FURTHERING THE RECLAIMED MATERIALS EXPERIENCE

By
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Submitted to the graduate degree program in the School of Architecture, Design and Planning and Graduate Faculty of the University of Kansas in partial fulfillment of the requirements for the degree of:

MASTER OF ARTS IN DESIGN MANAGEMENT

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Chairperson:  Richard Branham

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Date Defended: 16 April 2012
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FURTHERING THE RECLAIMED MATERIALS EXPERIENCE

Chairperson: Richard Branham

Date approved: 07 May, 2012

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[Acceptance page should be numbered ii.]
ABSTRACT

A comprehensive study of the reclaimed materials industry and ways it could be improved from a management standpoint by working through a Design Management problem solving approach.

Project Objectives:

To improve the sourcing of reclaimed materials within a local arena.

To develop a framework using these improvements that could be replicated on a larger scale throughout other Habitat ReStores.

To improve design research and development skills and demonstrate gained knowledge through a project that would cover a broad spectrum of Design Management principles.

Scope of Work:

The topic is specifically related to the reclaimed materials industry and ways to improve the buyer’s and seller’s experience in relation to the location and sale of materials as seen through the lens of the Habitat ReStore structure.

Concepts contained within this presentation have been developed through the collection of qualitative and quantitative research data, user testing, prototyping, applied design methodology, and existing references.

Problem:

Reclaimed building materials are everywhere but finding them is difficult.

How does design apply?

Examine the problem through the eyes of the customer and apply the gathered data to produce new solutions that will improve the experience for both the buyer (customer) and seller (ReStore).

Solutions:

Provide a set of potential changes to the physical space to improve the customer’s experience.

Provide a set of potential changes to the virtual space that would improve the customer’s experience.
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Advancing the Reclaimed Materials Experience

“Simplify complexity and do it at scale.”
- Don Norman

Graduate Thesis - MA Design Management

Committee
Richard Branham, chair
Michael Eckersley
Wally Meyer

16 April 2012
intro

research
development
solutions
next steps
this building is not trash.
motivation for project

“People waste materials.”

The concept for this thesis project had two main driving forces behind it’s conception:

1. My personal interest and experience within the materials industry and a frustration that developed from trying to locate reclaimed materials for personal and professional projects.
2. An observation of the massive amounts of waste the construction industry produces and the idea that a possible solution to this problem could be developed through using a design approach.
project objectives

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problem

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How does design apply?

Examine the problem through the eyes of the customer and apply the gathered data to produce new solutions that will improve the experience for both the buyer (customer) and seller (ReStore).
Provide a set of potential changes to the physical space to improve the customer’s experience.

Provide a set of potential changes to the virtual space that would improve the customer’s experience.
analysis of materials (industry? cycle?)

a quick overview of terms

the reclaimed materials industry

trash

recycling
What is a reclaimed material?

Reclaimed materials: Waste materials and byproducts that have been recovered or diverted from the waste stream for reuse.

examples include:

windows  siding
doors  plumbing parts
raw lumber  electrical parts

Where do reclaimed materials come from?

deconstruction

commercial renovations

residential renovations
Where do reclaimed materials come from?

*deconstruction is...*

“The careful and systematic dismantling of a building structure to maximize the recovery of valuable building materials. Deconstruction is an environmentally friendly alternative to demolition, which produces large quantities of debris requiring disposal.”

Where do reclaimed materials come from?

commercial renovations

The renovation, construction, and deconstruction of commercial spaces provides for a large variety of excess, usable material. Some examples include:

- steel I-beams
- various metal components
- concrete
- cinder blocks
- corrugated roofing materials
- glass / windows
- old office furniture sets
- fasteners such as nuts and bolts
Where do reclaimed materials come from?

*residential renovations*

Residential renovation, construction, and deconstruction projects produce excess materials similar to commercial ones, but on a smaller scale. Some examples include:

- dimensional lumber (studs, joists, etc.)
- concrete
- cinder blocks
- vinyl & aluminum siding
- roofing materials
- glass / windows
How are reclaimed materials used?

commercial uses
- new construction
- renovations
- building repairs
- creation of art

residential uses
- renovations
- decoration
- new construction

other uses
- hobby & craft projects
- educational purposes (shop classes, engineering teaching examples, etc.)
material waste

In 2003, construction and demolition (C&D) materials generated was estimated at 5.01 million tons for nonresidential construction.

On a per building basis, demolition waste quantities are often 20 to 30 times as much as C&D materials generated during construction.

Thus, the average single-family and multi-family houses are assumed to be that of 1975 (1,600 ft2 and 1,000 ft2), respectively, when demolished.
where do these materials go?

landfill

recycling center
materials life cycle

landfill cycle

1. new product created
2. purchased by consumer
3. consumer uses new product
4. new product becomes used product
5. used product becomes waste
6. waste picked up by garbage service
7. garbage service taken to landfill
8. landfill

landfill cycle

Why do people use this model?

- efficient
- easy for consumer

Why shouldn’t people use it?

- waste
- environmental
recycling cycle
**Why do people use this model?**

to promote best ecological practices
self-satisfaction
monetary gain via bottle exchanges, aluminum recycling, etc.

**Why don’t people use it?**

inconvenience
higher initial costs
laziness
framing the problem
Why ReStore?

Local setting.
Real situations.
Real people.
Fits personal project criteria.
ReStore business model

What unique service do they provide that generates revenue?
The Business Model Canvas

<table>
<thead>
<tr>
<th>Key Partnerships</th>
<th>Key Activities</th>
<th>Value Propositions</th>
<th>Customer Relationships</th>
<th>Customer Segments</th>
</tr>
</thead>
<tbody>
<tr>
<td>The network of suppliers and partners that make the business model work.</td>
<td>The most important things a company must do to make its business model work.</td>
<td>The bundle of products and services that create value for a specific Customer Segment.</td>
<td>The types of relationships a company establishes with specific Customer Segments.</td>
<td>The different groups of people or organizations an enterprise aims to reach and serve.</td>
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<td><strong>Channels</strong></td>
<td><strong>Revenue Streams</strong></td>
<td></td>
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<td>How a company communicates with and reaches its Customer Segments to deliver a Value Proposition.</td>
<td>The cash a company generates from each Customer Segment (costs must be subtracted from revenues to create earnings).</td>
<td></td>
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</tbody>
</table>

Cost Structure
All costs incurred to operate a business model.
Key Partnerships

The network of suppliers and partners that make the business model work.

Strategic alliances between non-competitors
Habitat for Humanity
Other ReStore branches

Buyer-supplier relationships to assure reliable supplies
Donors:
  local businesses and contractors
    - Donate overstock, wrong item deliveries, left over materials, etc.
    - Gives donors a tax write off and helps ReStore stock valuable inventory.
Key Activities

The most important things a company must do to make its business model work.

maintain retail inventory in-store
The ReStore’s main task is the sale of items in a retail outlet, which supports their parent organization, Habitat for Humanity. Without keeping a well-stocked retail inventory, they would be unable to do this.

be available to accept donations
The ReStore’s entire inventory is comprised of donations, so the availability of staff to receive donations at all times is the highest priority.
Key Resources

The most important assets required to make a business model work.

physical
The ReStore building, the delivery truck, general operations equipment.

intellectual
The ReStore brand, which connects them to their parent organization, Habitat for Humanity. This connection allows people to immediately recognize their non-profit business structure.

human
The regular paid staff runs the day-to-day operations. A steady flow of volunteers is crucial to assisting the staff and making the store run.

financial
Its not-for-profit structure allows ReStore to accept donations and resell items for profit while still getting tax breaks that help keep them in business.
Value Propositions

The bundle of products and services that create value for a specific Customer Segment.

pricing
Reclaimed goods are always cheaper because of their used status.

material variety
With a constant flow of new donations occurring, customers know to constantly return to see what new materials have shown up.

location
The Lawrence ReStore is located on the edge of the city’s oldest sector, which is filled with old buildings needing constant attention. The owners of these buildings like the ReStore’s location in relation to their neighborhoods and the convenience it provides. Many customers are walk-ins.
Customer Relationships

*The types of relationships a company establishes with specific Customer Segments.*

**personal assistance**
A real person is always available to help customers at the ReStore, both in-store and on the phone.

**communities**
A large part of the Lawrence ReStore experience relies heavily on a small community of regular shoppers. Many don’t buy every time, but if they’re in and see something that someone they know could use, they make a point of letting that person know. This sort of informal network helps the ReStore to advertise without advertising.

*(Communities outlined in greater detail below.)*
Channels

How a company communicates with and reaches its Customer Segments to deliver a Value Proposition.

virtual
Website with general information about the ReStore and its products.

physical
- In-store bulletin board posting events, sales, and general store information.
- Word of Mouth advertising.
- Occasional print ads for larger sales or events.
Customer Segments

The different groups of people or organizations an enterprise aims to reach and serve.

occasional shopper
The customer who stops in 1-2 times per month. They almost always purchase something during their visit.
Average spending: $40

window shopper
The customer who stops in at least once per week, but only buys something around 20% of the time.
Average spending: $8

frequent buyer
The customer who stops in 1-3 times per week and buys something at least 50% of the time.
Average spending: $5-15

high volume buyer
The customer who only stops in 1-2 times per month, but does so to make larger purchases.
Average spending: $100+
Cost Structure

All costs incurred to operate a business model.

cost-driven model
The ReStore focuses on minimizing costs wherever possible.

fixed costs
ReStore operations costs, such as rent, utilities, & salaries, fluctuate very little from month to month.

variable costs
Minimal. Costs such as delivery truck fuel can be considered variable.

economies of scale
Larger donations allow ReStore to stock more valuable merchandise, which provides them with a steadier revenue stream.

economies of scope
Due to their affiliation with HFH and the general helpful nature of the organization, ReStore enjoys community support in ways that other businesses don’t. Examples are finanancial donations, time & service donations for item repairs, etc.
Revenue Streams

The cash a company generates from each Customer Segment (costs must be subtracted from revenues to create earnings).

asset sales
The ReStore’s main revenue source is the sale of merchandise.

monetary donations
The ReStore also enjoys the occasional monetary donations from various local and national businesses.
comparable services

low perceived value

low actual cost

high perceived value

high actual cost

materials industry offerings

- **Actual cost**
  - Low
  - High

- **Inventory age**
  - Old
  - New

- **Branding**
  - ReStore
  - Menards
  - Home Depot
  - Liquidators
  - Premium Hardware
  - Patina Vintage Home Outfitters
  - Olde Good Things
  - Duluth Timber Company
ethnographic research methodology

method: USER INTERVIEWS

method: OBSERVATION

method: SURVEYS & QUESTIONNAIRES

method: SHADOWING
method: USER INTERVIEWS

purpose
Interviews were conducted with ReStore staff and customers willing to take a minute to talk. These proved to be an invaluable resource for knowledge and user insight.

Still from interview with Michele Johnson, Lawrence Habitat ReStore manager.
method: USER INTERVIEWS

findings

- insight into user needs
- insight into ReStore staff wants and needs
- knowledge of ReStore system
- greater knowledge of reclaimed materials industry
method: OBSERVATION

How was it applied?
Observation played a big role seeing the more subtle interactions between customer and environment.
method: OBSERVATION

findings

People move in unpredicted ways.
Spotting the confused or lost is easy.
How was it applied?

There were two main surveys: one done through an email service to acquaintences all over the country, and another done in-store to gather basic demo- and psychographic information. A sample template was also drawn up for one-on-one interviews.
method: SURVEYS & QUESTIONNAIRES

findings

People have a wide range of individual needs but their overall service needs are basically the same.

People want:
- online listings of materials
- an easier way to find things in the store
- standardized pricing on common items
method: SHADOWING

ReStore Staff
Several days were spent at the ReStore facility watching how staff interact with the environment and the store’s retail system. Besides watching, I also got a change to work as an employee does to improve my insight into the experience.

Michele Johnson, Manager
The majority of the shadowing was done with Michele. This proved to be a valuable experience, for not only were her interactions able to be monitored, but she would also provide input into various situations.

Byron, regular volunteer
Byron does much of the handling of donation intake. From picking up larger donations on the Friday truck runs to managing the intake of drop-off donations, he is very active in the store.

hourly employees
Handle day-to-day operations such as cash registers, donation intake, and floor inventory.

volunteers
Either there on own accord or court-appointed. Asked to help with basic tasks such as cleaning off new donations, shuffling inventory, helping with deliveries, or assisting customers.
development
user analysis

behavior modes
personas
need requirements
need cluster matrix
needs-based directives & solution architecture
### behavior modes

<table>
<thead>
<tr>
<th>mode</th>
<th>description</th>
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</table>
persona 1

occasional shopper

Jim

age: 43
occupation: medical sales
store visits: 1-2 per month
average trip spending: $40

Jim does a lot of home improvement projects in his free time, which is limited.

He always ends up finding something he thinks he could use somewhere whenever he visits. The ReStore is a novelty experience for him.

He likes the ReStore because he can usually find odd items to fit the needs of his various projects. Much of his time is spent wandering the aisles since he never knows exactly where anything is located.
persona 2

window shopper

Darlene

age: 72
occupation: retired

store visits: 1+ per week, buys 20% of the time
average trip spending: $8

Darlene likes ReStore for its low prices, random materials, and friendly social atmosphere.

would like to be able to find things more easily in the store instead of having to always ask for help.
persona 3

frequent buyer

Ann

age: 60
occupation: nurse

store visits: 1-3 per week, buys at least 50% of the time
average trip spending: $5-15

Ann likes the ReStore because of the constant influx of new inventory.

She spends a lot of her free time doing craft projects so the ReStore's eclectic inventory is a perfect fit for her interests.

Ann would like to have an easier way to check new inventory that doesn’t require her to stop into the store, as she is also a busy mom and is always strapped for time. She feels like the store is very cluttered and things are hard to find.
persona 4

high volume buyer

Steve

age: 52
occupation: contractor

store visits: 1-2 per month
average trip spending: $100+

Steve likes ReStore for its occasional stock of larger building materials.

The location is convenient for him since he works on a lot of older homes in the same area.

He would like to be able to check inventory while on jobsite to save time instead of having to visit. He would be a more frequent shopper if they had a wider variety of heavy materials.
**need requirements**

<table>
<thead>
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<td>organized inventory</td>
<td>A cleaner store layout that has clearly marked sections and legible signage.</td>
</tr>
<tr>
<td>extended retail</td>
<td>A way to connect with the store beyond the physical space, possibly through an improved website or better advertising.</td>
</tr>
<tr>
<td>experience</td>
<td></td>
</tr>
<tr>
<td>live inventory</td>
<td>A way to check the store’s inventory from your computer or phone, saving you time and money.</td>
</tr>
<tr>
<td>greater reach</td>
<td>The ability to check the inventory of other stores in the area beyond the Lawrence store without having to travel to them.</td>
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</table>
needs cluster matrix

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<td>extended retail experience</td>
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<td>2.</td>
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needs-based directives & solution architecture

1. improved inventory organization

**logical organization**
- improve signage
- improve space layout
- increase shelf space to free up floor space

**standardized electronic system**
- electronic inventory connected to

1. extend the experience

**relevant services**
- building references

**increase online presence**
- building references
experience mapping

What does the customer go through?
customer experience

donating
customer experience

shopping
introduction
research
development
solutions
next steps
collision - common ground

how do these two pieces meet?
Where are the service gaps?
What are some improvements that could be made?
what do we do with this common ground?

solution 1 - physical improvements

solution 2 - virtual improvements
existing physical space

**donation intake**
- paper forms
- no scheduling for drop offs
- intake information not connected to front office

**sales floor**
- disorganized
- poor or no signage
- lack of spacial flow between aisles and sections
- difficult to find specific items
- scattered inventory

**cash / wrap**
- paper-based accounting system
- no connection to donation area or other ReStore outlets
- sporadic employee attendance

potential physical space

donation intake
computerized inventory syncs with network
standardize the process to improve efficiency

sales floor
flexible architecture
improved wayfinding
better space planning & organization
widened aisles

cash / wrap
barcode inventory
computerized inventory syncs with network
improve help & info availability
existing virtual space

index page

pros
- good navigation categorization

cons
- poor graphic layout
- eye doesn’t know where to go
- lack of information hierarchy
existing virtual space

hours & location page

pros
hours listed
simple map is helpful

cons
poor graphic layout
- lack of visual hierarchy
- no current page heading / highlight on nav
existing virtual space

donations page

pros
simple overview of donations
- criteria for acceptance

cons
poor graphic layout
- lack of visual hierarchy
- no current page heading /
highlight on nav
low dynamic user interaction
existing virtual space

donations page (cont’d)

pros
instructions listed

cons
confusing process
existing virtual space

volunteer page

pros
basic volunteer information listed

cons
confusing to read through
poor informational hierarchy
existing virtual space

inventory page

pros
listing of weekly sales

cons
no sub-navigation for inventory
no individual listings
existing virtual space

inventory page (cont’d)

pros
photos

cons
photos aren’t actual inventory
no individual listings of product
existing virtual space

inventory page (cont’d)

pros
inventory listing

cons
what looks like button field is only a table of inventory selections
potential virtual space

possibilities

improved donations page

new location / map feature

new login feature for employees, volunteers, & customers

improved inventory page

index page
potential virtual space
improved donations page

possibilities

pre-donation
  customer fills out form online & submits pic of items

drop off donation / donation pick up
  paper forms sync with computer forms

online pick up & drop off scheduling

digital pre-inspection via video feed
potential virtual space
improved donations page
possibilities

- online donation forms
  - pre-donate: customer does online for & submits pic (if possible)
  - drop off donation / donation pick up
    - current: use all computerized forms at time of intake
      - future: digital form on tablet
- donation section ties into inventory system
- schedule pick up / delivery to accommodate store staffing
- digital pre-inspection via video feed
potential virtual space
improved donations page
potential virtual space
new mapping page

possibilities

show rough materials location

show local ReStore
  shows other ReStores in area
  sync with phone or GPS to direct

shows other local resources
  Habitat for Humanity offices
potential virtual space
improved map page
potential virtual space
other web solutions

help & info sources
  “how to” section
  basic calculators
  “projects” section for possible uses of reclaimed materials
  “building with reclaimed” section - how they are used
  basic construction information
possible next steps

Submit to Habitat ReStore for possible implementation.

Take findings and create own offering.

Submit findings to other non-profit for possible implementation.
Thank You.