

TR2202

**NATIONAL UNIVERSITY OF SINGAPORE**

**TR2202 – TECHNOLOGICAL INNOVATION**

(Semester 2 : AY 2003-04)

Time Allowed: 2 Hours

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**INSTRUCTIONS TO CANDIDATES**

1. This examination paper contains **TWO (2) Questions**. You must answer **ALL THE QUESTIONS**.
2. You will be rewarded for writing answers that are thoughtful, creative and concise.
3. The total score for this examination is 100 marks. Please pay attention to the number of marks awarded for each question in deciding how much time to spend on it.
4. This is an open book examination. Students are allowed to bring in any books and any amount of notes. Students were told beforehand to bring in copies of the case studies discussed during the semester.

## QUESTION 1: (40 Marks)

*Instructions for this question: Refer to the Harvard Case Study on “Abgenix and the XenoMouse”, which you brought into the examination hall. You should apply frameworks and concepts taught in TR2202 to analyze and present your response.*

“Both Ray Withy, Chief Business Officer, and Geoff Davis, Chief Scientific Officer, had been “on the road” a great deal presenting the clinical data telling the ABX-EGF story to prospective partners...”

One fine day, Ray and Geoff came knocking on the door of your Venture Capital firm, “Super Molecule Venture Capital”, that specializes in such biotechnology investments. They had hoped that they could convince your firm to invest some money in their ABX-EGF development program or at the very least, hear your words of wisdom in their strategies for entering the EGF market.

Imagine that you are the Managing Partner of “Super Molecule Venture Capital”, and that you are aware that they have been speaking with Pharmacol and Biopart as potential partners.

- 1.1 Before deciding to invest in Abgenix, what factors would you consider and why?  
Consider factors external and internal to Abgenix 10 marks
  
- 1.2 At that point in time, Abgenix faced three options for entering the EGF market as presented on page 11 of the case.
  - 1.2.1 Which of these options is the most risky? Which is the least risky? Explain your answer clearly. 10 marks
  - 1.2.2 What recommendations do you have for Abgenix in their strategies for entering the EGF market? 10 marks
  
- 1.3 After listening to your advice, one Abgenix manager quipped:  
“We will be a world-class organization that innovates our products and services continually, because we will be hiring the most creative people, empowering them and granting them autonomy. Everything else will take care of itself!”  
Do you agree with his viewpoint? If you agree, provide supporting evidence. If you disagree, provide an alternative viewpoint. 10 marks

--- END OF QUESTION 1 ---

**Question 2: (60 Marks)**

After listening to the talk by Walter Lee from Starhub, a team of fictitious<sup>1</sup> students was inspired to do something. You happened to listen in to their conversation.

- Andrew: Let's start a business together. I have an idea. Starhub is trying to connect mobile phones to computer networks using wireless Local Area Networks (LANS). We can try to do the opposite.
- Eugene: What do you mean? Disconnect the Starhub phones? (everyone laughs)
- Andrew: No, I mean we should try to connect computers to mobile phone networks. Think about it. Right now, if you have a notebook computer, you can only gain internet access if you are close enough to a wireless LAN access point, such as the NUSNET Winzone or at Changi Airport. In fact, you have to be within 300 feet from an access point to connect<sup>2</sup>. Why not put an entire mobile phone INSIDE the computer? That enhances your computer so that you can gain internet access from wherever there is mobile phone coverage. You can even use your computer as a mobile phone.
- Boo Han: I see... a two-in-one device! No messy telephone wires or network cables. With a mobile phone built into your computer, you don't need to carry a mobile phone around anymore. Cool! Let's call it a **Phoneputer**.
- Minyi: It would be too slow for browsing the web. Mobile phone networks are much slower at transferring data than wireless LANs. Besides, the technology for mobile phones is already patented by companies like Samsung and Nokia.
- Boo Han: Maybe we can use 3G, like NTT Docomo. It is pretty fast. And maybe we can tie up with companies like Nokia or NTT for mobile phone technology.
- Doreen: Why would people bother to use this? NUSNET is free of charge, and if they have a wireless LAN at home it is also free. I also heard that places like restaurants are starting to offer free wireless connectivity. So why would they use a Phoneputer, for which they would have to pay a company like Starhub for each minute it is connected?
- Surya: In that case, make it free of charge. In exchange for free connectivity, the owner must allow us to run programs on his or her Phoneputer while it is not being used. Many people leave their computers turned on but idle. We can combine the idle computing power of these Phoneputers and then sell it to companies that need a lot of computing power, such as weather forecasting. I heard that companies like Kazaa are using this approach; they aggregate the idle computing power of end-user machines running their file-sharing software, and resell it to corporate customers.
- Anshul: Interesting! But it sounds like a lot of computer programming is needed. We certainly don't have enough manpower amongst ourselves to do it. Hmm... we should make it an open-source project like Linux, and share the source code with anyone else interested. That way, we can get programmers from elsewhere to help us out.

**Question:**

- 2.1 Use the Teece 2x2 matrix discussed in class to analyze this team's Intellectual Property and Complementary Asset Position. Propose what the team should do. 20 marks
- 2.2 Describe exactly how networks and standards play a role here. 10 marks
- 2.3 Should this team use an open-source software development approach? 10 marks
- 2.4 After discussing their idea further, the team decides to contact Walter Lee to see if he is interested to collaborate. Walter picks up his Starhub™ phone and replies:  
"I am in a meeting right now. Please send me a short email (no more than a page) saying what you want from Starhub, what we can gain from it, and what your team want to achieve. Also include one or two questions you would like me to answer."  
Please draft this email message. 20 marks

- END OF PAPER -

<sup>1</sup> Any resemblance to actual persons, living or dead is purely coincidental.

<sup>2</sup> Wireless LANs have a maximum range of 300 feet from an access point. They have high transfer speeds of up to 11 Megabits per second (<http://www.intel.com/business/bss/infrastructure/wireless/solutions/technology.htm>)