COMP4 Coursework

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Contents

Chapter 1

Analysis

1.1 Introduction

1.1.1 Client Identification

My client is Josh Campbell, he is 24 years old. He uses computers regularly for deisgn work, so has experience of computer systems. He uses his computer to design flyers, handouts, banners and visual graphics for projection, as well as surfing the web, email and various social media networks.He rarely uses hard copies other than to preview hes work before sending it off to print. Josh uses a 2012 Mac Pro with the latest version of Apple's operating system, OS X (10.9).

Josh is the head of the media department for Cambridge Community Church. This involves being responcible for the large amount of Audio and Visual equipment used on the churches Sunday services. This currently invloves spreadsheet with limited info on each item.

Josh would like to have a database management system to be able to hold information about each item and their various attributes. He would likke this database to be lovated on the churches central server so that it can be accessed by all staff if it it deemed necessary. He would use this database to store location, value and insurance details incase of damage or theft.he would like all of the information kept as a virtual copy as well as a hard copy to kept as a visual backup in case of harddrive failure or corruption.

He would also like to keep the location of each item as up to date as possible and if the location changes, he would like to be notified by email when it is entered/updated in the system.

1.1.2 Define the current system

The current system consists of multiple excel spreed sheets. There is one spread sheet for each of three locations; main office, main church building, and storage. Each spreedsheet consists of items located there as well as information on the value of each item, the quantity and the total value for the items with multiple entries. Each spreedsheet is divided up into equipment type (i.e Cableing, lighting, audio, visual/camera's)

1.1.3 Describe the problems

There are a number of problems with the current system. One of the problems is that there is no notification system to tell you when information is getting outdated or something is changed. For example, if an item is bought or sold, the total costings for that item will be updated and no-one will be notified. Another problem is that the current system doesn't show the PAT testings for all the items, these tests go out of date every 6 months and there is no way of being notified when a new PAT test is needed on an item.

1.1.4 Section appendix

1.2 Investigation

1.2.1 The current system

Data sources and destinations

In the current system, there are multiple data sources. The client and his colleagues as well as members of the AV crew for the church can enter data into the spreadsheet by using a computer in the office and accessing the on the server.

Algorithms

In the current system, there are only a few algorithms in place.

Algorithm 1, When new item is bought:

```
IF Item = NewItem DO
        Enter Item into Spreadsheet
    ELIF Item = ItemMatch Do
        Update Item Quantity
```

Algorithm 2, When an item is sold or replaced:

```
IF Item = Sold OR Item = Damaged or Item = Stolen DO
    Update Quantity
    IF Item = Stolen OR Item = Damaged DO
        Claim Insurance
```

Data flow diagrams

Figure 1.1: Flow Diagram Key.

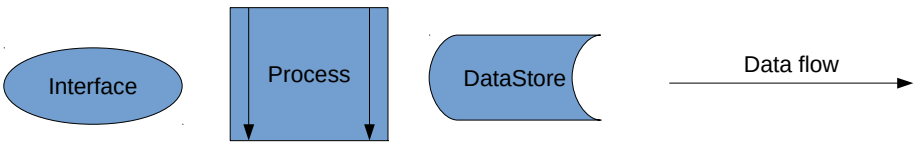


Figure 1.2: Entering a new item.

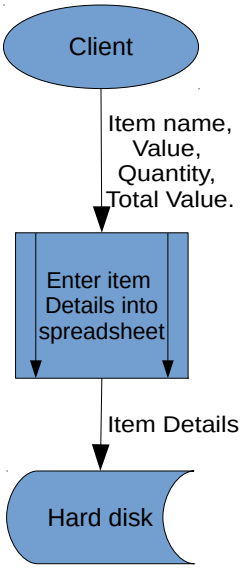
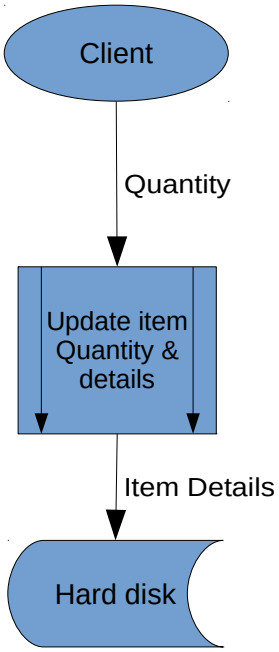


Figure 1.3: Flow Diagram Key.



Input Forms, Output Forms, Report Formats

Unfortunately Josh has no output forms To give me for this section as the inputs are all done by him on his own machine and he doesn't have any sample quote sheets or invoices I can use

1.2.2 The proposed system

Data sources and destinations

The Following table shows the proposed data and their respective sources and destinations.

Figure 1.4: Data sources and destinations

Source	Data	Data Type	Destination
Josh	ItemID	Integer	Database - Item Records
Josh	ItemName	String	Database - Item Records
Josh	ItemType	String	Database - Item Records
Josh	Value	Real	Database - Item Records
Josh	Quantity	Integer	Database - Item Records
Josh	SubTotal	Real	Database - Item Records
Josh	OnLoan	Text	Database - Item Records
-	-	-	-
Josh	LoanID	Integer	Database - Loan Records
Database - Item Records	ItemID	Integer	Database - Loan Records
Database - Item Records	ItemName	Text	Database - Loan Records
Josh	LoanRate	Real	Database - Loan Records
Josh	LoanStart Date	Date	Database - Loan Records
Josh	LoanEnd Date	Date	Database - Loan Records
Josh	LoanTime	Time	Database - Loan Records
Josh	LoanCost	Real	Database - Loan Records
-	-	-	-
Josh	TestID	Integer	Database - PAT test records
Database - Item Records	ItemID	Integer	Database - PAT test Records
Database - Item Records	ItemName	Text	Database - PAT test Records
Database - Item Records	LastTest	Date	Next PAT test Calculation, Database PAT test Records
Next PAT Test Calculation	NextTest	Data	Database - PAT test Records

Data flow diagram

Figure 1.5: Flow Diagram Key.

Figure 1.6: Enter New Item.

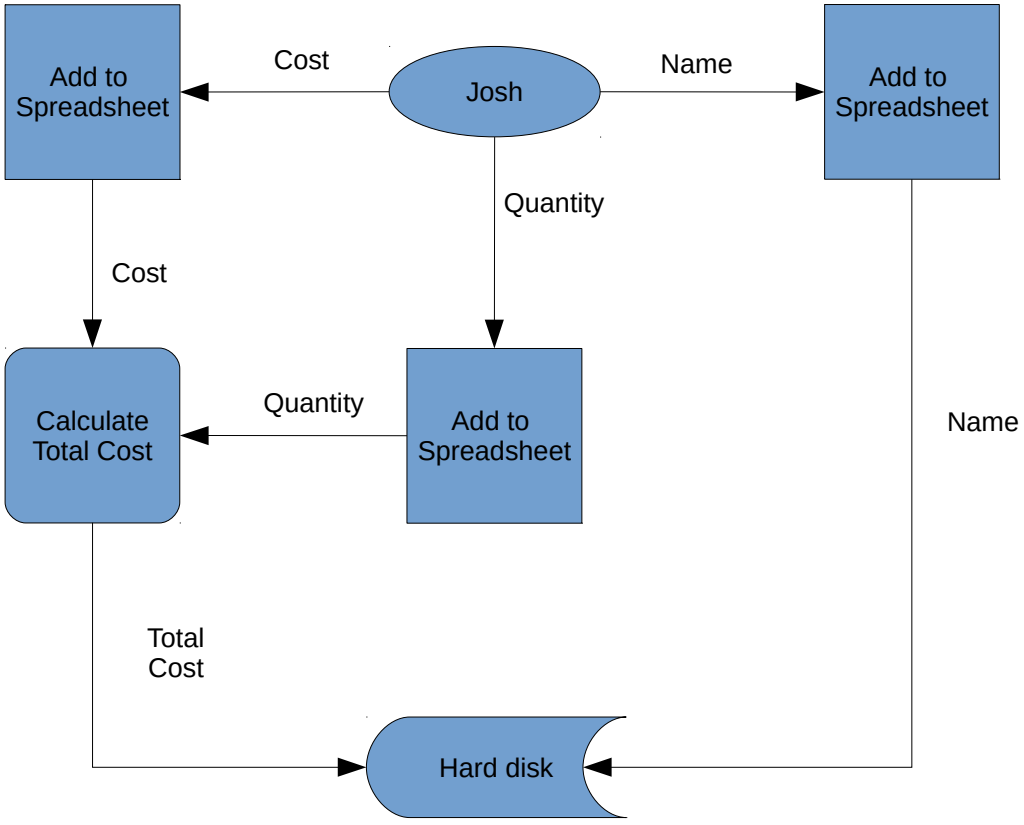
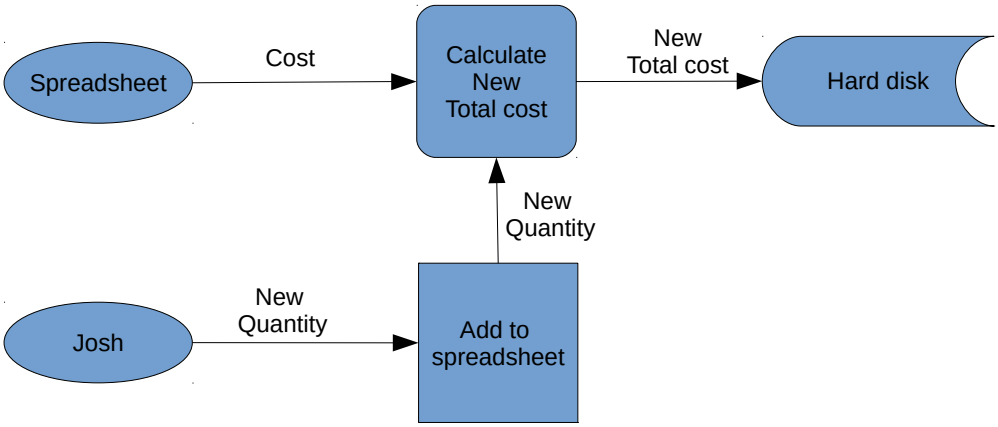


Figure 1.7: Enter New Item.



Data dictionary

Figure 1.8: Data Dictionary.

Name	Data Type	Length	Validation	Example Data	Comment
ItemID	Integer	1-435	Range	184	-
ItemName	Text	5 - 40 Characters	Length	Mac Pro	-
Value	Real	2-5 figures	Range	1,300	-
Quantity	Integer	1-150	Range	8	-
Total Value	Real	2-8 figures	Range	133,204.86	
OnLoan	Boolean	-	Status Check	True	If an item is on loan or not
LoanRate	Real	1-3 figures	Range	75	
LoanStartDate	Date	-	Format	25/09/2014	
LoanEndDate	Date	-	Format	27/09/2014	
LoanTime	Integer	-	Date Range	7 Days	
LoanCost	Real	1-4 Integers	Range	250	
LastTest	Date	-	Format	01/10/2014	
NextTest	Date	-	Format	20/10/2014	Calculated 12 months from LastTest date

Volumetrics

I have chosen to start off with only 20 Item Records along with 20 Loan Records and 20 PAT Test Records. In total there will be 60 Records. I have chosen this number of records as my Client and I had previously agreed that this would be a suitable number of records to start with in order for him to get used to the system and train up other colleagues to know how to use it also. This can be increased as time goes by.

The Item Records Database, Loan Records Database and the PAT Test Records Database will store 18 fields of combined data. Each field should take up 1KB of hard disk space. With this the required initial storage space will be:

18KB * 60 = 1080KB

1080KB / 1024 = 1.05MB

If the rest of database managemnent system took up 28MB, the client would need 19.05MB of space for 60 records, with 18 fields of data

1.3 Objectives

1.3.1 General Objectives

- Easily understandable layout and structure for records.
- Easy structure for input and outputs.
- Easy viewing of records

1.3.2 Specific Objectives

Record viewing:

- Clear labels for data attributes.
- Next and Preious record buttons.
- Edit button so data cannot be changed accidentally.
- Submit button to save data changes (if any) to the current record.

- First and Last record buttons to jump to respective record.

Data input:

- Data fields become editable
- Drop down selection for location selection
- Changes saved immediately after editng has finished (ie submit button pressed)

Data output:

- Print button and functionality
- Export records to PDF
- Print/Export a batch of records to PDF
- Email notifications when new item is entered into database or an item is updated, the details and who entered/updated.

1.3.3 Core Objectives

- Viewing of Item/Loan/PAT-test Records
- Item/Loan/PAT-test data input
- Item/Loan/PAT-test data editing
- Sending of Loan Invoices

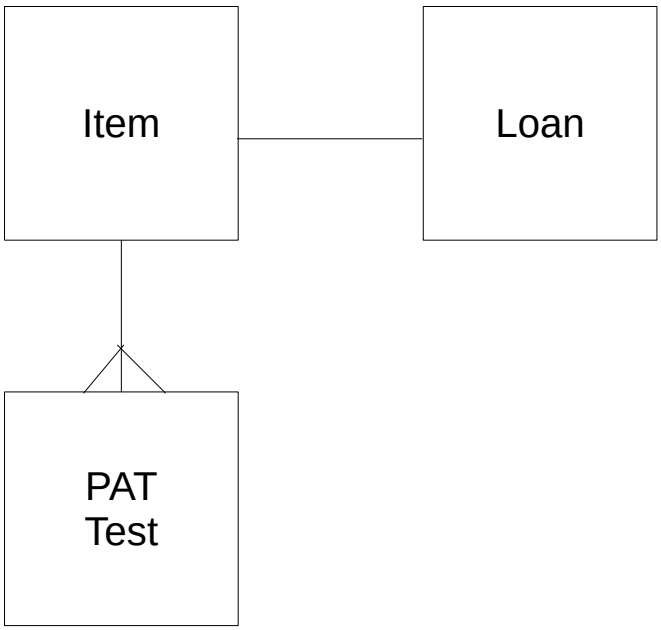
1.3.4 Other Objectives

- Printing records/invoices
- Exporting records/invoices to PDF

1.4 ER Diagrams and Descriptions

1.4.1 ER Diagram

Figure 1.9: ER Diagrams.



1.4.2 Entity Descriptions

Item(ItemID, Name, Location, Value, Quantity, SubTotal, OnLoan, *PATNeeded*)

Loan(LoanID, *ItemID*, *ItemName*, LoanRate, LoanStartDate, LoanEndDate, LoanTime, LoanCost)

PATTest(TestID, *ItemID*, *ItemName*, LastTest, NextTest)

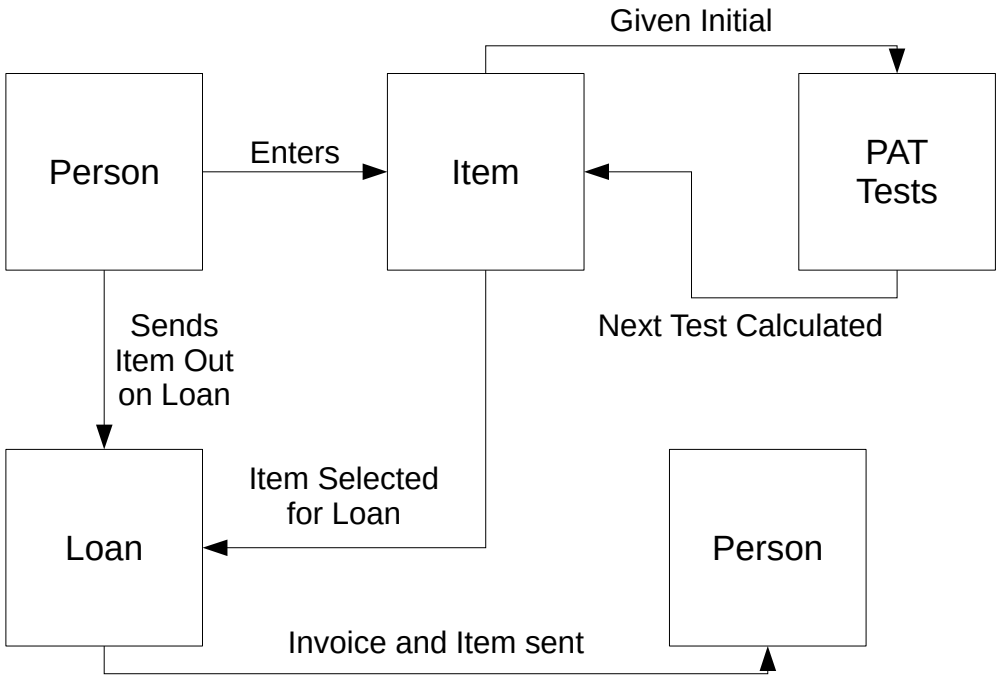
1.5 Object Analysis

1.5.1 Object Listing

- Client
- Item
- Loan
- PAT test

1.5.2 Relationship diagrams

Figure 1.10: Relatioship Diagram.



1.5.3 Class definitions

Figure 1.11: Class Diagram Key.

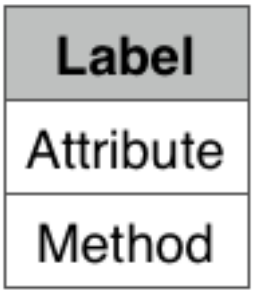
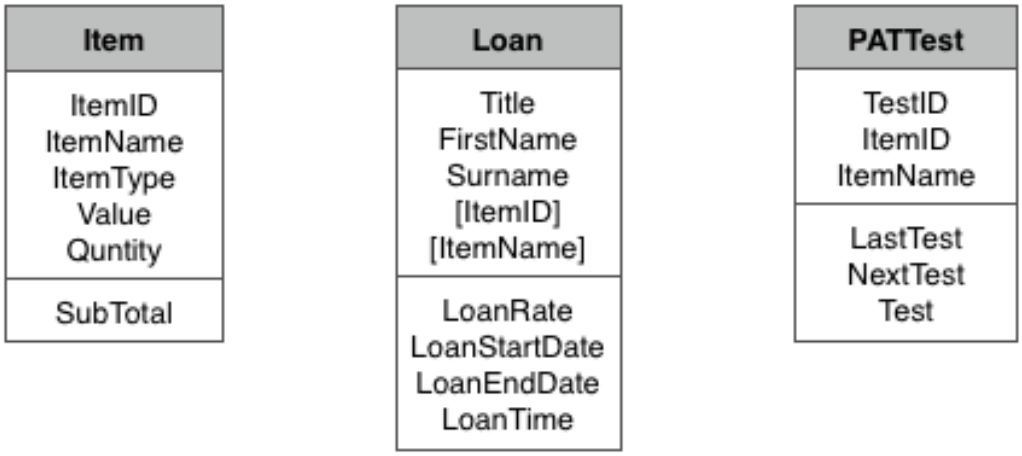


Figure 1.12: Class Diagrams.



1.6 Other Abstractions and Graphs

1.7 Constraints

1.7.1 Hardware

Presently, Josh uses a custom built, 2008 MacPro Desktop Computer. This is primarily used as a file server for images, audio and video files a well as a backup for his current work desktop. My system will need to be compatible with this system.

Computer Specifications:

- 2x 2.8 GHz Quad-Core Intel®Xeon™Processor
- ATI Radeon HD 2600 XT 256MB Graphics Card
- 661-4449 Apple Mac Pro A1186 Motherboard
- 16.00GB DDR3 RAM
- 1TB SATA Disk-Drive
- 6TB RAID Storage
- Apple SuperDrive
- 15" LG E1942 LCD Display. 1280 x 720 pixels

The proposed system should have little to no impact on this machine as the processing power and memory that can be disipated by the computer, greatly excedes the requirements for the proposed system.

There are, however, a few hard constraints that will have to be considered. One of which is the resolution of the display. The proposed system will have to be designed and implemented by taking this into account, otherwise the system may not fit the screen size appropriately.

One other constraint of the computer to be used is that it is a desktop computer. This means that the system is only accessible where Josh chooses to have the computer based in his place of work, as the computer is not portable. In addition to this, the computer requires a constant supply of

power in order to opperate as there is not internal battery.

1.7.2 Software

Josh has told me that there little restriction as to what software can and can't be stalled. The only restriction in place is that I don't install pirated, illegal or damaging software on the machine as it is part of an inter network of systems and can be accessed by other computers. The current operating system in place is Apples OSX 10.8 (Mountain Lion). Josh wishes to update the software sometime in the near future to OSX 10.9 (Mavericks) and possibly update to OSX 10.10 (Yosemite) when a stable version has been released within the next 3-5 months.

1.7.3 Time

Josh has said that there is no deadline requirement for the proposed system to be in place and doesn't need it until I have finished implementing it. The only deadline I need to meet is the project deadline set by my Computing course leader. This is Friday 13 th February 2014.

1.7.4 User Knowledge

1.7.5 Access restrictions

1.8 Limitations

1.8.1 Areas which will not be included in computerisation

1.8.2 Areas considered for future computerisation

1.9 Solutions

1.9.1 Alternative solutions

1.9.2 Justification of chosen solution