Specifying Choosing and Implementing Computer Systems

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Contents

Specifying, choosing and implementing computer systems

3

Specifying, choosing and implementing computer systems

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After obtaining a Ph. D. in chemistry, I decided accountancy was to be my chosen career. I qualified with Price Waterhouse & Co .before joining the Boots Company PLC. I spent most of my working life in accounting systems, as an internal auditor and accounting services manager. While I was head of Accounting Services for the Industrial Division of the company I led the team which purchased Oracle Financials General Ledger and Accounts Payable modules for the division. I was then involved in the implementation of these modules, writing the manuals and training users.

The ideas documented in this book are based on this experience but should be equally applicable to the purchase of any computer system. They will also be relevant where systems are being written 'in-house' although more systems analysis work would be required.

I have written other books on internal audit (www.internalaudit.biz/) and managing information (http://www.managing-information.org.uk/).

Conventions used in the book

Spellings, date formats and terminology are based on UK practice, although I have used the US term 'vendors' for the computer system suppliers.

I have used the term 'computer systems' throughout the book, as opposed to 'applications' or programs'. I've done this because the book not only considers input and output but also the manual processes which surround the computer systems, since these may also have to be changed as a result of the new systems.

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Specifying, choosing and implementing computer systems

The aim of this book

The aim of this book is to provide some ideas as to how to specify requirements, choose a computer system and implement it. It is not intended to be a comprehensive manual detailing every stage of the process but it should provide enough detail to build on. These ideas are based on experience gained implementing Oracle Financials (part of Oracle's E-Business Suite) but the principles apply to the implementation of any package such as financial, stock control, point-of-sale, rocket launching or traffic monitoring.

This book does not consider hardware requirements, since these will vary widely across organisations, or project management techniques, since these would require a separate book! I have tried to base the ideas in the book around a practical example – that of a builders merchants. I have chosen the business as most readers will understand the basics of selling paint, screws, wood, cement and other materials.

The book is accompanied by examples of spreadsheets which might be used in the project.

Structure of this book

The book is divided into three parts

> ➢ Part A. Ideas about specifying, designing, choosing and implementing computer systems.
> ➢ Part B. Specifying and choosing computer systems-– example documents.
> ➢ Part C. Implementation of a computer system – example documents.

In part A references to examples are in part B are noted as (WP 1-2) where the first number is the section and the second the document. References to a spreadsheet are noted as (SS 2-1 Tasks), which is the title on the spreadsheet tab. Part B of this book has extracts from the spreadsheets, but these should be downloaded to understand their use.

Part A. Specifying, choosing and implementing

The principles behind the ideas

Most organisations, large and small, use computer systems and most will prefer to buy a 'package' system already written. This has the advantage that, 'what you see is what you get'. The problem is: how do you ensure 'what you get' is 'what you need'?

There are two parts to the solution:

1. Understanding what you need.
2. Ensuring what you get delivers what you need in the most efficient and effective manner.

This book is structured around these two parts:

1. Understanding what you need is determined by understanding the users objectives and the information required to achieve these objectives. Knowing the information required enables a choice of computer system to be made.
2. The computer systems you have purchased will be driven by screens used to input data or specify output. Thus the processes you design need to be determined by these screens. The idea suggested in this book is to write the detailed procedures manual around these screens, and their related tasks, as part of the implementation, not after it.

If you are building a computer system 'in house' the ideas in this book may still be helpful. Understanding the objectives and the information required will specify the data necessary, and therefore the databases to be built. Writing the detailed procedures manual based around the tasks will assist in determining the input and output screens required.

The stages

The stages for specifying, choosing and implementing are:

1. Establish the foundations:
   - Determine the aims of the systems you are about to purchase/design (WP 1-1).
   - Recruit a project manager, ideally full time, depending on the project.
   - Establish a 'Problems, issues and requirements database' (SS 1-7).
   - Hold an introductory meeting(s).
   - Hold an initial risk workshop to determine circumstances which threaten the successful delivery of the project.
   - Draw up an approximate timetable (SS 1-6 Plan).
   - Determine who will be affected by the new system – the users (also called stakeholders) (WP 1-9).
2. Question the users to define the output they require to achieve their objectives (SS 2-2).
3. Summarise and specify the requirements for the new system in terms of the output it is to produce and the input which is therefore required (WP 4-1).
4. Evaluate and choose the system which best meets your requirements (or design it).
5. Establish the technology to support the system.

Specifying, choosing and implementing computer systems

6. Make the system available to users.
7. Write the procedures manual (Section C)
8. Carry out user acceptance testing.
9. Train all users.
10. Implement the system (in parts if necessary).

Thus stages 1 to 4 are those which specify the information required and choose the system which can best supply it. Stages 5 to 10 are those which implement the chosen system.

Stage 1 - Establish the foundations

What is your aim?

The overall aims of the project should be specified by the project sponsor. In a small company this will probably be the owner or Managing Director. In a larger company the sponsor will probably be a director supported by senior management. The project sponsor (aided by other staff as necessary) should ask the following questions:

➢ When the system is in operation what do you want it to have achieved? What will have improved (WP 1-1)?
➢ What is the rough budget going to be?
➢ How long do you want it to take?
➢ Which systems will interface (that is pass output and/or receive input) with the proposed system. This should arise from the determination of input and output requirements but it's always good to have another view.
➢ What are the features of the current system? Document the current and proposed features (1-2). When the activities and tasks are documented, align the two (SS 2-1 Tasks) to ensure consistency and completeness. The 'Proposed new system' column is useful as it sets the general direction of the project and may highlight inconsistencies at an early stage.

Get the project sponsor to formally approve the aims, budget and timing when appropriate.

The Project Manager

A person to manage the delivery of the project is essential to ensure it is delivered on time and within budget. The Project Manager will not normally be the project sponsor. Qualities of the Project Manager are:

➢ Ideally full-time.
➢ Knows the organization, its procedures and people.
➢ Confident to work with computer systems and users.
➢ Diplomatic, assertive, friendly, open to learning and new ideas, able to motivate, calm, honest, realistic.
➢ Supported by the users (WP 1-3).
➢ Targeted with delivering the output required, within the time and budget specified in the documents approving the expenditure.
➢ Maintains a daily diary to record what worked and what didn't (WP 1-4)
➢ Maintains an index of meetings and their purpose (WP 1-5)
➢ Oversees the 'Problems, Issues and Requirements' (PIR) database (SS1-7).
➢ Maintains the risk registers (SS1-8, 1-9)

Specifying, choosing and implementing computer systems

> ➢ Structures the project and sets up a project plan (SS 1-6). Monitors this to ensure timely delivery (Not covered in this document).
> ➢ Regularly reports progress to the project sponsor and users.

The success of the project will depend on the abilities of the project manager - so choose carefully.

Establish a 'Problems, Issues and Requirements (PIR) database

On the project involving me, we established a 'Problems, issues and requirements' database which was maintained by the Systems Analyst. The intention was to capture any questions as soon as they occurred and make sure they were answered. Each PIR was uniquely numbered and contained the following data fields:

> ➢ The date raised
> ➢ Person raising the PIR or reference to the schedule it came from
> ➢ The problem, issue or requirement
> ➢ The relevant activity and task
> ➢ The person responsible for dealing with the PIR
> ➢ The answer to the question
> ➢ The date resolved
> ➢ Reference to the document which shows resolution of the PIR

If no database is considered necessary, a spreadsheet should be used. The problems, issues and requirements relate to actual circumstances which require action. The lists of risks (below) relate to circumstances which may occur and may need action to reduce their threat.

The users (stakeholders)

Having decided on what the project is to deliver, you should be in a position to decide which jobs are affected by the system. The people doing these jobs are the users. Users will be job holders who:

> ➢ Require information from the system to make decisions to assist them to achieve their objectives. (Don't forget users who may get data electronically from any system being replaced). (More information at www.managing-information.org.uk).
> ➢ Input data, either manually or electronically.
> ➢ Process information, prior to input.
> ➢ Implement the system (not strictly 'users' but we will consider them as such).
> ➢ Operate the system (may be an external company engaged to support the computer systems).

List the users' job titles together with their responsibilities and the tasks to which they relate (WP 1-3). At this point the related activity will be a 'best guess'. The actual activities will be identified in stage 2. The job titles are given a number which is later used to reference their objectives.

Hold an introductory meeting

A meeting (or meetings) of people who might be remotely affected by the new system should be held. Remember to include senior managers whose staff might be involved. Topics at the meeting should include:

> ➢ Why the new system is needed.
> ➢ What are its aims?
> ➢ What are its benefits?

9

Specifying, choosing and implementing computer systems

- ➢ How it will be implemented.
- ➢ Timescale.
- ➢ The support required from them.
- ➢ What are the activities and tasks involved? The detail will be determined in stage 2 but it's useful getting a high level view at this stage (SS 2-1 Tasks).
- ➢ What problems, issues and requirements do they foresee?
- ➢ Use this meeting to complete the current and proposed features (WP 1-2) document.

This meeting is an opportunity to get those people affected by the new system 'onside'.

Risk workshops

Risks may threaten the achievement of objectives in two ways:

- ➢ During implementation, cause the budget to be exceeded, implementation to be delayed and/or the requirements not to be delivered (SS 1-8).
- ➢ After implementation ('go live') result in a failure to deliver objectives, such as satisfying customers (SS 1-9).

The implementation risks are best determined by a risk workshop held at the start of the project, with the list being regularly updated in meetings of relevant users. This gives the opportunity to spot risks which may bring the project to a halt if not addressed.

The risks arising in the implemented systems should be determined when the objectives are clearly understood.

There may be some crossover between entries in the PIR and in the risk documents, since 'risks' could be defined as 'issues'. A means of differentiation is to consider risks as being circumstances in which a loss will occur, and which may require controls to be implemented, whereas an item on the PIR may just be a question answered when choosing the system. The distinction is not vital, since both types of 'issue' should be resolved.

Advice on holding a risk workshop can be found in book 1 at www.internalaudit.biz

Stage 2 – Determine the information required

Activities and tasks

'Activities' are high-level responsibilities such as buying, marketing and selling which aim to achieve the objectives of the organisation. 'Tasks' are sub-divisions of activities which are carried out by one person from start to finish, although a single task (such as shop sales) may be assigned to several people. Activities and tasks should be based on objectives to be achieved, not departmental structure, existing job responsibilities or current processes, since these may be inefficient and not suitable to operate the new computer systems.

Having got an overview of the requirements, you should be able to define the activities and tasks involved in the computer system (SS 2-1 Tasks) since this will help in identifying the requirements of the system, choosing the system and in implementing it. The proposed features of new system (WP 1-2) can be added to this spreadsheet, amended as necessary. As the project progresses the activities and tasks involved will be clarified and the spreadsheet updated.

The tasks on this spreadsheet will eventually be linked to the screens of the purchased system and provide planning for testing and training. Thus this spreadsheet spans both specification and implementation phases, while the requirements spreadsheet (SS 2-2) covers specification and choosing.

Objective and information requirements

This part of the project determines the information required from the system and therefore forms the basis of the requirements for the new system. The information required defines the database structure and the input necessary. It is the most important part of the project and will take time and care.

- ➢ Each user will need to be interviewed to:
    - o Determine their objectives, the decisions they need to make to achieve these objectives and the information they require to make those decisions (SS 2-2). The objectives are given a reference number which links them to the job (WP 1-3).
    - o Uniquely number each objective/decision/information to enable easy identification.
    - o Assess the significance ('S') of the information required (3=essential, 2= desirable 1 = wishful).
    - o Identify activities and the task within those activities as noted on SS 2-1. These will need to be updated as the project progresses.
    - o Obtain copies of existing reports that they receive. Ask them what improvements need to be made to these reports as well as new reports required.
    - o Obtain copies of any input documents used.
- ➢ Although the above information can be recorded in a word processed document, it is preferable to record it in a spreadsheet (SS 2-2), since it is much more easily manipulated. An example is downloadable from the website. Examples in this document are extracted from the spreadsheet.
- ➢ Allocate each objective/information combination to the activity/task which will fulfil the objective by producing the information.

Specifying, choosing and implementing computer systems

- ➢ Ask in particular about problems encountered (for example the use of different currencies, customers who have forgotten their credit card). Although you don't need to document procedures, you do need to understand the scenarios that the system will have to accommodate.
- ➢ Again think in terms of detail because that is at the end of the day what you're going to have to produce.
- ➢ It can be useful to draw up the format of the output which a user needs to fulfil one or more of their objectives (SS 2-3)
- ➢ Understand the risks affecting the output so that the management of these can be documented in the procedures. Risks and PIRs arising should be noted on the appropriate forms and referenced.
- ➢ The Tasks and Requirements spreadsheets should be updated throughout the project as you understand more of the requirements.

Stage 3 – Summarise and specify system requirements

Consolidate output requirements

This is a very important stage of the selection process. At this stage you should have one spreadsheet (SS 2-2) which brings together all the information requirements identified by the users and allocates these to the activities and tasks which will also have been identified. In order to produce a logical system it will probably be necessary to make changes to both activities/tasks (SS 2-1 Tasks) and objectives/information (SS 2-2). Some minor tasks (for example moving stock between locations) may not have been identified. It may also be useful to draw flowcharts to show how the tasks, information and databases are linked. (SS 3-1).

Since the software will be structured by activity/task the objectives/information data (SS 2-2) will be sorted by activity and task. It is this spreadsheet which will drive the selection of shortlisted software and the detailed testing of this software.

You may at this point be wondering why the Project Manager doesn't analyse the existing system and draw up the requirements from them without bothering about all the objectives. The problem with this approach is that it will just replicate the existing systems with a few improvements; there will be no allowance for the aspirations of users. In our example, we might not include the need to operate from several locations.

Purchasing software

You will now be in a position to understand what is required of the new system. The next stage is to put together about 10 essential requirements - that is the features the system should have without which you won't consider it (SS 4-1). This helps to eliminate some packages immediately and enables you to draw up a shortlist. These requirements should include cost. They should also include essential features which might not be standard in the packages being considered, for example: a separate despatch address for each invoice; the ability to generate suggested orders, taking into account supplier lead times.

These essential requirements can be extracted from the requirements spreadsheet by a small group representing the users.

12

Specifying, choosing and implementing computer systems

If you can't meet all the requirements of all the users you need to consider which will have to be dropped and discuss this with users in order to manage expectations. There may be alternative ways to produce the information they require, such as extraction into spreadsheets or other packages. This you can then build these in to the overall plan.

Developing software in-house
If you are building a system, you should now be able to design the database structure from the information requirements. The data items required for the output can be included as a column in the Requirements Spreadsheet (SS 2-2). These data items can then be linked to the users who are able to provide it. Knowing the data required and the users, you can design the input screens and test their practicality by writing the manual. Since you also know the users, you can design the technical infrastructure required.

Additional analysis
However, life isn't usually easy and some system requirements, and possibly users, may have been missed. For complex systems it may also be useful to:

> List all input forms currently in use and link these to related tasks
> List all output reports currently in use and link these to related tasks
> Document current systems to compare them with the proposed systems
> Reference the current input/output/systems to the proposed systems to ensure requirements are met.

The time you spend analysing the existing systems will depend on how closely you wish to replicate those systems. I would be reluctant to spend too much time, since you will be replacing them with something which is, hopefully, better. Concentrate on:

> Delivering information which will enable users to fulfil their objectives effectively (SS 2-2).
> Managing the risks which threaten the achievement of these objectives (SS 1-9).

Advantages of this method
This process of detailing output is very time consuming BUT:

> It will have to be done at some time.
> Users, and their requirements, are identified early in the project. They therefore will feel more involved and supportive. If any of their expectations will not be met, they can be managed.
> The method is based on the users' objectives, which should be clearly understood. It avoids the general question, 'What do you want from the new application' which users find too general, especially if they don't clearly understand what the application will do.
> The requirements are based on what users need to achieve their objectives, not what is done at present plus a few enhancements. It may therefore result in requirements not usually specified, such as materials asked for by customers but not sold.
> The earlier that planning is done, the more time that is saved later in the project making adjustments for requirements missed in the initial planning.
> There is a greater chance of the application you choose meeting your requirements and, just as important, you will know where it doesn't.

13

Stage 4 - Choosing a system

Advice

It is not the purpose of this website/book to cover this subject in detail because there are so many options depending on the size of organization, technical requirements, budget etc.

Based on experience, I suggest you consider the following:

➢ If you haven't already done so, recruit a project manager to lead the selection team. How to plan projects (critical path analysis for example) is outside the scope of this book.

➢ Form a small selection team (less than 10) from the users who will be most affected by the new system.

➢ Be clear on your objectives and requirements (see above)

➢ Get the users to approve the requirements (SS 2-2) and Essential Requirements (SS 4-1).

➢ Check that risks likely to affect the implementation (SS 1-8) have been identified.

➢ The selection team now examines the requirements (SS 2-2) and pulls out those which are considered essential. These are numbered and copied onto an evaluation sheet (SS 4-1)

➢ Your choice of software vendors will depend on your requirements. Be prepared to have a 'long list' of vendors which you can quickly reduce to a 'short list' by checking whether they can deliver your essential requirements.

➢ Understand 'vendorspeak': A 'bug' is an issue the vendor will fix; a 'feature' is an issue which the vendor won't fix.

➢ Check if the software has a user group. What are its current requests? How quick is the response to requests? Can you ask members of the group?

➢ If you are dealing with a small vendor, check their accounts for financial stability.

Drawing up a 'Long list' of software vendors

Where to find software vendors selling the computer system you require? Starting points are:

➢ A web search.

➢ Trade associations and their publications.

➢ Contact with other companies in the same business as yours.

➢ If you have a software supplier (in our example, Belper Software Ltd.) ask them for suggestions.

Reducing the long list to a short list

You should have identified about 10 essential requirements (SS 4-1). You will now need to check if the vendor's system will deliver these. This could be done by:

➢ Checking the vendor's website and documentation. This isn't ideal as these may omit information and be over optimistic about what the system will deliver.

➢ A phone call with a vendor's salesman.

➢ A presentation from a salesman. This can be time-consuming and is best left to shortlisted vendors.

➢ Using trial software. Again, this can be time-consuming and is best left to shortlisted vendors.

Choosing the best system from the short list

➢ Ideally there should be about three vendors on this list, since you may have to spend several days evaluating each one.

Specifying, choosing and implementing computer systems

- You may have already had one presentation from the shortlisted vendor as part of the 'long list' reduction. You will now need much more detail.
- Your choice of software vendors will depend on your requirements. They should carry out a presentation of their systems. Ideally visit their offices for this; it will give you an idea about how they operate.
- Evaluation will be against a series of requirements based on the output requirements you have identified, ordered by activity/task. SS2-2 is used to drive this part of the process..
- Prior to the presentation, send the vendor the list of requirements and scenarios which will affect the system. Require an actual demonstration to ensure the system meets these requirements. Be wary of salespeople assuring you that your requirements will be met without a demonstration.
- Set up example input forms to take to the evaluation. In our example these should include; item set up; location set up; supplier set up; order details; typical items; typical payments. The aim, as far as possible, should be to operate the system as it would be operated in your business.
- Take examples of the output forms to check if these can be produced.
- If possible, get a trial system to really check its suitability. If so, formally document your tests and their results.
- If you can, visit installations already in operation.
- If none are able to meet your requirements, consider picking other suitable candidates from the long list. Otherwise you will have to examine the requirements which can't be met and consider if there are 'work arounds' to meet them.

The implementation stages

The software has been chosen. Your project manager (you?) will hopefully set up a project plan which details what needs to be delivered, and when. This plan should include:

- As appropriate, writing programs, spreadsheets and databases to deliver the functionality required. This work is outside the scope of this document.
- Establishing the technology to support the system (Stage 5)
- Setting up a test system which is available to users in order to experiment. This system may have to be replaced at regular intervals to keep it consistent with the 'live' system as this is developed. (Stage 6).
- Setting out the structure of the procedures manual and planning its completion (Stage 7).
- Documenting the input. (Stage 7)
- Documenting the processes around the system (Stage 7).
- Documenting the output (Stage 7).
- User acceptance testing (Stage 8).
- Training (Stage 9).
- 'Go live' date (Stage 10).
- Holding regular meetings to assess current risks to the project (SS 1-8).

Stage 5 - Establish technology

Having chosen, or designed, the system, the technology infrastructure (PCs, servers, wiring, EPOS terminals) should be defined and a plan drawn up for the required implementation. (Further detail is outside the scope of this book).

The hardware should be installed as soon as possible, in order that it can be tested alongside the software.

Stage 6 - Make the system available to users

In practice this stage will run in parallel with stage 7, which involve documenting the system. It should be complete before user acceptance testing (stage 8) starts. It is an important stage because the earlier users can try out the system; the earlier problems can be found and corrected. It should also give users more confidence in the system.

The aim is to start with a small core of representative users who have been involved in the selection process and gradually increase the number until all users are involved.

Whether the system is purchased, or being developed in house, users should be encouraged to experiment and try out all the scenarios the system will have to handle. Ideally they should note what they do and the results. Tell them that it doesn't matter if they crash the system; just remember how they did it!

Stage 7 -Write the Procedures Manual

What it is

The Procedures Manual is at the core of the ideas outlined in this book. I believe it helped the team I worked in implement Oracle Financials General Ledger with very few problems. The Procedures Manual details all of the tasks required to produce the desired output. With most systems implementations it is written just before (or after) the system is implemented with the reasoning that you can't write a detailed procedures manual until you have established the detailed procedures!

However, I worked on the principle that you have bought the system and therefore there is no point in spending time analysing it and trying to fit it into your existing systems. You start with the system you have purchased and build out from that. This is done by linking the input screens to the tasks you have identified, changing these as necessary. The procedures manual is then written around each task. By writing the procedures manual as part of the design process you force out the issues early in the implementation. As you may know, when it comes to systems implementation, 'The devil is in the detail'.

(You wouldn't by a microwaveable meal and then read recipe books about how to cook the individual items. You would read the label to check it conforms to your requirements and cook it as instructed.)

Basic structure of the manual (see example section C)

- ➢ The manual is split into discrete sections, one for each task. Each section has pages detailing the work required to: input data; process data around input screens; or produce output. Sections involving complex operations may have an introduction with a flow chart. Each section is cross referenced to others, for example when a process (such as receiving invoices) feeds into another (input of those invoices). Users only need access to parts of the manual which affect their responsibilities.
- ➢ There is a problem: *people don't read manuals*. The solutions:
    - o Make it worthwhile the users to use it. So use it in systems design, user acceptance testing, training before 'go live', and training for new staff when the system is in operation (induction training).
    - o Only provide parts of the manual relevant to the user's job. (This is the reason for splitting the manual into tasks).
    - o Divide the manual in such a way as to make it easily accessible.
    - o Ensure the users using the manual approve their parts, as part of user acceptance testing.
- ➢ This manual is distinct from any manual (or help screens) produced by the vendor which relates to how the software is used.
- ➢ As each section of the manual is completed, it is discussed in a meeting with those users directly affected in order to ensure it is complete, accurate and understandable.
- ➢ The manual needs to be written by someone very familiar with the software and users' requirements.
- ➢ Where the system is being developed 'in house', the manual could be written alongside (or even before) programming commenced. It would then form the basis for database structure and program design.
- ➢ The manual starts with a summary of activities and tasks which are referenced to the detailed sections
- ➢ Sections of the manual which relate to input screens only used during initial set-up should be written to ensure the process is understood, but they need not be included in the final manual.

Advantages of this methodology

- ➢ It forces consideration of most (if not all) of the detail early in the implementation. So, hopefully, no late surprises requiring last minute changes.
- ➢ It should not be necessary to document existing systems in detail.
- ➢ It gives the users an early opportunity to check that their requirements are being fulfilled.
- ➢ Processes can't be forgotten (for example, who's going to provide foreign currency rates?).
- ➢ The relevant sections of the manual can be used as a basis for user acceptance testing, which not only tests whether the system works as expected but that the manual is correct.
- ➢ In training, the relevant sections of the manual can be given to the user with examples of the documentation used for input (invoices, overtime worked, stock dispatched). This makes the user familiar with the manual, is efficient (no separate training manual) and checks the correctness of the manual.
- ➢ It provides an opportunity to address the 'Problems, issues and requirements' noted in the database.
- ➢ The procedures manual is available on the 'go live' date.

Categorize input screens

There will be many input screens, some being used only during implementation. So it is useful to group them:

> **Setup screens:** Only used to set up the system. They can define the structure of the database and are therefore unlikely to be used after setup. Only a few senior users need access. Examples include: account code structure.
> **Infrequent standing data changes**. Rarely used and possibly having major significance. Only a few senior users need access. Examples include: the accounting calendar; tax rates; new currencies, new stock locations, new departments. ('Standing data' is used to allocate transaction data (by customer, for example) or for calculations (foreign exchange rates)).
> **Regular standing data changes**. Updated, usually monthly. Access will vary with responsibilities. Examples include: currency rates.
> **Frequent standing data changes**. Occur often and when required. Access will vary with responsibilities. Examples include: new customers; new suppliers (vendors): new stock items.
> **Transaction data**. Usually daily input and high volume. May also come from electronic transfers. Examples include: orders; invoices; stock movement; cash received; time worked.
> **Output**. Reports, usually on screen but can be printed, which are pre-programmed (cash taken by each checkout) or user defined as a result of queries (orders outstanding from a particular supplier).

While grouping the input screens in this way is not essential, it does assist understanding the system and aids linking the screens with the task(s)

Document how data is input

The tasks (SS 2-1) are now linked to the input screens (SS 10) required to complete the task. The input screens are also referenced to the task in order to ensure all input screens have tasks associated with them, unless the input is not required (for example foreign currency rates). New tasks may be identified at this important stage. The processes to complete the task are now documented in the procedures manual. The general principles are:

> Each task has a section in the manual.
> Each task is linked to the job(s) responsible for completing it.
> Tasks are not split between jobs. This is to ensure that when a user is given the section(s) of the manual relevant to their job, no other user is responsible for carrying out any part of the task. Thus one user can focus on the whole task. Note that one task can be carried out by several users. For example a shop sale can be carried out by any of the shop staff, but the task only needs one of the shop staff to complete it.
> Tasks involving several screens will have an introduction.
> Each input screen has a page(s) in the section of the manual.
> The document should anticipate the risks arising from incomplete or inaccurate data and cover suitable management, for example edit checks.
> Every field in every input screen therefore has instructions concerning the source of the data to be input.

Specifying, choosing and implementing computer systems

Example documents are provided in the manual (Section C). The sections of the screen input instructions are:

Title of task

Purpose:	Objective of the task detailed in these instructions		
Responsibility:	Job titles of users carrying out the task	Task code: Code of the task (three capital letters)	Page X of Y Page number and total pages *within* this task
Screen:	Screen name (and short code)		
Input	Field Title	Instruction	Output
Processes preceding the task which feed data into the task, including documents	Title of the field as shown on the input screen	Data to key in to the field. Indicates if options are available and any special considerations	Code of tasks which follow on from this one, including output screens, further input screens or screens to be used if standing data is missing.

By setting up this document as soon as the system is purchased, issues should be forced out early on in the implementation. For example:

- ➤ Who will input into each screen?
- ➤ If a screen has only one user, what happens if they are unavailable?
- ➤ Where does the data come from which is required to complete this field?
- ➤ What happens if the standing data necessary in a drop down list is not present?
- ➤ Which VAT option do I choose?

Document the procedures
Where input is manual (that is input into a screen from a document or bar-coded item), a process is required to bring that document to the relevant screen efficiently and effectively. Examples include:

- ➤ Sorting the mail.
- ➤ Banking of cash and cheques (checks).
- ➤ Receiving of goods by the store.
- ➤ Processing customer returns.

Specifying, choosing and implementing computer systems

The basis of this methodology is that these procedures are driven by the input (or output) screens not by 'what we do at the moment'. This should ensure maximum efficiency and eliminate the need to document the existing systems in detail. (It might be beneficial to document existing systems at a high level prior to purchase/design to ensure all users and output is identified).

As with input, each process should be documented by individual task such that it covers one job holder's responsibilities (although there may be more than one person doing that job, for example check-out operator). In this way, as with input, the sections of the manual relevant to a specific job can be given to the job holder(s).

As part of documenting the procedures you will need to consider the risks which threaten the objectives of each procedure and the ways of managing them. For example the risk that you take payment from a fraudulent credit card threatens your objective of maintaining profits. You might manage this by checking the address the goods are sent to agrees to the address of the card holder.

Document the procedures necessary to supply output.

While some output (especially electronic output) will be generated automatically from batch programs, most output will be produced from screens, either as a result of queries or from standard reports chosen from a menu.

The documentation has a form similar to that used for input.

Where reports are required on a regular basis (daily, weekly, monthly), a check-list should be written to ensure all are produced when required.

Stage 8 - Carry out user acceptance testing

At this stage, the detailed procedures manual should be complete for a purchased or in-house system, except for any amendments resulting from testing and training.

UAT is the equivalent of a dress rehearsal in the theatre. It is not the opportunity to discover that Romeo hasn't learnt his lines; the nurse's costume doesn't fit and the balcony wobbles alarmingly when Juliet steps onto it.

An in-house developed system should have been subject to internal testing (alpha testing) to ensure all problems have been resolved. Users should not be presented with software containing known 'bugs' as it will just undermine their confidence in the system.

User acceptance testing (UAT) requires:

- ➢ A technical infrastructure which has been tested.
- ➢ Example data covering all situations (scenarios) which will be encountered.
- ➢ Evaluation of all the risks which could occur during input (that is incomplete or inaccurate data). These situations should have been anticipated during the documentation of input for the manual.
- ➢ The relevant section of the manual, copied into a spreadsheet (8 UAT)
- ➢ Prediction of the output.
- ➢ Input of example data.

20

Specifying, choosing and implementing computer systems

➢ Written amendment of the manual where it is incorrect or unclear.
➢ Checking of the predicted output against actual output.
➢ Documentation of all the above.
➢ Formal approval by the responsible user for the process involved.

UAT is based on the input forms in the manual, copied into a spreadsheet where full details of the test and results can be recorded (SS 8 - UAT). Exceptions found are noted on the PIR database (SS 2-3 PIR).

Whenever a program is amended, user acceptance testing should be repeated for all processes which could be affected by the amendment. (That's why late amendments should be avoided – the UAT can take more time than the amendment).

The manual should be amended as a result of comments from testers.

Stage 9 - Train all users

When UAT is complete, all users will need to be trained to use their processes. Since training revolves round the tasks the user will be carrying out, the Task Database (SS 2-1 Tasks) can be used for planning.

The basic format of training is:

➢ Instruction in the use of the software: Logging on; moving around the screen; access to help screens; action if the system 'freezes.
➢ Copy (or obtain) typical and exceptional items for input (invoices, time sheets, non-bar-coded goods, new employee forms).
➢ Provide to the trainee the copy forms, or items
➢ Provide the relevant section(s) of the manual.
➢ Demonstrate how to input data from the forms, using the manual as a basis. Cover exceptional circumstances (for example, refusal of a credit card).
➢ Let the trainee input data, with reference to the manual, under supervision of the trainer.
➢ Allow the trainee to input with further examples, asking questions if necessary.
➢ Ask the trainee for feedback on the manual.
➢ Record the date of final training on the Task database (SS 2-1 Tasks).

Stage 10 - Implement the system (in parts if necessary).

If the system is to be implemented in parts, the Task database (SS 2-1 Tasks).can be used the dates of go-live.

On the 'go live' date and until the system is operating without problems:

➢ Project manager and all stakeholder users to provide support to new users.
➢ Appointment of a Systems Administrator to maintain some standing data, such as access and passwords, plus liaison with the company providing software services. (Depends on size of organization implementing the systems).
➢ Establish a central help desk to answer users' queries.

Specifying, choosing and implementing computer systems

- ➢ At the end of the first day, ask users how they feel about the new procedures. Formally record their comments.
- ➢ Review the previous day's successes and problems early on the following day. Take action as necessary, for example modify procedures and change the manual.
- ➢ After 6 weeks (so one month-end has passed) formally review the project. Did it deliver the expected output/functionality on time and within budget? Note learnings for future projects.

Regular risk assessment meetings

As already mentioned a 'Risk Workshop' of all the users should be held in order to identify:

- ➢ The opportunities which may arise to benefit the achievement of the objectives (for example: major improvements to the software, beneficial changes to the output required).
- ➢ The risks which may arise to threaten the achievement of the objectives (for example: loss of key staff, adverse changes to the output required).
- ➢ The risks and opportunities should be documented, scored in some way to order them in terms of importance and the means of managing them recorded.
- ➢ This list should be examined by a group of users at least monthly to update the opportunities/risks and take action as appropriate..

Parts 2 and 3 - The examples

The example documentation which follows is based on a fictitious builders merchant. My own experience comes from implementing Oracle Financials general ledger and accounts payable but I wanted a less specialist example which would be understood by most readers. The Tasks and Requirements documents are not based on practice, since GL and AP have relatively standardised reporting which we were able to check thoroughly on an Oracle test system before purchase. The detailed procedures manual is based on that I developed for the GL and AP implementations and which worked well.

Note that the examples are not complete – they are examples.

Part B Example documentation

Index to example pages				
Stage		*Page title*	*This doc*	*Spreadsheet*
		Background to the company	Org chart	Org chart
1	Aim	Aim of the new system	1-1	
		Proposed features of the new system	1-2	
	Users	The users	1-3	
	Project Manager	Project manager diary	1-4	
		Project manager meetings	1-5	
		Plan	1-6 extract	1-6 Plan
		Problems, issues and requirements	1-7 extract	1-7 PIR
		Risks affecting project delivery	1-8 extract	1-8 Risks Del
		Risks affecting the implemented project	1-9 extract	1-9 Risks Imp
2	Specify output	Activities and Tasks database	2-1	2-1 Tasks
		Requirements database	2-2	2-2 Requirements
		Required reports templates	2-3	2-3 Reports
3	Summaries	Flow chart	3-1	3-1 Flowchart
4	Choosing	Evaluation –Essential requirements	4-1	4-1 Essential
		Evaluation – Scenarios for short listed vendors	2-2	2-2 Requirements
		Evaluation – Evaluation of applications	2-2	2-2 Requirements

7	Procedures	Screens	7	7 Screens
24		Manual - Personal sales (SCO) flowchart	7	7 SCO flowchart
		Detailed procedures manual	Manual	
8	UAT	User Acceptance Testing	8	8 UAT
9	Train		2-1	2-1 Tasks
10	Implementation	Implementation by task		2-1 Tasks

Background to the company

(Useful to provide this to vendors as part of the system requirements document)

Bloggs & Co. is a builders merchants based in Buxton, Derbyshire, UK. It was established by Fred Bloggs in 1980 and has now been passed to his daughter, Elizabeth Smith (Mrs) who is the Managing Director.

The company has one shop with a store behind for goods not kept in the shop and an adjacent yard. The shop and store stock paint, tools, clothing and hardware while the yard has bricks, paving, cement and aggregates (gravel, stones). Items may be self-selected in the shop or requested from the store. An invoice is hand written for each sale. The yard materials are ordered in the shop and an invoice copy taken to the yard for collection. All items may be ordered for delivery by phone. Invoices may be paid at the counter by cash or credit card. If customers have an account, they sign an invoice copy as proof of receipt which goes to Accounts Receivable.

Mrs Smith is the project sponsor who wishes to expand the company into other locations and introduce computer systems. Currently the only computer system is in the accounts department. The Sage software has General Ledger, Accounts Payable and Accounts Receivable. The computer system is maintained by a small local company (Belper Software Ltd.) who will be involved in the choice of software.

The company has 16 employees (organization chart below).

(I've used a small company as it makes the example easier. The principles apply to any size of organization).

M. D.
(Elizabeth Smith)

P.A. to Mrs Smith plus HR and Payroll
(Jane Carter)

Buyer
(John Jones)

Shop and Yard Manager
(Bert Stiles)

Accountant
(Helen Rice)

Assistant Buyer
(Heather Watson)

Shop
and yard staff

Accounts Payable Clerk
(David Morgan)

Delivery Drivers (2)

Accounts Receivable Clerk
(Ruth Hunter)
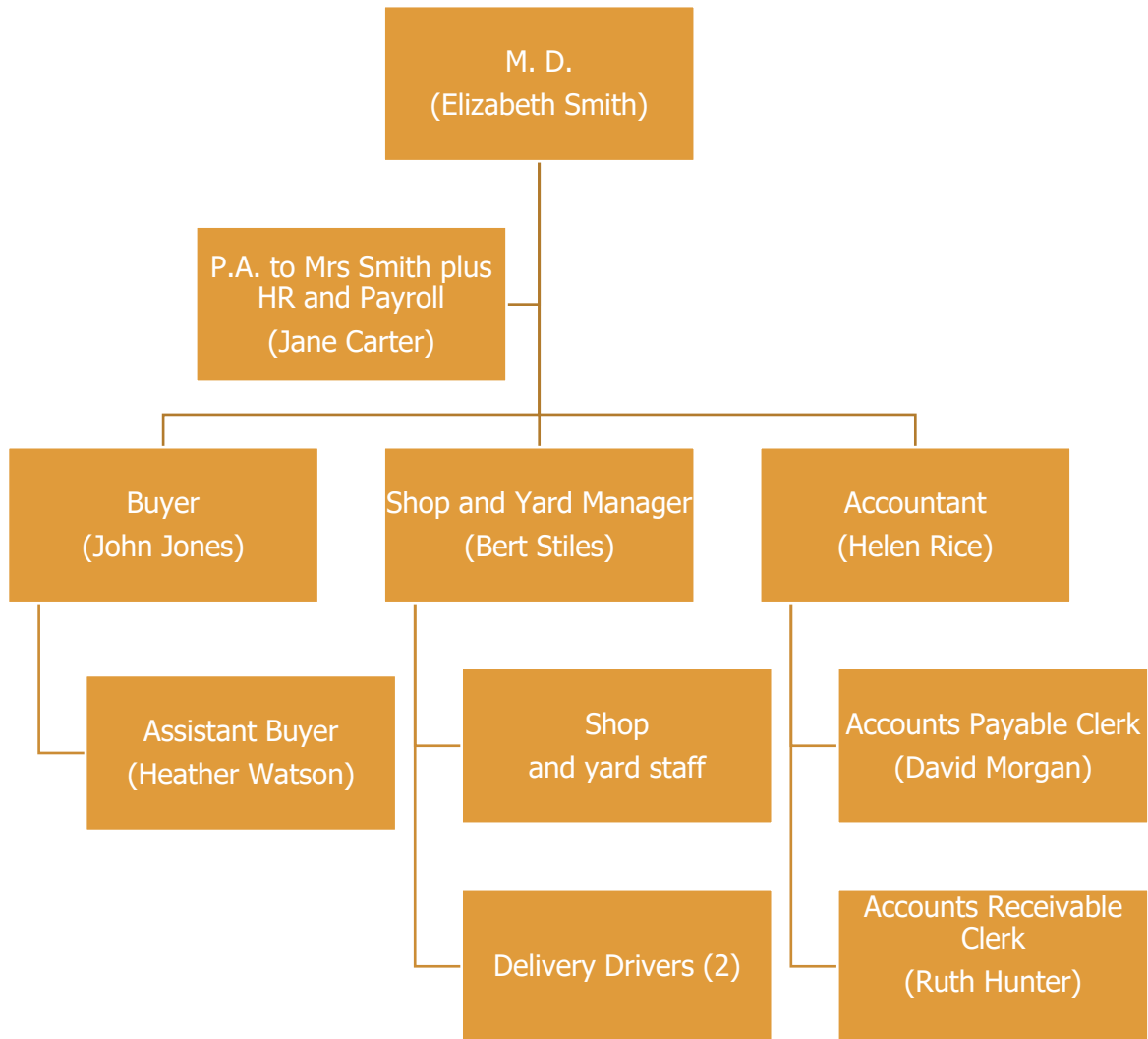
Stage 1 - Establish the Foundations

1-1 Aims of the new system		
Aims	**Notes**	**Objective (SS2-2)**
The Project Sponsor, Mrs Smith has noted the following aims for the new system:		
To assist in expanding the business into other locations, such as North Derby		1.1
'To drag the business into the 21st century'	(This project is a part of this objective)	
To maximise profits		1.2
To record all sales, using product barcodes. Sales may be paid by cash, credit card or account. Ideally account details should be passed electronically to accounts receivable.		4.1
To record stock received, with details passed to accounts payable.		4.7
To value stock at cost for accounting purposes		7.1
To produce despatch notes for picking and delivery		4.1
It is hoped that the system can be implemented in six months at a budget not exceeding £50,000, including new computer equipment. but excluding additional staff costs	Project Manager to deliver this objective!	1.3
(This page lists the aims of the project. These would normally come from board approval documents justifying the expenditure. In small businesses the owner sets out the aims. These aims are linked to the stage 2 objectives to ensure they are included in the essential requirements.)		
(In this and subsequent pages notes are made by the Project Manager for future reference. The reference column is used to note the document page number to which the notes are carried forward)		

27

Stage 1 - Establish the Foundations

1-2 Proposed features of the new system (copied to SS 2-1 Tasks)		
Activity	**Current system**	**Proposed new system**
Buying	New products are identified from suppliers' representatives and promotional literature.	As current plus reports of new items requested by customers
Buying	Cost prices fixed by supplier	It would be useful to know total unit sales in order to negotiate discounts
Buying	N/A	Supplier details input in computer
Buying	N/A	Item details input in computer prior to first order being placed
Buying	Retail prices are usually those recommended by the supplier or cost plus a fixed mark-up	Need to know total profit by item in order to assess how a change in the retail price affects profitability
Buying	Stock running low is noted on blackboards in the shop and yard. The Assistant Buyer checks these daily and orders as appropriate.	Some form of automatic ordering based on stock levels, units sold, minimum order quantity and lead times would be useful
Buying	Paper order written out and posted to supplier	Order created on the computer with option of e-mailing to supplier
Buying	Unfulfilled orders are held in a paper file	Report required of overdue orders
Buying	Products no longer available are identified from suppliers' representatives.	As current plus reports on slow moving stock.
Stock	Goods unloaded from lorry and put in 'usual' place (shop, store or yard). Delivery noted checked, signed and sent to Accounts Payable.	Goods unloaded and put in 'bin'. Goods received matched to order, stock records updated, details passed electronically to Accounts Payable.
Stock	No stock records	Sales update stock records
Stock	No record of stock by location	When stock is moved (for example from store to shop shelves) item records need to be updated
Stock	No record of stock quantities	Regular physical counts to check stock quantities are correct. Stock to be adjusted on computer.

1-2 Proposed features of the new system (copied to SS 2-1 Tasks)

Sales	Customer selects goods in shop or asks for goods in store. Orders goods available in yard (timber, bricks, aggregates). Multi-part invoice manually prepared, priced from price sticker on goods or price lists. Totals and VAT calculated. Top invoice copy to customer, second and third to yard (and delivery driver) fourth to Accounts Receivable.	Customer selects goods in shop and asks for goods held in store, which are priced from barcode. Other goods selected from screen on till (search function and pictures would be useful). Totals and VAT calculated by computer. Customer account allocated on screen with credit check. Four part invoice printed. Sale passed electronically to sales ledger (Accounts Receivable).
Sales	Second and third invoice copies given to yard staff. Goods may be taken by customer or delivered.	Second and third invoice copies given to yard staff. Goods may be taken by customer or delivered.
Sales	Orders phoned in. Order noted on invoice set and passed to shop and yard for assembly, prior to loading on lorry.	Longer term, orders received via an app on customer's phone. Invoice set printed for assembly as current.
Sales	Stock returned is checked, a credit note written out and copy sent to Accounts Receivable.	Stock returned is checked and details entered into the system. Credit note printed out, copy given to Customer, stock updated. Credit passed electronically to Accounts Receivable.
Delivery	Lorry loaded. Second and third invoice copies given to delivery driver by yard staff.	Lorry loaded. Second and third invoice copies given to delivery driver by yard staff.
Delivery	Delivery driver given two invoice copies. Gets one signed on delivery leaves the other with the customer. Signed copy returned to Accounts Receivable.	Delivery driver given two invoice copies. Gets one signed on delivery leaves the other with the customer. Signed copy returned to Accounts Receivable.
Hardware	Computer systems limited to Sage Accounting software in company office plus office software.	Computers will also be installed at the shop counter and in the yard office.
Software	N/A	Obtain trial software from shortlisted vendors and aim to set up the system required.
Set up application	N/A	This data (such as account code structure) is input during set up and never changed
Set up application	N/A	Data input is required on a regular basis such as monthly or annually

Stage 1 - Establish the Foundations

1-3 Users				1-3
Job No.	**Job title**	**Responsibilities/Objectives**	**Related activity**	**Job Holder**
1	Managing Director	Overall responsibility for the proper operation of the company	Management	Elizabeth Smith
2	Buyer Project Manager Systems Administrator	Identifying new products	Buying	John Jones
		Negotiating prices	Buying	
		Setting retail prices	Buying	
		Approving orders	Buying	
12	Project Manager	Deliver project	Project Man.	
10	Systems Administrator	Access control and liaison with system Vendor and Belper Software	Sys Admin	
3	Assistant Buyer (deputising for Buyer)	Generating orders	Buying	Heather Watson
4	Shop and Yard Manager	Meeting customers' needs	Buying	Bert Stiles
		Requesting stock	Buying	
		Ensure proper operation of yard and shop	Management	
5	Shop and Yard staff	Serving customers	Sales	David Jones, Ali Khan, Jo Nyall, Ann Harper, George Smith, Wayne Dyer
		Receiving and storing stock	Sales	
		Loading lorries	Sales	
6	Delivery drivers	Loading lorries	Delivery	Ken Walker, Alison Dyer
		Driving lorries	Delivery	

Stage 1 - Establish the Foundations

		Offloading at site	Delivery	
31				
7	Accountant	Production of monthly accounts	Accounts	Helen Rice
		Production of statutory accounts	Accounts	
		VAT return	Accounts	
		Credit Control	Sales	
		Banking cash	Cash and banking	
		Payments to suppliers	Payments	
8	Accounts Payable Clerk	Maintaining purchase ledger	Accounts	David Morgan
		Generating cheques/direct transfers	Accounts	
9	Accounts Receivable Clerk	Maintaining sales ledger	Accounts	Ruth Hunter
		Receipt of cash	Cash and banking	
11	Belper Software Ltd.	Installation of the new application, plus associated hardware. Ongoing maintenance.	Software installation Hardware installation	Greg Bentham
(The job responsibilities will be copied from formal job descriptions, where they exist. Activities may be added and amended as the project progresses – they are a means of classifying evaluation testing.)				

Stage 1 - Establish the Foundations

The Buyer, John Jones, has been appointed Project Manager. His workload will be split between the M.D. and the Assistant Buyer. John will retain some responsibilities, such as setting up new users, as the Systems Administrator after implementation.

1-4 Project Manager Diary			1-4/1
Date	**Diary**	**Lessons & notes**	**Ref**
11/1/20XX	Start of project! Met with Elizabeth to discuss the overall aims for the new sale and stock application plus her specific requirements for output	Rough budget of £50,000. We'll have a better idea when we start talking to software vendors.	WP 1-1 WP 1-2
12/1/20XX	Held meeting with all staff likely to be affected. Outlined the aims and how I would involve them. Generally well received though some concerns about refusing account customers with overdue debts. Completed the 'Proposed features of new system' form. Completed output forms for my requirements as a buyer. Discussed these with Heather. Also completed forms for her requirements. Started to research possible software applications	Need many reports. Hopefully these will be standard. Some issues raised	1-2 (Spreadsheet of Output reports) 1-7/1 & 1-9/1
13/1/20XX	Completed output forms with Bert Stiles and then his staff.	The shop and yard have the most complex requirements. Bert will need to be closely involved with Vendor demonstrations.	SS 2-2 Requirements
14/1/20XX	Completed output forms for delivery drivers.	Generally confirmed what Bert identified. Some Implementation risks identified	SS 2-2 Requirements 1-9/2&3

15/1/20XX	Completed output forms with Helen (accountant). Started to arrange vendor presentations of their software	Valuation of stock may be an issue	SS 2-2 Requirements
18/1/20XX	Held first Risk Workshop	Some discussion about what's the difference between a 'risk' and an 'Issue'. Promised to think about it!	SS 1-8
	(Diary continues)		
20/3/20XX	Meeting with Bert Stiles and Ali Khan to discuss section SCO (shop sales).	Need to include what to do if credit card refused.	Manual SCO
(This page records significant events in the life of the project, with any lessons to be learnt from those events)			

Stage 1 - Establish the Foundations

1-5 Project Manager Meetings index			1-5/
Date	**Attendees**	**Purpose**	**Ref**
11/1/20XX	Mrs. Smith	Define aims of project, specify output	1-1 SS 2-2
12/1/20XX	All stakeholders	First meeting to talk about the project	
13/1/20XX	Heather Watson	Complete forms detailing required output for buyer and Assistant Buyer	SS 2-2
14/1/20XX	Elizabeth Smith, Bert Stiles, Helen Rice, Ali Khan	Risk Management workshop to identify the risks threatening the delivery of the project	SS 1-8
	(Further entries here)		
20/3/20XX	Bert Stiles Ali Khan	Check section SCO of the Procedures Manual	Manual SCO
(This page lists the meetings which the project manager has held. There will be separate notes of each meeting, circulated to attendees, giving details of what was agreed and with action that attendees need to take, together with the date by which they must complete it.)			

Stage 1 - Establish the Foundations

1-6 Plan (part from SS 1-6)

	Week No.	3	4	5	6	7
Stage	**Week start date**	**11/01/2019**	**18/01/2019**	**25/01/2019**	**01/02/2019**	**08/02/2019**
1	Establish the foundations:					
2	Question the users to define the output they require to achieve their objectives.					
3	Summarise and specify the requirements for the new system					
4	Evaluate and choose the system which best meets your requirements (or design it).					
5	Establish the technology to support the system.					
6	Make the system available to users.					
7	Write the procedures manual					
8	Carry out user acceptance testing.					
9	Train all users.					
10	Implement the system (in parts if necessary).					

In practice the time allotted in the plan will depend on the resources available, the hardware required, the complexity of the software and the availability of users for acceptance testing and training

Stage 1 - Establish the Foundations

1-7 PIR (part from SS 1-7)

No	Date raised	User	Source	Issue	Task	Responsible	Answer
1	12/1/20XX	Bert Stiles	Introductory meeting	How do we denote different locations in the yard, shop and stockroom?	Stock recording	PM (Project Manager)	Get some ideas from apps before making a decision.
2	12/1/20XX	Heather Watson	Objectives meeting 2-2 *(Not detailed)*	Can we get descriptions, barcodes etc electronically from supplier?	Buying/item setup	PM (Project Manager)	Get some ideas from apps before making a decision.
3	12/1/20XX	Heather Watson	Objectives meeting 2-2 *(Not detailed)*	Can supplier information link with accounts payable?	Buying/supplier setup	PM (Project Manager)	Get some ideas from apps before making a decision.
4	12/1/20XX	Heather Watson	Objectives meeting 2-2 *(Not detailed)*	Can we have a report of overdue orders?	Buying/Monitor undelivered orders	PM (Project Manager)	Get some ideas from apps before making a decision.
5	12/1/20XX	Helen Rice	Objectives meeting 2-2	Why do we still need paper invoices?	Sales	Bert Stiles	Many of our small builder customers like paper invoices and paper despatch notes to prove goods have arrived on site.
More PIRs added as project progresses							
20	26/5/20XX	Bert Stiles	Manual (SDL) Meeting to check	If Yard Manager is unavailable who can set up Locations?	Set up items	PM (Project Manager)	Ali Khan will be appointed as Bert's deputy and will have appropriate access

Stage 1 - Establish the Foundations

1-8 Risks to project delivery (part from SS 1-8)

No.	Date raised	User	Source	Risk	Risk level (H/M/L)	Task	Resp	Management of the risk	Risk level (H/M/L)
Objective: to deliver the project within budget, on the date specified and with all the functionality required									
1	18/1/20XX	Project Manager	First risk workshop	System which best fits our requirements exceeds the budget	High	Project Management	PM	If it occurs, discuss with MD to decide on whether we increase the budget of remove some requirements	Low
2	18/1/20XX	Project Manager	First risk workshop	Vendor doesn't deliver any agreed modifications	High	Project Management	PM	Choose a reliable vendor	Low
3	18/1/20XX	Project Manager	First risk workshop	Vendor goes bust	High	Project Management	Accountant	Check Vendors audited accounts	Low
4									

Stage 1 - Establish the Foundations

1-9 Risks affecting the implemented project (part from SS 1-9)

Objective: To ensure, on 'go live' date that the systems are properly controlled									
No.	Date raised	User	Source	Risk	Risk level (H/M/L)	Task	Responsible	Management of the risk	Risk level (H/M/L)
1	12/1/XX	Asst buyer	Add Stock item	VAT rate wrongly set at zero or exempt	High	Add Stock item	Shop manager	Daily report of new items added to be checked by Shop and Yard Manager	High
2	13/1/XX	Shop manager	Objectives meeting	Customer's account is blocked	High	Could be a serious problem if we don't keep records up-to-date	Shop manager	Check the account is correct. Contact Accounts Receivable to check if account is still blocked. Offer to accept another card or cash. Otherwise cancel sale.	High
3	13/1/XX	Shop manager	Objectives meeting	Items obtained through the shop or delivery and fraudulently put on a customer's account.	High	Need to consider other controls.	Shop manager	Insist on an order number.	High
4									
5									
6									

Stage 2 - Determine output required

2-1 Tasks (part from SS 2-1)

Activity		Task		Key	Notes	Responsibility	Title	Screen Code	Test number
1	Buying	1.1	Identify new items to stock	INI	Based on supplier information and requests from customers	Buyer and Asst Buyer	User defined output - Buyer	*oub*	
1	Buying	1.2	Negotiate with supplier	NEG	Cost price and discounts	Buyer and Asst Buyer	User defined output - Buyer	*oub*	
1	Buying	1.3	Identify stock to reorder	ISR	Early notification of low stock to prevent items running out.	Buyer and Asst Buyer. Store and Yard Manager	Identify stock to reorder	*tsr*	
1	Buying	1.4	Place order	POS	Place order with supplier for delivery.	Buyer and Asst Buyer	Place order	*tpo*	
1	Buying	1.5	Monitor undelivered orders	MUO	Report required on overdue orders	Buyer and Asst Buyer	User defined output - Buyer	*oub*	
1	Buying	1.6	Decide on items to remove	REM	Remove items when no longer in stock and available	Buyer	User defined output - Buyer	*oub*	
2	Stock	2.1	Receive stock and match with order	ROG	Should automatically update stock quantity	Store manager and store staff	Receive stock	*trs*	
2	Stock	2.2	Store in location	STS	Locations are: shop, store, yard	Store manager and store staff	Store stock	*tss*	
2	Stock	2.3	Move stock between locations	MVS	For example stock moving from store to shop.	Store manager and store staff	Store stock	*tss*	

39

Stage 2 – Determine requirements

2-2 Requirements sorted by 'Objective' (part from SS 2-2)

Activity	Task		Source	Objective		Decisions required		Information required	Evaluation result -Vendor 1
	Strategy		Decide on locations	Managing Director	1.1	To expand the business into other locations, such as North Derby	1.1.1	Where to set up new stores and/or yards	Report on customers by postcode and total sales, with the option of sales details by individual customer.	
	Strategy		N/A	Managing Director		'To drag the business into the 21st century'		What software applications to install	Not part of this project.	
1	Buying	1.1	Identify new items to stock	Managing Director	1.2	To maximise profits	1.2.1	What materials to sell at what price	Report of total profitability by item. See Example	
1	Buying	1.1	Identify new items to stock	Managing Director	1.2	To maximise profits	1.2.1	What materials to sell at what price	Free form field on computer allowing staff to key in details of items requested but not sold. Report of such items.	
2	Stock	2.2	Store in location	Managing Director	1.1	To expand the business into other locations, such as North Derby	1.1.1	Where to set up new stores and/or yards	App will need to handle more than one site.	
10	Project Management	10.2	Deliver project within budget	Managing Director	1.3	It is hoped that the system can be implemented in six months at a budget not exceeding £50,000, including new computer equipment. but excluding additional staff costs	1.3.1	Action necessary if budget looks like being exceeded	Total value of orders placed; invoices received and outstanding compared to expected spend. Budget split into as much detail as possible (hardware, software, consultancy fees)	

40

Part B – Example documentation

Activity		Task		Source	Objective		Decisions required		Information required	Evaluation result -Vendor 1
1	*Buying*			*Buyer*	*2*	*Objectives from Buyer (2) are inserted here*				
2	*Buying*			*Assistant Buyer*	*3*	*Objectives from Assistant Buyer (3) are inserted here*				
3	Sales	3.1	Counter sales	Shop and Yard Manager	4.1	Customers are served promptly, get what they want quickly and leave happy	4.1.1	What are the goods? (Non-barcoded stock can be difficult to identify)	Barcode on item	

Stage 2 – Determine requirements

2–3 Proposed report									
Job: Managing Director		**Holder: Elizabeth Smith**				**Date: 11/1/XX**			
Report:	**Total profit by item**				**Task: Planning**				
Type of item (paint, tools, hardware, wood, brick etc as defined on the database)									
Supplier	**Bar code**	**Item description**	**Cost price**	**Selling price**	**Profit**	**Unit**	**Units sold**	**Total Profit**	
Purpose of report: to show items not generating sufficient profit									
Sorted by: type of item/total profit/supplier									
Totals: By unit type									
Period: User defined day, week, month, YTD, 12 months, or custom dates									
Comment: Requires each item to have (at least); Type, supplier, bar code, description, cost price, selling price (excl VAT), unit of measure (singles, weight, length, etc), units sold.									
This page is useful to illustrate what the job holder requires and supports the 'Data' form. It can illustrate how the user requires the data to be presented, which will need to be demonstrated by Vendors or programmed in a built system. Where an application (system) is to be purchased only those reports unlikely to be produced by the app need to be specified. If a system is being programmed, all reports need to be specified.									

Stage 3 Summarising

3-1 Flowchart of tasks

Three letters refer to tasks (SS 2-1)	Supplier information	Sales information
Collect requests from customers	Decide on new items to stock INI	Decide on items to discontinue REM
	Negogtiate with supplier NEG	Decide to sell off product REM
	Set up new item SUI	Update sel ling price SUI
Recommended reorder ISR	Place order POS	
	Receive stock ROG	
	Store stock STS	Move stock location MVS
	Flowchart for counter sales SCO	

Stage 4 Choosing

4-1 Essential requirements evaluation (part from SS 4-1)

Activity		Task		Source	Objective		Decisions required		Information required
10	Project Management	10.2	Deliver project within budget	Managing Director	1.3	It is hoped that the system can be implemented in six months at a budget not exceeding £50,000, including new computer equipment. but excluding additional staff costs			
2	Stock	2.2	Store in location	Managing Director	1.1	To expand the business into other locations, such as North Derby	1.1.1	Where to set up new stores and/or yards	System will need to handle more than one site.
3	Sales	3.1	Counter sales	Shop and Yard Manager	4.1	Customers are served promptly	4.1.2	Where are the goods?	Item description (found by query); stock location
3	Sales	3.1	Counter sales	Shop and Yard Manager	4.1	Customers are served promptly	4.1.6	How does the customer want to pay?	Cash required.
3	Sales	3.1	Counter sales	Shop and Yard Manager	4.1	Customers are served promptly	4.1.6	How does the customer want to pay?	Account: request identity. Search for customer.
4	Delivery	4.2	Deliver	Shop and Yard Manager	4.5	Lorries are loaded with the right materials at the right time and deliver to the right place	4.5.2	Where to deliver?	Delivery address

7 Screens (part from SS 7)

Type	Screen	Screen ref	Notes	Activity		Task		Task Ref.	Access
Set up	Company	suc	Company name, address, VAT number etc	8	Set up application	8.1	'Once only' data	SUO	Project Manager
Set up	Account code structure	sua	Account code structure	8	Set up application	8.1	'Once only' data	SUO	Project Manager
Infrequent Standing data changes	Stock locations	isl	Individual locations where stock is held	8	Set up application	8.2	Standing data	RSD	Shop Manager. Assistant
Infrequent Standing data changes	VAT rates	isv	VAT rate for each VAT code	8	Set up application	8.2	Standing data	RSD	
Infrequent Standing data changes	Departments and jobs	isd	Departments and jobs within those departments	8	Set up application	8.2	Standing data	RSD	
Infrequent Standing data changes	Users	isu	Names, staff number, job description	8	Set up application	8.2	Standing data	RSD	
Infrequent Standing data changes	Access	isa	For each screen, users permitted access	8	Set up application	8.2	Standing data	RSD	
Infrequent Standing data changes	User names, passwords	isp	Set password for new users	8	Set up application	8.2	Standing data	RSD	

8 User Acceptance Testing (part from SS 8)

Task: Add, Amend or Delete stock item details (SUI)				
	Test number:			**10**
	Test:	**Test adding an item with no exceptions**		
	Date of test:	**9/7/20XX**		
Input field	**Action**	**Data**	**Result**	**PIR ref**	**Pass?**

Input field	**Action**	**Data**	**Result**	**PIR ref**	**Pass?**
(Menu screen)	Select 'Add, amend or delete stock items'		Input screen selected		y
Action	Select 'Add new item' from drop down box		Input screen selected		y
Supplier	Enter supplier name. Box will give potential suppliers as you type. Select supplier.	Rutherford & Co	Supplier found		y
	If supplier is not present, set up new supplier	n/a			
Barcode	Input barcode from supplier details	553231594154	Accepted		y
Description	Use supplier description. Ensure it is complete and cannot be confused with any other product	100 4x6 mm galvanised screws	Accepted		y
Unit of measure	Select from:				
	Single - applies to individual items such as tins of paint, boxes of screws, tools.	single	Accepted		y
	Pack: Applies to group of individual items, such as lengths of wood in a pack of 4				
	Kilograms- applies to loose material such as sand and gravel				
	Meters - applies to lengths of wood, piping, cable. Note that some items, wood for example, may be priced as a length. In which case use single				

Bloggs & Co.

Builders Merchants

Buxton, Derbyshire, UK

Buying and Stock System

Procedures Manual

Procedures Manual - Index

Ref	Activity	Ref	Task	Code	Responsible	Example
1	Buying	1.1	Identify new items to stock	INI	Buyer	
1	Buying	1.2	Negotiate with supplier	NEG	Buyer	
1	Buying	1.3	Update supplier	SUS	Buyer	
1	Buying	1.4	Update item	SUI	Buyer and Asst Buyer	Yes
1	Buying	1.5	Identify stock to reorder	ISR	Buyer and Asst Buyer. Store and Yard Manager	
1	Buying	1.6	Place order	POS	Buyer and Asst Buyer	
1	Buying	1.7	Monitor undelivered orders	MUO	Buyer and Asst Buyer	
1	Buying	1.8	Decide on items to remove	REM	Buyer	
2	Stock	2.1	Receive stock and match with order	ROG	Store manager and store staff	
2	Stock	2.2	Store in location	STS	Store manager and store staff	
2	Stock	2.3	Move stock between locations	MVS	Store manager and store staff	
2	Stock	2.4	Count physical stock and make adjustments	CPS	Store manager	
3	Sales	3.1	Counter sales	SCO	Store manager and store staff	yes
3	Sales	3.2	Yard collection	SYC	Store manager and store staff	
3	Sales	3.3	Ordered sales for delivery	SOR	Store manager and store staff	
3	Sales	3.4	Returned stock	RTS	Store manager	
4	Delivery	4.1	Load lorry	DLL	Store manager and store staff	
4	Delivery	4.2	Deliver	DLC	Delivery drivers	
5	Output	5.1	Standard output - Buyer	SOB	Buyer; Asst buyer	
5	Output	5.2	Standard output - Shop	SOS	Shop and Yard Manager	
5	Output	5.3	Standard output - Accountant	SOA	Accountant	
5	Output	5.4	User defined output - Buyer	UDB	Buyer; Asst buyer	
5	Output	5.5	User defined output - Shop	UDS	Shop and Yard Manager	
5	Output	5.6	User defined output - Accountant	UDA	Accountant	
5	Output	5.7	Electronic data	SED	Accountant	
6	Standing data changes	6.1	Individual locations where stock is held	SDL	Shop and Yard Manager	

Ref	Activity	Ref	Task	Code	Responsible	Example
6	Standing data changes	6.2	VAT rate for each VAT code	SDV	Accountant	
6	Standing data changes	6.3	Departments and jobs within those departments	SDJ	Systems Administrator	
6	Standing data changes	6.4	Names, staff number, job description	SDE	Systems Administrator	
6	Standing data changes	6.5	For each screen, users permitted access	SDA	Systems Administrator	
6	Standing data changes	6.6	Set password for new users	SDP	Systems Administrator	
6	Standing data changes	6.7	Set dates when monthly period closes	SDC	Accountant	
6	Standing data changes	6.8	Addition and removal of customers from Accounts Receivable	SDR	Accountant; Accounts Receivable	

Ref	Activity	Ref	Task	Code	Responsible	Example

SUI Add, Amend or Delete stock item details

Purpose:	To add new stock items; amend details of items on the database; remove discontinued items.	**Page 1 of 3**
Responsibility:	Buyer; Asst Buyer	**SUI**
Screen:	Stock item (fsi)	

Add new items

Input	Field Title	Instruction	Output
Opening menu		Select 'Add, amend or delete stock items'	
Notification of new item from supplier	Action	Select 'Add new item' from drop down box	
	Supplier	Enter supplier name. Box will give potential suppliers as you type. Select supplier. If supplier is not present, set up new supplier	SUS
	Barcode	Input barcode from supplier details	
	Description	Use supplier description. Ensure it is complete and cannot be confused with any other product	
	Unit of measure	Select from: Single - applies to individual items such as tins of paint, boxes of screws, tools. Pack: Applies to group of individual items, such as lengths of wood in a pack of 4 Kilograms- applies to loose material such as sand and gravel Meters - applies to lengths of wood, piping, cable. Note that some items, wood for example, may be priced as a length. In which case use single	If in doubt, contact Shop and Yard Manager

50

51	Cost price.	This is the cost price (£.p) per unit of measure. If packs are involved make sure that the price is per pack, not per the individual item in the pack.	
	Retail price ex VAT	This is the retail price excluding VAT	
	VAT code	Choose 'Standard' from drop down list. Never choose 'Zero rated' or 'Exempt' without written authority of the Accountant.	
	Location: Depot	Currently defaults to Buxton	
	Location: Place	Choose shop, store or yard	
	Location: Bin	Enter bin number, if known. Can be overridden when delivered items are stored. If bin number not shown, request Yard Manager to set it up.	SDL
Average sales per day

Supplier lead time on item (days) | Reorder level | Stock quantity which, taken with supplier lead times, will trigger a reorder. Value is sales quantity/day multiplied by lead time plus 3 days. | |
| Supplier's estimate of lead time. | Supplier lead time | Time between placing an order with a supplier and the delivery date. If no information from supplier, rely on experience. | |
| | Save | When all data has been input, click the 'Save' button. A 'Pop up' box will appear listing the data which will be updated. If it is correct, click 'OK; if it is incorrect, click 'Back to form' and correct the data | |

Purpose:	To add new stock items; amend details of items on the database; remove discontinued items.	Page 2 of 3

Amend items

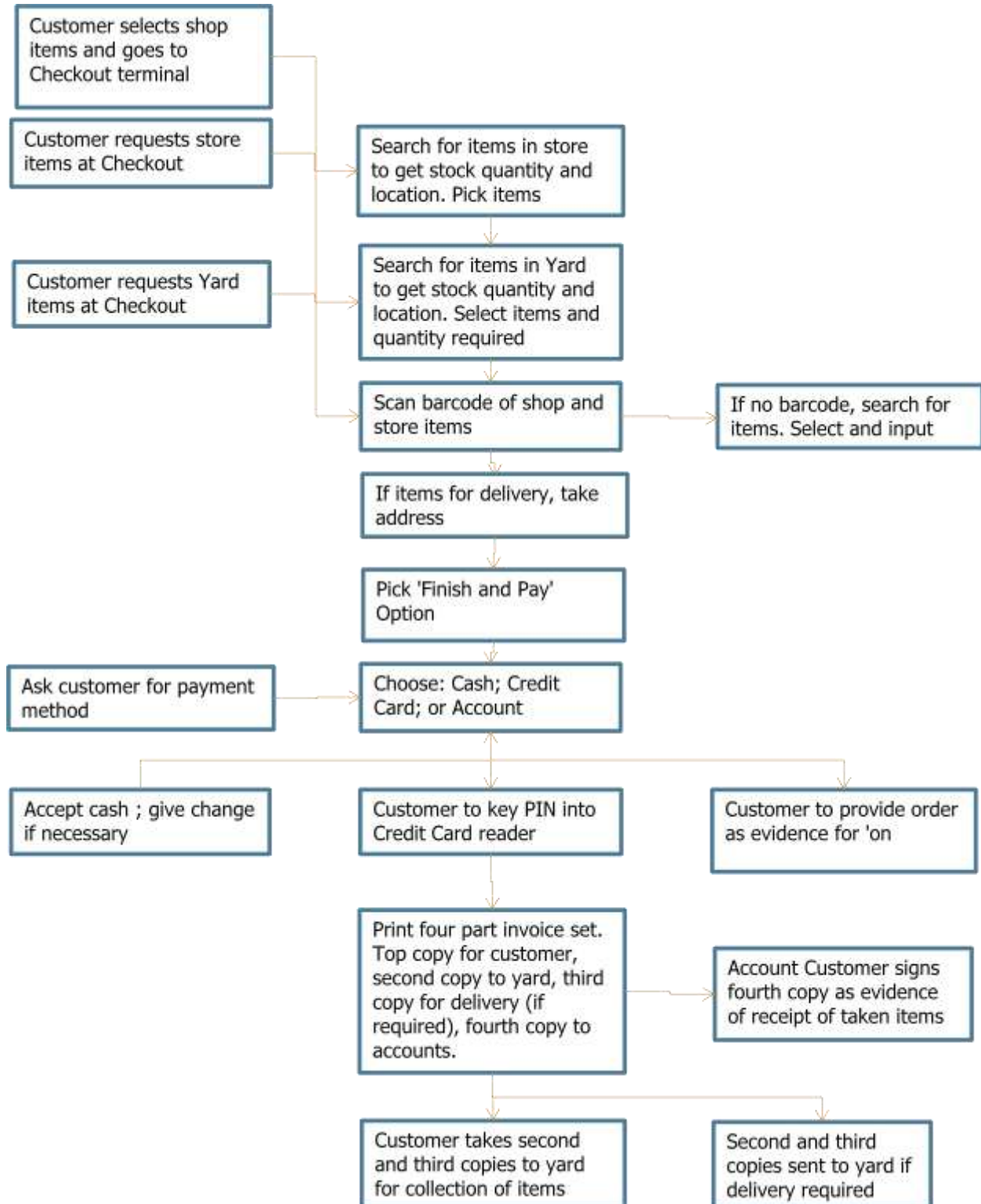| Input	Field Title	Instruction	Output
Notification of amendment item from buyer, supplier or Yard Manager	Action	Select 'Amend item' from drop down box	
	Barcode	Input barcode	
	Supplier	Supplier name will be shown. If more than one supplier is supply items, click 'Add another supplier button' and enter details	SUS
	Unit of measure	Should not normally need to change this. Check on reasons for change with originator.	If in doubt, contact Shop and Yard Manager
	Description	Should not normally need to change this. Check on reasons for change with originator.	
Notification from supplier	Cost price.	This is the cost price (£.p) per unit of measure. If packs are involved make sure that the price is per pack, not per the individual item in the pack.	
Notification from Buyer	Retail price ex VAT	This is the retail price excluding VAT	
	VAT code	Should not need to change this	
	Location: Depot	Currently defaults to Buxton	
	Location: Place	Choose shop, store or yard	

52

53	Location: Bin	Enter bin number, if known. Can be overridden when delivered items are stored. If bin number not shown, request Yard Manager to set it up.	SDL
	Save	When all data has been input, click the 'Save' button. A 'Pop up' box will appear listing the data which will be updated. If it is correct, click 'OK; if it is incorrect, click 'Back to form' and correct the data	

Purpose:	To add new stock items; amend details of items on the database; remove discontinued items.		Page 3 of 3
Input	**Field Title**	**Instruction**	**Output**
Delete items			
Notification of deletion from buyer only		Check the item to be deleted has no stock.	Use User defined query report - buyer (UDB) specifying this item
	Action	Select Delete item' from drop down box	
	Barcode	Input barcode	
	Supplier	Supplier name will be shown. Check it is correct.	SUS
	Description	Check this agrees with notification	
	Save	When all data has been input, click the 'Save' button. A 'Pop up' box will appear listing the data which will be deleted. If it is correct, click 'OK; if it is incorrect, click 'Back to form' and correct the data	

54

SCO Shop and Yard Sale

Purpose:	To sell items to personal customers	**Page 1 of 3**
Responsibility:	Shop and Yard Manager; Shop and Yard Staff	**SCO**

Flow chart of task

Purpose:	To sell items to personal customers	Page 2 of 3
Responsibility:	Shop and Yard Manager; Shop and Yard Staff	SCO
Screen:	Shop and Yard sale (tsi)	

Input	Field Title	Instruction	Output
Customer requests items held in store	Search button Keypad on touch screen	For items held in store, if necessary search for item to get bin location and confirm stock exists. Put items on left of till.	Put item on right of till
Customer should put items selected in shop on the left of the checkout till		Use hand held barcode scanner to read barcode. Listen for the beep which confirms code has been read, check screen for item.	Put item on right of till
	Search button Keypad on screen Quantity field	If no barcode on item, or it cannot be read, use search function on touch screen to select item. Check description against item and, if necessary confirm with customer. Enter quantity.	Put item on right of till
Customer requests items held in yard	Quantity field Unit of measure field (default, cannot be changed)	Common items will be on a 'picture board'. Check item with customer, scan in adjacent barcode, check description and enter quantity. Make sure units are the same as those quoted by customer. (Metric not Imperial). If no picture, use search function.	
Customer requests delivery	Address Postcode What3words Special instructions	Enter address and postcode. If it is a new housing estate ensure 'Special Instructions' give sufficient details for delivery driver. Check if delivery has to be for a specific time. Ask for What3words address if possible.	

56

Purpose:	To sell items to personal customers		**Page 3 of 3**
	Finish and pay	Ask customer, 'Anything else?' If not, 'How to you want to pay?' Select finish and Pay' from screen	
Customer to pay cash	Cash tendered	Select 'Pay by cash' button. Input cash tendered. Select 'Finish button'	Screen displays cash change
Customer to pay by credit card		Select 'Pay by Card' button. Hand card reader to customer. When payment confirmed. Select 'Finish button'. If payment not accepted, ask for cash. Otherwise select 'Cancel' button on screen and 'OK' to confirm.	
Customer to pay on account	Customer account number Customer name Order number	Customer MUST produce a copy of their order with order number to prove identity. Select 'Pay on Account'. Use keypad to find customer details, confirm with order. Enter order number. Select 'Finish button'. If account blocked, ask for cash. Otherwise select 'Cancel' button on screen and 'OK' to confirm.	Attach copy of customer order to fourth invoice copy
		When sale is complete select 'Print invoice' on screen.	
		Give top copy of invoice to customer. If a yard collection is involved, give second and third copies to customer.	
		Ask Account Customer to sign copy for receipt of items. Put fourth copy in 'Accounts Receivable' tray. If yard items involved, give fourth copy to customer for signing when yard items collected.	

57

Version Control

Version	Date released	Changes made	
1.0	8 Mar 19	First release	
1.01	9 March 2019	Minor formatting changes	
1.02	16 March 2019	Flow chart (3-1) added. Minor text updates.	