

Faculty of Design

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## Designing for second life: Systemic design for sustainable packaging in appliance manufacturing industry

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# Designing for Second Life

Systemic Design for Sustainable Packaging in  
Appliance Manufacturing Industry

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[www.nid.edu](http://www.nid.edu)

Sponsored by

IFB Appliances, India

[www.ifbappliances.com](http://www.ifbappliances.com)

RSD8 Symposium

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19th Oct 2019

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IFB Industries Limited  
manufactures **more than**

**3,00,000**

**front load washing machines**  
at its manufacturing facility in  
Goa **every year.**

**= 15,00,000 kg**

**Weight** of packaging weight  
generated every year

**= 24,595 m<sup>3</sup> = 95,854**

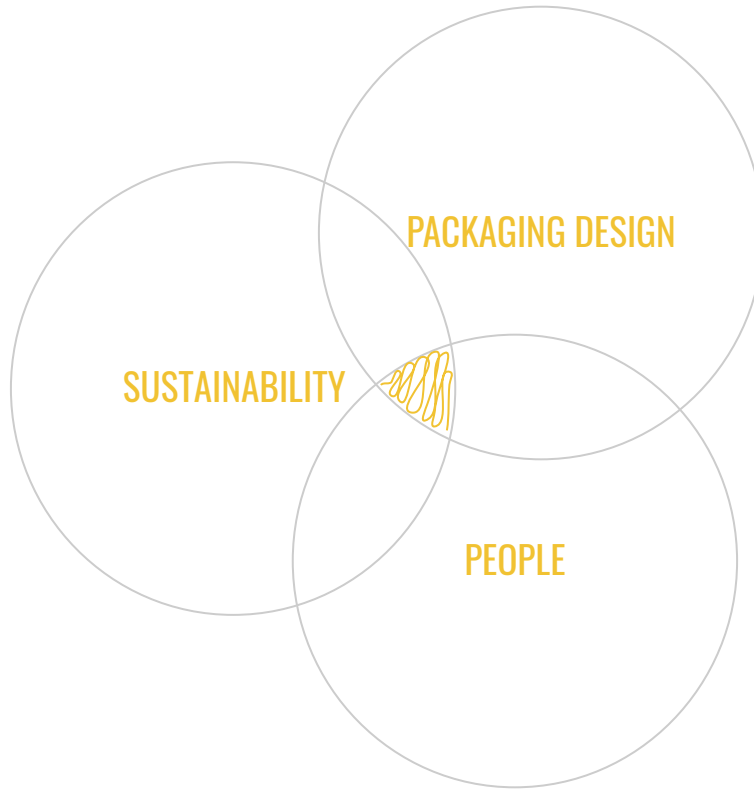
**Volume** of packaging weight  
generated every year

Space taken by

**95,854**

Front load washing machines





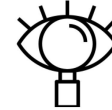
## SYSTEM DESIGN



To understand the whole system involved in the area and dependent on the area

### NOW

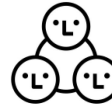
To understand the current situation



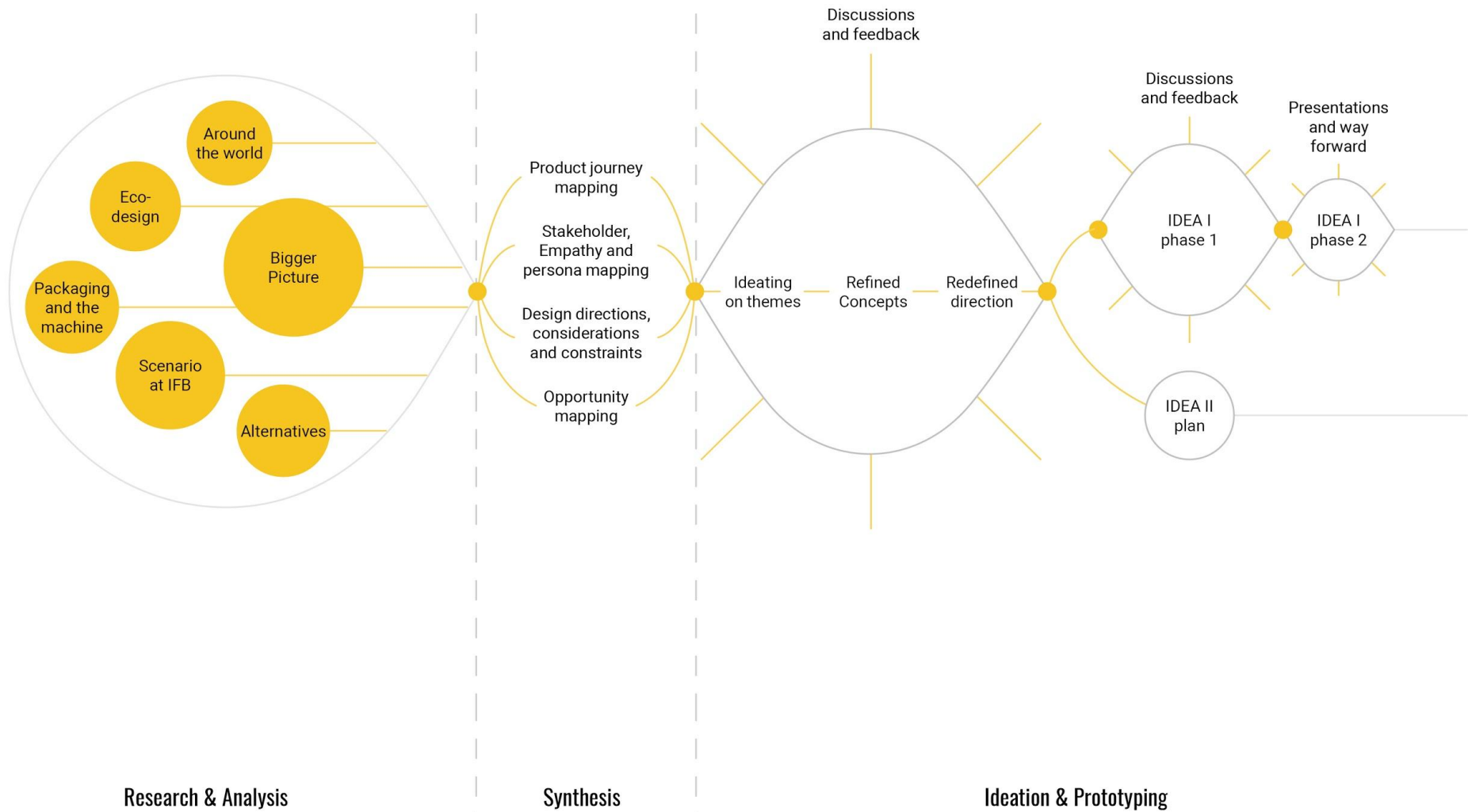
To identify and get actionable insights



To find the scope and levels of interventions possible



To understand the audience and their ethnography





Tobacco pack reused as picnic lunch box

**MONSANTO**  
Cotton

**How To Make  
Precious Cotton Cloth**

*Do Double  
Work!*



Print the cloth with colorful, attractive patterns. (Bemis' exclusive patterns are designed by one of America's leading artists.)



Make the cloth into bags for feed and flour. (Bemis, a leader in the field, makes millions of printed cloth bags every year.)



Distribute that feed and flour to American farms and families. (Bags carry practically all of the nation's feed and flour to market.)



Make the printed cloth from the bags into dresses, aprons, curtains... scores of things. (So the cloth does double work... for a long time.)



As spring flowers, modern as tomorrow, serviceable as the finest... that's what housewives across the country get in the home-sewn clothes made of printed cloth from Bemis Bags. There is always a wide selection of right-up-to-the-minute designs... new ones regularly available.

Ideas for many important uses for cloth from bags are found in the booklet "Bag Magic for Home Sewing," published by the National Cotton Council, Dept. 101, Box 18, Memphis, Tennessee. Write for a free copy!

☆☆☆

It's a smart thing—making cotton cloth do double work. First, it carries poultry and livestock feed, as well as flour, to help feed America. And then it helps to clothe countless families and furnish countless homes.

Best part about using cotton cloth this double-value way is that it *adds* to the nation's clothing material... doesn't diminish the supply of bolt goods made primarily for clothing, draperies, etc. That's because cotton textiles for bags are specially woven for that purpose... they're really different fabrics.

So, when millers put their feed and flour in Bemis dress-printed cloth bags, it's just like multiplying the output of the nation's cotton mills.

**BEMIS BRO. BAG CO.**

GENERAL OFFICES • St. Louis 2, Mo.

Burlap, Cotton and Paper Bags



26 PLANTS THROUGHOUT THE COUNTRY

Flour sacks repurposed as dress materials

*Upcycling **increases** value while  
Downcycling **diminishes** value*

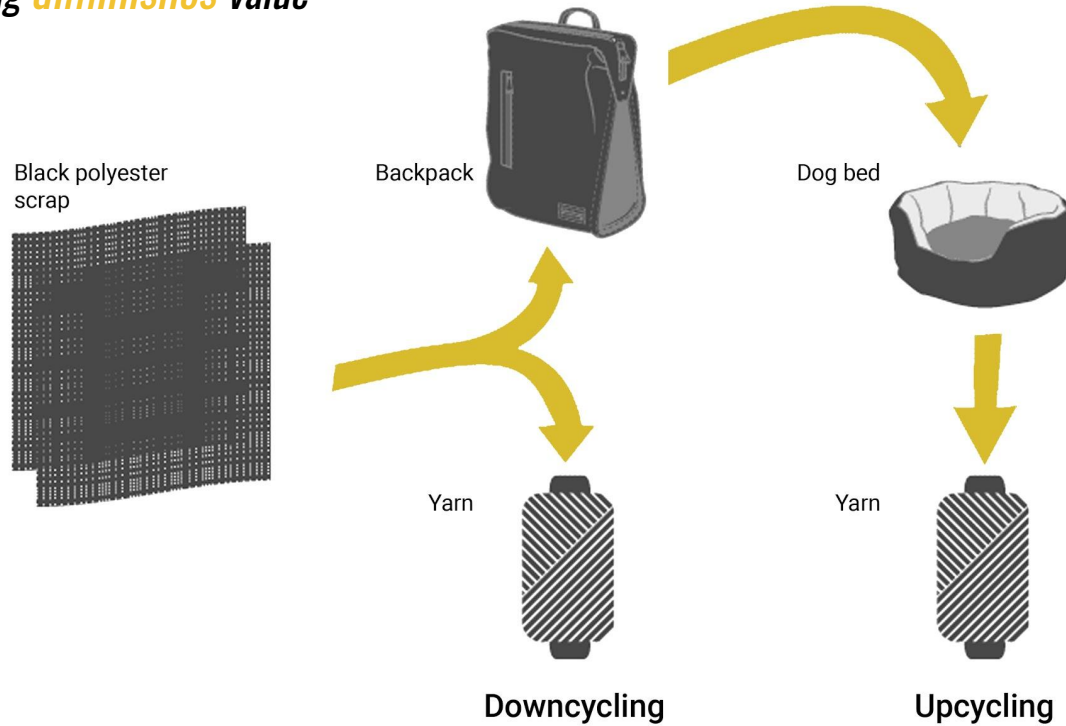


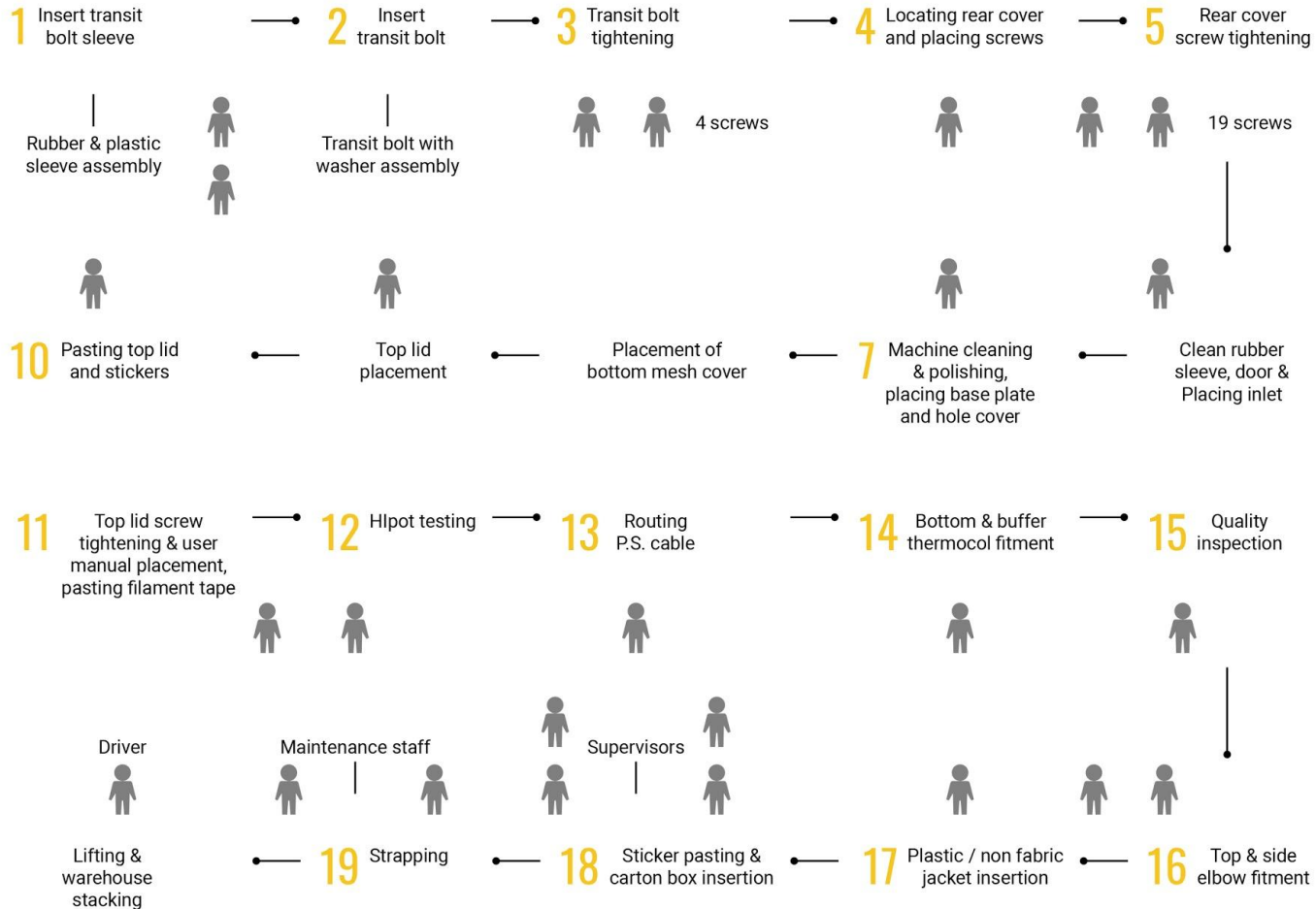
Image Courtesy : [www.looptworks.com](http://www.looptworks.com)



Ecovative Mycellium based packaging    Give Back Box

Puma's Clever Little bag

# The Packing Line





Why is packaging in  
India different from other  
parts of the world ?



The reasons are ....



Roads



Mishandling



Extreme weather conditions



Approx.

**24 %**

of **total volume** of each machine during transport is packaging.

Approx.

**7 %**

of **total weight** of each machine during transport is packaging.

## Manufacturing



## Customers



## Sales, transportation and installation



## People at the end of life



There is a lot of **energy** left in the materials that needs to be put back in the value chain

## Recycling Value

Courtesy : <https://vrecycle.in>

Most segregators take items on the basis of its recycling value which is classified into :

### High value

Items fetching more than 6 Rs/kg  
PET bottles, News paper & Cardboard, Metals, Hard plastic

### Low value

Items fetching 1-4 Rs/kg  
Tetra pack cartons, plastic carry bags etc.

### No value

Items fetching 0 Rs/kg  
Old clothes, thermocol etc.

### Current packaging

Corrugated  
Packing box



PE Plastic Jacket  
& PP Strap



EPS  
Packing Cushion





To better understand how consumers emotionally respond to protective packaging in the packages they receive, Pregis collaborated with Package InSight to determine which common packing materials were most favorable.

## EMOTION? DETECTION?



State of the art technology was used to capture the movements of 42 facial muscles that represent different emotions



## WHAT'S INSIDE?

The study incorporated the usual suspects found in most parcel packaging



## MOST POSITIVE



Participants displayed the MOST POSITIVE emotion toward bubble cushioning, paper and Pregis Air Pillows



Peanuts were not as loved

## IMPACT OF DAMAGE!

# 73%

Would be unlikely to purchase from a company again if their products arrived damaged



## MOST COMMONLY RECYCLED MATERIAL

Pregis GREEN Air Pillow packaging was the most commonly recycled material, closely followed by paper packaging!

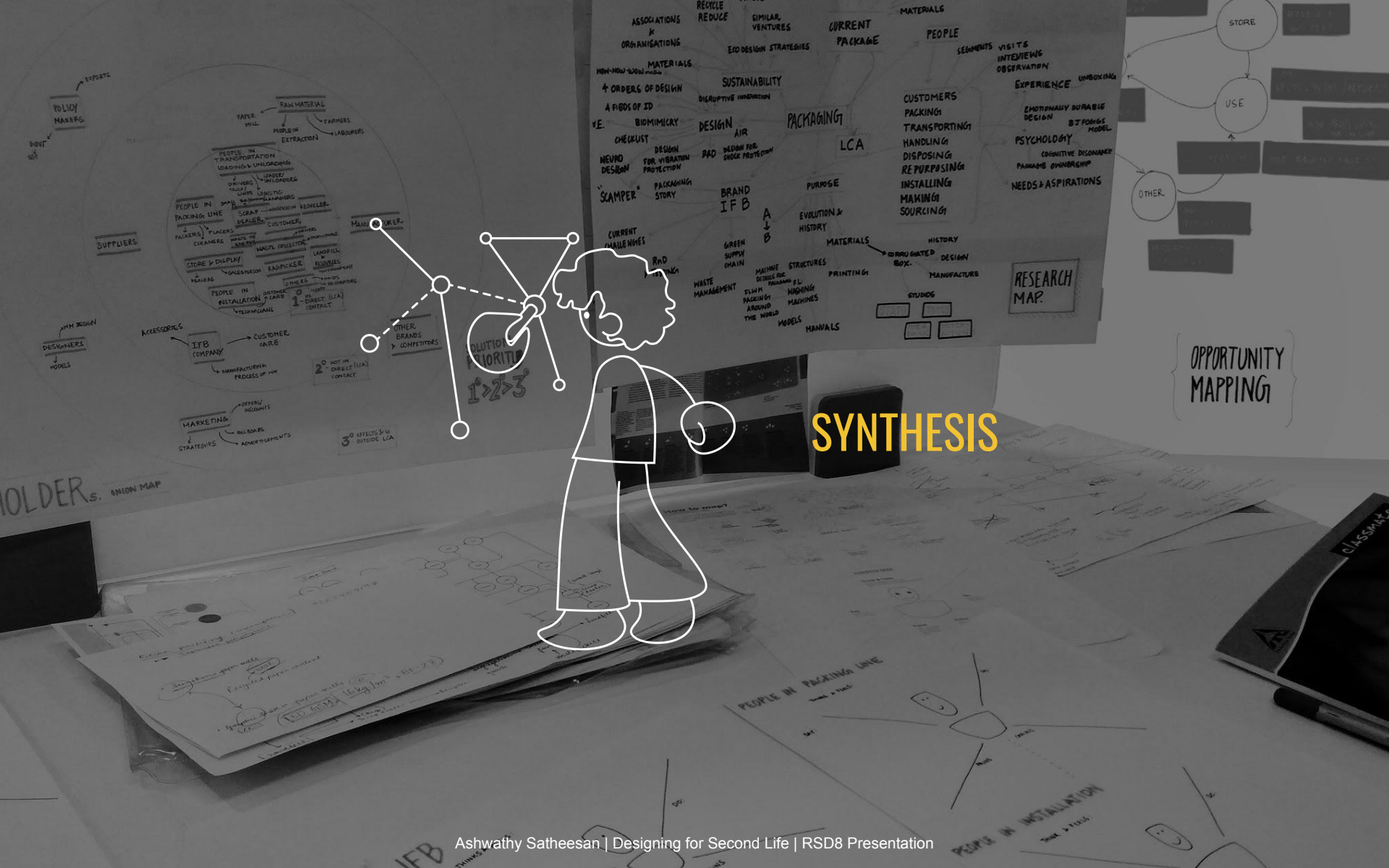
Download the complete whitepaper:  
<https://packageinsight.com>



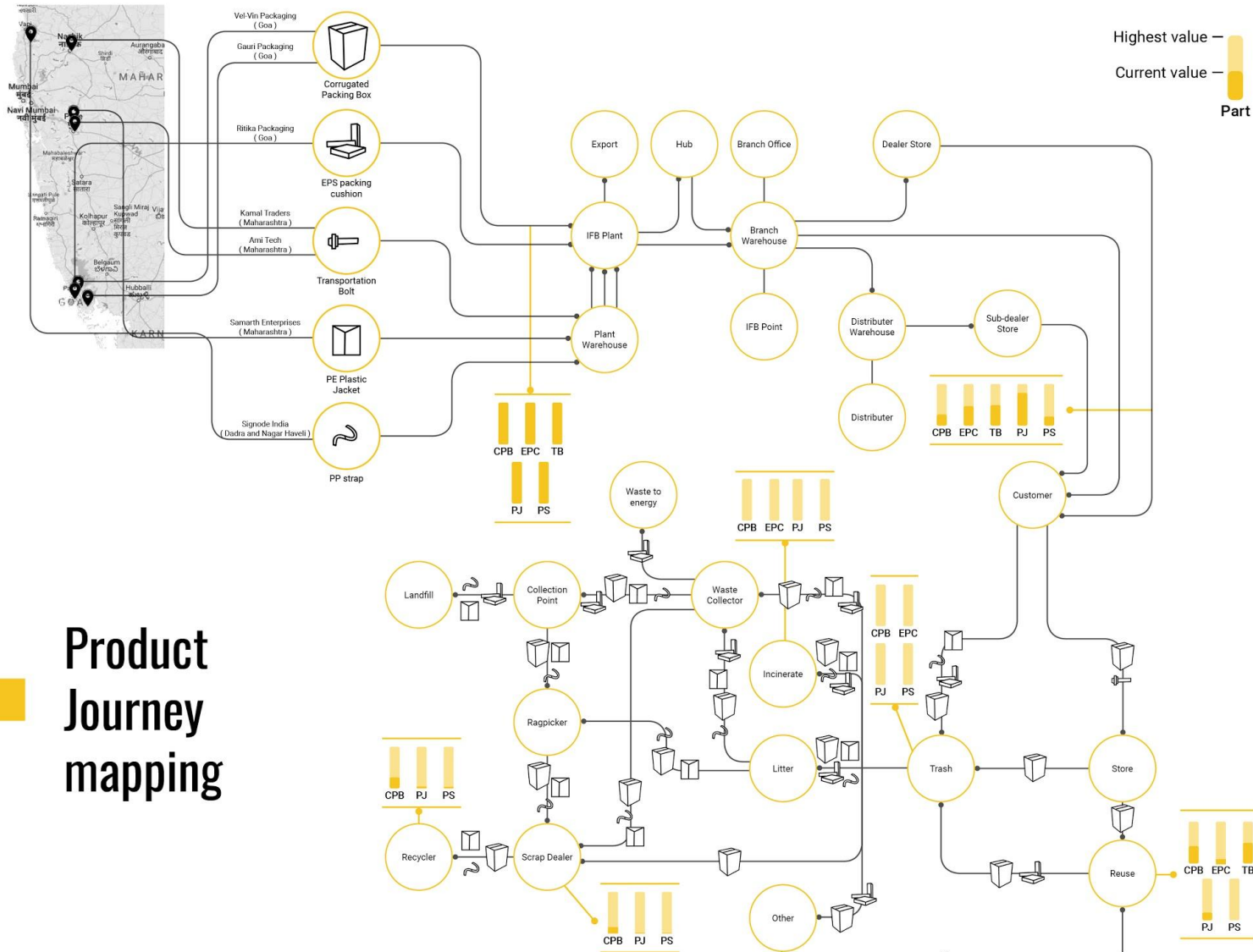
## Customer emotions during unboxing

Pride  
Curiosity  
Surprise





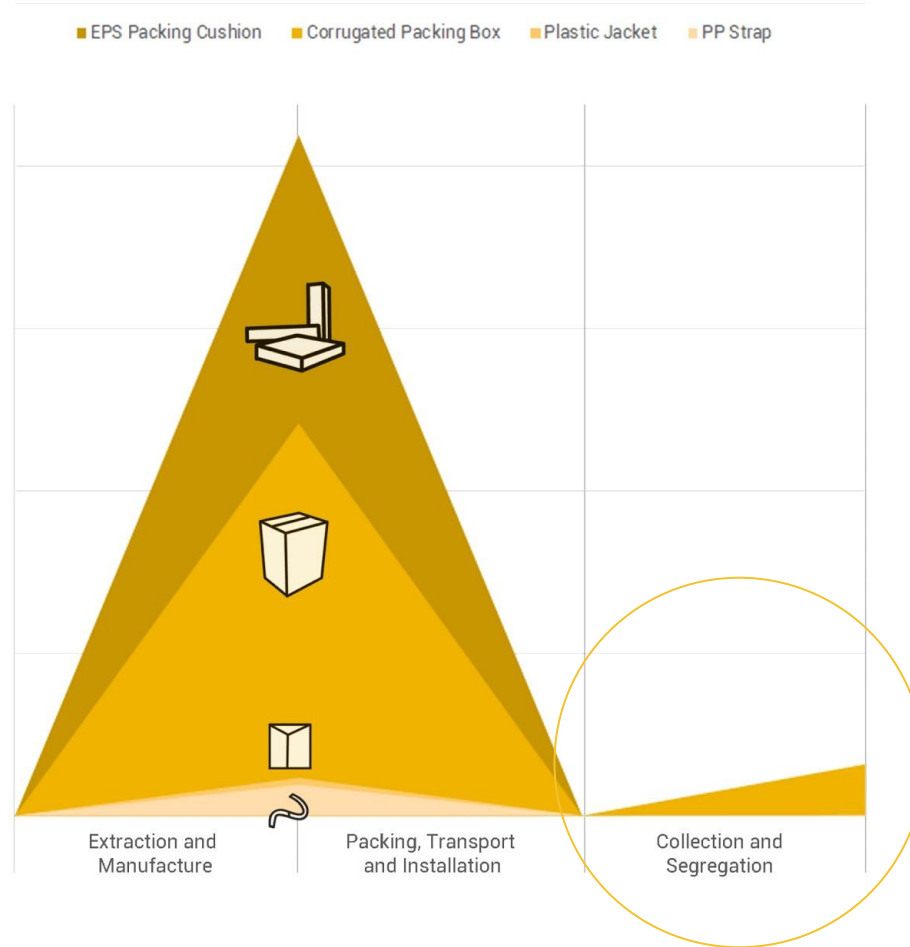
# SYNTHESIS



# Product Journey mapping

## Value of parts in different lifecycle stages

Reusing / Upcycling of these package  
can generate more value from these  
parts than recycling



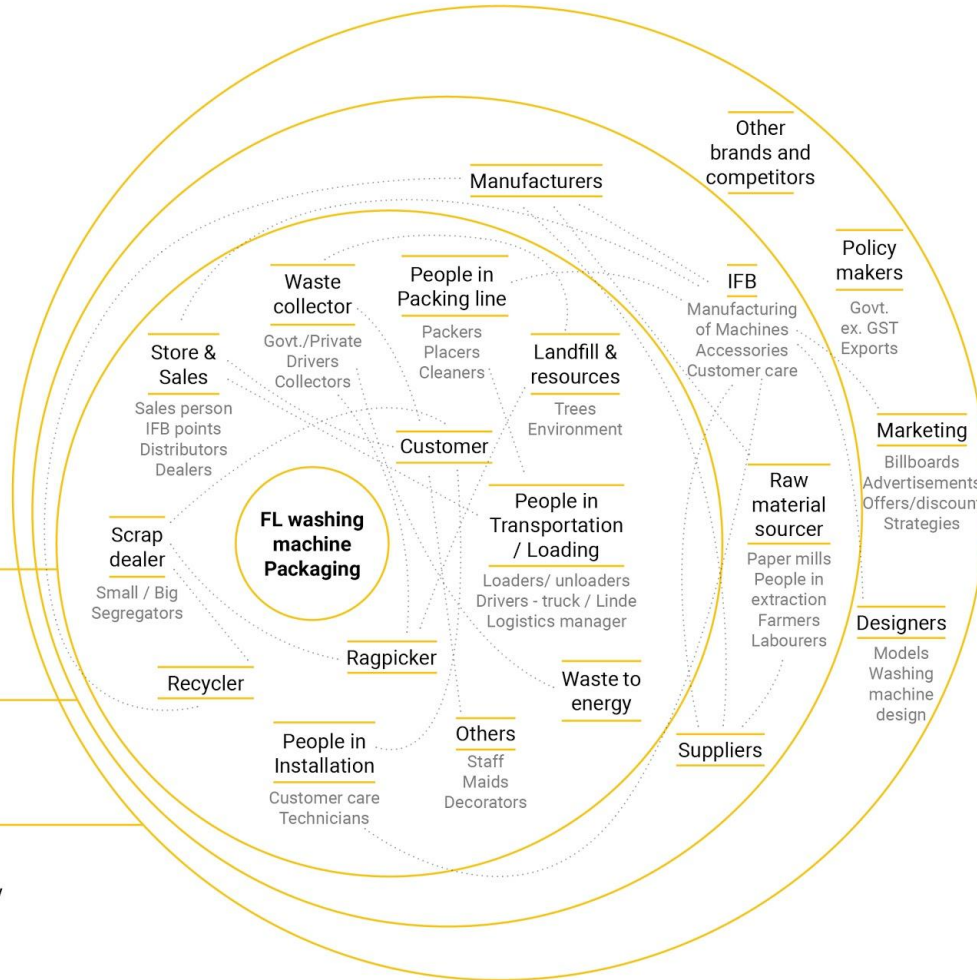
# Stakeholder onion mapping

$1^0 > 2^0 > 3^0$

$1^0$   
in direct  
contact

$2^0$   
directly  
affects

$3^0$   
in directly  
affects



# Empathy mapping of stakeholders



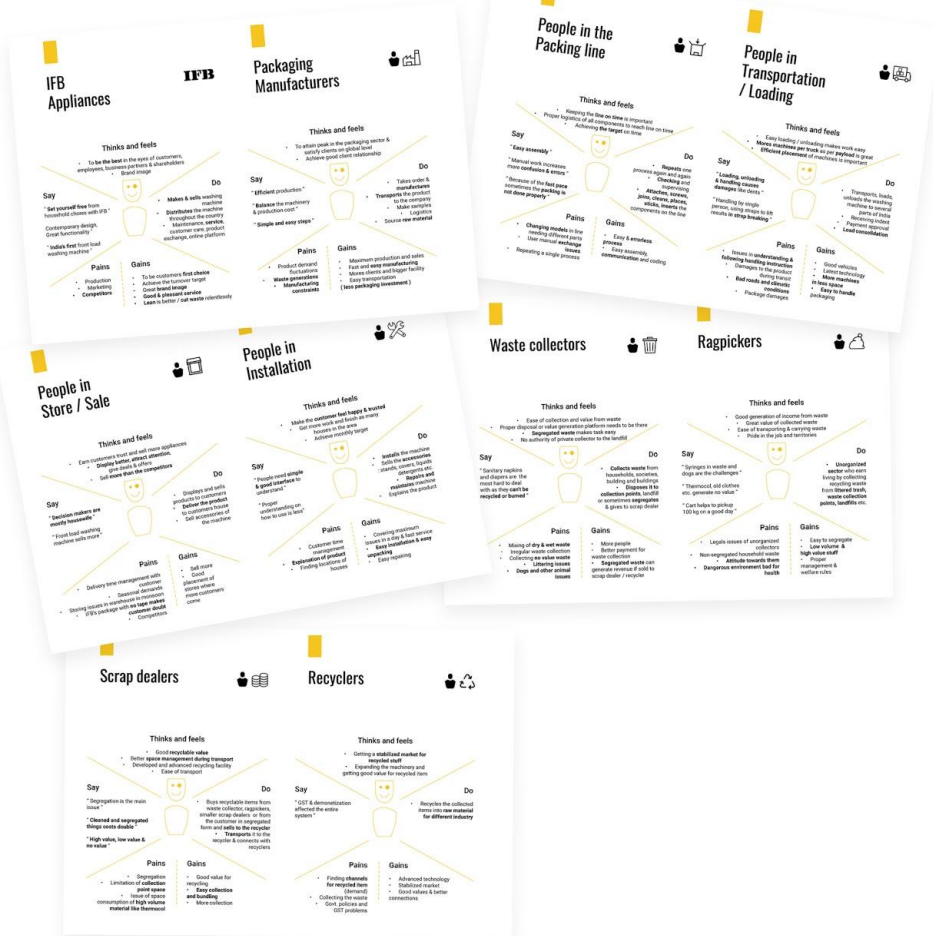
**" Manual work increases more confusion & errors "** - People in the Packing line

**" Handling by single person, using straps to lift results in strap breaking "** - People in Transportation / Loading

**" EPS (Styrofoam) is a big issue "** - Ragpickers

**" Segregation is the main issue "** - Scrap dealers

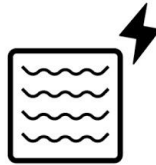
**" Tax & demonetization affected the entire system "** - Recyclers





### Consumer psychology

**Insight :** Customer's experience of unboxing and using the machine is not remembered



### Value engineering

**Insight :** The material and energy of the package is not used to the fullest



### Ergonomics

**Insight :** Mishandling and damages happening during the transit



### Sustainability

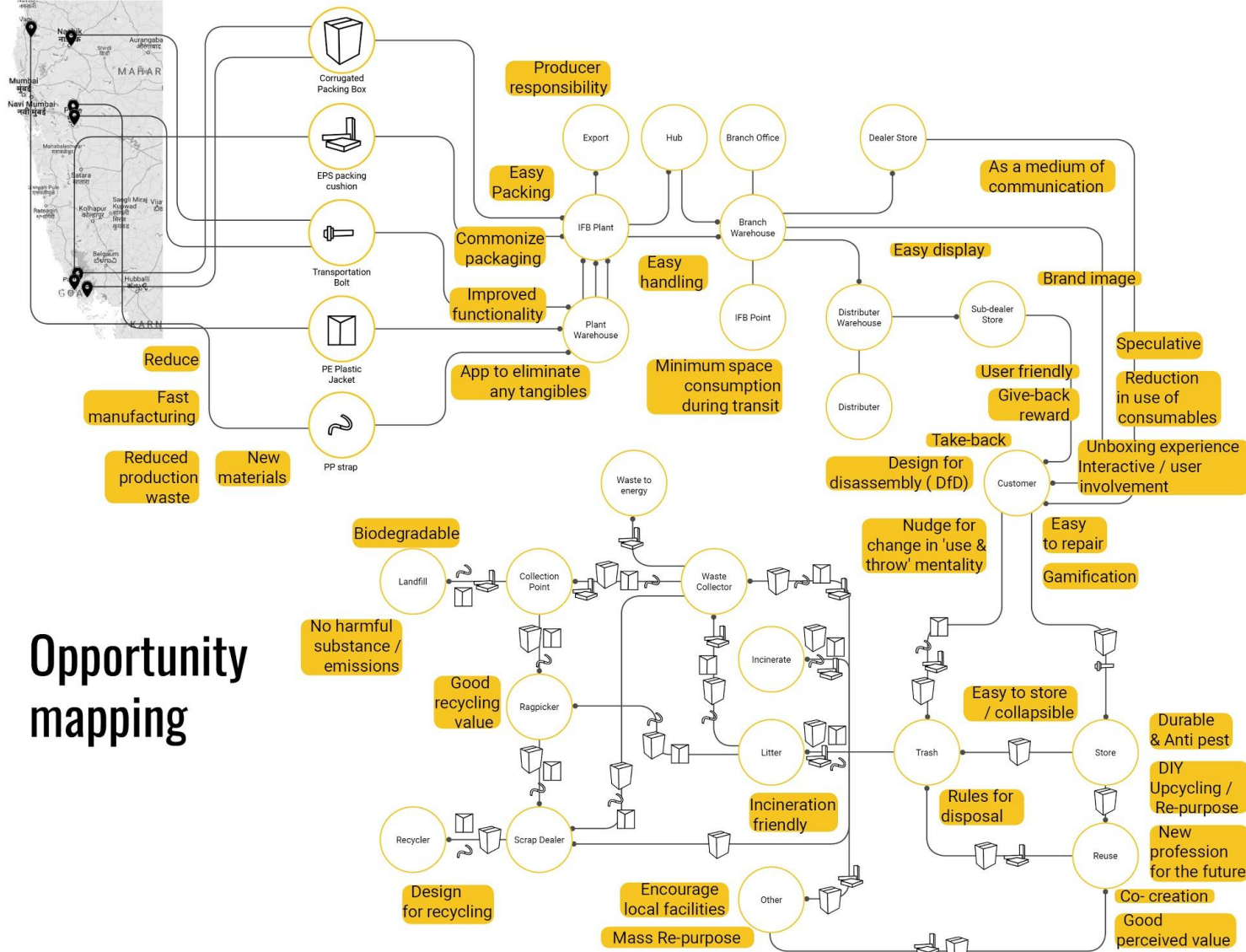
**Insight :** EPS filling landfills and polluting the environment

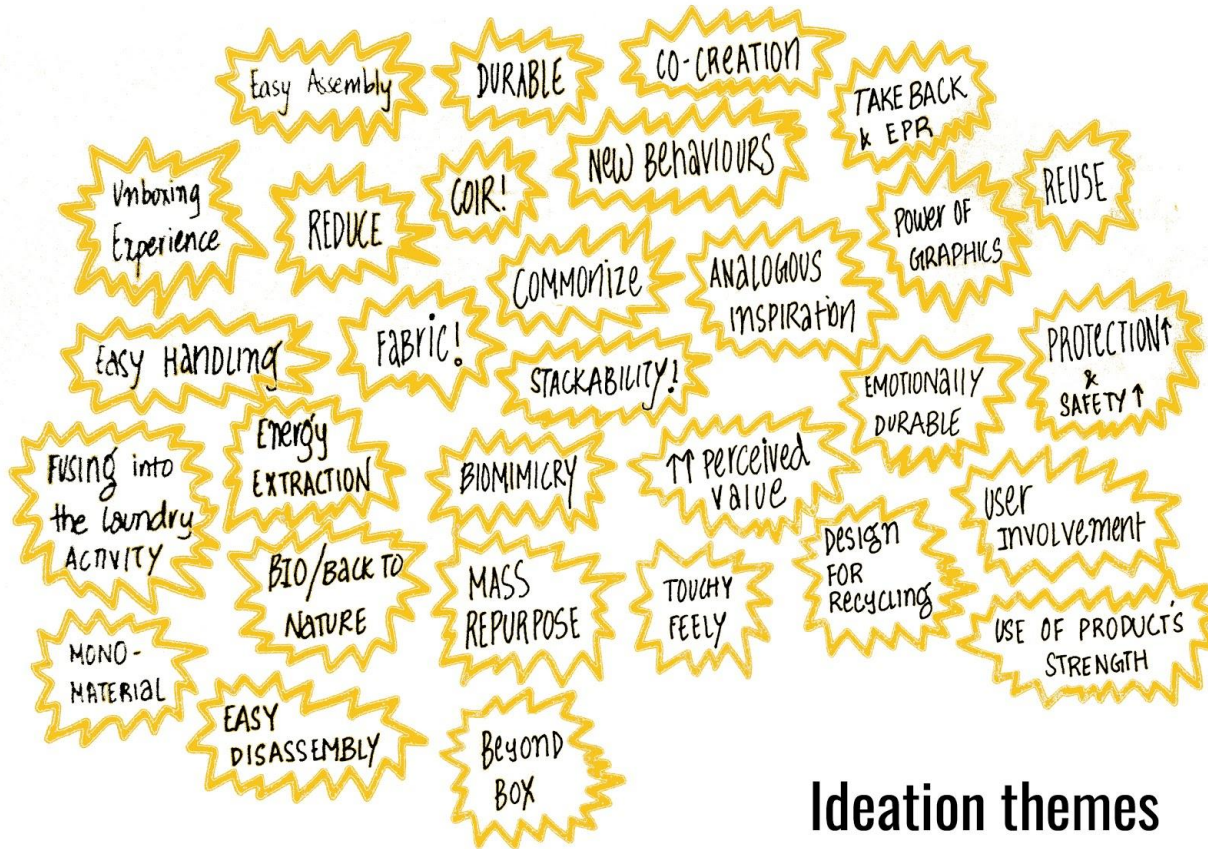
How might we redesign the package to make it user friendly and emotionally durable ?

How might we redesign the package so that it can be used efficiently ?

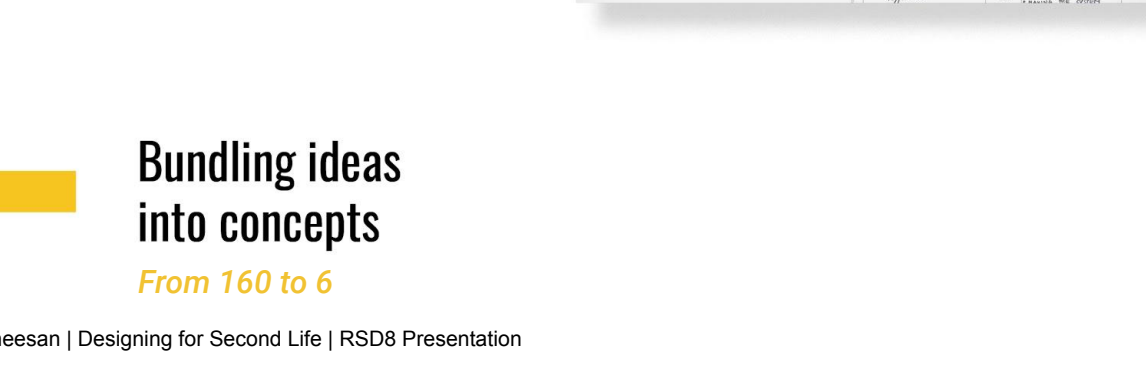
How might we redesign the package to avoid any impairment to its value during transit ?

How might we redesign the package avoiding use of EPS ?





## Ideation themes



1.  Take-Back & Recycle
2.  Monomaterial
3.  Eco-material
4.  Sensory experience based
5.  Upcycle
6.  Compostable



“ Stop looking at yourself as a consumer and think  
of yourself as just using resources in one form  
until they can be transformed into another form. ”

- Mike Biddle



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