

DESIGN SEED: AN APPROACH FOR THE CREATION OF DESIGN-BASED
MANUFACTURING INDUSTRIES IN UNDER-INDUSTRIALIZED
REGIONS, LIKE, ALABAMA'S IMPOVERISHED
BLACK BELT REGION

Except where reference is made to the work of others, the work described in this thesis is my own or was done in collaboration with my advisory committee. This thesis does not include proprietary or classified information.

Mark Christopher Smith

Certificate of Approval:

Clark Lundell
Professor
Industrial Design

Tsai Lu Liu, Chair
Assistant Professor
Industrial Design

Christopher Arnold
Assistant Professor
Industrial Design

Joe F. Pittman
Interim Dean
Graduate School

DESIGN SEED: AN APPROACH FOR THE CREATION OF DESIGN-BASED
MANUFACTURING INDUSTRIES IN UNDER-INDUSTRIALIZED
REGIONS, LIKE, ALABAMA'S IMPOVERISHED
BLACK BELT REGION

Mark Christopher Smith

A Thesis

Submitted to

the Graduate Faculty of

Auburn University

in Partial Fulfillment of the

Requirements for the

Degree of

Master of Industrial Design

Auburn, Alabama
August 4, 2007

DESIGN SEED: AN APPROACH FOR THE CREATION OF DESIGN-BASED
MANUFACTURING INDUSTRIES IN UNDER-INDUSTRIALIZED
REGIONS, LIKE, ALABAMA'S IMPOVERISHED
BLACK BELT REGION

Mark Christopher Smith

Permission is granted to Auburn University to make copies of this thesis at its discretion,
upon request of individuals or institutions and at their expense. The author reserves all
publication rights.

Signature of Author

Date of Graduation

THESIS ABSTRACT

DESIGN SEED: AN APPROACH FOR THE CREATION OF DESIGN-BASED
MANUFACTURING INDUSTRIES IN UNDER-INDUSTRIALIZED
REGIONS, LIKE, ALABAMA'S IMPOVERISHED
BLACK BELT REGION

Mark Christopher Smith

Master of Industrial Design, August 4, 2007
(B.S., Auburn University, 2006)
(B.F.A., Pratt Institute, 1999)

100 Typed Pages

Directed by Tsai Lu Liu

Almost two hundred years ago, in a crescent shaped region of Alabama that stretches from Alabama's eastern boundary with Georgia to its western side abutting Mississippi, half of Alabama's enslaved population of Africans were put to work. In those times the region was known as the Black Belt because of the rich, dark soil that made it ideal for crops. It became the core plantation area in Alabama and vital to Alabama's economy. So vital, in fact, that 65% of the population in the Black Belt were slaves.

Today, the Black Belt in Alabama is also called, "Alabama's Third World", and the term Black Belt more commonly refers to a region of Alabama where the blacks outnumber the whites. The legacy, the damage, of slavery can most acutely be seen in

this region that exhibits some of the worst rural poverty that can be seen in the United States.

The following counties exhibit the characteristic problems of this region: Bullock, Choctaw, Dallas, Greene, Hale, Lowndes, Macon, Marengo, Pickens, Perry, Sumter and Wilcox.

The Design Seed outreach project intends to utilize the material resources of wood and/or paper products found in Alabama's Black Belt to design a family of educational toys that can be competitively manufactured in the Black Belt. By the creation of a family of products rooted in the needs, and resources of the community, Design Seed seeks to provide the methodology to "seed" Alabama's Black Belt with viable manufacturing industries with limitless potential.

Design Seed is an outreach project that seeks to examine the power of industrial design to create industry under adverse conditions. Design Seed seeks to "grow" manufacturing industries from the ground up in Alabama's poverty-stricken Black Belt region by designing products with resources found in that area that can be marketed worldwide .

ACKNOWLEDGMENTS

The author would like to thank Auburn University Outreach for its crucial grants supporting field outreach research and product development. Also, the author thanks the financial support of the College of Architecture, Design and Construction, and the Auburn University Office of Diversity and Multicultural Affairs.

Thank you to the faculty, and staff, of the Department of Industrial Design, who gave an amazing amount of support and encouragement. Thank you to Auburn University's Alabama Technical Assistance Center (ATAC), College of Business, Office of Technology Transfer, Department of Industrial Engineering, and College of Architecture's Rural Studio.

A special thanks to the excellent people, businesses and organizations of Alabama's Black Belt, who gave of their time and knowledge to this project. And a special thanks to parents, family and friends, who's support made returning to school possible, and all my family and friends, who encouraged and believed in me.

Style manual or journal used:

American Psychological Association

Computer software used:

Microsoft Word

Microsoft Excel

Adobe Illustrator

Adobe Photoshop

Rhinoceros 3-D Modeler

TABLE OF CONTENTS

LIST OF FIGURES	xii
CHAPTER ONE: INTRODUCTION.....	1
1.1 Problem Statement.....	1
1.2 Need for Study	7
1.3 Objective for Study.....	8
1.4 Literature Review.....	11
1.5 Definition of Terms.....	16
1.6 Assumptions of Study.....	17
1.7 Scope and Limits of Study.....	17
1.8 Procedures and Methods.....	18
1.9 Anticipated Outcome	20
CHAPTER TWO: FIELD RESEARCH.....	23
2.1 Overview.....	23
2.2 Selection of 5 Counties	23
2.3 Research Goals.....	25
2.3.1 Needs of the community	25
2.3.2 Challenges.....	26
2.3.3 Resources.....	26
2.4 Research methods and instruments.....	26

2.4.1 Qualitative.....	27
2.4.1.a Community Leaders	27
2.4.1.b Photography	28
2.4.2. Quantitative – Postcard Questionnaire.....	28
2.5 Qualitative Research Results	31
2.6 Quantitative Research Results	32
2.7 Design Seed Outreach Report.....	32
2.8 Field Research Conclusion	32
CHAPTER THREE: IMPLEMENTATION STRATEGY.....	34
3.1 Overview.....	34
3.2 Implementation Examples	34
3.2.1 Knoll	35
3.2.2 WPA case study	37
3.3 Selection of material resource.....	40
3.4 Selection of product category	41
3.5 Pilot location	42
3.6 Toy industry marketing research	43
3.7. Manufacturing research	45
3.8 Overall implementation plan.....	46
CHAPTER FOUR: PRODUCT DEVELOPMENT	47
4.1 Overview.....	47
4.2 Materials in Black Belt	48
4.3 Cultural Context.....	49

4.4 Concept sketching.....	52
4.5 Form Development	52
4.6 Design Alternatives.....	56
4.7 Prototype	56
4.8 Manufacturing	57
4.8.1 Manufacturing process.....	57
4.8.2 Manufacturing time.....	57
4.8.3. Manufacturing cost	57
CHAPTER FIVE: CONCLUSIONS	58
5.1 Implementation Model.....	58
5.2 Manufacturing in the Black Belt.....	61
5.3 Industrial Design as Outreach.....	64
5.4 Recommendations.....	68
REFERENCES	70
APPENDIX A. Quantitative Research Results.....	72
APPENDIX B. Design Seed Outreach Report 1	73
APPENDIX C. Design Seed Outreach Report 2	74
APPENDIX D. Design Seed Outreach Report 3	75
APPENDIX E. Design Seed Outreach Report 4.....	76
APPENDIX F. Design Seed Outreach Report 5.....	77
APPENDIX G. Business Plan	78
APPENDIX H. Design Concept 1	81
APPENDIX I. Design Concept 2.....	82

APPENDIX J. Design Concept 3.....	83
APPENDIX K. Design Concept 4	84
APPENDIX L. Design Concept 5.....	85
APPENDIX M. Design Concept 6.....	86
APPENDIX N. Design Concept 7	87

LIST OF FIGURES

Figure 1. Slavery scene I (Library of Congress, 1863).....	2
Figure 2. Slavery scene II (Library of Congress, 1863)	2
Figure 3. Slavery scene III (Library of Congress, 1863)	2
Figure 4. General soil map of Alabama (University of Alabama, 2000).....	3
Figure 5. Black population map of Alabama, 2000 (University of Alabama, 2000).....	4
Figure 6. Families in poverty map of Alabama, 2000 (University of Alabama, 2000).....	4
Figure 7. Black Belt – rural landscape (Smith, 2006).....	5
Figure 8. Black Belt – burned out building (Smith, 2006)	6
Figure 9. Black Belt – trailer park (Smith, 2006)	7
Figure 10. Black Belt – 5 County signs	24
Figure 11. Black Belt – Mark Smith in the field.....	25
Figure 12. Postcard questionnaire.....	30
Figure 13. WPA Poster 1	38
Figure 14. WPA Poster 2	38
Figure 15. Alabama forest types map	49
Figure 16. Brer Rabbit and the Tar Baby.....	51
Figure 17. Gee’s Bend Quilt	51
Figure 18. George Washington Carver Stamp.....	51

Figure 19. Alabama River, Wilcox County	52
Figure 20. Birds in Migration mobile - Rhino Rendering 1	53
Figure 21. Birds in Migration mobile – Rhino Rendering 2.....	54
Figure 22. Laser cutting setup.....	54
Figure 23. Laser cutting mobile	55
Figure 24. Laser cut bird elements.....	55
Figure 25. Laser cut cloud pattern	56
Figure 26. Administrative structure of Design Seed project.....	58
Figure 27. Abandoned plant in Hale County 1	62
Figure 28. Abandoned plant in Hale County 2	62
Figure 29. Abandoned plant in Hale County 3	63
Figure 30. Factory in Philippines.....	67

CHAPTER ONE: INTRODUCTION

1.1 PROBLEM STATEMENT

Almost two hundred years ago, in a crescent shaped region of Alabama that stretches from Alabama's eastern boundary with Georgia to its western side abutting Mississippi, half of Alabama's enslaved population of Africans were put to work. In those times the region was known as the Black Belt because of the rich, dark soil that made it ideal for crops. It became the core plantation area in Alabama and vital to Alabama's economy. So vital, in fact, that 65% of the population in the Black Belt were slaves.

Today, the Black Belt in Alabama is also called, "Alabama's Third World", and the term Black Belt more commonly refers to a region of Alabama where the blacks outnumber the whites. The legacy, the damage, of slavery can most acutely be seen in this region that exhibits some of the worst rural poverty that can be seen in the United States.



FIGURE 1: Slavery scene I (Library of Congress, 1863)

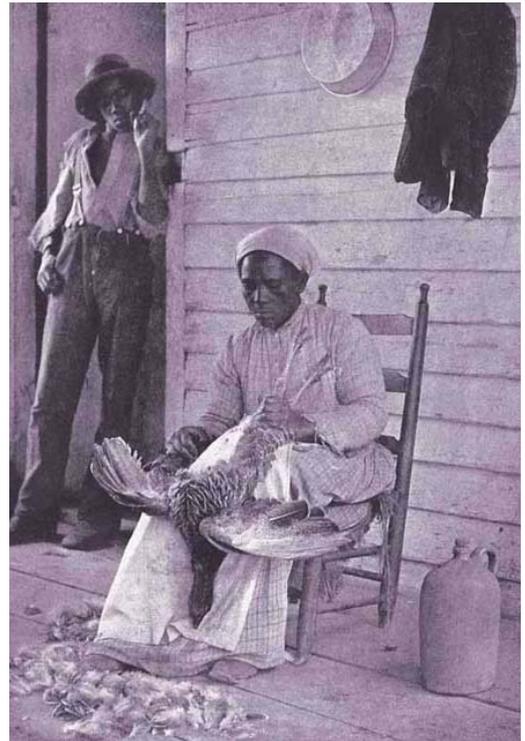


FIGURE 2 AND 3: Slavery scene II & III(Library of Congress, 1863)

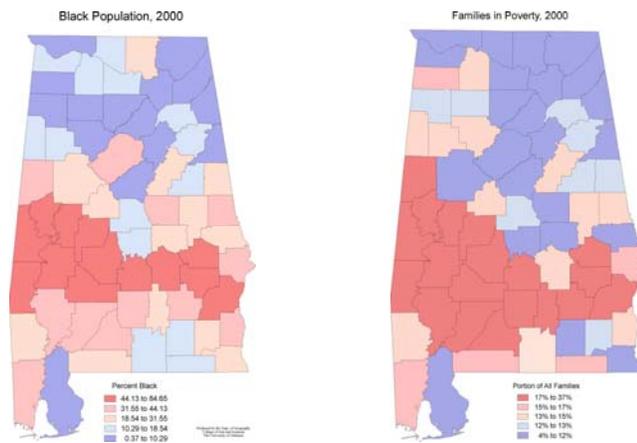
The region encompasses Barbour, Bullock, Butler, Choctaw, Clarke, Conecuh, Crenshaw, Dallas, Escambia, Greene, Hale, Lowndes, Macon, Marengo, Monroe, Perry, Pickens, Pike, Russell, Sumter, Washington and Wilcox counties. In the United States 18.2%* of children under the age of 18 live in poverty. That's far too many, but in Alabama's Black Belt that figure more than doubles to 37%*; meaning over a third of the children in the Black Belt are subject to insufficient healthcare, sub-standard education and all the other problems poverty brings. In the Black Belt 61.7%*, almost two-thirds, of single mothers with children under the age of 18 live in poverty. *(United States Census 2000)



FIGURE 4: General soil map of Alabama (University of Alabama, 2000, <http://alabamamaps.ua.edu/contemporarymaps/alabama/demographics/index.html>)

This poverty is no mystery when noting that the unemployment rate in the Black Belt is also twice the national average. No surprise, when the median household income in the Black Belt is half the national median household income and over \$10,000 *less* than Alabama’s median household income. Alabama Governor Bob Riley initiated the Black Belt Action Commission in 2004 recognizing that if Alabama is to reach its full potential, the challenges of the Black Belt must be addressed. A survey conducted in twelve of the Black Belt counties by that commission yielded the following:

- The community stated the major problems of their county are a lack of jobs, a poor economy, bad roads and inadequate education.
- The #1 ranked problem was jobs/industry
- The majority stated the reason their communities were worse off than others in Alabama was a lack of jobs/economy/industry
- When the Black Belt Commission asked for advice the #1 response was, “Get jobs”.



FIGURES 5 AND6: Black population map of Alabama & Families in poverty map (University of Alabama, 2000
<http://alabamamaps.ua.edu/contemporarymaps/alabama/demographics/index.html>)

There has been, and is, much discussion and plans of action for the economic development of the Black Belt - education programs, social programs, infrastructure improvement - to name a few. However, without a sustainable economic solution, that brings vitality to the region, the dire need of the Black Belt will always exceed the limits of altruistic, and short-term solution, funding.



FIGURE 7: Black Belt – rural landscape (Smith, 2006)

The “Design Seed” studio thesis project has the capacity to transform Alabama’s Black Belt into an economically vital region of Alabama, and thereby counteract problems of healthcare, infrastructure, education, etc. that currently plague that region. By planting the seed of change and growth through design “Design Seed” can potentially point to a new way to address poverty. Design, with its emphasis on creative problem-solving for a utilitarian purpose, is the perfect vehicle to industrialize Alabama’s “Third World.”



FIGURE 8: Black Belt – burned out building (Smith, 2006)

The potential of industrial design is still largely underappreciated. Recently, the corporate culture has begun to recognize the significant market advantage industrial design can provide. However, the full breadth of industrial design is yet untapped. There is within industrial design's focus on every aspect of a product's life, from concept to manufacture to packaged finished artifact positioned on its P.O.P. (point of purchase), a unique and expert understanding. Only industrial design methodology contains the necessary tools for a bottom-up approach to industry creation. The Design Seed outreach project seeks to explore these powers of industrial design by addressing the "third world" challenges of Alabama's Black Belt by designing an industry-creation model that can be replicated in areas suffering from similar characteristics. A model that will be a direct benefit to the workers employed by the pilot manufacturing business, and their families,

and their increased spending power resulting in increased revenue, and an indirect benefit, to the community in which they reside.



FIGURE 9: Black Belt – trailer park (Smith, 2006)

1.2 NEED FOR STUDY

The chief challenge of the Black Belt is that it was left behind industrially. A deficit of manufacturing industry, or other industry that would provide a large volume of skilled employment, has led to the continuing economic decline of the Black Belt. The Design Seed project recognizes the need to solve this challenge through industrial/manufacturing means. While there are agricultural, and horticultural, industries in the Black Belt region, they employ a relatively small amount of workers, yet require a large amount of land to operate profitably. Paradoxically, manufacturing industry occupies a

fraction of the space, yet can potentially employ hundreds of people at one factory. Since, the Black Belt suffers from a neglected infrastructure of everything from a lack of interstate roadways to insufficient sewage systems it's very difficult for the region to attract manufacturing industries. Design Seed believes it is imperative to explore industrial design as a means of creating viable manufacturing businesses, from the ground up, in the Black Belt and perhaps by doing so explore the potential of a manufacturing industry creation methodology through industrial design.

1.3 OBJECTIVE OF STUDY

The Design Seed project intends to study the living conditions in at least five counties of Alabama's Black Belt that exhibit the characteristic problems of that region.

After the research, a line of products will be identified, designed and prototyped via a funded senior design studio in the Auburn University Department of Industrial Design. We anticipate a class of 10 students generating 200 concepts and 20 prototypes. A pilot product(s) will be selected to be produced on an experimental scale in either the homes or a factory/community center (the construction of which can potentially be a collaboration with Auburn University's Rural Studio) in the Black Belt by their residents. Product value will be created by industrial design, human fine-touch, and local materials.

After the production, the products will be test marketed to selective US urban areas. We hope the products we design and produce will carry a label of "Made in Alabama's Black Belt, USA" to raise consumer's awareness in the USA and overseas.

The process, from information gathering to producing to selling in the marketplace, will be developed, monitored, and evaluated as a model that can be used in

every county of the Black Belt, and beyond, to improve the living conditions of that town by providing jobs and revenue to local businesses. The results of this model's viability will be published.

Design Seed project will serve a town, in a county of Alabama's Black Belt that is selected as the pilot location after Phase I. The direct participants of the project will be thirty people in that area who wish to work. The indirect beneficiaries will be the workers families, the town economy that will benefit from the workers increase spending power, and the overall county economy.

Our goal is to design products that will take a participant 30 minutes to finish a job. We estimate each participant can earn an average of \$10.00 dollar/hour. The driver job could earn \$15.00/hour on average.

The method of this proposed solution will be to identify products and create designs that can be produced with materials germane to that region, and sold in U.S./overseas markets. The goal is the creation of designs that can be manufactured in such a way as to overcome the infrastructure problems, like bad roads, of the Black Belt, and design a business model that meets the unique challenges of establishing an industrial business in the Black Belt region.

In pursuit of the goals of this thesis project, Design Seed, has been fortunate to be funded by the Auburn University College of Architecture, Design & Construction, also blessed to receive a \$5,000 grant from the University Outreach office of Auburn University for outreach research in Fall 2006, and another \$3,000 grant for product development in Spring 2007. The funding has played a crucial role in the scope this

thesis project was able to explore, however, equally crucial has be the generous time and guidance of the following list of Design Seed consultants:

1. Melissa Foster Denney, Development & Grant Officer, Rural Studio, Auburn University
2. Royrickers Cook, Ph.D., Assistant Vice President for University Outreach, Auburn University
3. Joe Sumners, Ph.D., Director Economic and Community Development Institute, Auburn University
4. Jeffery Smith, Ph.D., Professor of Industrial Engineering, Auburn University
5. Calandra Lockhart Ph.D., Assistant Professor, Field Experience Coordinator, Valdosta State University
6. Ben Kelly, Accountant for the College of Architecture, Design and Construction, Auburn University
7. Kimberly King-Jupiter, Ph.D., Director of Outreach Planning and Faculty Engagement, Auburn University
8. Brian Wright, Ph.D., Associate Director for Commercialization, Office of Technology Transfer, Auburn University
9. George Konstant, Associate Director, Contracts & Administration, Office of Technology Transfer, Auburn University
10. David Mixson, Management Scientist, Auburn Technical Assistance Center, Auburn University
11. Clinton LeNoir, Management Scientist, Auburn Technical Assistance Center, Auburn University

12. Dr. Daniel Butler, Thomas Walter Professor of Technology Management/Assoc.
Professor of Marketing, Auburn University

1.4 LITERATURE REVIEW

Design Seed: An approach for the creation of design-based manufacturing industries in under-industrialized regions, like, Alabama's impoverished Black Belt region, studio thesis project seeks to design products that can be profitably manufactured in the Black Belt region of Alabama for the purpose, and benefit, of economic development in that region. This project seeks to show that industrial design can be utilized as a method of industry creation in an unindustrialized region. This thesis was researched with books, periodicals and internet sources that covered the following subject matter:

- Manufacturing
- Alabama's Black Belt
- Manufacturing industry creative process
- Creative process
- Marketing

These subjects were selected to cover all aspects of the "bringing a product to market" sequence: idea, concept development, fabrication, manufacture and entrance into the market place. While the majority, of the resource materials selected support the idea that a "bottom-up" approach to industrial creation is viable there are also a number of resource materials that communicate an opposite opinion and highlight the difficulties in such an untraditional approach.

In order to properly evaluate the merits of this thesis, and resources that it utilizes, it is first important to establish the need that drives this thesis.

“Industrial Site Development Study: Cochrane, AL.”

Quotes:

1. “Treated water is not available at the Cochrane Industrial Site at this time; however, the site is located adjacent to the Tobmbigbee River which is an excellent source.”
2. “Sewage facilities are not available on the site at this time.”
3. “At this time there are no roads penetrating the site, however, a road is proposed that will allow equal access to all divisions on the site ...”

Opinion:

The problems in Cochrane, AL are indicative of the infrastructure problems to be found in the Black Belt. This book focuses on the challenges of creating an industrial site in Cochrane and Design Seed believes it this type of analysis and problem-solving which must be instituted during the design phase.

“Integrating Design and Manufacturing for Competitive Advantage”, edited by

Gerald I. Susman

Quotes:

1. “The term design for manufacturing, or DFM, is used in this book to characterize efforts by design and manufacturing to improve the product-process fit or to increase the degree to which the product and process are designed simultaneously.”
2. “The role of suppliers was not explored in this study and needs to be included in the new research of this type. Since it appears that the rational of design to manufacturing

engineers is related to concept development (the greater the balance, the more effort on concept development) ...”

3. “The finding that “medium”-sized firms appear to spend more effort on concept development is provocative ... It may be that smaller firms have less trouble integrating function ...”

4. “Design for assembly (DFA) is a systematic analysis process primarily intended to reduce the assembly costs of a product by simplifying the product design. It does so by first reducing the number of parts ... then by ensuring that remaining parts are easily assemblable ...”

5. “In truth it is more a designer/manufacturer conflict than it is a design/manufacturing conflict, i.e., it is rooted more in the organization than it is in the design and manufacturing tasks themselves.”

Opinions:

Design Seed proceeds from the idea that a more close relationship between the design and manufacturing aspects of bring a product to market can overcome much. Mr. Susman’s books has helped a great deal in identifying the importance of culture in a close design/manufacturing relationship. Design Seed agrees that the efficiency to be found in a DFM model can yield substantial benefits for a micro-manufacturing (quote #3) approach of the kind Design Seed envisions. In quote #2 Mr. Susman focuses on the incompleteness of his study by not including suppliers. Design Seed agrees this is a significant limitation. The supply of materials plays a key role in Design Seed’s viability.

“Product Design for Modularity”, by Kamrani and Salhieh

1. “The design specifications both drive and control the design throughout the process. They are especially important during the early phases of the design effort because they serve as the principal guidelines for the project team ...”
2. “The main disadvantage of the sequential method is the weakness of links between the functional departments that should be cooperating to develop a new product. To overcome this weakness, it is necessary to change the steps of development into a more simultaneous and less sequential process ...”
3. “Modularity focuses on decomposing the overall problem into functionally independent sub-problems, in which interaction or inter-dependence between sub-problems is minimized. Thus, a change in the solution of one problem may lead to a minor modification in other problems ...”
4. “DFMA is a systematic design evaluation process that is used to improve part design and part manufacture early in the design process ... Design for manufacture (DFM) methodology analyzes individual part geometry and process choices for impact on material, manufacturing process, and tooling costs ...”
5. “The DFMA process is done by a team rather than by a single engineer. The DFMA process team is a cross-functional team from all aspects of design and manufacturing”

Opinions:

Design Seed most agrees with the team approach early in the DFM process (quote #5). However, Design Seed is unsure if modularity is a good system for a micro-manufacturing model. Modularity seems better suited to a large complex manufacturing model where there are many components. Design Seed doubts, on a small scale, if the problems identified in quote #2, would be as important.

“Knoll Design”, by Larrabee, Eric

1. “ – but also a pursuit of greater rationality about manufacture: use the most appropriate material, seek the most economical method.”
2. “They did a line of chairs in soft woods with discarded army webbing or parachute cloth ‘very basic, very simple, inexpensive, easy to make,’ as Risom describes them ...”
3. “It is, first of all, absurdly easy to make, resembling as it does four giant hairpins locked together, from which hangs the sling in which one sits. For the frames, metal rods and a welding torch are all one needs; housewives in California and drop-outs in Greenwich Village proved to be equally adept at putting them together ...”
4. “He came at a solution by process of elimination. He did a thousand solutions for any one design. You got what you got by throwing away everything that wasn’t as good – but you tried everything.”

Opinions:

This book was very enlightening and revealed the importance of simplicity and practicality. Knoll was founded on value through the power of design and a micro-manufacturing model, both of which Design Seed aspires. In quote #3 it is evident that it is imperative to design a manufacturing system that is easy for workers to be trained on. Design Seed agrees with the process and perspective of this book, especially the use of recycled materials (quote #2) for the products.

1.5 DEFINITION OF TERMS

Alabama’s Black Belt - Almost two hundred years ago, in a crescent shaped region of Alabama that stretches from Alabama’s eastern boundary with Georgia to its western side

abutting Mississippi, half of Alabama's enslaved population of Africans were put to work. In those times the region was known as the Black Belt because of the rich, dark soil that made it ideal for crops. It became the core plantation area in Alabama and vital to Alabama's economy. So vital, in fact, that 65% of the population in the Black Belt were slaves. Today, the Black Belt in Alabama is also called, "Alabama's Third World", and the term Black Belt more commonly refers to a region of Alabama where the blacks outnumber the whites. The legacy, the damage, of slavery can most acutely be seen in this region that exhibits some of the worst rural poverty that can be seen in the United States.

Outreach - Working to help people and improve quality of life in their communities.

Industrial Design - industrial design is, quite literally, design (problem-solving, innovation, creativity, art, culture, form, function, etc.) that is industrial (mass-produced, manufacturability, affordable, market-driven, etc.).

Methodology – a systematic way of doing things that can be repeated.

Infrastructure – road, sewer, water, and electricity availability and quality; also, for the purposes of this project infrastructure refers to education and skill level of people.

1.6 ASSUMPTIONS OF STUDY

- Industrial design can be used as a method of outreach.
- The best method for creating a manufacturing business is to start with the product and work from there.

- The industrial design profession possesses the unique skill set necessary to consistently create industry, from the bottom-up, in today's economy.
- Industry can grow in Alabama's Black Belt.
- Economic development can significantly reverse poverty, the hold of racism, inadequate education and healthcare, and a segregated society.
- Industrialization is a positive force for social good.
- The capitalistic system of the United States of America is a good system if one is making a decent living.
- Teaching someone how to fish is far superior to giving him a fish.
- All people seek to accomplish something in life and that no one is happy sitting on the side lines.
- We all have something substantial to contribute.
- Slavery is a wound that must be healed before the United States of America can be a truly strong country.

1.7 SCOPE AND LIMITS OF STUDY

Scope - The scope of my outreach research are five counties of the Black Belt. The scope of the implementation of the Design Seed project is one town in one of those five counties.

Limits:

- Time
- Ability to talk to all the people in the counties
- Money

1.8 PROCEDURES AND METHODS

The project will be structured in three phases:

Phase I – Research

This is a six month phase and culminates with a research report. The research report will include:

- Documented (photo and video) on location interviews with Black Belt residents utilizing a questionnaire. There will be a separate list of questions for community leaders and potential workers.
- Social culture research to analyze possible products
- Market research on possible products
- Market trends
- Materials and manufacturing research as they relate to the specific conditions of the Black Belt
- Production processes
- Business facilities location scouting
- Demographic study
- Competition study

Phase II – Product and Business Plan Development

This is a six month phase and culminates with product prototype and detailed business plan. The phase includes the following:

- Material selection – the selection of materials for manufacture.
- Pilot location selection – the selection of an appropriate location to place factory.

- Manufacturing process selection - the selection of a specific manufacturing process.
- Human factor research – a study of various human needs as it relates to given product.
- Define design goals
- Establish performance criteria – list of parameters necessary to meet design goals.
- Technology research – a study of available technologies as related to product.
- 2-D concept development – developing concepts on a two dimensional surface, i.e., drawing, marker rendering and drafting.
- 3-D concept development – model making a three dimensional form for the purpose of developing a product.
- Concept evaluation – determining which product concepts best meet performance criteria.

Phase III – Implementation Model

This is a three month phase and culminates with a finished implementation plan. The phase includes the following:

- Product function development – developing features that improve the functionality of the product.
- Prototyping – generating an original model on which the product will be patterned.
- Create alternative solutions
- Documentation for engineering – orthographic technical drawings that explain how design is constructed in detail.

- Project documentation – record keeping of project process.
- Detail market analysis – conclusions drawn from marketing research.
- User studies – studying user reactions to develop better prototype.
- Operating procedures – established or prescribed methods to follow for the performance of product concept.
- Legal research – investigation of patents that relate to product concept.
- Cost analysis – conclusions that estimate the cost of producing product concept.
- Pro-forma income projections (profit & loss statements) – a financial statement that projects whether the business will make a profit, or not.
- Capital equipment and supply list – a list of all supplies and equipment necessary to manufacture product.
- Break-even analysis – a breakdown of how much is expended and how much income is received.

1.9 ANTICIPATED OUTCOME

The findings of the Design Seed outreach project will be that a viable, profitable manufacturing business can be created in an area with a distressed infrastructure and severe poverty by utilizing industrial design methodology, and a product-first, approach.

The deliverables will be:

Phase I

- (a.) Outreach report that communicates the major resources and challenges of the area, as well as, communicates the needs of potential workers.

(b.) Marketing report that communicates potential markets and industries to develop products for.

(c.) Region report that communicates the materials, resources, demographic, infrastructure and human factors of the region.

Phase II

(a.) Product category selection

(b.) Pilot location selection

(c.) Marketing research

(d.) Manufacturing process research

Phase III

(a.) Product concept development

(b.) Form development

(c.) Product prototype(s)

(d.) Implementation plan

The tangible result of the project will be a pilot product, or products, and an implementation plan that can be utilized to launch a manufacturing business in one of the counties of Alabama's Black Belt.

From a long term perspective the consequences of the Design Seed project could be staggering. Design Seed outreach project literally has the potential to be the blueprint to industrialized the under- or un-industrialized areas of the world. With its capacity to employ a large number of workers, at good wages, in a relatively small area, manufacturing industries have proven to be unique in its power to drive progress as our society has come to define it. The Industrial Revolution established a new hierarchy

worldwide. The Design Seed project could provide the methodology to finish the industrialization process, reaching out a helping along those pockets that have been left behind, and thereby affecting all aspects of poverty from infant mortality to education.

CHAPTER TWO: FIELD RESEARCH

2.1 OVERVIEW

It was suggested to me that before someone can seek to serve a community that person must first listen to what the community to be served has to say. Upon listening, that person may find that their great, and noble, ambitions are misguided, misplaced or just plain wrong. It is through listening, I was told, that we learn, and through first learning that we are best equipped to serve.

With this suggestion in mind it seemed imperative to make a sound reading of Alabama's Black Belt before a single product sketch was drawn or implementation strategy strongly considered. The Black Belt, however, is a formidable region encompassing from twelve to twenty-something counties; depending on what source one relies upon. With the generosity of a \$5,000 grant from Auburn University's Outreach Office the Design Seed outreach project had the finances to travel the Black Belt, the challenge, however, was limited time, and manpower, to do so.

2.2 SELECTION OF COUNTIES

The solution to the dilemma of hearing what the people of Alabama's Black Belt had to say, and to directly assess the Black Belt itself as objectively as possible, was to research a sampling of the Black Belt.

Five counties were selected utilizing a combination of the following:

- Statistical data that showed that these five counties were strong examples of the economic problems to be found in the Black Belt
- Maps that indicated significant geographical differences between the counties that would lead to different strengths and weaknesses that could be compared later
- Suggestions made by those experienced in Alabama's Black Belt, for instance, Melissa Denney of the Auburn University Department of Architecture's Rural Studio based in Hale County (a county in the Black Belt), Dr. Joe A. Sumner, Director, Economic Development Institute of Auburn University, and Dr. Royrickers Cook, Assistant Vice President for University Outreach of Auburn University.

Based on this input Dallas, Hale, Greene, Perry and Wilcox counties were selected for field research.



FIGURE 10: Black Belt – 5 County signs (Smith, 2006)

2.3 RESEARCH GOALS

The purpose of going out into the field to study the five selected counties was to ascertain the needs of the people of Alabama's Black Belt, to assess local resources, both material and otherwise, and to identify the challenges indicative of the region in regards to starting a manufacturing industry in the region. The information gathered should provide a clearer understanding of what is involved in attempting to create a manufacturing business in that region.



FIGURE 11: Black Belt – Mark Smith in the field (Smith, Lewis H. 2006)

2.3.1 NEEDS OF THE COMMUNITY

In order to better serve the community in which Design Seed seeks to provide manufacturing jobs it was imperative to investigate the needs of the community. Often, outreach projects and programs are initiated with great fan-fare and fail. The reason is often a disconnection between the well-meaning project people and the community they intend to serve. Ideas can be seductive, especially ideas on how to help others. A thorough investigation of

the true needs of a community is the first step in forming an outreach project that is relevant and needed.

2.3.2 CHALLENGES

It is the position of the Design Seed Outreach Project that every challenge in an under-industrialized region, such as, the Black Belt can be either overcome or converted into an asset through industrial design. However, to accomplish this task the challenges to be faced must be identified. The identification and thorough investigation of challenges, therefore, became an important task of the field research.

2.3.3 RESOURCES

The definition of resources is a broad one. The resource could be a skill, a geographical feature, a material, local businesses, the local culture – the list is endless. Since, the Design Seed approach is to utilize local resources to create a viable, manufacturing business, an open mind approach was used to investigate the resources of the Black Belt.

2.4 RESEARCH METHODS AND INSTRUMENTS

Before traveling to the Black Belt it was necessary to first select a method, or methods, of data collection. After consulting with Joe Sumners, Ph.D., Director, Economic and Community Development Institute, Auburn University, he advised a two pronged approach: one qualitative and the other quantitative. As he explained, although there were specific questions that needed to be asked, hence the quantitative

approach, it was perhaps even more important to hear what the people had to say in a more lengthy, organic interview. Dr. Sumners and Dr. Royrickers Cook, Assistant Vice President of University Outreach, Auburn University, stated that the Black Belt had been an extensively researched region from a statistic standpoint. However, a qualitative approach had the potential of hearing answers to questions we were not knowledgeable to ask, and also, to discover questions that we should be asking. Based on the recommendations of Dr. Sumner and Dr. Cook the two pronged, qualitative and quantitative, approach was adopted.

2.4.1 QUALITATIVE

A qualitative research method has the danger of meandering too far away from the topic to be addressed. Often open conversations, or conversations with the wrong subjects, yield unreliable and useless data. It was decided therefore to approach the qualitative segment by concentrating primarily on community leaders as subjects, and photography.

2.4.1.a COMMUNITY LEADERS

Also at the advice of Dr. Sumners community leaders were the subjects selected to be interviewed. Local business owners, city and county officials, judges, directors of human resources, etc., often have a macro-view of the community, in which they live or serve. Local community leaders are often privy to information regarding why a local manufacturing business closed, what the local budget is, and where the money is coming from to for roads and schools. Also, from a practical research methodology perspective community

leaders were easier to interview, because they were at work in the community. Often the average employed person was traveling long distances to go to work or did not have the flexibility at their place of employment to take time out to be interviewed. The average interview time with a local community leader was 35 minutes.

2.4.1.b PHOTOGRAPHY

The landscape of the Black Belt was as important to gain an understanding of as the people. Would it be more feasible to renovate a space for the factory, or build from scratch? Is it advisable to place the manufacturing facility in town, near town or far from town? These are the sort of questions that photography could answer. A picture saying a thousand words regarding the infrastructure, people and resources of the Black Belt.

2.4.2. QUANTITATIVE – POSTCARD QUESTIONNAIRE

A six question postcard survey was handed out at key locations to be distributed to those who were classified as potential workers. Management at local libraries that supported job seekers with library computers, owners of favorite local eateries, directors of human services departments, directors of job link centers and local community service agents were asked to distribute the postcard questionnaire to individuals over the age of 18 years old. A thousand postcard were distributed with this methodology in the five field research counties. The purpose of the survey was to investigate the opinions of potential workers regarding various manufacturing job

environments, determine the skills to be found in the Black Belt, and gain an understanding of the concerns of the workers we hope to employ. Their opinions construct an important consideration in proposing a production model in the Black Belt region that will recruit and train the current work force in the region.

The six questions asked on the postcard were as follows:

1. Would you like a manufacturing job where you worked in your home?

a. Yes

b. No

2. Would you like a job working with your hands? *For example: sanding, painting, carving, sewing, gluing or assembling.*

a. Yes

b. No

3. Please circle which skills you have.

Welding/metal work

Driving

Sewing

Construction

Painting

Assembling/fabrication

Carpentry

Other _____

Printing

4. Which place would you prefer to work a manufacturing job: *Please chose one.*

At your home

A central factory with an area for

At a local church or community

childcare

center

5. Would you willing to work for less pay if childcare was included as part of the job?

a. Yes

b. No

6. Which is your biggest worry about a new job? *Please choose your top 3 concerns.*

Pay

Security of the job

Benefits

Work hours

Getting along with others

Enjoyment of work

Environment

Opportunity for advancement

Safety

Training



FIGURE 12: Postcard questionnaire (SMITH, 2006)

2.5 QUALITATIVE RESEARCH RESULTS

The community leaders interviewed provided in-depth qualitative assessments of the problems and outlooks in their areas from their perspectives. The forty two community leaders interviewed included court judges, school teachers, mayors, county human resource directors, business owners, church leaders, and so on. All interviews were digitally recorded and summarized. The questions were asked in different manners, including “What resources in your area do you believe are under utilized?” and “What do you believe is special or unique about your area?”

The majority of interviewers said “people” are their greatest resource. They supported statements like, “Right now people drive two hours to get to work; folks want to work” and “We got skilled people here, there are just no jobs” and “the people are here, and they want to work, there are just not enough jobs.” Almost every community leader was passionate about the value of the people in their community, “...the people here are good...family-oriented...” as well as the belief that, if given the opportunity, the people of their communities can accomplish amazing things.

When asked about the challenges in their community, most community leaders pointed out that education and basic infrastructures are the main obstacles to economic growth. Alvin Reed, Director of Perry County Department of Human Resources indicated that many single mothers cannot work because of the lack of reliable and affordable day care. He also noted that many people are willing to work but they do not have transportation. In addition, racism was mentioned in the interviews. Some community leaders also revealed that a small group of people in their community are very reluctant to see progress in order to protect their own interests.

2.6 QUANTITATIVE RESEARCH RESULTS

The quantitative research results from the postcard question were calculated in to percentages, and put into the form of pie charts and graphs. These postcard questionnaire research results are attached in appendix A.

2.7 DESIGN SEED OUTREACH REPORT

A comprehensive report of the field research was produced. This outreach report included, statements taken from the interviews of community leaders, photography of the region, and its people, statistical information from secondary sources, material resources discovered by my field investigation, a summary of the needs of the community taken from the interviews, and the quantitative results of the postcard questionnaire. The outreach report was the deliverable for the \$5,000 grant given by the Auburn University Outreach Office. The Design Seed outreach report is attached in the appendices pages B – F.

2.8 FIELD RESEARCH CONCLUSION

The Black Belt is a region rich in material resources. With the degree of poverty found there I expected to have to dig deeper to uncover resources that would be conducive to manufacturing industry; the successful implementation of such industry being the purpose of the Design Seed project. However, with its rich timber surplus, utilized for paper, packaging, wood pellets, drumsticks and all manner of products, its still powerful agricultural capabilities, its vast stretches of good land, waterways, and

most importantly, large, willing workforce to pull from, a manufacturing industry would have no more difficulty in the Black Belt than some other prime industrial location in the Southeast. Indeed, many manufacturing industries remain successful in the Black Belt and in counties, such as Dallas County, there is a large influx of industry coming into the community.

So what is the problem? I draw your attention back to the demographic information in this report. On average 90% of the white communities of these counties live above the poverty level, while almost half of the black communities live below the poverty line. That is a giant gap, and in my interviews I heard consistently that the bulk of the land, industries, banks, etc., are owned by small group of whites determined to keep things that way. While many of the local governments in these majority black counties are seeing a change in civic leadership in the election of black mayors, probate judges, council members, etc., they are also seeing an increasing polarity between the races. It is this racial strife expressed in segregation of schools, political controversies, a hoarding of resources and the undermining of progress that appears to me to be the core challenge of the Black Belt.

CHAPTER THREE: STRATEGIC ANALYSIS OF BLACK BELT DATA TOWARDS AN IMPLEMENTATION PLAN

3.1 OVERVIEW

During the research phase it was imperative to keep an open mind and not draw any premature conclusions. As stated earlier, there has been exhaustive study of Alabama's Black Belt region, however, no dialogue with the people of the Black Belt regarding issues pertinent to establishing a manufacturing business in the region. The honest, untainted responses of the residents interviewed, or polled in the questionnaire, are data that could have a lasting impact on Design Seed, and perhaps other projects. After gathering that data, however, it was necessary to begin forming opinions. The processing of that raw data, and drawing strategic conclusions from it, was the next step in the methodology of creating a manufacturing business tailored to be successful in an adverse, under-industrialized region, such as, the Black Belt.

3.2 IMPLEMENTATION EXAMPLES

The approach to sifting through the field and statistical data to ascertain what was relevant to the project involved looking at ventures that were similar to Design Seed. Two case studies were examined for their similarities, either as a design-based

manufacturing business or a social enterprise. Each proved invaluable as a guide to strategic processing of the Black Belt data.

3.2.1 KNOLL

Knoll is now a giant in the world of furniture design, but even a giant has to start somewhere. Research into the background of their success indicated strong ties to design process, and an adherence to a design for manufacture (DFM) and a design for assembly (DFA) approach. How a design could be manufactured quickly and efficient was a major concern, even attention to who would likely be the worker making the product.

“It is, first of all, absurdly easy to make, resembling as it does four giant hairpins locked together, from which hangs the sling in which one sits. For the frames, metal rods and a welding torch are all one needs; housewives in California and drop-outs in Greenwich Village proved to be equally adept at putting them together ...”

This process and perspective proved quite valuable as a guide in analyzing the Black Belt data. The skill level of the workers available, revealed from the worker postcard questionnaire, became a key component in painting the picture of what kind of products it was best to pursue making. Also, the Knoll stories brought up the issue of training. How long would the workers need to be trained? Would a training specialist, for instance on a piece of automated equipment, need to be brought in? For how long, and at what cost? These questions, and the example of Knoll, pointed to pursuing a

product category, and design concepts for that product category, that are “absurdly easy to make”.

The Knoll story pointed the way further:

“ – but also a pursuit of greater rationality about manufacture: use the most appropriate material, seek the most economical method.”

The Knoll example showed that an important factor of the analysis of the Black Belt data was linking the material resource data gathered with various product categories; and finding material resources in the Black Belt and a product category that complimented one another. Also, looking past conventional material offerings:

“They did a line of chairs in soft woods with discarded army webbing or parachute cloth ‘very basic, very simple, inexpensive, easy to make,’ as Risom describes them ...”

Since Design Seed is a design-based manufacturing business, Knoll’s design approach also had a lot to teach. The chief assertion of this thesis is that design has the power to overcome the challenges of an under-industrialized region regarding the formation of a manufacturing business, because design can add significant value to inexpensive materials and manufacturing processes. Design process of a successful design-based company like Knoll becomes very relevant. The following quote, “He came at a solution by process of elimination. He did a thousand solutions for any one design.

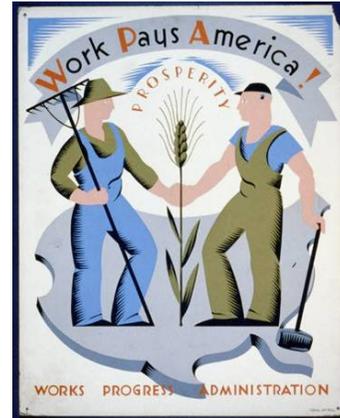
You got what you got by throwing away everything that wasn't as good – but you tried everything.”, initiated questions regarding analyzing the Black Belt data from a business model perspective, factoring in design process issues into a profitable business structure.

3.2.2 WPA CASE STUDY

The Milwaukee WPA Handicraft Project was perhaps the closest model found that mirrored the ambitions of the Design Seed Outreach Project. In 1929 the Great Depression hit the United States, and quickly spread to Europe. The result was devastating poverty, the dramatic decline of farming and rural areas where crop prices dropped as much as 60%, industries of all types failing, the halt of new construction and a crushing blow to the spirit of the American people.

In response to this tragedy President Roosevelt initiated New Deal programs in 1933. The Works Progress Administration (WPA) was created in May 1935 with the later perspective of providing work in order to bolster the morale of Americans. The WPA was the largest and most comprehensive New Deal agency, employing millions of people and affecting most every locality, especially rural and Western Mountain populations.

As a case study to assist in analyzing the Black Belt data, the New Deal programs, and the WPA programs in particular, proved important in stressing the morale of the people to be served as a factor to consider when constructing the implementation strategy. President Roosevelt and his policy makers understood that it was imperative to provide not only jobs, but pride, a sense of equity that the workers were part of the rebuilding of their country, and hope that their work was building a brighter future for their children.



FIGURES 13 and 14: WPA Poster 1 and WPA Poster 2 (Source: Google Images)

When interviewing Mr. Joseph F. Steigall, Superintendent, Board of Education Hale County in Greensboro, AL, he concluded his interview with a story that expressed he views regarding the needs of the community from the perspective of working in a manufacturing business.

“There was once in France a great cathedral being built. It was said that this cathedral would eclipse all other cathedrals known to man. Thousands were employed in its construction. There was a young monk who was fascinated by the building arts, but was not permitted to be a part of the great cathedral’s construction. One day, he stole away from the monastery to explore the new cathedral that was nearing completion. He had to complete all his chores before leaving so by the time he entered the incomplete building it was the end of the day and everyone was leaving to go home. Some workmen were walking towards him covered in sawdust, ‘What do you do here?’, he asked them. ‘We plane the

beams’, they said. Further in, a group of workmen covered in stone dust was walking out, ‘What do you do here?’, he asked of them. ‘We cut the stone for the walls’ they replied. Further in another group of workers, these covered in glittering dust, came towards him. ‘May I trouble to ask what you do?’ he said. ‘We make the glass for the giant cathedral windows”, they replied. Finally, he came deep into the now almost completely empty cathedral. Sitting alone was a blind woman washing the rags left by the workmen. ‘Excuse me, old mother’, he said, ‘May I trouble to ask what you do here?’ She looked up at the voice and said, with greatest pride, ‘Young man, I am helping to build a glorious house to our Lord.’ (Interview with Joseph F. Steigall, October, 2006)

Mr. Steigall challenged that whatever the final manufacturing model’s form might be the workers that make it up should perceive their job as the old woman did, not as the others who saw only the task immediately in front of them; and inspiring the workers to feel that connected was the responsibility of Design Seed.

The Milwaukee WPA Handicraft Project is a good example of Mr. Steigall’s vision of Design Seed. Elisa Ulbricht, a faculty member of Milwaukee State Teacher’s College took on the formidable job of starting a manufacturing business from the ground up. This was a WPA, government-subsidized venture. Ulbricht hired her talented visual art seniors, and recent graduates, as designer-foremen and they developed designs that could be produced by the workers they hired. Her designer-foremen were responsible for training the workers and to develop quality product designs within the limitations of materials available, and skills of the workers.

From 1935 to 1942 Ulbricht and her designer-foremen grew their manufacturing business to a height of employing as many as 1,350 workers. At this peak, the project occupied three floors of a factory building one square block wide. They had nine production units: wood production, cloth toy production, furniture production, appliqué production, weaving production, rug production, block printing production, screen printing production, costume production and doll production. The production units often worked in concert. The costume production unit might design and produce small dresses for the dolls produced by the doll production unit.

A perspective of diversified production units, the success of their manufacturing model, and the challenges, such as, constant turnover of their female workers, provided valuable insight into the Black Belt data and the formulation of an implementation strategy.

3.3 SELECTION OF MATERIAL RESOURCE

The selection of the material resource was based primarily on:

1. Availability of large quantities of material
2. Amount of processing material would require
3. Conduciveness to lucrative product categories
4. Expense of manufacturing process for that material

While the material investigation offered materials with excellent potential, like the gourds found in Wilcox County, these materials required a sizeable investment to initiate, as well as, process.

Wood and paper products were selected as the pilot material. The Black Belt region currently enjoys a surplus of wood, and there are two large paper mills in the region that utilize the sizeable slash pine (used for making paper products) industry. Wood and paper products require little further processing after purchase. Also, there are several relatively inexpensive manufacturing processes that are extremely conducive to a design-based business that will be discussed in further detail in 3.7 manufacturing research.

3.4 SELECTION OF PRODUCT CATEGORY

The selection of a product category was put objectively to a group of eight designers following a Microsoft Powerpoint presentation of the Black Belt research. The unanimous choice was developmental/imaginative play toys made from wood, or paper products, for children up to the age of seven. It was voiced at this meeting that such educational toys, especially if designed to be culturally reflective of the workers who would be making them, would not only fair well in the marketplace but provide the inspirational element for the manufacturing model. Poor education is one of the crisis issues plaguing Alabama's Black Belt, and is a common challenge of other under-industrialized regions. It was agreed that producing toy products that were culturally reflective of the people of the Black Belt, were products that the workers valued and wanted to share with their families, and empowered the community to be a part of the answer of addressing the problems that plague them was a winning scenario.

3.5 PILOT LOCATION

After the selection of the product category, and the material to be used, analysis of the Black Belt data pointed to two counties as well suited for a wooden toy manufacturing industry: Greene County and Dallas County. Both counties possessed good concentrations of the types of wood necessary for a toy business, and both had community leaders who were passionate about implementing the project in their counties.

The advantages to Greene County were:

1. Interstate access
2. Support from Housing Authority in initiating a supplemental cottage industry model
3. Close proximity to resources of Tuscaloosa County
4. Close proximity to an airport

The advantages to Dallas County were:

1. Larger worker supply
2. Closer proximity to the Auburn University support network
3. Selma is a larger city than Eutaw, in Greene County, and possess a wider range of derelict buildings to occupy in downtown Selma
4. More “city” resources like a well-maintained library, with computer access, an active Chamber of Commerce and Industrial Board, etc.

Greene County, Eutaw, Alabama, was selected as the pilot location primarily because it did not possess as much political and social strife as Dallas County.

Qualitative research into Dallas County, Selma, in particular, indicated a number of political controversies, and an inability for the city, and county, boards to come to an

accord on a number of issues. The support of local officials in Greene County appeared more uniform, and more reliable regarding a pilot implementation of the project.

3.6 TOY INDUSTRY MARKET RESEARCH

In the local market the top three competitors in the market of developmental/imaginative play wooden toys are Brio, Melissa & Doug and Janod.

In this market our number one competitor is Brio. It is estimated that they hold a market share of 53%. The average prices of their products vary, retailing at Target from \$9.95 to \$139.00. Their primary customer attraction is name recognition. They are particularly good at creating fun, visually appealing products that allow for extended play for the children. Their competitive strengths are customer loyalty, name recognition, and market penetration. Their competitive weaknesses, however are their location. As a company based in Sweden, Brio is not as well-equipped to design toys that are culturally relevant to U.S. consumers.

In this market our number two competitor is Melissa & Doug. It is estimated that they hold a market share of 12%. The average prices of their products, on-line and retailing at Target and Walmart, is from \$9.95 to \$239.95. Their primary customer attraction is a strong focus on educational play toy products. They are particularly good at meeting the needs of the customer at an affordable price. Their competitive strengths are market penetration, name recognition and pricing. Their competitive weaknesses are customer loyalty, and pricing.

In this market our number three competitor is Janod. It is estimated that they hold a market share of 2%. Their products range from \$6.99 to \$49.99 at Target. Their primary

customer attraction is visually appealing toys. They are particularly good at adding value to traditional wooden toy technologies. Their competitive strengths are market penetration and pricing. Their competitive weaknesses are location, like Brio, their business is based outside of the U.S.

All toy market research did not focus on competitors in the field. Some research focused on identifying businesses that were neutral and could be learned from. One such company is Momoll, in Sweden. Currently Momoll does not distribute through U.S. retailers. Momoll products can be ordered for U.S. customers via their website, however, as of the writing of this thesis, Momoll does not actively market to U.S. consumers.

The Momoll story is similar to the story Design Seed seeks to have. The difference is that, like the Milwaukee WPA Handicraft Project, Momoll is government subsidized, where as, Design Seed proposes an earned-income, non-profit business structure that is self-sustaining. To address an unemployment crisis in Switzerland, Nico Schweizer, went into the toymaking business, creating Momoll, a wooden toy business that manufactures dollhouses, mini-apartments and kiddie kitchens with a contemporary flair made from routed sheets of birch plywood and tinted Plexiglass. The designs were reduced to their absolute basics, so that worker can be trained quickly. Momoll's designs require no nails, glue, hinges or other elements to attach the pieces together. Each component slots together and is collapsible. In fact, Momoll, prides themselves on the assertion that the children themselves can put these products together.

Momoll is also an excellent example of taking advantage of gaps in the, at first glance, saturated children's toy market. Speaking to distributors of children's dollhouse Momoll learned that there was a lack of dollhouse that reflected modern aesthetics.

Momoll's toys are also designed within a cultural context, expressing the Scandinavian pale colors and clean lines. The success of companies like Momoll proved an accurate guide in assessing the Black Belt data.

3.7. MANUFACTURING RESEARCH

An analysis of the Black Belt data from a profitable manufacturing model perspective was the most important portion of the strategizing for implementation phase. During this phase the expert opinions provided by Dr. Jeffery Smith, Professor, in Auburn University's Department of Industrial Engineering, were instrumental in isolating the aspects of Black Belt data that were key issues.

According to Dr. Smith the compelling issue is skilled verses unskilled labor. Unskilled labor requires more automated machines, which created an greater start-up cost and demand a higher output of product to be profitable. Skilled labor, means you pay the workers more, but you can rely on manual machines that are far less expensive. Skilled labor also has the added benefits, according to Dr. Smith, of greater manufacturing flexibility regarding output volume profitability, as well as, the simple fact that unlike automated machines that you are paying for whether they are in use or not, you don't have to pay people as soon as they punch out.

Given the guidance provided by Dr. Smith it was evident that the Black Belt data needed to be reviewed with a shrewd eye on minimal automated machines, more manual machines and a product category, and product development that is conducive to fast training. The more flexible the manufacturing model regarding the production volume to profit ratio the better.

3.8 OVERALL IMPLEMENTATION PLAN

A business plan was developed to provide a structure for implementation. The business plan is attached in the appendix G.

CHAPTER FOUR: PRODUCT DEVELOPMENT

4.1 OVERVIEW

The approach of design for assembly (DFA) and design for manufacture (DFM) (see 1.5 Definition of Terms) were employed during the product development stage for the purpose of making the products as easy, and economical, to make as possible. The fulcrum of the methodology to create design-based manufacturing industries in an under-developed region, like the Black Belt, is the product development phase. It is in this stage that it is possible to leverage the full problem-solving latitude of industrial design. During product development the field research that was gathered regarding the resources, community needs and challenges are incorporated in the design criteria.

It is through these design criteria, that addresses the concerns that have negatively impacted manufacturing businesses in the area, fully utilizes resources that may not have been fully explored previously, and tailors the business model to the community in which the business will be based, that industrial design shows itself as having the unique ability to overcome problems before they start. It is the flexibility of the product development stage that provides the ability to create a manufacturing businesses from the ground up in a region that is considered an extremely harsh environment to do so.

4.2 MATERIALS IN THE BLACK BELT

During the implementation strategy phase wood was selected as the manufacturing material for the product; along with the product category of toys for children up to the age of seven. In the product development stage the quality of the types of wood available in the Black Belt are explored in greater detail. This is part of the DFM approach, to look at woods that are both easier to manipulate, available, and conducive to toy production.

While there is a surplus of loblolly-short leaf pine, primarily used for paper production, the hardwoods of oak and gum cypress, that are good for toy design, are located primarily in Greene and Dallas counties (highlighted on the diagram of Alabama Forest Types). In order to take full advantage of the material resources available product development proceeded utilizing oak, and paper based products.

The white oak of the region, *Quercus alba*, has the following characteristics: “Straight-grained, with medium-coarse to coarse texture. Similar in appearance to European oak, but more variable in color. Impervious to water. Workability: Good ... Common uses: Construction, flooring, furniture, interior joinery, plywood, veneer, barrels. Finishing: Good.” The Complete Manual of Woodworking by Jackson, Albert, David, Day and Jennings, Simon (2000).

Alabama Forest Types

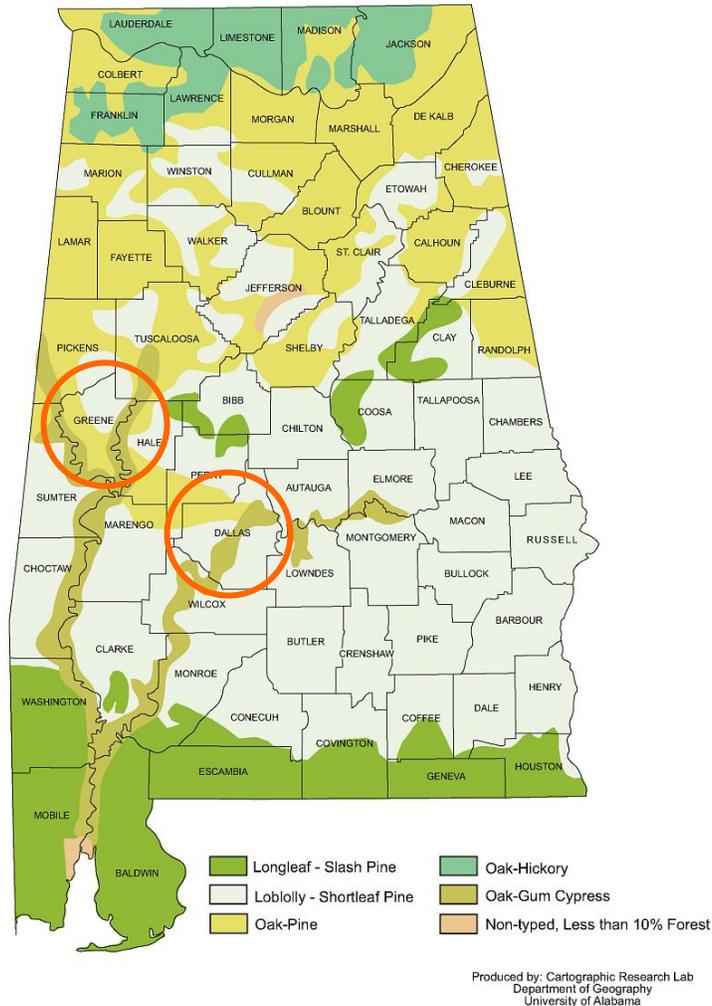


FIGURE 15: Alabama forest types map (University of Alabama, 2000
<http://alabamamaps.ua.edu/contemporarymaps/alabama/forestry/index.html>)

4.3 CULTURAL CONTEXT

Design Seed has developed toys that are relevant from a southern, rural and African-American cultural context. Design that focuses on cultural context is increasing improving product marketability. "...values aren't universal, one-size-fits-all ideas. They're biased. They assume specific cultural attitudes. They have an agenda. A glance at

America's political landscape suggests how polarizing values can be. It's nearly the same for products. Witness the gap in values between the Hummer driver and the Prius driver.

Culture-makers identify and propose meaningful cultural points-of-view for the product. They do more than simply respond to user-observations or trend forecasting. They look deeper into the psychology, values, and bias of a niche audience to identify the subjects that matter. And because making new culture almost always requires a leap of faith, they're persuasive champions of their chosen point-of-view.” (Toward a Cultural Innovation: Why American designers need more point-of-view by Scott Klinker, http://www.core77.com/reactor/09.06_klinker.asp) For the Design Seed Outreach Project cultural context based toy products become important on numerous levels.

The developmental/imaginative play, wooden toys for children up to the age of seven is a highly competitive market. Companies, such as, the Swedish wooden toy giant, Brio, have significant brand recognition and market share. Although, dominated by many European wooden toy companies, this market also has aggressive native competition, such as, Melissa & Doug Toys, based in Connecticut. For Design Seed to enter this market and seize market share will require more than cleverly designed toys. It requires addressing an under-served segment of market that has lucrative potential, as well as, providing a unique aesthetic.

By designing toys from a cultural context that is Southern, rural and African-American Design Seed produces a product that will be relevant to the workers it will employ, thereby, instilling in them, and the community, a sense of pride and excitement. Addressing the psychological and emotional aspects of the community is as important as addressing their practical need of employment. Educational toys that reflect their culture

being produced by them and being valued on the world market is the kind of product that Design Seed needs to be launching. To this end Design Seed looked to the tales of Brer Rabbit, the Gee's Bend quilters of Wilcox County in the Black Belt, old Southern and Negro spirituals, historical figures of the South, such as, Booker T. Washington and George Washington Carver, and the landscape of the Black Belt itself for inspiration.



FIGURE 16: Brer Rabbit and the Tar Baby (Source: Google Images)



FIGURES 17 and 18: Gee's Bend Quilt and George Washington Carver Stamp (Source: Google Images)



FIGURE 19: Alabama River, Wilcox County (Smith, 2006)

4.4 CONCEPT SKETCHING

While doing concept sketching the focus was integrating, as non-obtrusively as possible, the cultural influences of the Black Belt and Southern region. The concept sketches can be viewed on appendices pages H through O.

4.5 FORM DEVELOPMENT

After completing the concept sketching phase one concept was selected for refinement. This concept was “Birds in Migration”. “Birds in Migration” received excellent feedback from both child development expert, Dr. Lockhart, and cultural specialist, Dr. King-Jupiter, who both felt such a mobile would be a good learning element in a child’s environment from infancy to seven years of age. Dr. King-Jupiter advised that the colors utilized in the mobile be black, white or one of the primary colors

of red, blue, yellow and be very graphic; no pastels as is often mistakenly used on infant's mobiles. Dr. King-Jupiter stated that during those early years a child's visual development color, and shape, recognition was best pursued with simple colors and simple patterns. According to Dr. Lockhart, at the age of about four months, many infants show a preference for blues and reds. "Birds of Migration", according to Dr. Lockhart, may also assist in the increase of infant memory through Piaget's theory of object permanence during the sensor-motor stage. While other mobiles may accomplish this same goal, the connection to nature allows infants to transfer their new learning of birds to the mobile above their crib. Both, Dr. Lockhart and Dr. King-Jupiter believed that the combination of shape awareness (the triangle pattern of the bird's migrating) married with an observation of the natural world was a unique trait in the product and one that had great market potential.

A CAD model was made of the "Birds in Migration" concept in Rhinoceros. This CAD model allowed for the manipulation of the digital elements to quickly yield various versions of the concept and to begin to get a better understand of how to make it.

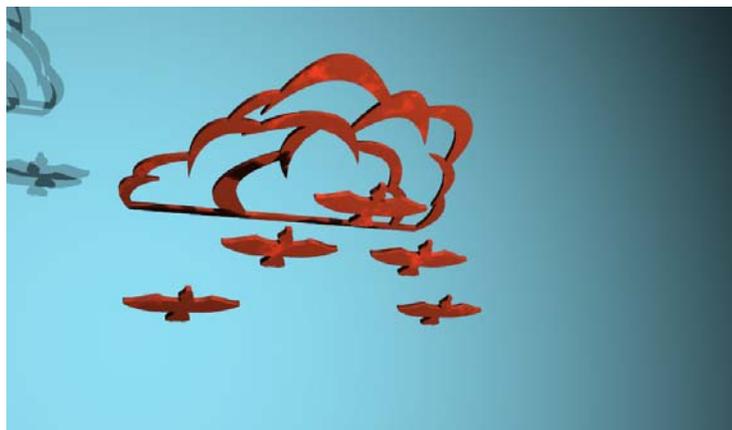


FIGURE 20: Birds in Migration mobile - Rhino Rendering 1 (Guise, 2007)



FIGURE 21: Birds in Migration mobile – Rhino Rendering 2 (Guise, 2007)

Next, utilizing Rhinoceros a 2-dimensional line drawing of the mobile elements was made and then using that line draw the mobile elements were laser cut out of Masonite. It is through the use of such technologies that preparing a product for market has become more cost effective for a micro-manufacturing business to accomplish. With the Masonite elements in hand it is easy to experiment with the elements and begin to determine the best way to proceed with bring the concept to life.

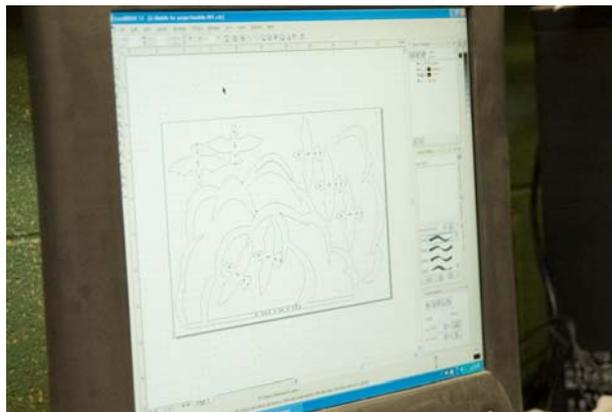


FIGURE 22: Laser cutting setup (Smith, 2007)

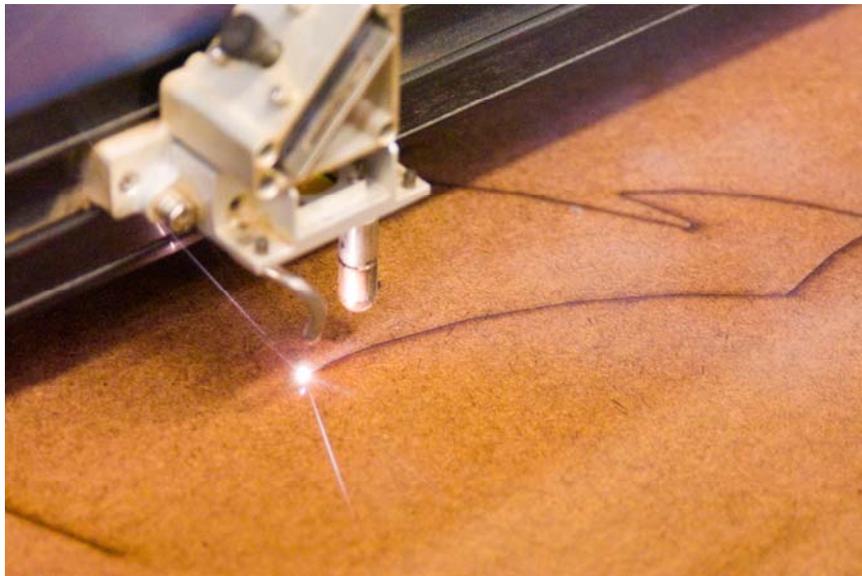


FIGURE 23: Laser cutting mobile (Smith, 2007)



FIGURE 24: Laser cut bird elements (Smith, 2007)

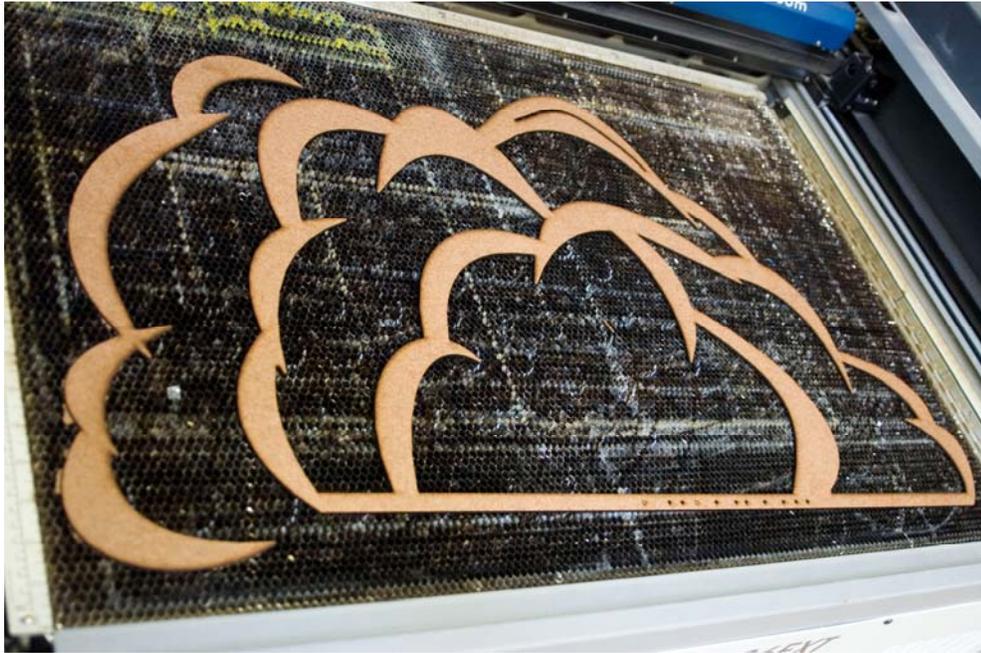


FIGURE 25: Laser cut cloud pattern (Smith, 2007)

4.6 DESIGN ALTERNATIVES

The chief challenge with the “Birds in Migration” concept is the orientation of the mobile. Most mobiles have a vertical orientation with a central support wire that attaches to the ceiling. In the “Birds in Migration” concept the mobile is in a diagonal position, which cause several spacial and support issues. These challenges necessitate the exploration of different design approaches to address these challenges.

4.7 PROTOTYPE

After solving the challenges encountered in the form development and design alternative phases a prototype version of the concept is produced. The prototype is usually as close

as the designer can get to the appearance of what the product would look like if mass-produced. In the case of “Birds in Migration” the prototype is exactly what the product will look like in production since the same methods of its creation will be the same process by which it is manufactured.

4.8 MANUFACTURING

4.8.1 MANUFACTURING PROCESS

The “Birds in Migration” mobile will be manufactured out of a compressed paper product. The mobile elements will be laser cut using a laser cutting machine. The laser cut pieces will be lightly sanded around the edges. Each element will be spray painted with detail elements painted by hand. The wire supports and ceiling anchor will be purchased from an outside vendor and not produced in-house.

4.8.2 MANUFACTURING TIME

The average manufacturing time per mobile is approximately 25 minutes.

4.8.3. MANUFACTURING COST

The manufacturing cost per mobile is estimated at \$5.00. This figure is based on the cost of materials, an hourly wage for a worker being \$10.00, and an estimation of the time value of the laser cutting machine.

CHAPTER FIVE: CONCLUSIONS

5.1 IMPLEMENTATION MODEL

Utilizing information gathered from the field research, information and recommendations provided by the project consultants, and the marketing and manufacturing research phases an implementation model was constructed. The purpose of this model is the exact same as that of a business plan: To provide a strategy of execution should the start-up capital be obtained. The implementation model's purpose is not to predict every possible variable that can affect start up but to provide a strong plan that all parties involved can consult for a unified understanding of expectation and progress.

The following diagram illustrates the administrative relationship Design Seed will have with its university host, Auburn University.

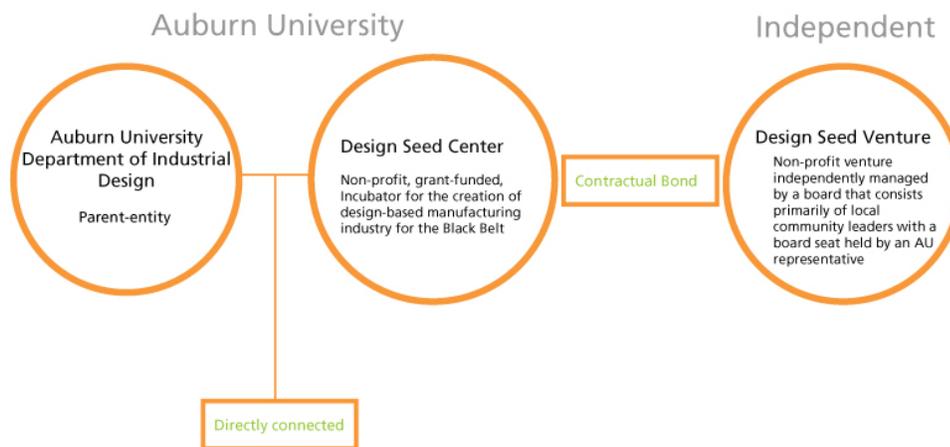


FIGURE 26: Administrative structure of Design Seed project (Smith, 2007)

This administrative form is dictated by three driving principles:

1. It would be problematic for Auburn University to be responsible for factory workers far from where they can reasonably oversee daily conditions.
2. It is imperative that the manufacturing business be “owned” by the community it serves.
3. A non-profit business structure both facilitates non-profit outreach grant funding and allows for the surplus profit to be reinvested in the creation of more design-based manufacturing businesses at the Design Seed Incubator Center, instead of merely making the owners of the business wealthier.

The following implementation model is based on implementing the MABA toy company in Eutaw, Alabama which is located in Greene County, one of the poorest counties in the Black Belt.

Phase 1:

Form the Board - The Board that runs the business should have one seat reserved for a representative of Auburn University, one seat reserved for the Design Director and the remaining seats occupied by leaders of the Greene County community.

The Basics - Obtain a city and state business license. Incorporate business. Obtain non-profit tax exempt status. Open a business checking account. Print all MABA toy business stationary set and business cards.

Sales/Marketing – Preliminary promotional campaign in the media.

Facility - Construct either a new facility, or renovate a derelict facility that will be leased, or bought, in Eutaw, Alabama. Eutaw has a number of derelict warehouse buildings whose size could accommodate the business. Facility start up should include obtaining necessary industrial equipment and machinery and incorporating such devices into the facility.

Supply Contracts – Negotiate contracts for the following suppliers: production materials, packaging, business printing, office supplies, and manufacturing supplies.

Employees - Hiring of management positions first will be a key component of success. The following positions will constitute MABA's management: Design Director, Plant Manager, Marketing Director, and Finance and Payroll Manager. The following positions will constitute MABA's staff positions: Executive Assistant to the Design Director, General Office Administrative Assistant, Salesperson, and Bookkeeper. The business will begin by employing ten plant workers.

Phase 2:

Training - Initial training of management, staff and plant workers should occur at a week staff retreat off-site where they learn, not only their role in the business, but have the opportunity to bond as a team on a common mission. The unusual approach of having management and workers at a retreat together is designed to promote efficiency and a common sense of equity in the company. This training should occur immediately following approval of the manufacturing facility to operate.

Secondary training will occur on-site, at the factory, and will be for one week.

Production – Initial production goals should focus on producing a consistently quality product. Efficiency will come in time.

Sales/Marketing – Aggressive pursuit of retail distributors, focusing primarily on large retailers such as Target and Toys-R-Us. Preparation for the National Toy Fair in January/February of that year.

After phases I and II the MABA toy company should be well underway. Perhaps one of its chief challenges in implementation is its dual nature as an earned-income venture and non-profit business. The creation of for-profit incentives in the non-profit company structure will be an important element in MABA's business success, yet a connectivity to the community it serves will also be imperative to maintain MABA's social enterprise center.

5.2 MANUFACTURING IN THE BLACK BELT

During the field research it was observed a large amount of derelict manufacturing facilities.



FIGURE 27: Abandoned plant in Hale County 1 (Smith, 2006)



FIGURE 28: Abandoned plant in Hale County 2 (Smith, 2006)



FIGURE 29: Abandoned plant in Hale County 3 (Smith, 2006)

However, the Black Belt is a region rich in resources. That was a surprise. With the degree of poverty found there it was expected that it would be more difficult to uncover resources that would be conducive to manufacturing industry; the successful implementation of such industry being the purpose of the Design Seed project. However, with its rich timber surplus, utilized for paper, packaging, wood pellets, drumsticks and all manner of products, its still powerful agricultural capabilities, its vast stretches of good land, waterways, and most importantly, large, willing workforce to pull from, - infrastructure issues aside - a manufacturing industry would have no more difficulty in the Black Belt than some other prime industrial location in the Southeast. Indeed, many manufacturing industries remain successful in the Black Belt and in counties, such as Dallas County, there is an influx of industry coming into the community.

The demographic information presented in this thesis tells the story. On average 90% of the white communities of these counties live above the poverty level, while almost half of the black communities live below the poverty line. That is a giant gap, and field interviews consistently voiced that the bulk of the land, industries, banks, etc., are owned by small group of whites determined to keep things that way. While many of the local governments in these majority black counties are seeing a change in civic leadership in the election of black mayors, probate judges, council members, etc., they are also seeing an increasing polarity between the races. It is this racial strife expressed in segregation of schools, political controversies, a hoarding of resources and the undermining of progress that appears to be the core challenge of the Black Belt.

The implementation model discussed above addresses that core challenge by placing the ownership of the business in the hands of a board that is reflective of the community in which the business is housed. The business will not add to the problems of the existing power structure. Also, by having a organizational structure that is closely connected to Auburn University the Design Seed Outreach Project circumvents many of the resources that keep the Black Belt status quo in place.

5.3 INDUSTRIAL DESIGN AS OUTREACH

The social capabilities of Industrial Design are becoming increasing evident as the abilities to practice design independently increase. “Three major factors are responsible for a recent mass-accumulation of independent design ventures: Readily available resources and graspable technologies, the involvement and application of real-world industry activity within traditional and self-propelled educational curriculums, and the

internet as a powerful, adaptable open source tool for inspiration, information, and self-promotion.” (Core 77 website, D.I.Y. ID:Indie Designers on the Rise by Jeannie Choe)

Industrial design is emerging as a major force globally, and projects similar to the Design Seed Outreach Project have been emerging all over. One such example is the Pratt Design Incubator of Pratt Institute, New York. Pratt Design Incubator is a, “Sustainable/Social Enterprise ... supporting the entrepreneurial talents of designers, artists and architects selected from the Pratt community who share a common goal: linking the social entrepreneur with the business of design. The Incubator sponsors environmental, social and cultural initiatives and benefits from a growing network of legal, business, engineering and manufacturing experts.”

(quote from <http://incubator.pratt.edu/about.html>)

In an internet article that has been quote here a few times already, Jeannie Cloe, editor at Core77, an design industry website, and a founding member of The Design Can, a Brooklyn-based design team, says it so well, “With an accelerated knowledgebase of emerging technologies, resources, and PR, today's indie designers truly have the cutting edge. They are more equipped than ever to make it happen and make it happen fast.”

(Core 77 website, D.I.Y. ID:Indie Designers on the Rise by Jeannie Choe)

The world of design is changing dramatically, and the potential to apply the problem-solving methodology of industrial design to social issues is an obvious one. Utilizing the conductor approach that is a integral part of being an industrial designer, bringing together people of differing disciplines under a common vision, industrial design is ideally place to yield a concerted effort that has real impact on issues of poverty,

homelessness, malnutrition, human conflict, a sustainable environment and all the challenges that plague humankind.

A good example of industrial design as outreach is personified in the story of William Gordon, an industrial designer who traveled to the Philippines and designed 175 products in seven weeks for seventeen manufacturers. “There are as many sex workers in the Philippines as there are factory workers. This is a numbingly tragic statistic, when you are confronted with the economic realities that push devoutly Catholic girls to be molested by middle-aged western men. Over 40% of Filipinos live below the poverty line. As a designer I saw the equation simply: More products sold at higher margins mean more work for the factories, which means fewer girls being tempted to this line of work. And the self-hatred I had developed as a designer working for a large corporation where the complexities of globalization wrestled with the plight of the individual worker pounding out my crap seemed to lift, once I realized that I could do something to help.” (Core 77 website, 16 Manufacturers, 175 Products, 7 Weeks: Reflections on a mission to Manila by William Gordon).



FIGURE 30: Factory in Philippines (Source: http://www.core77.com/reactor/01.06_citem.asp)

There are several stories of individuals, and groups of designers, grabbing hold of the realization that the time for the designer to stand on the sidelines has passed and that there is enormous untapped potential in what industrial designers do, that could be related here. Industrial design is first and foremost a vocation that focuses of the complete needs of people, from the most intimate to the most public. This focus should extend not only on the user but on the people who manufacture the product, as well. In design, the term “manufacturability” is often thought about from an automated machine perspective, however, the experience of those making the product, and their communities, should play as significant a role in our design philosophy as the user.

As the field of industrial design increases in its power to shape our lives, how that new power will be wielded from a social and global perspective becomes a question worthy of analysis and discussion.

5.4 RECOMMENDATIONS

The Design Seed Outreach Project extends beyond this thesis. Design Seed is currently applying for funding to launch the MABA toy company in Eutaw, AL. The project has been cultivating a interdepartmental relationship with Auburn University's College of Architecture, Design and Construction, Auburn Technical Assistance Center housed in the College of Business, and the Department of Industrial Engineering, and intends to formalize those partnerships upon further funding. These relationships will be a vital component of the Design Seed Center, located within the Department of Industrial Design; facilitating the incubation of other design-based manufacturing businesses. At present, utilizing a \$20,000 faculty grant awarded to thesis chair, Tsai Lu Liu, to work on the Design Seed Outreach Project, we will be conducting a cottage industry experiment in Eutaw, AL. in partnership with the Housing Authority of Greene County.

What is hoped is that this thesis provides a methodology for all those who wish to engage in the social enterprise potential of industrial design. What was revealed in researching this thesis is while there is an emerging consciousness of the potential of industrial design, and many initiatives exploring this potential, there is an obvious lack of methodology to encompass all aspects of bringing a product to market, i.e., from the creation of a manufacturing facility to getting the product on the shelf. This thesis, from the process of gathering information of the community to be served, to the

implementation strategy formulated and pursued based on the information gathered, to a design for assembly and design for manufacture product development phase, to finally, an implementation model, business plan, and a time-lined implementation budget, should provide a roadmap that can be applied to any underdeveloped area.

More detailed information, than is present in this thesis, should be generated for the implementation model phase should one seek to initiate such a business. Since the MABA toy company is a venture that is currently being pursued some sensitive business information, such as, financial sheets, were purposefully excluded from this thesis document.

REFERENCES

- Boothroyd, Geoffrey, Dewhurst, Peter & Knight, Winston (EDS.) (2002). *Product Design for Manufacture and Assembly*. USA: Marcel Dekker, Inc.
- Choe, Jeannie (2007). *D.I.Y. ID: Indie Designers on the Rise*. Retrieved May 2, 2007, from http://www.core77.com/reactor/02.07_choe.asp.
- Crowson, Richard (Eds.) (2006). *Product design and factory development*. Boca Raton, FL: Taylor & Francis Group.
- Dean, Andrea Oppenheimer & Hursley, Timothy. (2002). *Rural Studio: Samuel Mockbee and an architecture of decency*. New York: Princeton Architectural Press.
- Duncan, William L. (1994). *Manufacturing 2000*. USA: AMACOM.
- Fletcher, Alan. (2001). *The art of looking sideways*. London: Phaidon.
- Gordon, William (2007). *16 Manufacturers, 175 Products, 7 Weeks: Reflections on a mission to Manila*. Retrieved May 2, 2007, from http://www.core77.com/reactor/01.06_citem.asp
- Heim, Joseph A. & Compton, Dale W. (Eds.) (1992). *Manufacturing systems: Foundations of world-class practice*. Washington D.C.: National Academy Press.
- Jackson, Albert, David, Day and Jennings, Simon (2000). *The Complete Manual of Woodworking*. New York: Alfred A. Knopf, Inc.
- Jackson, Dudley (1998). *Profitability, mechanization and economies of scale*. Great Britain: Ipswich Book Company.
- Kamrani, Ali K & Salhieh, Sa'ed (2000). *Product design for modularity*. USA: Kluwer Academic Publishers.
- King, Robert (1995). *Designing products and services that customers want*. Portland, OR: Productivity Press.
- Kipnis, B. A. (1989). *Plant scale and manufacturing policies for peripheral regions: An intercultural analysis of Israel, Brazil and Belgium*. Great Britain: Gower Publishing Company.

Klinker, Scott (2007). *Toward a Cultural Innovation: Why American designers need more point-of-view*. Retrieved May 2, 2007, from http://www.core77.com/reactor/09.06_klinker.asp.

Larrabee, Eric & Vignelli, Massimo (1990). *Knoll Design*. New York: Harry N. Abrams, Inc.

Meyer, Darrell C. (compiled by) (1981). *Economic Growth in Elmore County*. USA: Central Alabama Regional Planning and Development Commission.

Meyer, Darrell C. (compiled by) (1978). *Industrial site development study: Cochrane, Alabama*. Montgomery, AL: Consolidated Planning Services, Inc.

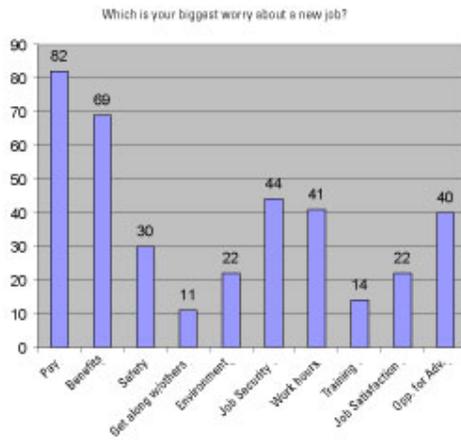
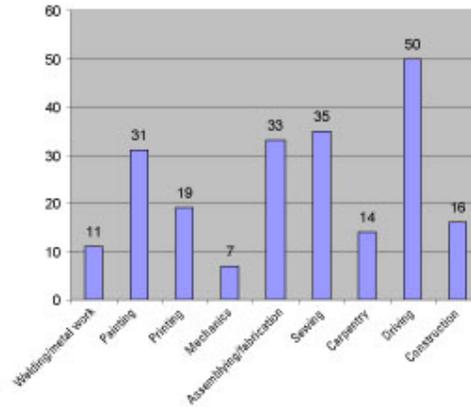
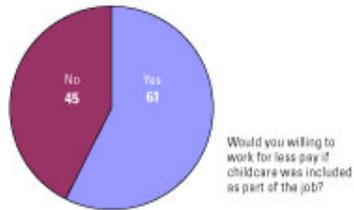
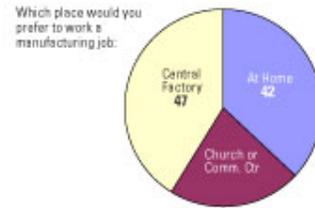
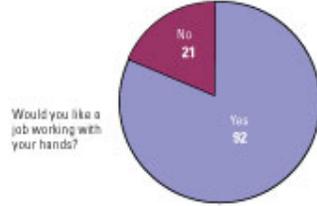
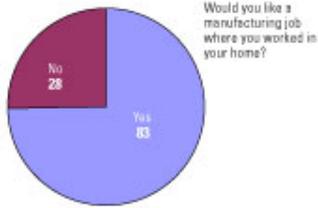
Quinn, Lois M.(1997). University of Wisconsin. *Replacing Welfare With Work in the WPA: The Handicraft Project That Made Milwaukee Famous*. Retrieved May 22, 2007, from <http://www.uwm.edu/Dept/ETI/pdf/QuinnFromkin.pdf>.

Pratt Design Incubator (2007). *About the Incubator*. Retrieved June 22, 2007, from <http://incubator.pratt.edu/about.html>.

Susman, Gerald I. (Eds.) (1992). *Integrating design and manufacturing for competitive advantage*. New York: Oxford University Press.

Voss, Christopher A. (Eds.) (1992). *Manufacturing Strategy: Process and Content*. London: Chapman and Hall.

APPENDIX A. Quantitative Research Results



APPENDIX B. Design Seed Outreach Report 1

1

Acknowledgements

This outreach report was made possible by the funding, and support, of the Auburn University Outreach Office, Auburn University College of Architecture, Design & Construction and the faculty and staff of the Department of Industrial Design.

Special thanks to Vice President of Outreach, Dr. Royrick Cook for all his support and insight. Thank you as well to David Messers and Clinton Laffner of Auburn Technical Assistance Center, Dr. Joe Summers of the Auburn University Economic Development Institute and Pam Doss, Director of The HERD Housing Resource Center in Greensboro, AL.

Mark Smith, Design Seed thesis student, wants to give a special thanks to my family for all their support and patience.

Most importantly, the Design Seed Project gives a sincere thanks to the amazing people of Alabama's Black Belt, who opened their arms to the project, and shared of their time, experience and knowledge. We hope this report honors your generosity and candor.

Table of Contents

- Project Description
- Research Protocol
- Black Belt Overview
- Dallas
- Greene
- Hale
- Perry
- Wilcox
- Preliminary Report
- Conclusion

The Root System

The Design Seed outreach thesis project intends to utilize material resources found in Alabama's Black Belt to design products that can be competitively manufactured in the Black Belt, and then marketed worldwide. By the creation of an implementation model rooted in the needs, and resources of the community, Design Seed seeks to provide the methodology to "seed" Alabama's Black Belt with viable manufacturing industries with limitless potential.

This report is a culmination of Phase I, which was research into the resources, challenges and community needs of the Black Belt. In Phase II, potential products will be designed and a pilot prototype product, and factory site, will be selected. In Phase III a complete implementation model will be generated.

Design Seed is an outreach project in the truest sense, never forgetting that our greatest resource will always be our people. Design Seed seeks to draw from the scholarship and resources of Auburn University, a land-grant institution, to pay dividends to all Alabamians by reaching out to Alabama's most disadvantaged region - the Black Belt - in a way that hopefully creates not only jobs, but a healthier, more whole Alabama.

Alabama's Black Belt is a strip of fertile, black prairie soil. During slavery

Design Seed Outreach Report Fall 2006

APPENDIX C. Design Seed Outreach Report 2

Ground Work

This report represents the qualitative findings of 42 interviews of urban Black Belt residents, over the age of eighteen, taken on location in the study counties, from October 10, 2008 to December 2, 2008. All interviews, except one, were digitally recorded. The five study counties are **Dallas, Green, Hale, Perry and Wilcox**. The quantitative results, represented by the project, are based primarily on interviews, but primarily, postcard opinion surveys distributed into communities of each of the 5 study counties. The receipt, and processing, of the postcard surveys is still on-going at the time of this report and will be reported in full at a later date.

Research methodology included traveling to the 5 study counties, interviewing community leaders and potential workers, photography of people and buildings, and investigating into possible material resources, and non-traditional resources, that could be utilized in product design.

It should be noted that the postcard survey was reviewed by the Auburn University Office of Human Subjects Research, prior to distribution, and was found not to constitute Human Research.

The Lay of the Land

Resources: The question of resources was put to the community leaders of the five study counties. These community leaders were business owners and reverends, mayors and judges, directors of county human resources and county engineers, to name just a few of the titles of those interviewed. The question of resources was asked in different ways from, "What resources in your area do you believe are under utilized?" to "What do you believe is special or unique about your area?"

The overwhelming majority said, "People" are their greatest resources. They supported this with statements like, "Right now people drive two hours to get to work ... folks want to work" and "The job skilled people have, there's just no jobs" and "The people are here, and they want to work, there's just not enough jobs". Almost every community leader was passionate about the value of the people in their community, "... the people here are good ... family oriented ... and the belief that, if given the opportunity, the people of their communities can accomplish amazing things.

Challenges: The question of challenges was also asked in a number of different ways to the community leaders. "Name three major inhibitors to economic growth in your area," "What businesses do you know of that have closed, and please speculate as to why," and "Name some significant changes in economic development in the past 10 years".

65% of the population were slaves. Today it is a region left behind, poor, underdeveloped, but it is also a region of people eager to work and grow,



The challenges to economic growth that the majority of the community leaders voiced (ranked in order of priority) were:

1. Poor education/largely unskilled workforce
2. Racism
3. Infrastructure needs, transportation, recreation, water systems, etc.

While many voiced frustration with these challenges, almost every community leader felt that these challenges could be overcome. It is important to note that many felt it is a small powerful group "... trying to keep things the same ..." that are the challenge, not the majority of the people. Most felt that the creation of, or influx of, jobs would significantly impact solving these challenges, and others.

"25(out of 50) career centers were closed (throughout Alabama) .. my staff went from 15 to 2... in some of the

a rural region of history: civil war, civil rights. The Black Belt is Alabama

Taking Highway 80 West I drove into Dallas County. In minutes, I entered the outskirts of Selma, the major city of Dallas County. There were many one-story structures along both sides of the highway but they were in rough shape. Many of the older buildings seemed dilapidated, as if occupied by a street car business or motel, the building still seemed to show neglect.

Driving around the downtown area I saw many empty buildings. Because of its capacity to be as prosperous a city as Montgomery or Mobile I felt sadly that Selma was a place stuck in time. Selma, Dallas County, has so much to offer. A strong argument can be made that key to uplifting all of West Alabama begins with the uplifting of Selma.

APPENDIX D. Design Seed Outreach Report 3

Project: Outreach - Outreach - Outreach

Date: _____

Black Belt counties where unemployment is the highest that's where they closed the offices.."

"This..is a poor county, but..has less than 60 families that receive welfare..you really have people who step up"

Resources
Selma has many supporting organizations, the Selma and Dallas County Libraries, the Alabama Career Link, Wallace Community College, for example, that can play a key support role.

Dallas County has 4 Industrial Parks: Gray Industrial Complex, Bell Road Industrial Park, Southfield Industrial Park, South

Dallas Industrial Park
Materials: Mineral: Sand, Gravel, Clay
Durable supply: Harder Types: Pine, Oak, Gum, Cypress, Poplar, Hickory
Transportation: Selma is located 45 miles west of Montgomery, Alabama's state capital. U.S. Highway 80, a modern four-lane corridor, connects Selma with I-65 and I-85 to the east and with

I-201-89 to the west.
Waterways: One of 19 cities in Alabama's State Island Duke system, Selma gives barge traffic access to the Gulf of Mexico just 200 miles down the river at the Port of Mobile.
Railways: Selma and Dallas County are served by two railroads, M & B Railroad LLC and Norfolk Southern Railway.

It's a chilly Friday morning as I drive up Highway 49 North from Denopopolis, AL, into Greene County. Before I can arrive at the first town, Forkland, Town of Opportunity, Fla. 364 at least that what the sign said, I saw Socony as the Flying Ace crashed into a tree on my left. Then I saw a giant Tin Man, from the Wizard of Oz fame, holding his axe and gleaming in early morning

sun. I see so many amazing creations that I am pulled, car and all, by the magnificence of them off the road and into a wonderland. The wonderland's entrance is 6944, "BIRD" Whether "BIRD" is the name of the artist or their part of work I do not know but I am struck by how each county is truly a unique experience. As I meet with community

leaders in the city of Eutaw, the major town of Greene County, the BIRD experience stayed with me.

Resources
The Greene County economy is still largely based on agriculture, cotton and cattle grazing. Timber is still a vital resource, veneer mills and manufactures are Green County's growing industries.

Design Seed Outreach Report Fall 2020

Project: Outreach - Outreach - Outreach

Date: _____

"We have a strong heritage of community..and..a need to go some of those scars are deep and some of them are real places..we have not been able to go" fresh, which leads to a lack of trust.. that lack of trust never

Material:
Timber types: Cedar, Hickory, Pine
Green County has 2 Industrial Parks in Eutaw. The Crossroads of America Industrial Park is located on Interstate 2659 east 20 Bogies. This park is complete with energy, telecommunications, rail, water and sewer services.
New Developments
Alabama Power's Greene

County Steam Plant is slated for expansion.
Transportation: Highways 20 and 59
Railroads: Burlington-Northern and Norfolk Southern Company
Waterways: Tennessee-Tombigbee Waterway - links the Tennessee River in north-eastern Mississippi with the Tombigbee River.

Travelling Hale County, Newbern, Greensboro, Akron and Moundsville, I was impressed by the size of the county. Cattle and cattle farms dominated the landscape in the southern portion of the county and forest dominated the northern portion. Hale County seems a county of many natural resources. Taking 61 North I saw larger power lines being put in and there was a sense

of developers in the infrastructure of Hale County in similar things I saw along Highway 69 north heading to Tuscaloosa. The people in the town of Greensboro were very vocal about their community and I was amazed at how similar the majority of the opinions were. The town of Greensboro was storm, with a few new structures like the Technology Resource Center. Auburn

Design Seed Outreach Report Fall 2020

APPENDIX E. Design Seed Outreach Report 4

problem is reliable daycare.. also people have lost jobs because they didn't have transportation"

"Gourds are an African plant..used for everything..birdhouses..music instruments..dippers..bowls.."

government building in the middle of town. There were new businesses opened in old buildings and a sense that the people of the town are fighting to create opportunities for themselves.

Resources:
Material: Timber
Transportation: U.S. Highway 80 runs through Perry County in the lower section of the county through Uniontown. State routes: 5,14, 175, 183 and 219. Perry Lakes Park is beautiful resource of Perry County. The Park is located five miles east of Marion, the county seat, near the State Fish Hatchery on State Hwy 175. Bald Eagles have nested in a giant Loblolly Pine tree in the Marion Hatchery woods at the entrance to the Park for the past two years. The Auburn Rural Studio Birding Tower is now open, giving a majestic view of the upper forest canopy. Judson College and the Marion Military Institute are unique resources. For the Black Belt, that Perry County. Since Marion is a college city the people are well-informed, eager to share new ideas, and ready for quality growth and development.

Coming into Wilcox County from its eastern edge on Highway 21 West the landscape is mostly thick with trees, but around the Camden, Ga.'s Bend, area, the landscape makes a definite shift from what is seen in most of the Black Belt. In the western portion of Wilcox County the waters of the Alabama River, as it spills into the Donnelly Reservoir, become a powerful presence. It is a gorgeous river, wide and blue and sparkling. A ferry boat, that I am told has the capacity to carry as many as 15 vehicles, carried me from Ga.'s Bend to Camden in about 25 minutes (although I was told the trip can be made in 15). **Resources:** Materials: Timber. Gourds grown locally have great material potential. Materially as hard a wood, naturally hollow, a wide variety of sizes, shapes and sizes, and able to be formed, with a mold, gourds can be used materials alone or with other materials. A strong craft material the potential for gourds for industrial use is yet untapped. While Wilcox County shares some of the usual resources

Design Seed Outreach Report Fall 2008

there's a million things you can make..and..you can grow them any shape you want"

Postcard Questionnaire Results

Found in other Black Belt counties it also has some very unique resources. Wilcox County is home to the internationally renowned Gees Bend quilters. Designers, who could be a strong resource for a design-based manufacturing business. Transportation: Camden is located at the junction of Alabama highways 10, 28, and 41. It is about 60 miles west of I-65 (north-south) and 100 miles south of I-95 (east-west). Pine Hill is served by the Norfolk Southern Railroad. Burlington-Northern Railroad also serves the western part of the county. The Camden Municipal Airport is a 4200-foot runway located 3 miles southwest of Camden.

To date we have received 90 postcards back. It is a strong start and the project thanks all those who took the time to fill out the questionnaire and all those persons, deeply concerned with the future of the Black Belt, who made sure these postcards were distributed throughout their community. The above charts do not show the amount of people who did not respond to the questions. Also, the results to question #3, which asks the respondent to indicate which skills they possess, is not represented above. A complete representation of all data received will be displayed at a later date.

childcare? was also asked in the 42 interviews done in the Black Belt. This question was asked of both community leaders and potential workers. Although, the above results show only a slight leaning to towards a central factory, the overwhelming field interview response was that the central factory with an area for childcare was the best model to meet the needs of the community sitting reasons such as, the need to socialize outside the home, the ability to advance through training at the workplace and providing an environment that promoted understanding and unity in the community.

Design Seed Outreach Report Fall 2008

APPENDIX F. Design Seed Outreach Report

Design Seed Outreach Report

Whispers in the Trees

Journeyming out to listen to the people of the Black Belt has been a profound experience for me. I thank every person I interviewed who gave of their time hoping their candor might serve to improve the lives of their communities.

The Black Belt is rich in resources. I expected to have to dig deep to uncover resources that would be conducive to manufacturing industry. However, with it is timber surplus, its powerful agricultural capabilities, its vast stretches of land, waterways, and large, willing workforce to pull from, a manufacturing industry would have little difficulty in the Black Belt. Indeed, many manufacturing industries remain successful in the Black Belt and its counties, such as Dallas County, where is a large influx of industry coming into the community.

So what is the problem? On average 80% of the whites of these counties live above the poverty level, while almost half of the Blacks live below. Whites are primarily in control of the pursestrings: land, industry, banks, etc., and have little motivation to change. Although, many of the local governments in these majority black counties are seeing a change in civic leadership, in the election of black mayors, police judges, school members, etc., they are also seeing a increasing polarity between the races: segregation of schools, political controversies, and the undermining of progress. It is rare that appears to be the core challenge of the Black Belt.

From the people of both races whom I interviewed I have come to believe the majority of people, black and white, wish to move forward together in a harmonious relationship for the betterment of their communities and their future; only a small, powerful group is resistant. I hope in some small way this project serves to help the Black Belt move towards a shared prosperity.

Mark Smith
Field Interviewer and Design Seed graduate student



Design Seed Outreach Report (September-December 2016)
Report is shared and owned by Design Seed graduate students.
The visualization on this Design Seed Outreach Report please contact Paul Curtis, Systems Professor, School of Design, Department of Industrial Design

APPENDIX G. Business Plan

Design Seed outreach project would be part of the manufacturing industry. The target market within this industry would be children up to the age of 7. The initial primary products would be five wooden/paper toy products. The products would be manufacturing using an automated CNC router, automated laser cutting machine, automated silk-screen printing machine, and various manual wood shaping, and drilling, machines.

The plan is to develop an earned-income stream through the sale of wooden toy products. This earned-income strategy represents a significant diversification of the organization's overall funding needs, which will lead to stronger long-term organizational sustainability, lessen dependency on charitable dollars, provide for objective and measurable growth and strengthen the greater assets of the community-at-large.

The mission of Design Seed is to serve the communities of the Alabama's Black Belt through economic development. We will fulfill this mission by creating design-based manufacturing businesses in the Alabama Black Belt region. We differ from our competition in that we seek to support ourselves exclusively through the manufacturing business and use surplus revenue to incubate, and launch, new businesses that will create jobs in the Alabama Black Belt. Our vision is that in the future our organization will become fully sustainable.

Our business strategy is to develop an earned-income stream that will significantly impact the growth and long-term sustainability of the organization and allow

us to serve more people better.

Core elements of this strategy are:

Money: We will increase the earned-income of the organization through the development and sale of developmental/imaginative wooden toys. Estimated net revenue of the projected market share would be \$0.00 in year one, \$0.00 in year two, and \$100,000 in year three.

Markets: We will take full advantage of our current assets, strengths and competitive advantages in order to ensure the venture's success. Our marketing strategy will be to sell to retailers and some direct internet sales..

Management: We will build upon the professionalism and expertise that we bring to this industry. Our management approach and level of knowledge sharply contrasts with our primary competitors most particularly in an ability to design products within a cultural context that is currently under-served in the marketplace.

The most current data available indicates that nationally this industry represents \$100,000 - \$500,000 units in total annual units sold, and \$500,000 - \$750,000 in total annual sales. Locally this market represents over 1 million units in total units sold, and over \$1 million in total annual sales.

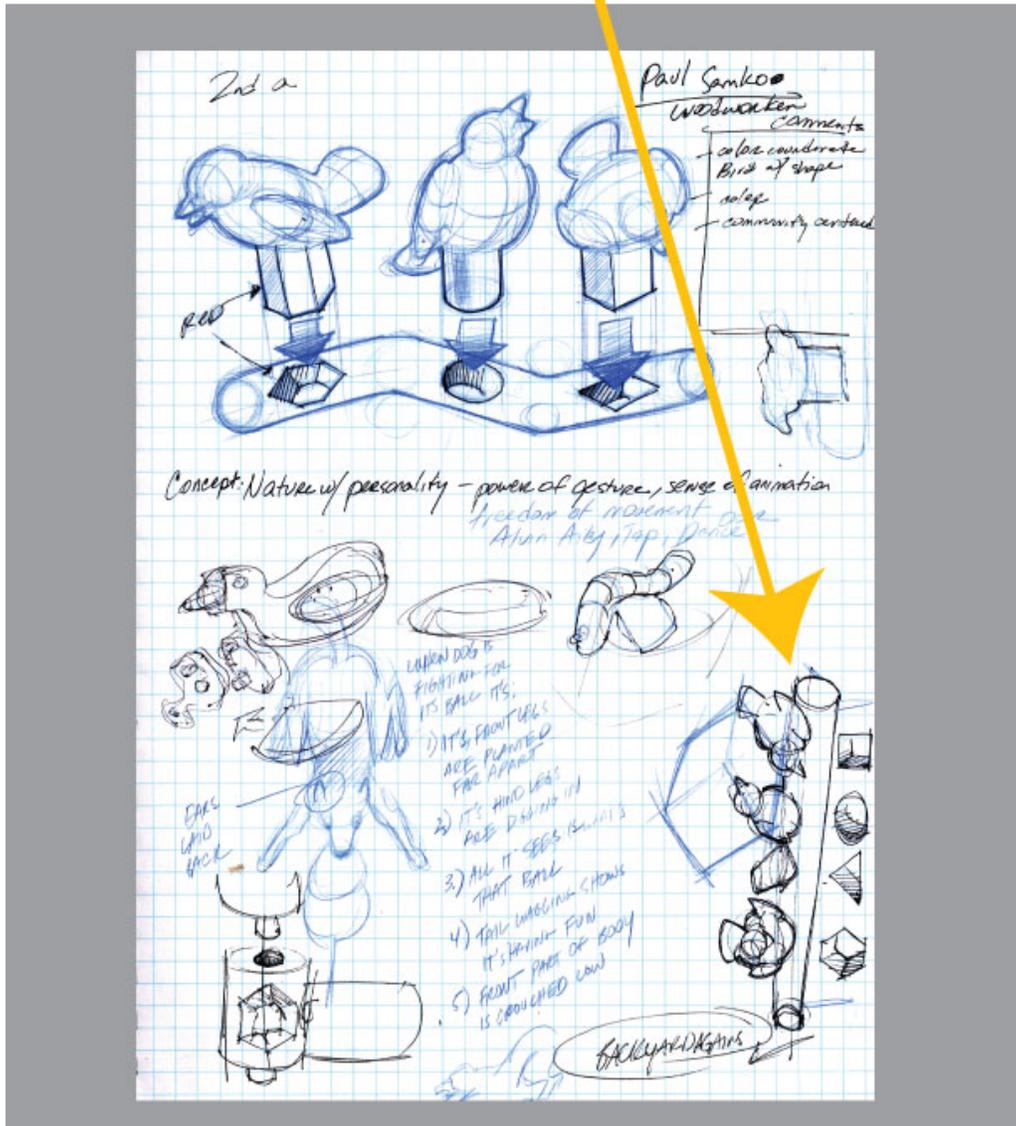
Careful due diligence has indicates that on a local level (the United States market) this market has seen a modest increase. Our plan is to secure 0% of this local market in year one of operation, 1% in year two, and 3% in year three. This market share would represent \$0.00 in gross revenues in year one, \$3,920,000 in year two and \$11,760,000 in

year three. Estimated variable costs of securing this projected market share are \$250,000 in year one, \$100,000 in year two and \$65,000 in year three. Fixed costs estimates are \$1,000,000 in year one, \$600,000 in year two and \$500,000 in year three. Estimated net revenue of the projected market share would be \$0.00 in year one, \$100,00 in year two and \$400,000 in year three. Assuming projected net revenue earned-income will become a significant proportion of the organizations overall development funding and represent \$0 in year one, \$50,000 in year two and \$100,000 in year three.

APPENDIX H. Design Concept 1

BIRD SLOTTY

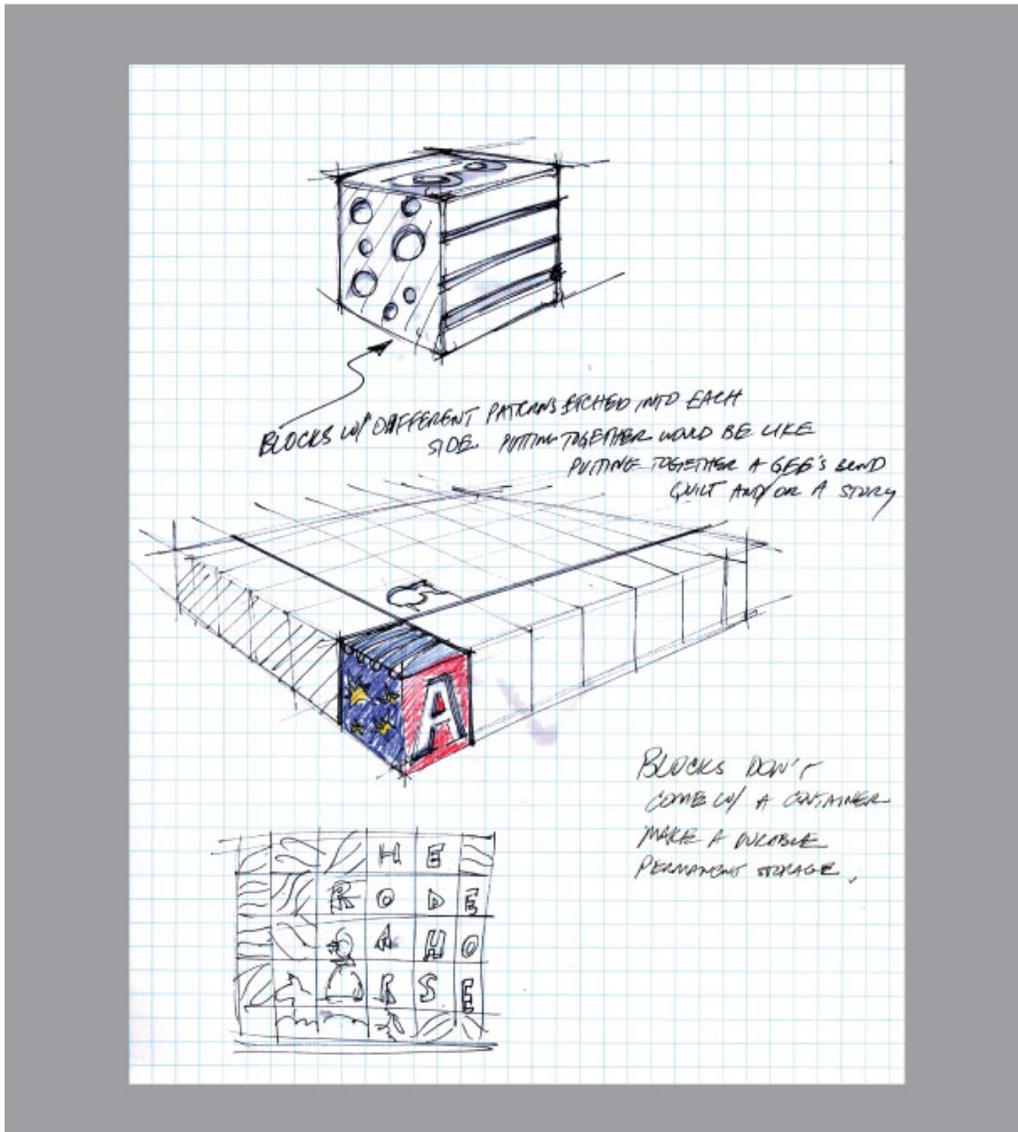
A different take on the traditional slot toy. The concept is a focus on nature and the rural world. No trucks, machines, buildings, etc. This sketch is more accurate.



APPENDIX I. Design Concept 2

ALPHABET BLOCKS W/PATTERNS

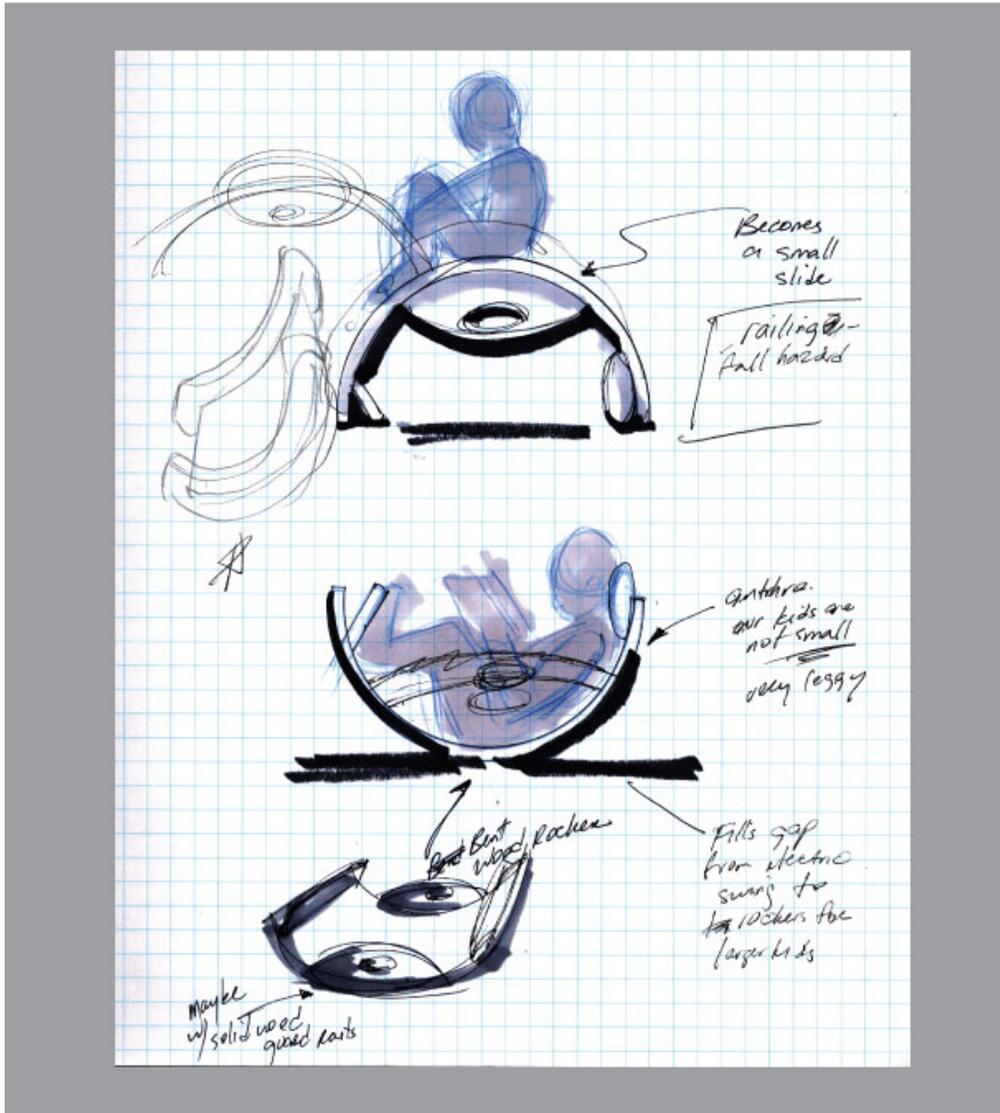
These blocks are designed with the quilting work of Gee's Bend in mind. The blocks have a letter side and patterned side that allows the child to use the blocks to create a picture with words. At the bottom the blocks come together to show a man on a horse and the blocks read (somewhat disjointedly) "He rode a horse".



APPENDIX J. Design Concept 3

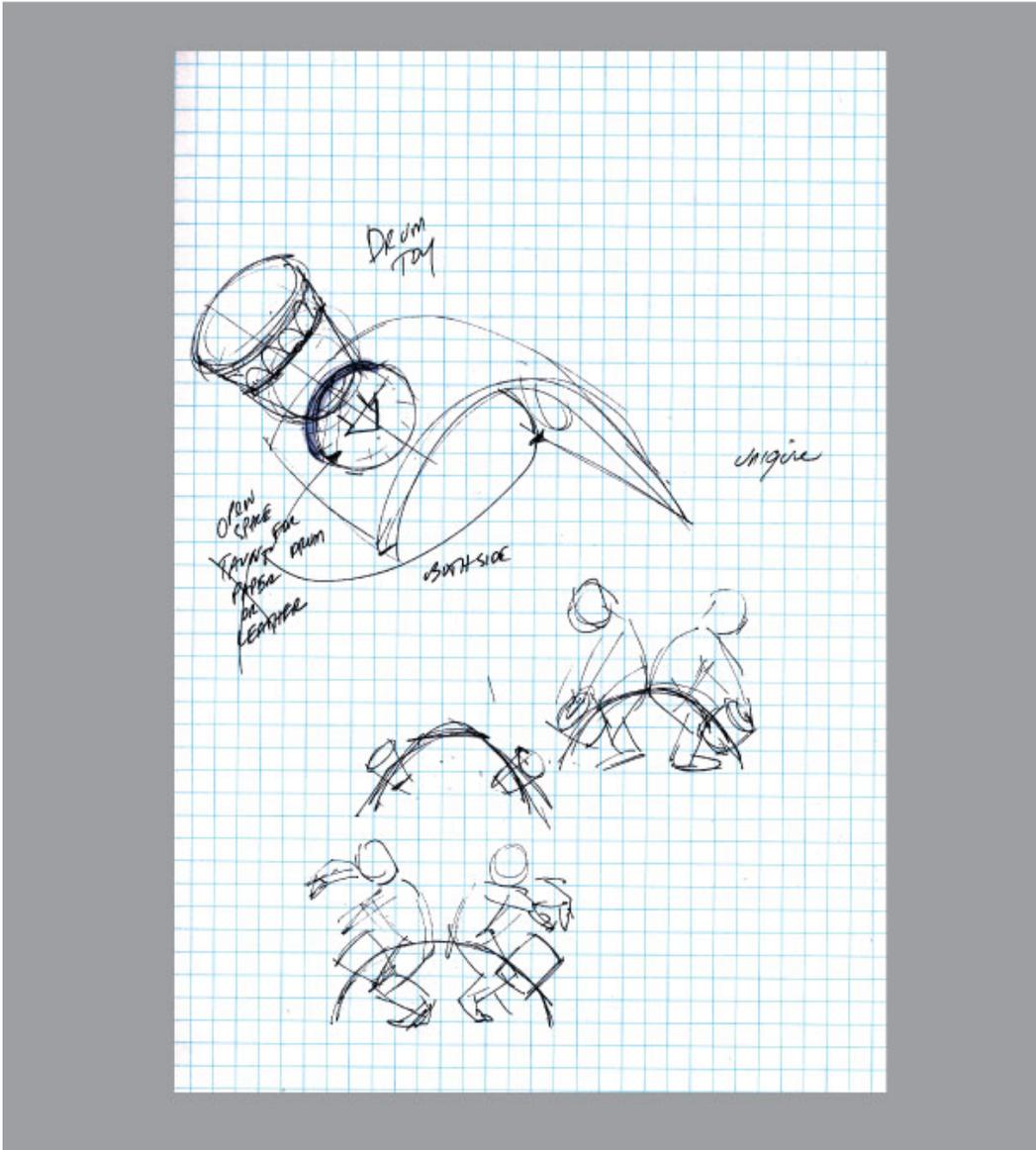
CRADLE ROCKER

The cradle rocker is a soothing rocker toy, as opposed to an active rocker like the rabbit rocker. Also, it can be turned upside down to be a small slide.

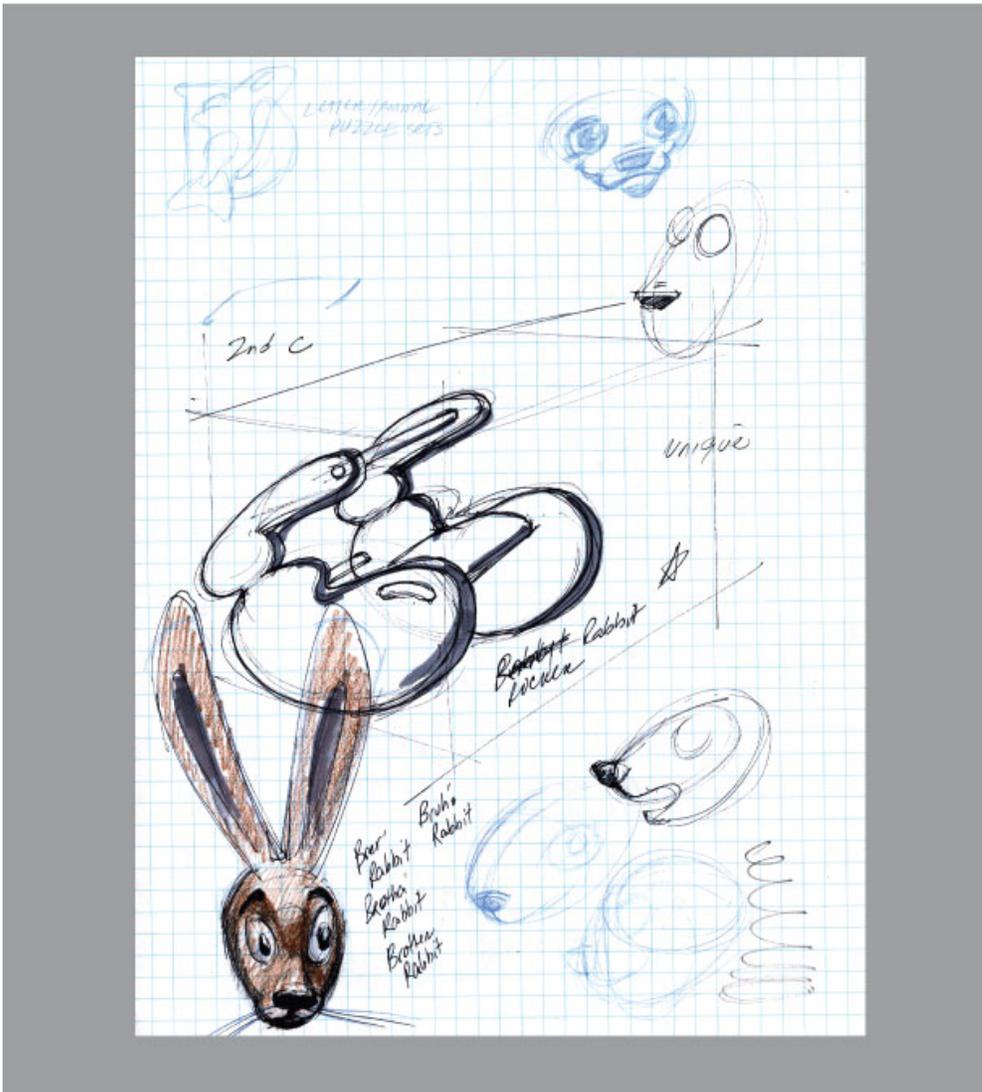


APPENDIX K. Design Concept 4

DRUMMER



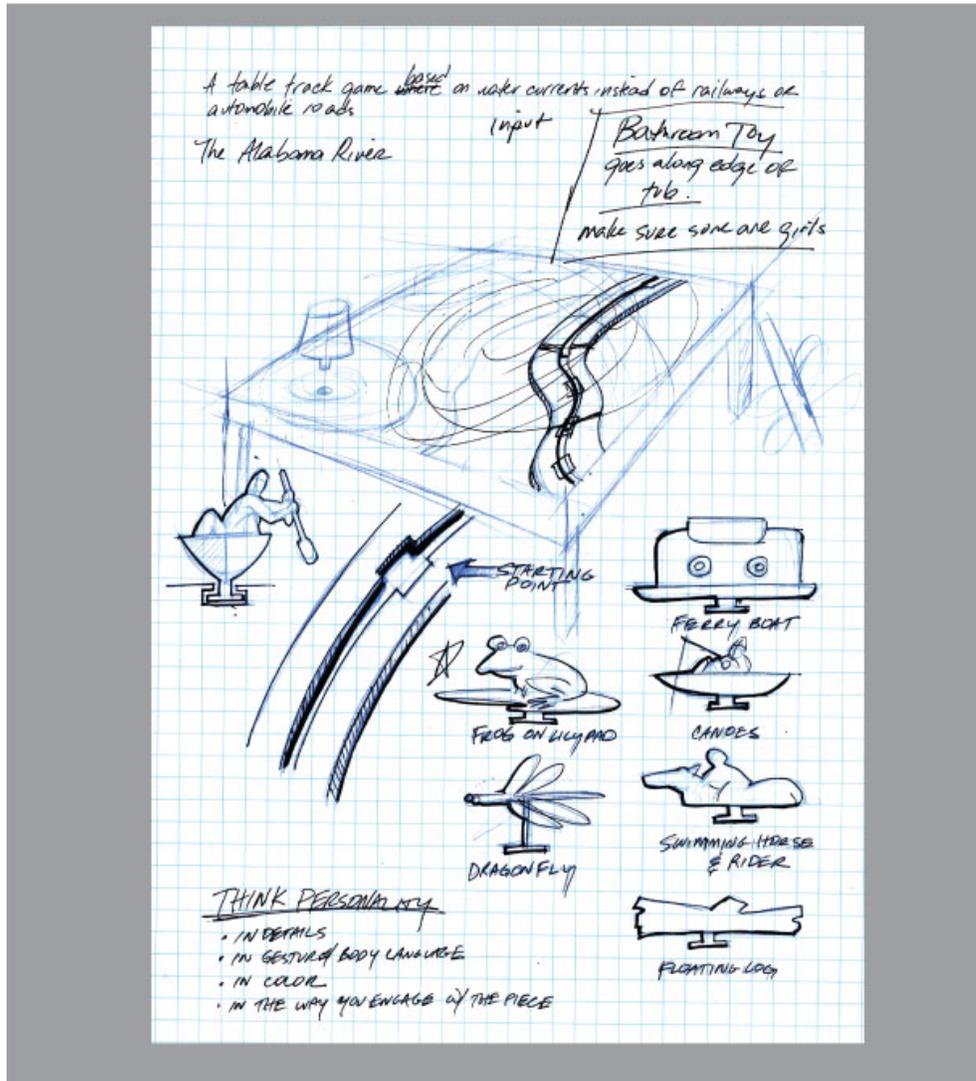
APPENDIX L. Design Concept 5
BRER RABBIT ROCKER



APPENDIX M. Design Concept 6

ALABAMA RIVER RAIL TOY TABLE

This is a different take on the table rail toy. Instead of a train or car highway the rail tracks represent the water currents.



APPENDIX N. Design Concept 7

WOODEN XYLOPHONE AND TURTLE TOY BOX

The xylophone's purpose is to create a strong connection between numbers, sound, color and maybe an image.

The turtle toy box has a top (the turtle box) where different shapes can be dropped into the box. The top could be changed out to accommodate different shaped blocks.

