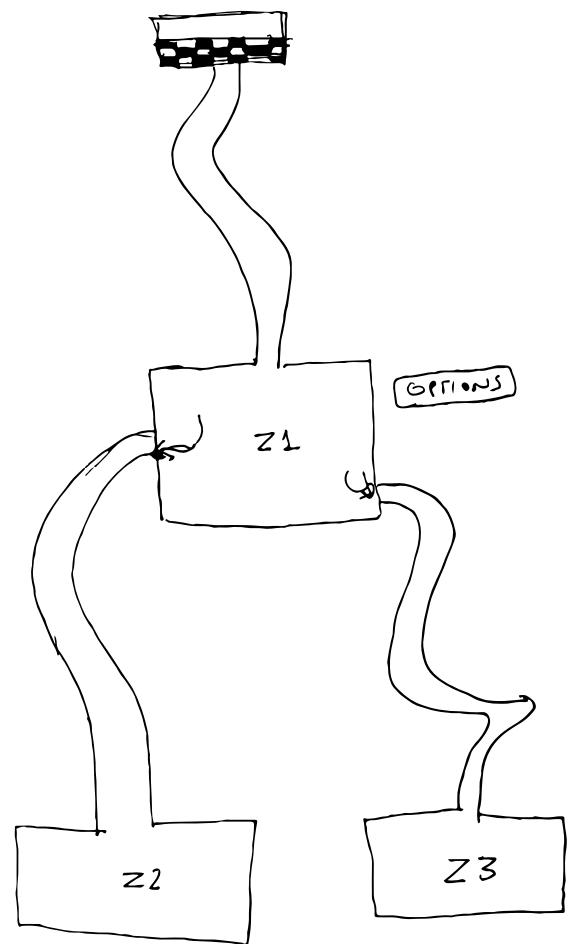
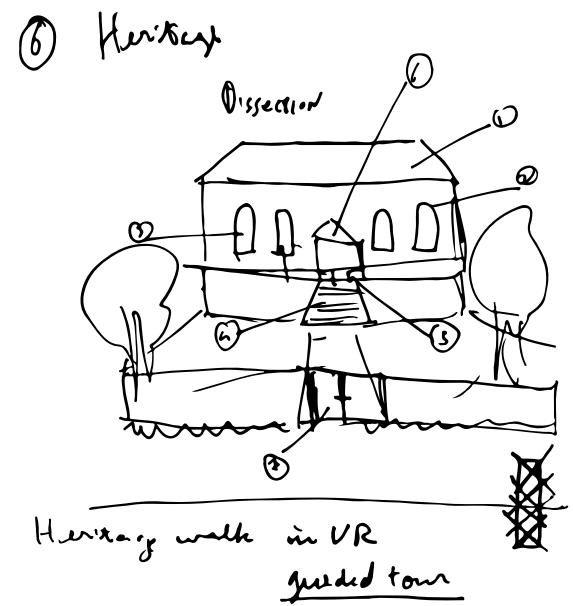
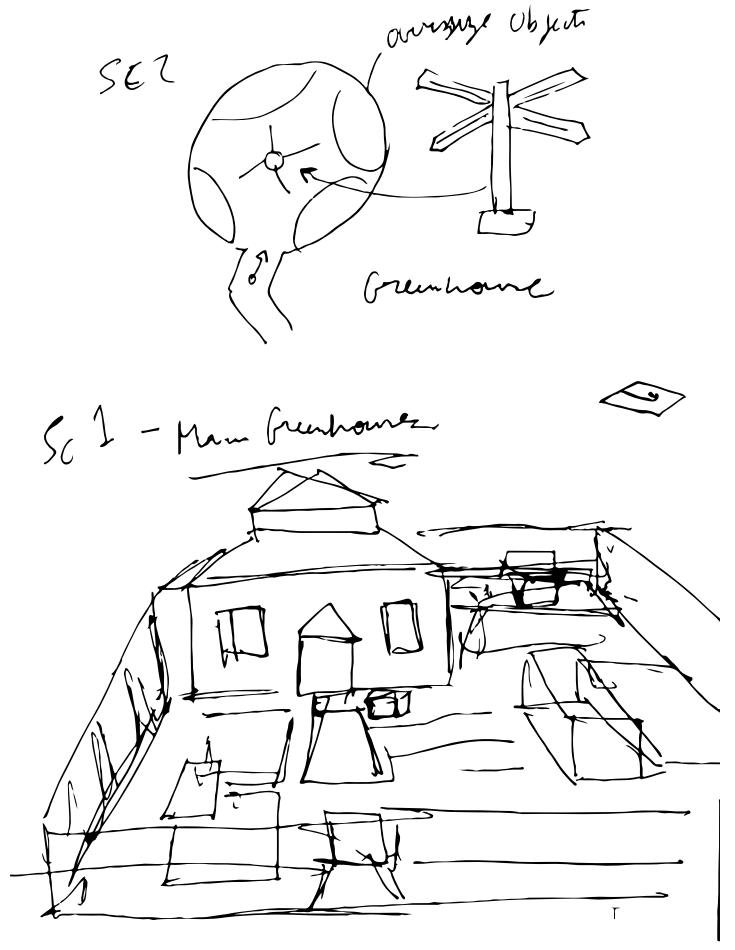
FUTURES SPACE



CRAFT



ART/Digital VA

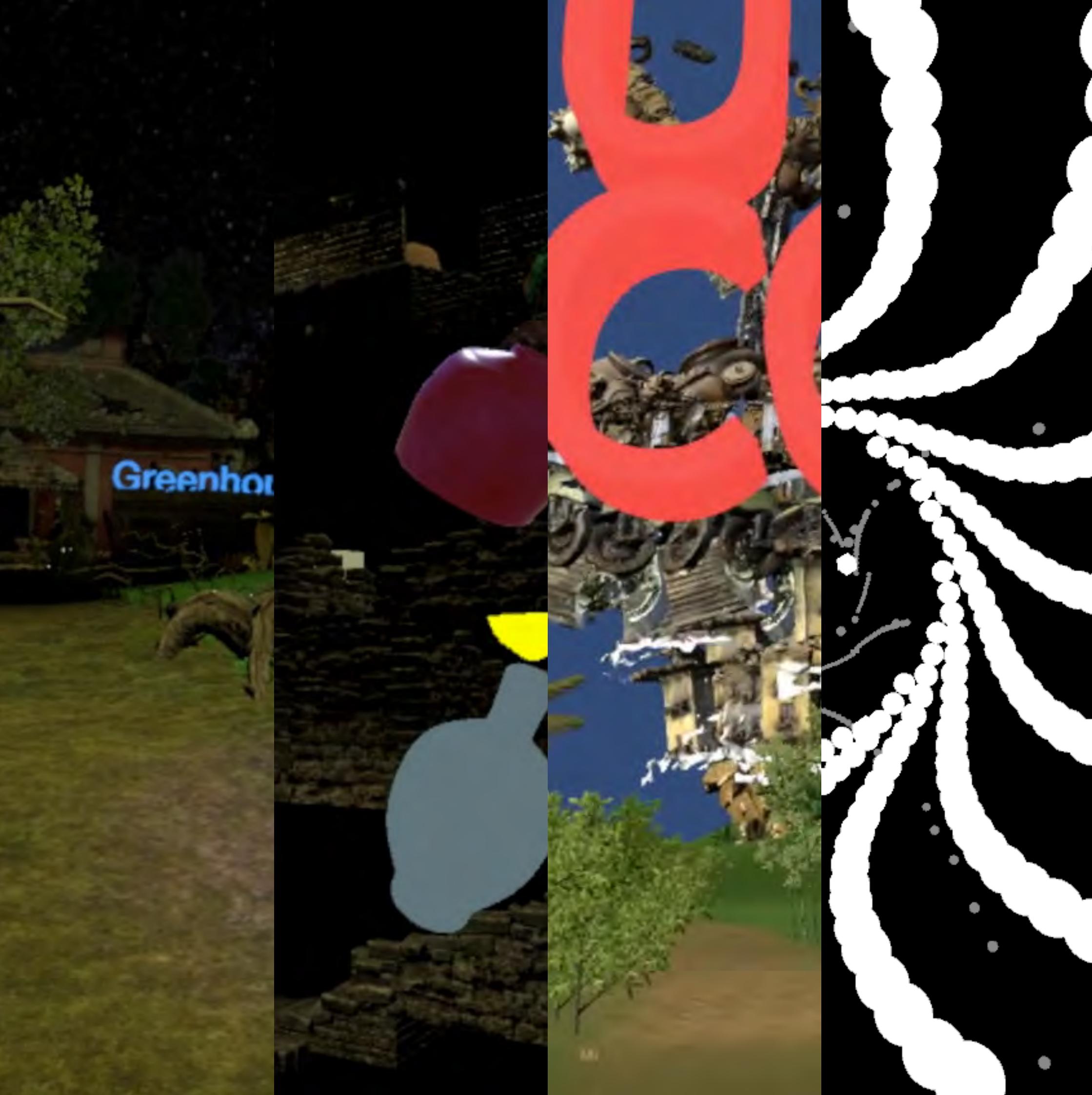


Sketches exploring ideas
of the spaces for each
zone

Final Build

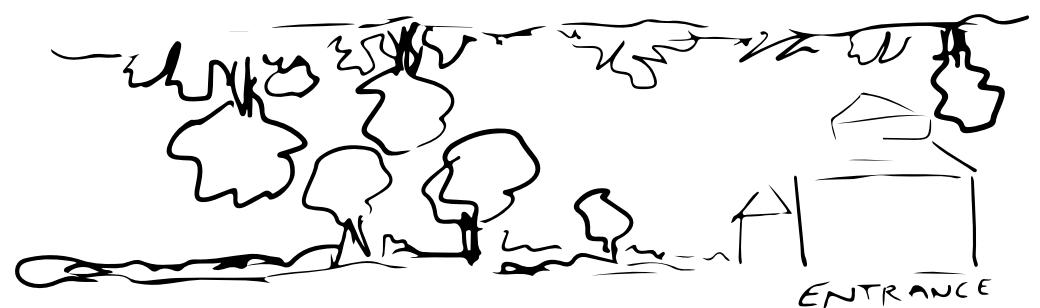
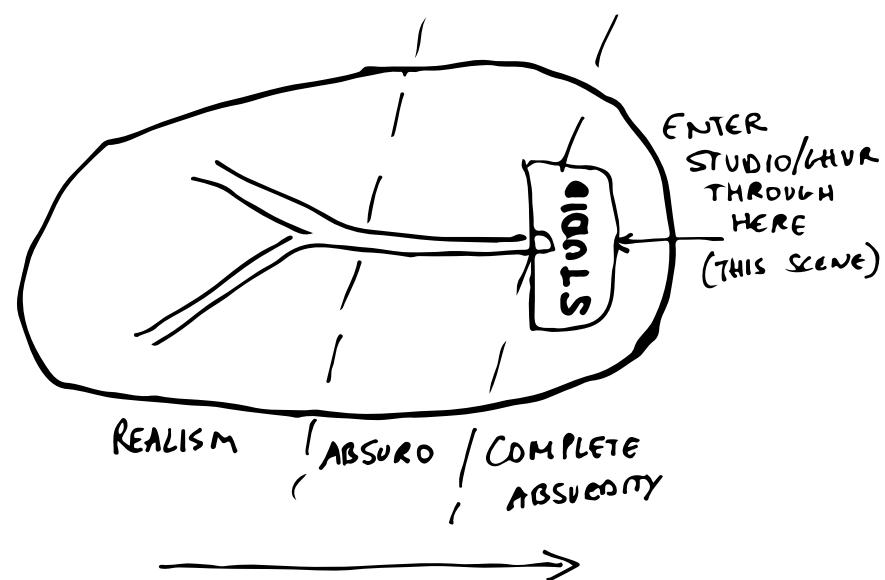
FINAL SCRIPT/PREMISE

"As you put the headset on and enter virtual reality, all you see is a black room lit by the white light coming through the gaps. You refocus your eyes, getting used to this strange room, and slowly, pixel by pixel, the room changes into a place with a overgrown, abandoned villa. As you look around you, you start to see that you're in the compound of a Goan villa, with a small stone pathway at your feet, a half filled pool to your right, and an overgrown mess of vegetable creepers to your left. Up ahead of you is a pink villa, with those classic Goan mangalorian tiles, with a small porch up front. The place looks like it's been untouched for a few years. The tiled roof has holes in it, with vines punching through. The now deprecated window frames still have a few mother of pearl shells left in them, with only darkness visible through the gaps. A snake emerges from the filthy, algae infested pool, and make its way around the house clearly occupied with something. Lunch I assume. There's a small raised stone platform near the pool, housed with a broken frame. A single chair lies underneath a mess of branches and leaves fallen from the adjacent tree, it's metal frame keeping it from succumbing to time. To the left of the porch, on the outer wall, there's a series of small dots. You walk toward it to see what it's about. There's nine lines of dots and dashes, with each line varying in length. It looks a lot like Morse code, so you try and decipher it. There's a sheet of paper lying to the side on the ground. Picking it up, you see a scribble planning out the mural, and see the text decoded. It reads KINGPLUTO. Surprised at this, you say King Pluto aloud. For a moment, nothing happens, but then you hear a bark from the porch. Curious to see where the noise came from, you go inside the porch and see a clean new box lying there, completely detached from its surroundings. The cover of the box twitches. Whatever is inside wants to get out. Reaching out, you gingerly lift the cover of the box. A powerful light emits from the box, and dissolves the villa, the porch, the pool, everything. The white light overpowers everything, and just as quickly as it came, the light fades away, depositing you in a new place."

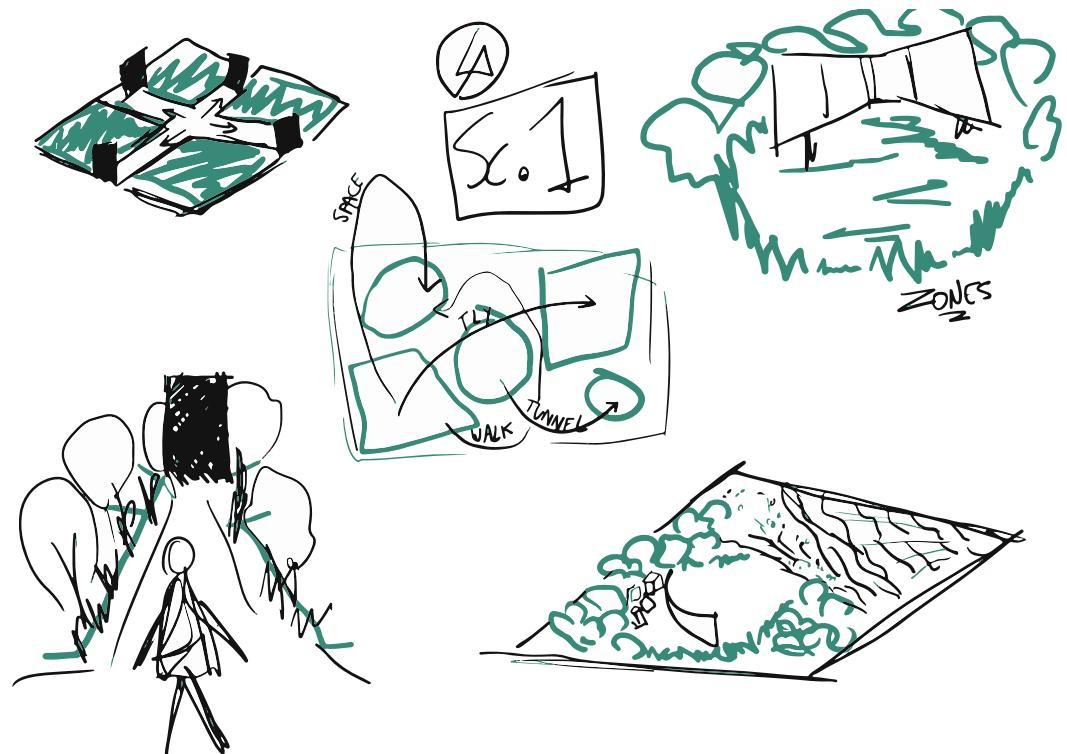
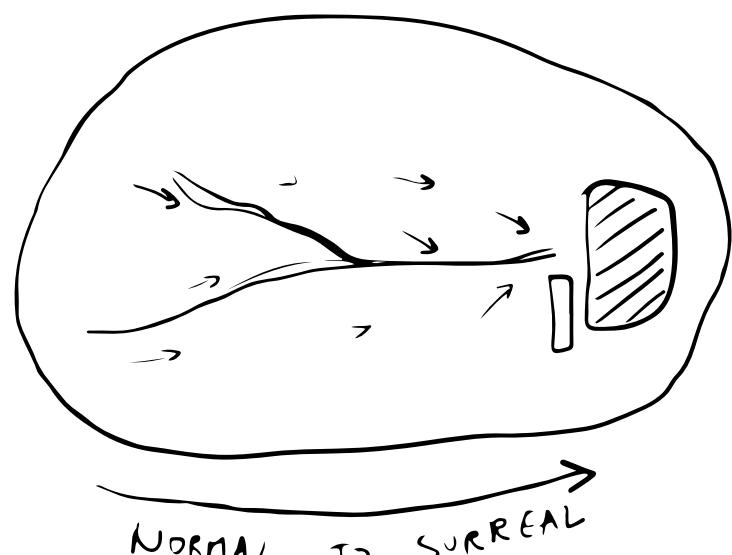




Short frame by frame storyboard showing the approach toward the studio



ENTRY SCENE



Landing Space

The Landing Space wasn't a part of the original demarcation of zones, but as the overall narrative is equally important, the first scene is important to set a context for the experience. The Greenhouse is set up to be a place that serves as a platform for the partners to work on something new, something experimental, and completely different from their main practice. **The partners aim to give this space an almost surreal nature**, where collaborations are born from the strangest of individuals. This had to be communicated in the space.

The studio is in the middle of a forested hillock, and this is one aspect of the studio that the partners are very fond of. So the inherent closeness to nature was a detail that had to be emphasised upon in the space. The journey map to the studio reflects this. This space takes the viewer from a normal space to one entrenched in absurdity. **The gradation of normality to surrealistic shows the user that they are entering a space which is not normal, and they should expect anything.** It serves as an introduction to the studio, and what it stands for.

The first draft of the scene wasn't to the liking of the partners. Although it was a good start at creating a scene, because after all, I was learning while making, it had to improve. The journey was coming through,

and it was a comfortable scene to walk around in, but it wasn't interesting. This was partly due to the fact that **the space was too big, and there weren't enough elements to fill the space**, which made the scene feel empty. This was something that was difficult to get around. In VR, everything has to be built, from the biggest assets to the smallest pebble on the ground. Constructing all these details takes time and plenty of effort.

Simply building out the spaces isn't enough in this case. Although it is very important to flesh out the space by placing elements and blocking out areas, that is just half the work done. Lighting, movement, animation, and further technicalities such as shaders, and camera settings need to be configured to create a VR scene. These are the elements that will make the elements work in Virtual Reality.

The feedback on this scene was that I would have to work a lot harder to build in the elements of surrealism and keep the 'art filter' in mind while creating. **The aim is to explore VR and its capabilities as much as possible while creating the scene.** Keeping this in mind, I set about creating the next draft of the Landing Scene.



Images from the first draft scene





Build Process

The second space I built for the Landing Space was more to the liking for the partners. This time around, I used a smaller area, packed it densely with elements, and started **using environmental effects from the beginning to give an additional element of realism that tied the scene together**. So from the very outset of building the scene, I was able to see how the environmental elements affected the scene, and hence the experience. Building the scene takes quite some time, as I have to constantly check the scene with a VR headset to ensure that the elements work together as desired and that nothing untoward happens. For example, I initially felt a little motion sick as I traversed the scene, but some changes to the speed of the movement, and height adjustment cured that particular sensation.

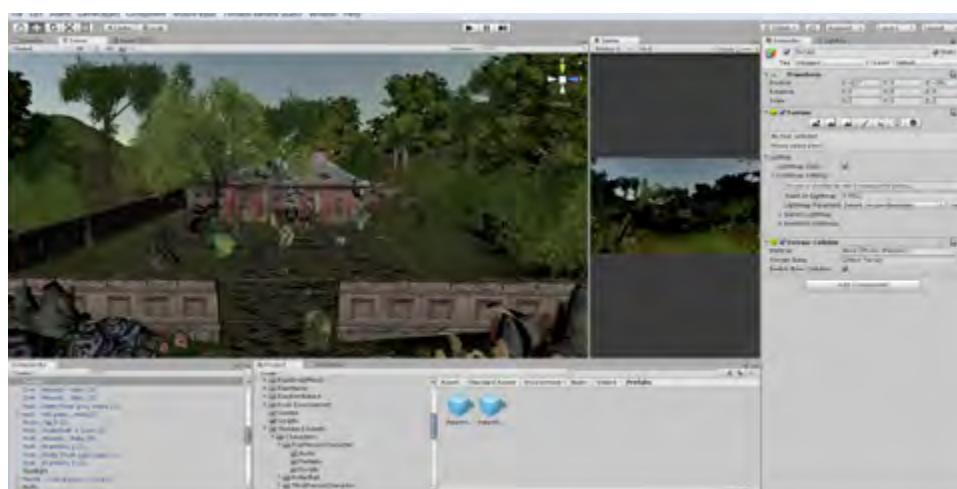
I beta tested the scene with the visitors of the studio to get feedback and understand if the scene was safe to view, from a VR standpoint. **Safe scenes in VR are those which do not cause any discomfort to the viewer**. This is the one issue I had to constantly battle with as I added more and more elements. There were many elements and features I had to discard as they made the viewer feel unstable and dizzy. One direction that was quickly abandoned was using layers of water to shroud the destination, the studio. These water walls were very useful as they only showed the

silhouette of the studio from a distance, and the ever changing reflections were surreal, to say the least. Although it looked great on the screen, it was very uncomfortable to look at through the VR headset. We had to remove this element as it made the viewer feel unwell.

Technicalities aside, this second draft was a much more complete scene, as it was **much more successful at establishing suspension of disbelief**. To show the transformation from normal to surreal, I transitioned the nature in the scene from reality to downright strange and alien. The change in scenery gives the viewer a subtle hint about the change in atmosphere as they move through the space.

To guide the viewer through this space, a **single path was used, so that the user can only walk in one direction, which is toward the studio at the end of the journey**. Although this does limit the freedom the viewer has, the amount of detail built into the surroundings, and the shrouded studio at the end of the path makes the viewer want to walk in one direction, that is towards the end of the path.

The elements used were either photogrammetried or taken from the existing stock of assets from the Quicksand GamesLab.



3.12.1.1 GREENHOUSE SPACES

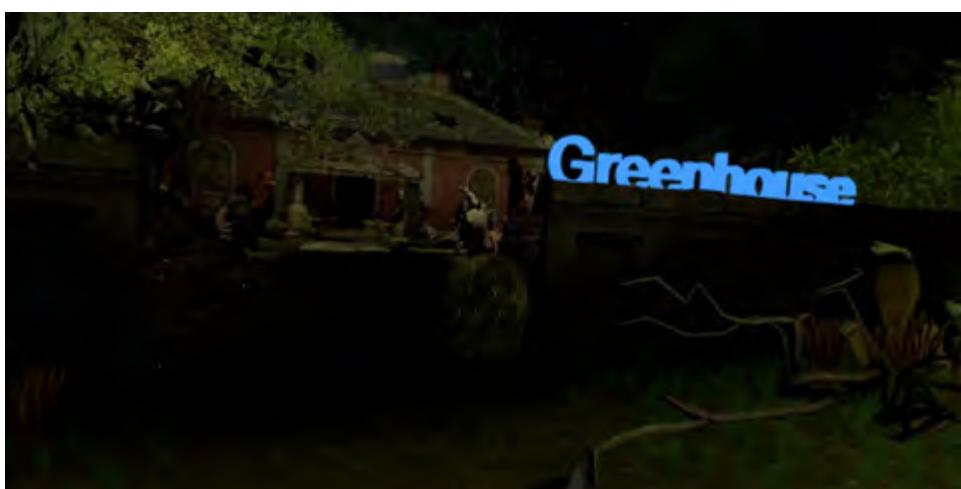


GREENHOUSE v3.0

Landing Scene Walkthrough

Images showing the viewer journey through the space







Landing Space Build

The Landing Space serves the purpose of **introducing the viewers to the studio, and what it stands for**. Akin to an orientation, it communicates to the viewer that the studio is a place where strange occurrences take place, and not to expect the ordinary.

The scene starts off with the viewer in a forest. It's raining, and the glowing angels along the path guide them toward the studio. Initially, it's quite dark, and with the rain, it's difficult to make out what is happening. As the viewer walks in the direction of the studio, they see well lit area ahead of them. As they approach it, a clearing appears. On entering the well lit clearing, the viewers will start to notice the change in foliage. The subtle change from normal nature that we know exists in our reality to an alien one that is quite bizarre and unsettling.

Soft Goan jazz music starts playing, and gently gets louder the viewer walk towards the end of the path where they can see a building with a neon sign outside that reads "Greenhouse". A glowing red giant squid falls out of the sky in slow motion above the studio, with its arms flailing ever so slowly. The atmosphere gets ever more bizarre as the viewer starts seeing strange things as they get ever closer to the studio.

Images from different points in the final build

When the viewer walks inside the studio compound, the building itself comes into view, flanked by oversized objects on all sides. A large seashell, a clay figure, pestle, and a clay monkey appear to be guarding the studio, which itself is resplendent in its coat of pink paint. The studio seems to be fraying at the edges, its structure disappearing into cracks and bubbles at the edges. As the viewer enters the porch and into the studio, the ambient lights in the background start flashing, and they are transported to the next scene.

The objects that the viewer sees around the studio will also be seen in the other scenes, so **these objects are a precursor, a taste of what they will be seeing next**. We wanted to implement a voiceover as a guide that leads the viewer to the studio and explains the objective and ethos of the studio. But due to the lack of time, we weren't able to do so. This is the one element that would have tied the whole experience together.

As it stands, **this scene serves as an introduction to the studio, marking the change from reality to surrealism**. An orientation for the viewers to change what they think they should expect from the studio.

When the scene appears into focus, the viewer finds themselves in a forest, in the middle of a rainshower. It's windy, and there's a glowing angel by the side of the path, pointing forwards. A sign appears, with an instruction that simply says, "Make your way to the studio."

As you walk in the general direction of the way the angel is pointing toward, you see a glimmer of light up ahead. A few more angels appear, encouraging you to walk towards the light. As you approach the well lit area, you start to notice the foliage has started to mutate. The normal forest has given way to some truly bizarre creations. You can faintly hear some Goan jazz music, that gently gets louder as you walk ahead. Through the mist you see a building up ahead, surrounded by walls. A neon blue sign reads, "Greenhouse". Above the studio, a giant red squid hovers, seemingly falling out of the sky in slow motion.

The scenery get ever more bizarre as you continue to walk toward the studio. As you get to the studio entrance, you see a pink Goan villa flanked by a strange collection of distinctly Goan objects. Strangely lifelike, they resemble everyday craft objects. You walk forward to the entrance of the studio, and look around to see the studio compound, which has strange flora floating around, with no regard for the rules of gravity. The squid meanwhile, has fallen below the treeline, it's flailing tentacles just visible over the branches.

You enter the studio, and darkness envelopes, and you find yourself in the next scene.

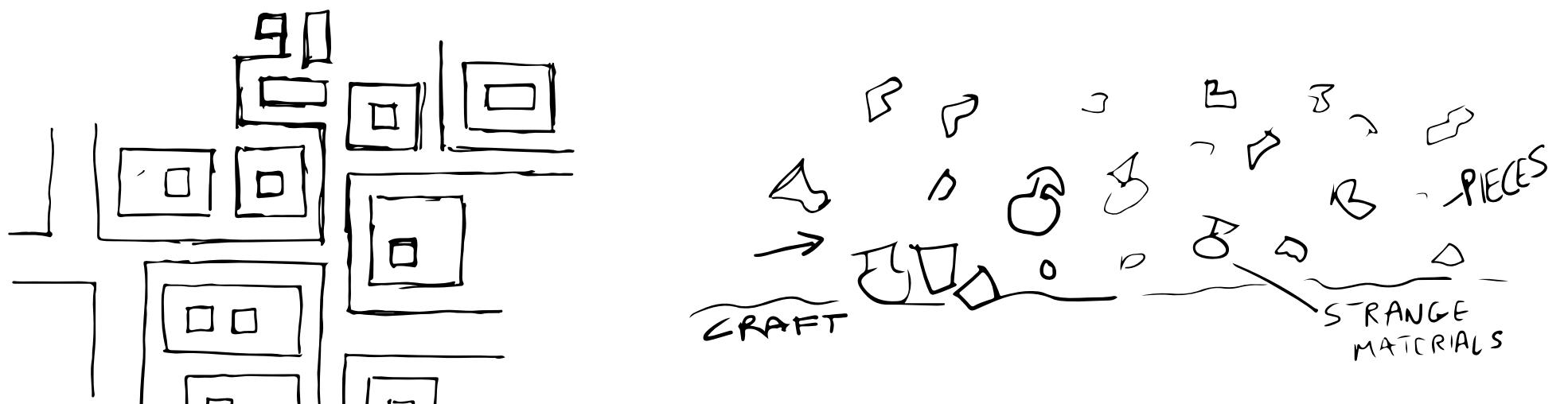








POTENTIAL OF CRAFT



Craft Space

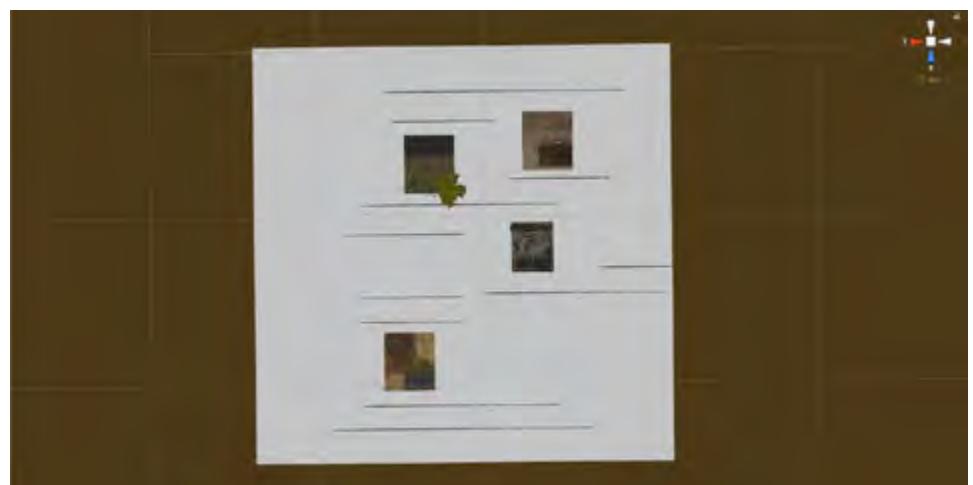
The Future of Craft is one of the two streams of which the Greenhouse intends to work on. When the project first started, I was given the task of mapping out the crafts of Goa and tracking down the craftspeople. **A two week exploration of North and South Goa, revealed the few crafts that were still active and practising in the region.** We got in touch with a few of these craftsmen and designed a few products with them. The plan is to continue to work with craftsmen and develop experimental products by collaborating with other craftsmen and artists.

To show the crafts we had explored, and the plan forward for the Future of Craft, we wanted to build a space that showcased our intent toward working closely with craft. This space also had the same instructions as the others, design with a serious 'art filter'.

While sketching out the spaces, **one of the major themes that kept occurring in my sketches was that of a maze.** The difficulties in finding the crafts and the craftspeople contributed to this feeling of confusion and helplessness. We ran into a lot of dead ends, followed trails till they went cold, and encountered the situations where entire villages had disappeared.

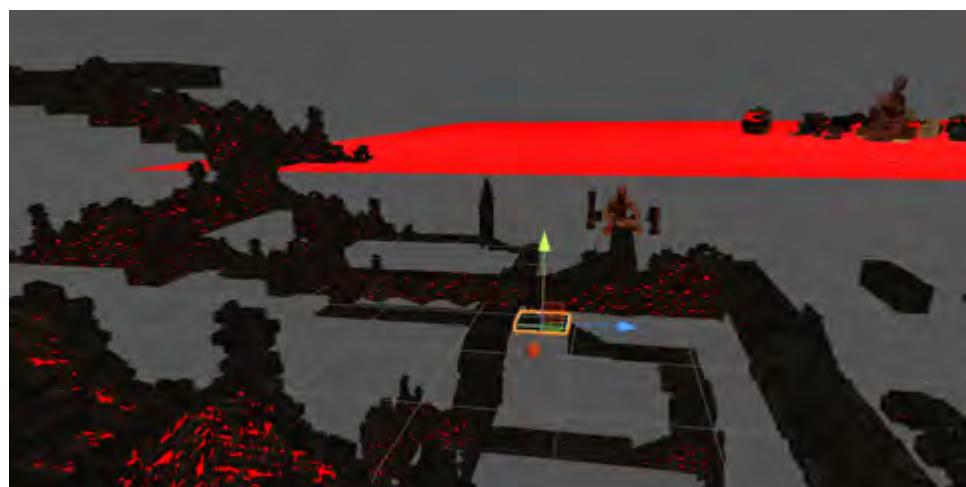
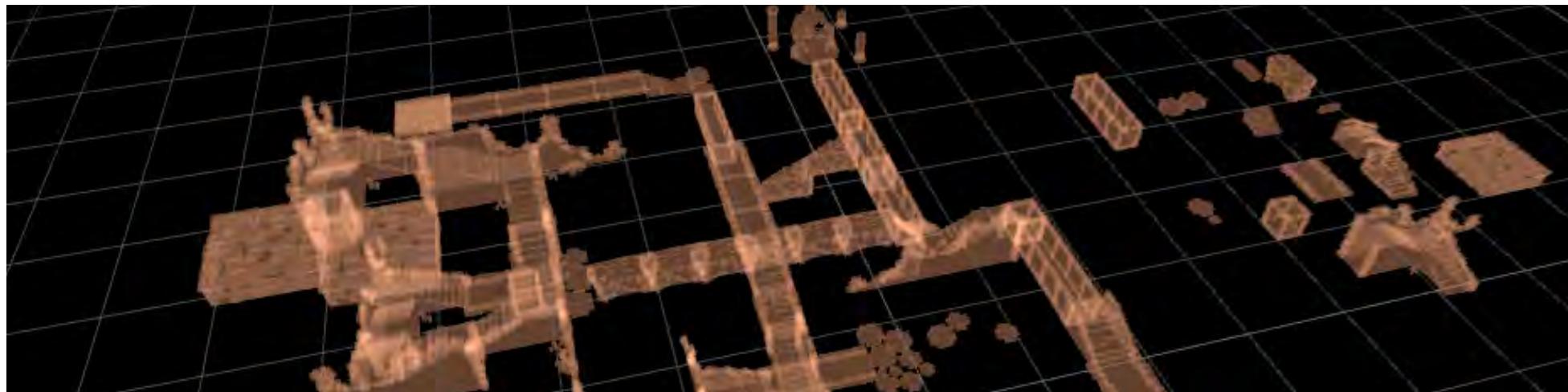
The first few spatial explorations reflected that feeling, as I built mazes, with the locations of the crafts hidden within. The journey map was to make it difficult to find anything of value until you find the craftspeople and their place of work. Developing this scene also helped me understand the importance of limiting the amount of light in the scene, and using darkness to guide the viewer through the desired path.

The idea of the maze was definitely something that appealed to the studio, but the execution of it wasn't compelling and did no justice to the medium of VR. The qualities of the maze had to be integrated into the space in a more exciting manner, and a structure was needed to guide the user through the space. As exciting as a maze is, it could leave the viewer frustrated, and lead to them missing out on many of the experiences hidden within. This negative aspect of the maze had to be fixed so that viewers could enjoy the challenge of the maze, but still see all the sights in the narrative.



Images from the first draft scene





Build Process

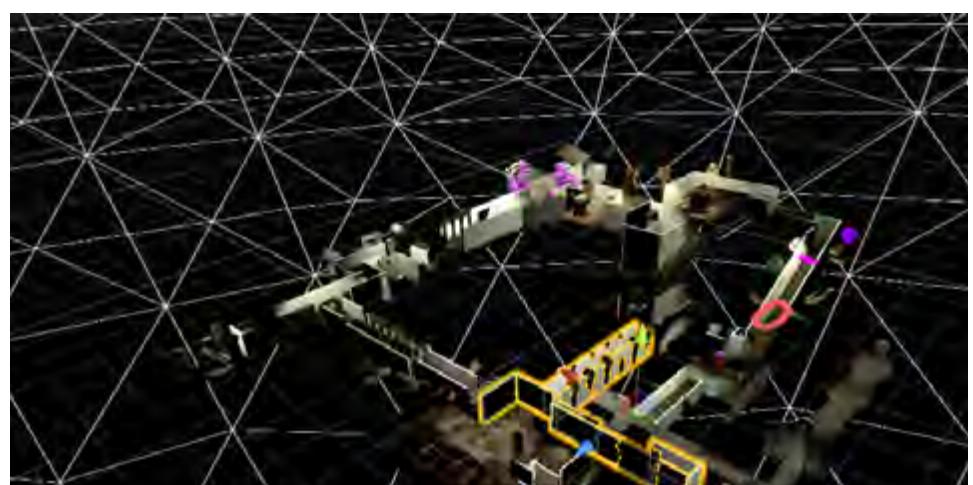
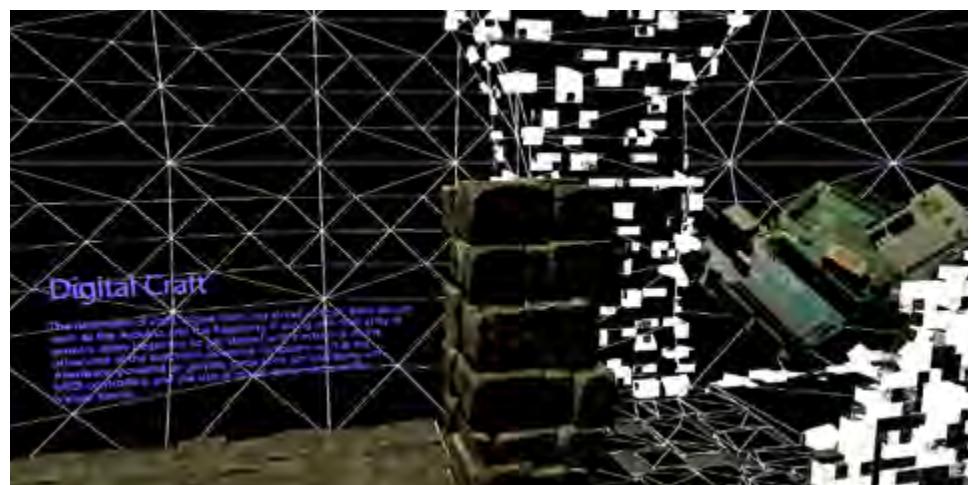
I went back to the drawing board to create a maze like world, with a more compelling narrative, both within the story of craft and visually. The idea of the maze was still very attractive as it communicated the difficulty in finding crafts of Goa. I had to find a way of integrating the concept of a maze within the design for the space.

Goa has many forts scattered along the beaches and inland. Some of these forts are small and have very simple paths that run through them. A few of these forts, such as the Reis Magos Fort, are much bigger and have intricate, crisscrossing paths within them. **This inspired me to create a de-constructed fort in space, which would serve as the main route for the viewers to walk through.** The fort felt inherently Goan and was an exciting map to traverse. The crafts were strategically placed along the path, and although the viewer has the freedom of choice to select the path they wish to take, all paths are connected, akin to a Moebius strip. So no matter which route the viewer wishes to take, they will eventually end up seeing everything on the map.

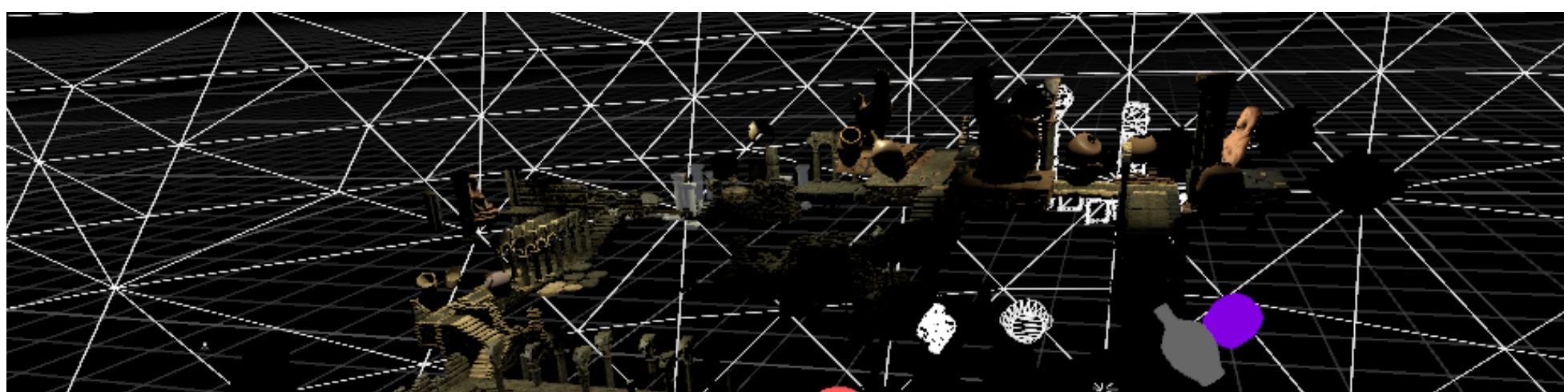
The information about the crafts and their objects are placed in their own exclusive zones. To demarcate those zones, I switched out the materials of the fort in the preceding and proceeding areas

with the material of the respective craft. **This twisting of reality is possible in VR, and I wanted to take advantage of that fact.** The paths take the viewer through low arches, stairs, and narrow corridors. The architecture presented an interesting opportunity to make the experience feel real and immersive. By adjusting the height of the camera, and the size of the architectural elements, I made it so that, if the viewer had to pass through certain areas, they would have to duck or step aside to be able to walk through. Although this was an interesting interaction, and it certainly helped with the suspension of disbelief, it did lead to motion sickness for some viewers, so in the end, we decided not to drop this idea.

To prevent the viewers from falling off the ledge and into space, I had to place invisible walls on every edge. **These invisible walls, also known as colliders, stop the viewer from falling off by using Unity's inbuilt physics engine laws.** On falling off the ledge, the viewers often felt as if they had actually jumped off, akin to what it feels like to fall in a dream. Interestingly some viewers loved the sensation of falling off during testing, as they could see the entire fort from below as they fell. But as the majority viewers felt uncomfortable, I had to work meticulously to ensure that no one falls over the edge. **This is where beta testing feedback was very important.**



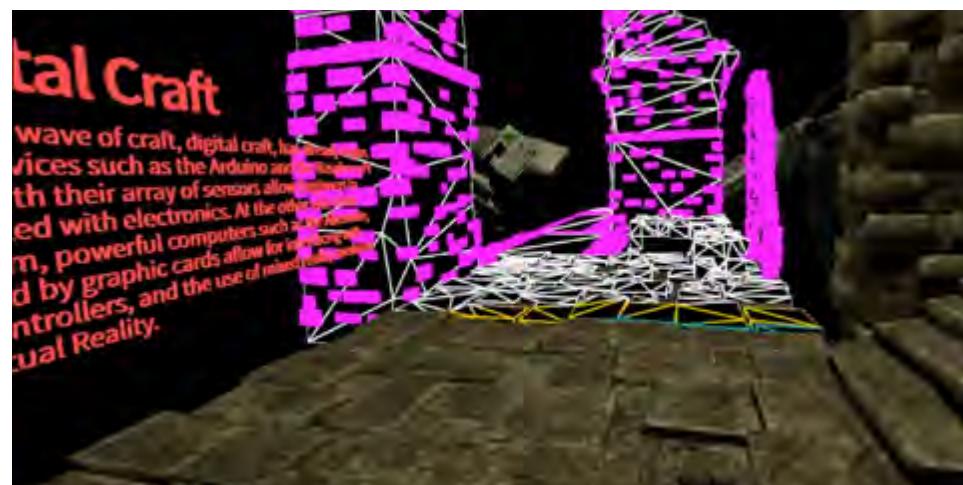
Images showing the progress of the build at different stages



Craft Space Walkthrough

Images showing the viewer journey through the space







Craft Space Build

After the viewer enters the studio through the porch, and the lights start flashing, they are transported to the next scene, the Craft Space. They find themselves on a narrow platform, with drop-offs into infinite space on both sides. Ahead of them is an archway and behind them a door with an exit sign. A text-box ahead explains what this scene is about, and how to explore it. The better method would be to communicate the same via a voiceover, but due to the lack of time, we weren't able to write, record, and master the audio to include it into the scene.

As the viewer walks ahead, they see multiple paths opening in front of them. Above, below, and around them, they can see strange objects floating around.

The paths of the de-constructed castle, as clearly visible they are, still induce a feeling of the unknown. Depending on which path they take, they will encounter any of three different crafts first. As they approach each zone, the environment around that area mutates into the material of that particular craft. For now, a text-box explains the craft, and the potential the studio sees in it, but a voiceover would be a better way to communicate the same.

The objects, either photogrammetried, or traditionally modelled on 3D software, are floating and rotating about, on display for the viewer. I wrote a script which makes the objects do this action, and this was my first

try at coding in C# for Unity. The script uses a simple function which uses a rotate function to tell the object to rotate around the Y-axis, and then employ a Sin wave to float up and down.

```
transform.Rotate(new Vector3(0f, Time.deltaTime *  
degreesPerSecond, 0f), Space.World);  
  
tempPos = posOffset;  
  
tempPos.y += Mathf.Sin(Time.fixedTime * Mathf.PI *  
frequency) * amplitude;  
  
transform.position = tempPos;
```

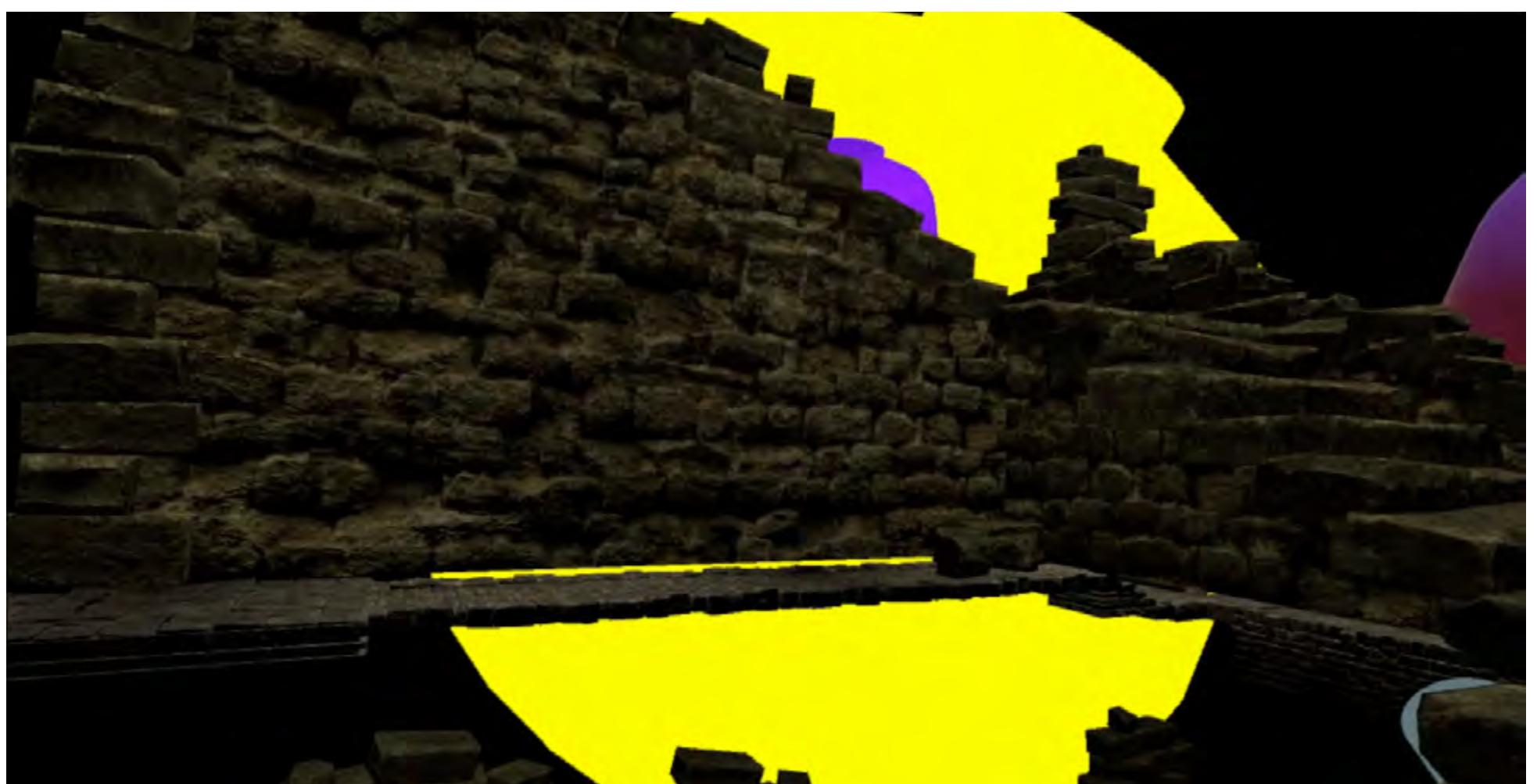
It's not easy to create the same functionality using the abstracted Unity menu system, hence writing custom scripts allows for far more customised actions that can be easily applied to any object. I wrote a few more scripts for this scene, that allows for computationally efficient actions to be applied to objects.

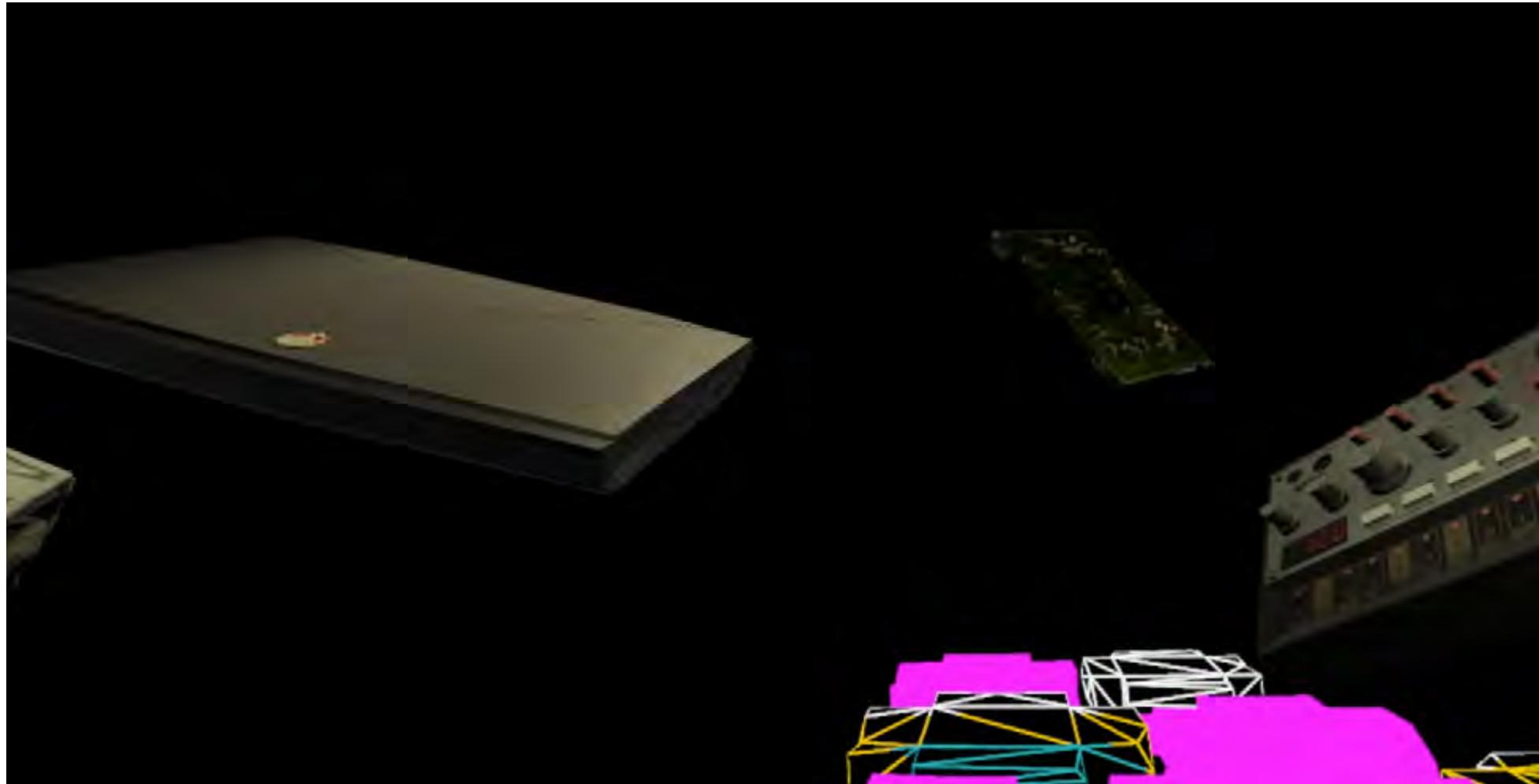
This scene is meant to show the viewer the craft research done at the studio and the potential projects that can be worked on. One section of the scene covers the conceptual products that could be formed from the collaboration between traditional crafts, or by the introduction of newer age materials.

The configuration of the space reflects the difficulty the studio faced in finding these crafts, and the excitement in doing so.

Images from different points in the final build



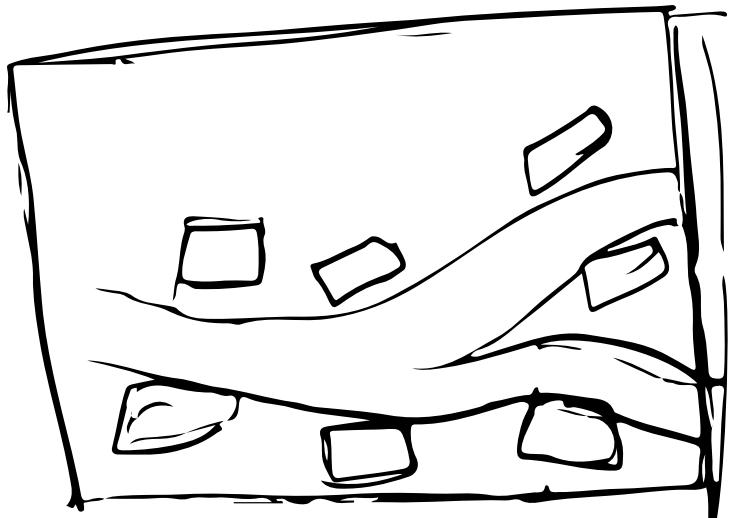






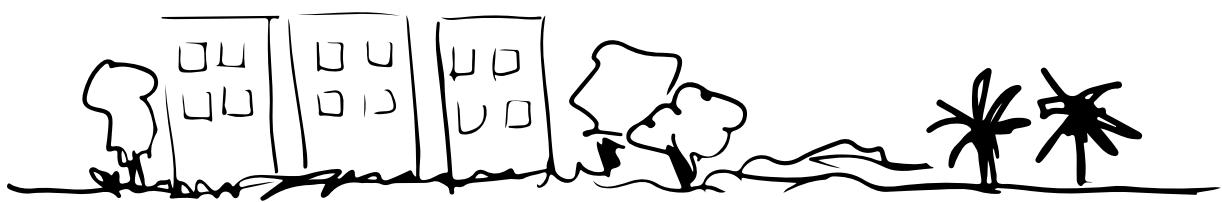


- House (Heritage)
- Stacked Houses
- Future RUINS
- Mechs
- Craft Object]
- House amalgamations
- Normal nature
- Bloody sky?
- Strange Movements
-



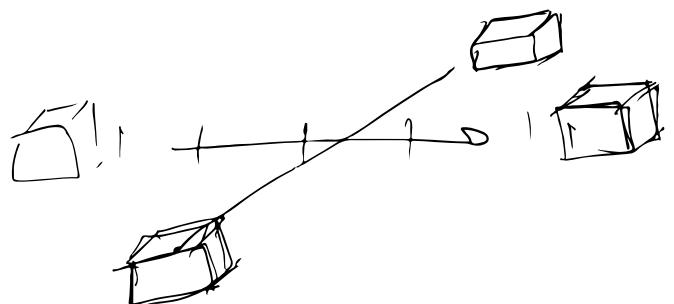
explore multiple futures
—dystopian → — Utopian

FUTURE RUINS - HERITAGE FUTURES



AMALGAMATION - BUILDING

Sketches exploring different concepts of Future of Cities



Futures Space

The Futures Space showcases the work done at the Greenhouse on the Future of Cities wing. Both, The Busride and Quicksand have been working on their own projects exploring the Future of Cities.

The Busride has been working on the Bandra Project, an urban design project which involves experiments in the suburb of Bandra in Mumbai. They have also started work on a new venture called the Futures Labs, for which they held their first workshop titled Futures Lab: Chapter 01: Conservation, in which various well-known experts in their field of conservation were invited to share their thoughts and processes.

Quicksand has been looking at the topic through projects such as MechBelief which explores a culture or a place with mechs, or Mechas, which are robots or machines controlled by people. Mechas are typically depicted as "walker" types robots. These mechs are designed with the context of the culture, hence exploring the items

and artefacts of that place. MechBelief is a design workshop focused on creating mechanical robots, automatons, characters and worlds around Indian culture either by the lens of lived experiences or historical and cultural contexts. Mechbelief aims to create concept art and illustrations for mechs, automatons, characters and worlds that are make believe but are grounded in the reality of the Indian culture and heritage. The concepts can speak of the past, present, future or an imaginary time frame.

A prototype of this space was made for the Futures Lab workshop, where I simply created what was essentially a showcase for the Photogrammetried objects. But that served as an interesting start to this space, as we liked the look and feel of that prototype. **The directive for this space was to create something that was set in reality, but had elements of something very deeply, yet subtly wrong**. As ever, the 'art filter' had to be switched on while designing.

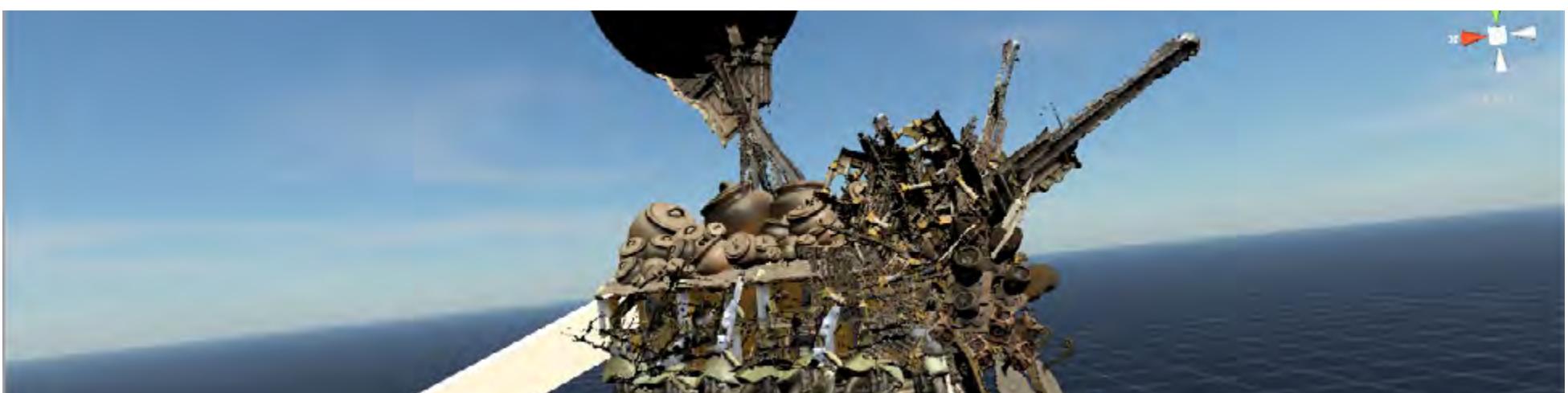
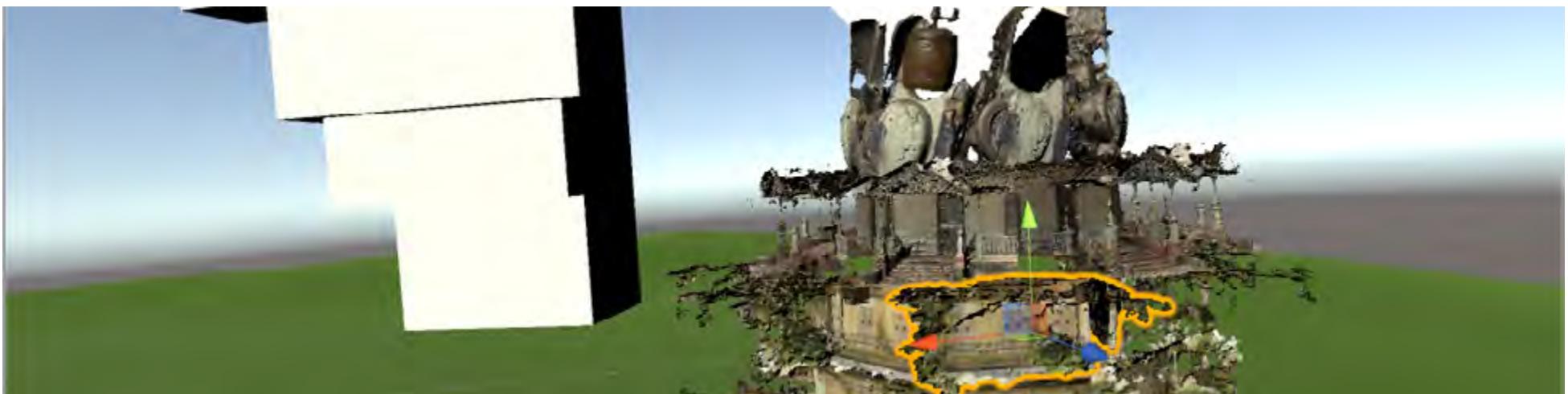


Images from the first draft scene-Futures Lab Prototype



SUBTLY
WRONG





Build Process

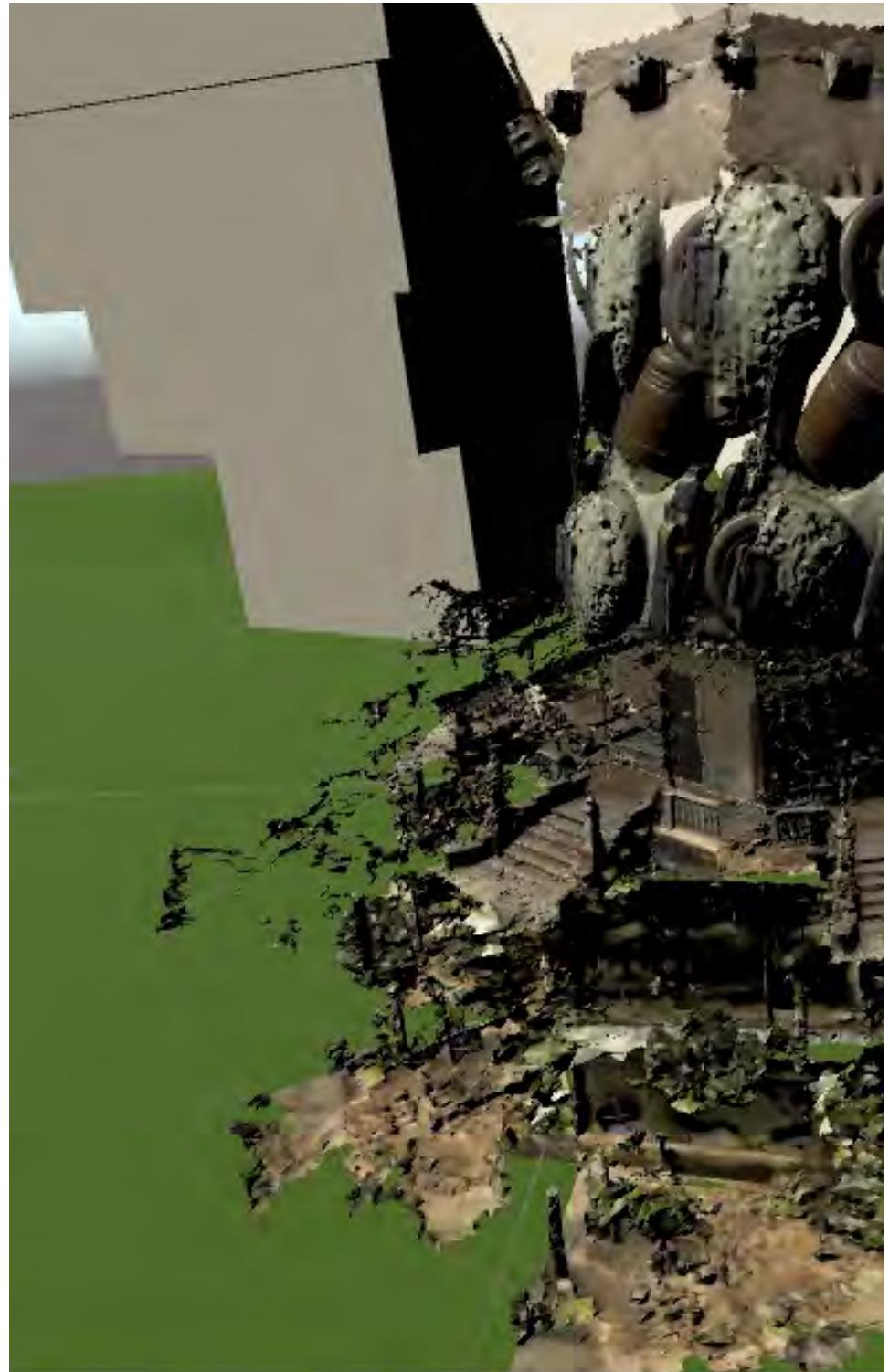
There wasn't much time left to complete this scene, but I attempted to create something which would serve as a base for future development. This scene is based on our reality but has elements to unnerve the viewer, to let them know that something is very slightly wrong. This is exactly what the studio believes our cities will feel like in the future. **There won't be sweeping changes like the ones popularised in the media, but rather, it's the smaller things that we take for granted that will be most affected.** This is the feeling, the experience, that we want the viewers to feel.

One of the biggest elements in the space is **the mech structure in the scene, which will serve as a focal point in the space**, drawing the viewers toward it. The mech structure is a reference to the MechBelief workshops hosted by Quicksand, and is built using Goan elements. Building the mech structure was quite a challenge as I had never before even drawn a mech, let alone build one in 3D using detailed photogrammetried elements. Building this mech was a complex task, and took me some time to do so. Each part of the mech was built using elements photogrammetried from traditional Goan objects. Finding these objects was a challenge in itself, and so was cleaning up the 3D assets in Cinema4D to get them ready to assemble a mech in Unity.

Building a mecha isn't as simple as putting a whole lot of elements together in a vaguely human-like form. It has its own design process in giving the mecha functionality and using parts in context. In the interests of time, I had to bypass many steps of that process and instead simply concentrate on using the parts correctly in the right places to give the appearance of function. Hence I used lots of mechanical parts in the areas where the functionality of mecha is of importance.

First, I **blocked out the profile of the mech using cubes and then started fleshing out the form with the parts** directly. The areas around the joints and moving parts were built first, and then the surrounding areas were detailed out. Architectural elements were used in the main body parts alongside craft objects. Goa's proximity to nature also makes itself felt in the mech, as one of its hands disappears in a rich patch of greenery.

The journey map through the scene takes the viewer through the work done by Futures Lab along a choice based path system. The viewer has the choice to take any path they wish to, but the looming, oversized mech in the background has a magnetic effect that draws the viewers to it, hence setting a direction to the overall scene.



Images showing the progress of the build at different stages



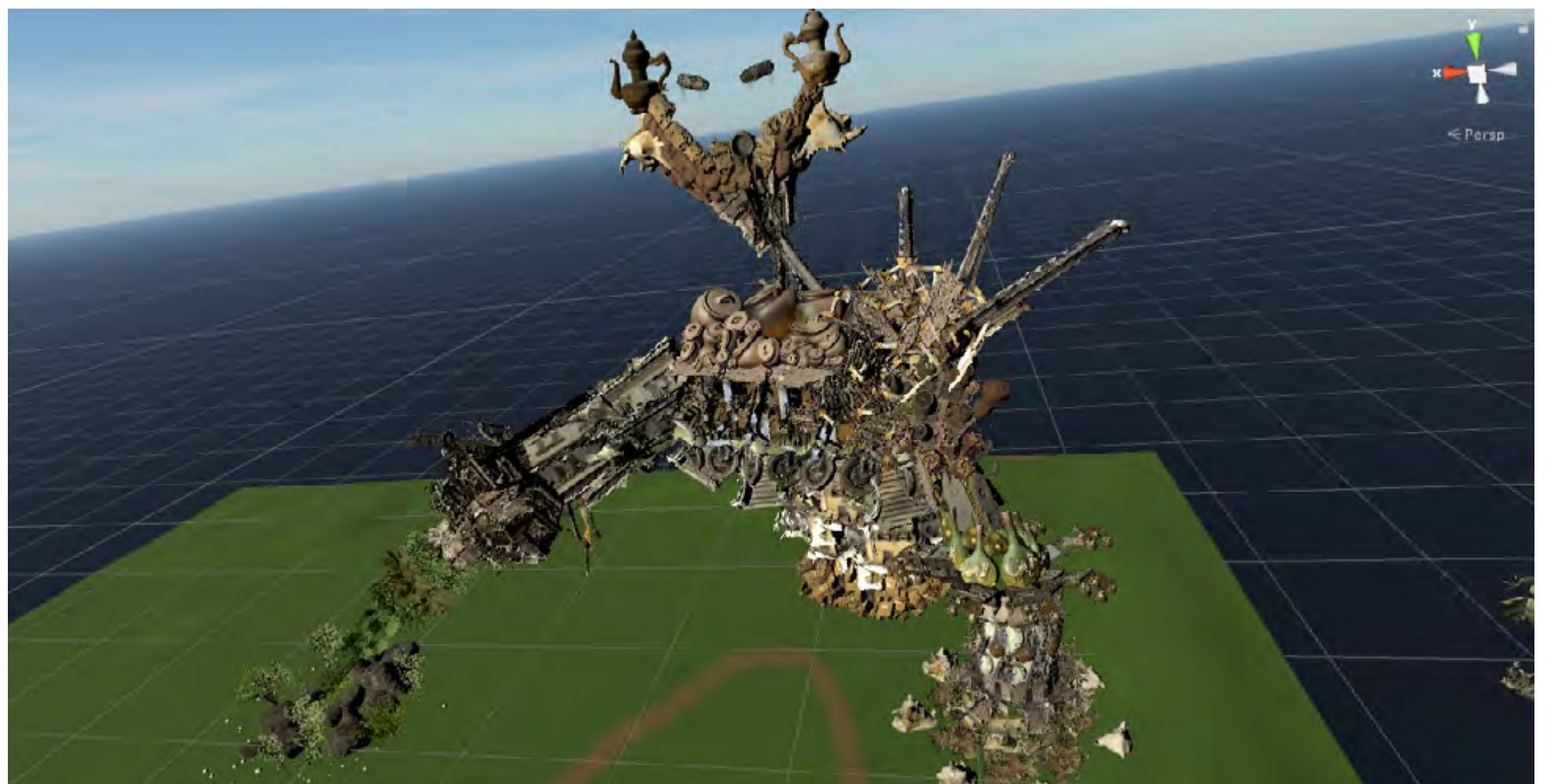
Futures Space Walkthrough

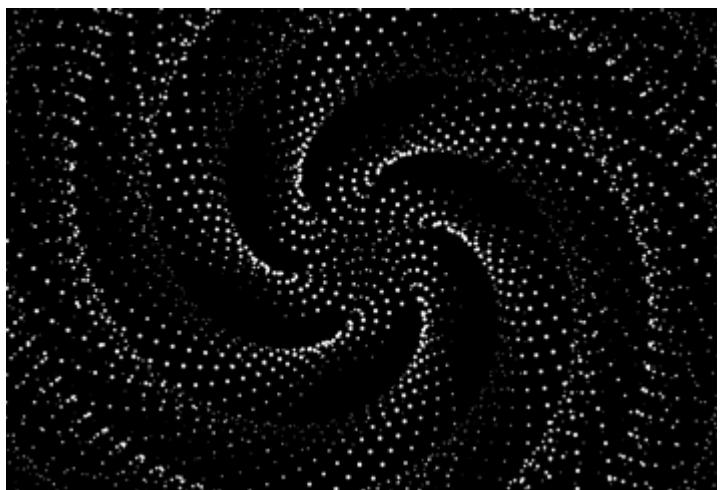
Images showing the viewer journey through the space



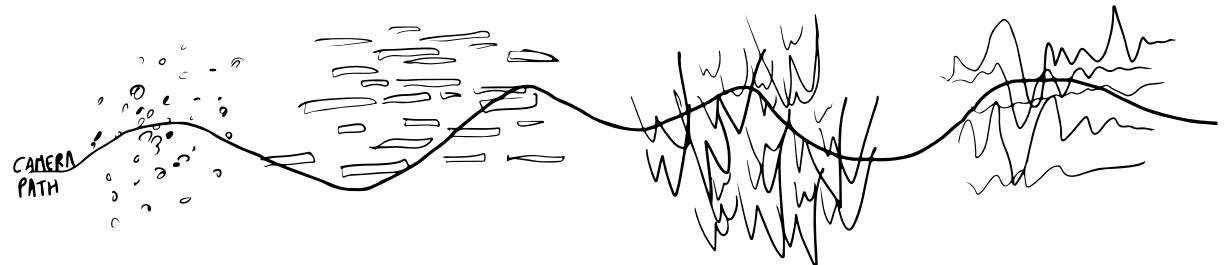
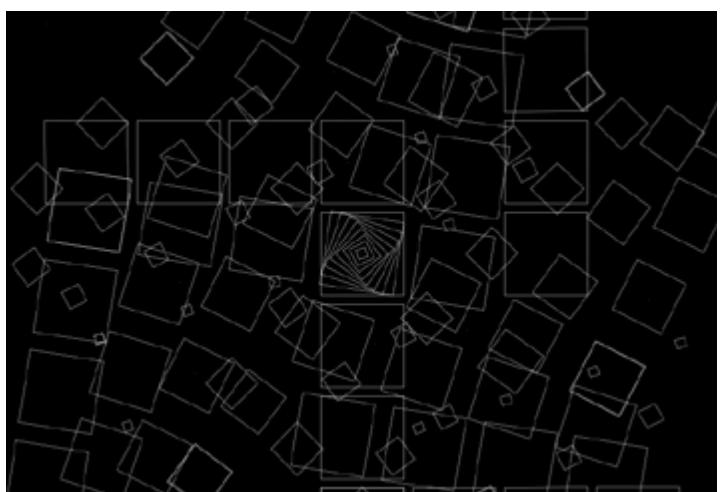
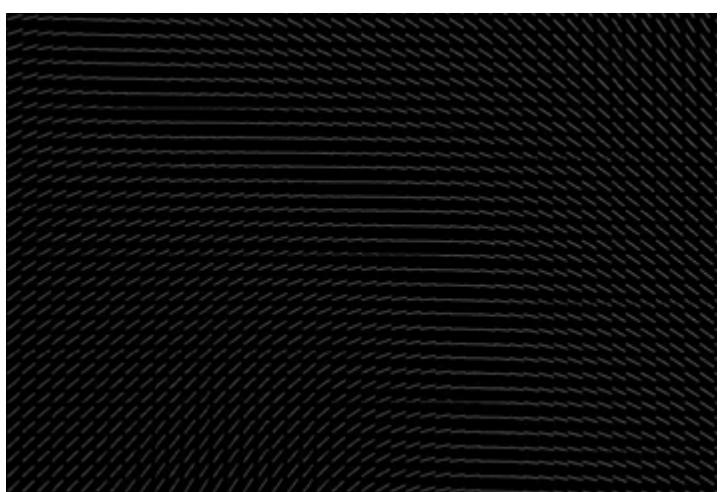
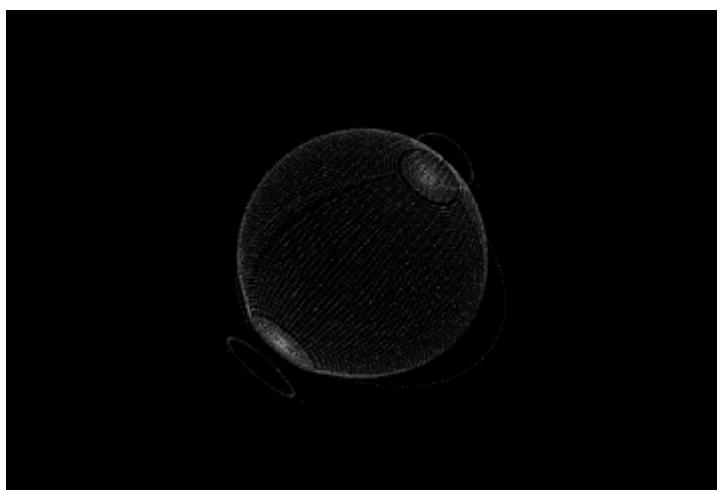


is a design workshop focused on creating mechanical robots, automatons, characters and worlds around Indian culture either by the lens of lived experiences or historical and cultural contexts.

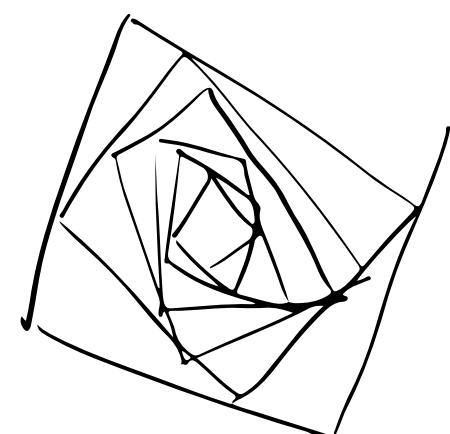
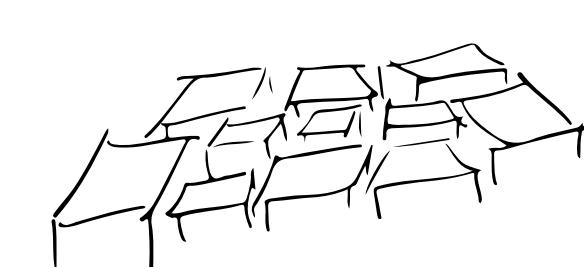
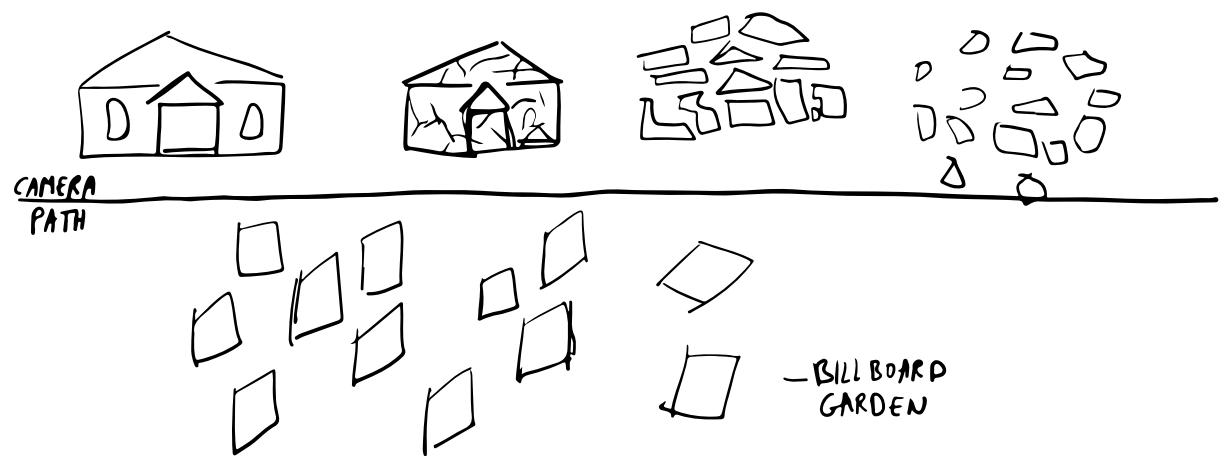




Digital Arts



Sketches showing the path of the viewer through the scene



Frames taken from various Processing sketches developed as visuals for the music performances

Arts Space

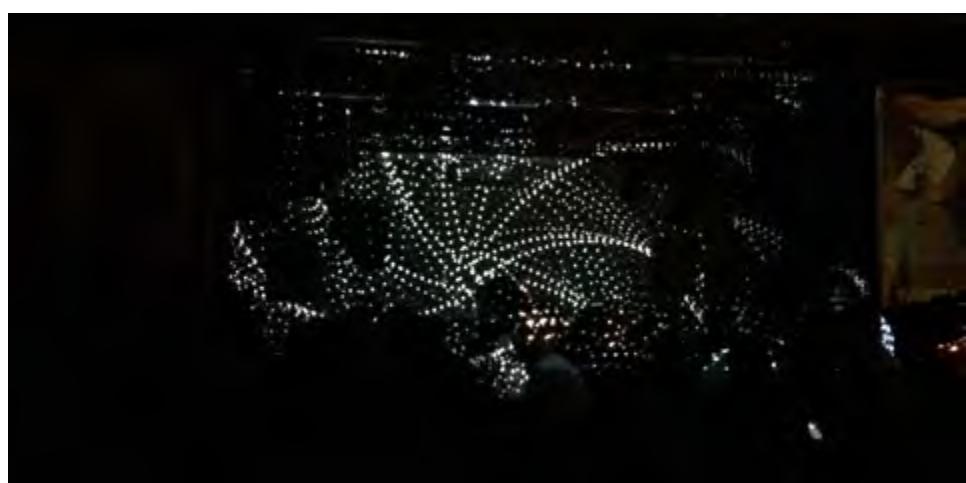
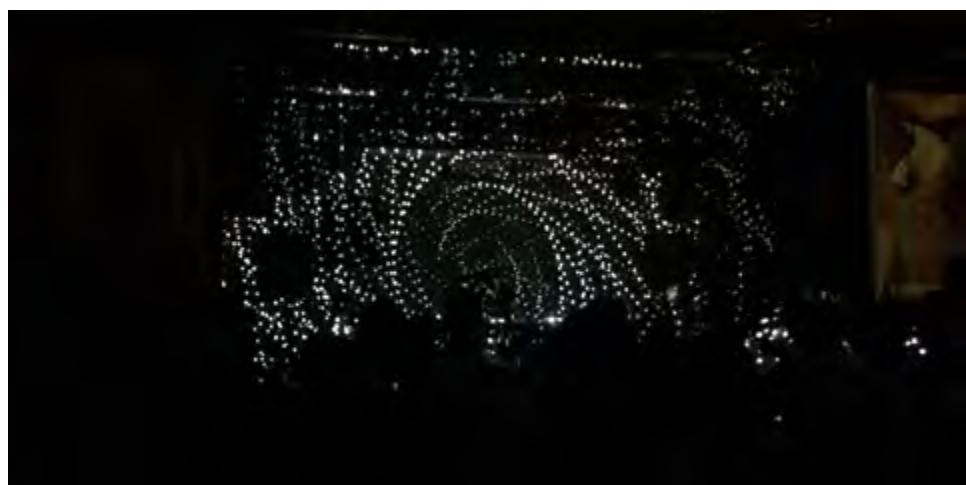
Apart from the serious aims of research and interventions in the Future of Cities, and Future of Craft, the Greenhouse also serves as a space to explore new forms of art and new media experimentation. **Every member of the studio is encouraged to pursue something they're passionate about, and for me, that is using code to create visuals.**

During the EyeMyth festival, I was encouraged to create visuals to play in the background during the music events which were part of the festival. Avinash, formerly the visuals component of the successful audio-visual band called BLOT!, encouraged me to give it a shot. **During the performance of the music producers Spryk and FILM, my visuals were used in the backdrop.** I had never before seen my work used in a setting like this, and it was stunning to see it in a such an immersive experience. This small taster of producing visuals for a music performance was quite exciting.

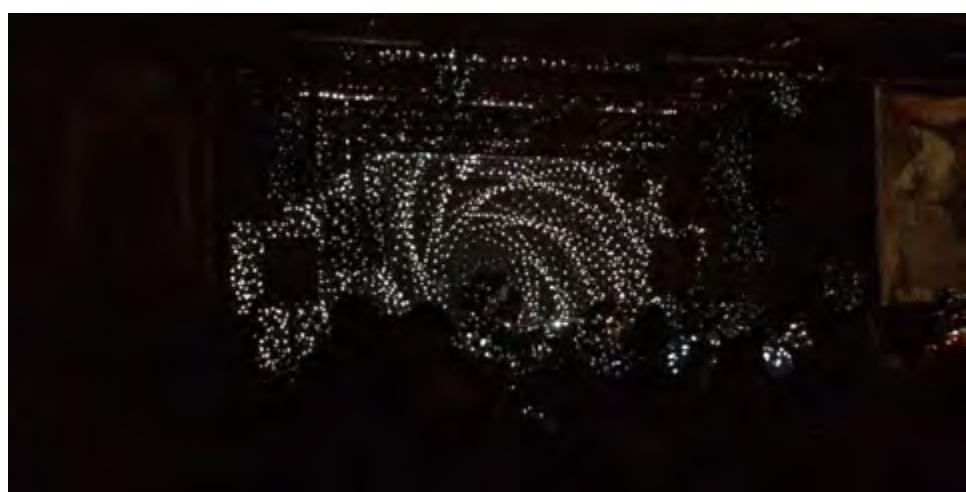
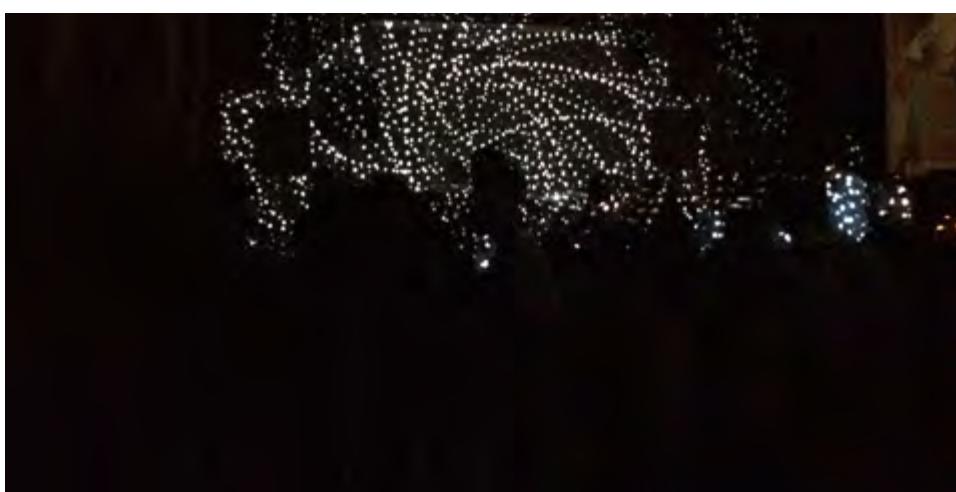
Other members of the studio have been performing for some time now, and are part of Quicksand's visual collective known as Alt-Q. **VJ-ing might become a big part of the activities at the studio,** with performances lined up this till the end of 2017 in Goa, Hyderabad, and Jaipur. Intense discussions on the technicalities and visuals take place at the studio regarding the performance aspect of visual jockeying.

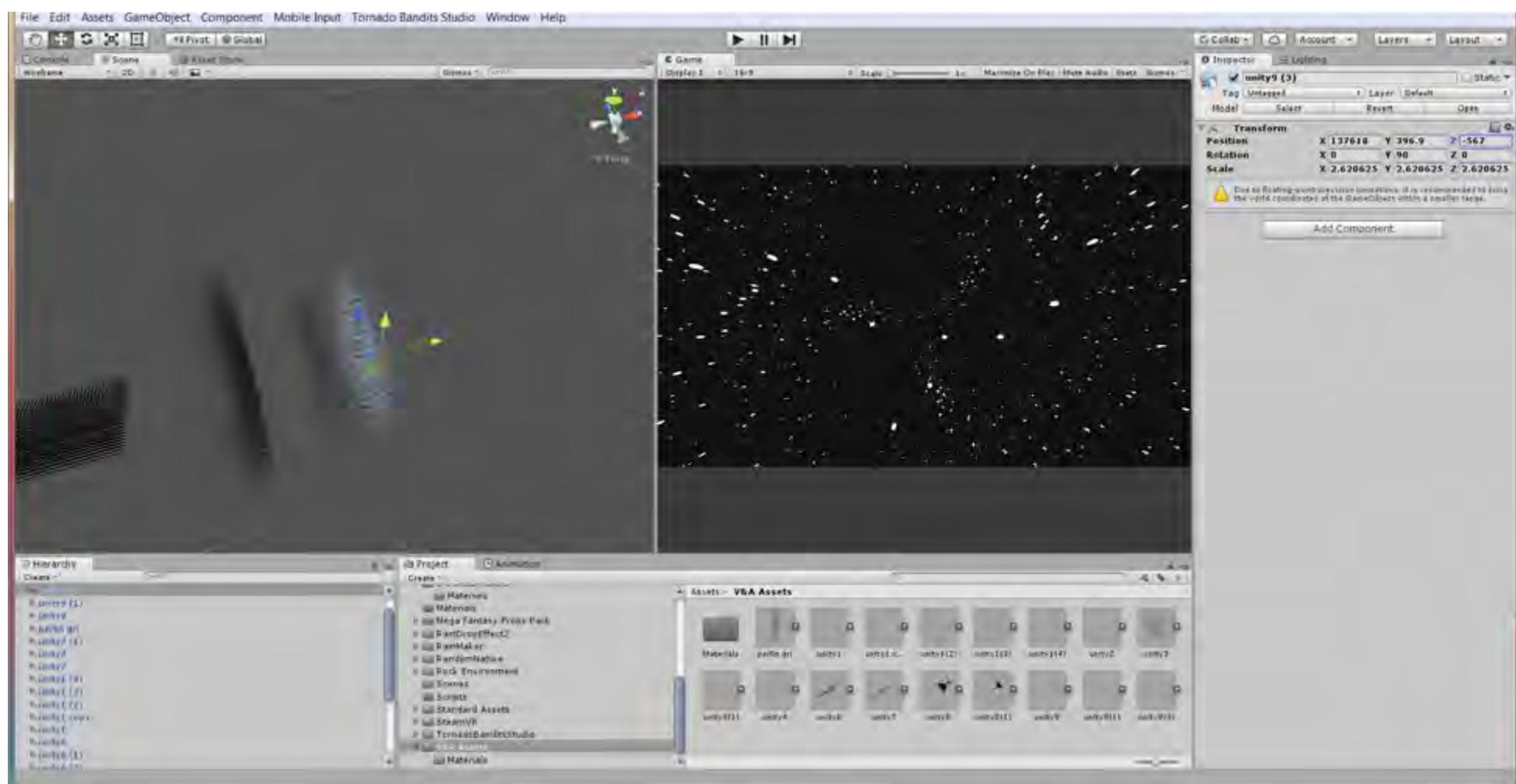
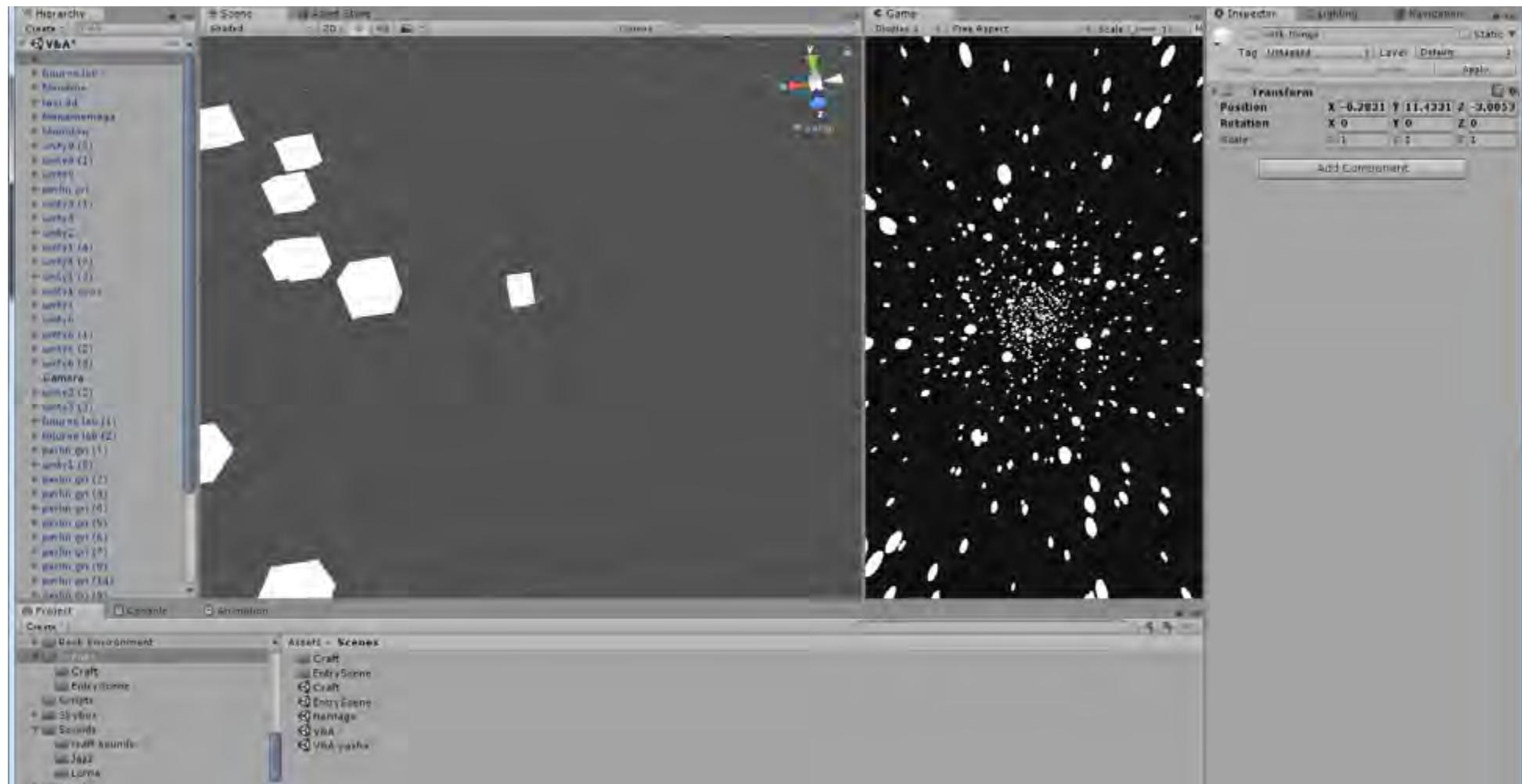
Visual Jockeying is a bit like painting live, with the projector screen being your canvas, and your visuals playing the part of paint, with the music your conductor. **The visuals have to go hand in hand with the music, to provide a cohesive and immersive experience for the viewers.** Any break in the flow and the audience will be brought back to reality, and it will be difficult for them to engage with the music again. It's a difficult tightrope to walk. The artist should be very aware of the energy in the room, and perform accordingly to mirror the emotions of the audience.

All this was in 2D, albeit through projections that filled an entire wall of the venue. **But what would it be like if this was seen in Virtual Reality? Could the immersive nature of the medium heighten the experience of music and visuals?** We wanted to explore this idea, so I set about trying to create an audio-visual experience for Virtual Reality.



Images from the performance at Anti-Social, Khar in Mumbai during the EyeMyth Festival





Build Process

The workflow for this space was unique and special. **Every single element in this space was procedurally generated using music data.** Clever camera clipping planes and the use of scale gives the viewer the impression that the visuals they see are being generated live as the music plays, but in actuality, everything has been placed in a certain manner to make it seem that way.

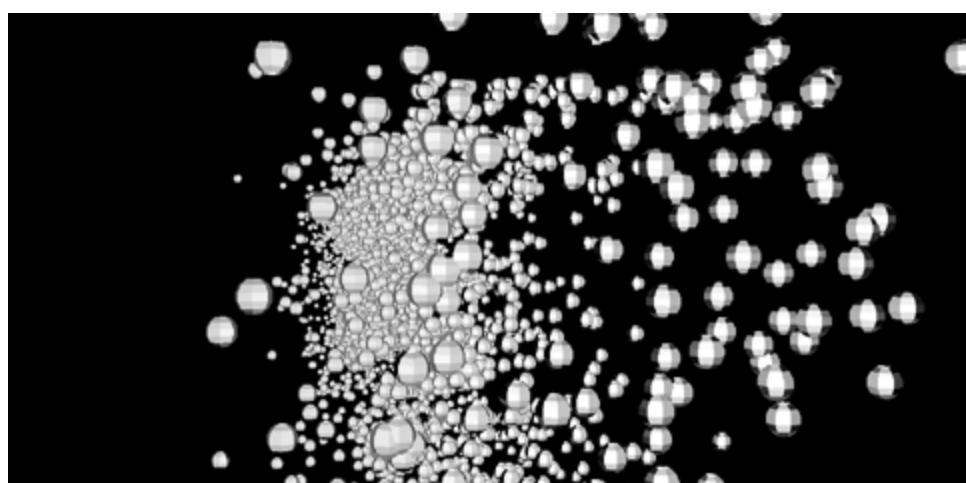
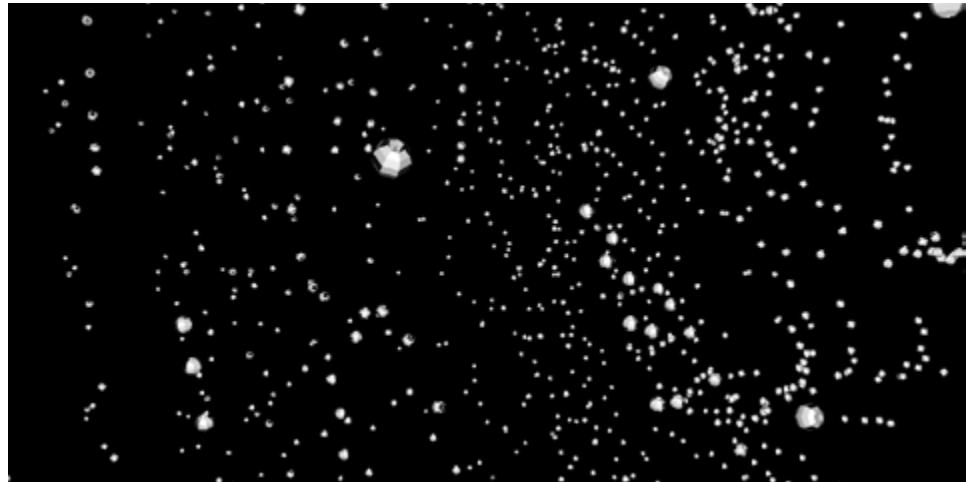
One of the best platforms for producing procedural art is an IDE called Processing. It compiles an abstracted version of Java to print visuals on to the screen. I have been coding in Processing for the last four years or so, and this prior experience was very useful when I was attempting to produce 3D generative work, which I had never tried before. Processing isn't an ideal platform to create and export 3D models, but with no other solutions readily available, I had to make the best of what I had. With not a lot of time left to create this scene, Processing was the only viable option.

Integrating music data and exporting to 3D is a computationally intensive task, but my experience in Processing meant that I was able to write efficient code that could do the job. To keep it simple, I plotted a camera path that would move in a straight line from one point to another, passing through the 3D models. This linear path required a certain type of visual aesthetic which

would accentuate the feeling of travelling in a straight line. Using Sin and Cos waves, I plotted spiral-like forms that would draw the viewer into the shape. The code below was the basic template which I tweaked and adjusted to get many different variations and forms.

```
for (int i = 0; i<fft.specSize() - 1;  
i+=10) {  
    float c = abs(in.mix.get(i+1)*1000);  
    float Fe = map(c, 0, 400, 2, 15);  
    float Fs = map(c, 0, 400, 0,  
0.000019); //0.00008 for the melody  
0.00002 for the audio  
    rotate(sin(t)+Fs);  
    strokeWeight(Fe);  
    pushMatrix();  
    translate(t, i, i);  
    sphere(5);  
    popMatrix();  
    t += Fs;  
}
```

The models produced by Processing are very heavy and inefficient to process, which saps a lot of system resources when trying to create with the resources in Unity. **The more efficient method to get the same results would be to generate the visuals directly in Unity using C# scripts.** That would truly be a real-time procedural visual generation.

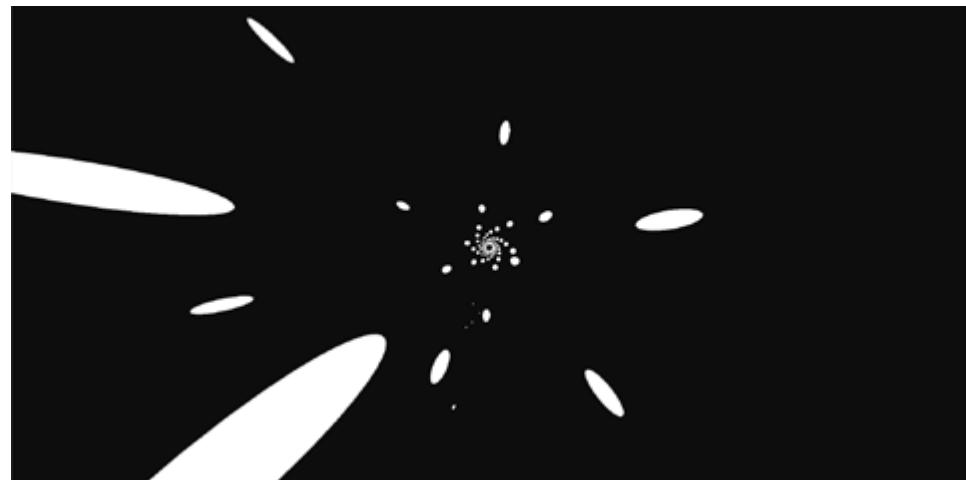
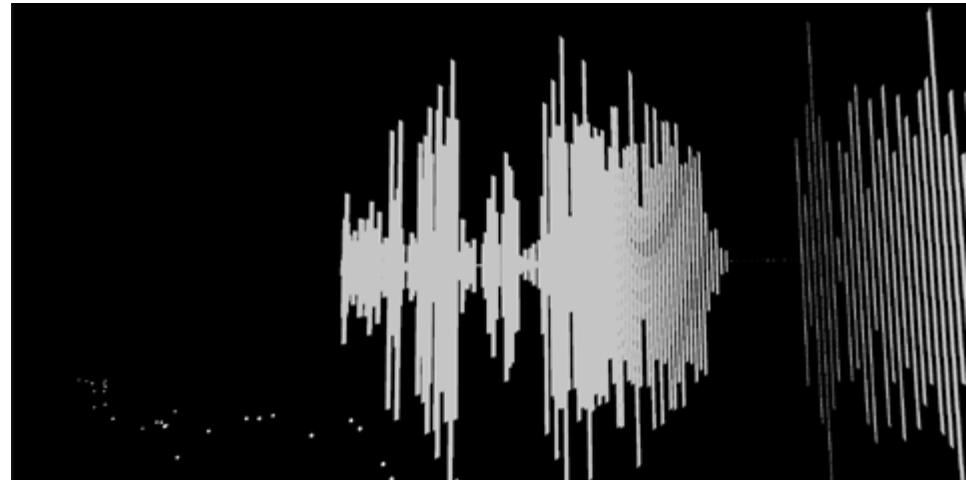
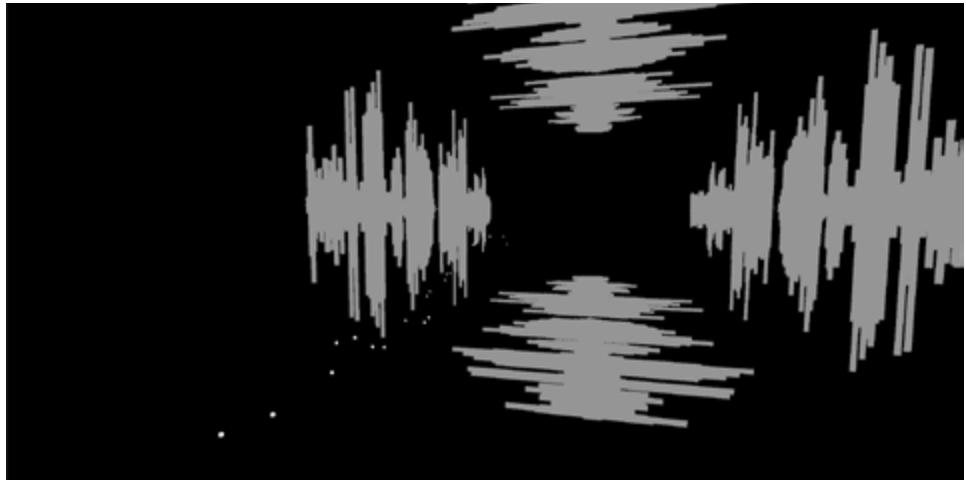


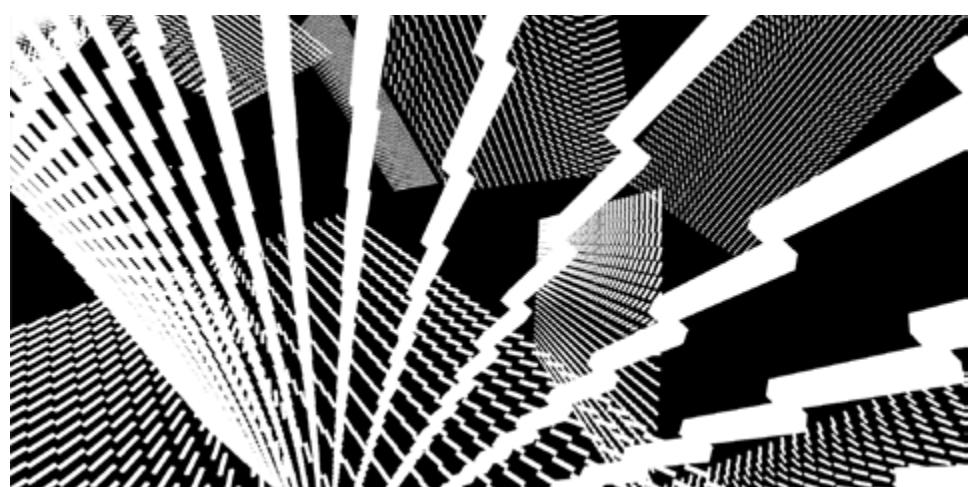
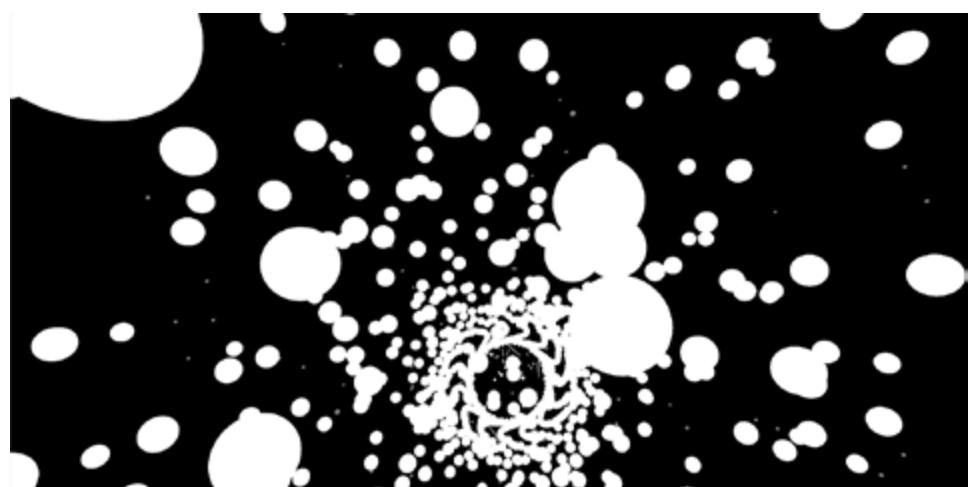
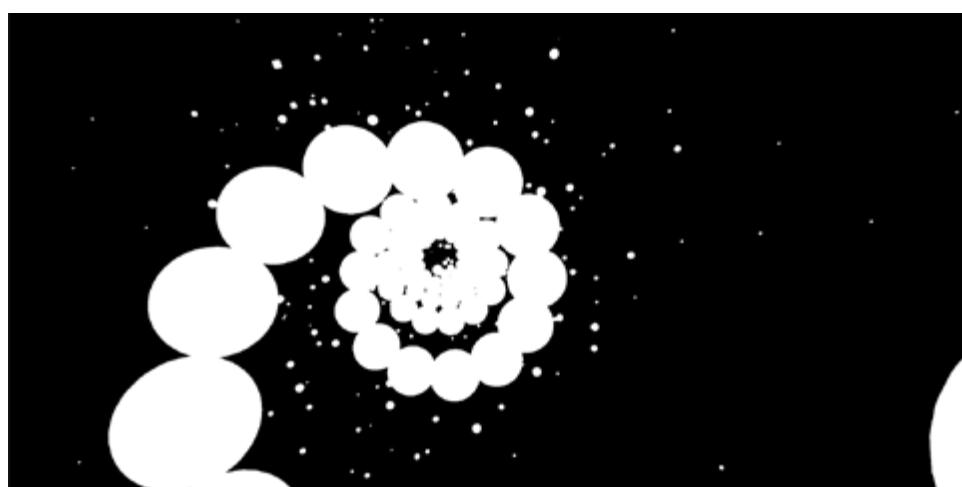
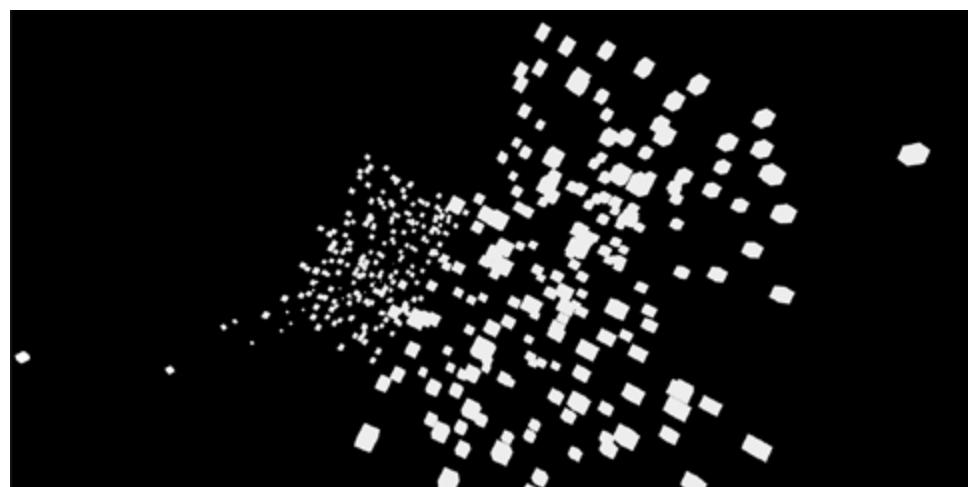
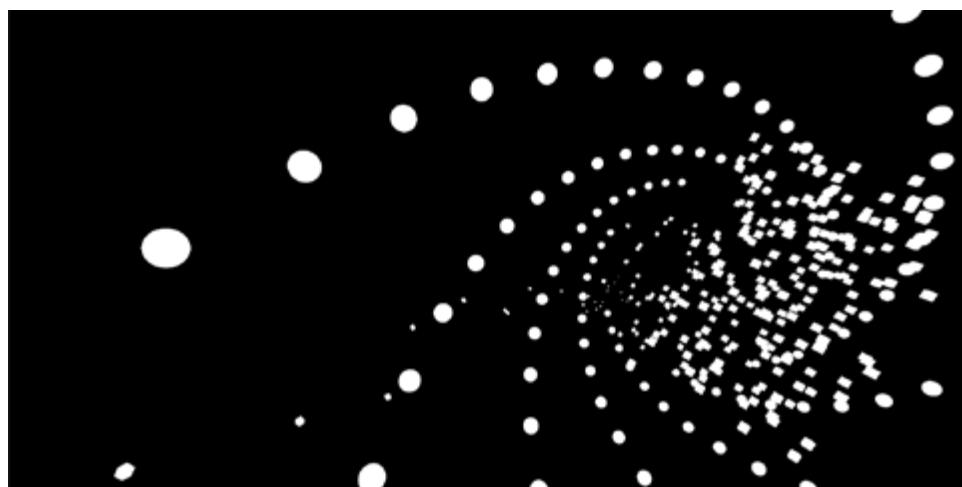
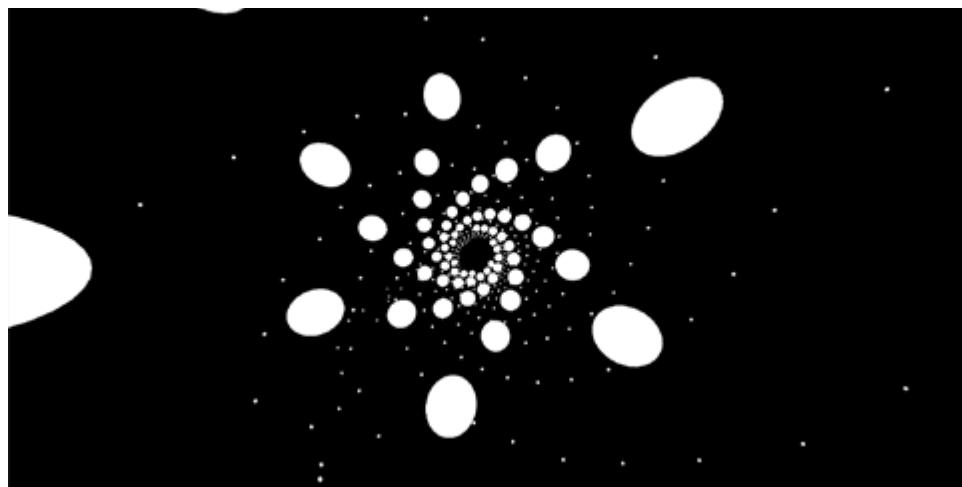
Images showing the progress of the build at different stages

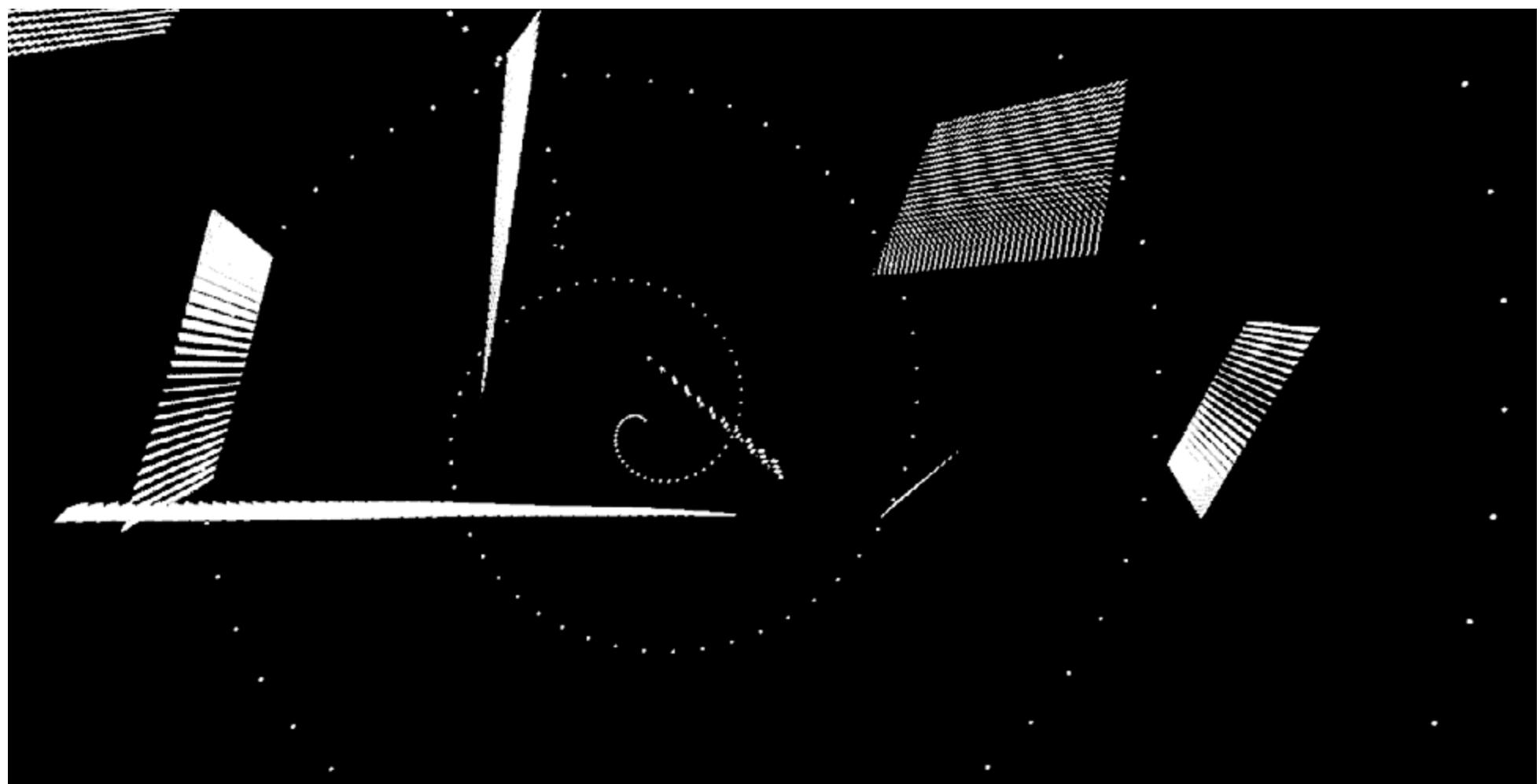
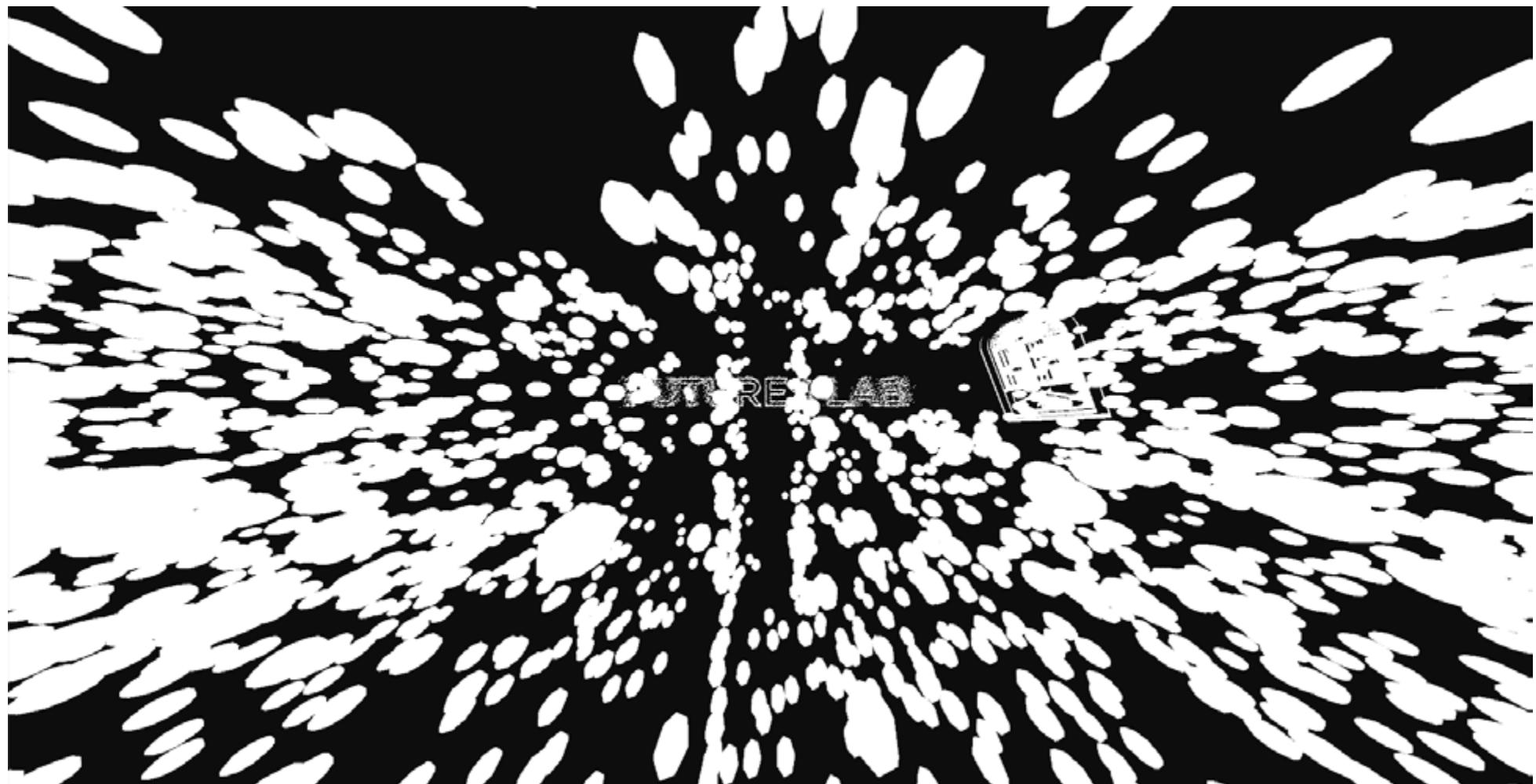


Arts Space Walkthrough

Images showing the viewer journey through the space







Art Space Build

This audio-visual experience uses procedurally generated assets, and an audio track to give the viewers a cohesive and immersive experience. **All visuals are generated using the unreleased song titled Desert Rose by the artist Galimatias.** I sent a rough cut of the VR experience to the artist, asking for permission, and he very graciously gave me his blessings to use the song. I chose this song for multiple reasons. It has a wide range of highs, lows and mids to generate interesting visuals, and it is universally easy to listen to. It has also some very interesting rhythms and beats which makes it a very immersive song to listen to, which goes hand in hand with a Virtual Reality experience. The song feels like it fills the room, per se.

To create the stark contrast to replicate the sharp feel of 2D visuals, I removed all sources of light and made every object emit light. As all elements only emitted one colour: white, it successfully replicated the crisp effect of visuals on a screen.

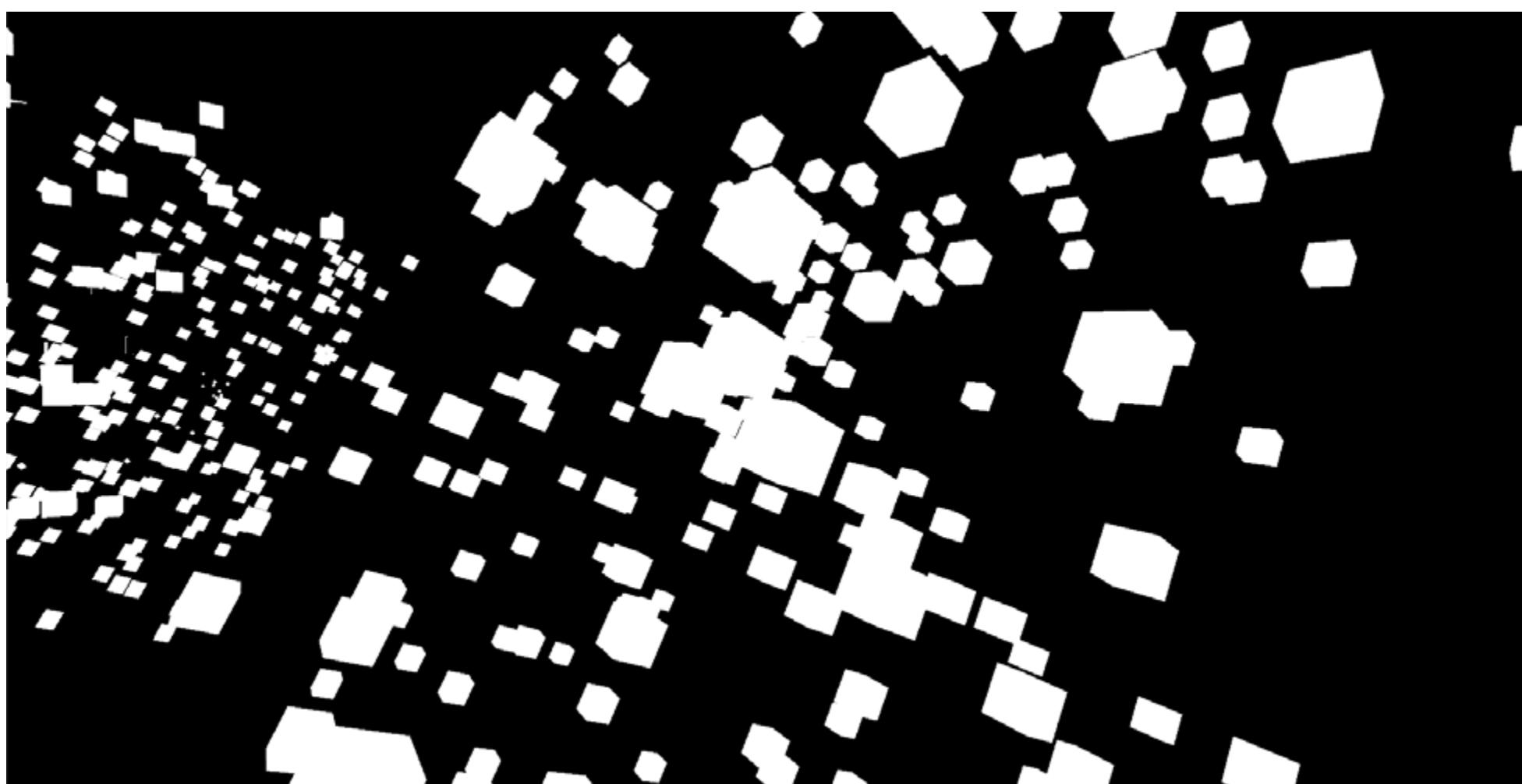
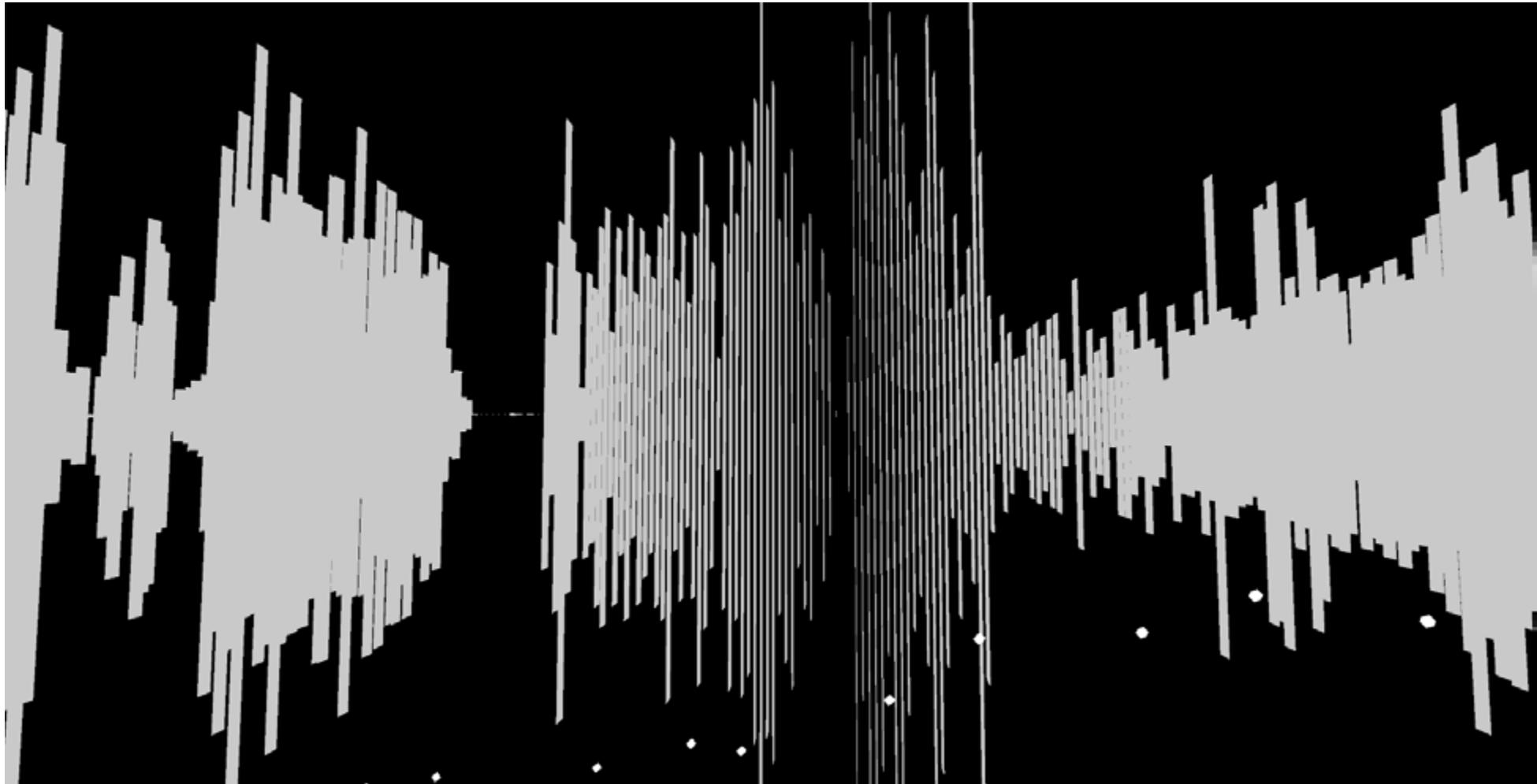
In an audio-visual performance, especially in a darkened room, many artists use complete blackouts to their advantage. Instead of switching from visual to visual directly, they will project complete darkness in the space, which coincides with the music. Strange Movements, an audio-visual performance by artists bigfatminimalist and Spryk use this method to great effect.

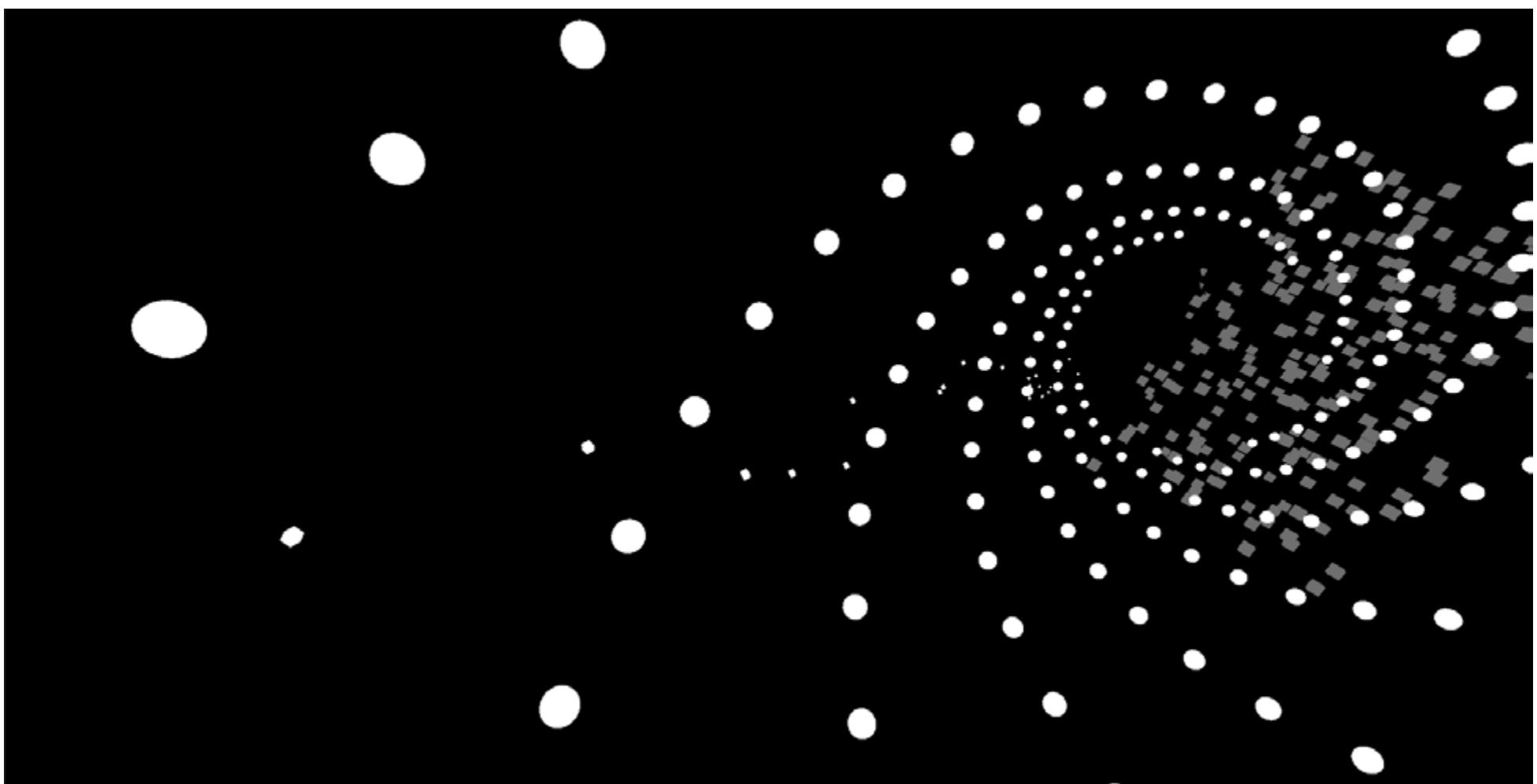
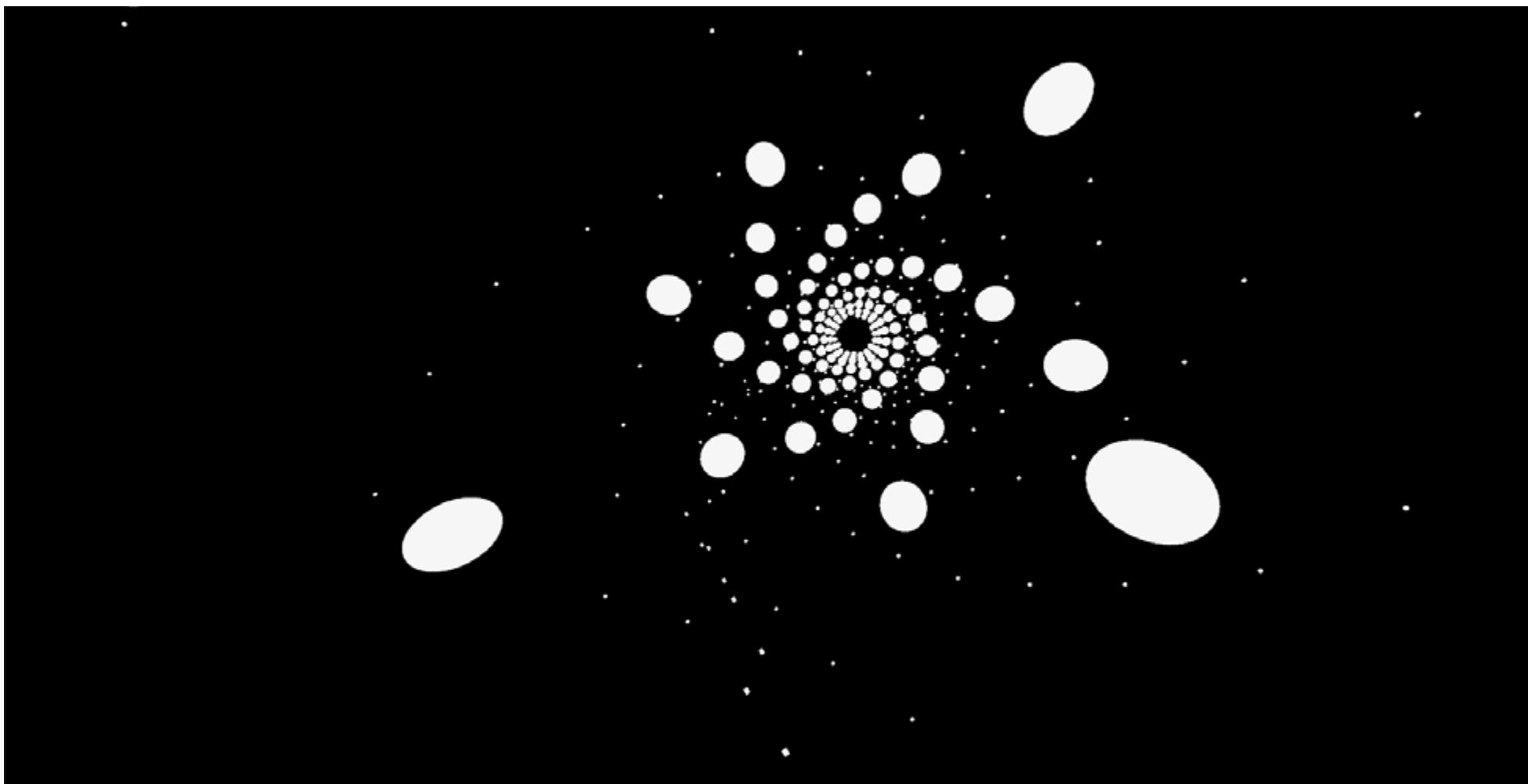
To replicate this effect, I wrote **a script that would actively sync the amount the light emission of values of the objects to the amplitude of the music.**

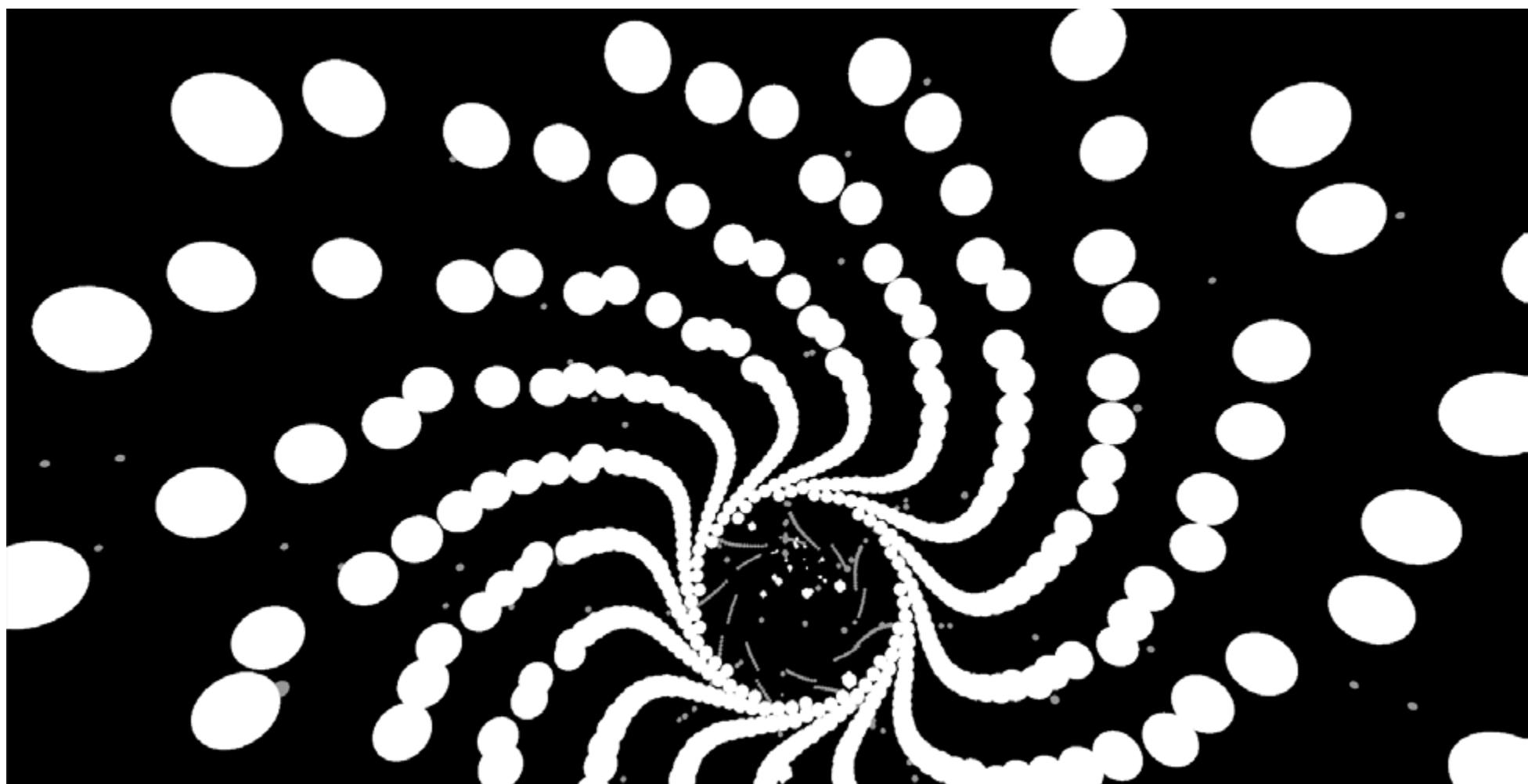
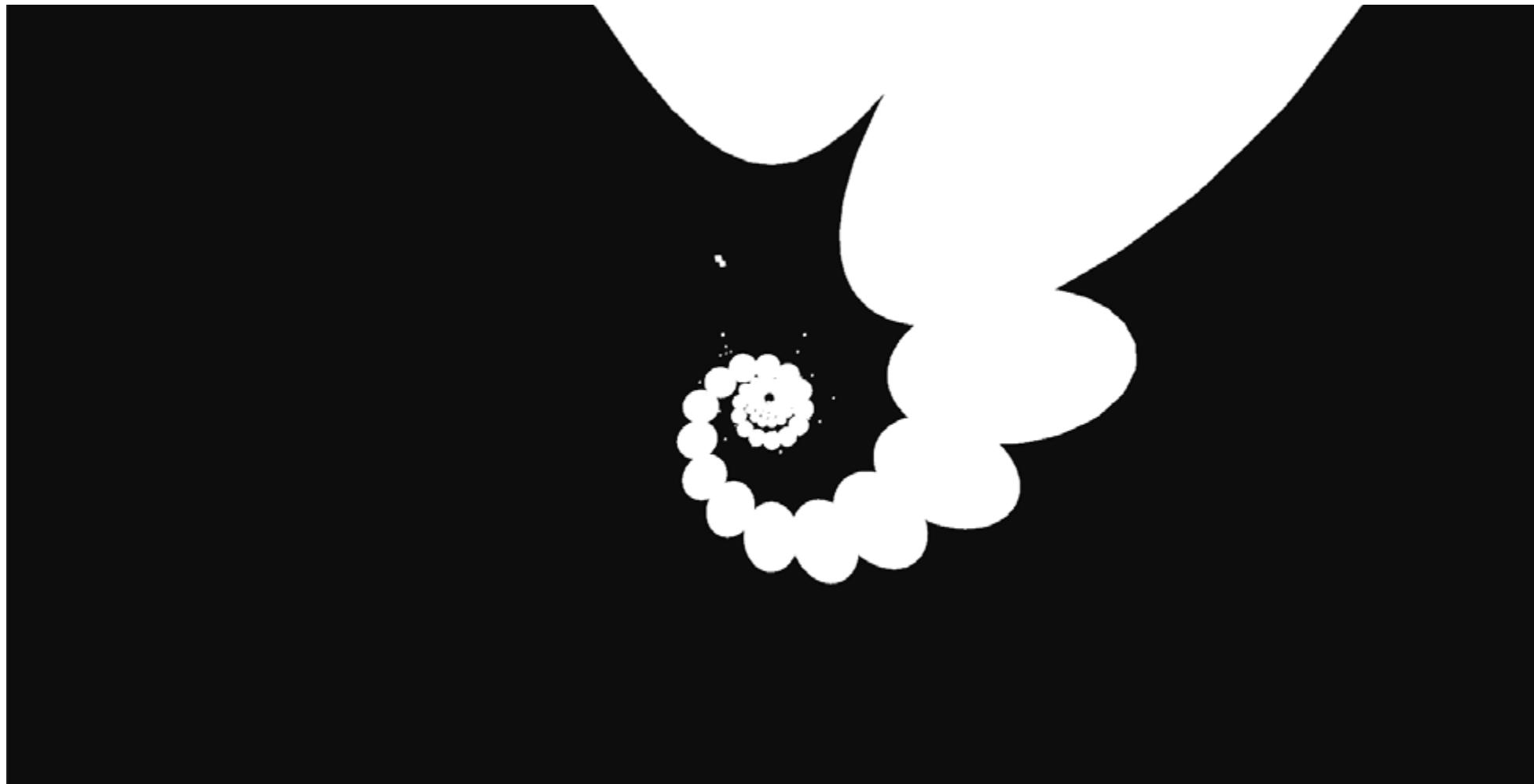
```
audioSource.clip.  
GetData(clipSampleData, audioSource.  
timeSamples);  
clipLoudness = 0f;  
foreach (var sample in clipSampleData)  
{  
    clipLoudness += Mathf.Abs(sample); }  
clipLoudness /= sampleDataLength;  
float emission = Mathf.Lerp(0,  
clipLoudness*10, 0.5f);  
Color baseColor = Color.white;  
Color finalColor = baseColor * Mathf.  
LinearToGammaSpace (emission);  
mat.SetColor ("_EmissionColor",  
finalColor);
```

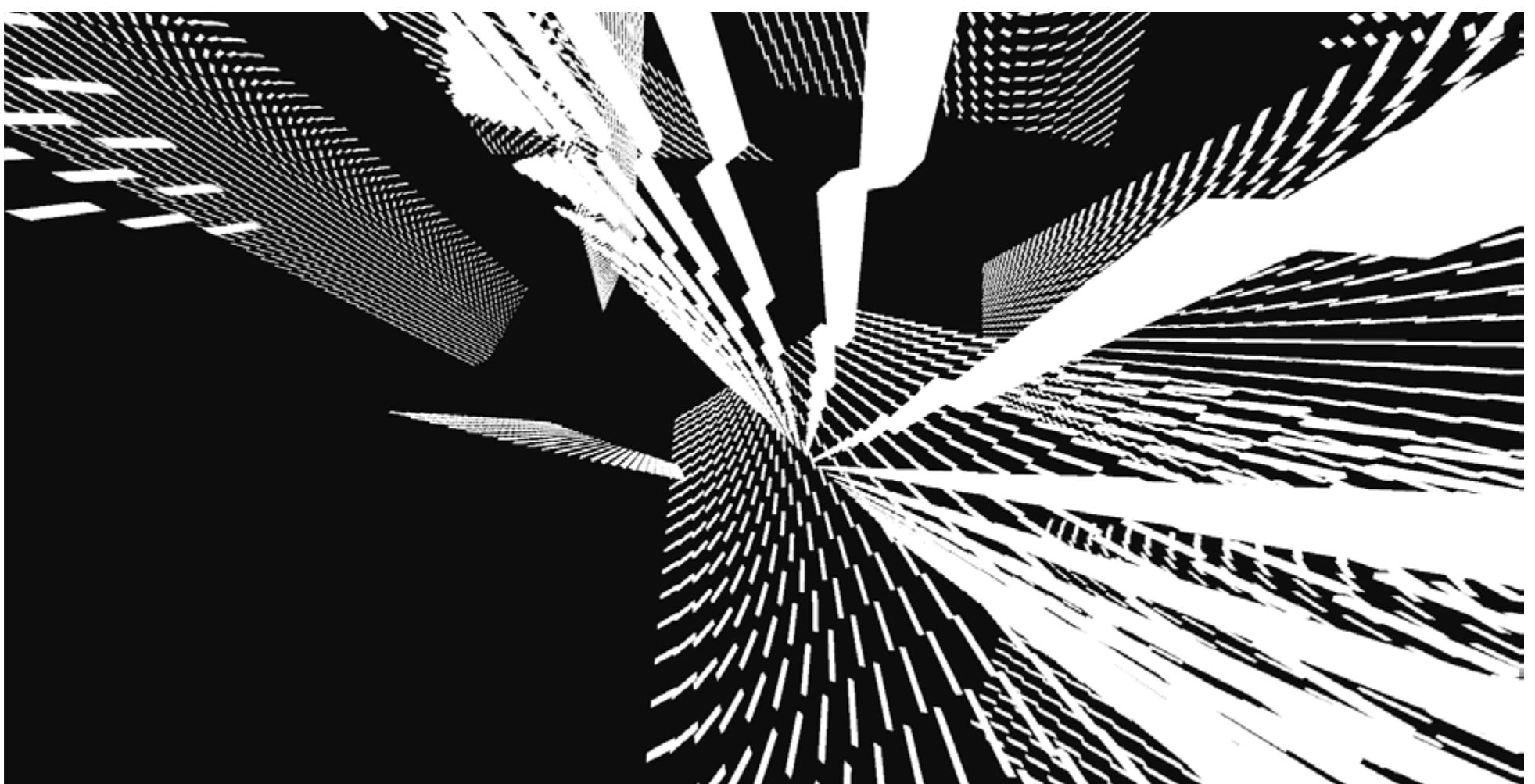
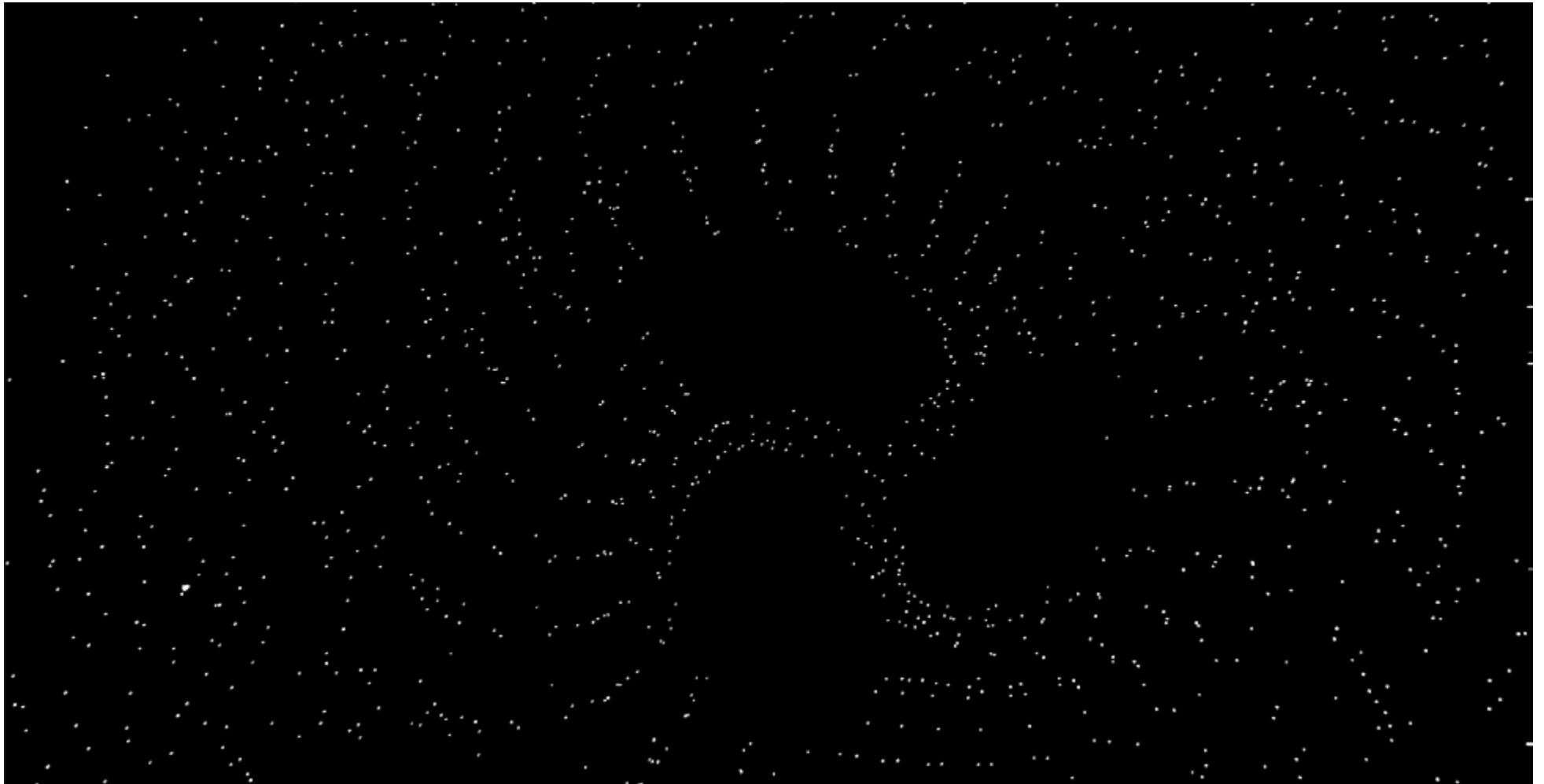
This script makes the forms look like they are actively synced with the music playing and the whole space feels like its reacting to the music, which is a similar experience to what one would feel at an audio-visual experience.

In the next iteration of this space, **there is potential to build in greater interactivity and let the viewer take control of the experience.** This scene also served a testbed for upcoming Unity conference in Hyderabad, where the studio was invited to perform an audio-visual experience using Unity.











Feedback

To help me design the spaces, I was supplied with a constant stream of visitors who beta tested the latest builds, and their feedback is what I worked with to modify the spaces. The feedback was broadly positive, but there were some criticisms regarding the navigation and the presentation of information. **One of the biggest complaints was about the information being presented in the form of text.** Although this was something we knew would be a compromise, but we weren't aware how big an issue it would ultimately turn out to be. Voiceovers or visual cues are a better method to communicate information. Unfortunately, due to the lack of time, we weren't able to record and master the audio to use in the VR spaces.

Another aspect of the experience which was disliked was the need to locomote from one point to another. Covering long distances between points of interest on the map was slightly frustrating to traverse. It felt like nothing of interest was happening during that time, and that this was something that should've been leveraged with the power of VR to teleport between different points in space.

The photogrammetried objects drew a lot of praise from the viewers, as they looked indistinguishable from real life. The fact that they looked so lifelike, and were unique

to Goa is what made the overall experience feel special and unique to the studio. The use of different kinds of 3D assets gives the space a collage aesthetic, which happened to be the opposite of the polished, and homogeneous feel of other experiences available for VR on the marketplace. The viewers appreciated this aspect, and thought of it as an interesting visual detail.

The Craft Space was also widely appreciated, the deconstructed castle being the highlight of that experience. Although viewers did not like the travelling between the various points of interest, they did enjoy the exploration of the space. **Locomoting in VR is problematic as the eyes tell the viewer that they are moving, but the vestibular system, the sensory system of your inner ear that controls your sense of balance and inertia knows that you haven't moved at all.** This contradiction of information to the brain is what causes viewers to become motion sick. There is ongoing research into stimulating the vestibular system into believing that you are moving by using tiny electrical impulses. But till that technology trickles down to consumer VR headsets, designers will have to find other solutions to combat this problem.

The sound and the music of the space was found to be a powerful and vital component of the experience. **The viewers found the**

music to be the binding element that held the experience together. It comforted them and gave them a sense of safety. This aspect could be seen in the Arts Space where the viewers felt completely lost within the experience, as the music and visuals worked together to completely immerse the viewer in Virtual Reality. Viewers often saw the experience a few times over, not knowing when it looped over.

The partners of the studio were quite happy with the end result, but we knew that there were still a few iterations to go through before we arrived at the final product. **This was a great result for a first draft,** but there is still work left to be done. Add to the fact that this was achieved in very little time, and with no technical guidance made this a respectable accomplishment. The next steps are to complete the Futures scene, and either fix or re-iterate the other scenes. There is potential to improve, and also create more scenes.

A photograph of a large tree with dense foliage and a thick trunk, set against a bright sky.

Part.04

Conclusion

It's fair to say I found what I was looking for, and probably got more than I bargained for. I was looking to challenge myself, delve into the unknown, and get uncomfortable. It wasn't easy, not one bit, but I can't hide the fact that I had a lot of fun. Every day was a challenge, but it was worth it. I'm extremely lucky to have people who supported me on this journey and gave me enough room (perhaps too much) to work in. I can only hope that I have met their expectations. A nervous start to the project led to a confused middle, and it ended on a manic(!) high.

It wasn't only the work that was satisfying. The conversations I've had, the long walks, drives to the beach, and dinners at Eldou's, every bit of my time there was illuminating. I didn't just grow as a designer, but as a person as well. When the going got difficult, that was when I enjoyed it the most. The EyeMyth festival was one of the most exciting week-long journeys I've had, even though the long hours and no sleep drove us all to sickness. Working with some of the most talented people in the country day in, day out was enriching, to say the least. The 6 months flew by, with weeks and months blurring into each other. I have no idea what happened when, making the writing of this document quite a task. My ever faithful rented Honda Active tells me I have driven over 7,000 kilometres in the last six months, but I can only remember the first two kilometres in all fairness, and quite vividly at that.

I attempted two projects in unfamiliar domains, and although I may not have completed them to produce a polished end product, I'm happy that I now know what the design process is. Trying to design a

toolkit, but ending up questioning their validity at the end of it was satisfying. Not too many others are rethinking the concept of toolkits. I had always been in awe of toolkits and often wondered what the design process behind such devices of information dissemination was. It was a great experience to see how toolkits are designed, and the thought that goes into structuring and communicating the information.

I had never before thought about collaboration so deeply before. For sure, I had read plenty about teamwork, and group dynamics, but I had no idea that an entire world of research existed in this domain. The act of collaborating is something that is so obvious that we never actually stop to think about the act itself. This is true for me, at any rate. This has been an intensely interesting area of research for me, and I intend to continue along this path and finish what I have started, and take it beyond the finish line as well. The opportunity to meet such accomplished individuals, and listening to them break down their process of collaboration on the spot was exciting, to say the least.

This was a completely new realm of design for me, and I genuinely do believe there is much to be excited about in the field of service design. Not only is it satisfying to try and solve these design problems, but it's ultimately extremely insightful as well. I got to learn so much more about how humans behave, and it definitely goes a long way in helping my personal growth.

Entering the world of Virtual Reality was probably one of the most exciting parts of the project. Having never even worn a VR headset before, this was a whole new world

for me, both literally and metaphorically. The moment I put on a VR headset, I could instantly see the near infinite latent potential that lay within. It's something I struggle to funnel into words. We have barely scratched the surface of what is possible, and the technology is only going to mature and become ever more immersive. It's a whole new world out there, and we haven't even gotten out of the door yet. In retrospect, what I created in such a short time doesn't push any boundaries, or break any records. But these are the critical first steps toward creating something exciting in this new medium.

It was very interesting to take my knowledge of traditional spatial design into Virtual Reality. There's not much of difference as the same principles and rules apply in the digital realm as well, but there are some handicaps that designers need to be aware of while creating experiences in Virtual Reality. There are still some key senses missing in VR that no amount of coding or visual trickery can solve, so those aspects need to be taken into account. It was also very intriguing to note how my knowledge of computer systems helped me design VR experiences. We design spaces in reality based on our understanding of how reality works. Similarly, having an understanding of how computers work is important to the design process. The parameters are very different, and the process is structured and linear, unlike real life.

In retrospect, Exhibition Design was the ideal discipline to help me approach projects that I had no prior experience in. The breadth and the variety of work we do in the various projects helped me maintain an adaptive mindset that helped me get up

to speed with new technologies and topics relatively quickly. Exhibition Design's focus on the narrative and experience was a vital tool that definitely helped me in designing both, the toolkit, and the VR experience. The discipline also gives its students a good grounding in both visual communication, and industrial design, which was useful as I could handle multiple types of projects, which added another dimension to my learning during the internship.

I have always gotten the distinct impression that as a discipline, Exhibition Design zags, when others zig. Taking the road less travelled has given its students an advantage as it tends to prepare them for the future demands of the industry, rather than the contemporary ones. One area in which I feel Exhibition Design could definitely improve upon, is to teach its students the next generation digital tools and techniques. I was completely unfamiliar with the concepts game engines, Virtual Reality, Augmented Reality, amongst others, which left me with a steep learning curve. My familiarity with coding in Processing contributed to my getting up to speed so quickly with these next-generation digital mediums. These digital mediums are going to be a big part of our future, in one way or the other. Gaining a basic familiarity of their workings would go a long way in helping us adapt to any new digital mediums. In the same way that our familiarity with the constructs of the real physical world helps us in any kind of project, understanding the workings of the digital realm will do the same.

The studio encouraged me to follow my passions and was especially supportive of my creative coding work. I have had

the chance and opportunity to use the generative work in real life projects. This constant development and growth of my skill set in creative coding led me to a serendipitous moment while creating the Art Space in the VR project. It was satisfying when my work with Processing sparked off an idea with Virtual Reality. The coming together of the music, and visuals in this medium was utterly bewitching. I thoroughly enjoyed creating this scene, and perhaps it's no surprise that it was no one wanted to take off the headset after watching the Art Space. It was by far everyone's favourite scene. As someone who operates solely on logic and function, these moments of magic are exciting. The love shows through the work after all.

There were many such moments where I realised that my approach toward work was making life difficult for me. I needed to take it easy, allow for those serendipitous moments to happen and let my mind wander. Over-thinking the problem at hand did not help anyone. Initially, I struggled to deal with the lack of structure and framework, but order was soon restored as I adapted to the different environment. Learning to adapt my working style, and being flexible in the way that I work and communicate with other people has been critical to my growth during the internship. The research conducted for the toolkit was especially important in this regard, as it gave me a closer look at how successful people operate.

I did have some reservations before coming to Goa to start the project, and it wouldn't be honest to say that everything was perfect. I was skeptical of coming to Goa, with it having a reputation of a laidback

atmosphere. Although it didn't affect the work in the studio, not one bit, it was a stumbling block in a few other aspects. Getting any sort of work done from the market was difficult, and this was one of the reasons why the initial week-long projects were ultimately cancelled. The working hours in the studio, however, were much longer than the ones followed in Delhi! No matter how hard we tried to stop work at a reasonable time, we simply couldn't do it.

In theory, it did seem like the studio would be an exciting and vibrant place to work at. It was for sure a great place to work, and the collaborative nature of the place meant that we always had something or the other happening, which would open up more opportunities for me. The one issue the studio currently faces is the lack of commitment and time given by the partners toward this collaboration. My project was the primary collaborative activity between the studios, and although that was good for my project, it certainly doesn't bode well for the Greenhouse in the future. The partners need to devote more time and resources to the Greenhouse, in order to make it work. It's true that the bread and butter work that feeds this studio arguably takes priority, but if the Greenhouse gets the attention it deserves, then it too could potentially help out financially.

As of now, the Greenhouse is less of a collaboration, and more of a shared office, an intimate co-working space. A co-operation if you will. A coming together of people usually progress from Co-ordination to Co-operation to Collaboration. The Greenhouse is on its path to Collaboration, but the sooner it gets there, the better.



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Colophon

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*We keep on working, we do our thing,
we are who we are. Never lift. Never
stop believing.*

SEBASTIAN VETTEL

