**COST ESTIMATION SPREADSHEET MODELS**

A cost estimation spreadsheet model is a mathematical algorithm that interprets costs. It predicts the cost of a project. It applies the use of values to some factors to predict cost and various people in a team always do it to come up with an accurate cost prediction.

Dysert, L. R. (2003). Sharpen your cost estimating skills. Cost Engineering, 45(6), 22.

The main features of cost estimating spreadsheet models are the unit cost for the various inputs, the number of inputs, the desired output, and the final total input cost for the variable. Kitchel, B. G., Moore, S. O., Banks, W. H., & Borland, B. M. (2014). Probabilistic drilling cost estimating. SPE Computer Applications, 9(04), 121-125.

Many cost estimation models bring in various advantages when used. Some of the examples of advantages of using these models are the following:

1. They encourage flexibility in the process of calculations
2. They encourage efficiency, and therefore tasks are done more quickly, and accuracy is also increased.
3. Cost estimation models are subjective.

And therefore, various models can be used to come up with cost predictions. Leung, H., & Fan, Z. (2002). Software cost estimation. In *Handbook of Software Engineering and Knowledge Engineering: Volume II: Emerging Technologies* (pp. 307-324).

For this case, we use a spreadsheet to perform our cost estimation to come up with a design prototype for this task. Order of magnitude, definitive, and budget estimates can be performed in the process.

Seshadri, S. B., Arenson, R., Khalsa, S., Brikman, I., & van der Voorde, F. (2003). Prototype medical image management system (MIMS) at the University of Pennsylvania: Software design considerations. *Journal of Digital Imaging*, *16*(1), 96-102.

The cafeteria offers sales of soft drinks and snacks.

For the cafeteria to run well and smoothly, there is need to include the spreadsheets. This ensures that there is maximum output operation. Spreadsheet model is the best angle for this scenario.

**Note: when developing the actual spreadsheet model, I was told by my supervisor that you must download a file containing information of the data that would be stored in the actual spreadsheet model for the cafeteria. This file should contain sample information such as Soft Drinks Price List, Snacks Price List Category, Stock Available, and Customer Details. He said you can download these files online. So, you will need to download this file online to add the information to the spreadsheet model. This document contains information of the prototype design of the spreadsheet model. You must develop the actual spreadsheet model decision support system in MS Excel just as it is seen below. You must include all the pages below into the spreadsheet model. This document also contains information of what the spreadsheet model must do and how it must perform. Note: You must have knowledge of how to use MS Excel to successful do this task. It must be done by the 25/07/2022. Also please ignore the notes to the right hand side of the document.**

**A Prototype Design of the Spreadsheet Model Sample for a Cafeteria Business Enterprise**

Landing/Login Page

**NAME OF RESTAURANT**

Username

Password

Login

The illustration above is the very first page, the landing page for the cafeteria. This is where the system user logs in to proceed with the other related activities.

Main Menu

**MAIN MENU**

Soft Drinks Price List

Snacks Price List Category

Stock Available

Customer Details

Add/Edit Customer

This menu follows after the user logs in successfully. The user is taken to this page.

Depending on the selected button, various buttons shall assist them in navigating the system.

Soft Drinks Price List

**Search Drink**

Search Button

Submit Button

Back to the main Menu

Exit System

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Soft Drink Code | Price | Name | Quantity | Description | Select/Deselect |
| “ | “ | “ | “ | “ | “ |
| “ | “ | “ | “ | “ | “ |
| “ | “ | “ | “ | “ | “ |

This menu has got various items available in the Soft Drinks category. It has the search text input field for searching the drink, upon which the user can also see the various prices.

The page also has got other two buttons, one for navigating backward and the other button for submitting the selected drinks for purchase. The exit button is also available; the user can exit the system at any given time when not using the system.

Snacks Price List

**Search Snacks**

Search Button

Submit Button

Back to the main Menu

Exit System

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Snacks Code | Price | Name | Quantity | Description | Select/Deselect |
| “ | “ | “ | “ | “ | “ |
| “ | “ | “ | “ | “ | “ |
| “ | “ | “ | “ | “ | “ |

This menu has got various items available in the Snacks category. It has got the search text input field for searching the snacks upon which the user is also able to see the various prices too. The exit button is also available; the user can exit the system at any given time when not using the system.

The page also has got other two buttons, one for navigating backward and the other button for submitting the selected items for purchase.

Available Stock

**STOCK AVAILABLE**

Exit System

Back to Main Menu

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Item Code | Unit Cost | Price | Name | Quantity | Supplier | Description | Category (Snacks/Soft drink) |
| “ | “ | “ | “ | “ |  | “ | “ |
| “ | “ | “ | “ | “ |  | “ | “ |
| “ | “ | “ | “ | “ |  | “ | “ |

This menu shows all items available in the two categories: soft drinks and snacks.

The page also has one button to assist the user in navigating to the main page/menu. The exit button is also available; the user can exit the system at any given time when not using the system.

Customer Details

**CUSTOMER DETAILS**

Edit

Exit System

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Customer ID | First Name | Last Name | Phone Number | Address | Gender |
| “ | “ | “ | “ | “ | “ |
| “ | “ | “ | “ | “ | “ |
| “ | “ | “ | “ | “ | “ |



This menu lists all the customers who have visited the cafeteria to buy soft drinks or snacks. The Menu has the Back to the main menu button, which assists the user in navigating back after successfully seeing the customers. Edit button for editing the customer names is also available. The exit System button is also available; the user can exit the system at any given time when not using the system.

**Edit/Add New Customer**

**EDIT/ADD NEW CUSTOMER**

Update/Edit

Submit

|  |  |
| --- | --- |
| Customer ID | “ |
| First Name | “ |
| Last Name | “ |
| Phone Number | “ |
| Address | “ |
| Gender | “ |



This menu is used to add more customers to the system. The Menu has the Back to the main menu button, which assists the user in navigating. The update button is also available. Submit button is also available to be used to save the newly added customer to the system.

The prototype sample is very important for coming up with a working system. When all the screens are included, we can know the available stock worth and the price of each item available under each category for soft drinks and snacks. Cost prediction for profits and losses is also made possible using the spreadsheet model. We can also predict the items which need to be stocked in large quantities and, therefore, the amount we need for the new stock.

There are various models that can be used to assist experts in doing cost estimation and they include the following:

1. COCOMO model- it defines three types of projects which includes organic, semi-detached, and embedded.
2. Putman model-it describes the time and effort that is needed to complete a software task development.
3. Function points-based models- it concentrates on the amount of business output and functionality for which a product provides to a user.
4. To achieve an almost accurate cost estimation value for the above prototype, there are various principles of the cost estimation process that must be taken into consideration. The following are the principles of cost estimation:
5. Existence of an expert team to perform the task
6. Integrity in the process of cost estimation
7. The provided information must be accurate
8. Validation
9. Risk and uncertainty must be taken into consider Navarro, E. O., & Van der Hoek, A. (2005, April). Scaling up: How thirty-two students collaborated and succeeded in developing a prototype software design environment. In *18th Conference on Software Engineering Education & Training (CSEET'05)* (pp. 155-162). IEEE.

The cost process is necessary for informed decision-making, budgeting, planning, and taking care of the available resources. The cost estimation spreadsheet model prototype can be modified according to the need basis to take care of any additional information as time passes. It's made up of various types of data that help in cost analysis and estimation, which include:

1. Actual cost data- this cost is found from similar vendors of the same item in the field so that the value of items sold is not too low or too far from the field prices.
2. Company data or historical data- data from previous sales within the enterprise.
3. National data refers to set values by the government.

There are various techniques used to perform cost estimation and they include:

1. Expert judgement- can provide good estimation and its faster
2. Analogous estimation-based on actual project data
3. Parametric estimation-it often wins the contract
4. To down- its system level focus
5. Bottom up estimation-based on detailed analysis
6. Three point estimation

Therefore, in conclusion, no one technique can be applied to the various problems at hand and therefore it is recommended that experts apply the usage of the best model which fit the need according to the case scenario.

Dysert, L. R. (2003). Sharpen your cost estimating skills. *Cost Engineering*, *45*(6), 22.

Cost estimation is very important for the government agencies and in the private sector. It can assist in funding a program over another program which are being compared. Also enhances budget estimates, assists in evaluating resources needed and also to estimate performance baseline. This process ensures that a program succeeds. Kitchel, B. G., Moore, S. O., Banks, W. H., & Borland, B. M. (2014). Probabilistic drilling cost estimating. *SPE Computer Applications*, *9*(04), 121-125.

Early cost estimation is emphasized in the early decision-processes to set a way in which the project needs to be done to ensure that the process becomes successful. The proposed cost estimates can be used as the adaptable cases to evaluate the impact of the project implementation process. The main goal of the process is to reduce the project cost variance by making better the quality of the whole process in industrial based projects. The factors that will affect the estimated cost are Labor, Material, Equipment, and other costs. Dysert, L. R. (2003). Sharpen your cost estimating skills. *Cost Engineering*, *45*(6),

Therefore, this process provides a plan to avoid or reduce uncertainties. Leung, H., & Fan, Z. (2002). Software cost estimation. In *Handbook of Software Engineering and Knowledge Engineering: Volume II: Emerging Technologies* (pp. 307-324).

References

Leung, H., & Fan, Z. (2002). Software cost estimation. In *Handbook of Software Engineering and Knowledge Engineering: Volume II: Emerging Technologies* (pp. 307-324).

Dysert, L. R. (2003). Sharpen your cost estimating skills. *Cost Engineering*, *45*(6), 22.

Boehm, B., Abts, C., & Chulani, S. (2015). Software development cost estimation approaches—A survey. *Annals of software engineering*, *10*(1), 177-205.

Kitchel, B. G., Moore, S. O., Banks, W. H., & Borland, B. M. (2014). Probabilistic drilling cost estimating. *SPE Computer Applications*, *9*(04), 121-125.

Kemerer, C. F. (2017). Empirical validation of software cost estimation models. *Communications of the*

*CM*, *30*(5), 416-429.