Title: System for pH Measurement in Incubators

Team Members: Mike Swift, Steve Huffacker, Sara Alford, Ryan Porter, Byoung Choe, Kristi Hinner, Laura Wing, Gabriel Martinez-Diaz, Carla Maas

Team leader: Mike Swift
Communications: Ryan Porter
BSAC Rep: Gabriel Martinez-Diaz
BWIG Rep: Sara Alford

Client: Dr. Theresa Duello
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Problem Statement: To develop a device that can constantly monitor the pH levels of the bathing medium for bovine embryos inside an incubator. This device cannot alter the incubator in any way. It must also be able to accurately measure the pH within tenths of a pH level.

Restatement of Team Goals: Our small groups are still making progress in accomplishing their goals. The stand group still needs to supply the specifics of the stand to the paper group. Mike and Kristi are planning on meeting and getting something ready for the paper group for Wednesday night. Byoung is also drawing a final sketch of the stand for the final paper. The probe group has obtained a working probe and transmitter are running tests and making sure that there is a connection to a laptop.

Summary of Accomplishments: This week the three goups worked independently on their respective projects.
Communication was maintained between the groups as needed. Each of the groups' accomplishments are as follows:
Stand Group: Kristi, Byoung, Steve, Mike
The stand group has been frantically trying to get the stand built and ready for Friday. All of the peices have finally been obtained and machined. Now we have to put the pieces together. Moral is high in getting it done by the presentation time. In the worst case, the majority of it will be done for the presentation and then it will be completed for Theresa right after finals which she

agreed would be fine.
Paper and Presentation Group: Laura, Carla, Sara
For the paper/presentation (these are kind of separate groups now)
Paper group:
On Friday, Laura and Carla worked in CAE to update the slides and paper according to comments from Nimmi. The group
attended a meeting with the client to discuss ethical issues w/ the bovine embryos. Dr. Duello told them that she has to file annual
reports to the RARC. Bovine embryos do not have the ethical issues that human embryos do. The treatment of the "parent"
cows is humane. The eggs are from slaughterhouse cows and the sperm is harvested from the bulls. No unnatural chemicals are
added to the embryos, so there is no chance of creating monster cows. The ethics info was updated in the paper. On Sunday,
the paper group met with Kristi for discussion on the stand section. Laura and Carla decided we need more info such as
organized notes from the stand group. This is difficult as changes are being made to the stand design. The paper group expect
some sort of written info from the stand group by Wednesday. The paper group will meet on Wednesday to add this info,
including sketches by Byoung to the paper. The group is communicating with Ryan and Gabi to keep our testing section of the
paper up to date (Ryan will email more info on his testing Wednesday). An abstract has been added to the paper.
Presentation group:
Gabi will cover design alternatives (excluding stand) and final design solution. Steve will cover the stand section of design
alternatives, Carla will cover intro, background, design components, Ryan will do a demo of the pH probe and receiver which
will input pH data into an excel spreadsheet (on a notebook PC?). Carla and Gabi met to organize the order of speakers and
who will cover which slides. A meeting for practicing and timing the presentation is scheduled for Thursday 7:30 at Health
Sciences. Carla is updating the slides as new information and sketches come in (waiting for skans of stand sketches). The stand
slides are not yet done. Slides are included with this email.
Ordering and Company Relating Group: Ryan and Gabi
This week the ordering group ordered and recieved a new probe because the other one was defective. They ran tests to make
sure that the probe and transmitter worked. They also met with Nimmi in order to work out details about how they are going to
demonstrate the testing of the probe during the presentation. Finally, the worked on hooking up the RS232 cable to a laptop in
order to interface the probe with a computer.

Statement of Team Goals: Do well on presentation and be done.

Project Schedule:
Week Date Design Activities
1 1/31 Meet with client
2 2/2 - 2/9 Gather research
3 2/9 - 2/16 Gather more research and ask client questions
4 2/16 - 2/23 Come up with ideas for design and write outline
5 2/23 - 3/2 Complete the Report and Slides for the Presentation
6 3/2 - 3/9 Meet with the client and discuss our design ideas
7 3/9 - 3/23 Break into small groups to begin final design
8 3/23 - 3/30 Meet with client, form list of needed items and break into small groups for the building phase
9 3/30 - 4/6 Design stand, begin writing paper, talk to companies about ordering parts
10 4/6 - 4/13 Independent group work on the progress of the design
11 4/13 - 4/20 Independent group work on progress of design as it nears the point of presentation
12 4/20 - 4/27 More Independent group work.
13 4/27 - 5/4 More Independent group work.

Difficulties: not altering the incubator, not damaging the embryo or the bathing medium, not affecting the pH or
temperature of the bathing medium while taking measurements

Activities: Each group had progress this week as indicated above.

Time Spent on Project Outside of Class (this does not include time spent in class which is noted on Friday)

If there are hours I missed I will include them in next week's report.

This Week (in hours)

Mike 23, 1 for meeting with Nimmi about stand, 1 for progress report, 3 for design ideas to make the *#@% stand
work, 18 for building the @#%& stand

Gabriel 14, 4 for presentation and paper help, 6 for meeting with client summary for paper group, 3 for product
testing, and 1 for advisor meeting.

Sara 8, working on paper

Steve 33, 5 for planning for diagrams and measurements, and 28 for building

Byoung 10, helping build stand and drawing sketches and diarams for final presentation

Ryan 10, running tests of pH probe, meeting with Nimmi, client meetings and ordering

Kristi 8, helping with construction of the stand, meeting with paper group, and two from last week that were missed
(meeting with Nimmi and design sketching).

Laura 10, 8.5 for paper writing, 1.5 for meeting with paper group, and .5 for client meeting

Carla 6.5, 2 for slide and paper updates, 1.5 for meeting with Gabi, 2 for meeting with Kristi, and 1 for checking
slides

Total Hours
Mike 71.5
Ryan 34.5
Sara 41.5
Steve 80.5
Byoung 23
Gabriel 52
Kristi 29.5
Laura 42.5
Carla 30.2