Island Medical Clinic

Business Proposal

For:

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Island Medical Clinic

Prepared By:

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IS101 G7

Island Medical Clinic: Business Process

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                  ┌─────────────┐
                  │   Patient   │
                  └─────────────┘
                         │
                         ▼
                    ◇ Registration ◇ ──────► ┌──────────┐
                         │                    │  Repeat  │
            ┌────────────┴──────────┐         │ Medicine │
            ▼                       ▼         └──────────┘
      ┌──────────┐          ┌──────────┐           │
      │   New    │          │  Repeat  │           │
      │ Patient  │          │ Patient  │           │
      └──────────┘          └──────────┘           │
            │                      │               │
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    ┌──────────────┐         ┌──────────┐          │
    │   Medical    │◄────    │  Queue   │          │
    │    Leave     │         └──────────┘          │
    └──────────────┘              │                │
    ┌──────────────┐              ▼                │
    │   Medical    │◄─── ┌──────────────┐          │
    │  Procedure   │     │   Doctor's   │          │
    └──────────────┘     │ Consultation │          │
    ┌──────────────┐     │ Examination  │          │
    │  Specialist  │◄─── └──────────────┘          │
    │   Referral   │            │                  │
    └──────────────┘            ▼                  │
    ┌──────────────┐     ┌──────────────┐          │
    │    X-Ray     │◄─── │ Prescription │          │
    └──────────────┘     └──────────────┘          │
    ┌──────────────┐            │                  │
    │  Laboratory  │◄─── ┌──────────────┐◄─────────┘
    │     Test     │     │   Dispense   │
    └──────────────┘     │   Medicine   │
                         └──────────────┘
                                │
                         ┌──────────────┐
                         │   Payment    │
                         │   Receipt    │
                         │   Invoice    │
                         └──────────────┘
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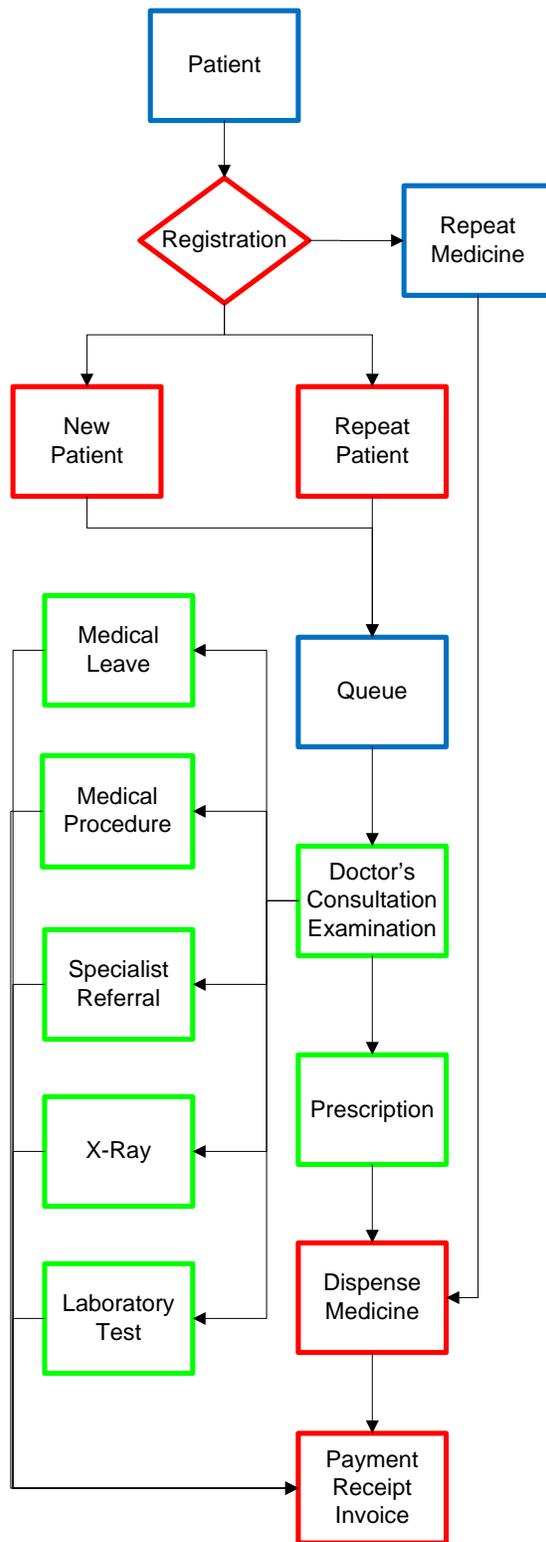
(A)   Company Overview

Island Medical Clinic is a private medical practice owned and run by general practitioner Dr Liu Hao Ming. It offers consultation and a wide range of medical services for patients, including minor surgery, Electrocardiograph (ECG), Nebulisation.

As the manager and doctor of the clinic, the success and failure of this practice depends on the performance and business decisions of Dr Liu. Dr Liu's responsibilities include conforming to the latest guidelines as directed by the Ministry of Health, and providing excellent medical care to the patients. Dr Liu also handles the management of the drug inventory

2 clinic assistants are responsible for the administrative processes, from the moment the patient enters the clinic till the patient pays and leaves the clinic.

(B1)   Business Processes: Clinic Assistant

I shall describe the key business processes of the clinic assistant. Processes outlined in red involve information systems. Blue represents normal processes not involving information systems, while green represents processes specific to doctor's medical skills.

1.1   When the patient enters the clinic, the clinic assistant determines whether the patient is new or repeat by checking the IC number with the clinic's database. A new patient's details are taken and recorded in the database.

1.2   The patient then joins the queue, and is informed by the clinic assistant when the doctor is ready to see them. The clinic assistant may be required to assist the doctor in minor surgery and procedures.

1.3   After the patient is reviewed by the doctor, the prescription is passed to the clinic assistant. The clinic assistant then dispenses the corresponding medicine, double checking with the doctor before issuing the medicine to the patient.

1.4   Finally, a receipt or an invoice is given to the patient, depending on the patient's mode of payment. All of these processes are recorded in the clinic's database.

(B2)   Competitive Advantage/Disadvantage

Advantages

The clinic assistant assists with medical procedures such as helping facilitate the ECG readings and assistance in minor surgery. This contributes to the quality of medical aid the doctor provides (as compared to the doctor without a helping hand). Very few clinics/polyclinics offer such procedures as they do not invest in the equipment (ie. ECG machine etc...).

Advantages (IT)

One advantage of the automation can be seen at the "Dispense Medicine" step. Here, the clinic assistant receives the prescription from the doctor, and keys in the medicine to be issued to the patient into the system. After which, the clinic assistant confirms with the doctor once again before issuing the medication. This acts as a double check to confirm the correct medication is given.

The clinic assistant is very tech savvy. As shown in the prior part, virtually all the processes the clinic assistant participates in involve an information system. Simply put, the clinic assistant enters all patient details into the database using the clinic's in-house application[1]. On top of that, the doctor writes all the patient details manually on the patient card.

Firstly, this gives the clinic an advantage versus other clinics/polyclinics as all the patient data is backed up on 2 mediums (manual and computer).

Secondly, the clinic is able to sort and find data using technology, much more efficient than manually doing so. It is crucial for clinics to be able to do this, especially in the event of a drug recall. For example, the recent recall of Epogen and Procrit by Amgen on 24th September 2010[2]. The clinic should be equipped to find out and list patients whom were issued with the particular drug so appropriate actions can be administered quickly and effectively.

Thirdly, the in-house application can be customized as and when necessary (eg. to add or remove new drugs, to add more medical processes etc…), without depending on an external party.

Disadvantages

However, therein lays the disadvantage of utilizing technology. Firstly, a lot of time is needed to train the staff to use the system. This is especially difficult for older staff who do not pick up technology as quickly and easily as younger tech savvy generation. Moreover, older staff are preferable, as younger tend to job hop more, meaning more time has to be dedicated to train new staff. Referring

Moreover, there is the problem of entering in wrong information. Staff must ensure that information entered is correct. Besides avoiding data entry mistakes, they must be careful to avoid other forms of data mistakes. For example, staff may accidentally create an extra receipt. As a result, there is a blank receipt created and the total number of receipts tallied at the end of the month does not add up. This causes a problem when the doctor does the accounting.

This is a technical problem. All receipts have a serial number attached to it. It is troublesome to investigate and trace the blank receipt (eg. s/n 63) and void it.

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[1] The application was created in 2005 by Dr Liu Hao Ming and myself, using File Maker Pro 8
[2] http://www.fda.gov/Safety/Recalls/ucm227202.htm

Automated Billing System Information Systems

Patient

Consultation — $

Laboratory Test — $

X-Ray — $

Medical Procedures — $

Specialist Referral — $

Prescription

$

Dispense Medicine

| Medicine | Dosage | Amount of medicine |

| | | Amount of medicine |

$

Payment Scheme

Patient → Receipt

Insurance → Invoice

(B3 & B4)   **Elaboration of business process**

The process I have selected from B1 to elaborate on is Payment: Receipt & Invoice.

The diagram on the left shows the overall processes in the clinic, with emphasis on processes outlined in red (where an information system is involved), and its link relation to the final billing/payment. Once again, blue represents normal/manual processes, while green represents processes specific to the doctor's medical expertise.

Right at the start, the "$" amount is outlined in red, as consultation is a fixed price set by MOH, and the system automatically captures this when the patient sees the doctor. Since the price of other medical procedures vary, they are outlined in blue as they have to be manually entered.

When medicine is dispensed, the type of medicine, dosage and amount are all input into the system, and a subtotal is automatically summed up. The total amount is calculated by adding the consultation fee, and any other medical procedures from earlier.

Finally, at payment, the system checks the payment scheme (on a healthcare scheme or not) of the patient by referring to the patient registry (these details were input when the patient registered). From there, the clinic assistant knows whether to issue the patient a receipt for cash payment, or issue an invoice to bill the company (or healthcare scheme) the patient claims insurance from. The clinic assistant will follow up on a regular basis until the invoice has been paid.
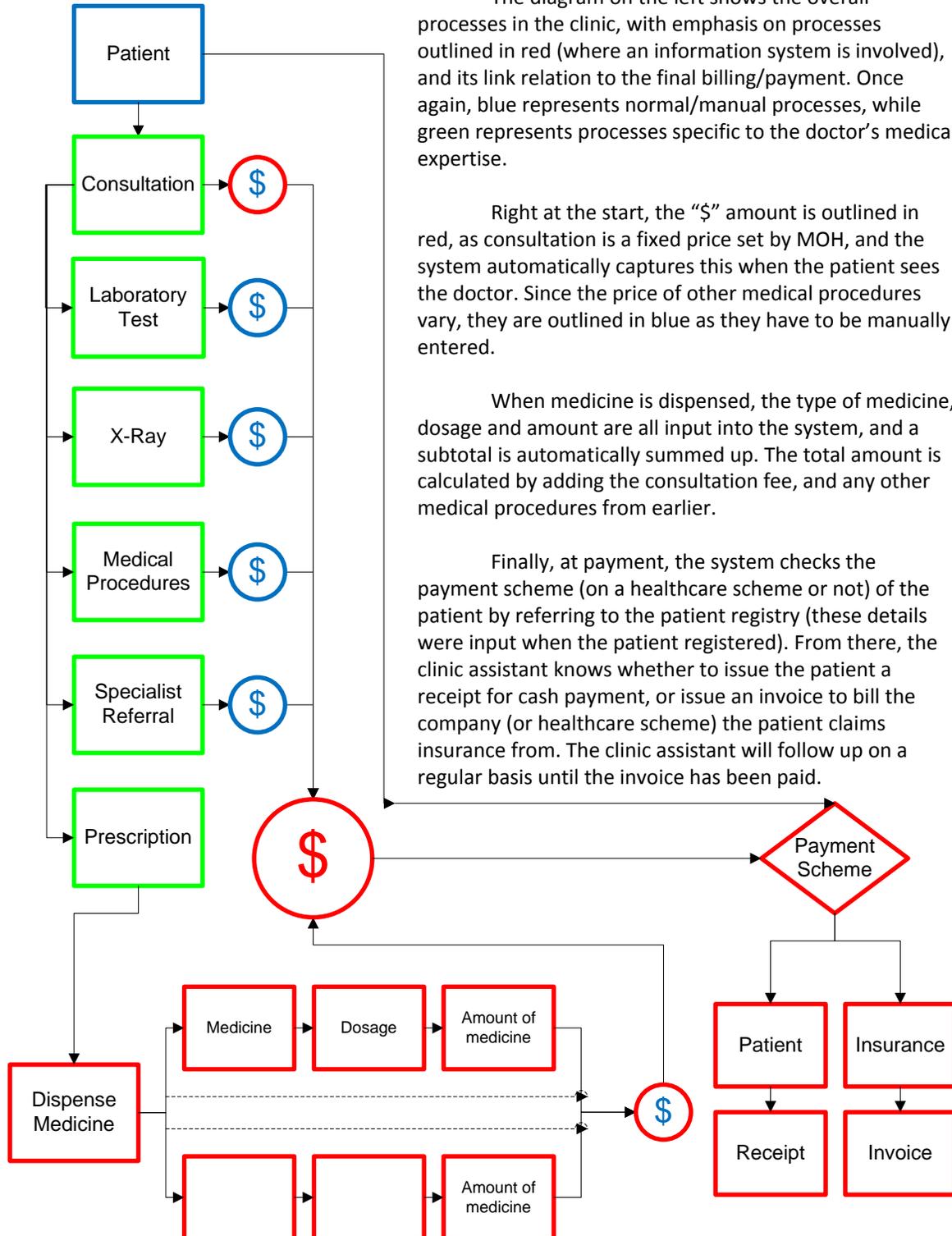
(C1)   Forces of Change

<u>Overview of Situation</u>

   In line with Singapore's Intelligent Nation 2015 (iN2015) master plan, infocomm will link hospitals, clinics, nursing homes and laboratories with patient homes, enabling healthcare professionals to access comprehensive patient information instantly.[3]

   On April 2004, the Ministry of Health (MOH) initiated the start of the link up of the sharing of medical records across the public hospitals.[4] As of 2007, the 2 public healthcare clusters – Singapore Health Services and National Healthcare Group, were fully integrated with the Electronic Medical Record Exchange (EMRX), facilitating the secure health information exchange between the different hospitals.[5] Plans are being made to extend this sharing platform to the private sector (hospitals and GP clinics).[6]

   The force of change is a combination of technology innovation (emphasis on infocomm industry) and government regulation (implementation of shared data across healthcare industry). This basically means that eventually, all healthcare businesses will have to be interconnected, as directed by the government.

<u>Impact on Organization and Job Role</u>

   Given that the government hospitals were running EMRX by 2007, and it is now 2010, it is a matter of time before the private sector will have to follow suit. This will affect many clinics, especially those that have not automated, and are still running on the paper/manual system. They will be faced with a change and will take time to assimilate the new technology/processes required.

   In order to be prepared for this change, my company will first have to establish network connectivity with EMRX. It will also have to ensure that the data EMRX requires is already captured by the current system. If not, the system will have to be customized to include any missing fields. If this is not possible, we may have to seek outside professional software providers, which may prove costly.

   Secondly, it will imply that all future medical staff will have to be proficient in Information Technology (IT) skills as all hospitals and clinics get computerized. This impacts my job role as I will have to know how to be able to upload the relevant information onto the EMRX on top of my existing job roles. This will be troublesome for older staff who may not be tech savvy, as they will have to be trained to use the new application effectively.

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[3] http://en.wikipedia.org/wiki/Intelligent_Nation_2015
[4] http://www.moh.gov.sg/mohcorp/pressreleases.aspx?id=1366
[5] http://www.thecommonwealth.org/files/178362/FileName/Singapore%20Survey.pdf
[6] http://www.sma.org.sg/sma_news/3605/commentary_glg.pdf

(C2)   Proposal

In order to respond to this imminent regulatory change, the major issue will be ensuring that our system will be able to capture the data required by the EMRX. Below are 2 proposals addressing the issue for your perusal.

	Proposal 1 (continue with in-house)	**Proposal 2** (switch to outsource)
Description	Modify current system to capture all the fields and format of data EMRX uses	Contact Singhealth's EMRX vendor (iSoft) Transfer database to iSoft EMRX application
Benefits	Full control of system Simple to modify Not reliant on external support	Definite compatibility with EMRX Complies with government standards Professionally designed system (robust) External vendor to take care of system
Risks	May not be compatible with EMRX Software customization constraint, may not keep up with future EMRX possible changes	Over dependency on vendor Initial inefficiency as staff are not used to new system
Timeline	**7 weeks** 1st : study required data field changes as directed by MOH[7] 2nd - 4th : implementation and testing 5th - 6th : trial 7th : system fully functional	**9 weeks + 4 weeks** 1st : initiate contact with vendor 2nd - 3rd : vendor study company business 4th – 5th : vendor customizes software 6th – 7th : implementing/testing 6th – 9th : 4 weeks expected time for staff to get used to application starting in week 6 4 weeks : transfer records from original application to iSoft application
Cost and Resources	**Free** (capital) Time invested to test modifications	**Expensive** (capital) Cost of data logging/transfer to iSoft Ongoing costs (maintenance contract, version upgrades etc…)

Firstly, the proposal (whichever is chosen) should be implemented as soon as possible to ensure that teething problems can be weeded out. This will allow the company to comfortably transition when the government extends the EMRX requirement to all hospitals and clinics.

While Proposal 2 guarantees compatibility and meets the standards, it is not as feasible due to the high capital required, which is not a justifiable cost for our small company.

I recommend going for Proposal 1 for several reasons. First, our in-house application has been working fine since it was implemented in 2005. Second, we will retain the ability to modify our application as and when needed (eg. new drugs or drug recalls). Next, our staff will not have trouble adapting to the "new" additions as they are used to the interface of the current set up. Also, there will not be any exorbitant costs incurred, as it will continue to be handled in-house. Finally, we can always revert to Proposal 2, or adopt solutions other clinics use (with minimal losses) should Proposal 1 fail.

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[7] http://www.moh.gov.sg/mohcorp/uploadedFiles/News/Press_Releases/2004/EMRb_Flyer_Eng03path.pdf