**Integrated Engineering Meeting Report**

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| **Meeting Date: 19/11/2018** |
| **Name: Chakradhar Koppula** |
| **Team number: 11** |
| **Specialist Team: CS/EEE** |

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| **Meeting Purpose: Cultural Context** |

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| **Updates and next steps from each specialist team** | |
| **Specialist Teams updates** | **Note/Action/Next Steps** |
| **CEGE/ME**  Their task is to design a power plant to provide power for the vaccine plant.  Location of vaccine plant has been decided. The location chosen was left of Mbarara in a place called Ibanda.  The area was chosen as it has a low population density.  **BE/CE/BME**  In the past week their focus has been largely based on the calculations required to get the bioreactor to work as intended and needed.  Calculations worked out include working out how to maintain the mixing and control in the bioreactor; required concentrations; required costs; required dimensions and optimum ratio and diameter of the impeller.  They have also planned how to optimize the heating in the bioreactor, planned experiments to be done later in the week and planned how to scale up the process.  Each vaccine costs $0.66 and each person needs 2 shots to be immunised. The target reach is 90% of the population.  **EEE/CS**  Have created a block diagram for the overall systems control and have also decided on four subsystems that we will delegate to small groups within the CS/EEE team.  They are: Heating control, Stirring control, pH control and the User Interface to allow for easy use by other teams.  Have also drawn basic circuit diagrams for the subsystems and have written psudeocode for each subsystem. | In the upcoming week they plan on deciding on and confirming the location of the hydroplant.  They will then work out how the plant will work and will design the hydroplant.  In the upcoming week they will start their lab sessions and will begin to try out, test and refine the porccess of creating the vaccine which is done by using yeast to create protein which is then used in the vaccine.  In the upcoming week we plan to begin implementing our desings using circuit components and a microcontroller.  We will also begin to write the code that will control the subsystems and maintain them within a certain resolution.  Need to communicate with the BE/CE/BME team to find out what the required temperature, pH and stirring speed will likely be so that we can start testing as soon as possible under what will likely be the realistic conditions of use. |

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| **Discussion topics - Summary** | **Actions/Decisions for Uganda TB Vaccine Project** |
| Not many medical staff on site, there is only 1 doctor trained in western medicine per 22,000 people in the area meaning that distributing the vaccine could be an issue. Also means exposure to western medicine is greatly reduced so need to find a way to make the locals feel comfortable and accepting of the vaccines.  Some proportion of people are anti-vaxination and will refuse to take the vaccine due to misinformation in the 90s leading to a 31% decline in people getting vaccinated.  Very traditional view on medicine in which traditional healers are looked upto by the community and provide an interface between the population and national healthcare.  Large population growth occurring currently in which the population more than doubled in size in the span of about 12 years. Although no further data provided it can expected that this trend will continue to some degree so there may be an issue of supply in terms of getting enough vaccination to the area should the population take to them well.  Relocation of local people due to construction of power plants as well as the loss of agricultural land and wildlife. | Start up a volunteer programme in which people can sign up to be trained to administer vaccinations as in terms of medical skill it is fairly trivial. Set up vaccination camps/stations in the more densly populated areas to begin with in an effort to provide some herd immunity.  Try to include education programmes in schools to change views on vaccination and start up ad campaigns such as banner ads. Another solution is the use the same tactics used on ciggerate packaginig in which strong imagery of affected individuals are shown to make locals feel the need for the vaccine.  Try to reach out to and educat the healers first and try to help them to understand the gravitas of the situation. They can then relay this information to the population who look upto them. Same thing can be done with leaders or influencial people in the community.  Use data from the country such as birth rates and death rates to find out how many people used the vaccine in the current year and extrapolate the data to accomadate for the population growth. This allows us to estimste the amount of extra vaccine needed one year compared to the last.  Provide compensation to farmers for the land that they loose. Help in the process of relocating those that have had to move and find a place to build the power plant that is in a relatively unpopulated area with minimal environmental impact. |