Plastering Management Application

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Chapter 1

Analysis

1.1 Introduction

1.1.1 Client Identification

My client is 30 year old plasterer Dan Austin who runs his own plastering business known as DnA Plastering. Dan mainly uses his Toshiba laptop (Dual Core Intel with 6 GB Ram and running Windows 8 64 bit) to do basic tasks such as social networking and receiving/sending emails.

The current system is a paper based method where he records the prices and measurements of the plastering/screening/rendering jobs he undertakes. Dan works in an around the Suffolk/Essex area but occasionally takes on larger jobs further afield in places such as London or Epping. All the recording and calculations are done by Dan himself and does not require additional assistance in completing these tasks but is looking for a digital solution to the organisation problems faced with the current manual paper method.

Dan is looking to introduce a computer based system to replace the current one in order to make keeping track of jobs and pricing up new jobs easier and more efficient. Alongside this he would like to be able to keep information on all of his customers so he can simply search for clients' details and contact information all in one location. He will also be able to look up the jobs that he has done for them to make sending invoices easier and manageable.

1.1.2 Define the current system

The current system in place is a paper/notebook based system where details of clients are stored along with prices of jobs and cost of materials needed etc.

The details of the clients include their address, phone number, email, first name and surname. The infromation about the job usually includes the measurements of what needs to be plastered along with how long it will take to complete and if he is taking any labourers to too. Calculations are often also made to work out how much to charge depending on the price he is charging per square meter. This rate often changes depending on the current economy.

Once all the calculations are made, he works out how much the materials are going to cost and also how long it will take him to complete the job. Once all these calculations and prices have been evaluated he notifies the client of the price; when the price is confirmed the job is undertaken.

Finally, Dan writes out an invoice using a standard invoice book purchased from a stationary store to inform the client of the costs and charges of the job. The current folder containing the invoices for his clients is not organised and offers another problem whereby finding information for jobs is difficult due to the inability to search quickly for any given customer.

1.1.3 Describe the problems

Problems are plentiful in the current system. One of the main problems is keeping valuable client data from being lost or damaged as there is only one hard copy made in a notebook. Another problem with the notebook is not being able to easily search through the details of all the clients to find specific phone numbers or contact details. Using a computer based system would allow Dan to search through his clients efficiently and allow him to make backups of the valuable client and job data.

Interview with client

1. **What system are you currently using?**

   I've got a Toshiba laptop with Windows 8, 6GB RAM and a dual core processor

2. **Are there any issues with the system currently being employed?**

   Just organisational issues when it comes to finding clients information etc. Would be good to have a database which I could search for info with.

3. **What data do you record at the moment?**

   The clients name, address, phone number, job information like measurements of the rooms etc.

4. **How often do you record data in the current system and how much data is stored each time?**

A few times a week and not much, a few lines in the workbook I use.

5. **What happens to older client information?**

   Normally gets lost as and when I replace any of my books I write the details down in.

6. **Are there any storage issues when it comes to storing data manually?**

   No, nothing really as I only need room for a book or two.

7. **Are changes often made to existing records of client data or job info?**

   Occasionally when a client gives me a new contact number but nothing major.

8. **What is the typical routine when it comes to gaining a new client or job?**

   Normally I get a call from a colleague who gives me the details about a job which I can take on or not depending on the time I have available. Sometimes clients will find my number through my website dnaplastering.co.uk or through word of mouth and will ask me to give them a quote on a job. Then I will go to the job and work out any costs involved and the time it would take to complete. Then I can arrange a time to do the job and after the job is completed I will usually write out an invoice for the client telling them about the cost for materials,labouring and profit etc.

9. **What does the client recieve in terms of invoices?**

   I write out an invoice and give it to them in person after the job is completed.

10. **What format should the outputs be in within the new system?**

    It would be good to be able to print the clients invoices out with minimal effort involved and possibly email the clients the invoice.

11. **Will you need to print reports and invoices or will it be sent entirely digitally to the client via email?**

    I definitely need to print out some of the invoices as most of my work is done face to face so it is easier to give it to them in person. It might be useful to email it to them as well.

12. **Is there a security issue in regards to the data you store in the**

current system?

Not much of an issues as it is just client information but added security would be a bonus.

13. **Are there any foreseeable constraints required in the proposed system?**

    None that I am aware of.

14. **Do you have a picture in mind of what the new system could look like?**

    Not really bothered about the look of it too much anything that works as expected would be brilliant.

Signed:

1.1.4 Section appendix

1.2 Investigation

1.2.1 The current system

Data sources and destinations

There are four main data sources within the current system - The plasterer, the client, the builders merchant and visting the clients job. A client contacts Dan through a phone call placed to Dan's mobile. Sometimes a client may leave Dan a voicemail message if he is too busy to answer the call at that given moment. If this is the case then Dan will get back to the client as soon as possible. Most of the data in the current system will come from the client or the clients job - this data will be the job measurements and the clients contact information. The main data destinations are the forms given to the client i.e the quote and the invoice document.

Source	Data	Example Data	Destination
Client	Client Contact information First-name - Lastname - phoneNumber - AddrLine1 - Addr-Line2 - AddrLine3 - AddrLine4 - PostCode - Email - JobType	John - Smith - 07809726812 - 15 - Crowley Road - Haverhill - Suf-folk - CB90DJ - john@gmail.com - Plastering Bed-room	Appointment and Client Book.
Plasterer	Appointment Time and Place	16:00 at 15 Crowley Road, Haverhill	Client Calendar or Diary
Visiting Job Site	Measurements of Job Size and Mate-rials that need to be purchased	4m x 5m x 3m = $60m^2$ 10 Bags of Plaster	Work Notebook
Plasterers Calcula-tions	Quote for the work that needs doing and agree a date it can be done.	£600, 1 Day, 15th October	Quote written out on paper or agree in person.
Plasterers calcula-tions for the mate-rials needed for the job	Quantity of materi-als needed for the job	25 bags of plaster and 12m of angle beading	Builders Merchant
Builders Merchant	A price for the ma-terials needed	£350 for the bags of plaster and angle beading	Plasterer
Plasterer	Total cost of the job broken down - cost of parts,labouring and vat. Date of Job	£600 - £350 mate-rials - £50 VAT - 14/08/14	Client.

Algorithms

There are three main algorithms utilised in the current system. The first is an algorithm to agree the price of the job with the client.

Algorithm 1 Agreeing a price Algorithm

```
1: SET agreed TO false
2: WHILE agreed = False DO
3:     IF "Client does not agree with quoted price" THEN
4: Discuss price and change quote if new price is agreed upon.
5:     ELSE
6:         SET agreed TO true
7: Arrange a date for the work to be started on.
8:     END IF
9: END WHILE
```

The second algorithm currently being used in the system is an algorithm used to see whether the work is completed.

Algorithm 2 Checking whether work is complete or not.

```
1: SET Complete TO False
2: WHILE Complete = False DO
3:     IF "Issue/problem not fixed." THEN
4: Check the current problem and fix issue.
5:     ELSE
6:         SET Complete TO True
7:     END IF
8: END WHILE
9: Create and send invoice
```

The third algorithm being used in the system is an algorithm used to see whether the work has been paid for completely.

Algorithm 3 Checking whether work has been paid for yet.

```
1: SET Paid TO False
2: WHILE Paid = False DO
3:     IF "Money has not been given." THEN
4: Send invoice and contact client
5:     ELSE
6:         SET Paid TO True
7:     END IF
8: END WHILE
9: Update job to paid for in book.
```

Data flow diagram

Input Forms, Output Forms, Report Formats

1.2.2 The proposed system

Data sources and destinations

Data flow diagram

Data dictionary

Volumetrics

1.3 Objectives

1.3.1 General Objectives

1.3.2 Specific Objectives

1.3.3 Core Objectives

1.3.4 Other Objectives

1.4 ER Diagrams and Descriptions

1.4.1 ER Diagram

1.4.2 Entity Descriptions

1.5 Object Analysis

1.5.1 Object Listing

1.5.2 Relationship diagrams

1.5.3 Class definitions

1.6 Other Abstractions and Graphs

1.7 Constraints

1.7.1 Hardware

1.7.2 Software

1.7.3 Time

1.7.4 User Knowledge

Chapter 2

Design

2.1 Overall System Design

2.1.1 Short description of the main parts of the system

2.1.2 System flowcharts showing an overview of the complete system

2.2 User Interface Designs

2.3 Program Structure

2.3.1 Top-down design structure charts

2.3.2 Algorithms in pseudo-code for each data transformation process

2.3.3 Object Diagrams

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2.4 Prototyping

2.5 Definition of Data Requirements

2.5.1 Identification of all data input items

2.5.2 Identification of all data output items

2.5.3 Explanation of how data output items are generated

2.5.4 Data Dictionary

2.5.5 Identification of appropriate storage media

2.9.1 Outline Plan

Test Series	Purpose of Test Series	Testing Strategy	Strategy Rationale
Example	Example	Example	Example

2.9.2 Detailed Plan

Test Series	Purpose of Test	Test Description	Test Data	Test Data Type (Normal/ Erroneous/ Boundary)	Expected Result	Actual Result	Evidence
Example	Example	Example	Example	Example	Example	Example	Example

Chapter 3

Testing

3.1 Test Plan

3.1.1 Original Outline Plan

Test Series	Purpose of Test Series	Testing Strategy	Strategy Rationale
Example	Example	Example	Example

3.1.2 Changes to Outline Plan

Test Series	Purpose of Test Series	Testing Strategy	Strategy Rationale
Example	Example	Example	Example

3.1.3 Original Detailed Plan

Test Series	Purpose of Test	Test Description	Test Data	Test Data Type (Normal/ Erroneous/ Boundary)	Expected Result	Actual Result	Evidence
Example	Example	Example	Example	Example	Example	Example	Example

3.1.4 Changes to Detailed Plan

Test Series	Purpose of Test	Test Description	Test Data	Test Data Type (Normal/ Erroneous/ Boundary)	Expected Result	Actual Result	Evidence
Example	Example	Example	Example	Example	Example	Example	Example

3.2 Test Data

3.2.1 Original Test Data

3.2.2 Changes to Test Data

3.3 Annotated Samples

3.3.1 Actual Results

3.3.2 Evidence

3.4 Evaluation

3.4.1 Approach to Testing

3.4.2 Problems Encountered

3.4.3 Strengths of Testing

3.4.4 Weaknesses of Testing

3.4.5 Reliability of Application

3.4.6 Robustness of Application

Chapter 4

System Maintenance

4.1 Environment

4.1.1 Software

4.1.2 Usage Explanation

4.1.3 Features Used

4.2 System Overview

4.2.1 System Component

4.3 Code Structure

4.3.1 Particular Code Section

4.4 Variable Listing

4.5 System Evidence

4.5.1 User Interface

4.5.2 ER Diagram

4.5.3 Database Table Views

4.5.4 Database SQL

4.5.5 SQL Queries

4.6 Testing

4.6.1 Summary of Results

4.10.1 Module 1

Chapter 5

User Manual

5.1 Introduction

5.2 Installation

5.2.1 Prerequisite Installation

Installing Python

Installing PyQt

Etc.

5.2.2 System Installation

5.2.3 Running the System

5.3 Tutorial

5.3.1 Introduction

5.3.2 Assumptions

5.3.3 Tutorial Questions

Question 1

Question 2

5.3.4 Saving

5.3.5 Limitations

5.4 Error Recovery

5.4.1 Error 1

Chapter 6

Evaluation

6.1 Customer Requirements

6.1.1 Objective Evaluation

6.2 Effectiveness

6.2.1 Objective Evaluation

6.3 Learnability

6.4 Usability

6.5 Maintainability

6.6 Suggestions for Improvement

6.7 End User Evidence

6.7.1 Questionnaires

6.7.2 Graphs

6.7.3 Written Statements