Sustainable Village

Phase One

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Sustainable Village
IPRO 301 Spring 2005

1. Objectives

The team working on this project has set itself three major objectives. Firstly it strives to create a comprehensive and in-depth database containing valuable information concerning sustainability. This database should be user-friendly and intuitively presented so people who are interested in sustainability are quickly educated with the key points and have easy access to relevant and high quality references and further readings.

The second objective of this project essentially consists of creating a roadmap and master plan on how to make Illinois Institute of Technology's (IIT) Main Campus sustainable. This will be done by auditing and then benchmarking IIT to other similar projects. This roadmap and master plan will be developed with the vision that once implemented IIT will be a leader in sustainability and encourage many others to follow our track.

Lastly the third objective is to create a house of the future. The house of the future has many objectives for itself. It should incorporate current design possibilities and make use of various available technologies to be sustainable and energy efficient among other things. This house should attract the public and educate them how easily sustainability can be achieved using current technology and knowledge at a competitive price.

2. Background

Sustainability is slowly becoming a buzzword for the current society as it is the key to the future. Currently the world is exploiting numerous natural resources and not replacing them for future generations. Further various available resources are not being used efficiently and countless opportunities to make efficient use of resources fail due to a lack of financial benefits and an active public support. Nonetheless various companies are eager to invest in sustainable design and become leaders.

IIT has set itself the goal of becoming sustainable and being a leader. In order for IIT to achieve this goal many aspects must be taken into account and analyzed. This project presents the initial stage of the project, or "Phase One". The purpose of Phase One is to get an overview of the situation, perform the necessary research and propose a master plan on how IIT can be made sustainable. After

this IPRO has been completed, the project will be handed over to a new group of students that will create a business plan based on the developed master plan. Phase One essentially creates the fundament for the whole project. The following phases then implement the proposed master plan in various stages over the coming years.

3. Research Methodology

Currently Phase One consists of two IPRO's working on two separate parts of the big project. This IPRO 301 will be working together with IPRO 304 which is concerned with creating a Hydrogen Fueling Station that will supply energy to the House of the Future and converting IIT's shuttle busses and other transportation vehicles on campus for use with their fueling station.

In order to tackle this project and the interdependencies with the other team four teams have been created that will interact with the according teams from the other IPRO.

Overall the team has been split into two big teams: The Sustainability Team and the House Team. Next to these two teams, various members have been placed into the Knowledge Team and the Website Team. A short summary of the visions and goals of each team are stated below:

Sustainability Team

The sustainable team is going to come up with a plan on how to make IIT a more sustainable campus. Sustainability does not necessarily mean to be completely self-sustaining, but a community that is environmentally friendly, and that uses renewable resources to the greatest extent possible while being economically affordable. There are many plans in progress at other universities toward sustainability. The vision and the purpose of the sustainability team is to research what has been tried, what will be tried, and other ways that have not even been tried yet to make IIT more sustainable and then to reevaluate and to see what will best suit IIT.

Alongside this vision of making IIT a sustainable society, the Sustainability team is going to implement specific ways in which IIT can improve its efficiency. One of the main things is power consumption. The job of the sustainability team will be to figure out the power consumption of this campus and to compare it to that of a comparable sustainable village. The team will also research ways to conserve power, such as installing motion sensors on lights, turning off heaters when not in use, researching new types of AC systems, etc… The team will also be looking into different types of renewable energy that the campus could take advantage of such as solar, wind, etc…

As a whole the Sustainability team will be looking at the essentials for life on this campus, such as water food and air, and how we get them, and if there is a cheaper, more efficient, and more environmentally safe way of moving them in. The water that comes into IIT is through the Chicago board of water supply, which comes from Michigan Lake. There is approximately 37 inches of rain a year in Chicago, and if it would be possible to take advantage of this rain, energy could be saved along with other resources for society as a whole.

A big part of this project will be looking at all of the major inputs and outputs into the campus as a whole. There are many areas that have not been mentioned in attaining sustainability such as economic sustainability that is not in the scope of this course. Economic sustainability is very essential though in reaching a sustainable society because if this resource runs out then as a business IIT will not be able to sustain itself. But this is an area that the team will not have control of and will be left as jobs of the administration. The Sustainability team will be focusing more on the aspects that would sustain the environment and the people around us.

One practical way that the Sustainability team is going to promote and start the movement toward sustainability in IIT is to promote and start a more efficient and better recycling program. Right now at IIT there are blue bins in certain places that recycle paper, but the Sustainability team is planning on starting a culture of recycling on this campus that will pave the way for IIT to become the first sustainable campus in the nation.

Obviously it is not practical for IIT to produce its own energy, food, water, etc… but the plan toward sustainability is much more than being a self sustaining society. The idea is not independence, but interdependence that leads to an environmentally safe program. The goals of the Sustainability team will be to provide IIT with a roadmap that will transform IIT into this sustainable village.

House Team

The goal of the house team is to provide details on, and to design a "house of the future". This house would be the benchmark for sustainability by being the standard for the future sustainable IIT buildings. It shall emphasize the fact that sustainability is an all around and integrated process. Furthermore, it shall serve as an attraction; also, it shall try to be a source of pride for IIT and a tool for recruiting financial aid for future sustainable projects. Moreover, this project should encompass the following segments:
Research: this includes discovering what is sustainability? What has being done in the past? What is possible in the future? Also, we shall try to catalogue our findings and possibly include the evaluation of financial costs and its effects on the feasibility of this project

Site selection: picking a future site for the "house of the future", this site would help maximize the efficiency of the sustainable resources required in the house.
Layout and rendering: a 3-dimensional view and or projection of the house to be used for marketing and feasible explanation tool for all interested.
Design: The house's design should integrate the following things; Lab space for testing effects of household products, adaptability of technology and connectivity with sustainability.

Knowledge Team

The purpose of the knowledge team is to catalogize all the information collected from all team members throughout the semester and periodically update the team with the information. There are many reasons why this team is important. First am foremost it is important that all team members can benefit from each others research. It also simplifies the process of creating a large and comprehensive database of issues that are related to and talk about sustainability.

Website Team

The website team has the function of designing and creating a website that presents all the information and findings from this project to the outside world. The website should not only make the database created by the knowledge team easily accessible but also to interact with the community and encourage sponsoring for this project.

4. Expected Results

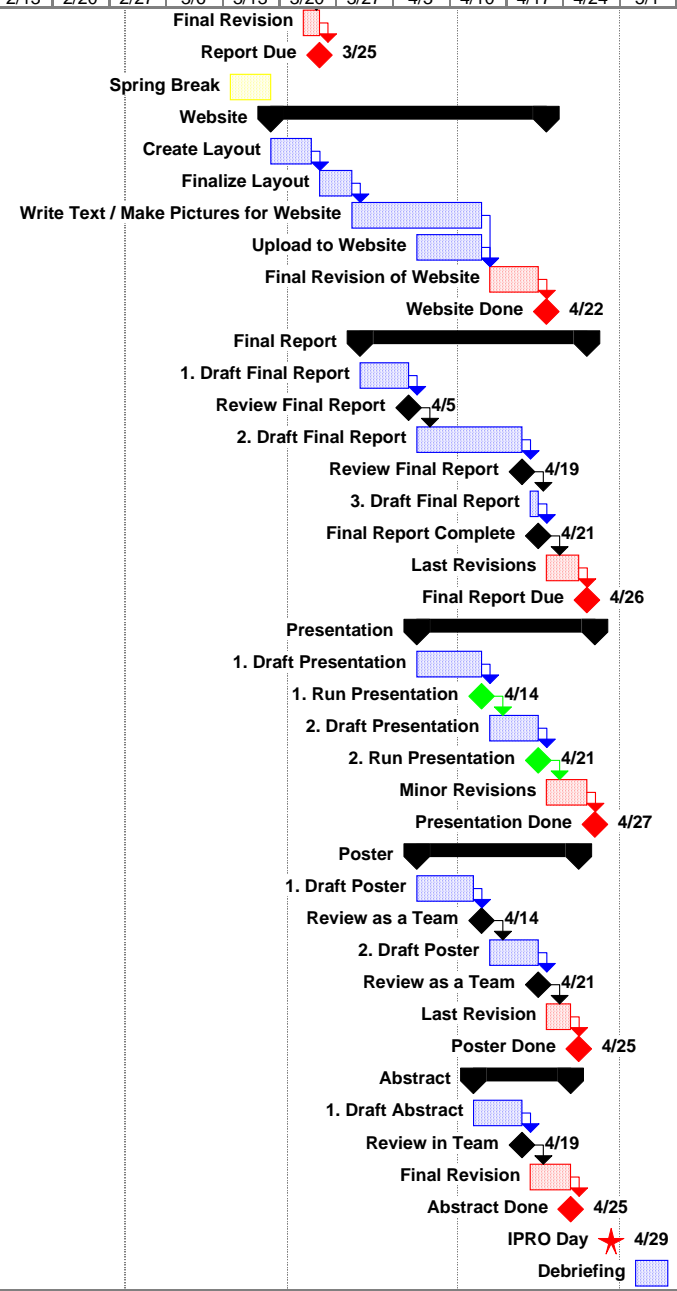At the end of the semester the team should have created the following results:

- Master Plan / Roadmap showing what needs to be done to make IIT sustainable
- Design for the House of the Future including drawings and a physical model
- Comprehensive and detailed database for sustainability
- Website to interact with the outside world

5. Schedule / Milestones

The following schedule with tasks has been created to show how the team will approach this project.

ID	ℹ	Task Name	Start	Finish
1		IPRO Briefing	Thu 1/27/05	Fri 1/28/05
2		**Project Outline**	**Fri 1/28/05**	**Fri 2/4/05**
3		Draft	Fri 1/28/05	Wed 2/2/05
4		Review	Thu 2/3/05	Fri 2/4/05
5		Proposal Due	Fri 2/4/05	Fri 2/4/05
6		**House of the Future Team**	**Fri 1/28/05**	**Tue 4/19/05**
7		Research House	Fri 1/28/05	Thu 2/17/05
8		Research Donors	Fri 1/28/05	Thu 2/17/05
9		Present Summary of Research	Thu 2/17/05	Fri 2/25/05
10		Decide Features	Fri 2/11/05	Tue 3/8/05
11		Location of House	Fri 2/11/05	Fri 2/18/05
12		Decide House layout	Fri 2/11/05	Mon 3/7/05
13		Check Safety Regulations	Fri 2/18/05	Mon 3/7/05
14		Present Proposal for House	Tue 3/8/05	Thu 3/17/05
15		Revise Proposal	Wed 3/9/05	Mon 3/21/05
16		Check Safety Regulations	Wed 3/9/05	Mon 3/21/05
17		Present Final Proposal	Tue 3/22/05	Tue 3/22/05
18		Create House in AutoCAD	Fri 2/25/05	Mon 4/18/05
19		Create Model of House	Wed 3/23/05	Mon 4/18/05
20		Create a rough Budget	Wed 3/23/05	Mon 4/18/05
21		Create Leaflet with Key Feature	Wed 3/30/05	Mon 4/11/05
22		House complete	Mon 4/18/05	Tue 4/19/05
23		**Sustainability Team**	**Fri 1/28/05**	**Tue 4/19/05**
24		Collect Data from IIT (Auditing)	Fri 1/28/05	Wed 2/23/05
25		Research Sustainability	Fri 1/28/05	Wed 2/23/05
26		Present Research	Thu 2/24/05	Thu 2/24/05
27		Continue Auditing	Fri 2/25/05	Wed 3/23/05
28		Recycling Program	Fri 2/25/05	Wed 3/23/05
29		Compare IIT <-> Others	Fri 2/25/05	Wed 3/23/05
30		Brainstorm areas of improveme	Fri 2/25/05	Wed 3/23/05
31		Present Improvements	Thu 3/24/05	Thu 3/24/05
32		Create a Roadmap	Fri 3/25/05	Mon 4/18/05
33		Create a leaflet with key feature	Fri 4/8/05	Wed 4/13/05
34		Roadmap complete	Tue 4/19/05	Tue 4/19/05
35		**Knowledge Team**	**Fri 1/28/05**	**Tue 4/26/05**
36		Collect Data / Links / …	Fri 1/28/05	Mon 4/25/05
37		Create final portfolio w/ all Know	Fri 4/22/05	Mon 4/25/05
38		Database complete	Mon 4/25/05	Tue 4/26/05
39		**Midterm Report**	**Wed 3/9/05**	**Fri 3/25/05**
40		Draft	Wed 3/9/05	Mon 3/21/05
41		Review Report	Tue 3/22/05	Tue 3/22/05

ID	ⓘ	Task Name	Start	Finish
42		Final Revision	Wed 3/23/05	Thu 3/24/05
43		Report Due	Fri 3/25/05	Fri 3/25/05
44		Spring Break	Mon 3/14/05	Sat 3/19/05
45		**Website**	**Sat 3/19/05**	**Fri 4/22/05**
46		Create Layout	Sat 3/19/05	Wed 3/23/05
47		Finalize Layout	Fri 3/25/05	Mon 3/28/05
48		Write Text / Make Pictures for W	Tue 3/29/05	Wed 4/13/05
49		Upload to Website	Wed 4/6/05	Wed 4/13/05
50		Final Revision of Website	Fri 4/15/05	Wed 4/20/05
51		Website Done	Fri 4/22/05	Fri 4/22/05
52		**Final Report**	**Wed 3/30/05**	**Tue 4/26/05**
53		1. Draft Final Report	Wed 3/30/05	Mon 4/4/05
54		Review Final Report	Tue 4/5/05	Tue 4/5/05
55		2. Draft Final Report	Wed 4/6/05	Mon 4/18/05
56		Review Final Report	Tue 4/19/05	Tue 4/19/05
57		3. Draft Final Report	Wed 4/20/05	Wed 4/20/05
58		Final Report Complete	Thu 4/21/05	Thu 4/21/05
59		Last Revisions	Fri 4/22/05	Mon 4/25/05
60		Final Report Due	Tue 4/26/05	Tue 4/26/05
61		**Presentation**	**Wed 4/6/05**	**Wed 4/27/05**
62		1. Draft Presentation	Wed 4/6/05	Wed 4/13/05
63		1. Run Presentation	Thu 4/14/05	Thu 4/14/05
64		2. Draft Presentation	Fri 4/15/05	Wed 4/20/05
65		2. Run Presentation	Thu 4/21/05	Thu 4/21/05
66		Minor Revisions	Fri 4/22/05	Tue 4/26/05
67		Presentation Done	Wed 4/27/05	Wed 4/27/05
68		**Poster**	**Wed 4/6/05**	**Mon 4/25/05**
69		1. Draft Poster	Wed 4/6/05	Wed 4/13/05
70		Review as a Team	Thu 4/14/05	Thu 4/14/05
71		2. Draft Poster	Thu 4/14/05	Wed 4/20/05
72		Review as a Team	Thu 4/21/05	Thu 4/21/05
73		Last Revision	Fri 4/22/05	Sun 4/24/05
74		Poster Done	Mon 4/25/05	Mon 4/25/05
75		**Abstract**	**Wed 4/13/05**	**Mon 4/25/05**
76		1. Draft Abstract	Wed 4/13/05	Mon 4/18/05
77		Review in Team	Tue 4/19/05	Tue 4/19/05
78		Final Revision	Wed 4/20/05	Sun 4/24/05
79		Abstract Done	Mon 4/25/05	Mon 4/25/05
80		IPRO Day	Fri 4/29/05	Fri 4/29/05
81		Debriefing	Mon 5/2/05	Fri 5/6/05

The following table summarizes important milestones in the project for the various teams:

Milestones	Due Date
House Team:	
Major Research Complete	2/17
Proposal House	3/8
Final Proposal	3/22
Drawings and Model Complete	4/18
Sustainable Team:	
Major Research Complete	2/24
Proposal Possible Changes to IIT	3/24
Master Plan / Roadmap Complete	4/19
Knowledge Team:	
Database Complete	4/25
Website Team:	
Website Complete	4/22
Reports:	
Progress Report	3/25
Final Report	4/26
Presentation	4/27
Poster	4/25
Abstract	4/25

6. Individual Assignments

The following list summarizes which individuals in the group have been assigned to which teams. Each team leader is in bold and the group leader is indicated by an asterisk.

Sustainability Team
Andrew Higashi
Jef Larson
Bezaleel Robinson
Tony Thomas
Joseph Clair

House Team
Evans Ogbebor
Anna Ninoyu
Michael Staats
Philip Golucki
Elena Savona

Knowledge Team
(*) Siddha Pimputkar
Jef Larson
Philip Golucki

Website Team
Philip Golucki
Bezaleel Robinson
Siddha Pimputkar

Technical Advisor Team
Joseph Clair
Elena Savona
Kris Kiszynski
Anand Sathyan
Riza Kizilel