IPRO 317: Nana
A Sustainable Restaurant Development

Presented by:
Ken Boubel
Kibum Kim
Jordan Margolis
Nana Organic

- Building Renovation
- 3267 S Halsted St.
  - Bridgeport
- All organic food
- Opened August 2009
Inside Look: Nana Organic
Mission Statement

• To conduct innovative, effective marketing within a 1 mile radius of Nana, increasing awareness to the general public while becoming environmentally friendly, sustainable and eventually significantly increasing the number of customers to enjoy the distinct Nana organic experience.
# IPRO Organization

<table>
<thead>
<tr>
<th>Business</th>
<th>Kenneth Boubel (Group Leader, Subgroup Leader)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seth Ellsworth</td>
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<td></td>
<td>Bushra Hussaini</td>
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<td></td>
<td>Matthew Kavicky</td>
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<td>Environmental</td>
<td>Jordan Margolis (Group Leader, Subgroup Leader)</td>
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<td></td>
<td>James Mellom</td>
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<td></td>
<td>Jessica Roth</td>
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<td>Sasha Bajzek</td>
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<td>Building</td>
<td>Kibum Kim (Subgroup Leader)</td>
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<td></td>
<td>Ray DeBoth</td>
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<td></td>
<td>Hye Sun Jeong</td>
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<td></td>
<td>Keo-Jin Jin</td>
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<td></td>
<td>Natalia Klusek</td>
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<td>Sang Yun Lee</td>
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<td></td>
<td>Sukmin Lee</td>
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<td></td>
<td>Tianshu Qi</td>
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<td>Joong Geun Yun</td>
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Business Subgroup: Research

• Newspaper advertising
  – TechNews
    • Ads from $72-$288
  – Chicago Tribune
    • Once a week- $200
• Radio Advertising
  – Average cost for 30 second spot: $362
• Social media marketing
• Local demographics
• Grants and other funding
• Online directories and reviews
  – Research, feedback and implementation
Feedback: Areas To Improve

• Time to wait for table/ food
• Poor Service
• Unable to accommodate large crowds
• Mediocre food
• Over priced for extremely SMALL portions
  – Both juices and meals

NOTE: Research Conducted mid February

Feedback: Positives

March 7: “Organic, locally focused, this little place has got a mission, and it's doing it, and doing it well.”

March 26: “was so incredibly impressed by this gem amid an otherwise barren area. The staff was incredible and gave great suggestions and was attentive to our needs.”

March 26: “I've been here a couple more times since my initial review, and my opinion only keeps getting more and more positive.”

March 27: “Wow and wow. Amazing! They were good in September, but now they are great! The food has improved tenfold!”

April 12: “I COMMEND them on their concept: family owned, ONLY humanely raised animals, no hormones or antibodies, no genetically modified mutant garbage, not even added coloring. they define ALL-NATURAL. I trust eating there better than from my own fridge”

Business Subgroup: Projects

• Student coupon
• Student / faculty survey
• On campus presentation
• Economic analysis of expansions
  – Dinner
  – Increased indoor dining
  – Outdoor café
• Text messaging notifications
College Coupon — 10% Off!

Come to Nana for 10% off one breakfast or lunch item! For menu and additional information, visit www.nanaorganic.com.

To receive discount, please turn in this coupon and present school ID.

Valid on Mondays and Tuesdays 9:00 A.M. to 3:00 P.M.
Street Address: 3267 S. Halsted (Halsted St. at 33rd St)
Phone Number: 312-929-2486
Expires 3/30/2010
### Economic Analysis: Outdoor Café
40 Additional Seats

<table>
<thead>
<tr>
<th>Annual Benefits/Costs</th>
<th>Year 0</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
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</thead>
<tbody>
<tr>
<td>Income</td>
<td>-</td>
<td>$89,600</td>
<td>$89,600</td>
<td>$89,600</td>
<td>$89,600</td>
<td>$89,600</td>
</tr>
<tr>
<td>Worker Costs</td>
<td>-</td>
<td>($40,320)</td>
<td>($40,320)</td>
<td>($40,320)</td>
<td>($40,320)</td>
<td>($40,320)</td>
</tr>
<tr>
<td>Additional Business Expenses</td>
<td>-</td>
<td>($8,000)</td>
<td>($8,000)</td>
<td>($8,000)</td>
<td>($8,000)</td>
<td>($8,000)</td>
</tr>
<tr>
<td>Permit costs</td>
<td>-</td>
<td>($2,000)</td>
<td>($2,000)</td>
<td>($2,000)</td>
<td>($2,000)</td>
<td>($2,000)</td>
</tr>
<tr>
<td>Net Sum =</td>
<td>($20,000)</td>
<td>$39,280</td>
<td>$39,280</td>
<td>$39,280</td>
<td>$39,280</td>
<td>$39,280</td>
</tr>
</tbody>
</table>

Internal Rate of Return (IRR) = 196 %
Economic Analysis: Indoor Dining
40 Additional Seats

<table>
<thead>
<tr>
<th>Annual Benefits/Costs</th>
<th>Year 0</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>-</td>
<td>$89,600</td>
<td>$89,600</td>
<td>$89,600</td>
<td>$89,600</td>
<td>$89,600</td>
</tr>
<tr>
<td>Worker Costs</td>
<td>-</td>
<td>($26,880)</td>
<td>($26,880)</td>
<td>($26,880)</td>
<td>($26,880)</td>
<td>($26,880)</td>
</tr>
<tr>
<td>Additional Business Expenses</td>
<td>-</td>
<td>($10,000)</td>
<td>($10,000)</td>
<td>($10,000)</td>
<td>($10,000)</td>
<td>($10,000)</td>
</tr>
<tr>
<td>Net Sum =</td>
<td>($40,000)</td>
<td>$52,720</td>
<td>$52,720</td>
<td>$52,720</td>
<td>$52,720</td>
<td>$52,720</td>
</tr>
</tbody>
</table>

Internal Rate of Return (IRR) = 130 %
Environmental Subgroup

Our goal is to determine several different environmentally friendly and green solutions to Nana’s everyday problems, including:

- Harsh chemical cleansers
- Cardboard waste
- Food waste
- Vegetable oil waste
- Rainwater collection
- Green walls and partitions
# Cleanser Analysis

<table>
<thead>
<tr>
<th>Cleaner Genre</th>
<th>Current Cleaner</th>
<th>Cost / oz.</th>
<th>Recommended Cleaner</th>
<th>Cost / oz.</th>
</tr>
</thead>
<tbody>
<tr>
<td>All-Purpose</td>
<td>Ecolab G.P. Liquid</td>
<td>$0.15</td>
<td>Sunshine Makers Simple Green Concentrate¹</td>
<td>$0.07</td>
</tr>
<tr>
<td>Bathroom</td>
<td>Ecolab Kemsan</td>
<td>$0.26</td>
<td>Canberra Corp. Husky 325¹</td>
<td>$0.10</td>
</tr>
<tr>
<td>Degreaser</td>
<td>Ecolab Degreaser</td>
<td>$0.30</td>
<td>The Clean Environment Co. PH Neutral</td>
<td>$0.11</td>
</tr>
<tr>
<td>Floor</td>
<td>Ecolab Wash ‘N Walk</td>
<td>$0.40</td>
<td>Amrep Misty Neutra Clean</td>
<td>$0.10</td>
</tr>
<tr>
<td>Oven</td>
<td>Ecolab Husky</td>
<td>$0.40</td>
<td>The Clean Environment Co. Non-Toxic Cleaner</td>
<td>$0.18</td>
</tr>
<tr>
<td>Toilet Bowl</td>
<td>Palmolive Disinfectant Bowl Cleaner</td>
<td>$0.16</td>
<td>The Clean Environment Co. No-Dye Cleaner</td>
<td>$0.14</td>
</tr>
<tr>
<td>Window</td>
<td>Ecolab Windex</td>
<td>$0.26</td>
<td>Rochester Midland Corp. Enviro Care¹</td>
<td>$0.10</td>
</tr>
</tbody>
</table>
Cardboard Waste Solutions

Below: 1424 W. Pershing Rd, 1.59 Miles from Nana. Open 7 Days a Week, Daylight hours

Above: 1752 S. Clark St, 2.1 Miles from Nana. Open 7 Days a Week, Daylight hours
Composting

**Earthmaker Composter**

- Composting allows Nana to utilize their waste
- Renewable energy for their new green features
- Placed on Nana rooftop
- 124 gallon capacity
- $249.00
Waste Vegetable Oil Reuse

-Waste Vegetable Oil (WVO) can be filtered and reused to fuel diesel vehicles.

-Needs 1-2 weeks to filter contaminants.

-Vehicle must be converted in order to properly burn WVO.
Waste Vegetable Oil Conversion

- Elsbett Tank Systems

**One Tank System (chosen)**
- Utilizes one tank.
- Can operate on just WVO.

**Two Tank System:**
- Switches between diesel tank and WVO tank.
- Necessary to switch over while idling to avoid overheating engine.
Waste Vegetable Oil Feasability

-Subject Vehicle: 2010 Volkswagen Jetta Wagon, TDI

-Local Diesel Fuel Price:
  (2-17-10, 3400 Milwaukee Ave, Gas Depot): $2.89/gallon

UPFRONT COSTS
-Elbett Conversion Kit $1,139.00
-Install (8hrs at $95) $760.00
-Filtration (drum/unit) $240.00

TOTAL UPFRONT COST $2,139.00

5% Contingency $106.95
TOTAL WITH CONTINGENCY $2,245.95

TIME OF REPAYMENT
-Gallons of Diesel Fuel Used Weekly 14.5gal
-14.5 gallons at $2.89= $41.91 spent weekly
-Time of Repayment (54 weeks)
-Savings- YEAR 2 (104 weeks) $2112.69
Rainwater Harvesting

- **Rain Catcher Barrel**
- Annual average precipitation for Chicago is 38 inches.
- Averaging 10 inches of rain over a spring and summer on Nana’s roof yields 8,160 gallons of water
- Used to water outdoor seating area plants
- 54 gallon capacity
- $139.00
Woolly Pockets

- Woolly Pockets are a flexible, breathable, and modular solution to gardening containers.
- Indoor or outdoor use
- Built-in moisture barrier
- Lightweight: easy to use, move and store.
Vertical Gardening Partition
Building Subgroup

- Solar Panel
- Green Wall Garden
- Moving Shading
- Partition Wall
- Electric Charge Point
Building Group Goals

- Provide building insulation via a vertical garden (attached to the façade)
- Propose a (shaded) outdoor seating café (to advertise and maximize profits)
- Install solar panels on the building’s upper façade, providing light/heat to the outdoor café
- Propose electrical charge (car) stations
The solar panel system is self installed which provides the electricity for the lighting fixtures.
The angle of the solar panel can be adjusted to yield maximum power output. The support system is mounted along the edge of the roof.

Total weight = 118.123kg, Total Cost = $100
## Solar Panel Cost Analysis

<table>
<thead>
<tr>
<th>Number of Solar Cells</th>
<th>Output/hour (Wh)</th>
<th>Ave. Sun Hours (Chicago)</th>
<th>Elec. Loss from Inverter</th>
<th>Daily Output (Wh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>72</td>
<td>108</td>
<td>3.14hrs</td>
<td>&lt; or = 13%</td>
<td>295.03</td>
</tr>
</tbody>
</table>

The cells are 3 × 6 inches in size and are rated at 3 amps. Each cell produces 1/2 Volt. One Solar Cell can produce 3 Amps × 1/2 Volt which equals 1.5 Watts.

The solar cells are arranged as 6 units in a row and 12 units in a column. The size is 36 × 36 in. that is around 9ft² in area.

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar Cells</td>
<td>109.95</td>
</tr>
<tr>
<td>Inverter</td>
<td>99.99</td>
</tr>
<tr>
<td>SLA Battery</td>
<td>79.95</td>
</tr>
<tr>
<td>Charge Controller</td>
<td>20.50</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>310.39</strong></td>
</tr>
</tbody>
</table>
Green Garden Wall

This proposal of vertical garden will acts as not only funtional aspect to minimize heat loss and gain as a insulation, but also it will works as asthetic value to give strong identity as leading organic restaurant.
Green Garden Wall Detail

Semi-Rigid Plastic 4gal = 180 $
One module = 2gal
Cost of one module = 90 $

Molding casting allows to reuse form works as many as you can. Additionally, the casting time is short (30 min)
Green Garden Wall Module

The planter wall is composed of 4 modules with slightly different puzzle forms. The overall size of each module is 2'6" X 2'6" with holes of 6" diameter for planters.
Green Garden Wall Insulation

<table>
<thead>
<tr>
<th></th>
<th>Before Green Wall Installation</th>
<th>After Green Wall Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theoretical Heat Loss, Q (kWh/month)</td>
<td>505</td>
<td>151</td>
</tr>
<tr>
<td>Cost ($/month)</td>
<td>33</td>
<td>10</td>
</tr>
</tbody>
</table>

Main Assumptions:
1. Heat transfer rate changes only at the south wall (green wall).
2. The air temperature in and outside remains constant, and heat transfer is steady.
3. Mainly, heat transfers during the business hours (8am to 3pm).
4. Air hardly circulates, and it stakes in the nine holes of the green wall module.
The partition wall works like a screen, with felt pockets (Wooly Pockets®) covering alternate openings, each filled with succulent plants.
Partition Wall Detail
The shading device for the outdoor café can change its height and angle according to different sun angles throughout the day.
Electric Charge Point

Payment Method: RFID reader rented for customer
Credit card
Tax credit: 50% of the installation cost
Total Cost: 1000 USD
Conclusions
How do we relate?

Business, Environmental & Building groups

- Building and Environmental relationship
- Economic Analysis of projects
- Advertising potential
- Marketability
Difficulties and Successes

• Difficulties
  – Client interaction
  – Compiling group efforts

• Successes
  – Realistic business experience
  – End result:
    • Three subgroups learned to work as one team
Fall 2010 Recommendations

Business Subgroup

• Analyze survey results and marketing strategies
• Economic Analysis of future projects
• Host On Campus Presentation
• Website Review
• Organic “Competitors” (pros and cons)
• Delivery Options (breakfast/lunch)
• Text Messaging Alerts
Fall 2010 Recommendations

Environmental Subgroup

• Build Vertical Garden Partitions
• Install WVO system for company vehicle
• Investigate/Feasibility study of more efficient appliances/systems
• Home made energy efficiency upgrades/installs
Fall 2010 Recommendations

Building Subgroup

- Analyze roof solutions/structural conversion feasibility study
- Planning of additional spaces and code requirements for those changes
A Special Thanks To:

- Omar & Christian Solis (Owners of Nana)
- Professor Nancy Hamill
- IIT IPRO Staff