Exploring exhibition design: designing experiences for data visualization

Explorar o design de exposições: conceber experiências para a visualização de dados

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tangible data, data visualization, data experiences, storytelling with data

This paper explores how exhibition design can contribute to Information Design by conceptualizing experiences to promote tangible data explorations. It examines how spatial experiences and tangible user interfaces can make data visualization more accessible, reducing intimidation linked to technical tools. Through a data visualization project and a data collection experiment conducted at an academic conference, the paper highlights exhibition-based approaches to bridge this gap. It argues for a shift in focus toward the process of data-making itself, emphasizing its significance alongside the data it generates.

dados tangíveis, visualização de dados, experiências com dados, contar histórias com dados

O presente artigo explora como o design de exposições pode contribuir para o design de informações, conceituando experiências para promover explorações de dados tangíveis. O estudo examina como as experiências espaciais e as interfaces de usuário tangíveis podem tornar a visualização de dados mais acessível, reduzindo a intimidação ligada às ferramentas técnicas. A fim de ilustrar tal afirmação, o artigo apresenta um projeto de visualização de dados e um experimento de coleta de dados realizado em uma conferência acadêmica. Além disso, o artigo destaca abordagens baseadas em exposições para preencher essa lacuna e defende uma mudança de foco em relação ao próprio processo de criação de dados, enfatizando sua importância juntamente com os dados que ele gera.

1 Introduction

India's start-up ecosystem is thriving, with innovation at its core. However, while many start-ups emerge each year, only a small fraction receives both incubation and funding, highlighting a gap in support systems. Today, we have no shortage of data collection systems – large organizations employ teams to rigorously gather data, publishing detailed reports and academic journals to communicate findings at regular intervals. Amidst this structured research approach, can we create space for tangible and playful interactions with data? The India Incubator Kaleidoscope 2024, published during the Summit Up event that was held over 2 days at the Indian Institute of Management, Bangalore, aimed to do just that. As a comprehensive study of India's incubator landscape, it explored their role in the entrepreneurial

ecosystem and offered insights for crafting scalable, sustainable strategies for the future. The report embraced visuals that not only communicated findings but also reflected the essence of an incubator's spirit in today's ecosystem. The launch of the report was accompanied by a data collection experiment on Day 1 aimed at assessing whether the perception of the services offered by an incubator aligns with the realities of the ecosystem. The data collection experiment resulted in an assembly-scale formation of a data sculpture exhibited on Day 2 that presented the findings for the same. The key objectives of this conference were to develop captivating visuals that effectively communicate the complexity of the success of start-ups in India today and to offer a platform for the attendees of the conference that reshape their perception of data collection and analysis. This paper examines the design rationale and process behind the ideation and outcome of the visualizations, as well as the data collection experiment, which incorporated techniques and methods from the field of exhibition design.

2 Background and context

While conventionally present in spaces that seek to establish a narrative regarding a period, place, or people in history, the fundamental principles of exhibition design can be seen visible not just in spaces designed for recreation but also in lived and functional spaces – closets, desks, refrigerators, supermarkets, and airports to name a few. The "discipline of exhibiting" a phrase coined by the art critic Germano Celant, is only beginning to be understood.

The importance attributed to Data Visualization has considerably increased in the last two decades and has become synonymous with terms such as Big Data and Artificial Intelligence. Contrary to the assumption that the field of data visualization is inherently technical, humans have been using visual symbols and graphics to understand and document the world that we live in ever since the earliest practices of map-making. This project, done as a part of my final year project, titled "Reimagining Interactions between Humans and Data", focuses on exploring the role that exhibition design can play in the field of Data Science and Data Visualization. Can more democratic experiences be designed that act as spaces for dialogue? In an era where data plays an increasingly central role in decision-making processes across various domains, effective engagement and interpretation of data becomes essential.

In the spirit of exploring the field of exhibition design not just as an aesthetic experience but as a knowledge repository from which new learning methods and environments can be devised, this paper advocates for a shift in the way humans encounter, understand, and perceive data. Spatial experiences inherently provide opportunities for extended engagement while also creating spaces to renegotiate our relationships with the subjects we interact with – stimulating an environment where individuals can move beyond surface-level interactions. Producing three-dimensional physical encodings of data quickly, with familiar materials, lets learners enter the space of working with data in an unintimidating

way (Bhargava & D'Ignazio, 2017). While it is not within the scope of this paper to evaluate the veracity of the methodologies and theories used, it explores how low-tech, familiar, and playful environments can extend the role of exhibition design in synthesizing information. By doing so, it seeks to engage both experienced researchers and novices in exploring Information Design through unconventional formats. Moreover, the paper explores 'data physicalization' in today's screen-saturated environments, not as an alternative but as a contribution to the ongoing dialogue of who gets to tell a story and why it matters. Formulated by the Roman architect Vitruvius in his book De Architectura in 25 BC, Figure 1 represents the typical design requirements in the process of creation to achieve a working equilibrium. Using these aspects as a framework, this paper puts forth a possible framework displayed in Figure 2 that represents a possible intervention in the field of Information Design through the lens of exhibition design.

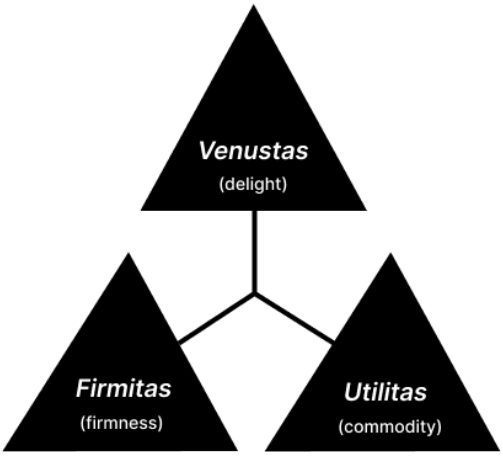

Figure 1 The Vitruvius Triangle.

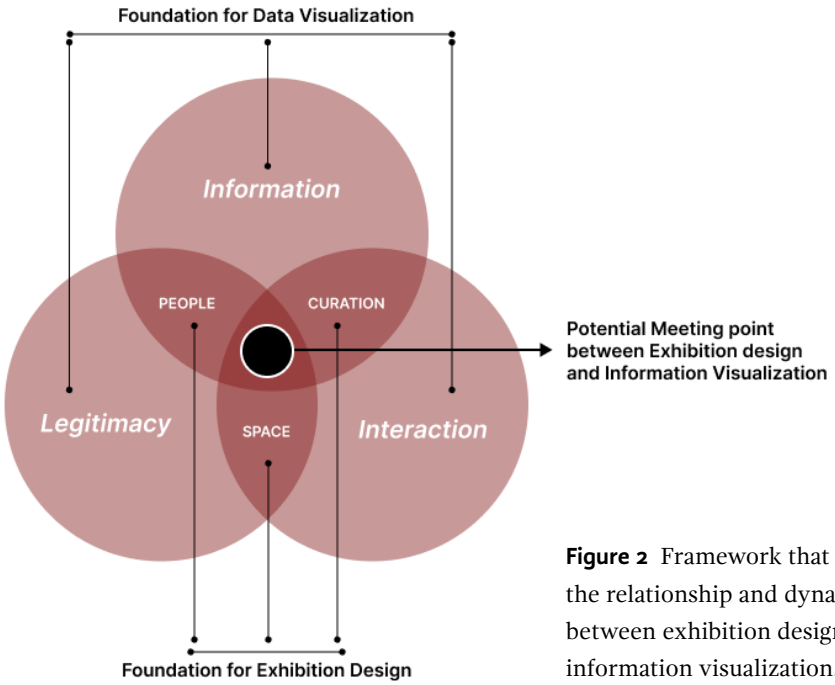

Figure 2 Framework that identifies the relationship and dynamics between exhibition design and information visualization.

3 Overview of the project

Title: The India Incubator Kaleidoscope 2024
Duration: 6 weeks
Collaborators: Centre for Research on Start-ups and Risk Financing, NSRCEL at the Indian Institute of Management, Bangalore.
Nature of the project: exhibition + participatory experiment
Audience and Participants: controlled (the viewers of the exhibition and participants of the experiment were attendees of Summit Up, a two-day conference on entrepreneurship in India).

Following are the theories and methodologies that were employed during the project.[1]

1 As defined in *Beautiful Trouble* (Boyd & Mitchell, 2013).

- Artivism: the intersection of art and activism, harnesses the critical imagination to design events and strategies that provoke new questions and new meanings in pursuit of more respectful ways of being.
- Breakfast is persuasive: providing a direct service that benefits your community can speak louder than any rhetorical argument.
- Show, don't tell: use metaphor, visuals, and action to show your message rather than falling into preaching, hectoring, or otherwise telling your audience what to think.
- Points of intervention: identify pressure points where you can take action to interrupt business as usual and press for change.

4 Process

This project aimed to communicate the essence of the report through two key contributions:

1. Developing the visualization framework for the printed report.
2. Designing the mechanics for the data collection experiment conducted over two days

Although the outcomes differed – one as a printed report and the other as a tangible, interactive experiment – the design process was conducted with attention to materiality across both formats. The visualization frameworks were developed through an iterative process involving word-building and world-building exercises. Here, the process of word-building aimed at building a repository of words with anthropomorphic qualities that would optimize the process of world-building. World building is the process of constructing an imaginary realm, a process we see regularly in a range of different contexts (Coulton et al., 2017). While these exercises are often utilized in the process of creating immersive fictional scenarios, in this project's context they were utilized to define and structure key entities within the Incubator Landscape to facilitate clearer representation and improve memory recall of essential concepts. While the final constants

were not explicitly anthropomorphic, their design was informed by an investigation into how visual and tangible representations can elicit emotional and cognitive responses. Although data itself is not inherently emotional, the physical and interactive nature of this project aimed to evoke an affective response. Spatial experiences inherently provide opportunities for extended engagement while also creating spaces to renegotiate our relationships with the subjects we interact with – stimulating an environment where individuals can move beyond surface-level interactions. This aligns with broader discussions on humanizing data – where even without complete anthropomorphism, the physical presentation of information can make abstract concepts more relatable and tangible.

Approximately 25 visualizations were created for the report. However, this paper highlights only a select few to illustrate the design rationale behind their creation. The visualizations were developed using Adobe Illustrator, a vector-based design tool known for its precision and scalability, which ensured clarity and consistency in the data representations.

Table 1 Brief overview and result from the World-building and Word-building exercises.

Identified stakeholders/entities/ processes from the report	**Word-building**	**World-building**
Incubator	A bed for growth, Launchpad, Support system, Protection, Nurture	Take off, Seedbed, Umbrella, Greenhouse
Sector	Organized pockets, Levels, Ecosystem	Boxes, Compartments, Slice of a pie
Venture	Wander with a purpose, Unprecedented, Path, Leadership	Backpack, Flowing of a river, Roots running wide
Bootstrapping	Self-sufficiency, Standing on one's own feet	Garages, Fire using Flintstones
Accelerator	Cleared Pathways, Fast Pace, Onwards and upwards, Network connections	Rocket, Shooting Star, Catalysts, Injection
Pitch	First Impression, Introducing an idea, Vulnerability	Stage, Teaser/Trailer
Investor	Trust, Expectations, Affiliation, Mentor	Angel, Patron, Gardener, Protector
Business	Establishment, Employment	A well-oiled machine, a ship through turbulent waters
Startup	Idea, Intervention, Unpredictability	Seed, Child, Flowers, Sapling
Technology	Ever-evolving, Adaptable	Toolbox, Magic wand, Engine
Network	Interconnectedness	Web, Channels
Scalability	Catering to the mass, Volume, Globalization	Ladder, Rise and fall of a wave, Waning and waxing of the moon
Funding	Necessity, Trust, Collaboration	Fuel, Watering can, Nutrition

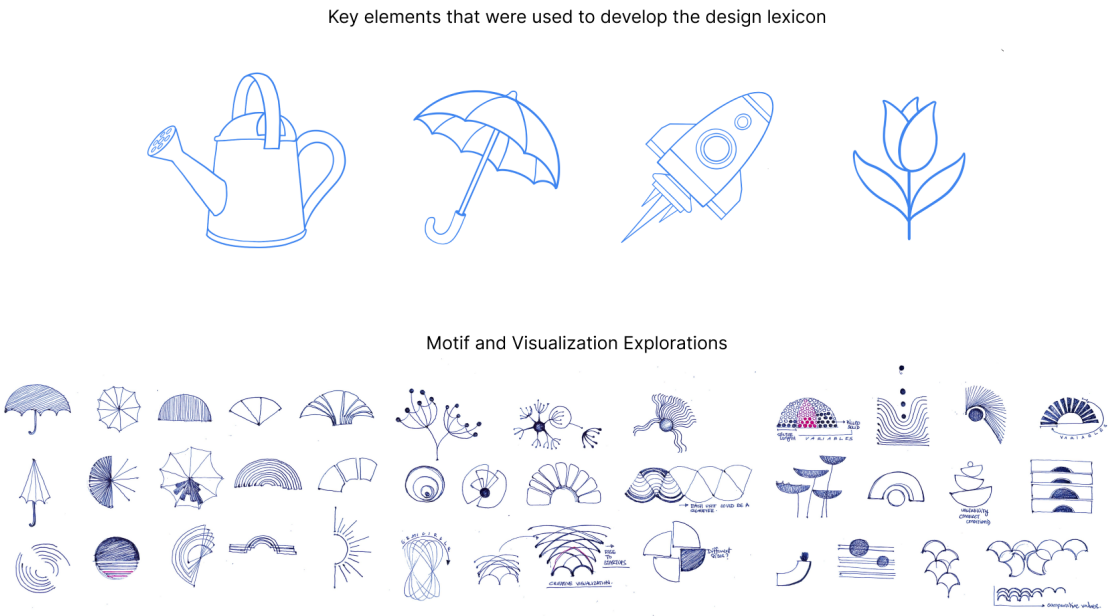

Figure 3 Sketchbook explorations that were instrumental in developing the final visualizations.

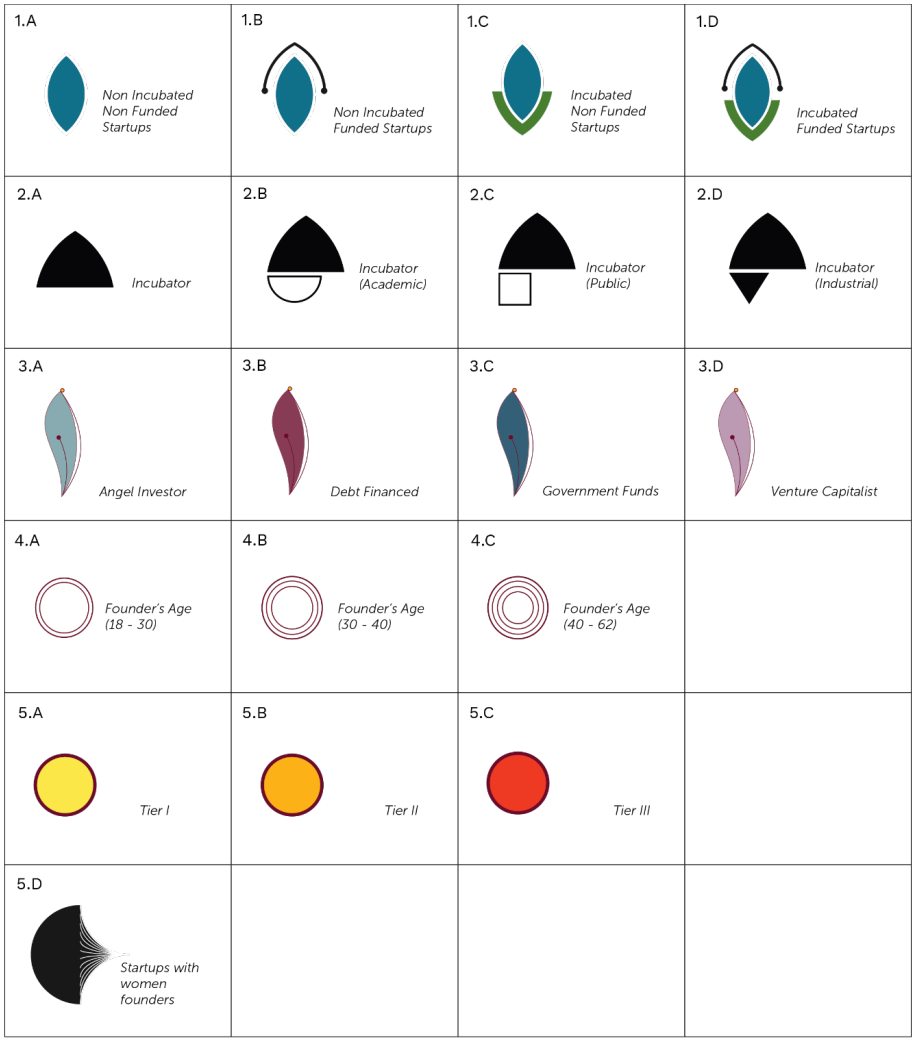

Figure 4 A design lexicon was established for the entities that would remain constant but prone to transformation in their arrangement in space.

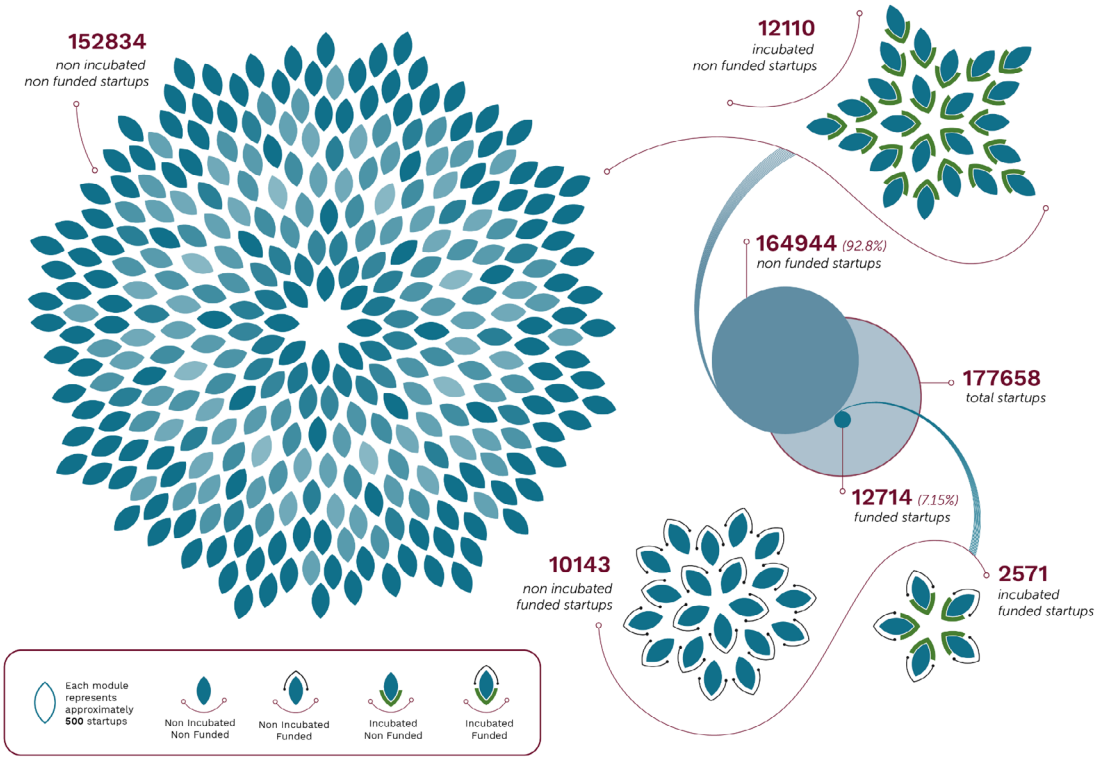

Figure 5 Visualization developed to represent incubated and funded startups.

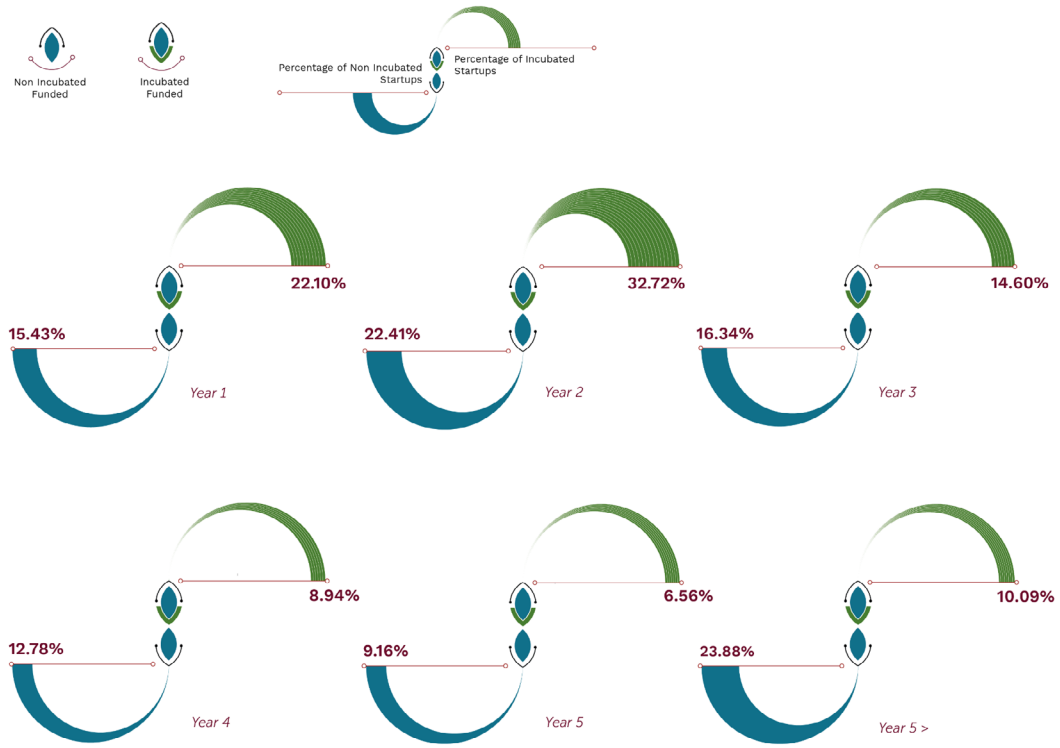

Figure 6 Visualization developed to represent the time taken from the incorporation year to raise the first round of funding for incubated and non-incubated startups.

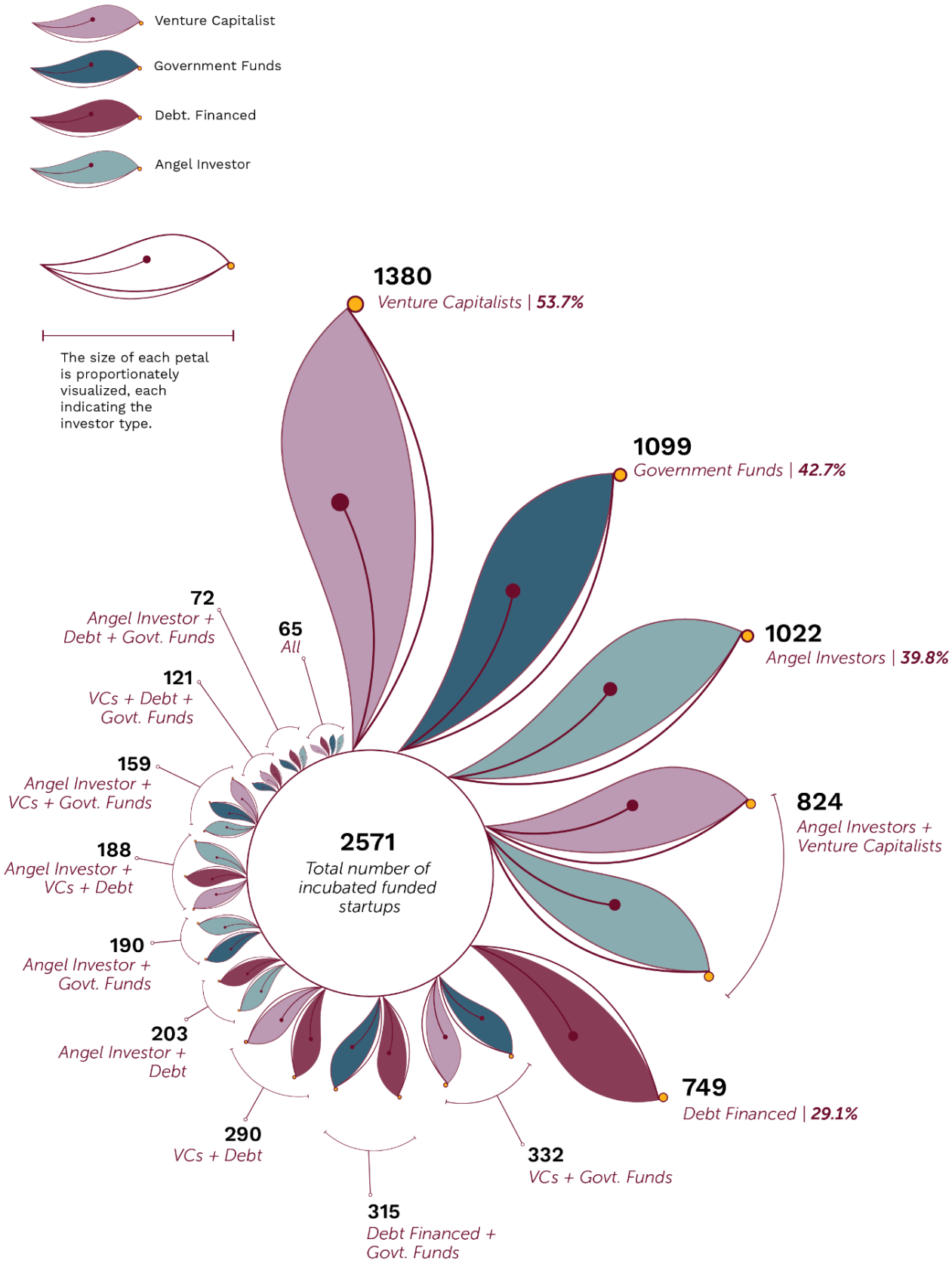

Figure 7 Visualization developed to represent the presence of investors in incubated funded startups.

4.1 Day 1

On Day 1, conference attendees were invited to explore a display of select visuals from the report. These visuals offered a concise overview of the research and its key findings. While the primary aim of the exhibition was to provide a snapshot of the report, it also helped attendees make an informed decision when casting their vote on the inquiry question. The inquiry question for the data collection experiment was as follows, "What is the most important benefit that start-ups get out of incubation?" The data was collected through physical tokens that were color-coded with the profiles of the conference attendees.

1. Founders
2. Investors
3. Incubator heads and managers
4. Researchers and students

Each attendee could choose one of the four options as their answer to the inquiry question:

1. Founders
2. Investors
3. Incubator heads and managers
4. Researchers and students

Attendees could choose from four options, and this inquiry was carefully selected to explore whether perceptions of an incubator align with the actual services it provides. The exhibition thus served as both an introduction to the report and a platform for deeper engagement.

Table 2 186 people participated and the number of votes received for each choice is mapped according to their profile.

Options	Founders (black)	Students (blue)	Incubator heads and managers (red)	Investors (yellow)	Total (No. of votes according to each option)
Funding	14	4	1	4	13
Branding and market access	23	6	6	3	14
Infrastructure	3	2	3	3	15
Knowledge and networking	61	27	21	5	16
Total (No. of votes respective to each profile)	101	39	31	15	186

Figure 8 The attendees picked out the token that best represented them and answered the inquiry question. Each participant was restricted to a maximum of one answer. Each option was enclosed to mitigate potential bias during the selection process.

Figure 9 Laser cut on MDF, the tangible tokens were designed to reflect the visual language of the report.

Figure 10 Selected infographics were printed and displayed, providing an overview of the incubator landscape in India. This visual context enabled attendees to make informed decisions when responding to the inquiry question.

Figure 11 Inquiry question on display for the data collection experiment.

4.2 Day 2

The data sculpture, assembled overnight, was exhibited on Day 2 and revealed intriguing insights into the results. While the opinions held by conference attendees didn't fully align with the statistics in the report, this divergence offered a valuable opportunity to understand existing perceptions. If rebranding the image of an incubator system was one of the objectives, this experiment provided a strong foundation for negotiating current assumptions and shaping future communication strategies. An ecosystem can only function effectively when consumers and stakeholders are well-informed about the services offered. This experiment underscored the need for service providers to take responsibility for ensuring transparent and effective communication about what they offer. By bridging the gap between perception and reality, this project aimed at creating spaces for informed conversations regarding the role of incubators. The emergent data visualization served as a provocative artifact that challenged participants to reconsider or reaffirm their initial stances. The exhibition and data experiment were placed right outside the auditorium entrance, making it easy for people to interact with. Over the two days, the space shifted from just a corridor people passed through to a place where contrasting ideas and conversations came alive. It became more than a transition zone – a space for engagement and exchange of ideas and opinions.

Figure 12 Results from the Data Collection experiment. The tokens were assembled and arranged together using zip ties and could be dismantled, thus enabling the tokens to be reused again in different contexts.

Figure 13 Over 2 days, the corridor turned into a place for conversations about data autonomy and tangible data visualization.

Figure 14 Over 2 days, the corridor turned into a place for conversations about data autonomy and tangible data visualization.

5 Reflective analysis

One of the primary objectives of the conference was to provide attendees with an opportunity to reimagine their perception of data collection and analysis. The application of exhibition design principles was found to not only increase curiosity toward the visualizations but also highlight possible areas for intervention in future projects of a similar nature. However, due to the time constraints imposed by the conference schedule, quantitative feedback on this approach could not be collected. To ensure that interactions with the data collection experiment remained brief and quick, certain participant details, such as age and gender, were not encoded within the physical token. Notably, attendees expressed greater enthusiasm upon realizing that no personal data except their professional profile was being collected for the project. Over two days, the evolving data sculpture and the display of visualizations attracted significant engagement due to their collaborative nature, creating an informal space for discussions on how data should be presented and whose interests it serves. In conclusion, such physical data formats contribute to the broader effort of inviting more people to the starting line in the field of data visualization and to engage with this evolving practice, one that is critical now more than ever.

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