COMP4 Project

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Includes full analysis, design, specific implementation, testing and evaluation

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# Analysis

## Identification of problem

The end user is my father, Peter, who currently owns a construction company called Top Builders. He conducts all sorts of construction work, including extensions, furniture fixing, painting & decorating, and more. He tends to work alone, but sometimes he will hire workers to help him with larger-scale projects. He needs a system to aid him in managing quotes, invoices, employees and his stock of materials in order to ensure a smooth running of the business and decrease the amount of time spent on bureaucracy and administration.

## Identification of prospective user (interview)

In order to find out more details about the prospective end user, I carried out a live interview\* with Peter. This interview aimed to provide the basis for analysis of the current system limitations, setting targets for the new system, planning a feasible solution and ensuring that the finished product meets the requirements of the end user.

**Norbert**: To start us off, what do you currently do for a living?  
**Peter**: I own a building company called Top Builders. I do all kinds of construction work including extensions, kitchen and bathroom fitting, tiling, painting and decorating, etc.  
  
**Norbert**: Do you work on your own?  
**Peter**: Mostly, yes. I am self-employed under the Top Builders name and the company is entirely self-run. However, for some bigger jobs, I may hire a couple of workers that help me. I pay them a working wage but act as the project manager, while still of course also working with them on-site.

**Norbert**: How do you co-ordinate your workers, keep track of how many hours they have worked, etc.?  
**Peter**: Heh, well, I guess I just keep it in my head, or write it down. I hand them the money after a week of work and just tell them the days when they should come in and where we’re going.

**Norbert**: That sounds a bit cumbersome?  
**Peter**: It is, but I don’t hire that much workers for it to be too much of an issue at the moment. However, if I carry on getting large-scale projects like I have been recently, it could get very disorganised.

**Norbert**: Do you ever advertise, or is your business quite small?  
**Peter**: I give out business cards to any potential clients which may require my services. I am advertised on Yell and have a van with my business logo and contact details on it. I also had a simple website which listed all my services, but found it not useful enough in bringing in new clients for the price I was paying.  
  
**Norbert**: How do you find your work, and then how do you proceed to complete it?  
**Peter**: I receive work, very often through recommendation, from a potential client and immediately arrange a meeting to inspect the premises and discuss the details. Using this information I then produce a price estimate (quote) listing all of the specific jobs that need to be done for the client, and the total cost. I then present this quote back to the client, discuss any amendments, and begin work immediately. Once complete, I hand the client an invoice, which is basically just the same as a quote, but with slight amendments to reflect the exact work that was completed.

**Norbert**: Could you tell me more about what you include in your quotes?  
**Peter**: My quotes tend to differ a lot due to the fact that I make them manually in Microsoft Excel. Usually I will have a table of 5-10 jobs for the project, with different materials listed for every job. I will then have a price for every job, and sometimes break this price up to indicate labour and material costs. I will also have a total at the bottom. I like to include my company logo and the name and address of the client, although sometimes forget to do this.

**Norbert**: And how long do these quotes take to produce?  
**Peter**: Well, I am nearly 50 years old and although I don’t consider myself completely backwards in terms of technology, messing around in Excel can sometimes take me up to 3 hours to complete one quote. Most of the time I just ask you [my son] to do it, as you’re much quicker. But as you know that involves a lot of disagreements, because you never seem to listen and do it exactly how I want!

**Norbert**: (Laughs) that’s because you never seem to know what you want! What would you like the new system to do for you?  
**Peter**: Well, everything would be nice (chuckles). I mainly want something easier than Excel produce my quotes for me quickly and efficiently. I want to be able to quickly launch an application, fill in some jobs details and figures and have it printed off and the client e-mailed within minutes. Of course the format still needs to be Excel, just not made using Excel, if that makes sense, as I find most clients are able to open such a format, and it can be made to look nice.

**Norbert**: Is that all?  
**Peter**: Well, I’m open to suggestions. Anything to make my life easier.

**Norbert**: Well, what about the future? Where do you see your business going?  
**Peter**: Right now, everything is going pretty well and I would love to turn this into a more of a structured enterprise rather than a small family business. I will definitely be pursuing some higher forms of advertising in the future so that I can get a much larger volume of clients. Of course, this will mean hiring a proper team of employees, especially with me getting so old. A website will eventually become a must.

**Norbert**: What would this website contain?  
**Peter**: A description of all the services I provide, a gallery, my contact details. It would also be nice if clients could request a quote online which I could somehow see and complete.

**Norbert**: That could definitely be something I could include in the application, allowing you to complete quote requests submitted online. Would that be useful?  
**Peter**: Absolutely! It would be incredibly convenient to direct potential clients onto the website and allow them to describe their problem without me having to take the time out to see them or call them.

**Norbert**: Okay! We haven’t discussed materials. How do you currently get all of the materials you need to complete a project?  
**Peter**: After producing the final quote I take a trip to any builders’ warehouse such as Selco and pick out all the things I will need. This sometimes takes more than one trip and is quite tedious to do, but there’s not much I can do about it. If the business was large enough, I would probably store a stock of materials somewhere and pick them out from there.

**Norbert**: Surely you would need something to manage that stock electronically?  
**Peter**: I would indeed.

**Norbert**: That’s something worth looking into for the new system. Finally, do you have any final thoughts on how you would like your new system to function?  
**Peter**: I just want something that works well, is fast and doesn’t look overly complicated. Initially I just wanted a simple quote maker, but now that I think about it, the expansion of my system may come quite soon and I will most likely require other tools to help me. For example, that stock of materials manager you mentioned sounds like it could be very useful.

**Norbert**: I will definitely aim to produce something that satisfies your long-term requirements. Thank you very much for this, it was very helpful in determining exactly what you need.  
**Peter**: No problem.

\*Interview was conducted in Polish and later translated and adjusted for easier understanding.

Following this interview, the end user will simply be referred to as **Peter**.

## Description of the current system

As discussed at the interview, Peter’s current typical work pattern is as follows:

1. Find a client, either through recommendation, advertising or otherwise
2. Consult with the client, assess the construction work to be completed
3. Produce a quote (price estimate) of the work and present this to the client
   1. The quote should include a breakdown of all the jobs to be done for the whole construction project, the details of each job, the materials required and the prices for each individual job
   2. This is currently done manually, using an Excel spreadsheet
4. Further consultation with the client based around the produced quote
5. Employees are hired for the project, and given concrete tasks/targets
6. Work then begins
7. After the construction project is complete, the client is handed an invoice which represents the actual work done, materials purchased, and overall cost
8. Employees are paid

Based on the conducted interview and outline of the system, the following limitations can be concluded:

* Creation of invoices is cumbersome and requires tinkering with Excel spreadsheets
* Invoices/quotes are not standardised, i.e. the layout and look of each quote differs
* Employees are managed on paper (sometimes not even formally recorded)
* No way of potential clients to request quotes prior to initial consultation
* No way of organising tasks between employees, leading to disorganisation
* Material must be found and purchased manually

## Identification of user needs

Peter needs a system which solves the above limitations. The list of user needs and acceptable limitations may be summarised as follows.

* Manages any amount of current projects
* Automates the creation of quotes/invoices, with the capability of exporting to Excel
* Allows customers to request a quote using an interlinked online form. These “quote requests” will be placed in a queue and completed in the order received. The client will be e-mailed with the completed quote
* Provides an employee management system, with capability of assigning concrete tasks and different pay rates
* Provides an employee login system which lists assigned tasks, pay rate and easy contact with project manager through e-mail
* Manages the stock of materials
* Allows new materials to be found through various online stores, through a search system which filters for best prices
* Allows customisation through an adequate list of settings/preferences to suit user needs

## Data analysis