WALKING ON WATER

Presented by: Michael Gubser, Shauna Martin, Sean Murray
Instructor: Phil Lewis
Presentation Outline

• Introduction
• Team Development
• Project Work
• Achievements and Challenges
• Next Steps For Future IPRO’s
Introduction
IPRO 344 Overview

• **Our Sponsor-Pentair Water**
  • Pentair is a global leader in providing innovative products and systems used worldwide in the movement, treatment, storage and enjoyment of water.

• **Team Moto**
  • “Problems cannot be solved at the same level of awareness that created them.” *Albert Einstein*

• **Other IPRO’s**
  • No previous IPRO’s
  • IPRO 345-Condensation Collection
Statement of the Problem:

The availability of water is a global problem. Over 20% of the world's population does not have access to safe drinking water.

American family uses about 45,000 gals. For gardening alone per year

On average 70% of the drinkable water used everyday is used to water the lawn and washing cars and other uses that do not require clean water.
The intention of this IPRO team is to develop a more innovative system which could become the catalyst for the implementation of many more rainwater harvesting systems in the urban and rural residences on a mass scale, specifically within the United States.
Team Development
## Organization of the Team:

<table>
<thead>
<tr>
<th>Team Member</th>
<th>Skills</th>
<th>Learning needs</th>
<th>Expectations</th>
<th>Team Structure and Tasks</th>
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<td>Sean Murray</td>
<td>- Architecture</td>
<td>- To learn how to market a idea that has been through multiple design phases.</td>
<td>To have a learning experience that involves design</td>
<td>Design: Sizes and dimensions prototype building Time Keeper</td>
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<td>Dendan McCloy</td>
<td>- Architecture</td>
<td>- Essays and develop speeches</td>
<td>To continue learning team management skills</td>
<td>Design: build and test prototype Team Leader</td>
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<td>Michael Gubser</td>
<td>- Architecture</td>
<td>- Learn more about leadership and communication within a team</td>
<td>To create a functional product that can be sold</td>
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<td>Mohammed Al-Sabah</td>
<td>- Architecture</td>
<td>- How to transition from designing stage to marketing</td>
<td>A great final presentation</td>
<td>Presentation: 3d renderings and drawings</td>
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<td>- Architecture</td>
<td>- To develop a marketing strategy and presentation</td>
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<td>Juan Martinez</td>
<td>- Psychology</td>
<td>- Develop an understanding of market aspects</td>
<td>How to test prototype designs</td>
<td>Marketing: research into surveying and demographics</td>
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<td>Muguadas Munir</td>
<td>- Business</td>
<td>- Learning to design prototypes</td>
<td>To create a tangible final product</td>
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<td>Shuana Martin</td>
<td>- Biology</td>
<td>- To learn how to design and develop communication skills with the design team</td>
<td>To make a project that has the potential impact on society</td>
<td>Communications: Public relations Tasks include contacting business and Pentair Agenda Maker</td>
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Division of Tasks and Team Work Ethic

- Cohesive group that was hard working and worked well while collaborating
- Most tasks tackled by at least two people
- Work divided into two stages

**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
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Project Work
Research

- Initial internet based searches
- Phone calls to manufacturers of similar products
- Periodicals/ Journals

**Research findings**
- The average American’s use of water outdoors accounts for 35% of their total annual usage
  - Equivalent to 44,590 gallons per year
- There are many rainwater harvesting products currently on the market
  - Most are costly and visually unattractive

![Pie chart showing typical annual water usage per American household (gallons/year)]
Walking on Water Concept:
- Individual pavers or paving slabs which allow water to pass through them
- Pavers or slabs sit on top of catchment devices
- Water can be stored to be used at a future time

Schematic Plan and Section

Initial Prototype
Visit to Pentair/Conference Call to Australia

Pentair Visit

The Group took a trip out to one of Pentair’s facilities in Wisconsin and met with representative.
- The group learned Pentair’s expectations.
- Got feedback on the initial design
- Established lines of connection and received thumbs up on progress of the group.

Recommendations from Australian office

- Sell our product to homebuilders and landscapers because the mass market does not have a ‘need’ to buy our product. There is no drought in the US and water is cheap.
- After some time (3 years) we can try and sell it at Home Depot but they strongly recommend that we don’t start out that way.
Prototype
Prototype
Prototype: Installation

Installation info:
Begin with step one

1. Lay ground nearly flush with the floor
2. Lay paper system on top of the cisterns
3. Connect the adjustable access cap box to be flush with the paper you have installed
4. Place metal mesh to hold the paper in place
5. Place pump access tube in the lower holder of the cistern
6. Put a cap on all other pipes not connected to another cistern
7. Put down next cistern
8. Twist and tighten the connector so that it connects both pipes connected to the cistern
9. Lay the next cistern down
10. Put connectors onto the pipe that is later going to be connected to the next cistern
11. Take plastic cistern out of box and attach the pipe
12. Dig a ditch to put cistern(s) in to the ground
13. Configure layout for the boxes
14. Have a plan and a large area on your property that has access to the downspout from your roof
Prototype: Networked System
Prototype: Performance Specs

• W.O.W. Module Specs
  • Dimension of Cistern:
    length: 2’-0”
    width: 2’-0”
    depth: 0’-6”
  • Total Volume: 2 cubic feet
    1 cubic foot of water = 7.5 ga
    1 module = 15 ga of water

• To water 800 sqft of garden:
  800 sqft x .5 ga/sqft = 400 ga required
  400 ga/ 15 ga per module ~ 27 modules
  27 modules (2’-0” x 2’-0” surface area) =
  108 sqft of module

• Amounts of rainwater collected per module
  • 10 inches of water per year:
    24” x 24” x 10” = 5760 cubic in
    5760 cubic inches / 1728 cubic inches / cubic foot =
    3.3 cubic feet
    3.3 cubic feet x 7.48 ga / cubic foot = 24.684 ga

• 25 ga of rainwater collected per module every year in an area that
  receives 10 in of rainfall per year

• One module of 15 gallons waters >30 sqft of garden
  OR
• Ratio area approximately 1:8 (e.g. 4 sqft of module
  accommodates ~ 32sqft of garden)

• 20 in = 50 ga/module
• 30 in = 75 ga/module
• 40 in = 100 ga/module
• 50 in = 125 ga/module
Marketing: Plan

• Introduction/Middle Marketing -
  • Targeting Middle Market merchants like Ace Hardware and Hardware Hank.
  • WHY?
  • They require less product for shelf life, and it serves as a field test for popularity of the product.

• The plan is to create the desire in the public with advertisements and information, then point them to the merchant.
Possible Partner Channels

• Homebuilders
• Landscaping
  • Valley Crest Landscaping company
• Contracting Companies
  • Bachtel Contracting company
Take a Step in the Right Direction!!

Start Harvesting Rain Water Today!

W.O.W!
(Walking.On.Water)

TXT “RAIN” to 4434445
DID YOU KNOW?

The Average American uses 176 Gallons of water a day?!??!

That’s about 5 Full bath Tubs!!!
DID YOU KNOW?

70% of the United State’s fresh water supply comes from the Great Lakes?

LETS NOT WAIT UNTIL THE WELL RUNS DRY!
START HARVESTING RAIN WATER TODAY!!!
Marketing: Surveys

Conducted written surveys
- Received aprox. 100 responses
- Trying to gain an insight to why rainwater harvesting hasn’t caught on.
- Questions asked were also geared towards developing a marketing plan

- Are you aware of rainwater harvesting/collecting?
  - Yes [71]
  - No [30]

- Rain is usually held in a cistern, would you want that container exposed or buried?
  - Exposed [17]
  - Buried [42]
  - Doesn’t matter [39]

- Do you plan on “going green” in the foreseeable future?
  - Yes [68]
  - No [66]

- Do you personally know anyone who collects rainwater?
  - Yes [71]
  - No [27]

- Are you aware that roughly 1/5th of the world’s population is suffering from chronic water shortages and the need of water will continue to increase?
  - Yes [69]
  - No [29]

- Did you know you can save money by collecting and using rainwater?
  - Yes [60]
  - No [40]

- If you are a renter of a property would you utilize a rainwater collection product in which your landlord or building owner implemented it in your building?
  - Yes [81]
  - No [13]
Marketing: Package Design

W.O.W.

Walking on Water
Rainwater Collection System

HOW DOES W.O.W WORK?

BOX INCLUDES:
- 6 Caters
- 6 Cogs
- 6 Pavement Trays
- 6 Silo Access Tubes
- 12 Couplings

BOX DOES NOT INCLUDE:
- Pump Kit
- Pavers

RAINWATER HARVESTING

SINCE WHEN?

There is a shortage in our water supply and increasing efforts are being made to conserve our water supply. Therefore, we need to find new ways to make use of water in our daily lives. Rainwater harvesting has been a popular solution to this problem.

WHY?

Rainwater harvesting is an effective way to capture rainwater for various purposes. It helps in reducing the burden on the existing water supply systems, conserving natural water resources, and reducing the need for treated water.

HOW?

Rainwater harvesting can be done in various ways, depending on the available space and resources. It can be done through a simple setup with a storage tank and a filter or a more complex system involving pumps, filters, and storage tanks.

WHO?

Rainwater harvesting is beneficial to everyone, whether it is homeowners, commercial establishments, or public institutions. It is an environmentally friendly and cost-effective solution for water conservation.

PRODUCT INFORMATION

W.O.W. is a modular rainwater collection system that can be placed under or above ground. The design allows the user to store rainwater without sacrificing the aesthetic value of their surroundings by having the product be used as a pavement as well to hide the water storage. It also gives the user the freedom to set up the system in many different ways such as a pathway, patio, or even a driveway.
Achievements and Challenges
What major obstacles did we encounter?

- design process / execution
  - material considerations
    - filter / filter fabric
    - filter box assemblies (parameters)
  - rainwater run-off
  - connectivity of modular units
  - flexibility
  - structural integrity of the assembly
    - material
    - molding (recycled plastic materials)
    - extruded plastic forms

- creating a public interest and desire for a product of this nature
  - marketing strategy

- cost / affordability
What did we accomplish this semester?

- Group met with Pentair/established a relationship

- Created an innovative rainwater system

- Field tested the prototype

- Created Marketing Plan

- Made a major step towards solving solving the water usage issue/

- Set the tone and paved a way for future IPRO’s
Next Steps For Future IPRO’s
What’s next?

- Research costs
- Meet again with Pentair and look into and begin targeting middle market vendors like an Ace Hardware, or other stores that are not main stream suppliers to implement field tests for the product.
- Continue to research the topic of rainwater harvesting and systems that exist, because with rapid advances in technology a new innovation could surface that could help the product.