

# Revitalization of Reclaimed Wood

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## **Revitalization of Reclaimed Wood**

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### **Abstract:**

Lumber industries provide materials for the construction business. Out of the daily material handling, there are different kinds of scrap woods for material protection lay around the warehouse and building site. Eventually, scrap woods will be collected with dumpsters and brought to landfills. If these scrap woods are utilized by turning them into new products, the new products can be made available to the needy, or the proceeds from selling them can be channeled to local charitable organization for the needy. The project not only will give scrap woods a second life in order to reduce amount of trash going to landfills, it will also benefit the needy in the community. Moreover, design students will learn to give back and serve the society by contributing their design skills, talents, and labor.

This project is set up as an experimental class, firstly, in collecting, classifying, and preparing scrap woods for project use. Students will study and develop product concepts, and use the scrap woods to prototype products. Students will then market the products through special events or solicit stores to help selling. The whole process could be repeated, once it is proven feasible, it can be developed into an extension service.

One key part of this research is to identify a material source. A building supplier has been approached and has agreed to supply scrap wood for this project. Russell Building Supply in Auburn has agreed to provide mostly 2"x 4" x 4' length yellow pine pieces that they want to

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dispose of. The value of this wood product, plus some other wood products to be donated, does not have monetary value in the market. This support will continue indefinitely as long as the project progress and hopefully it will be developed into an on-going project. The diagram shows a basic plan the project and different possible categories of solutions. Although this is an on-going project, conceptual ideas have been developed with a strategy of mass production using modular design, and with the aid of CNC equipment. The expected outcome of the project has two folds: 1) It is to provide design students an opportunity in the design process to be mindful of those who are less fortunate and may never be able to afford the luxury of design efforts. 2) Either by providing design solutions to those who are in need, or by making profit with design solutions then channel the profit to help those who have monetary needs, students learn to be responsible to the needs of the society.

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## I. Introduction

Lumber industries provide materials for the construction business. Out of the daily material handling, there are different kinds of scrap woods for material protection and handling lay around the warehouse and building site. Eventually; scrap woods will be collected with dumpsters and brought to landfills or be burnt on site. If these scrap woods are utilized by turning them into products through design, their value would be renewed. The new products can be made available to the needy, or the proceeds from selling them can be channeled to a local charitable organization for the needy.

The project not only gives scrap woods a second life in order to reduce the amount of trash going to landfills. It also benefits the needy in the society. Moreover, design students learn to be good stewards of our environment, and give back to the society by contributing their design skills, talents, and labor.

## II. Training Responsible Designers

In recent years, the subject of sustainability is one of the main concerns in the design arena. Although it has become an important issue, academic and industry alike, the subject is still more theoretical than practical. There is a dilemma between responsibility and viability. A company needs to survive by selling products while making sustainable products should be the goal. Designing new products with new technologies is always the practice in industrial design. When it comes down to recycling, it often brings a lot more constraints to the designer. Braungart & McDonough (2002) in their book “Cradle to Cradle: Remaking the Way we Make Things” states,

“Eco-efficiency is an outwardly admirable, even noble, concept, but it is not a strategy for success over the long term, because it does not reach deep enough. It works within the

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same system that caused the problem in the first place, merely slowing it down with moral proscriptions and punitive measures. It presents little more than the illusion of change.” (p.62)

Modification of a product to become more sustainable seems not to be the best way to approach the problem in a long run. A sustainable design often cost more to the manufacturer thus cost more to the users. Looking at the problem in a new way is needed. Better sustainable design practice is to leave no waste behind. If we put more attention to the waste products we generate and find ways to turn it into other products, wastes become useful.

Another issue in the design that has gained more attention is the concern of the other 90 percent. Paul Polak (2008), founder of the International Development Enterprises and author of the book “Out of Poverty” said,

“The problem is that 90 percent of the world’s designers spend all their time working on solutions to the problems of the richest 10 percent of the world’s customers. A revolution in design is needed to reverse this silly ratio and reach the other 90 percent.” (p.64)

The new generation of designers should learn to take up the responsibility of contributing their talents to the other 90 percent. With the recent economic downfall, according to Newsweek.com (June 12, 2008) and YourMonroeville.com (February 5, 2009) charitable organizations are suffering in receiving donations. If designers find ways to turn wastes into useful products and market them to consumers, proceeds from sales can be channeled to local charity organization to make up some of the downfall of donations.

Being trained as problem solvers, designers may use their skills and talents to help both situations: on one hand collects scrap wood to reduce wastes going to the landfill, and on the other hand turns the wastes into products for the needy. This project is to utilize available scrap

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woods from building supply store to develop wood products. Developed products will then be put in the market, and the proceeds will go to help a local charitable organization.

Groovystuff Inc., a furniture company in Dallas, Texas, has been collecting farm equipment from Thailand, and incorporates the beauty of the re-claimed materials to make all kinds of furniture and accessories. It has been successfully active in the furniture market for a decade. What Groovystuff does has proved that products from re-claimed materials is marketable and even profitable.

The project will be set up in class settings. The goal of the project is to instill the awareness of designers' responsibility to the society in reference both to the environment and the needy. In these experimental classes students first focus on collecting, classifying, and preparing scrap woods for project use. Students then study and develop product concepts, and use the scrap woods to prototype products. Finally, students market the products through special events or solicit stores to help selling. Hopefully, the project is a practical tool to educate design students to be accountable for the environment they live in and be responsible to the society. The whole process can be repeated, once it is proven feasible, and be developed into an extension service.

### III. Project Plan

The design part of the project was conducted through design class. Graduate research assistants were used in all three stages.

#### A. Design Phase

##### 1. Preparation

- a. Identify materials from construction and lumber industries that leave scrap woods for disposal.
- b. Collect and classify the scrap woods.
- c. Preparation of wood for design applications

##### 2. Product development stage

- a. Marketable concept development in a design studio

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- b. Construction of concept models and prototypes
- c. Evaluation and selection of final prototypes

### **B. Manufacturing Phase**

1. Streamline manufacturing process
2. Mass production test run
3. Evaluation and refinement
4. Mass production

### **C. Distribution and Future Plan Phase**

1. Market testing stage
  - a. Identify stores and events that help selling the developed products.
  - b. Sale tests with stores and events
  - c. Channel proceeds to local charitable organizations
2. Documentation stage
  - a. Documentation of the process
  - b. Development of guidelines for mass production

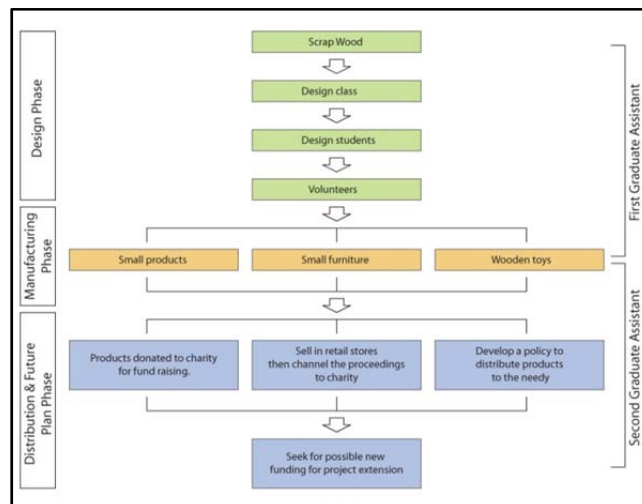


Figure 1: Project plan

## **IV. Design Projects**

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Figure 1: Scrap wood used to bundle up lumber products.



Figure 2: Scrap wood laid around in yard of building supply store.



Figure 3: Cart of selected scrap wood from the building supply store.



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Since the project started, there were three different design classes set up to come up with some solutions. Since all classes were set up on a voluntary basis, it has never been a full design class.

The first design class was an individual study with a graduate student Paul Possien. The student studied the collected wood and tried to classify the wood in different piles in terms of dimensions and shape. Some sketches were developed on how the wood could be used in making furniture pieces. However, no model was built as the student lost interest in the project.

The second design class was done when a group of visiting design students from Taiwan came visited Auburn University for a period of two months. The project was run as a design workshop to group Taiwan students from the National Cheng Kung University and the Shu-Te University, and Auburn students into design teams to develop some product concepts. Students were divided into four teams to work together in developing idea sketches, building scale models, and at the end of the workshop built full-scale models. The four groups of students from the three schools are:

Group 1: Stephen Jackson, I-Ning Wu, Cheng-En Wu, Yu-Kai Liao;

Group 2: Charles Griffith, Chris Burch, Brent Sparkman, Hsiao-Chi Yu, Meng-Long Wu

Group 3: Kathleen Chang, Matthew Livaudais, Ting-Yu Kuo, Chen, Nai-Feng

Group 4: Johnathon Haynes, Alex Jordan Wall, Yoshida, Kunihiro, Huang, Yu-Chun



Figure 4: Full-Scale models from the second class

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Figure 5: Products in use.

The third class is currently set up with two graduate students Wenyue Wang and Shuyin Li. This class focuses more on application of principles of modularity in the design in order to generate many different configurations of products. With modularity principles applied in the parts and component levels, specifications of parts and components are standardized. Time to manufacture parts and components is systematically reduced. Complexity of the process is also minimized. The students start with sketches, scale models, and CAD models to develop different concepts of products. Below are some CAD drawings showing the concept of standardization and modularity of parts and components.

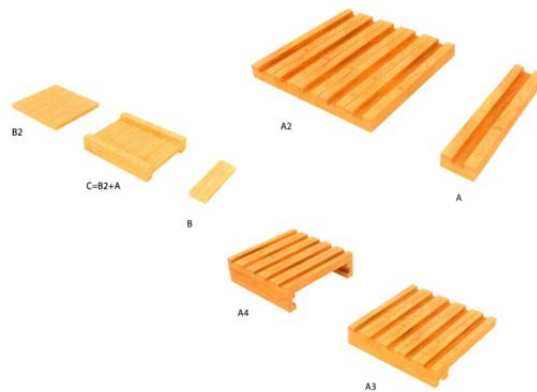


Figure 6: CAD models of standard parts and components.

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Figure 7: CAD models of products.

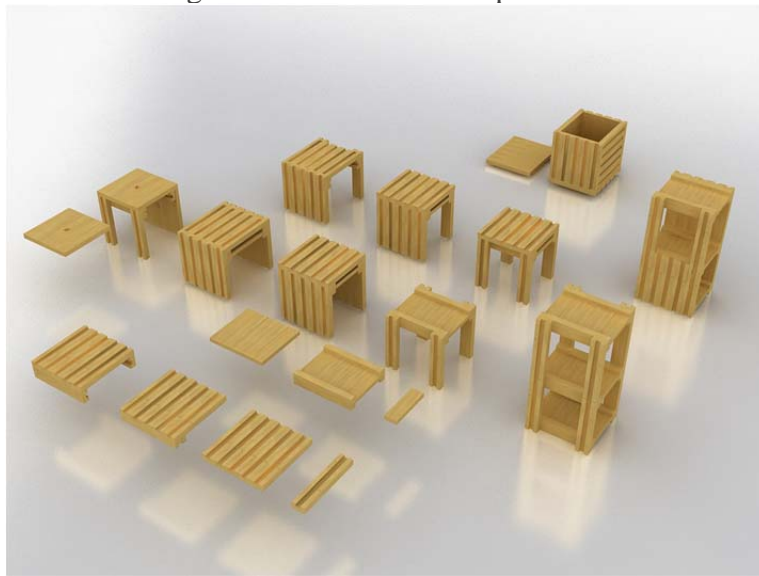


Figure 8: CAD models of different combinations of parts and components.

## V. Conclusion

After two rounds of design classes, it seems there is some promising outlook with the application of standardization of parts and components and with modularity principles. The difficult part of the project is that the collected scrap wood pieces are not in standard dimensions. Even though they can be classified into different piles, the dimensions are very rough due to the material sources are often different. To minimize the manufacture or building time required, design has to be flexible enough to allow loose tolerances without sacrificing the design quality. The next step of the project is to refine and start producing these modular concepts into products

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that may be used for market test. Once acceptability is identified, products can be mass produced. It is hope that this is not just an experimental project but a practical exercise to help local building supply store in the reduction of wastes, and make use of the neglected resource for charity cause.

### References

- Area Churches Grappling with Economy's Effects on Donation (February 5, 2009). Retrieved October 1, 2009 from <http://www.yourmonroeville.com/node/11905>
- Braungart, M. & McDonough, W. (2002). *Cradle to Cradle: Remake the Way We Make Things*. New York: New Point Press.
- Gross, D. (June 12, 2008). *The Coming Charity Crisis* [Newsweek Web Exclusive]. Retrieved October 1, 2009 from <http://www.newsweek.com/id/141161>
- Polak, P. (2008). *Out of Poverty: What Works When Traditional Approaches Fail*. San Francisco: Berrett-Koehler.