

Multimedia Pathways

*A Development
Methodology for
Interactive Multimedia and
Online Products for
Education and Training*



impartcorporation



MULTIMEDIA PATHWAYS

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*Multimedia Pathways: A Development Methodology for
Interactive Multimedia and Online Products for Education and Training*

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CONTENTS

Introduction

Overview

The Methodology

Structure of the Methodology

Phases of Development Matrix

Initiation 1

Specifications 13

Design 25

Production 37

Review and Evaluation 49

Delivery and Implementation 61

Appendix of Example Work Products 73

Project Diary

Risk Management Plan

Evaluation Plan

Introduction



OVERVIEW

The Australian Government supports six Cooperative Multimedia Centres who in turn are tasked to support the evolution of a dynamic national multimedia industry providing Australian content for Australian and international consumers and building a critical pool of talent with multimedia skills.

As a Cooperative Multimedia Centre, Impart Corporation (formerly STARLIT Multimedia Centre) is a consortium of leading education and information technology organisations committed to accelerate and promote the development of new technology-based learning environments. The consortium members are: Griffith University, Central Queensland University, the University of Wollongong, Newmedia Corporation and Oracle Corporation.

The development of a methodology for the design and development of interactive multimedia learning systems is one of Impart's core activities.

As a first step towards this multimedia development methodology, Impart acknowledged the pool of talent existing in its partners. It was natural that each of those partners, prior to the formation of the Impart consortium, had their own viable and legitimate processes for developing interactive multimedia, and that each of these processes would provide a valuable resource for the development by Impart of an integrated methodology that would build on the strengths of those developed by the partners.

The authors reviewed existing resources related to models and practices in interactive multimedia product and systems specifications, design,

development, evaluation and implementation. Best practice activities in interactive multimedia amongst partners and external organisations were identified and systematically documented.

To assist Impart and its partners utilise this 'best practice', the authors developed this print based document detailing Impart's *Multimedia Pathways: A Development Methodology for Interactive Multimedia and Online Products for Education and Training*. *Multimedia Pathways* includes a quality assurance and management framework which integrates with a methodology based on the iterative development of open architecture interactive multimedia solutions.

Working collaboratively, the authors developed a matrix which encapsulates the key categories of activity in each of the six major phases of interactive multimedia development. The expansion of the matrix forms the core of the methodology.

This document is the foundation on which Impart continues to trial, measure, modify and revise draft processes and practices, yielding detailed data which forms the basis of an ongoing best practice methodology for the development of both interactive multimedia and online educational and training resources. *Multimedia Pathways* has undergone an independent validation and verification and is currently undergoing rigorous evaluation by the partners. The comprehensive feedback and refinement will be reflected in ongoing edits. This will ensure the methodology continues to remain relevant, valid and reflects technological change.

development strategies outlined in this document are not intended to replace existing processes and methodologies, but to supplement them and offer suggestions and solutions that are consistent with those being adopted by other centres of excellence.

Multimedia Pathways is aligned with ISO 9001 and, more importantly, ISO 12207 specifications as well as being AICC compliant. The methodology is not just suited to the development of individual training packages but can be used as the standard methodology throughout an agency. This means that organisations pursuing ISO accreditation can do so based on *Multimedia Pathways*. The methodology has been designed to meet the needs of both small and large projects.

Aligned with the development of this document Impart has also produced an initial set of templates directly related to the Work Products of this methodology. Samples of these support templates are included in the Appendix. Like the methodology the set of templates will undergo evaluation, revision, modification and addition.

Visit Impart's web site at <http://www.impart.com.au> to see an overview of the *Multimedia Pathways* methodology and to download portable document format (pdf) files of the sample Work Product Templates. The support templates are available for purchase from the web site.

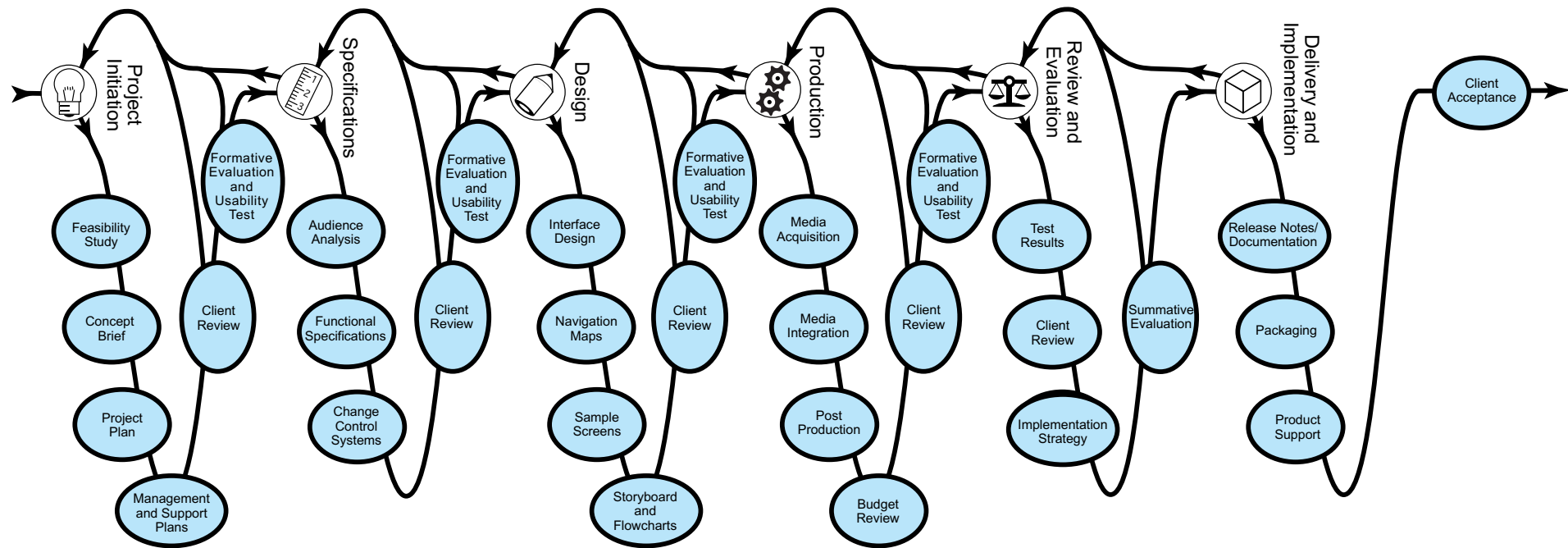
Multimedia Pathways

Multimedia Pathways: A Development Methodology for Interactive Multimedia and Online Products for Education and Training provides a framework which can be integrated within an organisation's current development of quality interactive multimedia resources for education and training. The use of this framework is intended to support multimedia developers in their endeavours to extend their capabilities and enhance their expertise in the delivery of courses into online and other multimedia environments. It can also be used as a resource to assist those who are outsourcing the development of their training.

The development blueprint is not a prescriptive step-by-step methodology, but a resource of processes and strategies of which all, or part, can be accessed depending upon the needs and the nature of the interactive multimedia initiative.

The methodology outlined in this book is, in effect, a benchmark that will facilitate quality improvement and increased efficiency in organisations engaged, or intending to engage, in the specification, design, production, evaluation and implementation of interactive resource-based education and training.

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Structure of the Multimedia Pathways Methodology







This methodology aims to incorporate the best attributes of the traditional software development methodologies (including extensive quality assurance considerations), the rapid prototyping development cycles of emerging interactive multimedia initiatives, and the creative talents of media designers and artists. The methodology is not necessarily about the presentation of 'new' materials or concepts but more about the innovative utilisation and organisation of a blend of existing and emerging disciplines.

Interactive multimedia products lend themselves to a development process based on collaborative analysis and design, iterative and rapid prototyping, small development teams comprised of specialists with advanced tool sets, and project management based on prioritisation. The methodology outlined in this document follows this process.

The methodology focuses on six phases of multimedia development — Initiation, Specifications, Design, Production, Review and Evaluation, and Delivery and Implementation, each of which is divided into three categories of activity — Development, Management and Support. The categories of activity are further subdivided. The Matrix on the next page shows the intersections between the phases, the categories of activity and the focus within each category.

An overview of each phase of development is provided, followed by a one page outline of each particular activity. The activity is described and associated tasks are outlined. Each section concludes with a list of work products and possible questions to confirm that tasks for the phase have been completed as required.

Categories of Activity

| | | Phases of Development | | | | | |
|-------------|---------------------------|---|--|---|---|---|---|
| | |  |  |  |  |  |  |
| | | 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 the 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 developmental environments and media integration strategies linked to the specifications and design solution. | Client review and user evaluation occur at periodic intervals in the development process to ensure 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 technology as the means of achieving them. | | 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 reflect the faster and more cost-effective process of development. | As 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 than in traditional software development and therefore more clearances to obtain for both production and/or delivery of product. | It is desirable to incorporate a significant proportion of original material in online resources, and ensure that linked materials are attributed to the respective authors. | All copyright restrictions and/or assignments and encumbrances should be resolved before production commences. | All required non-disclosures for outside parties involved in evaluation or acceptance testing are arranged. | 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 acceptance criteria. | 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 members and other matters are conducted in accordance with the concept brief and the detailed design document. | Each skill group, such as graphic artists, animators, programmers, goes about its tasks with appropriate guidance/support from the project manager. | Evidence is provided that the project achieves what it was designed to do. Independent evaluation of the expected outcomes from the use of the product is obtained. | 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. | Confirmation is secured 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 are ensured through the enforcement of agreed standards and control of change. | Changes to the user's requirements are identified during evaluation of the multimedia system and agreed through a formal process which is followed by modification of the product. | 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 confirms that the specification of user requirements has been reviewed for completeness and feasibility, and that any issues previously raised are addressed. | Confidence is established in that the design solution accurately reflects the user's requirements, and that the agreed standards are followed. | The developed system is shown to be derived from the agreed design using defined actions and agreed standards. | The agreed steps for addressing issues raised in evaluation are 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, are defined and applied. | The correctness and appropriateness of the design solution are demonstrated through a process of design review. | The developed system and its components are shown to be a robust and accurate reflection of the user's requirements. | Evaluation and testing confirm that the user's requirements have been fully addressed and technical and other errors identified and rectified. | 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. |

