



Packaging and the Environment

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Paper or Plastic?

“First of all, paper is more fun. You can color it, cut eye holes in it, and have yourself a mask.

Try doing that with a plastic bag, and you will suffocate, and that wouldn't be good.

The fact that plastic bags can make people suffocate is not at all good, making plastic bags unsuitable for little kids, or homicidal maniacs.”

Paper or Plastic?

“While we are on the topic of safety, let me ask you a question, have you ever gotten a paper cut from a plastic bag? Hopefully, you haven't. Not even I have done that.

You may think that paper cuts are not as serious as suffocating with a plastic bag. Well... it's not. But it is pretty close.

Think about this. A lot of people touch the edge of the paper bag. You just cut yourself on the edge of the paper bag. You now have all the germs that those people had.

You get sick, and slowly, you begin to die. That, in simple English, would suck.”

Paper or Plastic?

“We also must think of which is more fun to burn.

This is not to be confused with which one is easier to burn. Everyone knows that it is paper. Cavemen knew that.

But PLASTIC is more FUN to burn. Well, actually, it doesn't even burn, it melts. But that is cool.

It also gives off a horrible smell which, depending on how much of a GOOF you are, may or may not be wanted.”

- Matt, packaging expert, <http://www.geocities.com/goofinoo/paerorplastic.html>

What's the Big Deal?

- Packaging accounts for largest component of MSW in U.S. (~ 30% by volume, 32% by weight)
- Paper:
 - Largest component of packaging waste;
 - In 1990, 25 billion boxes were made in the US alone (100 per person)
- Wood
 - In 1996, more than 40% hardwood used went towards pallets! (That's about 6 pallets per tree.)
 - In 1995, 223 million pallets → landfill in US (6 million tons)
- Plastics, metals, etc.

What's the Big Deal?

- Packaging adds little to no value to the product,
 - yet on average, packaging costs are 9% of the total
- EU Directive on Packaging and Packaging Waste
 - Imposing recycled-content and extended producer responsibility
 - Producers risk product bans/fines
 - Coming to a state near you? CA and OR have rather rigid packaging laws

3 Types of Packaging

- **Primary** – the container that actually holds the product
 - can, bottle, tube, carton...
- **Secondary** – outer wrappings that help store, transport, inform, display, and protect
 - decorated outer carton, gift wrapping...
- **Tertiary** – packaging for storage, transportation
 - corrugated boxes, pallets, shrink wrap...

4 Purposes of Packaging

1. Containment
2. Convey Information
 - Warnings, contents, FDA requirements...
 - Marketing
3. Protection, including Product Integrity/Safety
 - medicine, food, electronics...
4. Distribution

Solutions by Design

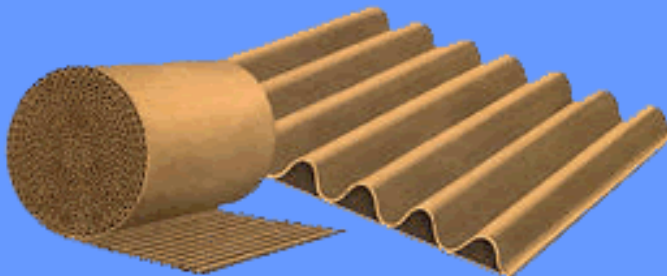
- Reduce
 - Design product with packaging in mind
- Reuse
 - Returnable Packaging
- Recycle
 - Recycled content packaging
- Material Substitution
 - Non-toxic, ex: unbleached paper – Ben & Jerry's ice cream containers
 - Biodegradable, ex: starch-based packing peanuts

Reuse

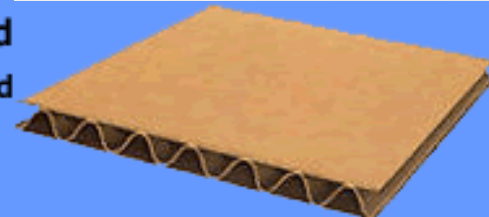
- Returnable Packaging
 - Good for high volume applications
 - Containers must be durable; life extended by maintenance
 - Need a return loop to get the containers back
- Ex: USPS corrugated plastic totes
- Ex: Pepsi's returnable plastic containers:
 - saves 98,000 tons of paper and \$44 million PER YEAR

Remanufacture

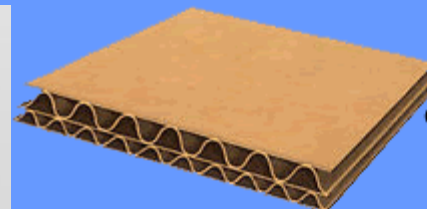
- Refurbished & Remanufactured corrugated boxes (Greenpak, UK, www.greenpak.co.uk)
- Integrity of corrugated board
 - Arches and columns give strength in 2 directions
 - Made from fluting (A,B,C,E) and facing
 - Single faced board, single walled board, double walled, etc.



**Single Faced
Corrugated Board**



**Single Wall
Corrugated Board**
(also known as
Double Faced)



**Twin wall
Corrugated Board**

Remanufacturing Boxes

- Enemies: creasing and water
 - Ratings for Edge Crush Test, Bursting Strength, Creasing Ability, Water Absorption, etc.



Recycled Content & Material Substitution

- Styrofoam Peanut substitutes
 - Corn/wheat starch peanuts (Eco-Foam, www.eco-foam.com)
 - Spiral-curl 100% recycled kraft (SpirOfil, www.spirofil.com)
 - Wood shavings, logging by-product (Sylvacurl, www.sylvacurl.com)
- Styrofoam block substitutes
 - Molded pulp using recycled fibers (Eco-Form, www.eco-form.com)
 - Blow-molded inserts from 100% recycled LDPE (Airflopac, www.airflopac.com)

Microsoft Windows 2001 for Mac



- MS Office 98 for Mac

MS Office 2001 for Mac



Microsoft Windows 2001 for Mac

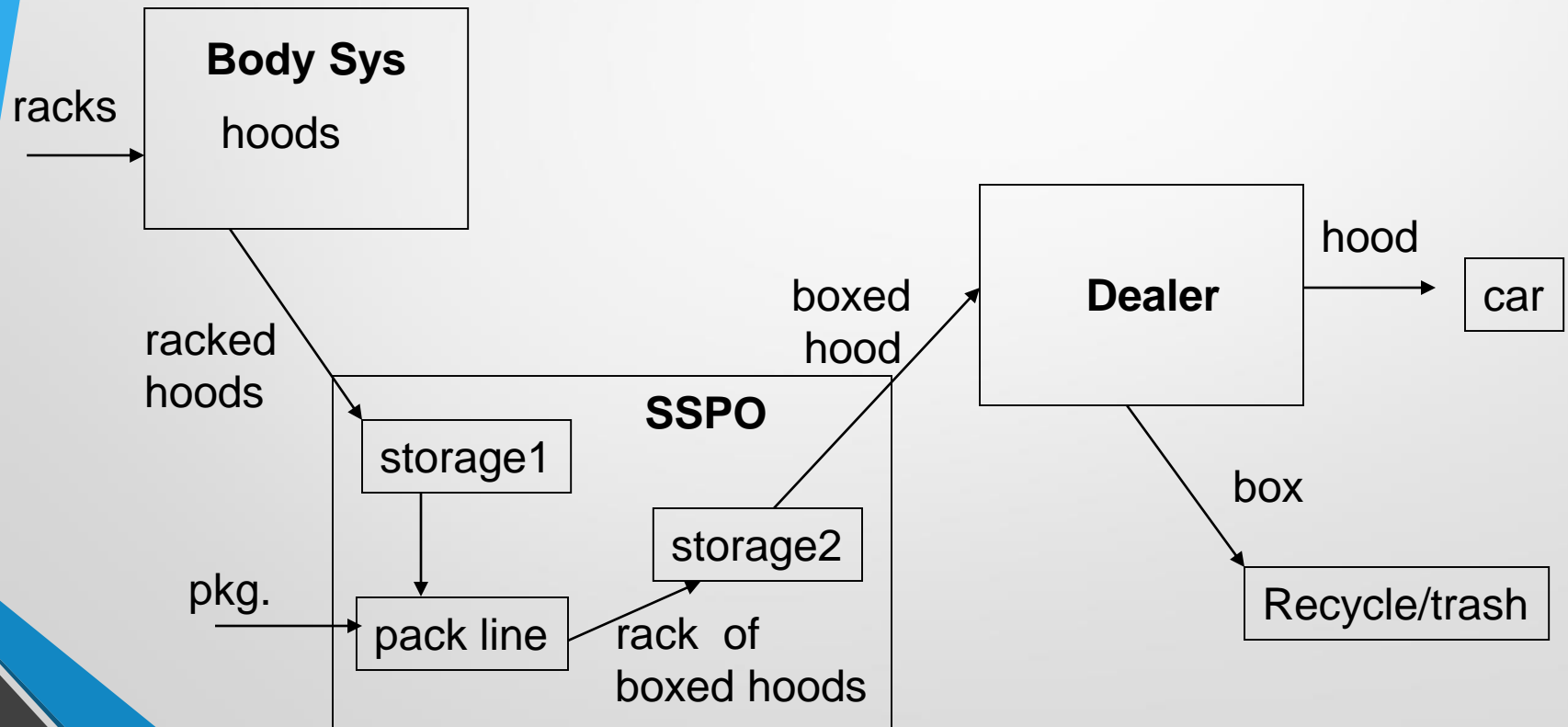
- 1/10th the weight of Office 98 pkg.
- 50% post-consumer resin
- Meets EU standards (and every other country's)
- Reusable, has extra storage for 10 CDs
- Several hundred pages of manuals now online, paper reduced to a few pages.
- Pkg. fee in Germany: 19.92 cents/unit → 6.5 cents/unit
- Transport pkg. reduced by 50%, in turn reducing vehicle emissions
- Gold medal winner in the 2001 Industrial Design Excellence Awards (IDEA).

Saturn Corporation

- Good use of returnable containers in manufacturing
- Service Parts Operations – all packaging to Dealers one-way, corrugated boxes
- Large, high volume parts became focus of potential returnable packaging
 - Hoods (25,000 per yr)
 - Fenders (60,000 per yr)

Saturn Corporation

- Initial Flow:



Saturn Corporation

“Gum Wrapper”

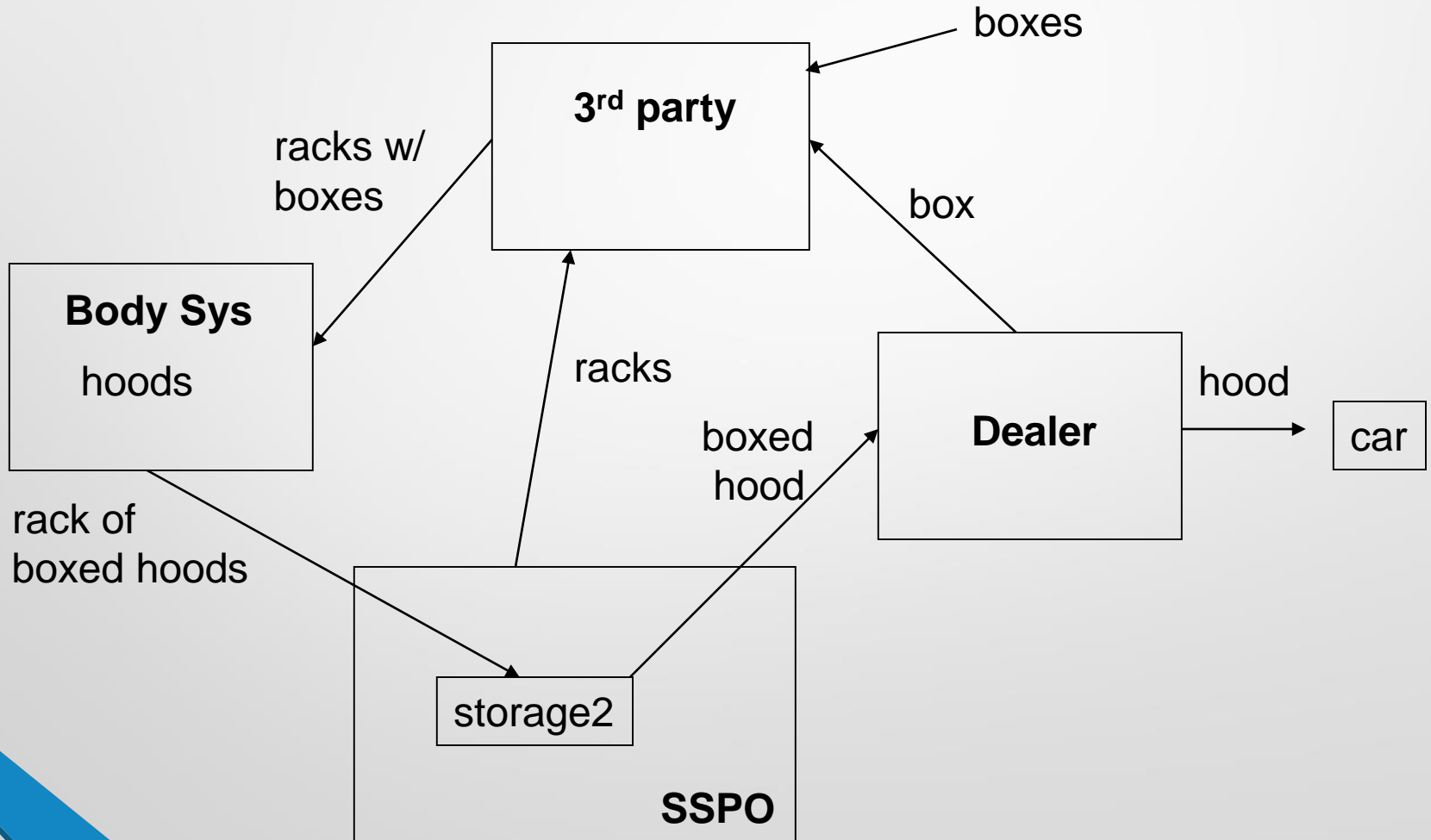


Hood Box



Saturn Corporation

- Redesign:



Saturn Corporation

- Original box: tray style (top and bottom) with foam dunnage, triple wall cover sheet, plastic banding
 - 8 people on a packaging line (SSPO) plus Body Systems personnel and shufflers
- New box: triple wall “gum wrapper” – slide hood in and close with velcro
 - No packaging line; the person who used to rack it in plant now slides it into box

Closing the Loop

- Recycling packaging
- Trex recycles polystyrene “stretch wrap” (tertiary packaging for stabilizing pallet loads)
- Combines stretch wrap with waste wood to get wood-polymer lumber for decking
 - No splintering
 - No sealing required
 - No rot or termites
 - Slip resistant surface
 - UV resistant

Trex – at a Florida Marina



Trex – in the Everglades



Trex -
at Mt. Rushmore!



What can YOU do as a “consumer”?

- Be mindful of packaging
- Buy in bulk or in concentration
- Don't use a bag for a product with built in handles
- Close the loop – buy products with recycled packaging