Midterm Progress Report

IPRO 303 – Spring 2007

Intra-Plant Communication

Regarding Equipment Maintenance and Alerts

Revised Objectives

IPRO 303 begins its first semester as a project designed to enhance the operations of both coal-burning power plants and the Smart Signal© Corporation. When critical equipment fails, it sends a shockwave throughout an organization and into its supply chain. Smart Signal's EPI*Center software solution enables companies to fill the equipment performance gap between current operations and corporate objectives through early, actionable warning of any abnormal performance.

The overall project goal is to recommend a user interface scheme aimed at maximizing the usefulness of EPI center within the operations staff culture of the plants. This semester the team will research the decision making culture and information flow within these coal burning power plants as pertains to equipment maintenance.

The team's objectives this semester are:

- To locate coal burning power plants who are not currently customers of Smart Signal for interview.
- To interview employees of the power plants.
- The gathered information will then be distilled into a graphical representation and easily digestible report to be delivered to Smart Signal.
- The team will also prepare the data we acquire to be passed on to the IPRO which will follow next semester.

Note: These objectives have been adjusted since the project plan and the initial goal setting and structure meetings. The most notable of objective changes is in the scope of the project. The prior team objectives encompassed a much wider range of focus in the interview questions and thus the final report.

Previously the objectives had been to research and represent in a report:

- The general decisions involved in the overall maintenance of a power plant
- All potential sources of information used in any given plant decision process
- Understanding the impact of erroneous or “bad” information to all these decisions

However, now the focus is more dedicated to gaining an understanding the complex process of a planned maintenance outage in a plant.

This is being pursued by addressing the following specific objectives:

- Identify critical decisions involved in a planned maintenance outage and who makes them.
- Determine the steps taken before and during a planned outage; examine significant operations that occur after a planned outage is completed.
- Note the sources of information that influence these decisions and asses how this information is interpreted (i.e. what information is more critical/has a higher priority than other information).

These narrower and more specific objectives allow the team to set goals that are manageable and allows the simplification of the interview process. This will hopefully result in interviews that are more focused and data that is more pertinent.

Results to Date

The most important, (and initial) accomplishment of the team is the organization and structure operations. Initially, the group was assembled into teams and sub teams, only to be disassembled and reassembled into different teams shortly thereafter as goal were accomplished and the focuse was refined. As of current, the team has established a firmer organized structure. In addition, great strides have been taken to gain contacts with local (and nonlocal) power plants.

Key milestones include:

- Interview workshop attended and the information has been digested and applied to the interview script
- The Interview script has been written and edited with feedback from our sponsor SmartSignal
- Six different Coal power plants are willing to assist us with interviews and perhaps technical organizational documents.
- Local power plants have been visited/toured and a personal contact has been courted and established
- Translated script into Korean/Interviewed Korean plants
- Two different power plants in Korea have been contacted and then interviewed

- A list of 42 power plants across the nation are being called in a weekly rotation to acquire more subjects for interview
- The project progress has been presented to our sponsor (Smart Signal©) during a joint brainstorming feedback session
- A nondisclosure agreement was researched and written with specific consideration to the companies and type of industry we are working with

Current Project Activities

The group is divided into three different teams. Each team has specific activities.

Contact Team: Continuing to generate new contacts for interview. This team also had the responsibility of interview the Plant Manager as a first contact.

Interview Team: The interview team's job is to conduct the interviews. Once the contact team has made contact and conducted their interview of the plant manager, these contacts are handed off to the interview team. They are in charge of maintaining and organizing communication with the contacted plants to gain as many interviews as possible with consideration to time and availability. Currently the team is scheduling interviews as the contacts are passed to them from the contact team.

Data and Deliverables Team: The data and deliverables team is responsible taking the data from the interviews and putting into a format that is clear and usable in the final report. While the entire team will focus on preparing the final report once interviews are completed the data and deliverables team is setting the groundwork ahead of time. Currently the team is working at designing a matrix that all the interviews can be entered into. This will aid in comparisons between the interviews and the plants.

Current Data Results

After interviewing individual plant employees via phone calls, visiting local plants, and attending plant manger meetings, an understanding of the operations of a plant and the decisions made by individual managers thereof has been gained. The data gathered from our questionnaires have helped begin the development of a graphical representation of the decision making process.

Potential Products

The development of a software interface for power plants to identify sources of plant problems could be developed by next semester. In addition, a matrix of responsibilities and decisions that plant managers must perform and a flowchart of sources of information and the travel of this information can be developed and delivered in a viewable representation.

Current/Potential Outputs

After completing individual and group tasks, a phone interview script produced, as well as an in-person questionnaire. To assist the plant managers in providing our team with critical information, a nondisclosure agreement was produced to encourage comfort and trust during the interview. A team dedicated to collecting contact information has provided the group with a list of power plant contacts as well.

Deliverables

For this particular IPRO, the sponsor suggested deliverables, based upon the research done and data gathered, is to be a tangible representation of data flow and the process of decision making in a planned outage. This “tangible representation” will take the form of a digestible report and a data-flow diagram or physical chart that identifies sources of decisions in a planned outage and what information is used to make these decisions.

Current Results & Sponsor

Currently, the results gathered have been too general to adequately address the questions our sponsor has posed. The scope of our initial objectives was too general. This was addressed in a meeting with the sponsor. The decision was to then redefine the scope of the semester's project. Changing the scope from the entire plant maintenance to only planned outages has made it possible to ask more direct questions and avoid answers that are vague and too general to be useful.

Results & Solution Framework

After concluding the IPRO for the first semester, the results obtained throughout the course will be applied towards a final deliverable for our sponsor (a final report and a graphical representation of the decisions and information that goes in to the planning and execution of planned outage). The data in interviews and the final deliverables (report and graph) will be passed on next semester's team as then begin to make suggestions of a user interface to smart signal.

Revised Task / Even Schedule

The scope of our project has been narrowed after getting feedback from our sponsor, SmartSignal. We are now focusing in decision-making and data collections made for planned maintenance outages, in a coal-fired power plant. As a result, our interview questions have been changed to focus more on maintenance decision making. Also, our Korean interview team had to translate interview questions as well as results.

B,C,D are given in the table below.

Tasks and Sub Tasks	Start Date	Finish Date	Hours	Members	Skills Needed
Determine the questionnaire and target company	2/20/07	3/6/07	30	4	Contacts
Determine the method of interview and survey	2/27/07	3/6/07	10	2	Interview experience
Start Interview and Survey (Visit or phone)	3/1/07	4/11/07	10	8	Communication
Korean Interview Translation and Interpretation	3/1/07	4/11/07	20	3	Spoken and Written Korean
Mid-term Report	3/14/07	3/23/07	10	3	
Prepare Poster	4/11/07	4/20/07	5	4	Creativity
Interview result interpretation	3/21/07	4/11/07	20	11	Analysis
The One-Page Abstract	4/15/07	4/20/07	3	2	
The Final Oral Presentation	4/11/07	4/18/07	5	2	Communication
The Final Project Report	4/11/07	4/26/07	15	6	
Team Work Product & Team Minutes	4/20/07	4/25/07	4	1	
Comprehensive Deliverables CD	4/15/07	4/25/07	8	3	
IPRO Projects Day Conference	4/27/07	4/27/07	8	11	

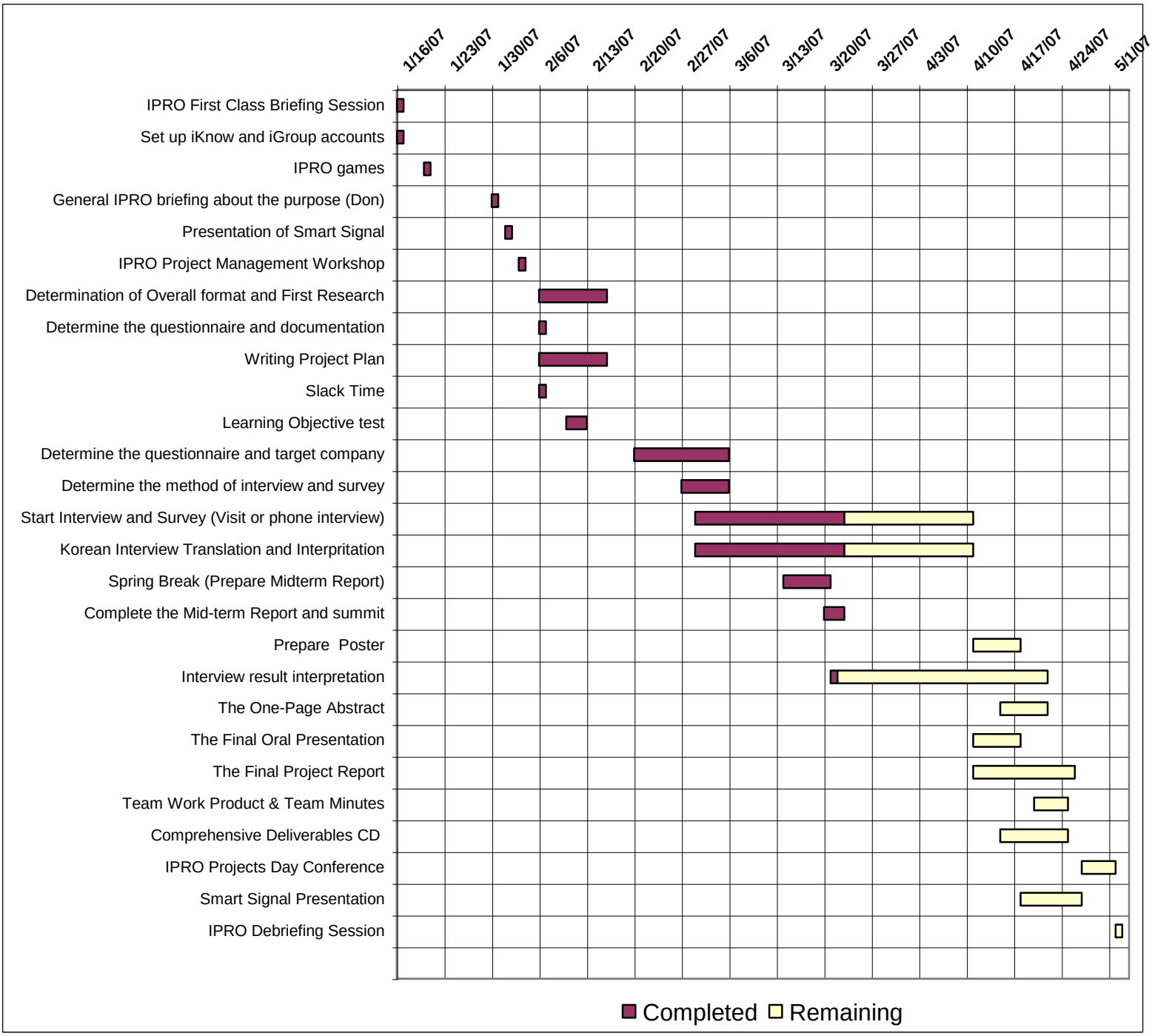
Smart Signal Presentation	4/20/07	4/27/07	1.25	4	Communication
IPRO Debriefing Session	5/2/07	5/2/07	1.25	11	

E. Also we had an unexpected contact with the power plant in Korea, which required translating questions and results. That has taken more interview people than expected. As a result, our interpretation of results will take more time and members.

F. Below is the list of completed tasks. The completed tasks and subtasks are foundation of our future deliverables. We had to meet with SmartSignal to understand our objectives fully. We had to determine how to achieve our objectives by breaking it down to tasks and assign individual people or teams. Determining the questionnaire and developing project plan was fundamental to our success in interviews.

- IPRO First Class Briefing Session
- Set up iKnow and iGroup accounts
- IPRO games
- General IPRO briefing about the purpose (Don)
- Presentation of Smart Signal
- IPRO Project Management Workshop
- Determination of Overall format and First Research
- Determine the questionnaire and documentation
- Writing Project Plan
- Learning Objective test

In addition attached on a next page is a Gantt chart of all tasks and/or subtasks completed and remaining.


1/16/07
1/23/07
1/30/07
2/6/07
2/13/07
2/20/07
2/27/07
3/6/07
3/13/07
3/20/07
3/27/07
4/3/07
4/10/07
4/17/07
4/24/07
5/1/07
IPRO First Class Briefing Session
Set up iKnow and iGroup accounts
IPRO games
General IPRO briefing about the purpose (Don)
Presentation of Smart Signal
IPRO Project Management Workshop
Determination of Overall format and First Research
Determine the questionnaire and documentation
Writing Project Plan
Slack Time
Learning Objective test
Determine the questionnaire and target company
Determine the method of interview and survey
Start Interview and Survey (Visit or phone interview)
Korean Interview Translation and Interpritation
Spring Break (Prepare Midterm Report)
Complete the Mid-term Report and summit
Prepare Poster
Interview result interpretation
The One-Page Abstract
The Final Oral Presentation
The Final Project Report
Team Work Product & Team Minutes
Comprehensive Deliverables CD
IPRO Projects Day Conference
Smart Signal Presentation
IPRO Debriefing Session
Completed
Remaining

Updated Task Assignments/Designation of Roles

Team Organization

As of now, IPRO 303 is organized in three distinct active teams: Contact Team, Interview Team and the Data and Deliverables Team.

Team Responsibilities

Contact Team: John Rhoda, Omair Rehman.

The responsibility of the contact team is Continuing to generate new contacts for interview. This team also had the responsibility of interview the Plant Manager as a first contact.

Interview Team: Kevin Tung, Kevin Lyles, Michael Hatch, Sarunas Palikevicius, Migun Choi, Taeho Hwang, and Chihwan Lee

The interview team's job is to conduct the interviews and record the data they receive. Once the contact team has made initial contact and conducted their interview of the plant manager, these contacts are handed off to the interview team. They are in charge of maintaining and organizing communication with the contacted plants to gain as many interviews as possible with consideration to time and availability.

International Interview sub-team: Migun Choi, Taeho Hwang and Chihwan Lee
This sub team handles all translations, interviews, and contacts with the power plants in Korea. They will also interface with the data and deliverables team to help interpret the data.

Data and Deliverables Team: Amanda Featherstone, Michael Hatch, and Sarunas Palikevicius (Michael Hatch and Sarunas Palikevicius are attached to this team to generate the mid-term report. They are the primary authors of the project plan and are familiar with the team's written goals and objectives. Once the mid-term report is finished they will join the interview team.)

The data and deliverables team is responsible taking the data from the interviews and putting into a format that is clear and usable in the final report. While the entire team will focus on preparing the final report once interviews are completed the data and deliverables team is setting the groundwork ahead of time. This team is also responsible for writing and submitting the mid-term report.

Member Roles

Each member of each separate team shares an equal responsibility for that specific team. Specifically, International Interview sub-team, each member must equally divide translating interview scripts and emails that have taken place back and forth; The Contact Team's members must equally divide the responsibilities of contacting a certain

number of power plant managers and hold phone interviews with said managers; the Data and Deliverables' team members have cooperated to do fair portions of the IPRO reports amongst and data analysis themselves.

Change in Structure

During the course of the semester the projects scope has narrowed in some areas, expanded in others and based on critical path planning the structure of the team has had to stay flexible to adapt to the changes in the project. These changes in team structure and roles have been made to respond to input given by our sponsor, our advising professors and the trial and error of our own experience. Entering into the last half of the semester these changes prepare us to maximize our output as times begins to become more of a factor.

Barriers and Obstacles

A major problems encountered during the course of this project are getting in contact with coal-fired power plants to interview. Most of the time plant managers are not present when we call. Leaving messages has not proven to be very effective either, since no-one calls back.

Currently the Interview Team is calling over 49 plants a week to try and acquire more inter contacts. We have determined that the best time to reach the plant managers are between the hours of 6 and 9 AM. The team has begun calling during those peak hours.

Another obstacle we have come up against is the language barrier between the Korean power plants and our team. However the International Interview sub-team has translated all the interview questions and recently finished translating two recent interviews. Since the structure of the plants in Korea are much different the International Interview team will help guide the interpretation of the data.