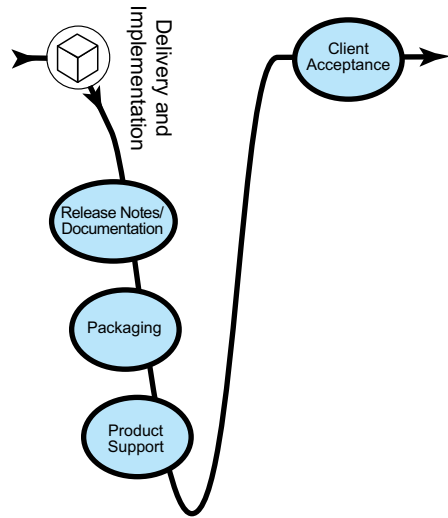


Delivery & Implementation





		Initiation	Specifications	Design	Production	Review and Evaluation	Delivery and Implementation
Development	Generic	The overall strategy for product development is determined by the initiation of ideas for MM projects which may come from a variety of sources, the client's expectations and budget.	Detailed specifications are derived from the client's expectations, the user's requirements and the capability of the production unit or organisation.	The design solution identifies the key components, and relationships between, the technical, interface and educational requirements reflecting the primary purpose of communicating effectively with the end user.	Production of quality MM requires the utilisation of development environments and media integration strategies linked to the specifications and design solution.	Client review and user evaluation occurs at periodic intervals in the development process, and ensures that the final product meets the needs of the client's.	Delivery and commissioning processes outlined at the planning stage are implemented.
	Online	Providing on-demand access to interactive education/training requires a documented account of not only hardware, software and bandwidth, but also the requirements of the user.	Course design for online delivery focuses on the objectives to be achieved and not on the means of achieving them, necessitating a shift in the instructional design paradigm.		Delivering course material online requires knowledge and understanding of technical issues so that the end user is not impeded by the limitations of the medium.	The review, assessment or evaluation, and modification of online course material will reflect the faster and more cost-effective process.	Once the course is operational, on-going management and maintenance strategies are implemented to ensure currency, correctness and applicability.
Management	Legal	Costs associated with copyright and rights negotiations need to be incorporated into the budget to ensure that legal complications do not jeopardise the project financially.	The diversity of inputs to multimedia means that there are more rights involved and therefore more clearances to obtain for both production and/or delivery of	Endeavour to incorporate a significant proportion of original material in online resources, and that linked materials are attributed to the respective authors.	All copyright restrictions and encumbrances are resolved before production commences.	Arrange any non-disclosures for outside parties involved in evaluation or acceptance testing.	All licencing agreements are confirmed as finalised and liability and insurance coverage is arranged for the delivery of the product.
	Project	Project scope and contract requirements are reviewed. The client is briefed on change control procedures, review and approval procedures, and confirms the	Stated and implied needs of the client are matched with appropriate development methods, tools and skilled resources to supply a quality product.	A global overview of the project is derived once revisions of cost estimates, schedules, team participants and other matters are conducted in accordance with the concept brief and the detailed design	Each skill group, such as graphic artists, animators, programmers, goes about their tasks with appropriate guidance/support from the project manager.	Provide evidence that the project achieved what it was designed to do. Obtain independent evaluation of the expected outcomes from the use of the product.	The handling, storage, packaging and delivery mechanisms are provided to guarantee the product is shipped as built. Release notes and instructions for installation and setup are provided.
	Risk	The scope of the risk management (business, technical and project risks) to be performed is identified.	Potential risks are identified, analysed and assessed, and mitigation strategies, metrics and corrective actions outlined.	Identified risks are quantified and qualified and corrective strategies are validated.	Mitigation strategies and error trapping techniques are employed to reduce the impact of technical risks and risks associated with interface complexity and creativity.	Confirm that risk management strategies have achieved their purpose in all previous phases and that potential risks are minimised for on-going delivery and implementation.	Strategies to reduce technical risks from version control, documentation development and pre-testing are employed.
Support	Change Control	The project deliverables and their associated supporting documents, are identified, presentation standards are defined and change procedures established.	A baseline for the user's requirements for the system is established and defined, and changes to the baseline are agreed through a formal process.	The design solution is traceable to the requirements baseline, and agreed changes are reflected in both.	The integrity and consistency of the developed system is ensured through the enforcement of agreed standards and control of change.	Changes to the user's requirements identified during evaluation of the multimedia system are agreed through a formal process.	The configuration for the developed multimedia product to be implemented and distributed is defined and agreed and placed under formal controls.
	Quality Assurance	Planning for the project assures key sponsors that the plans, procedures and standards outlined will be followed, and that the work products will meet the requirements for quality.	The QA group will confirm that the specification of user requirements has been reviewed for completeness and feasibility, and that any issues previously raised have been addressed.	Confidence is established that the design solution accurately reflects the user's requirements, and that the agreed standards are followed.	The developed system will be shown to be derived from the agreed design using defined actions and agreed standards.	The agreed steps for addressing issues raised in evaluation will be shown to have been followed.	The planned tasks for implementing and distributing the final product are shown to have been followed.
	Validation & Verification	A strategy, including tools, techniques and activities, is defined for determining whether each work product functions correctly and meets the user's requirements for the product.	Criteria for verifying the system specification, and for demonstrating that the requirements have been satisfied, will be defined and applied.	The correctness and appropriateness of the design solution will be demonstrated through a process of design review.	The developed system and its components will be shown to be a robust and accurate reflection of the user's requirements.	Evaluation and testing will confirm that the user's requirements have been fully addressed as well as identify and rectify technical and other errors.	The implementation criteria are seen to be fulfilled and the product meets the client's and/or end user's requirements in an operational environment.

DELIVERY AND IMPLEMENTATION

Development	Generic	Delivery and commissioning processes outlined at the planning stage are implemented.
	Online	As the course is operational, on-going management and maintenance strategies are implemented to ensure currency, correctness and applicability.
Management	Legal	All licencing agreements are confirmed as finalised and liability and insurance coverage is arranged for the delivery of the product.
	Project	The handling, storage, packaging and delivery mechanisms are provided to guarantee the product is shipped as built. Release notes and instructions for installation and setup are provided.
	Risk	Strategies to reduce technical risks from version control, documentation development and pre-testing are employed.
Support	Change Control	The configuration for the developed multimedia product to be implemented and distributed is defined and agreed and placed under formal controls.
	Quality Assurance	The planned tasks for implementing and distributing the final product are shown to have been followed.
	Validation & Verification	The implementation criteria are seen to be fulfilled and the product meets the client's and/or end user's requirements in an operational environment.

Overview of the Phase

This phase comprises all activities needed to prepare, deliver, install and maintain the product. These activities are separate from the development itself and are generally performed by personnel other than the development team. Distribution strategies are now put in place, the system is provided to the client and is installed for the users. User instructions, release notes and/or training materials are developed in either a print, electronic or online (or all three) format.

For multimedia products delivered on CD-ROM, packaging design is complete, the pre-mastering version is tested and mastered ready for mass duplication.

Ensuring the effective integration of the product into the routine of the client organisation will have been an on-going process throughout the development cycle.

If a specific date for delivery has been assigned, and the product is reviewed to the satisfaction of all stakeholders, then the final 'sign off' is formalised with an agreement to that effect. Any further modifications to the product would be, in effect, a new product and costed and developed accordingly.

Key Features

- The product is replicated for delivery on CD-ROM or installed on a server for delivery over the Internet or an Intranet.
- The Installation Strategy Plan is implemented.
- The development of the documentation, technical/installation and release notes is finalised.
- The level of client support, performance support and on-going maintenance is agreed with the client.
- The requirements for all licence agreements are confirmed and any new licences or warranties are developed.
- The final product is supplied to the client who is provided with a formal written notice to that effect. The delivery process is formalised with the client's signing of an acceptance agreement.
- A mechanism for on-going user feedback is established. This may be implemented as an integral component within the online version with alternative feedback mechanisms for 'traditional' multimedia products.

Delivery and Implementation

Delivery and commissioning processes outlined at the planning stage are implemented.

Description

The chain of multimedia development begins and ends with the client. The required delivery and implementation strategies are agreed in the early stages of the project and are now implemented. In addition, it will have also been decided how updates and service are provided. If the product is to be delivered on CD-ROM, there are a number of steps before the 'sign-off' point with the client. CD-ROM products have a number of additional steps not required for online delivery. In both cases the elements need to be prepared so that the files are efficiently organised and the data is optimised.

The time taken to replicate the CD-ROM (while minimal) is taken into account in the overall project schedule. The accompanying documentation is reviewed and the product is forwarded to the client or installed on the client's platform.

Revisit the project as soon as possible to elicit ways in which the processes may be improved.

Tasks

Check delivery means and costs

Review with the client the delivery and implementation plan to ensure that there is a clear step-by-step procedure to follow and that the cost of delivery is agreed and accepted.

Prepare the physical media

All product elements and any dependent system components must be prepared in the appropriate state for use, for example, placing files in the right directories and having windows and icons appear in the appropriate places. If delivery is to be on a CD-ROM, the data must be organised, optimised and premastered ready for final testing.

Duplicate the product

Before a product can be delivered to a client, it must be prepared for release and replicated in volume. If the product is customised for one client, strive to do the installation on-site and ensure that the product is operating correctly.

Review the accompanying documentation

Ensure that the accompanying educational/training materials have also been reviewed for accuracy. Useful, well-tested documentation can offset later maintenance responsibilities.

Install the product (where appropriate)

Prepare for installation to the user's platform ensuring that you have the appropriate file transferring/installation software.

Review the development process

Hold a postmortem with the team to review the process of development, particularly the actual schedule and cost. Planning strategies, budget issues, team collaboration and design conflicts are just some of the topics on which the team may focus, in order to develop mechanisms to improve processes.

Delivery and Implementation

As the course is operational, on-going management and maintenance strategies are implemented to ensure currency, correctness and applicability.

Description

The utility of the World Wide Web is due in part to its ability to handle multiple application protocols which give the system its global functionality. However, the end user requirements and network considerations can limit its use by some individuals and organisations so that while the implementation of courseware on the Internet may appear to be a relatively simple process, it may not be so for the end user.

Material developed for clients for educational or training purposes needs to be integrated into the existing infrastructure of the organisation. Educating the client about the value of online education/training, while an on-going task throughout the project, is critical in this phase to ensure that the product once implemented is used as intended.

Review with the client the other components which can support online courses such as online asynchronous conferences, the use of periodic topical notes to supplement the main body of material and access to other online resources.

Tasks

Assemble fully functional Internet/Intranet site

Once the configurations for the site have been determined upload the material from the archival storage and test with the same rigour as would be applied to a course delivered on CD-ROM.

The online interactive multimedia products are now installed on the host server. Some links might have been integrated into files beforehand and others are integrated once the system is 'live'.

Consider future growth options

Ensure adequate server performance and develop a migration strategy for future growth. As the Internet grows and bandwidth increases, it will be imperative to provide users with an optimum response time for downloading files or for viewing video or animations.

Implement maintenance and support strategies

Determine the type of maintenance to be provided:

- Preventative maintenance which anticipates conditions or changes that can cause problems in the future.
- Defensive maintenance which provides support and feedback when problems occur.

In either event, courses delivered over the Internet or an Intranet, which may have links to external resources on the Internet, require constant oversight to ensure that links are current and that the material is updated to take advantage of new developments in web browsers or other technologies.

Determine and implement feedback mechanisms

Feedback forms can be an integral component within the courseware, provided by email or accessed through bulletin board systems where documents can be attached.

Delivery and Implementation

All licencing agreements are confirmed as finalised and that liability and insurance coverage is arranged for the delivery of the product.

Description

Before multimedia products are released, details of the licence to use the product should have been agreed with the client. Help desk, software support, and on-going maintenance of the system is agreed before delivery.

A warranty disclaimer may be included with the release package, and this needs to be carefully drafted.

A System Registration Form may be used to confirm delivery, define commencement of any warranty period, and provide contact details for persons authorised to act on behalf of the client (or purchaser, or user).

Where delivery involves physical shipment of goods, the Project Manager may insure the package against loss or damage. The insurance liability is agreed between the client and the Project Manager, prior to shipment.

Tasks

Confirm requirements for Licence Agreement

Confirm that Licence Agreement requirements are current, and determine whether single user, site licence, server licence, or any combinations thereof are appropriate.

Develop Licence Agreement(s)

Develop and document licence agreements, with suitable clauses to limit liability. Define any warranties and their duration.

Confirm warranty terms

Confirm with the client that warranty is required, and agree on the terms and wording (for example - free replacement of damaged CD-ROMs).

Confirm System Registration requirements

Where users or purchasers are required to register their purchase or acquisition of the system, confirm the registration requirements and design the relevant forms. Check relevant international and national legislation to avoid potential problems with distribution.

Limit liability for shipment

Where the product is to be physically shipped to end-users or clients, arrange suitable insurance coverage to limit liability caused by loss or damage in shipment.

Confirm online agreements

Where WWW site hosting arrangements need to be made, ensure that agreements have been negotiated and are in place and that permission has been received for all links to other sites. All reproduction and/or retransmission rights are finalised.

Arrange formal acceptance by client

When acceptance conditions of the contract have been satisfied, obtain a formal acceptance authorised (signed) by the client.

Delivery and Implementation

The handling, storage, packaging and delivery mechanisms are provided to guarantee the product is shipped as built. Release notes and instructions for installation and setup are provided.

Description

Requirements for handling, storage, packaging, preservation, and delivery are determined as part of the acceptance criteria for the client. Documented procedures to meet these requirements will have been included in the Project Plan.

The multimedia product should be packaged in a way that facilitates its efficient and effective installation and operation by the client.

A quality product, as defined by the requirements, will be delivered successfully to the client site. It may then be installed and set-up according to documented procedures, based on the identified requirements.

Tasks

Supply the product

Identify and document requirements for delivery and successful installation and supply the product in a manner acceptable to the client.

Replicate product

Establish replication facilities to produce as-built replicas of the multimedia product.

Develop and document procedures for the efficient and effective handling, storage, packaging, preservation, and delivery of the multimedia product.

Register the product

Provide a mechanism for product registration for warranty, and on-going maintenance and support.

Close the project

The Project Manager arranges the checking of the results and records of the multimedia product(s), activities and tasks employed for completeness. The results and records are archived as required, and the client is provided with formal written notice that the contract or project has been completed.

Delivery and Implementation

Strategies to reduce technical risks from version control, documentation development and pre-testing are employed.

Description

Risks in this phase are mainly associated with the operating environment of the multimedia product. Previously undetected errors or defects may surface. Minor defects detected earlier may become major problems (if not rectified) once the product is operational.

A major risk is associated with version control used in the build of the product for delivery. It is not always appropriate to use the latest version of each asset in the final build, so the build lists for the product need to be reviewed. A unit development folder which provides full details of each component version, with known defects, test results, build lists and release notes, may be useful.

Documentation and help files may require testing of linkages in the final product. An incremental approach to development will assist in creating a reliable delivery process. Risks associated with handling, packaging, storage, preservation and delivery may be minimised by effective design. Risks associated with client acceptance are reviewed prior to delivery and implementation.

Tasks

Identify delivery and implementation risks

Where summative evaluation is performed as part of the implementation, the associated risks need to be identified. A plan for further development or amended releases may be required. This could have a serious impact on the final payment for the project.

Perform risk analysis on product release

Analyse risks associated with version control procedures, documentation integration and beta or pre-testing of the product in the field. Control of information about the product performance and acceptance in the field may be difficult or impossible.

Report risk status

Report risk status of the result of the analysis for each risk item. Risks associated with delivery and implementation can be severe, as they usually involve people outside the direct control of the Project Manager.

Incorrect or misleading reports about the product can have a devastating effect on product acceptance in the user environment.

Obtain early feedback

Team members and other stakeholders often find out about issues and problems before the Project Manager. A method of sending or receiving bad news anonymously may help to provide early warning of issues likely to impact on the project. This can be very effective during the delivery and implementation phase.

Delivery and Implementation

The configuration for the developed multimedia product to be implemented and distributed is defined and agreed, and placed under formal controls.

Description

Following successful completion of evaluation, the system is ready for delivery. Control of change and management of the system configuration is essential in this phase.

The contents of the released product must be documented, listing the specific version and other identification of each component, and the nature of the component in the release (eg whether as normal or compressed graphic file). Details of any compilers or other tools used in the building of the final release must also be documented.

Standards for packaging and distribution of the released product must be determined, and procedures established to ensure that all copies released meet the defined standards. The developer may not be responsible for this, but the organisation should ensure that the selected distributor meets basic criteria for competence and professionalism.

Tasks

Define the baseline for the final released product

Ensure that the configuration of the final product is clearly defined, and that a secure backup of both the system and of any source material is prepared and lodged securely. In the case of two-party contractual arrangements, some form of escrow arrangement may be necessary to protect the interests of both parties.

Define standards for packaging and distribution

The mechanism for installation of the software in the user environment - whether it is performed by the user or by another party - should be specified and developed well in advance of this phase, and should be evaluated with the earlier releases.

With online systems, the options of distribution are very wide and require careful management. These systems may be available from a single Internet site; they may work through a series of mirror sites; or they may be sold for distribution through corporate Intranets.

Pack and distribute the final product baseline

While the developer may not be responsible for the final distribution of the product, it should ensure that the defined standards for packaging are followed. The method for distributing a Web-based package may be an integral part of the configuration management system. For other options, a detailed procedure to ensure correct distribution may be needed.

Establish a mechanism for ongoing response to user feedback

The level of ongoing user support will vary from project to project, and needs to be defined and confirmed at an early stage. In general, though, some mechanism for receiving and acting on feedback from users - whether in the form of suggestions for improvement or reports of problems - needs to be established. The users should also be provided with feedback on the response to their problems. With current technologies, the use of Internet based technologies for user support is increasingly common.



Delivery and Implementation

The planned tasks for implementing and distributing the final product are shown to have been followed.

Description

Quality assurance provides confidence that the final implementation of the product meets the user's needs. This is achieved by checking that the Acceptance Test has been conducted properly, and reflects the agreed requirements; and then, by confirming that the packaging and delivery activities have been conducted in accordance with the defined procedures.

At this stage of the project, QA should be looking both backwards and forwards. It needs to identify whether problems in the overall conduct of the project have caused any deficiencies in the final delivered product, and what actions can be taken to address these problems. It must also ensure that customers are provided with a proper level of support for their on-going use of the system.

In addition to this, the quality assurance function ensures that the organisation learns from its experiences. Implementing the corrective actions recommended by an effective QA group will enhance the organisation's ability to undertake similar work in the future.

Tasks

Review Acceptance Test results

The results of the Acceptance Test are critical to satisfying contractual obligations, and it is important that the QA group reviews the results of these tests to ensure that acceptance has been properly conducted and that any identified problems have been addressed adequately. Acceptance testing can highlight deficiencies in the overall development process; failure to meet acceptance criteria is indicative of significant problems in the way the organisation addresses the user's requirements.

Confirm final product configuration

The QA group confirms that the final product configuration is correct, and reflects the final state of development. They check that all source files are complete and confirm the status of any outstanding problem reports or issues. They also gain assurance that a proper reference backup of both the source and the system has been made and securely stored, and that, where appropriate, secure escrow agreements have been established.

Review Delivery and Implementation actions

The procedures developed for delivery and implementation should be reviewed by the QA group before their application. The review should take account of the mode of distribution, the contractual arrangements in place, and the needs for security, reliability and product integrity.

The QA group conducts an audit of the final delivery and implementation procedures, ensuring that the defined standards have been followed. In the case of online systems, the audit should address issues of security and access to the system; where an online system is intended to have restricted access, the process whereby this is ensured should be checked. Where deficiencies in the delivery process are identified, corrective actions should be recommended.

Review user support arrangements

Following successful implementation, the QA group examines the management of feedback reports from users, with identified problems tracked to closure, confirming that the organisation remains responsive to the user's needs.

Delivery and Implementation

The implementation criteria are seen to be fulfilled and the product meets the client's and/or end user's requirements in an operational environment.

Description

The focus of the final stage in multimedia development is the acceptance of the developed product by the client. Criteria for acceptance will have been defined at a much earlier stage in the product life cycle, and should have been revised at regular intervals. In this phase, then, the tasks of verification and validation are twofold: firstly, to review and, if necessary, revise the acceptance criteria for the product; and secondly, to conduct the acceptance tests, providing final clearance of the system as meeting the requirements of the customer.

The final implementation of the system should be clearly traceable to the user requirements, with agreement on the manner in which each is addressed in the final product.

Finally, a summary report on the verification and validation activities is prepared, providing a basis for the organisation to learn from the project. The relative value of the different verification approaches used is outlined to determine the overall success in addressing the client's issues.

Tasks

Review Acceptance Criteria

The Acceptance Criteria represent the defined 'minimum acceptable' standard for acceptance of the product by the client. At this stage, prior to undertaking acceptance testing, the criteria is reviewed, to ensure that they still are an accurate representation of the client's expectations.

Particular emphasis is placed on ensuring that conformance to the criteria can be objectively demonstrated. If criteria are expressed in terms that are not objective, then scope exists for debate between client and developer as to whether the system meets the requirements.

Conduct Acceptance Test

Acceptance Tests are normally the responsibility of the client; however, in most cases, the developer will conduct a complete set of 'internal acceptance' tests, confirming that the system meets the criteria before it is handed over to the client.

Confirm traceability to requirements

The developer should trace the requirements to their final implementation, identifying at each stage the system components, modules and units, and their contribution to each of the requirements. A traceability matrix can be drawn up, and, once completed, provides a powerful validation tool; requirements with no annotations have most probably not been met, while modules with no confirmed requirement are of doubtful purpose.

Prepare final V&V report

The Project Manager prepares a summary report, identifying all of the V&V activities performed in the project. The report is of substantial use in evaluating the relative values of the different activities undertaken, and also in providing insight into the development capability of the producers. It is an essential contribution to organisational learning, enhancing the producer's ability to undertake similar projects in the future. It should form part of an overall project review document.

Delivery and Implementation

Work Products

Test Summary Report

An overall summary of the testing activities conducted during the project, with an evaluation of the overall effectiveness of testing.

Packaging Information

Packaging information to accompany the system should be developed, to provide an adequate description of the system that allows a user to successfully install the system.

Change Control Records

Records of changes requested and made to baselined products (work products, systems, etc). They should contain linkage to associated customer requests, internal change requests, etc, and a record of appropriate approvals.

Audit Requirements and Records

Requirements for audits conducted during the phase, mainly in the form of audit checklists, should be retained as should the results of reviews, audits and assessments conducted during the phase.

Review Records

These should provide the context information about all QA reviews conducted in the phase: the coverage of the review; the readiness for the review; and the required corrective actions.

Corrective Actions

Descriptions of actions taken to correct deviations from the planned activities, or to ensure achievement of the desired product quality.

Review Criteria

Criteria for reviewing the specifications should be developed and documented.

Problem Reports

Reports on problems identified during reviews of specifications should be documented.

Configuration Status Reports

Reports on the status of the Configuration Library, including the current status of baselined items.

Insurance Policy

Shipment Record

Release Notes

Provides the client with details of the system and requirements in addition to:

- copyright and license information
- technical support information
- backup and recovery details
- all known open problems, faults, warnings
- identification of the components and any parameter/command details.

Installation Guide

Documents the tasks in sequential order, for loading and installing the product. Installation requirements are identified.

Project Completion Record

This record from the client authorises the release of resources from the project and the archiving of project records. Requirements for completion and closure of the project are usually specified in the contract.

Delivery and Implementation

Questions to Confirm this Phase

Can the correct versions of all of the components of the system for final delivery be identified?

Is a secure copy of the final version of the system held away from the development site?

Have standards for packaging of the final system been defined and enforced?

Has final acceptance testing been conducted?

Have any problems raised during acceptance testing been recorded and tracked to resolution?

Has a mechanism been established for on-going support for users of the system?

Have arrangements been made for delivery and access to sites?

Is the course operational?

Have all licensing issues been finalised?

Has insurance coverage been arranged for shipping?

Does the product fully meet the client's/user's requirements?

Has the client accepted the product and signed the acceptance agreement?

Has a plan been set up for on-going maintenance and monitoring of the product?

Are there any outstanding legal issues to be resolved before delivery?

Who were the 'launch' customers and what was their response?

Have all invoices been paid by client?

Have all developers been paid?

What 'Help' documentation has been provided?

What maintenance agreements have been signed?

How did the summative evaluation with end users get reviewed?

What plans exist for further development of the product?

NOTES

