



The FR Specialists

DESIGN AUDIT PROJECT with Tarasafe International

Under the guidance of Prof. Mr. Bhavin Kothari

Objectives of Design Audit

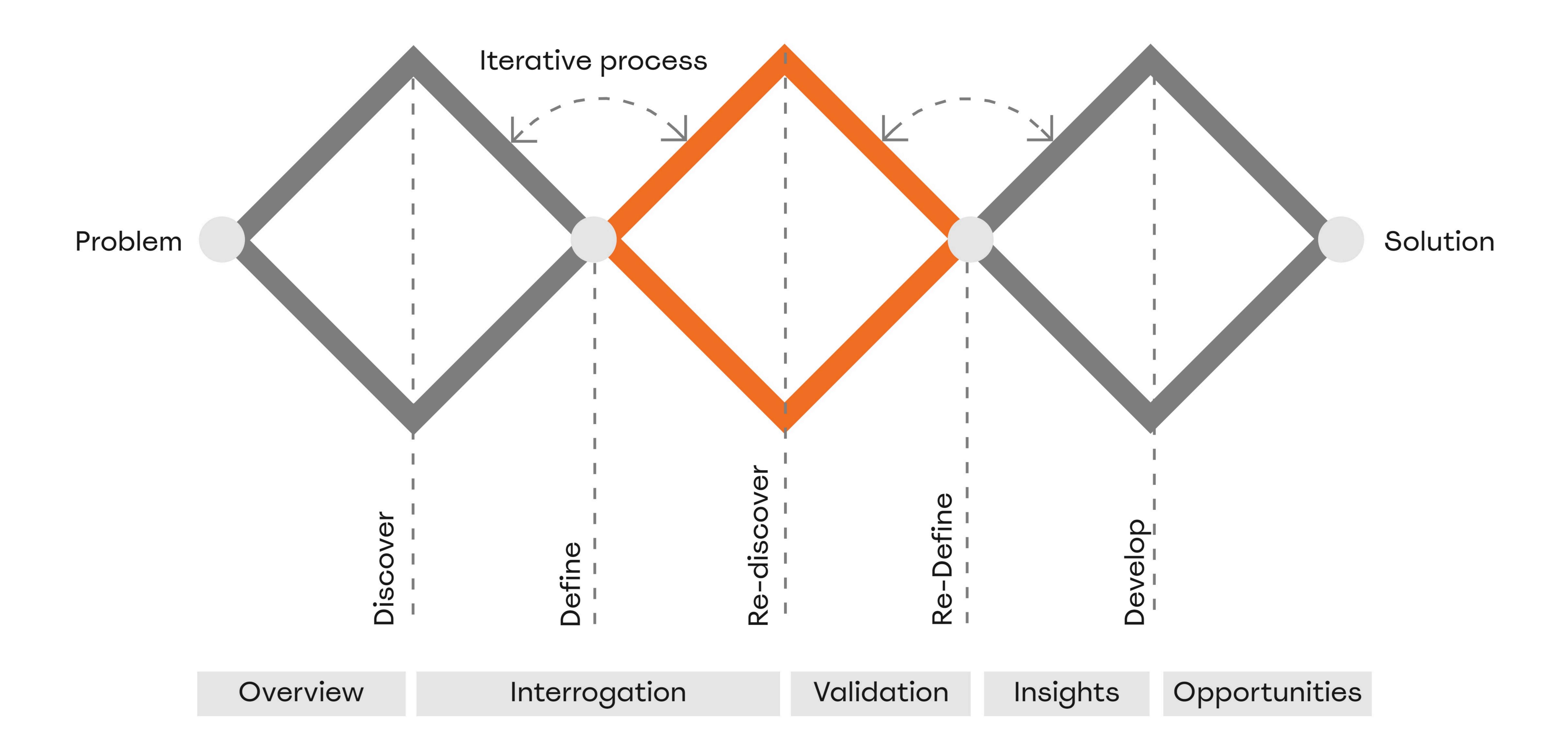


To select an **established organisation** with **multiple verticals** and study it's functioning, keeping in mind its **stakeholders, internal and external environment.**

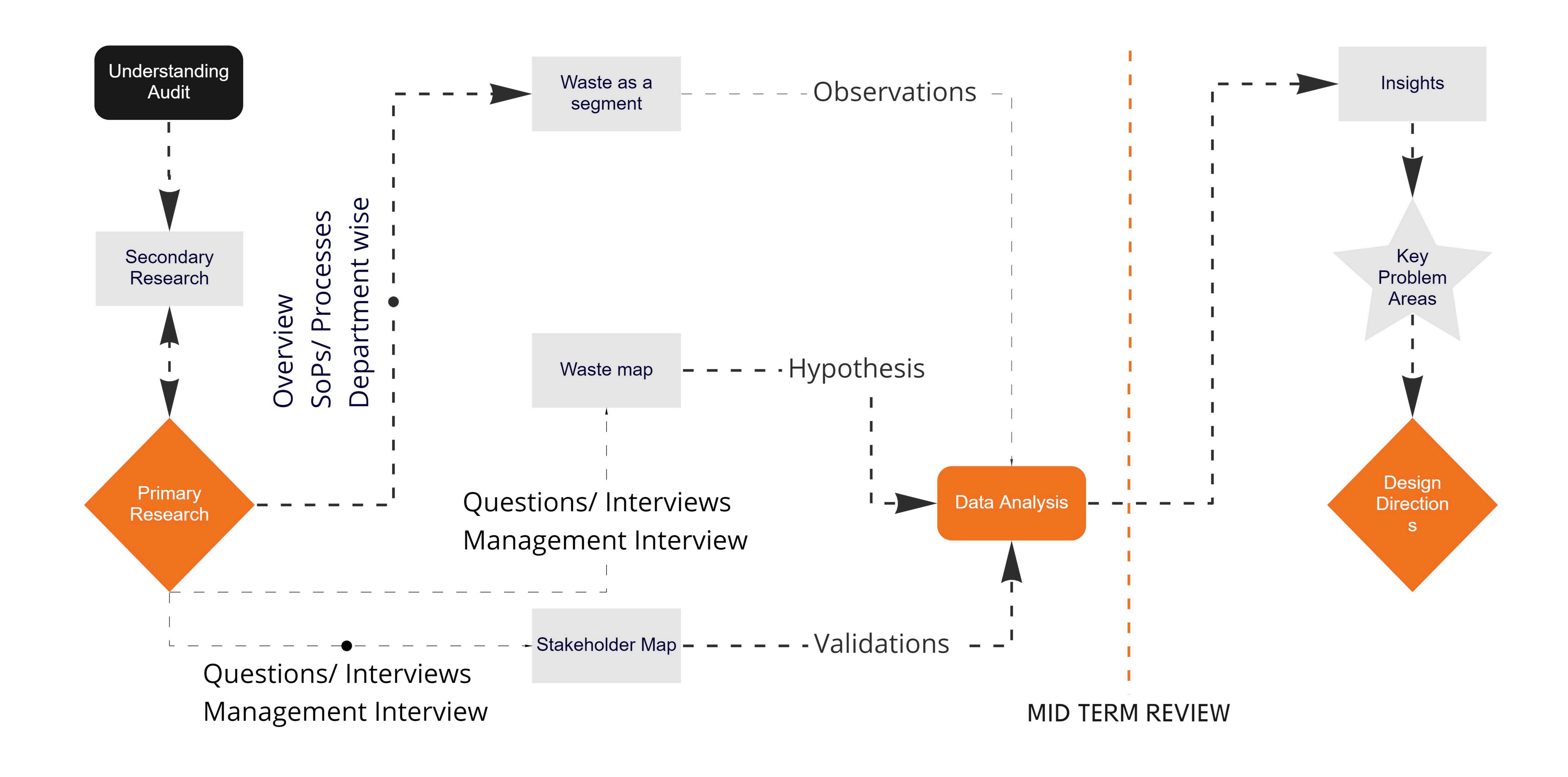
To analyse the organisation's strength and weaknesses, and establish a performance profile

To identify opportunity areas for the organisation to stay ahead of the curve

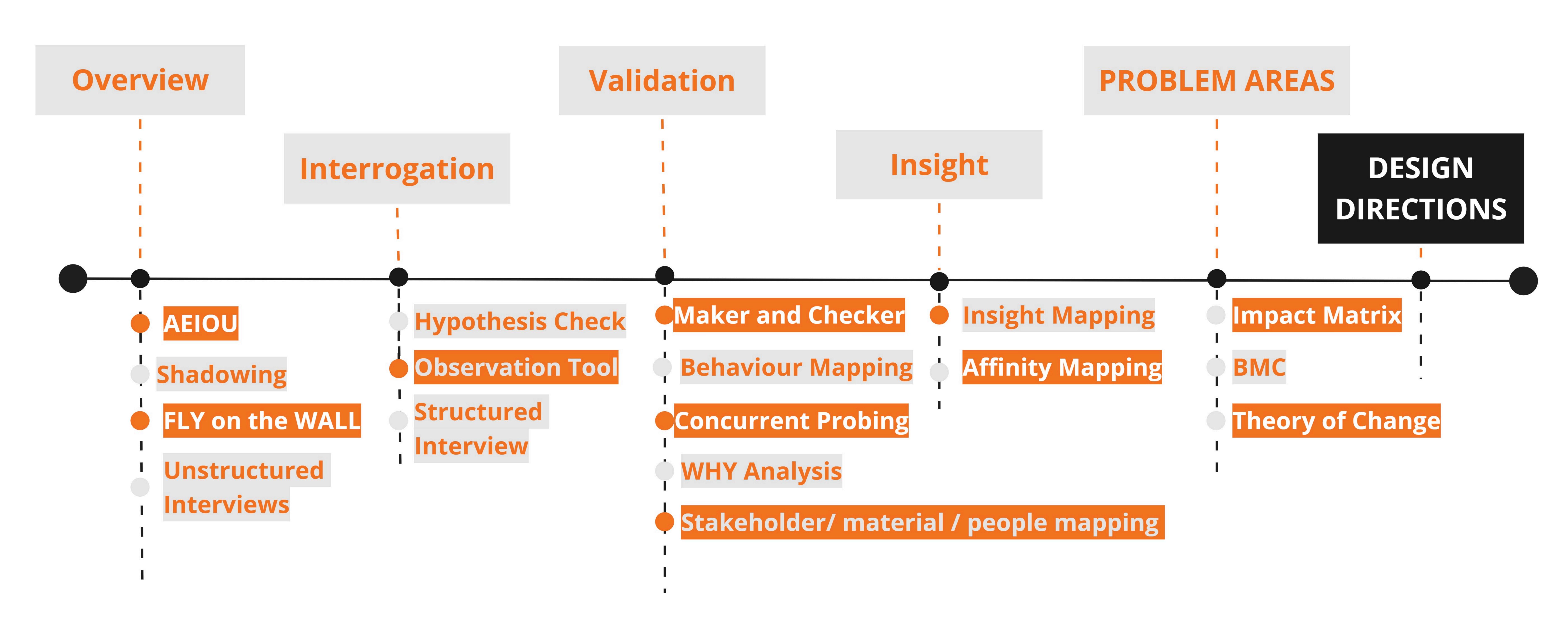
Triple Diamond Approach



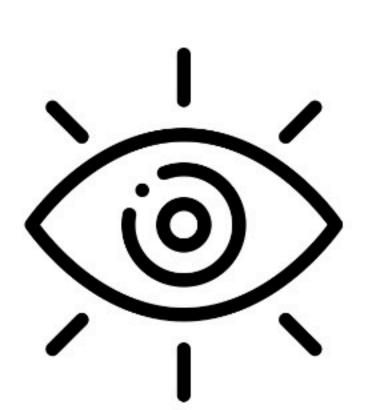
Research Flow



Research Methods



Introduction



VISION

foster a culture of caring , trust, ethical behavior with stakeholders and society by achieving the quality of goods



MISSION

To empower customer to secure life , property and business by delivering high quality & Innovative highest standards of the Fire protection solutions



CORE

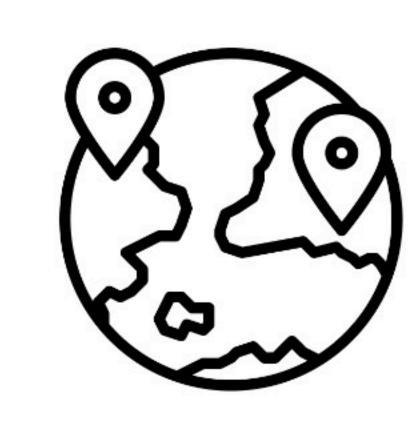
Producing quality and safety products as we care and want to protect lives of people.





SEGMENT

Decades producing garment for different segments of FR industry like oil & gas , electric arc , molten metal splash, flash fire and chemical splash.



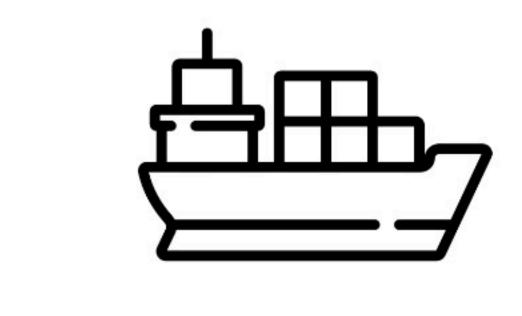
GEOGRAPHIC

Major focus in European, middle east , oceanic market with expansion in US and African market.



SHARE

India's largest producer of FR CAT-3 garments with annual turnover of 100 million USD.



INTERNATIONAL

Bulwark, Lac-mac, Inno Tex, Marck & Balsan, Steel Grip

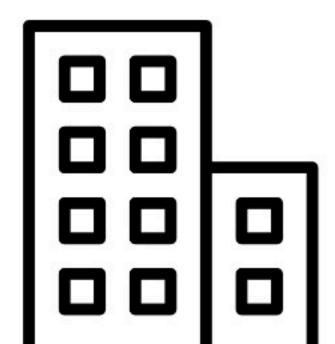


Arvind and Texport



PRODUCTS

Offer wide range of protective clothing solution like coverall ,Bib , jacket , shirt , trouser, balaclava



INFRASTRUCTURE

2 strategically located modern manufacturing units in Kolkata and Ahmedabad in SEZ area with 3000 per day capacity.

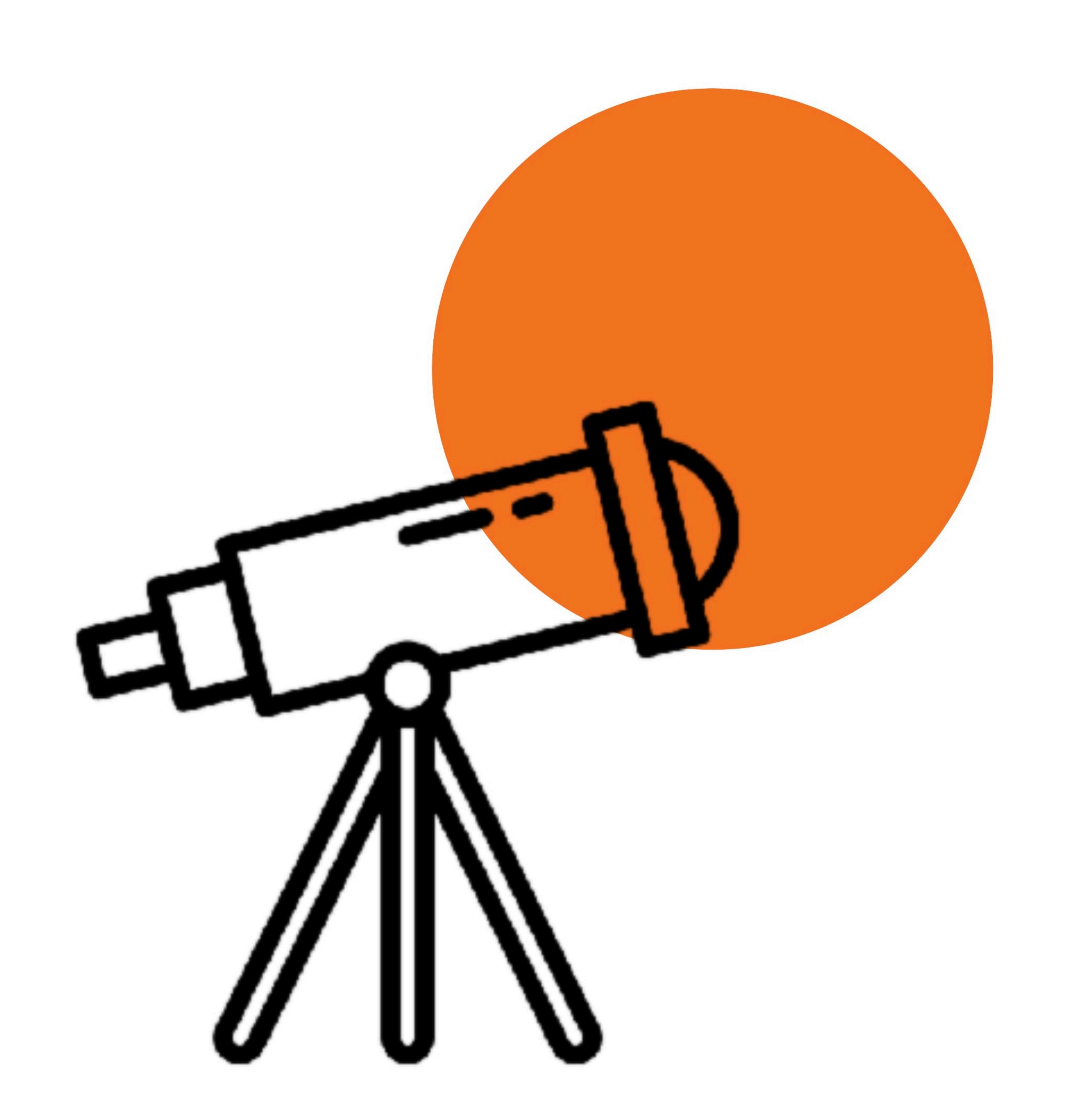


CERTIFICATION

Poses different certification like UL, CE, ISO 9001:2008 , PPE-High risk CAT III ,SA 8000 , Sedex for producing quality and safety products.

Flame Resistant Fabrics Market Size was valued over USD 4 Billion in 2016, and the industry will grow at a CAGR of up to 6.4% up to 2024. The overall FR market in Asia, Europe, and the United States in 2016 was around 1.8 million metric tonnes. It is estimated that the worldwide consumption of FRs will reach 2.8 million tonnes in 2024.

Discover

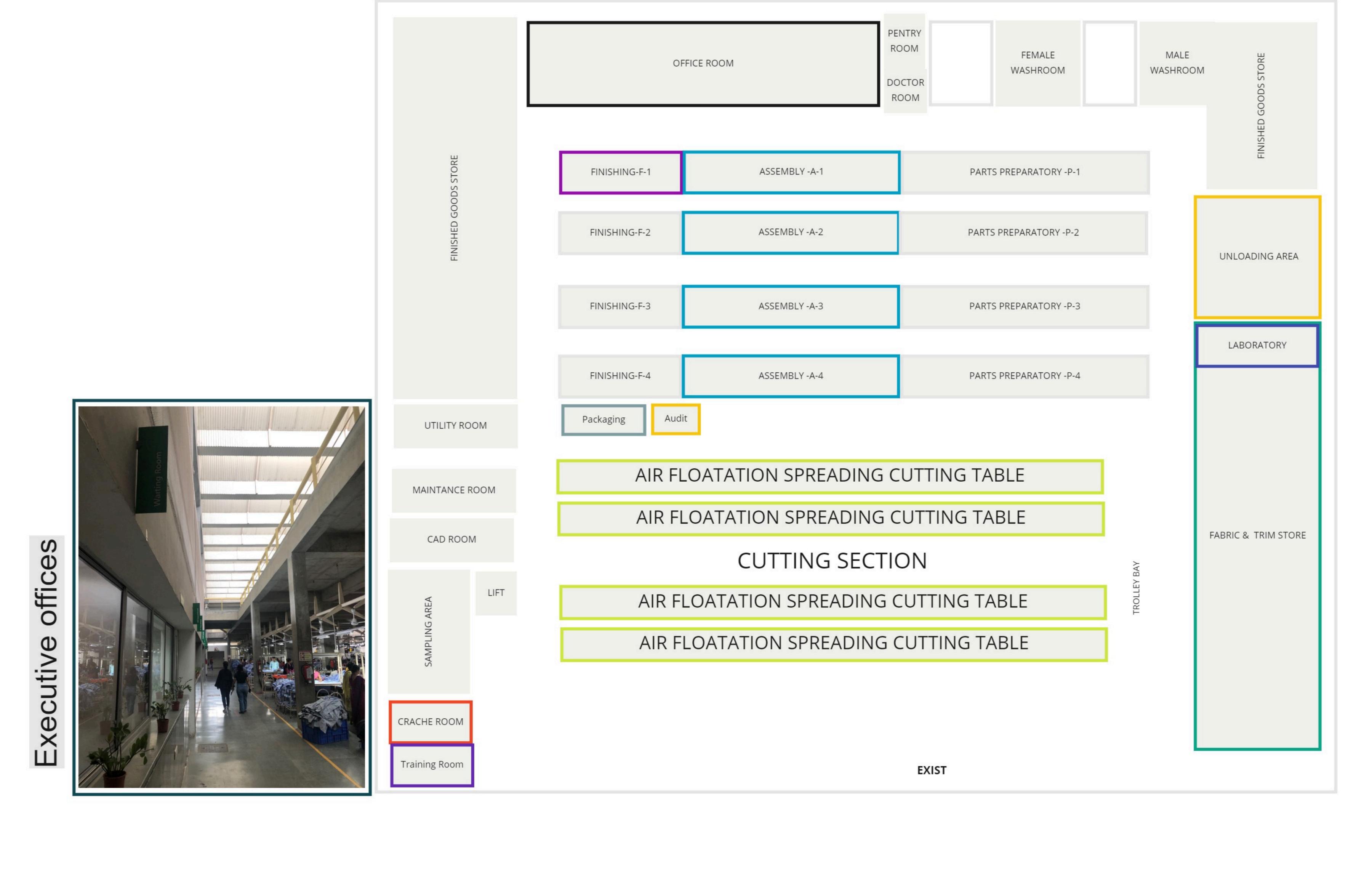


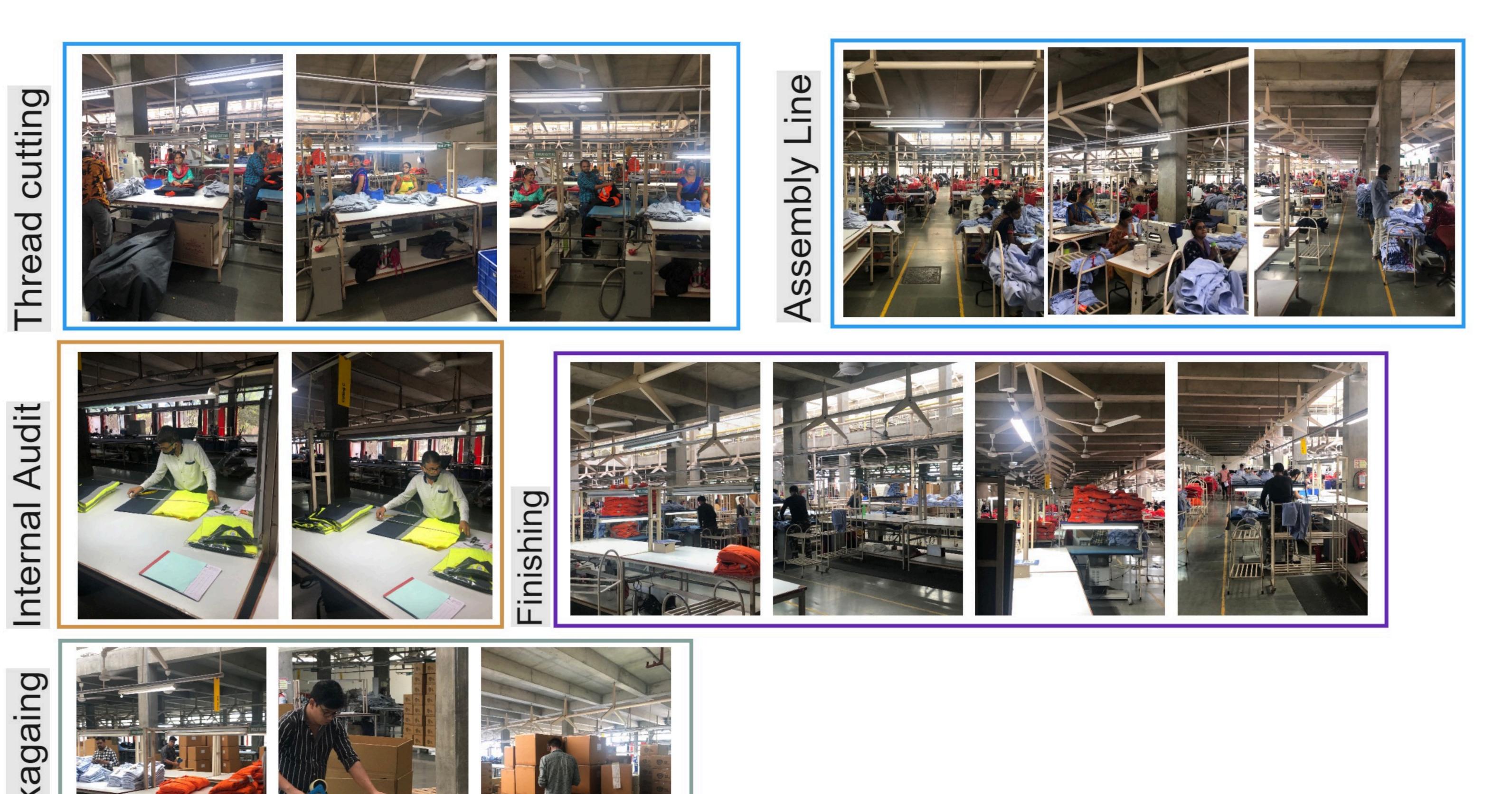
The stage of discovery focused on getting an overview of the organisation.

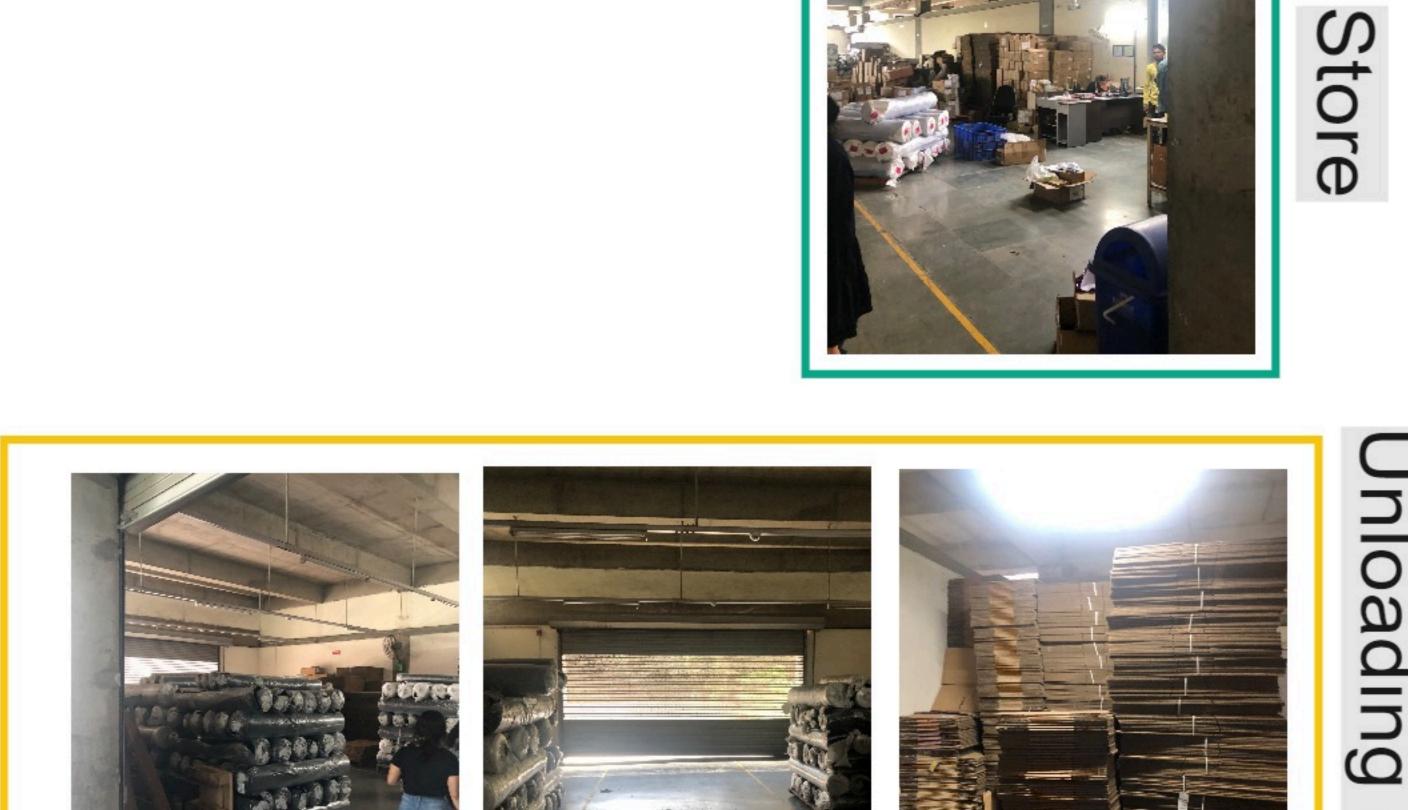
It involved **critical examination** of each and every facet, in hopes to uncover interesting insights

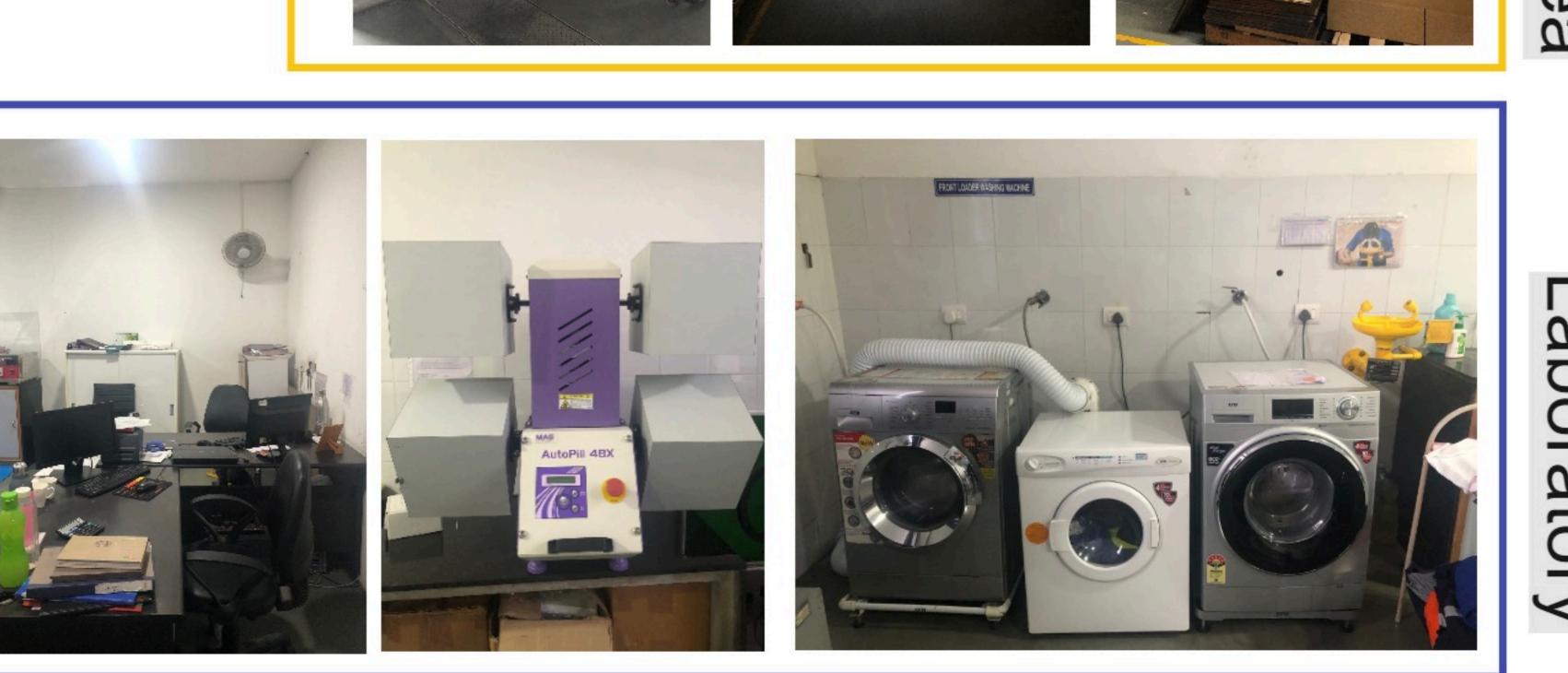
TOOLS: AEIOU, Shadowing, Fly on the Wall, Unstructured Interviews

Observation





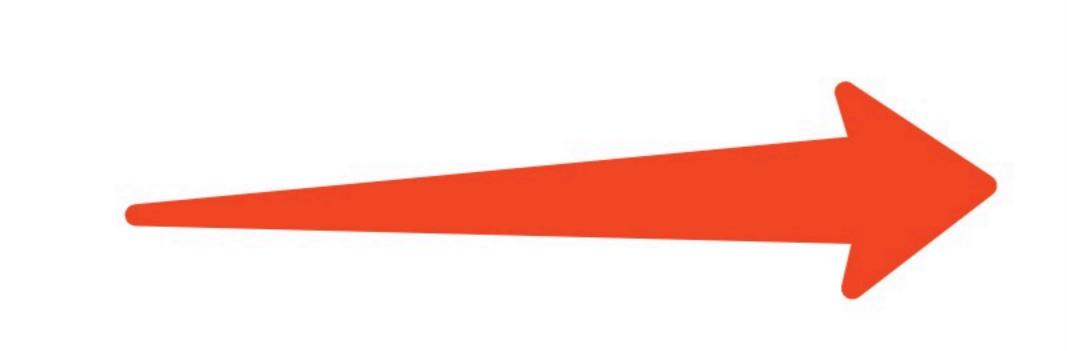


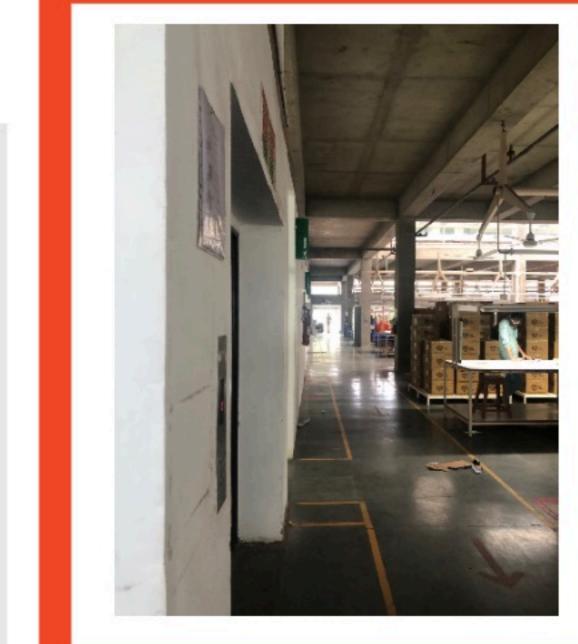


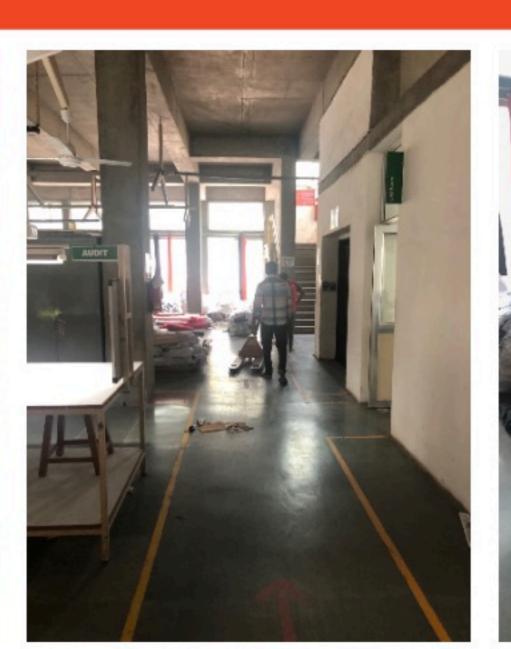


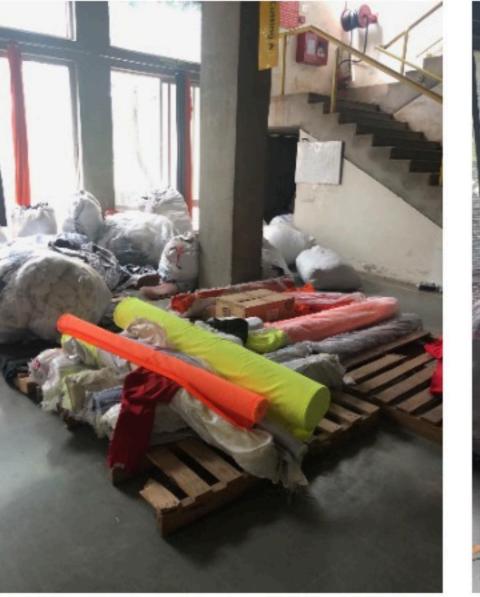




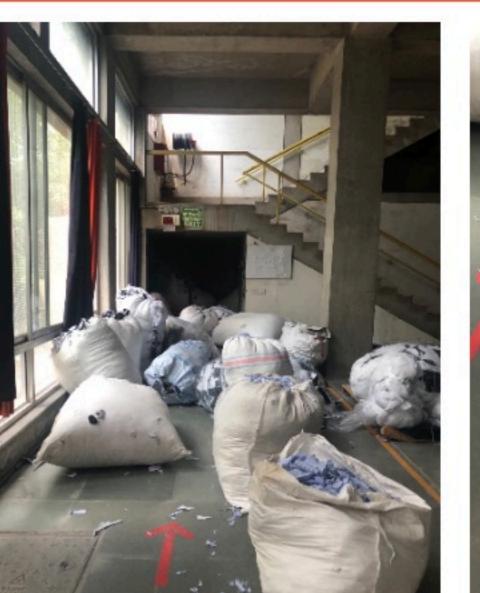




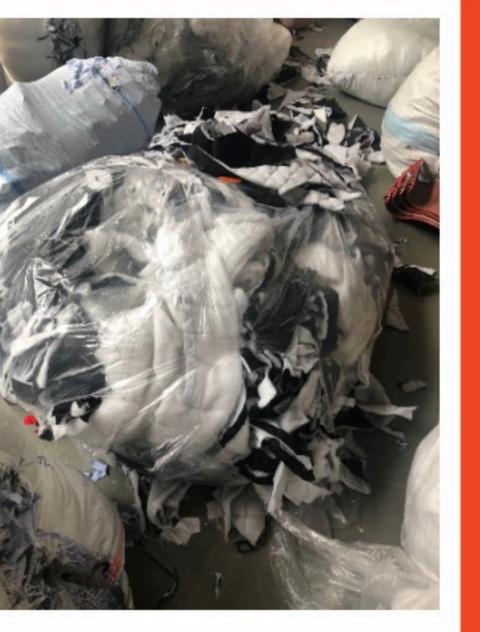












Hypotheses

Each **department is highly dependent** on the supervisor for its daily functioning. This makes it difficult to trace back any information in their absence.

Unclear segmentation and labelling in the storage which results in an inefficient inventory management system. This increases the time required to identify, find and issue materials.

The lab only **test a swatch against the whole fabric roll** which does not ensure that the entire roll is defect free. Thus, adding to fabric waste in case any defects are encountered later in the process.

The cutting stations are **generating alot of fabric and paper waste** which are not segregated and simply stored in bags. Incorrect handling of chemically treated fabric can have negative impact on the environment.

Data from every department **is tracked manually** and **in different formats**. This creates an issue in keeping track and analysis of important information.

During the whole production process, there is a significant amount of plastic waste generated at various stages such as store, finishing, internal audit etc.

Define



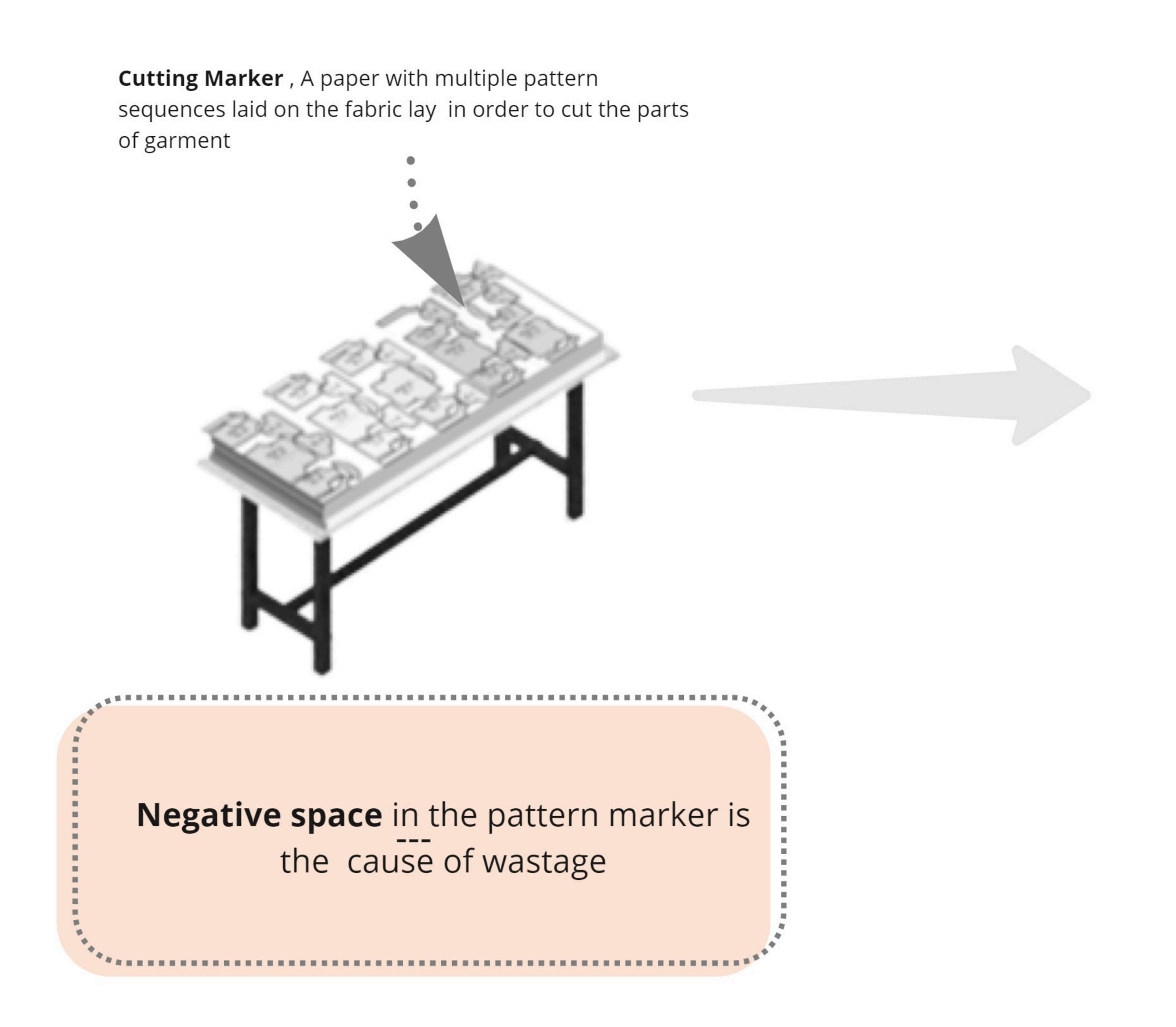
The observatory research discovered the area of Waste generation and management

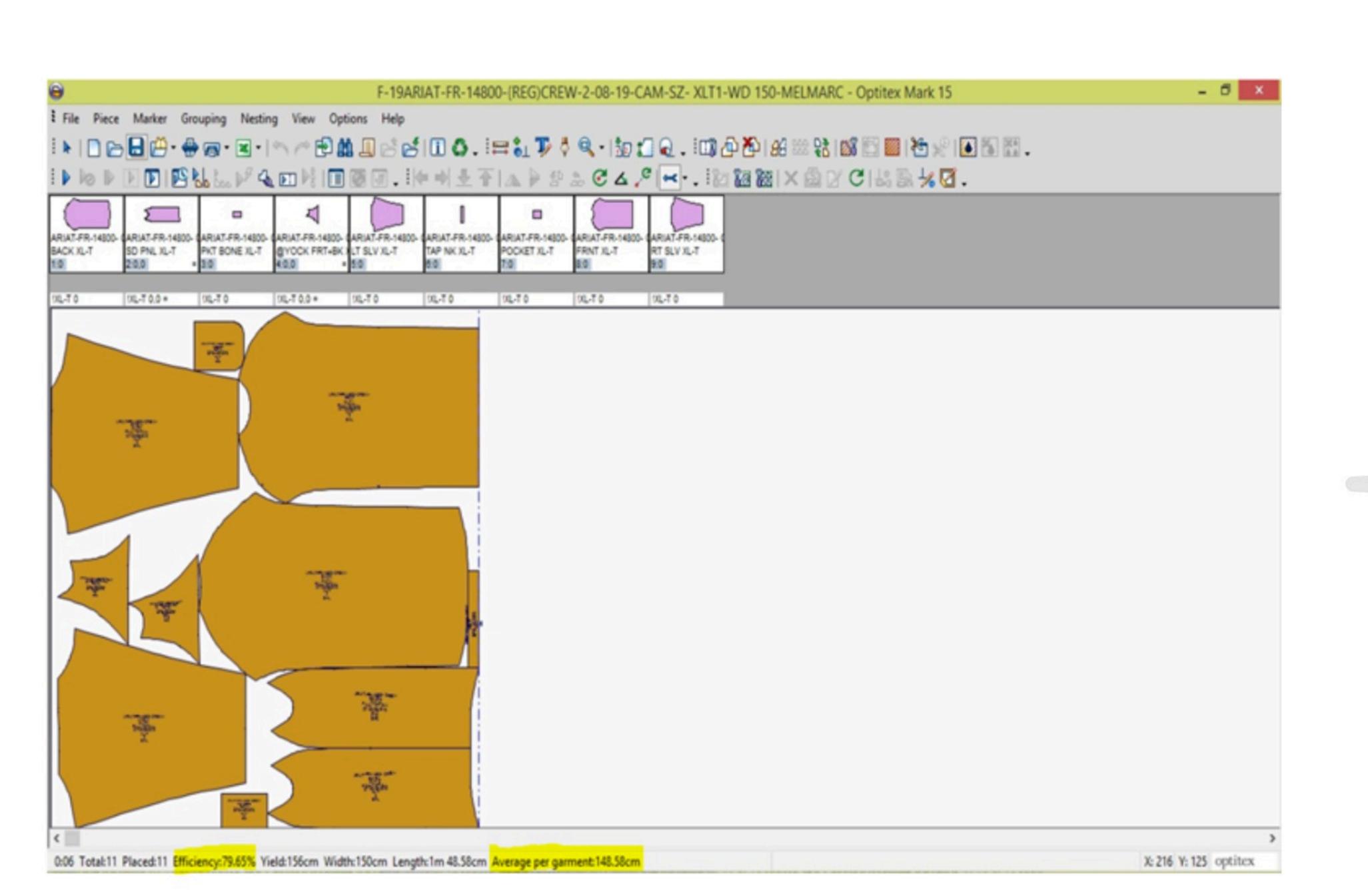
Defining the issues further, the research was directed at understanding the current context of the organisation

TOOLS: Structured Interviews, Hypothesis Check, Observatory tools

Interrogation

How is cutting wastage generated?

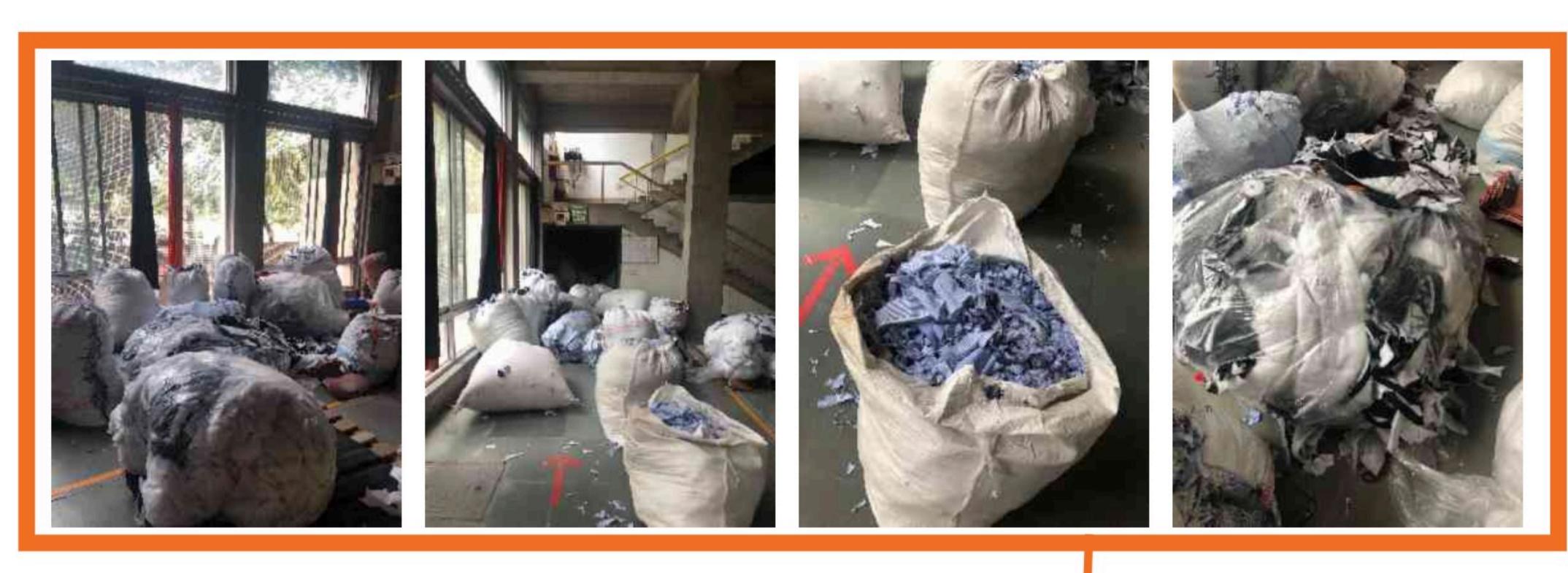




Due to curved lines in pattern create negative space which affect the marker efficiency.

Eg. In above marker 91% Marker efficiency is maintained which means there will be a wastage of 9% fabric wastage.

Less then 30% of the sold Waste is segregated and scientific disposal of waste is almost is never practiced- MoUD GOI 2010





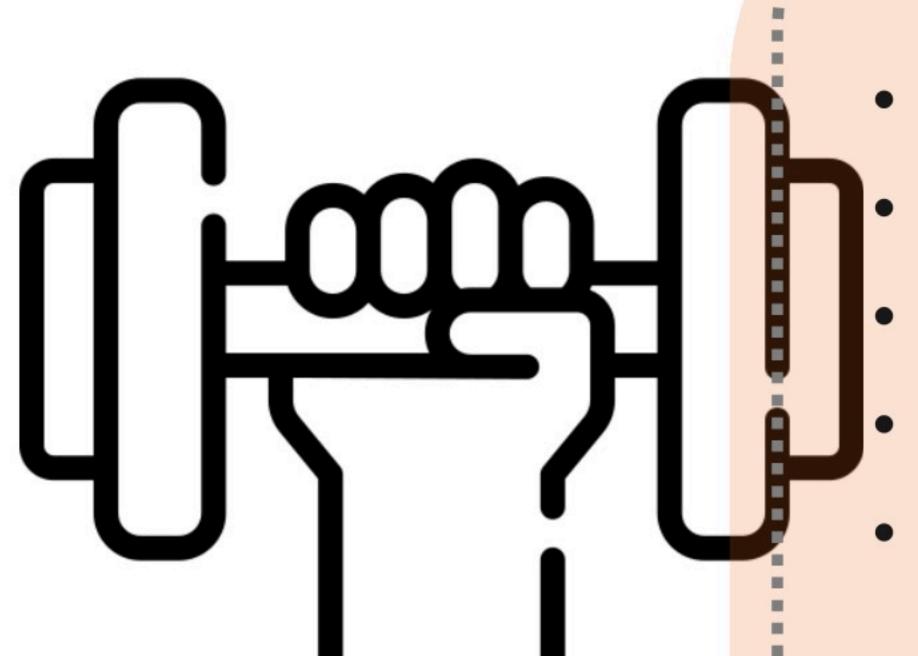
Annually wasting fabric worth of 30 Lakh rupees.

Tried to calculate the wastage per lay, per day, monthly, and annually

- Marker Efficiency : 90%
- Marker Length : 5 mt
- Per lay wastage : 10%
- Fabric cost : 240 per mt
- · Total cost wastage per lay:10000 rupees per mt
- · Total cost wastage per month: 1 Lakh
- Total cost wastage per year : 10 Lakh

In average cutting dept cut 3 lay that means they producing waste of 30 lakh which is a huge money.

SWOT Analysis



Pioneers in FR clothing in India

Innovation and Growth Mindset

Prime SEZ Location

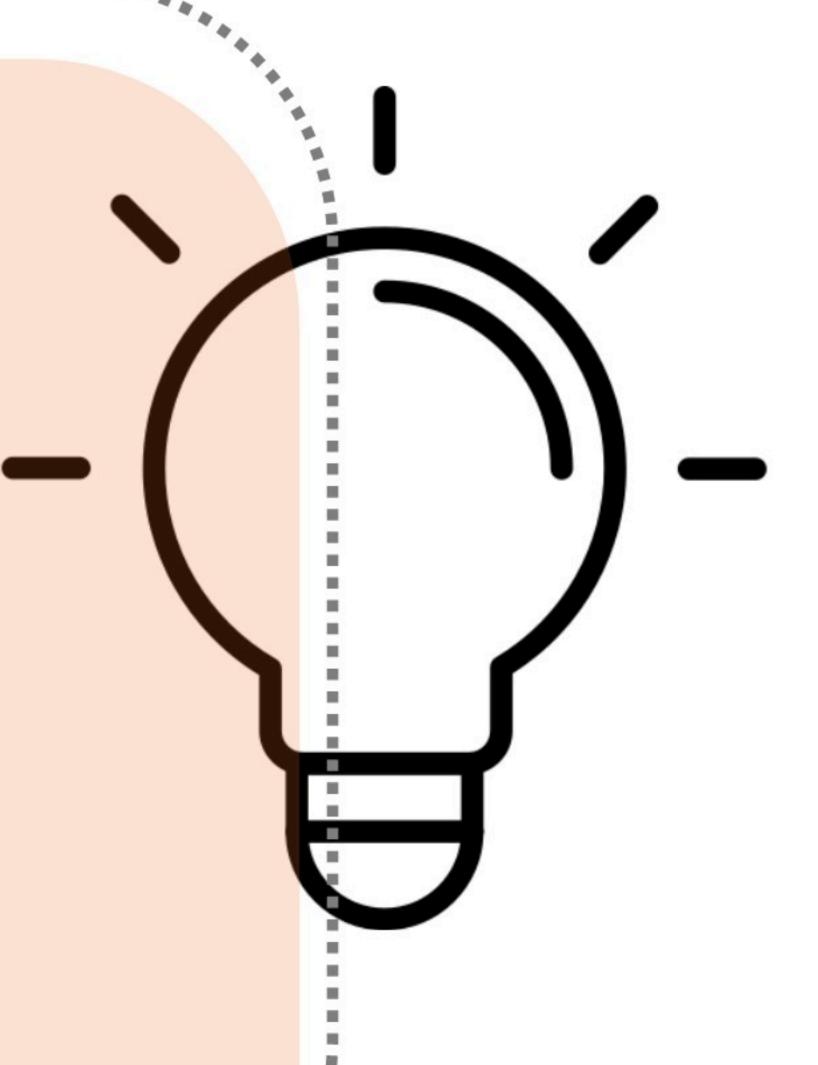
Work on small orders as well

 First to get certified on producing a category III garments in India and CE certification

STRENGTHS

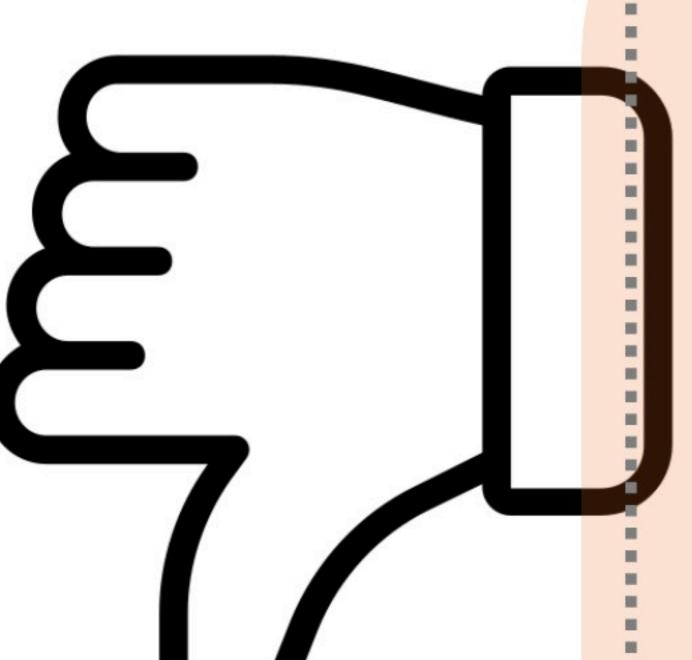


- New Markets for raw Materials
- New Segments
- JV's and tie ups
- · Waste management
- CSR



OPPORTUNITIES

WEAKNESSES

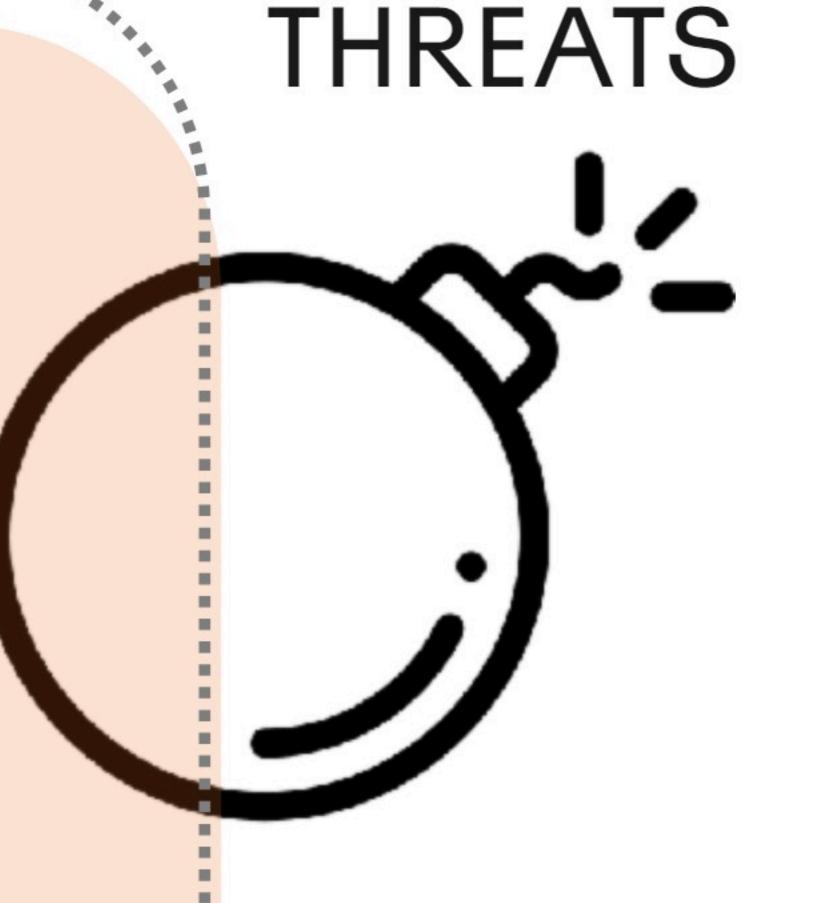


- Decentralised setup
- **Demarcation** of roles and responsibilities not defined .
- Non inclusive building
- Disorganised Store Management
- Not a lean manufacturing unit
- Absence of Safety measures for employees

- No visual checking of Fabric roll
- Not a vertical manufacturing unit

Dependency on Suppliers for Raw materials

- Indo-chinese relationship
- Vertical manufacturing units



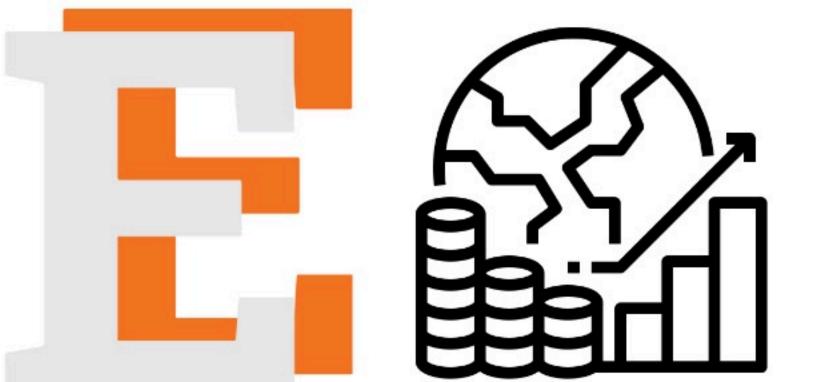
PESTEL Analysis



Import/Export relations with China, Europe etc.

Duty Free Trade

Import/Export duties



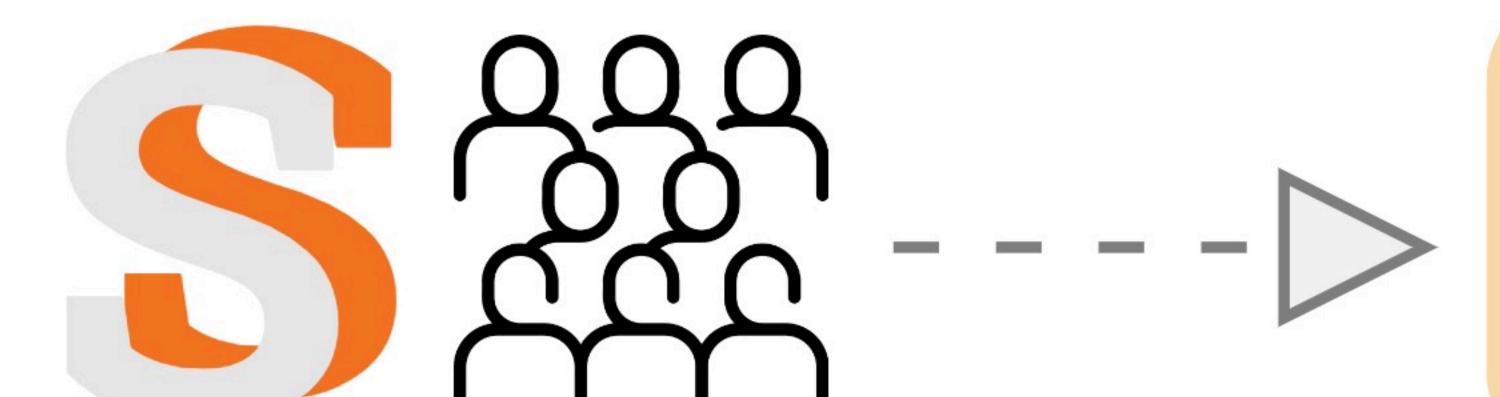


Inflation rates: raw material, transportation

Labour costs: min wages as defined by Gol

Tax benefits owing to their location in SEZ

Exchange rates: as most of their work is overseas



Local workforce First aid available at the unit but no safety wear provided

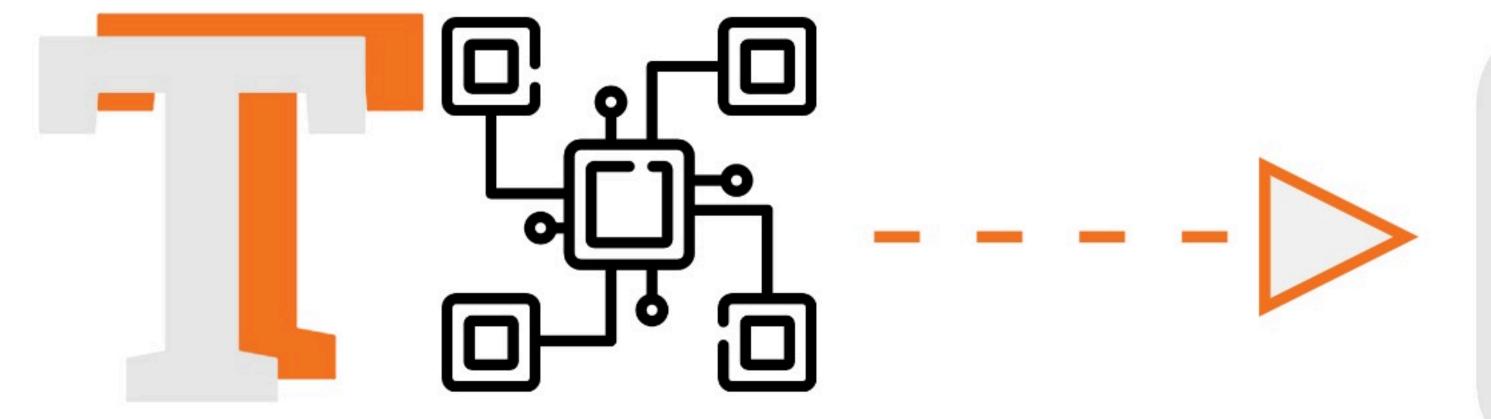
Higher number of women employees

Horizontal hierarchy of organisation

Young to middle aged employees

Low Iteration rates at executive level

High iteration rate at operator level



up to date in machines and tech + in house maintenance

R&D department exists but in Kolkata Redundant processes wrt inventory/store management



Fabric waste generated

Rejected fabric being burnt

Aiming for a Green Building certification



Compliances and certification

Unfavorable labor laws Aiming for a Green Building certification

Re-discover

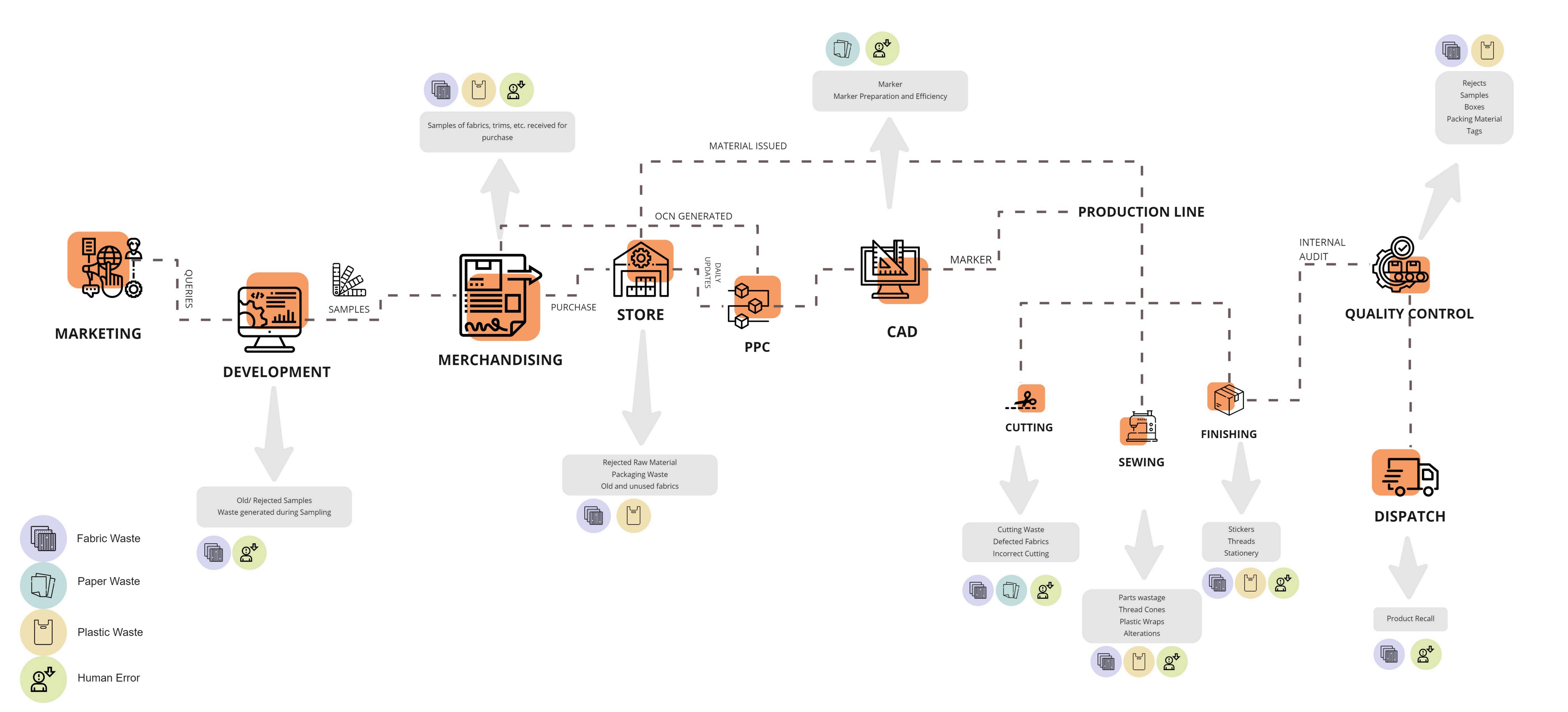


Using Waste Management as a lens to look at the entire organisation.

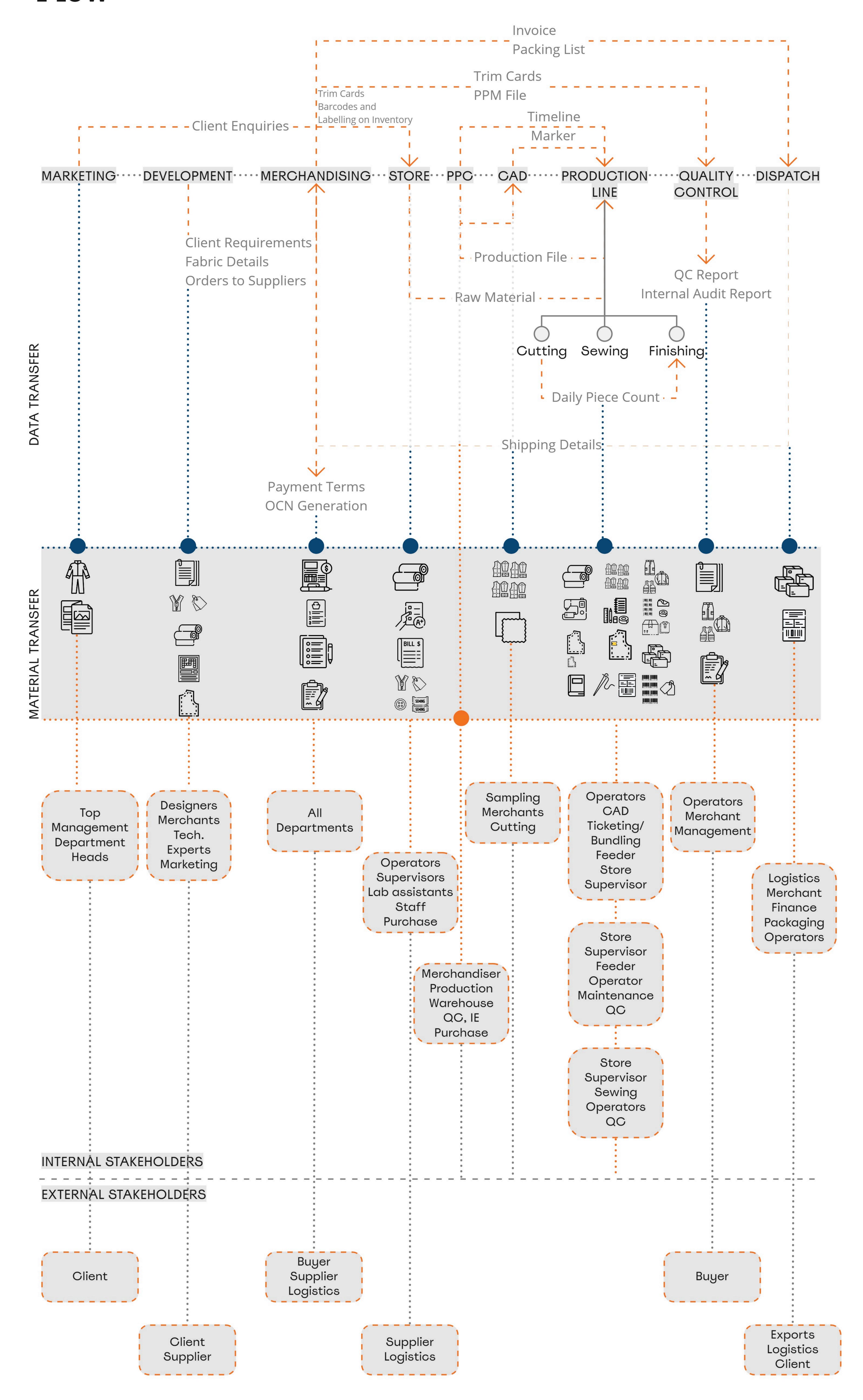
Mapping out the various internal stakeholders and information flow

TOOLS: Stakeholder Mapping, Structured Interviews, Hypothesis Check

Waste Mapping



Flow



Unused garments, if kept in storage for around 2 years, it loses it worth.

For us, feasibility is more important than style or looks.

The communication gaps are high-and packing complaints too, pallets, cartons open during travel, labelling of boxes is wrong etc.

There's no inspection here, or testing-we use the mill reports we get with the delivery.

There's usually no trace of where things went wrong.

If there's a fabric defect in between sewing, I write it down and keep the garment with me and wait to inform the roaming QC.

We are questioned if output target is not met and say out of 1000 pieces, 100 are damaged or don't pass the QC, our payment is affected.

Repair takes more time, approx 10 in a single lot.

We are aiming at getting a Green building certification soon, it's part of our 5 year plan.

There is no single file of the data for an order, in fact trims are also with just 2 people.

We're not scared of any competition, we're confident as we are pioneers.

have 2 notebooks, one rough for myself and one which we have to submit so that nothing is missed.

Re-define



Looking at the organisation through the lens of Waste, brought to fore an interesting question

Why is the organisation generating waste?

Especially when the organisation is aiming for a green building certification, which carries 13 points for Waste Management

"Waste is the result of inefficiency"

TOOLS: Concurrent Probing, Lean Waste, Maker-Checker, Behaviour Mapping

What are the reasons behind human errors and material wastage at TaraSafe?



To identify the reasons of waste generation at TaraSafe, we used the LEAN MANUFACTURING framework

Lean is the systematic approach to identifying and eliminating waste through continuous improvement by flowing the product or service at the pull of your customer in pursuit of perfection.

The waste generated at TaraSafe was categorised under the 8 categories of this framework

8 Types of Waste

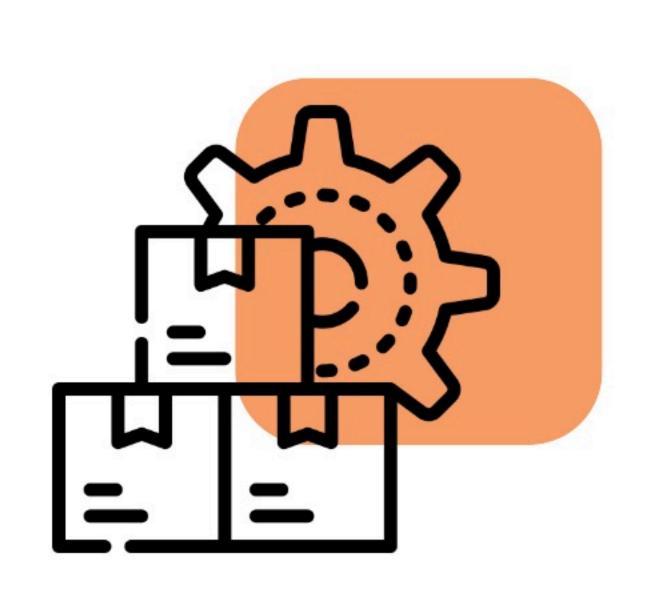




Wasted time, resources, and costs when unnecessarily moving products and materials.

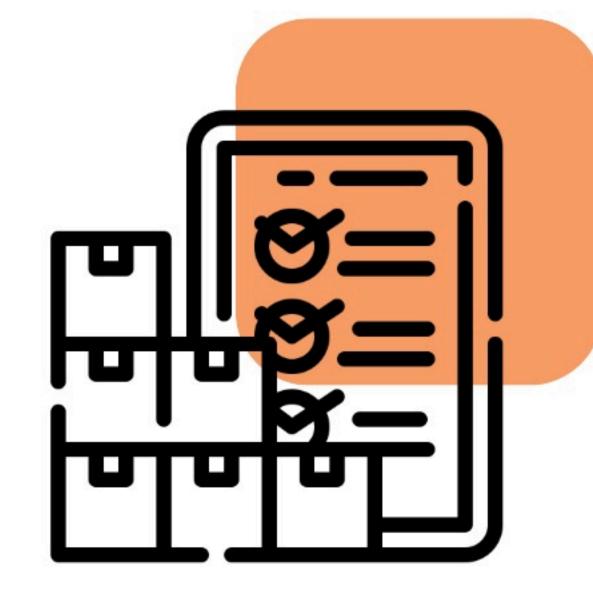
Panels Alterations Communication Information Tracing





Wastes from making more product than customers demand

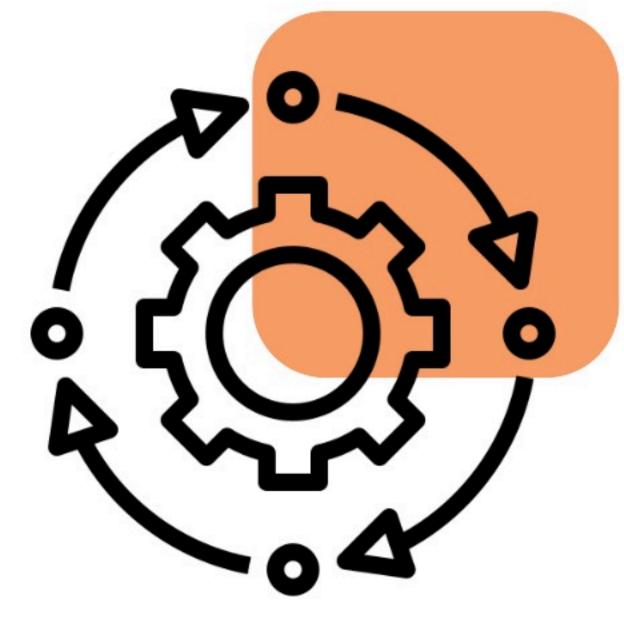




Wastes resulting from excess products and materials that aren't processed

Rejected Fabrics/ Rolls Improper Storage Incomplete Communication

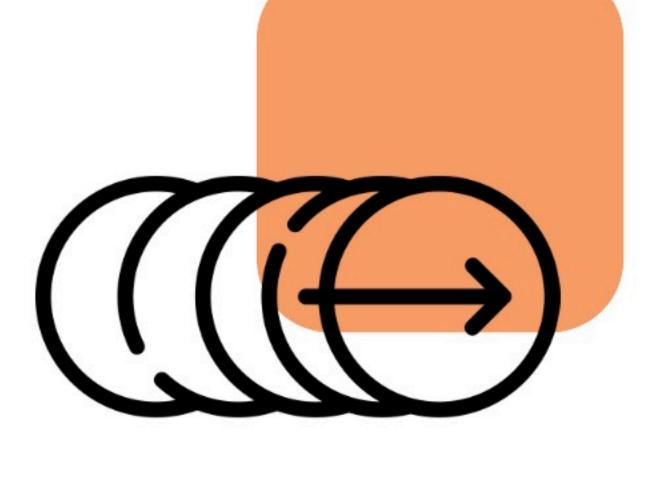




Wastes related to more work or higher quality than is required

Defected Panels are exchanged Alterations due to lack of info. of quality standard at operator level

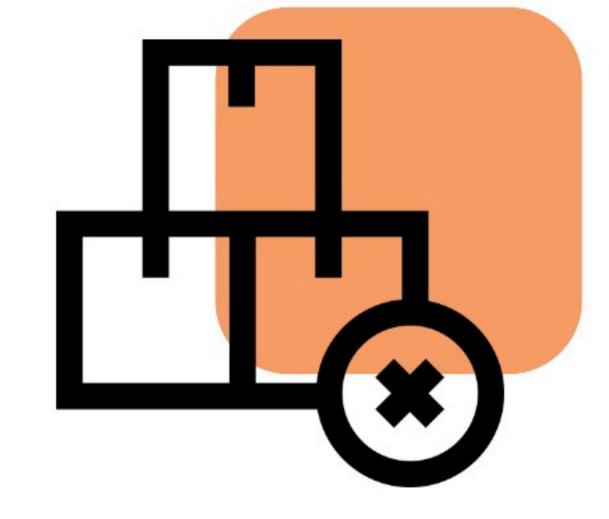




Wasted time and effort related to unnecessary movements by people or machines

Defected Fabric Lays Alterations and QC Dependency on Supervisors





Waste from a product or service failure to meet customer expectations

Fabric defects Trims and Labels Workmanship

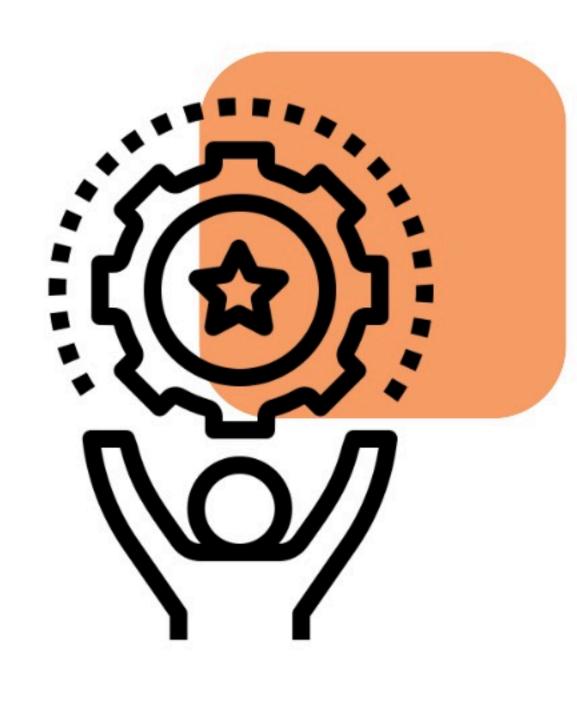




Wastes from time spent waiting for the next step to occur

Design communication Lack of complete information to operators maintenance of records.





Wastes due to underutilisation of people's talents, skills, and knowledge

Lack of responsibility Centralised decision making Dependancy on supervisors

How does it affect us?

4 pcs

Average Panel Replacement

Loss per order= 2% Cost/ Panel= 160 INR Total Loss/ Order= 12,800 INR

Loss/year= 1,10,97,600 INR*

*Assuming 20 panels are needed per garment Cost of fabric= 320 INR Maximum replacement are front panels Order Qtty= 100pcs

Alteration rate per order

Avg repair time= 6mins
Total repair time/order= 600 mins
Running costs= 5 INR
Total cost of repairs= 3000 INR
Yearly loss due to repairs=

7,20,000 INR #

#Assuming an order of a 1000 pcs Garments to be altered = 100 pcs



Cost of waste produced *

Marker Efficiency= 90%

Marker length= 5mt

Cost wastage/lay= 10,000 INR

Daily wastage with 3 lays= 30,000

INR

600 Mins

Avg time to take a decision

Running cost/min= 5 INR
Total cost/hour/ decision= 300 INR

Yearly losses= 4,33.500 INR[&]

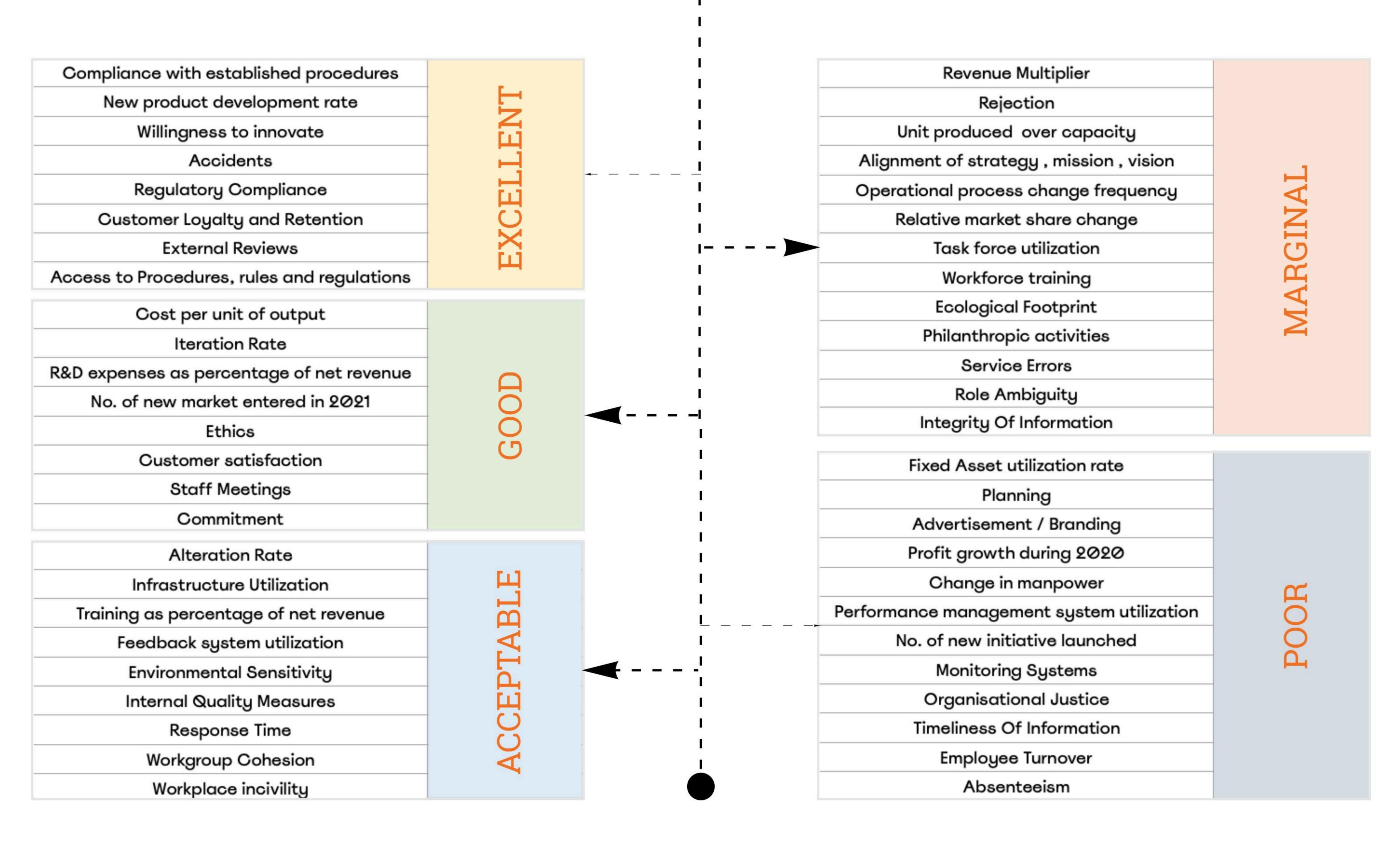
+Fabric Cost= 240 per mt

& Assuming 5 such decisions are taken a day

Culture **High Alteration Rate** Limited information is shared Lack of ownership, responsibility, Hence vision of Safety and between departments as • • • • • • • • accountability and proactiveness • • • • • • • Quality have not percolated centralised decision making by within the organisation amongst the workforce top management Everyone making own system Because management Following the mindset Because management following std • • • • doesn't include operator • • • of Brain and Machine • • • • • • haven't ask what system is mindset while preparing system burden to them operator want Silos Machine and brain mindset Boundaries Restrict lower level As management will not management to share their • • • • • • understand and end up problem or issues with upper losing job. management Insecurity Piece Rate System Which makes them dependent Fear of losing their Operator are resources, • • • • • on supervisor there to take no need investing in skilled operators. decision. training

Performance Profile

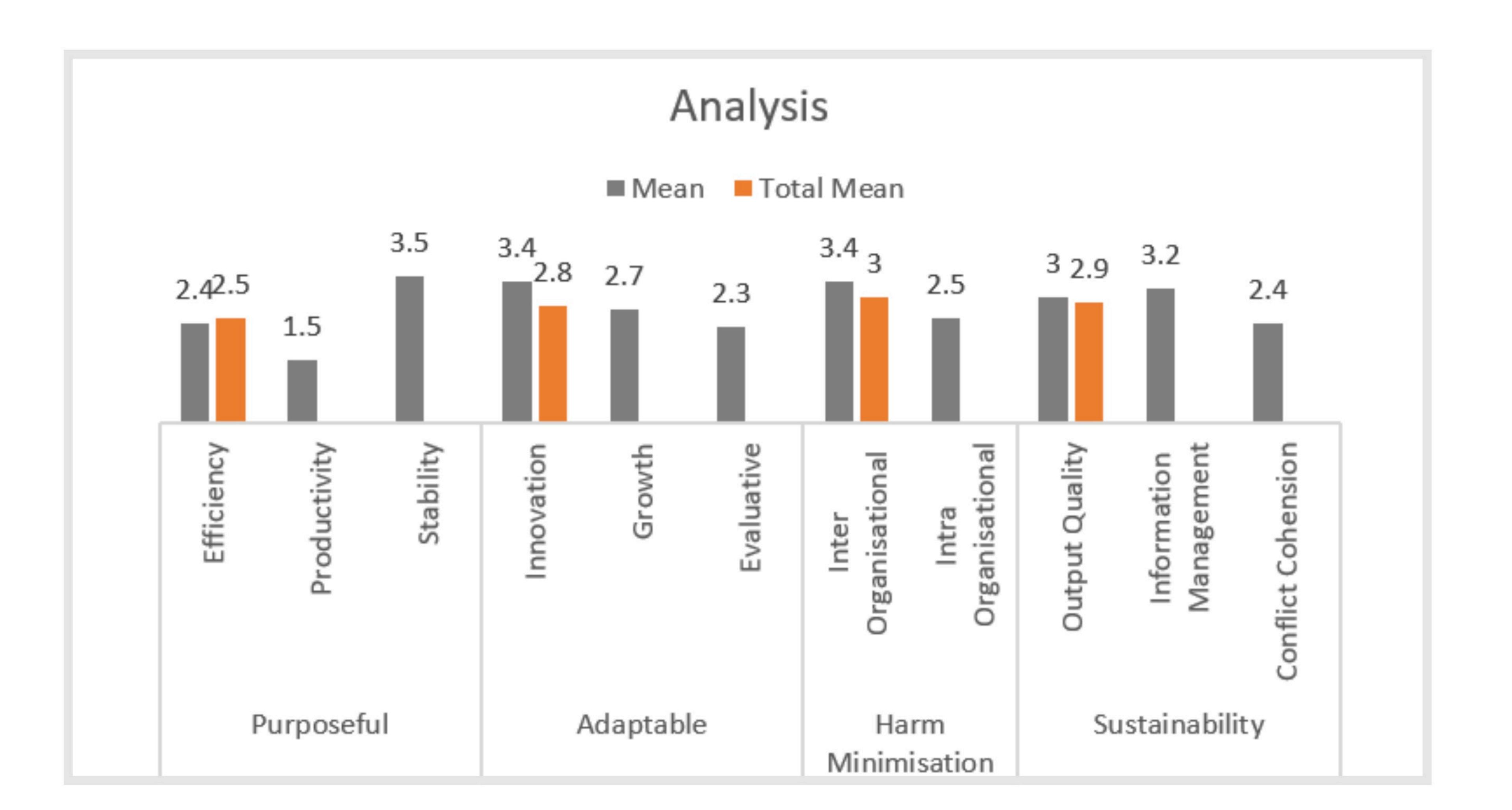
DIMENSIONS	CRITARION	POTENTIAL MEASURES	RATING					MEAN	TOTAL
			Excellent (5)	Good (4)	Acceptable (3)	Marginal (2)	Poor (1)		MEAN
Purposeful	Efficiency	Cost per unit of output						2.4	2.46
		Fixed Asset utilization rate							
		Revenue Multiplier							
		Alteration Rate							
		Rejection							
	Productivity	Unit produced over capacity							
		Infrastructure Utilization						1.5	
		Planning						3.5	
	Stability	Iteration Rate							
		Compliance with established procedures							
		Alignment of strategy, mission, vision							
Adaptable	Innovation	R&D expenses as percentage of net revenue						2.6	2.75
		Training as percentage of net revenue							
		New product development rate							
		No. of new market entered in 2021							
		Advertisement / Branding							
		Willingness to innovate							
		Operational process change frequency							
	Growth	Profit growth during 2020							
		Relative market share change							
		Change in manpower							
	Evaluative	Feedback system utilization						2.25	
		Performance management system utilization							
		Task force utilization							
		No. of new initiative launched							
Harm Minimisation	Inter Organisational	Ethics						2.5	2.75
		Workforce training							
		Monitoring Systems							
		Organisational Justice							
		Accidents							
	Intra Organisational	Regulatory Compliance							
		Ecological Footprint							
		Environmental Sensitivity							
		Philanthropic activities							
Sustainablity	Output Quality	Customer satisfaction						3	2.8
		Customer Loyalty and Retention							
		External Reviews							
		Internal Quality Measures							
		Service Errors							
		Response Time							
		Role Ambiguity							
	Information Management	Integrity Of Information						3.2	
		Timeliness Of Information							
		Staff Meetings							
	Conflict Cohesion	Access to Procedures, rules and regulations							
		Workgroup Cohesion							
		Employee Turnover						2.4	
		Absenteeism							
		Workplace incivility							
		Commitment							



Leverage Points



Willingness to explore new market



Adequate budget allocated to R&D

Lower the waste % by lowering the alteration rate

Increase the contribution in environmental sensitivities

Help in achieving the mission, vision and strategy i.e Green Building Certification

Develop



To develop strategies for the future, Need statements were articulated.

These statements were further used to create a strategic road map for the organisation.

TOOLS: Insight Mapping, Impact Matrix, Business model canvas, WHY Analysis

Insights

WASTE DISPOSAL

The lab only test a swatch against the whole fabric roll which does not ensure that the entire roll is defect free. Thus, adding to fabric waste due to defects encountered later in the process.

The cutting stations are generating a lot of fabric and paper waste which are not segregated and simply stored in bags because no one cared about it as it is non-value activity

MANAGEMENT

Each department is highly dependent on the supervisor for its daily functioning because operator are not trained to take decision.

Unclear segmentation and labelling in the storage which results in an inefficient inventory management system, increasing the time required to identify, find and issue materials.

process are made without considering them.

DATA ENTRY

Data is recorded twice by operators, first in a rough format which is faired out later resulting in loss of data and extra time consumption because following std are burden as system are not made considering them.

Need Identification

organisation, which reduces the redundancy of the process

The management is aiming for a Textiles can take up to 200+ Green Building Certification. years to decompose in landfills. According to the World Resources Material and resource There is a need to create multiple checkpoints to precisely test Institute, it takes 2,700 liters of management carries a the fabric roll and reduce wastage. reasonably high score in the water to make one cotton shirt. criteria for getting a Green Incineration and landfill of FR textiles produce large toxic outcomes. Building Certification. Vertical manufacturing units pose a threat to TaraSafe as There's a need to explore methods of better waste they are equipped to cater to disposal system. their own material waste internally. Current centralised management Slows down the process, There's a need for a robust store management system to system takes away the sense of reduction in efficiency, higher responsibility from the solve this problem. alterations. employees. There is a need for a more efficient, inter connected Will make it easier for other individuals to locate and procure needed items internal communication system that reduces dependency Reduced efficiency of store without being dependent on a single on few individuals. They work on a piece The current system of Unsystematic way of There is a need for another way of data entry in the based incentive system data entry adds to the manual data entry

and this takes away

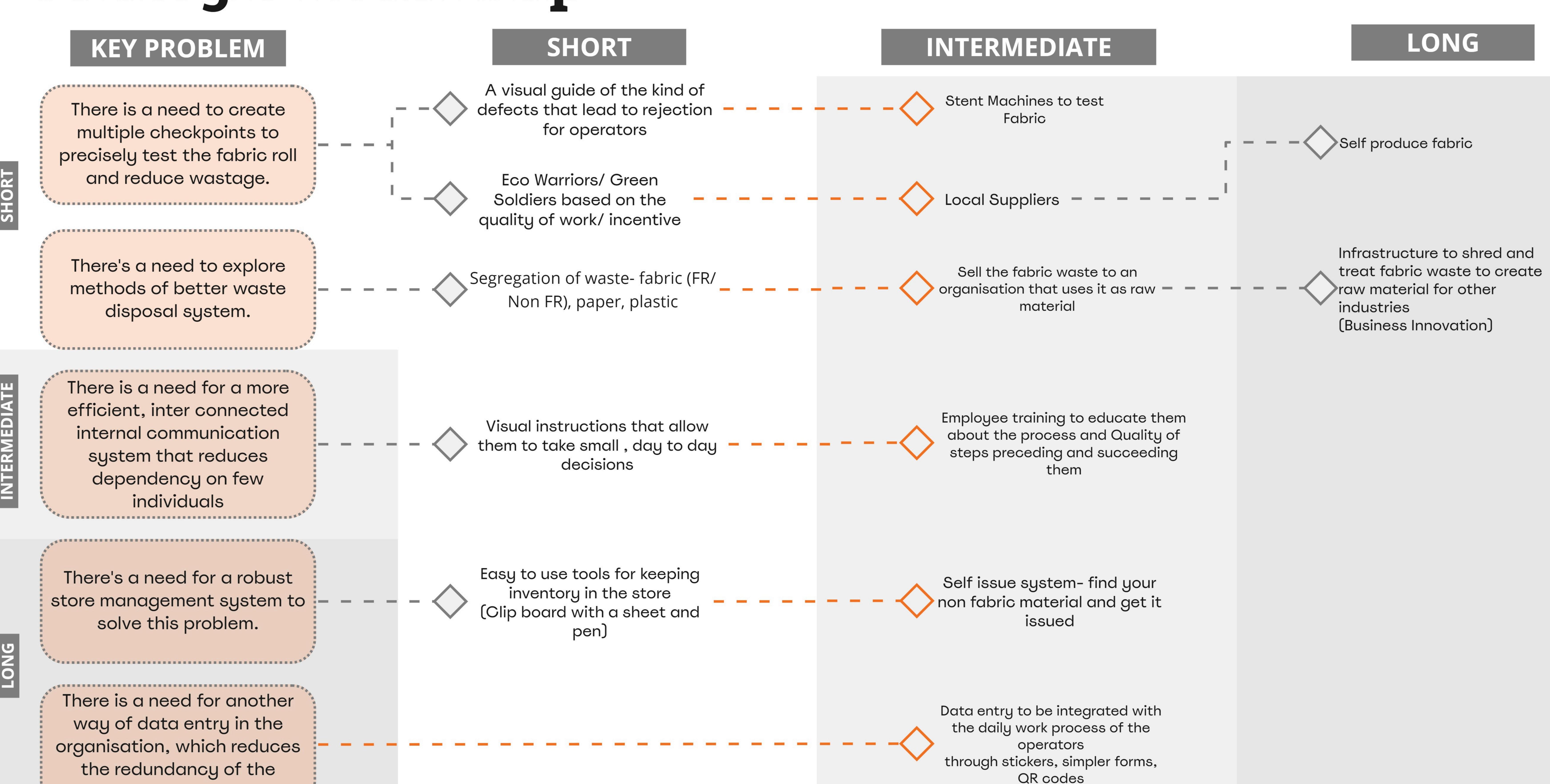
from their 'work' time.

results in data loss.

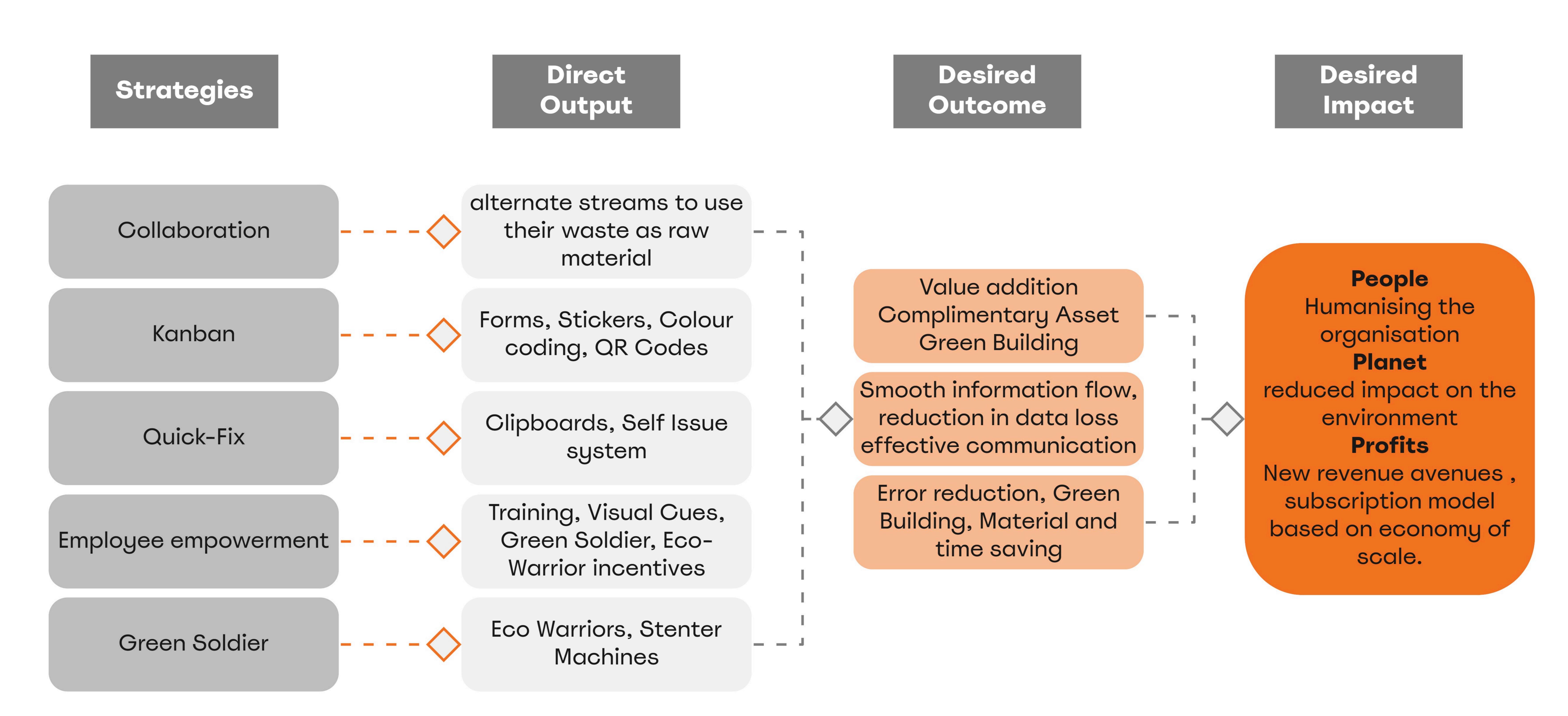
work of operators.

Strategic Road Map

process



Theory of Change



Impact Matrix

HIGH IMPACT

LOW IMPACT

LOW EFFORT

HIGH EFFORT

Forms for data entry

Green Warrior

Eco Soldier

QUICK ACTIONS

Recall garment

Visual Cues for Prompt decisions

Colour coding for data entry/inventory management

Alternate streams to use waste as raw material

Subscription model

LONG TERM

HIGH IMPACT

Self Issue System

Operator Training

Stickers for piece count

Clipboards

Consultancy

T.ACFHOIDER TASKS

Domestic Suppliers

Stent Machine

QR Codes for piece count

TIME WASTERS

LOW IMPACT

LOW EFFORT

HIGH EFFORT

Business Model Innovation

24th December 2021

Key partners

What are your key partners to get competitive advantage?

- Arvind Mills
- Vardhman
- Xinxiang Zhuocheng
 Special Textile.co LTD
- FR Fabric supply from China
- HDS Logistics
 Solutions
- BTTG
- Bureau Veritas
- Sedex
- IIT (R&D)
- Intra Tech (Lab)
- Chindi
- · Dwij
- Arvind Mills
- Coats
- · Twiga
- Automobile Seat
 Manufacturers

Key activities

What are the key steps to move ahead to your customers?

- FR Garment Production
- Marketing & BD
- R&D
- Fabric waste collection, segregation, processing
- Collaboration
- Co-Creation
- Recycling Fabric Waste

Key resources

What resources do you need to make your idea work?

- Raw Material
- 2 production units
- Skilled Operators
- Certifications
- Supply Chain
- Fabric Waste
- Existing buyers

Key propositions

How will you make your customers' life happier?

- empower
 customer to
 secure life
- delivering high quality & Innovative Fire protection solutions
- Pioneers in the Industry of FR, India
- Protecting environment and people

Customer relationships

How often will you interact with your customers?

- 24x7 Customer support
- Constant
 Communication for ongoing orders
- Daily updates on Social media
- Sustainability Updates
- Feedback Loops

Channels

How are you going to reach your customers?

- Social Media
- Websites
- Blogs
- Newsletters
- Pick ups for used garments

Customer segments

Who are your customers?

Describe your target audience in a couple of words.

- · ONGC, SAIL
- Oil & Gas
- Vedanta
- Fire Fighting
- Bharat Petroleum,
 India Oil
- Chindi
- · Car Seat Fillers
- Electrical Cords
- Insulation
 manufacturers in
 construction
- Yarn and Thread
 Making

Cost Structure

How much are you planning to spend on the product development and marketing for a certain period?

- Importing FR
 Fabrics from China
- Compliances &
 Certification
- R&D

- Legal
- Management /
 Maintenance
- · Recall

Revenue Streams

How much are you planning to earn in a certain period? Compare your costs and revenues.

- Order Based
- TaraArch
- Complimentary Assets- existing buyers to send used garments- raw material
- · Consultancy- Help with certifications
- Subscription Based Model

We Protect. We care.