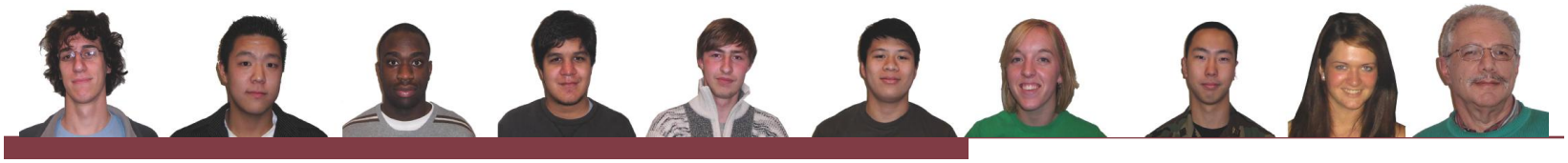
IPRO 319 Warehouse Logistics Tool

FINAL REPORT

final report



Instructor: Herb Shields
Sponsor: Warehouse Education and Research Council & The Kern Family Foundation

Team:
Khanh Duong
Uchenna Egwu
Justin Ma
Arthur Mcanally
Kristin Mrozinski
Douglas Oh
Nickolay Schwarz
Sarah Stone
Aleksandar Sudar
Arthur Zavala

IPRO319
Mathematical Model
Web-Based Application
RFI/RFP
Logistics Outsourcing Tool

Milestones

1 **Project planning phase**
- Identify Objectives
- Task Division

Create Project Plan 02-16

2 **Research Phase**
- Library Research
- WERC Research –web
- Interview Industry Workers

Create Midterm Deliverables 03-23

3 **Division into Sub-teams**
- Programming
- RFI/RFP Development
- FAQ Team

Create Final IPRO Deliverables 04-25

4 **Presentations**

Semester Problem

Problem

- Help companies deal with cost analysis through a web-based tool
- Provide assistance to companies seeking to outsource logistics operations
- Provide web-based RFI/RFP tools for use with the program

Objectives

- Finalize and enhance model for use on WERC website
- Develop instructions (FAQ) for helping users of the model
- Develop an outsourcing and pricing tool within the model

Research Phase

- Library and Online Journal Research
  - Materials Handling Management Journal
  - Logistics Management Journal
  - WERC website resources
- Interviews with Professionals
  - Bob Shaunessey from WERC / **February 13**
    - Financial issues and Warehouse costs
  - Strive Group / **March 23**
    - Warehouse Operations and Activities
    - Financials
  - Barb Franch from Sears / **March 6**
    - Information about warehouse operations
    - Helpful to RFI/RFP development
- Research the layout and programming of the WERC website's source code

Initial Task Division

Overall Team Assignments

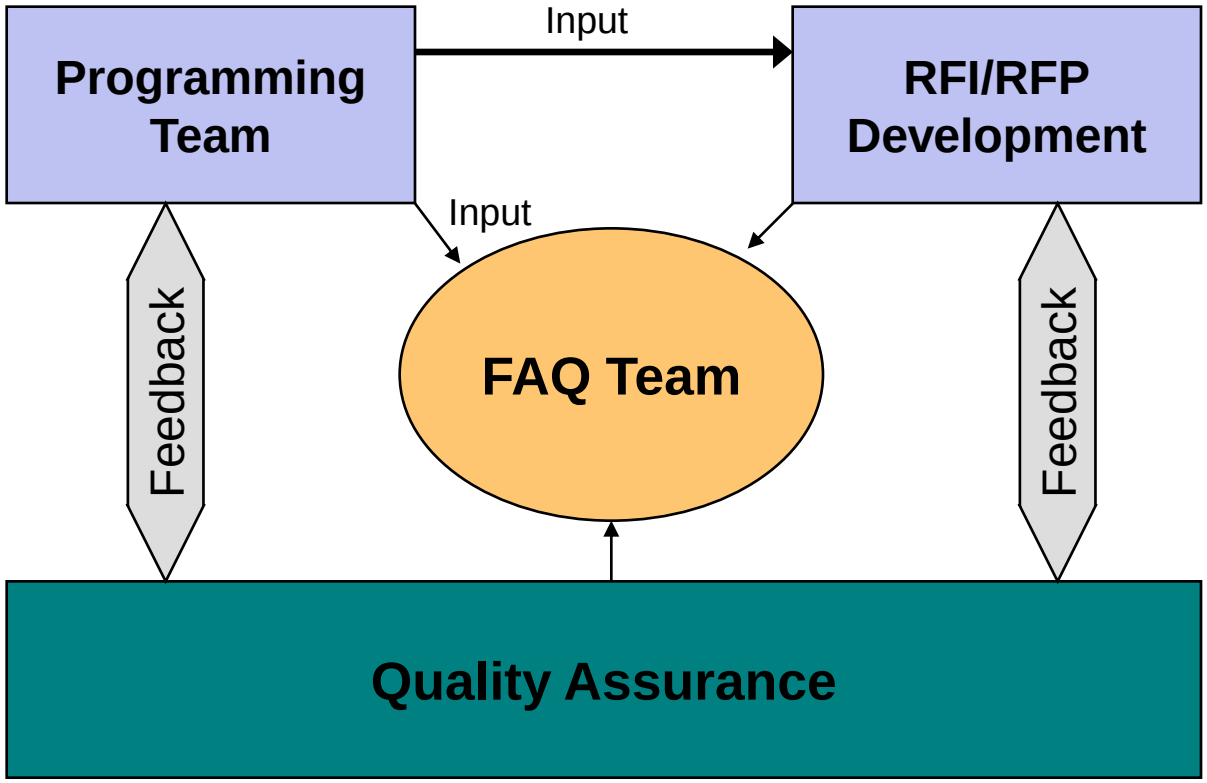
- No sub-teams for project planning and research phases

Nickolay Schwartz
Team Leader

Aleksandar Sudar
Assistant Team Leader

Sarah Stone
Secretary

Division into Sub-teams



Excel Model

- **Objective**: to create a model for the development team to utilize in their web tool for calculating **warehouse efficiency** and **benchmarking**

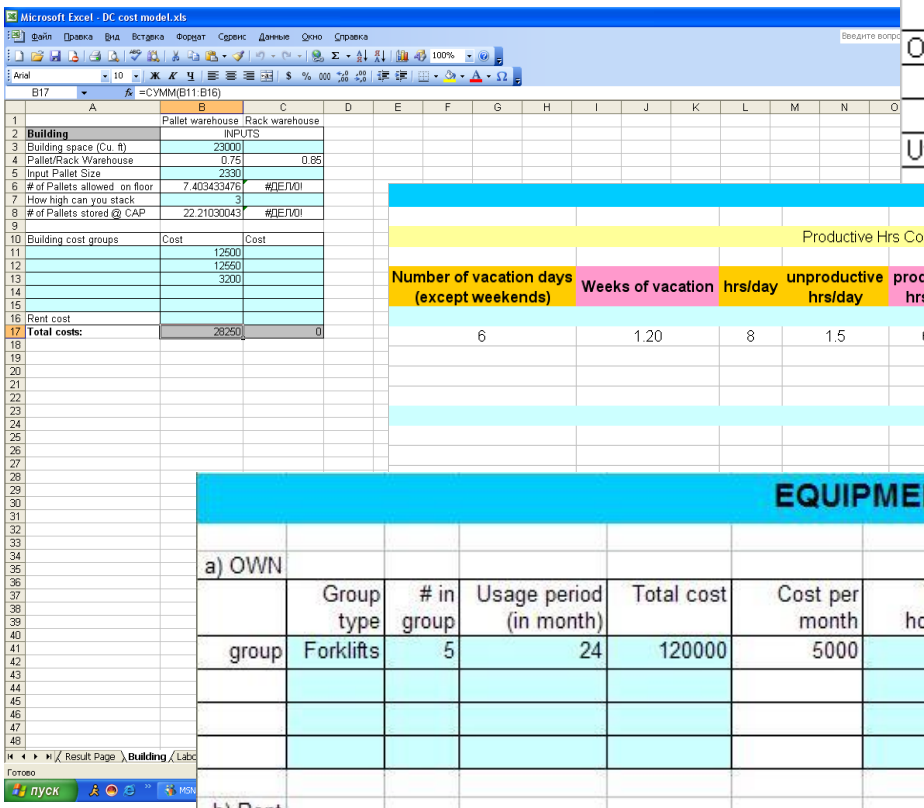
Research Contributions:

- Defined input and output variables
- Formulated calculations
- Defined basic model structure for generating outputs
- Implement output parameters of other companies for comparison

Our Primary Focus:

- Building and Equipment
- Labor, Maintenance, Utilities
- Output Results and Benchmarking

Excel Model



	A	B	C
1		Pallet warehouse	Rack warehouse
2	**Building**	INPUTS	
3	Building space (Cu. ft)	23000	
4	Pallet/Rack Warehouse	0.75	0.85
5	Input Pallet Size	2330	
6	# of Pallets allowed on floor	7.403433476	#ДЕЛ/0!
7	How high can you stack	3	
8	# of Pallets stored @ CAP	22.21030043	#ДЕЛ/0!
9			
10	Building cost groups	Cost	Cost
11		12500	
12		12550	
13		3200	
14			
15			
16	Rent cost		
17	**Total costs:**	28250	0

Maintenance, utilities and other costs:		Cost per month
	Total Equipment maintenance	
	Total building maintenance	
Other maintenance cost		
Utilities	electric	
ost per month		0

Productive Hrs Cost calculation.

Number of vacation days (except weekends)	Weeks of vacation	hrs/day	unproductive hrs/day	productive hrs/day	cost/hr	working days/week	working weeks/year	Cost for productive hrs
6	1.20	8	1.5	6.5	8	5	50.80	13208

EQUIPMENT COST

a) OWN

	Group type	# in group	Usage period (in month)	Total cost	Cost per month	Total work hours in day	Avg machine use hour	Rate of use of machine group	Productive cost per month	Maintance cost
group	Forklifts	5	24	120000	5000	16	14	0.875	4375	

b) Rent

	Group type	# in group	Cost per month	Total work hours in day	Avg machine use hour	Rate of use of machine group	Productive cost per month
group	Forklifts	5	6000	16	15	0.9375	5625

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FAQ/Instructions Sub-Team

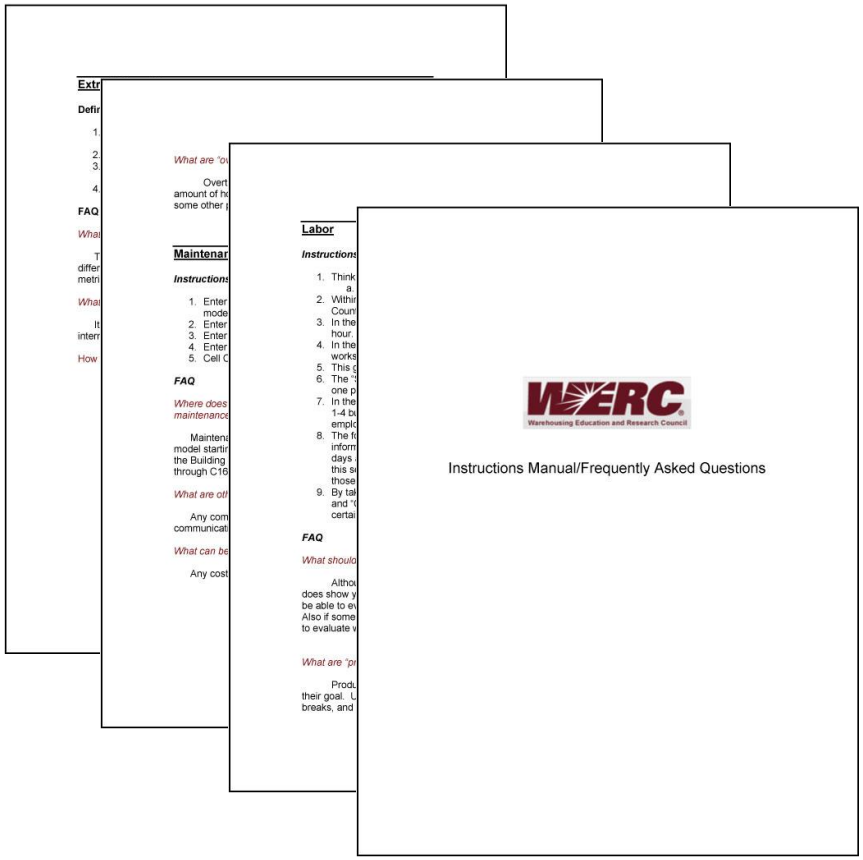
- The FAQ team developed an instruction manual for the model, which will be available to be developed into an instruction manual for the program.

Sarah Stone
Sub-team leader

Kristin Mrozinski

Douglas Oh

FAQ/Instructions Sub-Team



- Frequently Asked Questions…
  - Instructions for the model
  - Definitions of key terms
  - Questions that the user might have
- Continuously updated through website feedback

Programming Sub-Team

- Team is responsible for the development of cost based (DC operational cost model) online tool to provide users with easy step-by-step program that will analyze their data and will assist in decision-making process.

Nickolay Schwarz
Sub-team leader

Khanh Duong
Design and backend development

Arthur Mcanally
Design and backend development

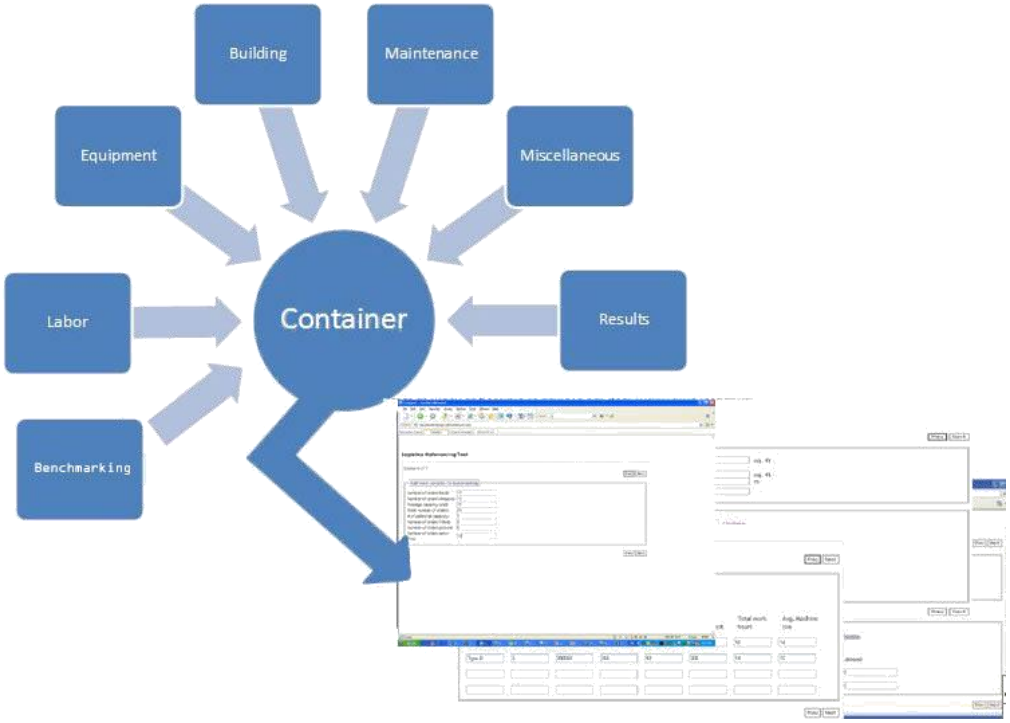
Programming Sub-Team

- Data structure for each page of the tool:
  - **Building**
  - **Labor**
  - **Equipment**
  - **Maintenance**
  - **Miscellaneous**
  - **Benchmarking**
  - **Results**

- Each structure is contained in a wrapper object called "**Container**".

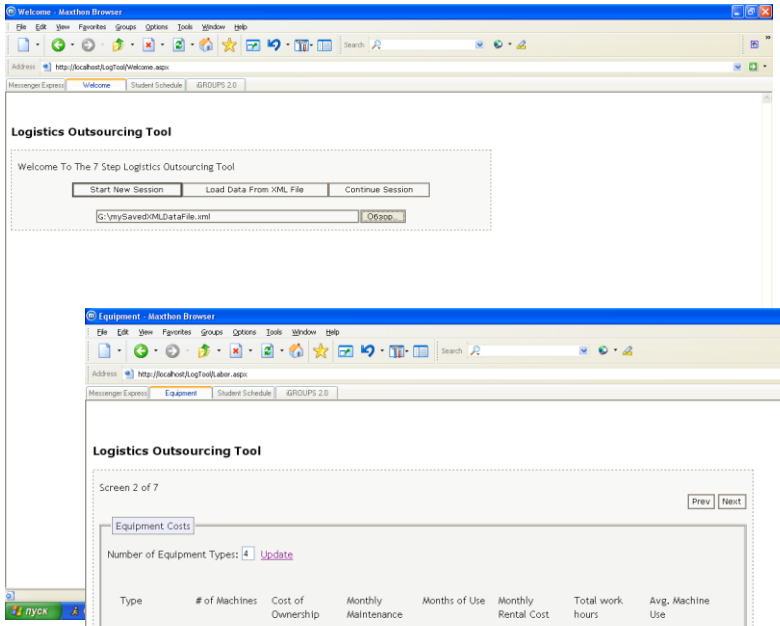
- User-end web application is driven by "**Container**," holds the user's data and performs necessary calculations

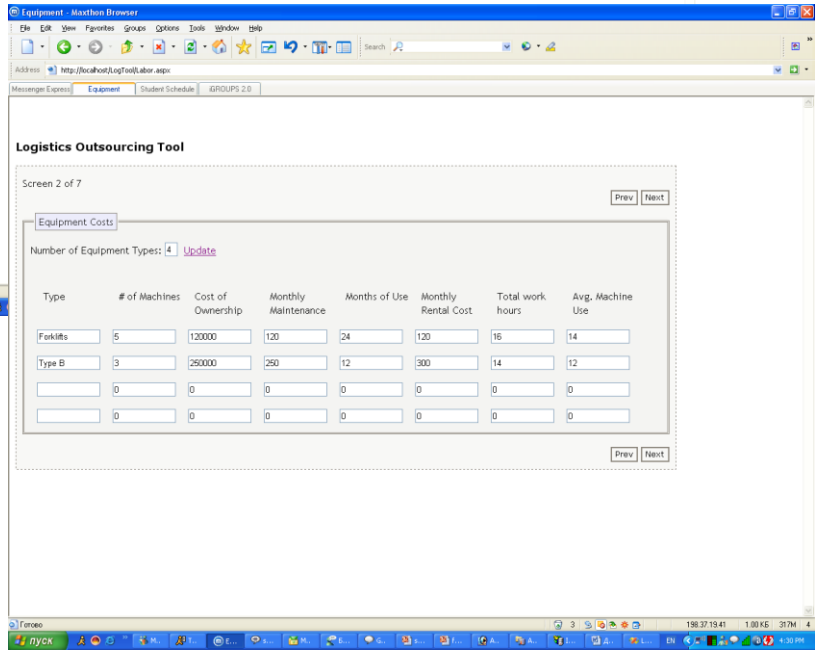
- Saves information as "**Sessions**"

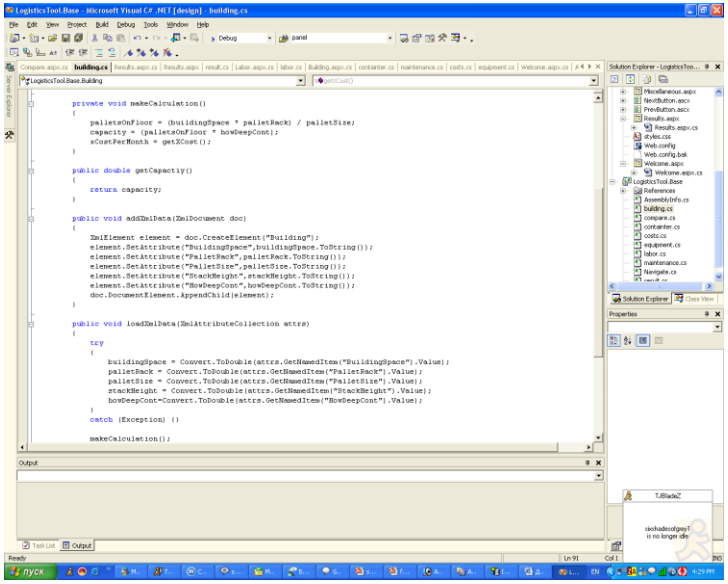


Programming Sub-Team

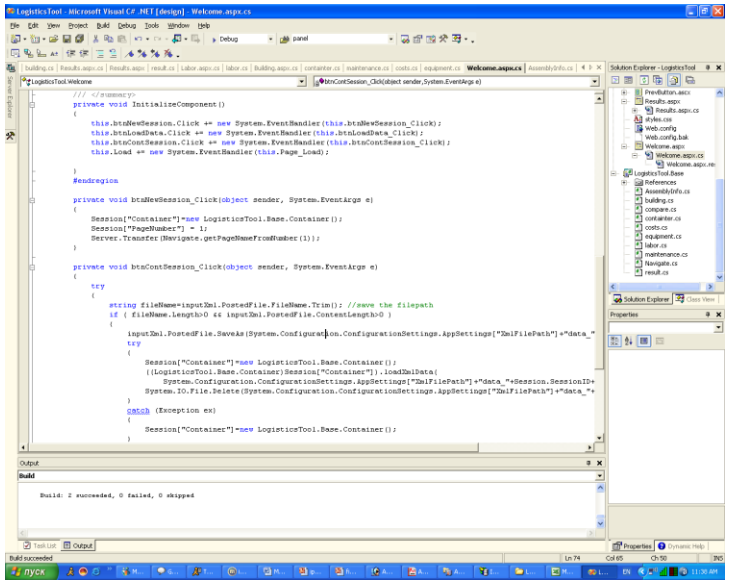
- Tool created on Internet Information Services (IIS) server
- Written in C# .NET with combinations with .asp technologies







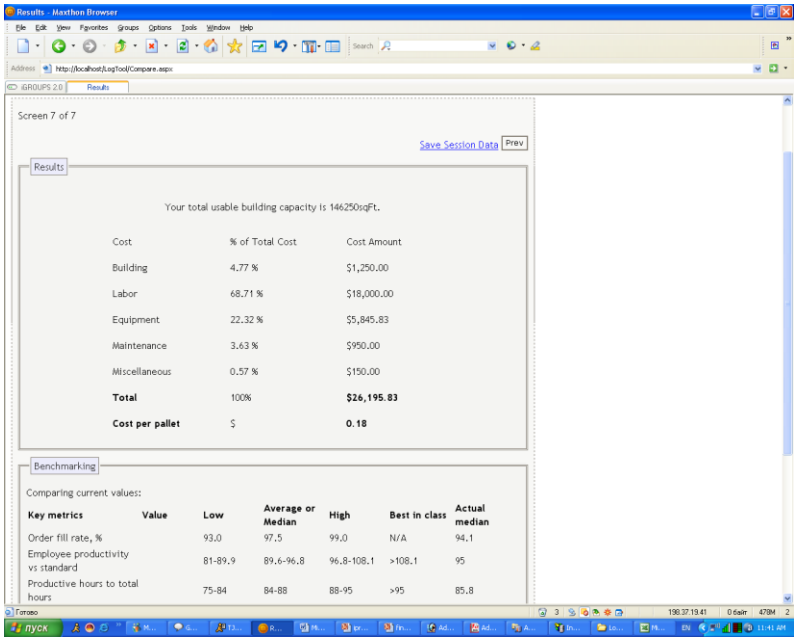
Programming Sub-Team



- Each component is split into 3 files:
  - ".cs" which uses the templates of the container
  - ".aspx" which sets up the actual webpage layout
  - ".aspx.cs" which loads and stores the files from the Excel model

Programming Sub-Team

- Simple to use tool
- Comparison to market values (provided by WERC) and used to help calculate efficiency



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RFI/RFP Development Sub-Team

- The team developed the web version of the request for information form and the request for proposal form.

Aleksandar Sudar
RFI

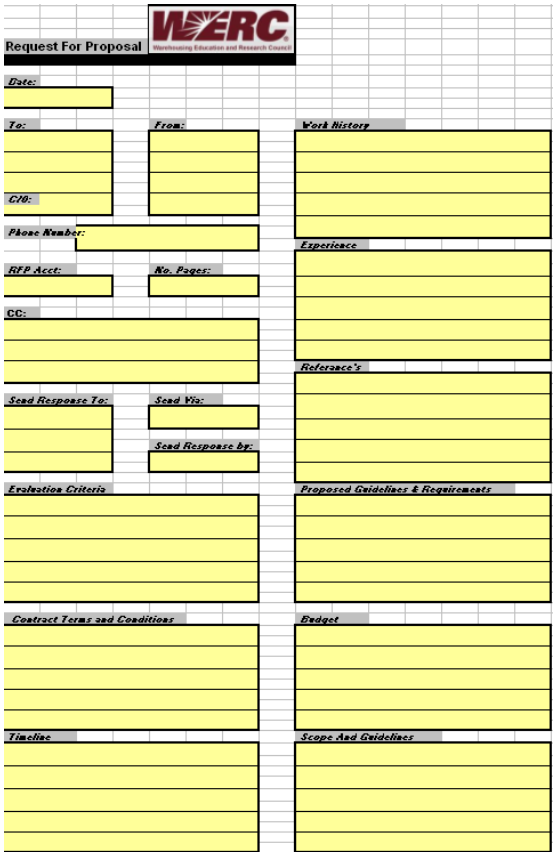
Uchenna Egwu
RFP

Justin Ma
Sub-team leader

Arthur Zavala
RFI



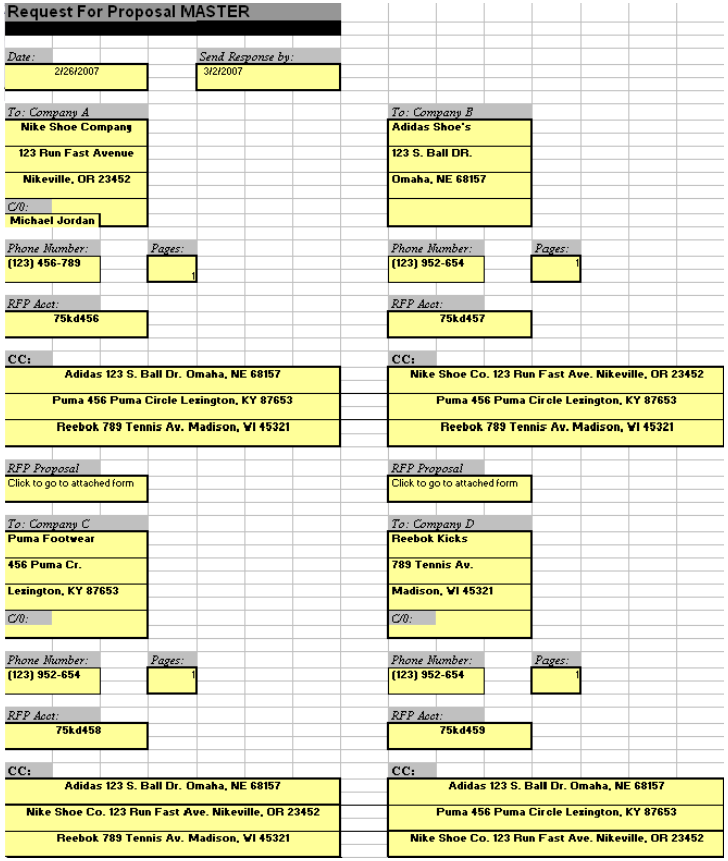

RFI/RFP Development Sub-Team



RFP

- RFP's are sent out to perspective companies to evaluate the benefits of outsourcing
- Construct a tool that would allow warehouses to easily create a RFP Form
- Allow for multiple fields of data to accommodate most RFP requests
- Capable of both electronic and hard copy formats
- Fully integrated into the warehouse logistics tool

RFI/RFP Development Sub-Team



Request For Proposal MASTER

Date: 2/26/2007 | Send Response by: 3/2/2007

To: Company A
Nike Shoe Company
123 Run Fast Avenue
Nikeville, OR 23452
C/0: Michael Jordan
Phone Number: (123) 456-789 | Pages: 1
RFP Acct: 75kd456
CC:
Adidas 123 S. Ball Dr. Omaha, NE 68157
Puma 456 Puma Circle Lexington, KY 87653
Reebok 789 Tennis Av. Madison, WI 45321
RFP Proposal: Click to go to attached form

To: Company B
Adidas Shoe's
123 S. Ball DR.
Omaha, NE 68157
Phone Number: (123) 952-654 | Pages: 1
RFP Acct: 75kd457
CC:
Nike Shoe Co. 123 Run Fast Ave. Nikeville, OR 23452
Puma 456 Puma Circle Lexington, KY 87653
Reebok 789 Tennis Av. Madison, WI 45321
RFP Proposal: Click to go to attached form

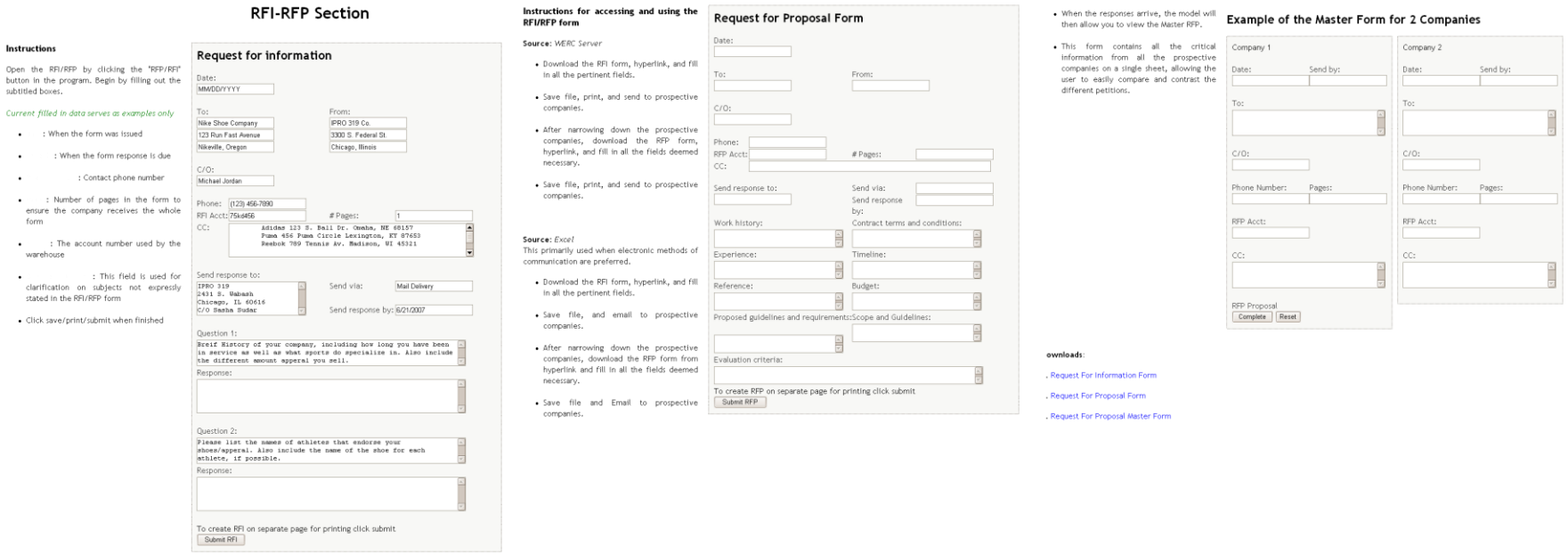
To: Company C
Puma Footwear
456 Puma Cr.
Lexington, KY 87653
C/0:
Phone Number: (123) 952-654 | Pages: 1
RFP Acct: 75kd458
CC:
Adidas 123 S. Ball Dr. Omaha, NE 68157
Nike Shoe Co. 123 Run Fast Ave. Nikeville, OR 23452
Reebok 789 Tennis Av. Madison, WI 45321

To: Company D
Reebok Kicks
789 Tennis Av.
Madison, WI 45321
C/0:
Phone Number: (123) 952-654 | Pages: 1
RFP Acct: 75kd459
CC:
Adidas 123 S. Ball Dr. Omaha, NE 68157
Puma 456 Puma Circle Lexington, KY 87653
Nike Shoe Co. 123 Run Fast Ave. Nikeville, OR 23452

RFP Master Form

- Create an “At A Glance” table for the key elements of the returned RFP’s
- Added convenience for warehouse operators, allowing easy review of data
- Enhancing the flexibility of the model

RFI/RFP Development Sub-Team



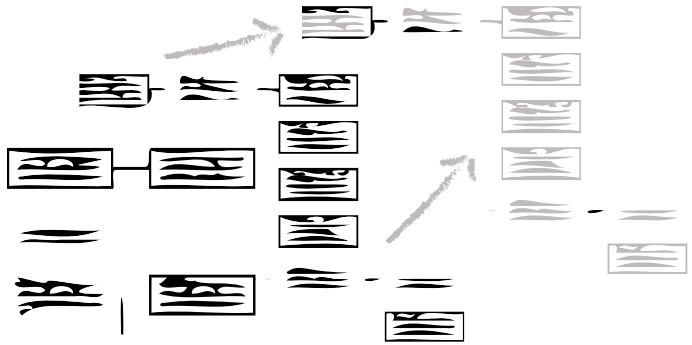
Web Example

- A visualization of the RFI/RFP
- Could be used for implementation of the model
- Come with examples and instructions, links to Excel sheets

Barriers, & Obstacles - A Learning Process

Project Management

Project Management



- Assign the work early and evenly
- Communicate between the team
- Make sure the project team is on task
- Review the status of the group at each step and revise tasks as needed
- Manage changes in the project and adjust the end goal if needed

Barriers, & Obstacles - A Learning Process

Ethics

Ethics

- Communicate and build trust
- Speak with respect
- Accept other team members and each person's role
- Consider problems in cross-cultural communication
- Non-verbal communication is very important

Barriers, & Obstacles - A Learning Process

Teamwork

Teamwork

- Take some time to build a team with patience
- Establish rules for team behavior in one of the first meetings
- Make an effort to be a team member
- Accept the role of each team member
- Find ways to create early success in each sub-team and for the whole IPRO team

Questions and Answers

Thank you for your time and attention.

If you have any questions we will direct you to the appropriate team member.

Please provide the us with any feedback you may have to improve our project.