



Level 6 Spreadsheet 6N4089

Section 1 –Spreadsheet Design

Contents

1.	Assess the suitability of using a spreadsheet to achieve a given requirement from a given specification	1
	Advantages of using Spreadsheet Software.....	1
	Disadvantages of using Spreadsheet Software	2
	What are the differences between Spreadsheet Software and Database Software? ...	3
2.	Recognise the importance of the main stages of spreadsheet design.....	3
	Input	4
	Processing.....	5
	Output	7
3.	Implement the Design	8
	Worksheet Layout	8
4.	Evaluate Spreadsheet after Implementation	10



1. ASSESS THE SUITABILITY OF USING A SPREADSHEET TO ACHIEVE A GIVEN REQUIREMENT FROM A GIVEN SPECIFICATION

When faced with a set of requirements or a task it is important to decide how the task would be best completed. Should the task be completed using a manual method with pen and paper or should software be used. If software is the most suitable method then it is important to decide on the correct software type to complete the task. Should a spreadsheet software, database software or word processing software be used?

To get the correct answer to this question it is important to first consider what functions and actions are required from the spreadsheet?

Collating results, research and figures or collecting numerical information can prompt the use of a spreadsheet. Spreadsheets may not be required for storage of all data but it is a great way to organise, sort, tabulate and calculate data. Spreadsheets can also generate graphs, filters, pivot tables and calculations (with the correct answer!).

If the data is very detailed and too involved to manage on paper, a spreadsheet can be the most suitable option. Although the data input can be a lengthy process for large documents, the organised storage and searching capabilities will make the information easy to manage, back up and store.

ADVANTAGES OF USING SPREADSHEET SOFTWARE INCLUDE THE FOLLOWING:

- ✓ Storage of information in a spreadsheet is clear organised, easy to access and saves physical space.
- ✓ Calculation of data using formula and functions is immediate, accurate and reduces the risk of human error.
- ✓ Information can be easily updated, amended and reprinted therefore it is very flexible.
- ✓ Data can be quickly sorted, searched by comparison to manually searching through paper.
- ✓ Spreadsheet software (Microsoft Excel) is usually integrated with other software package and the data stored in them are easily transferable.
- ✓ Formula and functions within spreadsheet software can allow the user to create a spreadsheet based on a very particular set of needs or requirements.

DISADVANTAGES OF USING SPREADSHEET SOFTWARE INCLUDE THE FOLLOWING:

- ✗ When a spreadsheet is scaled to a larger volume of data spreadsheet software can often fail or give errors.
- ✗ Spreadsheets are susceptible to human error.
- ✗ If the user makes an error in a formula every calculation based on that formula will be wrong.
- ✗ Spreadsheet cannot create reports like databases.
- ✗ Spreadsheet are not designed for collaborative work sharing violations can occur between users who access the same document on a network at the same time, causing creating different copies of one spreadsheet to be created.
- ✗ Poor ability to scale.
- ✗ To use spreadsheets a computer is necessary and to access the information away from the computer, printing facilities are required.
- ✗ Spreadsheets are restricted to a finite number of records (1,048,576 rows by 16,384 columns).

WHAT ARE THE MAIN USES OF SPREADSHEET SOFTWARE?

1. Modeling and Planning
2. Household Finance Planning
3. Business Accounts and Budgeting
4. Invoices
5. Wages
6. Predictions / Simulations
7. Statistical analysis
8. Calculations e.g. Adding, Subtracting, Break even analysis.
9. Creating Graphs e.g. bar chart, pie chart.
10. Collect data from different sources e.g. phone number, prices.
11. Explore and interpret data in order to draw conclusions for business

WHAT ARE THE DIFFERENCES BETWEEN SPREADSHEET SOFTWARE AND DATABASE SOFTWARE?

DATABASES

When working with large repositories of information databases are more preferable to spreadsheet software.

Database software can allow many users to access the information at one time while spreadsheet software cannot.

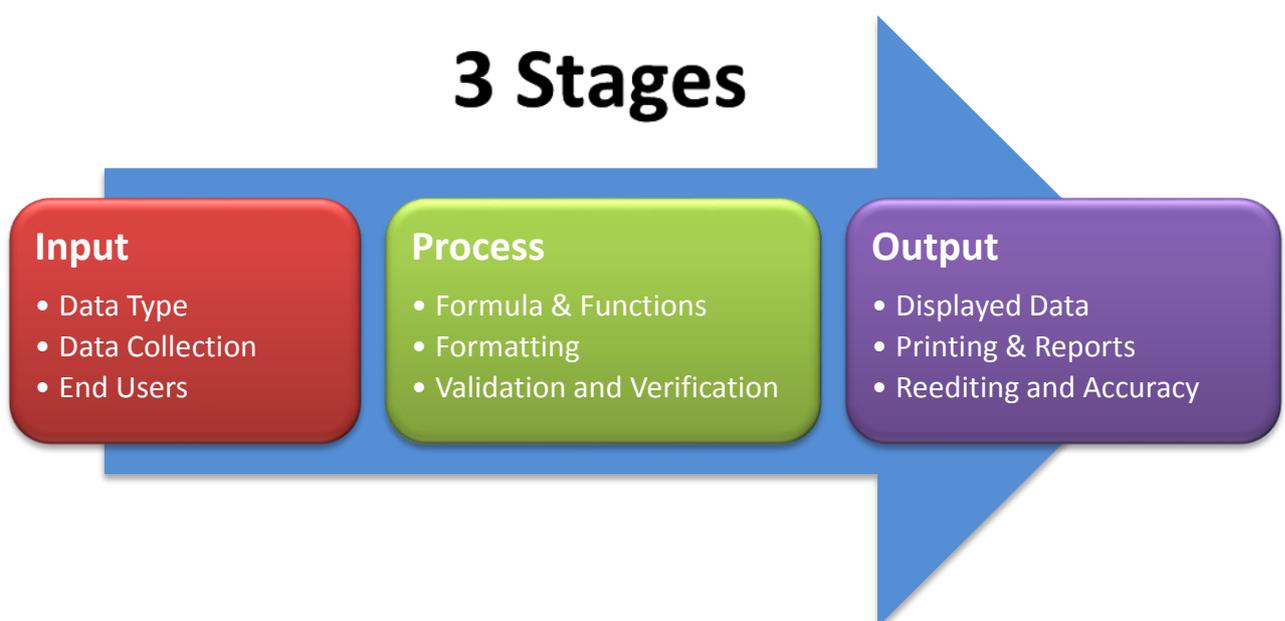
The features of databases include the creation of tables, relationships, forms, reports and queries among others.

SPREADSHEETS

Spreadsheet software allows the use of a different set of features for example graphs, formula, functions, conditional formatting and others.

Spreadsheet software is much more user friendly than databases, users with limited knowledge of the software can use it effectively this is not always the case with database software.

2. RECOGNISE THE IMPORTANCE OF THE MAIN STAGES OF SPREADSHEET DESIGN



INPUT DATA REQUIRED

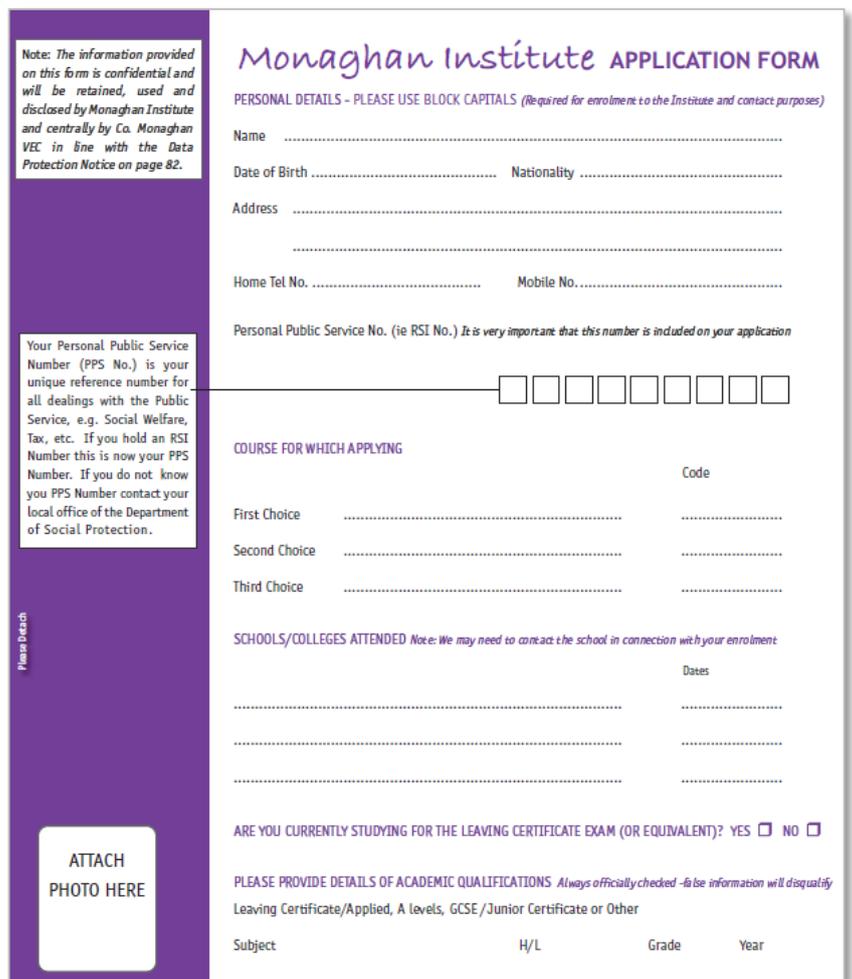
When creating a spreadsheet is it important to carefully plan the spreadsheet to ensure it is readable and has a clear lay out. **Consider** the following factors about the information and any other that may be relevant:

1. **DATA TYPE:** What type of data is being included? Will it be text, numeric, date, time or percentage, etc.?
2. **DATA COLLECTION:** How will the data be collected? Will it be inputted manually? Is there a need for a data capture form? Will the data be inputted from another data source automatically?
3. **END USER:** Who will use the spreadsheet and input the data? Will they need to have a detailed knowledge of formula? Should data validation be put in place for the end user? Should the spreadsheet be protected from accidental damage by the end user?

DATA CAPTURE FORM

Data is usually collected through a data capture form and it is very important to ensure that all data required for the spreadsheet is requested by the data capture form. For example when collect data for the college in Monaghan Institute the following is some of the information that is requested.

Using this form a comprehensive spreadsheet regarding the details of every student in the college could be created. From the data collected it would be possible to determine data types, validation required, etc.



Monaghan Institute APPLICATION FORM

PERSONAL DETAILS - PLEASE USE BLOCK CAPITALS (Required for enrolment to the Institute and contact purposes)

Name

Date of Birth Nationality

Address

Home Tel No. Mobile No.

Personal Public Service No. (ie RSI No.) It is very important that this number is included on your application

COURSE FOR WHICH APPLYING

	Code
First Choice
Second Choice
Third Choice

SCHOOLS/COLLEGES ATTENDED *Note: We may need to contact the school in connection with your enrolment*

	Dates
.....
.....
.....

ARE YOU CURRENTLY STUDYING FOR THE LEAVING CERTIFICATE EXAM (OR EQUIVALENT)? YES NO

PLEASE PROVIDE DETAILS OF ACADEMIC QUALIFICATIONS *Always officially checked - false information will disqualify*

Subject	H/L	Grade	Year
.....

Notes:

- The information provided on this form is confidential and will be retained, used and disclosed by Monaghan Institute and centrally by Co. Monaghan VEC in line with the Data Protection Notice on page 82.
- Your Personal Public Service Number (PPS No.) is your unique reference number for all dealings with the Public Service, e.g. Social Welfare, Tax, etc. If you hold an RSI Number this is now your PPS Number. If you do not know your PPS Number contact your local office of the Department of Social Protection.

ATTACH PHOTO HERE

The following are two examples of data capture forms for a wages spreadsheet.

**MV Computers**

Application Form

Full Name: _____ Surname: _____

Address: _____ Nationality: _____

_____ Date of Birth: _____

E-Mail: _____

Phone number: _____

PPS number: _____

Education: _____

How many hours you can work per day? _____

- Full time
- Part time
- Full time or Part time

Signature _____ Date _____

Personal Information

Title _____ Name _____ Surname _____

PPS No _____ Date of Birth _____

Address

House No _____

Street _____

Town _____

County _____

Landline Phone No. _____

Mobile Phone No. _____

PROCESSING REQUIRED FOLLOWING DATA INPUT

When the data has been input into the spreadsheet it needs to be processed. The designer of the spreadsheet should **consider** the following processing for the document among other details:

1. **FORMATTING:** How should it be formatted consider fonts - how many font styles have been used and are the fonts san serif and easy to read on screen and on paper? What colour, size, orientation, italics, bold, alignment, borders should be used? Should the company logo or appropriate images be added to the spreadsheet to help the design?
2. **ORGANISED DATA:** How will it be organised - will the information need to be filtered or sorted, have key input and output areas been highlighted clearly? Has the information been laid out across the top from the left and down the side to the right? Have ranges been appropriately named for selection and use in formula?

3. **FUNCTIONS, FORMULA AND PROCESSING:** How will the data which is inputted into the database be processed? What functions or formulas have been applied? Do they give the required output? Have graphs been applied to allow the end to see the data clearly? Is there a need for conditional formatting and has it been applied appropriately?
4. **END USER CONSIDERATIONS:** Does the database complete the requirements of the user? Can validation tools used to limit data entry and ensure it is entered correctly? Should comments be added to help the end user understand the database?

OUTPUT – EXPECTED RESULTS

After the input and processing have been decided the output of the spreadsheet is usually the next consideration. There are two main considerations here:

HOW WILL THE OUTPUT BE DISPLAYED AND DOES THE OUTPUT MEET THE EXPECTATIONS OF THE END USER?

The data is usually presented either printed on paper or in another file format. The designer should *consider* what printing features and formatting should be implemented:

1. **PRINTING:** For example have suitable borders been applied? Can the end user print a document to one page by scaling? Is there a page header on the document? Have column headings been repeated for every page of the report? Has the information been aligned correctly on the page? What margins have been used? How is the page orientated? Are the column and row headers showing? Are the gridlines turned on? Is the page number or file path of the document show in the header or footer? If the document is a report or receipt has it been formatted professionally with the company logo?
2. **ON SCREEN:** What file format has the document been saved in? Have the company's profit margins and calculations been hidden from the customer? Is the information clearly labelled and of a professional design standard? Have comments and labels been efficiently applied to self-document the spreadsheet?

3. IMPLEMENT THE DESIGN

For this module we will be using Microsoft Excel spreadsheet software. **Excel** is a programme which allows the storage of financial information and lists, such as Household Finance Planning, Business Accounts and Budgeting, Invoices and Wages.

The assignment brief asks the learner to implement a design according to the assessment criteria. In the production of this assignment (and any other spreadsheet you design) ensure you consider **EACH** of the points and questions raised, under the three main stages of Spreadsheet Design – **Input**, **Processing** and **Output** as outlined above.

WORKSHEET LAYOUT

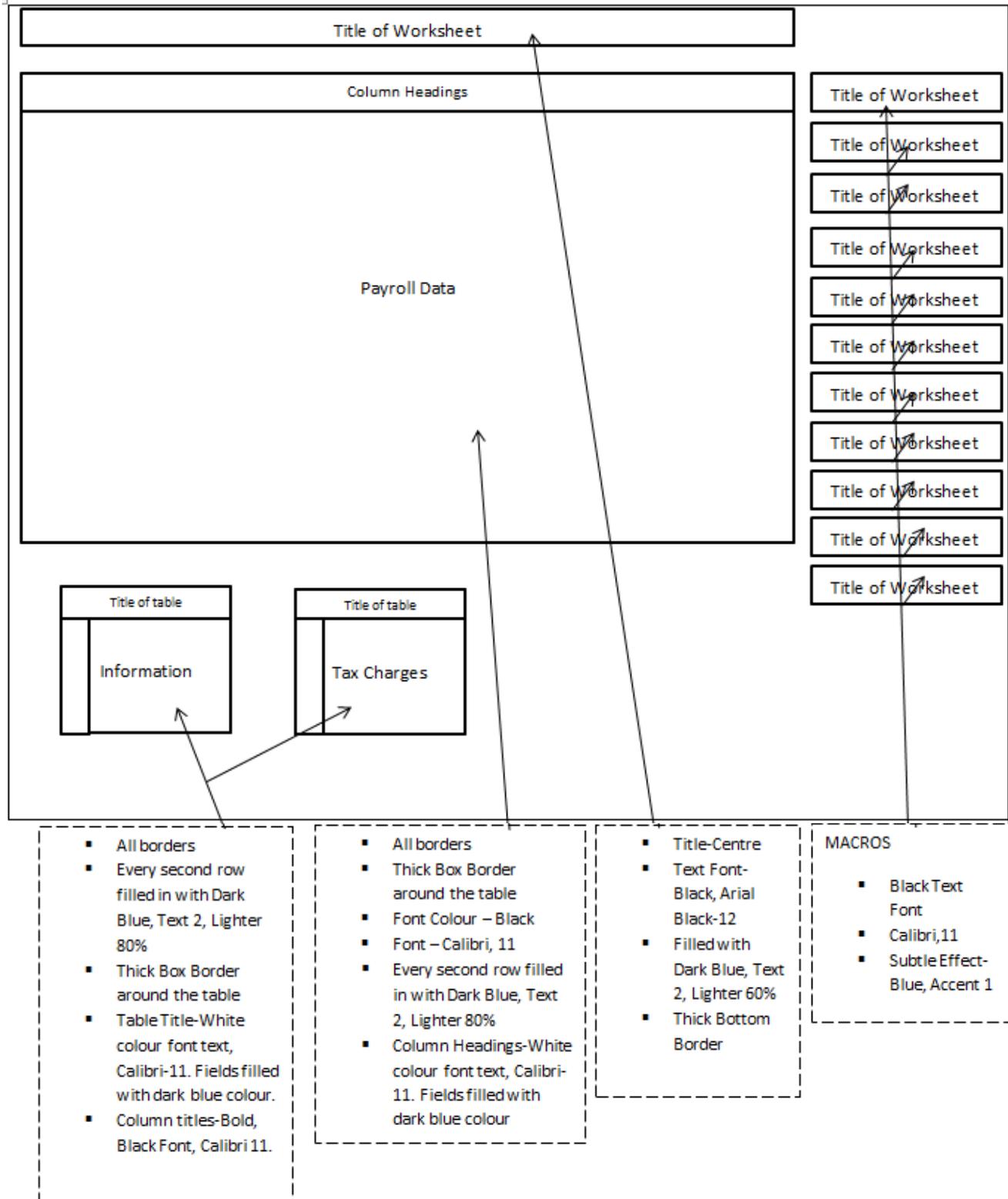
The layout of the data on a worksheet is a very important consideration in the design process. This should be decided before the data is inputted into the worksheet, in the format of a screen layout design.

Details included in this design should relate to the position of the information on the spreadsheet including details on any formatting that will be included. Specification of formatting could include: worksheet name, alignment, cell formats, column height and widths, font style, font size, font colour, location of borders (including the colour, style and weight), shading, page orientation, text direction, merged or wrapped cells, positions of images and macros.

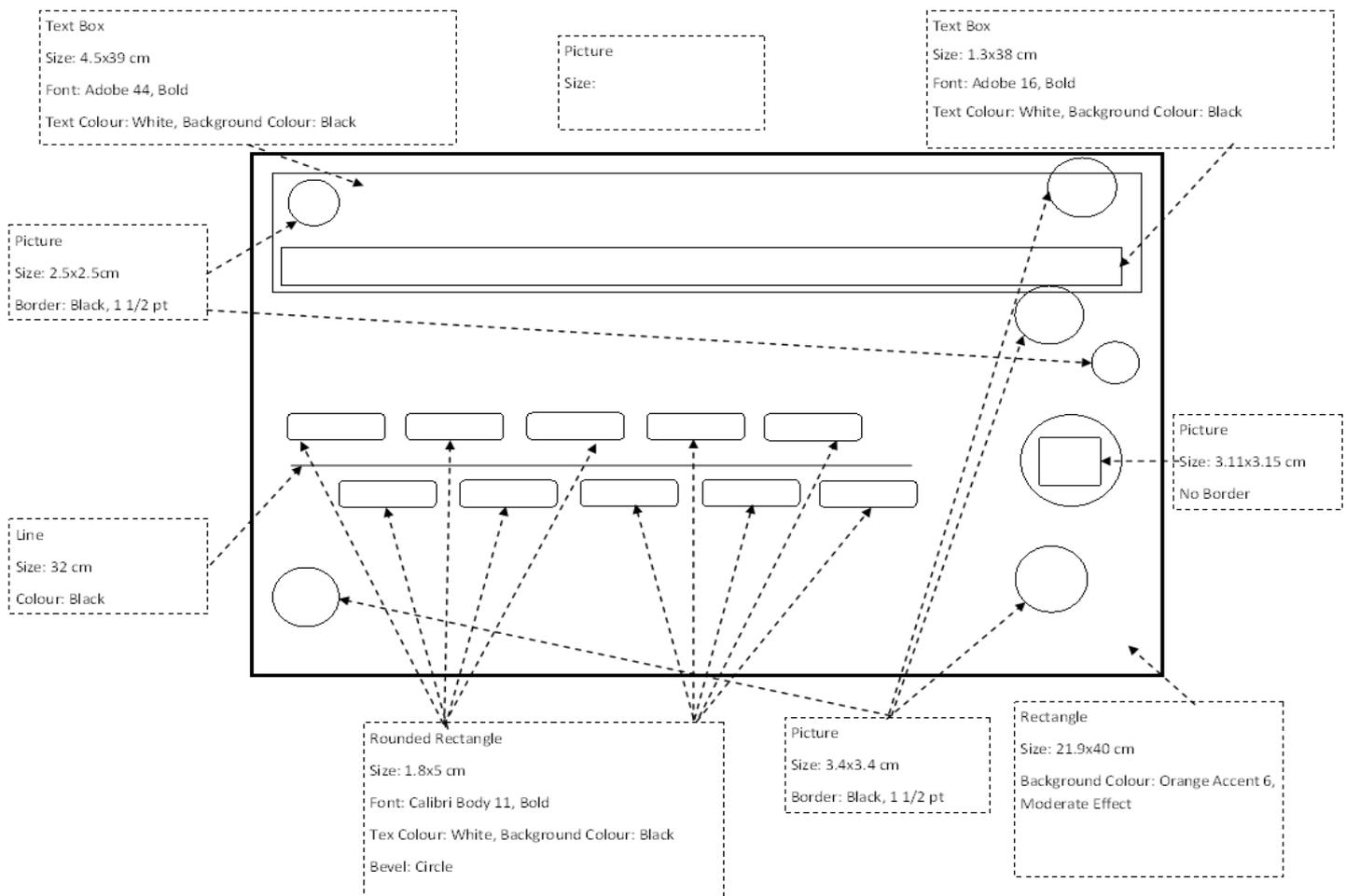
Notes:

The following are two examples of worksheet layouts, one for a payroll spreadsheet and the second from a home page.

Screen Layout of Payroll



Home Page Layout



4. EVALUATE SPREADSHEET AFTER IMPLEMENTATION

After any spread has been created it is vital to input test data from a data source. Critically analyse the spreadsheet from the point of view of an end user who has not seen the spreadsheet before.

Try to break the program. It is important to consider that every program ever written has errors, therefore you should be the first person to find the errors in yours and then debug those errors.

For the evaluation of your assignment it will be essential to create test data for an end user to enter, and then complete the testing by asking other users to enter the test data. Watch how they input the data and consider any improvements you could include helping their usage and understanding of the software. Ask them to evaluate the software by giving feedback on the strengths and weakness of the spreadsheet and asking for any suggested improvements.