

I PRO

It takes a team!

INTERPROFESSIONAL PROJECTS PROGRAM

RESIDENTIAL RAIN WATER HARVESTING

I PRO 344



WALKING ON WATER

Prepared By:

Mohammad Al-Sabah
Michael Gubser
Alysa Kirkpatrick
Shuana Martin
Juan Martinez
Declain McCloat
Muqadas Munir
Sean Murray
Adam Newman

Advisor:

Professor Phil Lewis

Motto

"Problems cannot be solved at the same level of awareness that created them." *Albert Einstein*

1.0 BACKGROUND

There is evidence that people have been harvesting rainwater since 4000BC. The Roman Empire developed an intricate infrastructure to direct water to be used for irrigation and sanitary purposes. For the most part, modern society has abandoned the practice of harvesting rainwater because water sources have been plentiful and inexpensive. Residents have become accustomed to turning on the tap and receiving potable water from their Municipal Authority or a free standing well. Essentially rainwater is undervalued and as such has not been given the priority it deserves. This circumstance is rapidly changing as fresh water is becoming more difficult to acquire. Municipalities are raising the price of water, adding regulations to restrict its use and promoting the rapid growth of investment in 'green' lifestyle solutions. These actions are increasing public awareness of the need to reduce our "water footprint" and a willingness to invest in conservation systems. In urban settings, two-thirds of the water provided by municipalities goes to residential properties. In a typical single family home, 70 percent of the water used annually is used in toilets and outside the home for lawn irrigation, gardens, washing cars, swimming pools etc. These applications could successfully utilize non-potable water, if a reliable source existed for capturing and recycling it in a convenient and affordable way. This IPRO will develop and test a system targeted at homeowners for rainwater harvest.

This project is responsive to the trend toward identifying, adopting and diffusing "GREEN" best practices and behavior. The project offers a solution to local water rationing regulations that limit homeowner's use of water outdoors for irrigation, car washing, etc. If the students participating in this IPRO project can create a viable system, they will create the opportunity for a permanent change in our society.

Furthermore, the project is sponsored by Pentair Water to further the company's "Green Marketing Initiative". Pentair aims to provide water solutions and technical products to meet the demands of today's ever-changing global environment. From distributing clean, safe drinking water around the world to keeping high-tech electronics and electrical equipment protected from overheating and other environmental factors, Pentair delivers solutions that improve lives daily. The team will begin the design process by conducting internet research on rainwater harvesting techniques and systems that are currently available. The research will be evaluated initially by the team and then with the client to determine opportunities for new product development. Evaluation will include functionality, form, quality, performance, complexity, pricing, distribution, market acceptance and life cycle. The team will develop a preferred set of specifications for a new system and begin development. With the help of Pentair, components will be collected and a system assembled. Concurrently with development, a sub-team will secure one or more test sites. Product will be installed at the test site and data collected and modifications as required made to the prototype. Concurrently a sub team will build the marketing plan. A final deliverable will be a report and presentation to Pentair that includes an opportunity assessment for the new product and a suitable market strategy.

2.0 OBJECTIVES

Our IPro objective is to design and market a rain water collection system that is more efficient, user friendly, and aesthetically pleasing than other products on the market. Additionally the system will be cheaper than other systems and easily marketed in “big box” stores. The following is a breakdown of the tasks to be undertaken in each phase.

Design Phase:

- consideration of alternative materials
- consideration of alternative sizes
- cost comparisons between different iterations
- create drawings, 3D model, and renderings
- build and test prototype

Marketing Phase:

- determine target market
- hand out surveys and document the results
- provide statistical data to support reasons for product
- advertise product and capabilities

3.0 METHODOLOGY/EXPECTED RESULTS

3.1 Group Methodology

This IPRO seeks to build a practical solution to rainwater catchment systems. The team will be working with Pentair Inc. which is multi-billion dollar water company. The team members are of various academic backgrounds, each of which is valuable to the team's success in this project. The group plans to create an inexpensive and user friendly device to collect rainwater in an aesthetically pleasing and workable way. Another indirect goal is to promote the idea of collecting water as another alternative to "going green." In the timeline the team has set, there will be a design phase, a prototype phase, and a final marketing phase.

To start off, each member of the group researched the rainwater harvesting topic and discussed what systems were already available and what could be improved. A brainstorming session followed and from there the timeline was created. The group had also spoken with Pentair to gain insight as to what expectations they had for us in this project. Additionally we were able to pitch them our ideas and have them point us in the right direction.

The end product is this IPRO's goal. Since it is a fairly moderate size group, there is no need to have subgroups. Everyone is assigned a task and knows what they must do to do their part to complete the goal.

3.2 Communication

Every week the team will meet on the designated IPRO class times and discuss updates and future tasks. The advisor will periodically come in and out and provide input to the group's ideas. iGroups will be utilized for mass communication and multiple trips to Pentair will occur to go along with our relationship with them.

3.3 Expected Results

Our team expects to create a product which will successfully capture and harvest rainwater. We also hope that we will meet and exceed the expectations of Pentair Water, our sponsor. Furthermore, our team has agreed that we would all like to be first in our track at IPro day.

4.0 Team Values Statement

Everyone on this team is expected to be responsible, ethical person with high integrity. They should be respectful of their classmates, arrive on time, actively participate in group discussions, volunteer for tasks and be accountable for said tasks.

5.0 PROJECT BUDGET

Expense Activity	Description	Cost
Travel (Transportation)	Site Visits to Pentair Manufacturing Plant (200 miles x 2 visits x 3 cars @ 0.50 cents/mile)	\$600.00
Prototypes	Materials (plastic containers, PVC piping, PVC pipe fittings, pavers, permeable surfaces, 3d plotting/printing)	\$275.00
Printing	Finishing costs for brochures/posters/final IPRO deliverables	\$50.00
Team Building	Lunch during IPRO meetings (9 people x 2 days @ \$5.00/meal)	\$90.00
	Total	\$1,015.00

5.0 TEAM STRUCTURE AND ASSIGNMENTS

5.1 Team Strengths and Skills

Team Member	Skills	Learning needs	Expectations	Team Structure and Tasks
Sean Murray [REDACTED] smurray2@iit.edu	-Architecture -Problem solving -Graphic design	-To learn how to market a idea that has been through multiple design phases.	To have a learning experience that involves design	Design: Sizes and dimensions prototype building Time Keeper
Declain McCloat [REDACTED] dmcclat@iit.edu	-Architecture -Creative -Finding the middle ground	-Essays and develop speeches -Spelling	To continue learning team management skills	Design: build and test prototype Team Leader
Michael Gubser [REDACTED] mgubser@iit.edu	-Architecture -Problem solving -Creative	-Learn more about leadership and communication within a team	To create a functional product that can be sold	Marketing: statistical data to support product
Mohammad Al-Sabah [REDACTED] malsaba@iit.edu	-Architecture -Rhino -Model making	-How to transition from designing stage to marketing	A great final presentation	Presentation: 3d renderings and drawings
Adam Newman [REDACTED] anewman2@iit.edu	-Architecture -Auto CAD -Adobe Suite	-To develop a marketing strategy and presentation	A presentation that teaches consumers how to harvest rainwater	Presentation: 3d model and graphics I-Groups Moderator
Alysa Kirkpatrick [REDACTED] akirkpa1@iit.edu	-Architecture -Inventing new ideas -Display of artistic ability	-Selling an idea or product to marketing	To create a product that generates an interest in rainwater harvesting	Design: model making and sample testing
Juan Martinez [REDACTED] jmarti21@iit.edu	-Psychology -Creative -Has unorthodox / outside of the box ideas	-Develop an understanding of market aspects	How to test prototype designs	Marketing: research into surveying and demographics
Muqadas Munir [REDACTED] mmunir@iit.edu	-Business -Thinking outside of the box -Time management	-Learning to design prototypes	To create a tangible final product	Communications: internal contacting the team and keeping all information current Minute Taker
Shuana Martin [REDACTED] smarti5@iit.edu	-Biology -Creative -Problem solving	-To learn how to design and develop communication skills with the design team	To make a project that has the potential impact on society	Communications: Public relations Tasks include contacting business and Pentair Agenda Maker

