

Re: NCCS-SMU FYP Weekly Update Sep 28 2019**Wong Fuh Yong (SingHealth - ONCO) <wong.fuh.yong@singhealth.com.sg>**

Sun 9/29/2019 10:56 PM

To: Justin CHOY Yu Min <justin.choy.2017@sis.smu.edu.sg>; Fong Mun Yee (NCCS) <fong.mun.yee@nccs.com.sg>**Cc:** Gan Soon Ann (NCCS) <trdgsa@nccs.com.sg>; GUO Lingxing <lxguo.2017@sis.smu.edu.sg>; CHUA Ming Yu <mingyu.chua.2017@sis.smu.edu.sg>; Tanny LAI <tanny.lai.2017@sis.smu.edu.sg>; TAN Jia Yun <jiajun.tan.2017@sis.smu.edu.sg>; Jesslyn CHANG <jesslync.2017@sis.smu.edu.sg>

I am ok with no commitment officially for the writing of a manuscript. Will take it out then.

regards

fuhyong

From: Justin CHOY Yu Min <justin.choy.2017@sis.smu.edu.sg>**Sent:** Sunday, September 29, 2019 10:47:39 PM**To:** Wong Fuh Yong (SingHealth - ONCO); Fong Mun Yee (NCCS)**Cc:** Gan Soon Ann (NCCS); GUO Lingxing; CHUA Ming Yu; Tanny LAI; TAN Jia Yun; Jesslyn CHANG**Subject:** RE: NCCS-SMU FYP Weekly Update Sep 28 2019

Hello Dr Wong,

I believe publishing an article shouldn't be too much of a problem, especially if it is just involving our team (students) since we will be documenting the process anyway. I just wanted to let you know this module is more focused on project management and application development than it is on the research methodology – from the feedback of seniors. I will let you know if we need to make any changes. As of now, we are waiting for the response from the project coordinator on the ordering of signing before/after proposal acceptance etc. Just wanted to know NCCS's stand to be ready to answer the prof in case he raises concern over this point.

Regards,

Justin

From: Wong Fuh Yong (SingHealth - ONCO) <wong.fuh.yong@singhealth.com.sg>**Sent:** Sunday, September 29, 2019 9:58 PM**To:** Justin CHOY Yu Min <justin.choy.2017@sis.smu.edu.sg>; Fong Mun Yee (NCCS) <fong.mun.yee@nccs.com.sg>**Cc:** Gan Soon Ann (NCCS) <trdgsa@nccs.com.sg>; GUO Lingxing <lxguo.2017@sis.smu.edu.sg>; CHUA Ming Yu <mingyu.chua.2017@sis.smu.edu.sg>; Tanny LAI <tanny.lai.2017@sis.smu.edu.sg>; TAN Jia Yun <jiajun.tan.2017@sis.smu.edu.sg>; Jesslyn CHANG <jesslync.2017@sis.smu.edu.sg>**Subject:** Re: NCCS-SMU FYP Weekly Update Sep 28 2019

Hi,

I am not sure if we are thinking of the same thing here. To clarify, what I meant was to publish an article in a peer review journal.

Such as these:

<https://doi.org/10.1177/1077558711399580>

Or

J Biomed Inform. 2019 Sep;97:103256. doi: 10.1016/j.jbi.2019.103256. Epub 2019 Jul 24.

Readmission prediction using deep learning on electronic health records.

If it is too much work, I am happy to leave it out just so that we can get started. Nonetheless, we would appreciate a brief writeup on the technical aspects of the machine learning and the results. This will be helpful to us when we write up this project eventually.

Hope it isn't too much of a bother.

regards

fuhyong

From: Justin CHOY Yu Min <justin.choy.2017@sis.smu.edu.sg>**Sent:** Sunday, September 29, 2019 8:48:02 PM**To:** Wong Fuh Yong (SingHealth - ONCO); Fong Mun Yee (NCCS)**Cc:** Gan Soon Ann (NCCS); GUO Lingxing; CHUA Ming Yu; Tanny LAI; TAN Jia Yun; Jesslyn CHANG**Subject:** RE: NCCS-SMU FYP Weekly Update Sep 28 2019

Good evening Dr Wong,

On closer inspection of the third deliverable of the RCA, "Manuscript to be published in peer reviewed journals with co-authorship from both NCCS and SMU", I would need to get your clarification on the level that is required in terms of Academic peer reviewing. I mention this mainly because I wanted to keep you aware that the school currently does two separate forms of this "FYP" module. This screenshot is from the school's wiki page specifying the module requirements.

[https://wiki.smu.edu.sg/ISProjectExperience/Course information#Roles and Responsibilities](https://wiki.smu.edu.sg/ISProjectExperience/Course%20information#Roles%20and%20Responsibilities)

IS Project Experience Options

Student must work on a project that is aligned to the declared track (1st Major or 2nd Major).

• Student may choose to complete an IS Application Project or an IS Research Project.

IS Application Project IS483	IS Research Project IS482
Requirements + Scoping + Design and Development (POC) + Testing (System and User Testing)	Research + Data Collection + Solution approach + solution implementation + report
Implemented POC (Demo of the implementation is need)	Implementation (Demo of the implementation is need)
	Student with GPA >3.4

The first is what we intend to do with NCCS, which is the application project IS483. As you can see from the above deliverables and requirements, it is very much more geared towards developing a working application and testing it with the sponsor (NCCS). This is our primary focus that we demonstrated to you through our paper prototypes in the first meeting.

The second however, is a research based project, which is not the module we are applying to take.

Through our project, we will definitely be documenting the different models we use and each of their performances etc. However, I am rather sure that IS483 does not entail a research level report with peer reviews. In view of this, I need to check if NCCS really requires the Academic aspect as one of the deliverables of the project, as the project coordinators of IS483 might feel that this aspect of the deliverables is not very aligned to the module.

I hope to better understand NCCS stand on this deliverable and if need be, work and agreement out.

Regards,
Justin Choy

From: Justin CHOY Yu Min

Sent: Saturday, September 28, 2019 11:15 PM

To: 'Wong Fuh Yong (SingHealth - ONCO)' <wong.fuh.yong@singhealth.com.sg>; 'Fong Mun Yee (NCCS)' <fong.mun.yee@nccs.com.sg>

Cc: 'Gan Soon Ann (NCCS)' <trdgsa@nccs.com.sg>; GUO Lingxing <lxguo.2017@sis.smu.edu.sg>; CHUA Ming Yu <mingyu.chua.2017@sis.smu.edu.sg>; Tanny LAI <tanny.lai.2017@sis.smu.edu.sg>; TAN Jia Yun <jiayun.tan.2017@sis.smu.edu.sg>; Jesslyn CHANG <jesslync.2017@sis.smu.edu.sg>

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Also, we are still working on clarifying **the fine print** with our professors, so if NCCS has a clear and detailed point on this matter it would help us clear this with the school faster. The pointers that I have mentioned in the long detailed email were the **general responses given to us** when we consulted the professors in person. We are **following up with an email** to them to **get their formal confirmation in email to ensure that we have proof of the terms that the school's relevant parties are agreeable to**. We will push to get this out along with RCA ASAP, next week.

Justin

From: Justin CHOY Yu Min

Sent: Saturday, September 28, 2019 11:09 PM

To: 'Wong Fuh Yong (SingHealth - ONCO)' <wong.fuh.yong@singhealth.com.sg>; Fong Mun Yee (NCCS) <fong.mun.yee@nccs.com.sg>

Cc: Gan Soon Ann (NCCS) <trdgsa@nccs.com.sg>; GUO Lingxing <lxguo.2017@sis.smu.edu.sg>; CHUA Ming Yu <mingyu.chua.2017@sis.smu.edu.sg>; Tanny LAI <tanny.lai.2017@sis.smu.edu.sg>; TAN Jia Yun <jiayun.tan.2017@sis.smu.edu.sg>; Jesslyn CHANG <jesslync.2017@sis.smu.edu.sg>

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Hello Dr Wong,

On the matter of agreements, the professors mentioned that it would primarily be between us (Students alone) and NCCS. However, they also strongly expressed that it would be much better if the data could be used only for the grading of our work and destroyed thereafter. In that case, the professors involved would need to sign on the agreement too. But gleaning from the points given by the track coordinator, I strongly believe it will not require an agreement at the level of SMU management. If it only includes us and the instructor, for each module, would that be workable? That would be the best arrangement for us academically, as well as to get the most accurate feedback and tap on the experience of our professors.

Regards,
Justin Choy

From: Wong Fuh Yong (SingHealth - ONCO) <wong.fuh.yong@singhealth.com.sg>

Sent: Saturday, September 28, 2019 7:18 PM

To: Justin CHOY Yu Min <justin.choy.2017@sis.smu.edu.sg>; Fong Mun Yee (NCCS) <fong.mun.yee@nccs.com.sg>

Cc: Gan Soon Ann (NCCS) <trdgsa@nccs.com.sg>; GUO Lingxing <lxguo.2017@sis.smu.edu.sg>; CHUA Ming Yu <mingyu.chua.2017@sis.smu.edu.sg>; Tanny LAI <tanny.lai.2017@sis.smu.edu.sg>; TAN Jia Yun <jiayun.tan.2017@sis.smu.edu.sg>; Jesslyn CHANG <jesslync.2017@sis.smu.edu.sg>

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Thanks for the very detailed updates Justin. I have forwarded it to our lawyers for their feedback as to the easiest and most expedient way forward. We can certainly look into reducing the numbers of features to be used for model building. Because we are only looking at breast

cancer, the complexities would be magnitudes lower.

Can I understand if I read you correctly that SMU only require that the agreements be signed between you and your team and our institution? That would actually minimize the rounds of reviews usually needed before we even get it signed.

Will let you know what our side says.

Thanks for helping us.

Regards,
Fuhyong

On 28 Sep 2019, at 4:49 PM, Justin CHOY Yu Min <justin.choy.2017@sis.smu.edu.sg> wrote:

<imagec08d66.GIF>

<EXTMSG>

Also, we have done some research and narrowed down on some findings.
I have attached the research in a word document if you are interested to review the current progress of our modelling.

Regards,
Justin

From: Justin CHOY Yu Min

Sent: Saturday, September 28, 2019 4:41 PM

To: Wong Fuh Yong (SingHealth - ONCO) <wong.fuh.yong@singhealth.com.sg>

Cc: Gan Soon Ann (NCCS) <trdgsa@nccs.com.sg>; GUO Lingxing <lxguo.2017@sis.smu.edu.sg>; CHUA Ming Yu <mingyu.chua.2017@sis.smu.edu.sg>; Tanny LAI <tanny.lai.2017@sis.smu.edu.sg>; TAN Jia Yun <jiayun.tan.2017@sis.smu.edu.sg>; Jesslyn CHANG <jesslync.2017@sis.smu.edu.sg>

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Hello Dr Wong,

Here is our Team's weekly Summary for the project.

Overview:

Over the past week, we were privileged to have a meeting with NCCS's management to present our paper prototypes and discuss the handling of data and other administrative tasks in order to get the project going (Monday 23 Sep 2019). In view of NCCS's strong support, we have pushed to acquire the approval of all the relevant professors and school departments to accept this project for our FYP. In this process, we have also consulted another professor teaching us Machine Learning (Prof. Wang Zhaoxia <https://sis.smu.edu.sg/master-it-business/academic-experience/faculty-staff/adjunct/wang-zhaoxia>) to get her advice on using certain prediction models. After consulting her, we found her feedback extremely valuable and proposed to NCCS to use our machine learning module as a practice runway to build the prototype of the cost prediction model with the guidance from Professor Wang Zhaoxia. We presented this intention to NCCS and received their support on this as well. In view of this, NCCS brought this up to their compliance department and a RCA (research collaboration agreement) will be drafted out in the coming week to ensure that all parties that need to use the data for research/grading will agree to its terms and conditions. Looking into next week, the two current priorities are 1. Completing RCA, 2. Starting to clean and filter data to allow the building of cost prediction models.

Contextual Timeline Overview to better understand the School Situation:

<image002.jpg>

Admin Matters:

1. RCA:

- Our Machine Learning Professor Wang Zhaoxia is keen to sign the RCA and work with us on this project over the course of our Machine Learning Module.
- The FYP Track Coordinator stated that they normally do not get involved in signing of NDA, and it is normally just between students and Sponsor. Furthermore, they will only get involved in any of these processes after they have accepted the project. This means that we might need to draft either NDA or resubmit another RCA upon project Acceptance for FYP. We will do our best to minimize the paper work for NCCS where this is concerned.
- We will push to get this done by next week

2. Intellectual Property Rights:

- As far as the FYP Track Coordinator's experience goes, the FYP like any other module is a course for students to learn and the school does not hold Intellectual property rights over the outputs of the project. We are in the midst of getting a black and white response from them as confirmation of this point. If this holds true, there is no legal action required for NCCS to take the product for its own use and expansion after completion.

3. Code Ownership:

- Similar to intellectual property, the Track Coordinator has mentioned that the school does not hold ownership of the code. Their only interaction with the code is in the grading process.

4. Data Usage:

- Both the Machine Learning Professor and FYP Track Coordinator has mentioned that they can do without the data and grade us based on what we present; i.e. the data never leave's our machines. However, both of them expressed that it would definitely be better for us if they had reference to the data in the grading of our projects. The Machine Learning Professor is in full agreement to the terms of RCA i.e. destruction of data after its use for grading. In a similar fashion, I suspect that the FYP Track coordinator should be in agreement as well.

In general, there are two main things happening here, FYP module and Machine Learning Module. As both happen in their own time frames, they might require their own set of administrative processes to be adhered to. We will try to condense all these requirements to minimize the paper work as much as possible, but we would need to know if you have any limitations on any of the considerations I have mentioned above. If there are, I will do my best to work something out.

Risk Analysis & Management (in order of priority):

Priority	Risk Item	Risk Level (low/med/high)	Mitigative Action
1	There are many features in the data set. Based on "curse of dimensionality" a lot of patient data is required to build models that predict based on many features, in the order of $10^{\text{number of features}}$. We need to filter out some features.	High	As this will greatly impact model accuracy and require NCCS to give us more patient data, we are arranging to meet NCCS's domain experts to go through the data features and narrow down on the most important ones to start building our model
2	The School must deem the project feasible and the deliverables must be realistic and enriching to the student's learning in order for them to approve the project. The Track Coordinator stressed that the value must be in the students learning, over building a commercially deployable product.	Medium	This risk is moderate because we need to make sure that the prediction model is at least reasonable and helps to address the problem statement by the time we hit the stage of project proposal. Also, we need to work with NCCS and the school on specific deliverables that are acceptable for both parties to ensure the acceptance of our project proposal for FYP.
3	We might need to sign an NDA on top of the RCA depending on school requirements	low	From the Track Coordinator's experience, projects that handle sensitive data, usually have to get NDA settled upon project acceptance. We are not sure if RCA is enough to already cover the need for NDA but we will check.

Thank you so much for your tenacious support thus far. We are honored to have this opportunity with you.

Regards,
Justin Choy & Team
<Literature Review Research.docx>



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