

Hong Kong Institute of Vocational Education (Tsing Yi)
Department of Information Technology
HD in SE
ITP4915M System Development Project
(2019/2020)

Case Study
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Please refer to the least version (if any) on Moodle

1 Introduction

The purpose of this Case Study is to provide students with material regarding a business-oriented project in ITP4915M System Development Project of the full-time Higher Diploma courses in Software Engineering.

2 Student role

You are the one of the software developers of a medium-size software consulting firm in Hong Kong. The firm aims to provide tailor-made software development services to the clients. A software development project of management system for retail shop is assigned to your team.

3 Supervisor role

Students are divided into groups. Each group of students has a supervisor who monitors the ongoing project work.

The role of the supervisors in classes is two-fold. Firstly, the supervisors monitor the progress of students against the student groups' plans by means of weekly progress meetings. Secondly, they are to help students by offering advice and suggestions. There is no model answer to the project; students will not be told what to do but to find out themselves what and how to do. They will, however, be guided so that they remain

within the given terms of reference to enable them to follow reasonable or practical methods of solution.

Supervisors will, in addition to their supervisory role, also give technical advice. During class contact hours, supervisors will, to some extent, “wear two hats”. Supervisors will be expected to give opinions or suggestions to students. It is up to the students to decide which opinions, if any are most useful to them. When offering suggestions, supervisors must bear in mind that only the staff member playing the respective case study role can give approval to the proposed solution, which is specifically the responsibility of that role.

4 Assessment

There is a business-oriented project in the ITP4915M System Development Project. The assessment of the project is continuous, with weighting of 7:3 in favour of the individual contribution (i.e. 70% for individual marks and 30% for group marks).

Each student will be assessed in the following four components, plus presentation of their work in progress and supervisor-student meetings.

The four components for individual assessment in the business-oriented project are:

- a feasibility study report and a system development proposal (after investigation and requirements elicitation) – Requirements Specification;
- an analysis report, an architectural and database design and an implementation plan (after initial design) – Initial Design Specification;
- a software product and
- a technical documentation (after development).

Normally, there are 4 students in a project group. Each student member of a group acts as the coordinator for one of the four components and its associated submission of work. However, each group member will be individually assessed in every component.

The group marks for a project is derived from the final product which is comprised of a software product, a full set of technical documentation and oral presentations. The

assessment factors and mark allocations are detailed in Teaching Plan. The breakdown of the individual and group marks will be distributed to students in due course.

5 Project Work Structure

The business-oriented project work is a group exercise which lasts for around 20 weeks. However, for assessment purposes and formal progress monitoring, of both group and individual, it is divided into four major stages that are:

- Stage One: Feasibility study and a System Development Proposal;
- Stage Two: System analysis and System design;
- Stage Three: First Prototype
- Stage Four: Second Prototype and Technical Documentation.

The deliverable(s) of each stage are as below:

<i>Stage</i>	<i>Deliverable(s)</i>
One	Requirements Specification
Two	Design Specification
Three	A software prototype
Four	A software product and a technical documentation

6 Project Details

The account manager had already interviewed difference staff of the client company in January and consolidated the record of the meeting. The software developer team should analyze the record and have their professional judgment when there is any contradiction in the record. The interviewees are very busy and very hard to meet them again, but they agree to provide further information and clarification if necessary.

6.1 Record of user interview

6.1.1 Managing Director

Hong Kong Cube Shop Limited (HKCS) is one of the largest chain cube shops started in Hong Kong since 2007. There are currently 5 stores in different locations, one in Causeway Bay, two in Mong Kok, one in Kwai Fong and one in Shatin. The number of showcases in stores varies from 32 to 120, and the size of each showcase is now fixed at 35cm x 35cm x 35cm, but HKCS is planning to launch some special sized showcases later this year. The charge for different showcases depends on its position and the location of store. Discount is also given to tenants according to the prepaid rental period, which is currently 5% and 15% off if the tenant prepaid 6 and 12 months respectively. Tenants can rent more than one showcase; extra 5% discount is given to every three showcases (which can be allocated in different stores) and the maximum extra discount is 10%.

The company policy is to keep showcases occupied especially for new shop. Currently, HKCS put advertisement boards in available showcase. Besides, HKCS also put some private label products in the showcase. In order to increase the competitiveness, more valued added services will be launched, such as putting product photos on internet and allowing tenants to check their sales status through the internet.

HKCS is planning to expand the business in Hong Kong and Shanghai next year, as the business becomes larger and therefore HKCS needs to computerize the management system.

The expected launch date for the system is mid-July. The budget is HKD800,000 including hardware purchasing for the business in Hong Kong and software development.

6.1.2 Information Technology Officer

Currently, a single server is installed in the head office. It provides basic file-sharing and internal mail services. There are 20 computers in the head office and mainly for word processing and email use. Each shop also has at least one computer for the staff in the shop to communicate with head office by email. Head office and shops subscribed internet service and can be used after the launch of this project. At present, the tenant, showcase, sales and other information are kept in the EXCEL spreadsheets and Word documents stored in the file server.

Regarding to the proposed system, a new server should be purchased for the installation of database server, web server (if any) and application server (if any). The company owns enough Visual Studio licenses for this system development. The development team also trained to use C#. Therefore, the new system should be developed in the programming language C#. To increase the system security, each staff including full-time and part-time should have their own login account.

6.1.3 Operation Manager

Cube Shop¹ is a new sales model developed in Japan and become more and more popular in Hong Kong since 2006. A Cube Shop is designed to store dozens or even hundreds of cube-shaped showcases for consignment of goods, the size of each cube is about 35cm x 35cm x 35cm, and the cost of renting each showcase is about \$400 to \$1000 Hong Kong Dollars, depending on the position of the showcase. Cube Shop may employ one to two staff responsible the sales of items in all showcases, therefore in addition to the rent charge; Cube Shop usually charge 5% to 10% commission. Since the operating cost is shared by all showcase tenants, the cost of starting the business is much lower than owning a shop. This also attracts young entrepreneurs selling firsthand or secondhand toys, DIY jewelry, boutique, watches, cosmetics ...etc in Cube Shop.

¹ 格仔店/格仔鋪 in Chinese and レンタルショーケース (Rental Showcase) in Japanese.

Reference (by Wikipedia) URLs:

<http://zh.wikipedia.org/wiki/%E6%A0%BC%E4%BB%94%E5%BA%97> (in Chinese)

<http://ja.wikipedia.org/wiki/%E3%83%AC%E3%83%B3%E3%82%BF%E3%83%AB%E3%82%B7%E3%83%A7%E3%83%BC%E3%82%B1%E3%83%BC%E3%82%B9> (in Japanese)

As the competition between Cube Shops increases, a lot of Cube Shops provide value added services, such as special sized showcases, special offers for valued tenants, allowing tenants to check selling status online...etc. In order to support such services and minimize the number of empty showcases, a complete showcase management system is needed.

The opening hours of stores are different and are about 8 to 10 hours a day. Each store has at least one full time staff that is monthly paid. Their salary is different depending on the store, experience and commission. There is 10 to 15 part-time staff and they may be assigned to different stores from time to time. Their roster is in general assigned every two weeks, but it is also possible to have special assignments to handle emergency needs. Since part-time staff is hourly paid, their working hours must be clearly recorded.

After the Minimum Wage Ordinance effected on 1 May 2011, the cost for hiring shop staff increased. The rent of the shop also increased. Instead of increasing the rent of the showcases, with the help of the new computer system, the tenant stock-in procedure has to be simplified. At present, the shop staff has to record all stock-in items one by one to the computer. It takes time. Also, an online platform of the proposed system allows tenant pre-input all stock-in items by themselves before they bring the goods to the shop. The shop staff only needs to confirm these stock-in items. Tenant can import by a text file instead of inputting from the online system if technically feasible.

The accounting clerk in head office prepares statement showing the rent and sales information of each showcase every calendar month end.

6.1.4 Human Resources Manager

Each store has at least one full time staff that is monthly paid. Their salary is different depending on the store, experience and commission. The salary, commission rate and other human resources information are private and confidential. There is 10 to 15 part-time staff and they may be assigned to

different stores from time to time. Their roster is in general assigned every two weeks, but it is also possible to have special assignments to handle emergency needs. Since part-time staff is hourly paid, their working hours must be clearly recorded.

The fixed pay for full time staff can be easily calculated at the end of each month. Cheques are ready on first working day of each month. However, cheques to part time staff and commission to both full time and part time staff of last month can only be ready on 4th – 6th of the each month. Shop managers have to submit the attendance record of part time staff and sales record of the month at the last day of the calendar month. Human Resources Department received many complaints about the pay date. Therefore, they would like to shorten the calculation time with the help of the new computer system.

6.1.5 Shop manager (Kwai Fong)

A showcase can only be registered in the same shop. The staff will suggest the best showcase to a tenant according to tenant requirements. If there is no showcase available, the shop staff can reserve the earliest available one to the tenant. Each tenant can rent more than one showcase and discount will be given according to the number of showcases rented and the rental period. Tenants have to pay the total rental fee before the rental period commences

Within the rental period, the tenant can put tenant goods in the showcase anytime. All goods put in showcase must be recorded by the shop staff. A new item number is given to new goods. For old goods, the shop staff will update the quantity of items in the showcase.

When a customer buys items in a store, the shop staff has to record the item information, such as quantity sold and the price. A copy of the receipt will be printed and given to customer. The customer should check the items carefully before payment and if any failed items are found, the shop staff will write it down

and inform the tenant to replace if necessary. Income after deducting the commission will be given to tenant in the end of the calendar month and part of the commission will be given to the responsible shop staff.

6.1.6 Shop manager (Mong Kok No. 1)

Similar information was received from manager of Mongkok No. 1 shop. As the shop is relatively small, the occupancy of the showcase is very high. When the showcase is “Full House”, the shop staff may help tenant to register the showcase(s) in other shop by calling the staff of other shop. It is very time consuming and only be available to “key clients”.

The shop in Mongkok are usually packed with customer. Mistakes are unavoidable because of the complicated tenant stock-in and item sales procedure.

6.1.7 Customer Service Manager

The Customer Service department received following comments, complaints and suggestions frequently and hopes the new computer system can help to improve these situations:

- Tenant requests to register at any store and also online.
- Tenant can have the same goods put in different stores, and he/she must be able to check the sales records among different stores (i.e. the sales record should associate the item with the store id, but not necessary showcase id).
- Tenant also suggests receiving SMS or email for their daily sales.
- Currently, the tenant received the monthly statement showing sales record and rent advice per showcase. Tenant suggested receiving consolidated statement instead.
- The tenant complains it was time-consuming for stocking in their product as the shop staff had to input each item on by one to the computer.
- Tenant also suggests the customer could buy directly from online system and pick up the item at the shop.

6.1.8 Sales Manager

The sales department is responsible for the sales of the private label items and advertisements business for unoccupied showcase in all shops. Although the showcase rental is our major business, the sale of the private label is still essential. It not only occupies the empty showcase(s) to increase the occupation rate, but also attracts more customers visiting the shop.

In the shop operation point of view, the showcase selling private label item is just a “special tenant”. However, the sales department is responsible for input the stock-in record. The shop staff receives the same rate of the commission for selling the private label items.

For the tenant of advertisement showcase, it is another “special tenant” which does not have any items for sales. The minimum rent period is 3 months. The rent is variant and decided by the sales department from time to time. The advertiser should contact the sales department instead of the shop.

The account manager requested HKCS to provide some samples of the reports and records which provides separately. Due to the privacy policy of the company, the Human Resources Department refuses to provide the sample form of attendance sheet, staff pay advice, etc.

6.2 Deliverables

6.2.1 Requirements Specification Report

The report should clearly identify the problem of the current system. The user requirements and project schedule for the proposed system are also expected. In addition, an initial design for functional and structural model is required.

6.2.2 Design Specification Reports

After considering the comments and suggestions from the user, the user requirements should be confirmed. The Design Specification Report is required to submit to the Management in mid-April.

6.2.3 Software (the management system)

The software should be conformed to the user requirements. The software package includes the executables, source code, database scripts and related applications. In addition, an installation guide should be provided.

6.2.4 Testing Plan

Test case should cover all aspects of the proposed system and should be executed before the release of the software.

6.2.5 Technical Documentation and User Guide

Technical documentation includes the architectural, structural and behavioral design of the system. This information is essential for maintenance in the future. The user guide provides clear steps and procedures to a specific task for administrator and/or end user.