Software Deployment

1.1.14 Describe strategies for managing releases and updates

Release management

Release strategies will vary from organisation to organisation. Some of the stages software may go through in its release cycle are as follows:

Pre-Alpha

An interim product release that does not contain all the features required but may demonstrate certain elements that have been built.

Alpha

An internal release delivered to the testing group. It will contain a preliminary build that is partially complete.

Beta

First product release for outside testing. Contains all features but has known issues and bugs.

Release candidate

All features are completed and there will be no additional new code but there may still be unwanted bugs to be fixed. This stage is often called code complete.

General availability

Stable release relatively bug free exceeds expectations of client.

Release numbering

This many appear to be a trivial matter but is very important in identifying and managing release strategy. The following is an example of IBMs numbering system:
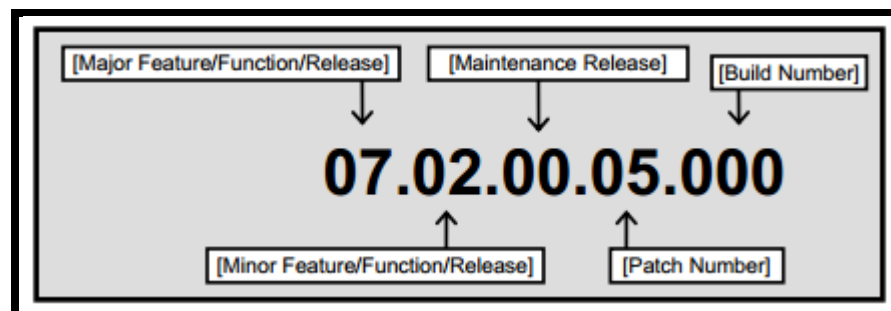
1.1.6 Discuss problems that may arise as a part of data migration.

Data Migration refers to the process of transferring data from an old system to a new system. Below are some of the common problems that can occur during this transfer.

Incomplete Data

Data can be missing partially or completely. For instance if some field values are null and during migration process these were not handled in elegant manner, could cause lot of problems in proper functioning of the migrated system.

Duplicate Data

Multiple instances of the same data is a big problem during data migration. It's unlikely that conversion will ignore duplicate data records. Since the data format is different in each of the duplicate records, though the information is the same, it is difficult to narrow down and ignore duplicate data records.

Data Non-conformity

This is because the way the data in the database is formatted differs greatly from individual to individuals who have created the database structure. Hence data is not present in the standard format.

Inconsistent and Inaccurate Data

When merging various systems, the data can lack consistency and represent wrong information. Data deteriorates over time, which can cause a lot of difficulties during migration.

Other issues include incompatible file formats, data structures, validation rules, incomplete data transfer and **international conventions** on dates, currencies, and character sets.

1.1.7 Suggest various types of testing

System testing refers to a series of tests whose primary purpose is to fully exercise the new computer system. Although each test has a different purpose, all work to verify that system elements have been properly integrated and perform as expected. Testing occurs at every stage of system implementation.

The types of system tests include

- **Unit Test** - this involves the testing of each individual module with test data to see if it's works as planned
- **System Test** - this involves testing the overall function performance of the system. This test often involves using software that can test other software, thereby automating parts of the testing process and reducing costs.
- **Recovery Test** - this test forces the software to fail in a variety of ways and verifies that recovery is properly performed.
- **Security Test** - this test attempts to verify that protection mechanisms built into a system will, in fact, protect it from improper access.
- **Stress Test** - this test executes a system in a manner that demands resources in abnormal quantity, frequency, or volume.

There is testing that is specific to software deployment.

- **Alpha Test** - is the first phase of testing in a software development process. The first phase includes unit testing and system testing.
- **Beta Test** - is the second phase of software testing in which a sampling of the intended audience tries the product out. Beta testing can be considered "pre-release testing."

Testing is conducted at several stages of the software development. The testing at each stage will be dependant on the stage and may be simply debugging code or user acceptance testing or even beta testing when the initial design has been completed but is not yet on general release.

Detailed test plans will be created and a typical test would contain:

- Details of what is being tested
- The test data to use
- What is expected to happen when the test is performed

When choosing the data we need to consider why we are testing: to see if the system works well and that the system does not break. In order to do this we can discern *three types of test data*

Normal

This is data that would be expected to be entered in the system. The system should accept it and process it.

Extreme

Extreme values are still normal but are at the edges of acceptable and are used to see that the system responds correctly to all normal data.

Abnormal

This is data that should not be accepted. The system should be able to handle this data without crashing or breaking. Validation checks and the handling of exceptions are often used to ensure this data is handled well.

User focus

1.1.8 Describe the importance of user documentation

User documentation describes how the product is used for a user of the system. It will describe each element of the system and assists the user. It is important that this document is not confusing and is written in a clear language. It must also be as up to date as possible. There are three broad approaches that this documentation can take:

- Tutorial
- Thematic
- List Reference

Tutorials give users practical exercises to do and guided through a task. A thematic element will often be chapter based and go systematically through each feature. Lists or references are useful for technical users who want quick reference to features. Documentation is best when a mix of all three are present.

User documentation is intended to help the users of the system. The users are usually non-technical people, who don't need to know how the system works. They just need to know how to use it.

The quality of user documentation can affect the rate of implementation of the new system.

User documentation usually includes:

- List of minimum hardware and software required to use the system
- How to install the system
- How to start / stop the system
- How to use the features of the system
- Screenshots showing the system in typical use
- Example inputs and outputs
- Explanations of any error messages that might be shown
- A troubleshooting guide

# 1.1.9 Evaluate Different Methods of providing user documentation

Manuals

These can be provided online or offline. an example of an online manual can be seen for the wave editor Audacity at http://manual.audacityteam.org/o/. This is in the form of a webpage and lets the user browse chapters of the manual and has tutorials. One of the bonuses of online manuals is the potential use of multimedia elements which cannot be placed in a printed manual.

Manuals can also be provided online as a pdf such as the manual for Ableton Live at http://downloads.ableton.com/manuals/80/ableton_live_8_manual_en.pdf. These have the advantage of being able to be printed. The advantage of the printed version is that it can be read and referred to away from the computer or an internet connection.

FAQ

Frequently asked questions can also be provided both online and offline to give users answers to a common set of problems that users of the system experience. They generally relate to usability issues. The screenshot below gives and example[2]:
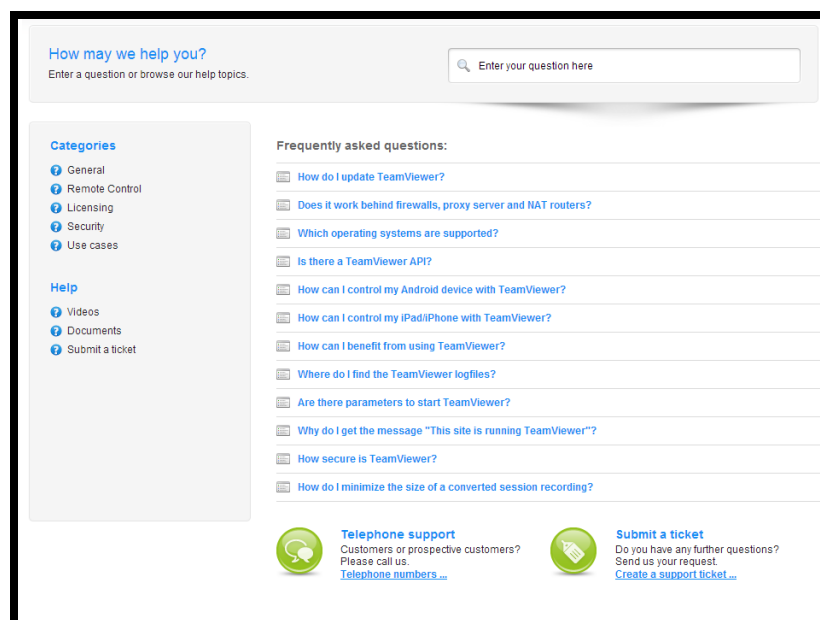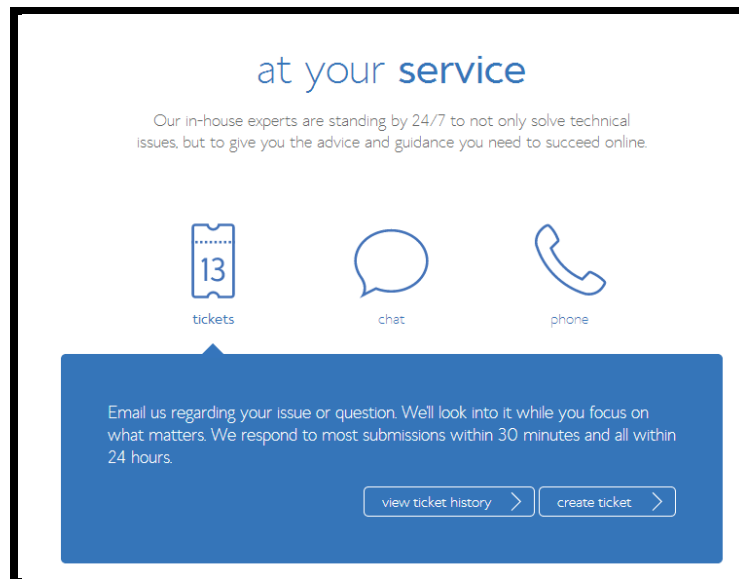
Online portals

Online support is provided in many ways depending on the product or service that is being documented. Online portals can provide manuals in the form of web pages or print versions in Portable Document Format (PDF). The can also provide FAQ pages as described above. The advantage of online portals is that they are more likely to provide up to date information. Companies will also often provide a range of support services from an online site.

email support

For example online support can be provided by a ticket system via an email address where you contact their support team and your problems are resolved by technicians via a ticketing system. an example of this is [Zendesk](). This is an asynchronous type of support as you have to wait for and responses to question but you are more easily able to track issues with ticket numbers and support ticket threads.
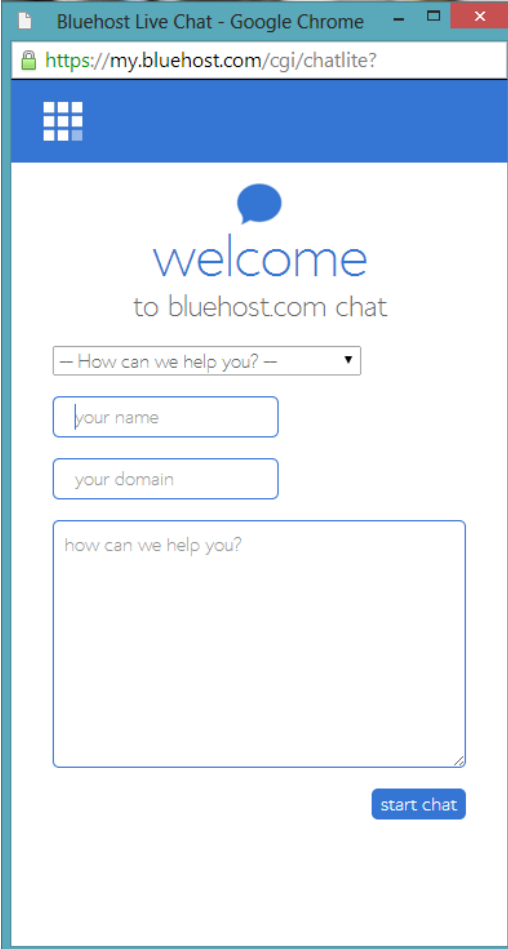
Live chat sessions

Online support can also be through a live chat or
video session whereby you can get real-time
support from a technician. This support gives a
feeling of being supported by a real person and
this is prefered by many people. It is also real time
so can be useful for issues that need resolving
quickly.

This real-time support may also be a video call.

Remote desktop connections

Support may also be offered by a remote desktop connection where a technician will connect to and be
able to control your computer to see first hand what the problem is and resolve it for you. This solution
is ideal if you want your problem solving quickly and also is very useful if the user is not very
experienced. there are obviously some security issues here as you are granting an unknown (albeit
trusted) third party access to your computer. Products such as Teamviewer offer this type of service.
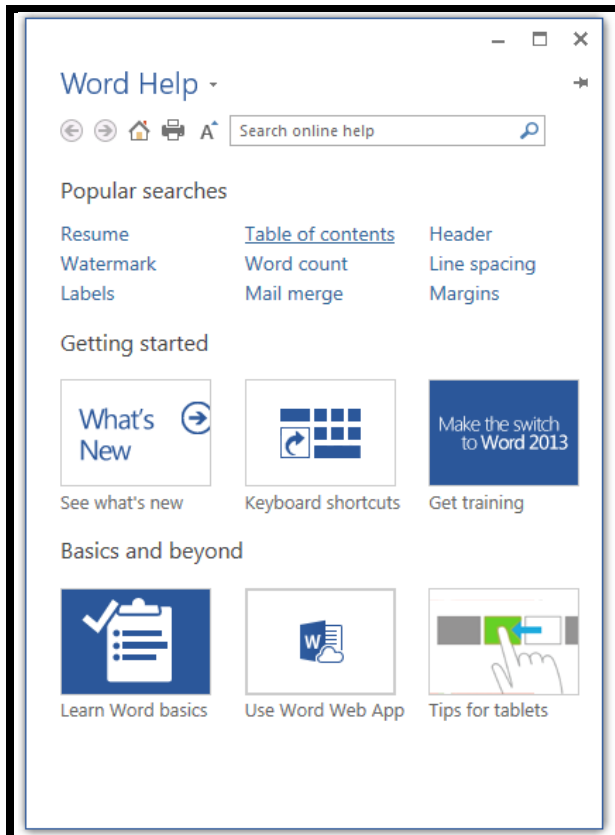
Embedded Assistance

Many systems now come with user documentation such as tool tips and tool tips and dynamic page content within the system itself.

One example is when you mouse-over an icon a small box appears with help information:
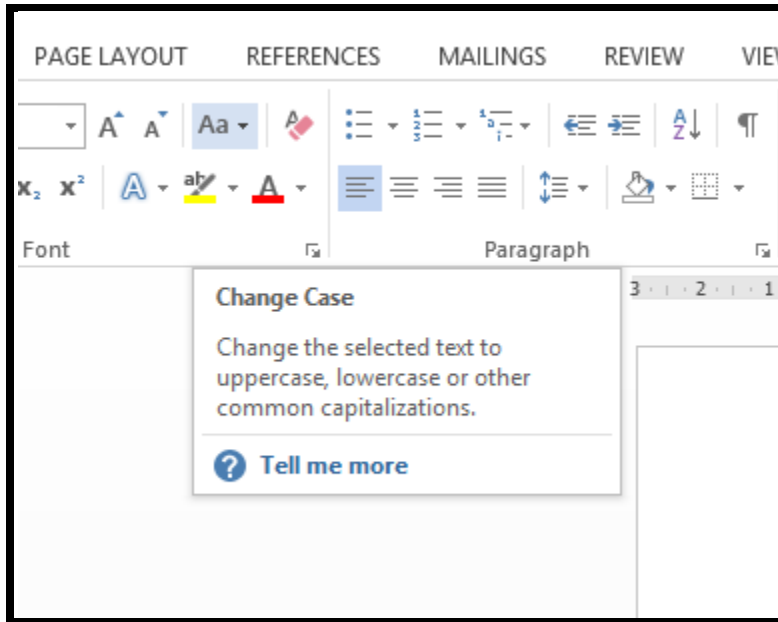
Programs will often have inbuilt help systems such as this example in Microsoft Word:

1.1.10 Evaluate different methods of delivering user training

User training can be delivered in a number of way. This will be handled differently depending on a variety of factors such as the size of the business, and the training budget. Other factors such as the type of system will influence the most appropriate method.

Self Instruction

Advantages

Self instruction will allow the student to learn whenever it is required. Manuals or other resources such as videos or exercises can be provided and used whenever the user has the need to find out a particular skill. This means the learning is done exactly when it is needed and there is no additional unnecessary time wasted on unneeded skills. There can be a cost saving as the there is no course to pay for or place to rent or instructor to pay and there is no time lost in training sessions.

Disadvantages

The effectiveness is based upon several issues such as the motivation of the user and their ability to learn on their own. If the materials are not well prepared or suited to the users learning styles or level of understanding there may be several issues.

Formal classes

Advantages

Having a formal classroom to conduct training allows an open exchange of ideas in real time. This can happen between the instructor and the students and there are no barriers to communication or delay as may be experienced in an online situation. A formal classroom can tend to focus the learning and gives a more social element to the process which many feel is essential. The classroom can provide a "real time" space to ask questions and resolve issues.

Disadvantages

A classroom situation may disadvantage more shy members of the group and can be dominated by more vocal and demanding members of the group. It can often be hard for instructors to isolate or teach those who are having difficulty as there may not be the time to support them or the need may not even be noticed in a large group.

Remote/online training

Advantages

Training can take place anywhere at any time and this allows training to be delivered globally across large distances and across many time zones. The fact the resources are available at anytime means that people have flexibility in how they fit the learning in around their own schedules. Also this allows training resources to be revisited or revised easily.

There is a strong element of synergy in online training as the interaction and reflection of a large number of people in an asynchronous dialogue creates an improved training effect that is greater than the sum of the separate individual effects.

There is a level playing field and discriminating effects such as age, gender, appearance, disability and race are reduced or even in some cases absent. it is also easier to include distinguished experts or train people from other companies.

Online training is also student centred due to reflection and dialogue with other students from the initial resources.

Disadvantages

In order for online training to be feasible there must be an equity in the access or provision of the required technology. there may be economic or logistical reasons for this not being the case. This may be as simple as the provision of computers or the access to a reliable internet connection. Problems also occur in the differences in computer literacy. If these skills are not present then the training will not be successful. The course itself must be user friendly and reliable if it is to succeed.

Good trainers in the "real world" do not necessarily make good instructors in the online environment and they will need to have a high level and understanding of the requirements and success criteria of running an online environment.

There are some things that cannot be taught online as the limitations are too great and a face to face or hands on approach is necessary.

System backup

1.1.11 Identify a range of causes of data loss.

Intentional Actions

- Intentional Deletion of File or program

Unintentional Actions

- Accidental Deletion of a file or program
- Misplacement of removable storage such as CDs, USB Thumb drives, etc

Administration Errors

- Inability to read unknown file formats

Failure

- Power failure - resulting in data in volatile memory not being saved to permanent memory
- Hardware failure - such as a hard disk crash
- Software failure - system crash or freeze, resulting in data not being saved in permanent memory
- Data corruption - such as file-system corruption or database corruption

Disaster

- Natural disasters - tornado, hurricane, earthquake, flood, etc.
- Fire

Crime

- Theft, hacking - sabotage, etc.
- A malicious act - such as a worm, virus, hacker or theft of physical media

1.1.12 Outline the consequences of data loss in a specified situation.

- **Client Data** - Artwork in digital format, usually backed up on removable media such as DVD or CD
- **Internal Process Data** - Internal forms, from general applications for employment to work requests, usually on a local server or machine
- **Customer Accounting Data** - Invoicing, general accounting of receivables and payables, includes tax documents, usually kept on a local server or machine
- **Customer Relationship Management** - Who your customers are, where they are located and how they interact with you, usually kept on a local server or machine
- **Marketing Materials** - Brochures, flyers, print advertisements, web-site originals, usually kept on a local server or machine
- **Correspondence** - Email storage, usually kept on a local server or machine.

Losing data can lead to businesses ceasing to function, in some cases, such as the loss of a file, it is an inconvenience resulting in lost productivity while the file is recreate. The loss of a customer database could potentially put a business out of business.

1.1.13 Describe a range of methods that can be used to prevent data loss.

A **backup** is a copy of your data, stored to prevent it from being lost or stolen.

Preventing Personal Data Loss

- **Removable Media** such CDs, DVDs, USB drives, or external hard drives are often used to store backups of personal files.
- **Online Backup** is a service managed by software usually installed on a PC to save files on a remote server via a secure internet connection.
- **Virus-protection Software** - use virus detection programs and keep them updated.
- Run **utility software** that can detect potential problems with a hard drive.

Preventing Data Loss in an Organization or Business

- **Failover or Redundancy System** - involves invoking a secondary system to take over when the primary system fails. Up-to-date copies of all required data and applications are maintained on the secondary system in order to respond immediately if the primary system becomes unusable.
- **Online Backup Service** - A remote, online, or managed backup service, sometimes marketed as cloud backup, is a service that provides users with a system for the backup, storage, and recovery of computer files. Online backup providers are companies that provide this type of service to clients.

References: *System Fundamentals* by M Brooke
        http://hwmath.net/IBCS/content/sf/Topic1Systemsinorganisations-StudentBooklet.htm
        http://bwagner.org/