

# Content Production Kit v.2

How to produce interoperable, durable, maintainable and affordable content in international projects of defence institutions

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Developed by International Relations and Security Networks (ISN)

Author: Jayne Fry

Content & review contributions: Reto Schilliger, Beat Oderbolz, Alexandra Tödt (v.1)

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## Introduction

This section provides a general introduction to the purpose and scope of the paper. It also outlines the phases of the production process describing course activities and milestones required of the project team during the development of the course. An overview of project roles and assigned responsibilities is also provided.

## About this document

### Purpose

The purpose of this paper is to outline the *recommended* production process for Advanced Distributed Learning (ADL) courseware. It has been written to support all those who have been tasked to create ADL courseware, especially for the ADL WG PfP Consortium.

- The objective of this paper is to provide guidance on the creation of e-Learning content that is interoperable, durable, maintainable, re-usable and affordable. The aim is to enhance and facilitate the development of ADL courseware by: Defining individual work phases and steps by which content is developed and delivered
- Defining the analysis, learning objectives, instructional design and test/self-assessment strategies
- Defining roles and responsibilities of project members
- Providing forms, templates, checklists, samples and further information relevant to the phases and steps of the project.

### Scope

This document advises on recommended standards, processes and design to enhance the development of ADL courseware from a technical and educational perspective. You may adapt this paper according to your needs.

This is a living document. Your feedback and change requests are highly welcome. Additional and revised content will be incorporated into subsequent revisions of this document. Please provide feedback and change requests to [e-learning@sipo.gess.ethz.ch](mailto:e-learning@sipo.gess.ethz.ch).

Additional papers on *Important Didactical Concepts* will be launched separately in the near future.

### Structure of the paper

The paper is structured as followed:

- The first section details the steps to be taken in a project. Each step is presented with its title, purpose, required actions and designated roles.
- The second and most extensive section contains forms guidelines that support project partners in carrying out their work.

## Process Overview

The process comprises seven main phases:

- **Project Initiation**  
Establishes the scope and objective of the proposed project, as well as roles and responsibilities of project partners, deliverables, and deadlines. During this phase a 'go/no-go' decision has to be made on whether to proceed with the build of the course or not.
- **Analysis Phase**  
Comprehensive analysis phase of the learning environment, learner personality, learning tasks and resources – all critical prerequisites for the production of effective e-Learning projects.
- **Design Phase**  
Defines the didactical structure of the course - learning objectives, test/self-assessment items, as well as course structure (information architecture) and didactics down to the SCO level.
- **Development Phase**  
Defines the production of the course from content outline, to storyboard, multimedia components and integration of content into the authoring tool.
- **Implementation Phase**  
Includes all steps from deployment of the course in the LMS to testing and accepting, sign off and the operational go-live.
- **Evaluation Phase**  
Contains the evaluation steps to obtain feedback on course usage and course quality.
- **Maintain/update course**  
Ensures the course is properly maintained and/or updated on a regular basis.

Attention: The project initiation phase and training needs analysis (TNA) phase of projects may differ considerably amongst partner institutions.

## Definition of Project Roles & Responsibilities

This section provides a brief overview of project roles and assigned responsibilities:

### Management Team

- **Project Initiator (PI):**  
The project initiator initiates the course project and looks for partnering organisations and potential funding.
- **Steering Committee (SC):**  
The steering committee comprises 2-3 key members of the project team (project initiator, project manager and curriculum representatives) who co-decide all important project issues including go/no-go decisions

### Development Team

- **Project Manager (PM):**  
The project manager is responsible for project delivery, management of schedule including controlling and monitoring of deliverables, status reporting and providing approval for the final product.
- **Instructional Designer (ID):**  
The instructional designer has overall responsibility for the instructional design of the course including: storyboard conceptualisation; writing learning objectives and assessment items; as well as consulting subject matter experts on instructional writing.
- **Subject Matter Expert (SME):**  
The subject matter expert is responsible for providing subject matter knowledge to the course by: consulting project team members (primarily project manager and instructional designer) on the topic; providing 'raw' subject matter content; and supports the instructional designer in defining the learning objectives and self-assessment items.
- **Multimedia Specialist (MM, optional):**  
The multimedia specialist is responsible for the design and development of visuals and interactive multimedia objects (including film/audio). The instructional designer takes over this role if no multimedia specialist is available.

### Curriculum Representatives

- **Teacher/End-User Curriculum Representatives (CR):**  
The curriculum representatives and teachers/organizations using courses in their curricula are responsible for ensuring course content is in line with the target audience and institutional curricula

### Support Team

- **Support team (ST):**  
The support team is responsible for the import and activation of the course into the LMS, the tracking of learners' activity and first level support

## Project Overview

The Project Overview graphic illustrates the project's production phases and steps with corresponding roles. To read the project overview, select a step (left-hand column) and align with corresponding role (top-row). The X demonstrates the step to be carried out by the appointed project role.

Nr.	Step	Project Roles							
		PI	CS	PM	ID	SME	MM	CR	ST
		Project Initiator	Steering Committee	Project Manager	Instructional Designer	Subject Matter Experts	Multimedia Specialist	Curriculum Representative	Support Team
<b>1.0</b>	<b>Project initiation</b>								
1.1	Project request/proposal	X							
1.2	Identify critical national/multinational issues		X	X	X			X	
1.2	Project kick-off meeting (incl. team constitution)	X	X	X	X	X	X	X	
1.3	Project go/no-go decision		X	X					
<b>2.0</b>	<b>Analysis phase</b>								
2.1	e-Learning environment			X	X			X	
2.2	Learner personality				X	X		X	
2.3	Learning tasks				X	X			
2.4	Resources			X	X	X			
<b>3.0</b>	<b>Design phase</b>								
3.1	Define learning objectives				X	X			
3.2	Develop test/self-assessment items				X	X			
3.3	Define course outline				X				
3.4	Design review meeting	X	X	X	X	X	X	X	
<b>4.0</b>	<b>Development phase</b>								
4.1	Content outline				X				
4.2	Storyboard				X	X			
4.3	Production of multimedia components						X		
4.4	Development review meeting	X	X	X	X	X	X	X	
4.5	Integrate				X		X		
<b>5.0</b>	<b>Implementation phase</b>								
5.1	Deployment (incl. add content object metadata)				X				
5.2	Testing & accepting			X	X	X	X	X	
5.3	Sign-off	X	X	X					
5.4	Go live				X				X
<b>6.0</b>	<b>Evaluation phase</b>								
6.1	After action review		X	X				X	
6.2	Track course usage		X					X	X
6.3	Course evaluation							X	
<b>7.0</b>	<b>Maintain/update course phase</b>								
7.1	Conduct revalidation of course			X				X	
7.2	Maintain course			X	X	X	X	X	X
7.3	Update course			X	X	X	X	X	X
7.3	Archive/decommission course		X					X	X

**Key**

Management Team: Project Initiator (PI), Steering Committee (SC)
Development Team: Project Manager (PM), Instructional Designer (ID), Subject Matter Expert (SME), Multimedia Specialists (MM)
Curricular Representatives
Support Team (ST)

Attention: During some projects an employee may take on multiple project roles.

# 1. Project Initiation

The project initiation phase establishes the scope and objective of the proposed project, as well as roles and responsibilities of project partners, deliverables, deadlines and so forth. Based upon these criteria a 'go/no-go' decision has to be made on whether to proceed with the build of the course or not. Experience has proven, that half-hearted commitment of partners to a project, as well as insufficient resources is detrimental to the success of a project.

## 1.1 Project request/proposal

The purpose of the project request phase is to gather all relevant information concerning the proposed course. As a sound project go/no-go decision can only be made based upon sufficient information. An informed decision requires the following information:

- General purpose or benefits of the course
- Educational and training needs
- Description of target audience
- Possible re-use of course by institutions
- Existing learning material resources that address the course in whole or part

To ensure future implementation of the course in the curriculum, potential curriculum representatives (i.e., teachers and organisations) should be contacted at this early stage in the project. As curriculum representatives are responsible for ensuring widespread re-use of the course.

		RESPONSIBLE
<b>REQUIRED ACTION</b>	Fill in appendix <i>Project Request Form</i>	PI
<b>MILESTONE</b>	Documented Project Request	PI

## 1.2 Identify critical issues of international/multi-partner co-operations

Before launching an international project or a national project with several partners, some basic issues need to be addressed/verified to ensure that the scope and objective of the project is valid across all the intended organisations and/or nations.

Past experience has proven that issues such as differing national values, laws or policies may affect common acceptance and/or widespread use of the course. Particularly delicate are issues that directly or indirectly concern value-concepts, national history or policy principles. Do NOT avoid these challenges by simply handling these problematic topics on a less detailed level, as this can result in superficial course content. Instead try to agree on detailed content at the beginning of the project. This helps to identify and address critical issues early. In the case of only limited discrepancies, some course parts may be implemented by each partner independently.

		RESPONSIBLE
<b>REQUIRED ACTION</b>	Consult PM/SC/SME on potential critical international and multi-partner issues	CR / SME
	Fill in Identify Critical Issues checklist	PM

<b>MILESTONE</b>	Identify critical multinational, national and local issues	SME / ID
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### 1.3 Project kick-off meeting

The purpose of the project kick-off meeting is to define the project further. During this meeting the following decisions need to be made:

- Assign roles, responsibilities and tasks of each project partner
- Agree course purpose, deliverables and deadlines
- Outline the structure and content of course
- Define the course life cycle
- Define intended quality expectations (i.e., media intensity and interactivity levels)
- Ensure intended course specifications are within the confines of resources

		<b>RESPONSIBLE</b>
<b>REQUIRED ACTION</b>	Moderate kick-off meeting with the aid of the kick-off meeting agenda Ensure all issues are addressed Document the kick-off meeting findings	PM
<b>MILESTONES</b>	Documented Project Request Proposal Documented Team Constitution Documented Project Plan Documented Lifecycle Management	PM

### 1.4 Project go/no-go decision

The purpose of the go/no-go decision is to abort projects in the early stages that could prove not fruitful. The go/no-go decision is taken after the findings of the kick-off meeting have been assessed and is based upon:

- Available resources
- Project partner commitment
- Curriculum representative involvement
- Re-use commitment

The most important of these criteria is the demonstrated commitment of project partners. Past experience has shown that if stakeholders are unwilling to attend the kick-off meeting, no binding commitment will be made to the project at hand. As a result, the project will be a continual uphill struggle. In such cases, it is recommended NOT to embark on the project that is, one should instead either look for new project partners or cancel the project.

		<b>RESPONSIBLE</b>
<b>REQUIRED ACTION</b>	Consult Checklist for go/no go decision Assess criteria and take go/no go decision	PM/SC
<b>MILESTONE</b>	Go/no-go decision	PM

## 2. Analysis Phase

A critical prerequisite for the production of effective e-Learning projects encompasses a comprehensive analysis of:

- e-Learning environment
- Learner personality
- Learning tasks
- Resources

The analysis provides a solid working base necessary for facilitating the development of content that optimally meets the learners' needs. Past experience has shown that when the analysis phase is not carried out properly numerous major corrections are generally needed at later stages in the lifecycle of the project, thus impeding effective development and causing high costs.

### 2.1 e-Learning environment

The e-learning environment differs greatly from project to project. Understanding the learning environment is imperative when developing a course that caters for diverse learning environments.

*Key question:*

**In which environment will the e-Learning take place?**

Analysis of the learning environment entails investigating issues such as:

- Where will the e-Learning course take place?
- How will the e-Learning course be embedded into overall training activities?
- What infrastructure(s) will deliver the course?
- How will the transfer of learning into field-performance be supported?

		RESPONSIBLE
<b>REQUIRED ACTION</b>	Consult appendix Analysis, part 1 and complete	PM
	Advise PM on all learning environment related issues	CR/SC
<b>MILESTONE</b>	Appendix Analysis	PM/PI/CR

### 2.2 Learner personality

The target audience(s) of an e-Learning course comprises a wide range of learner personalities with differing learning experiences and motivations. Developing an effective course requires catering for all learner personalities undertaking the course.

*Key question:*

**Which characteristics denote the typical learner personality for the e-Learning course?**

Analysis of the learner personality encompasses investigating issues such as:

- Level of education
- Previous learning experiences
- Attitude towards the content

RESPONSIBLE		
<b>REQUIRED ACTION</b>	Consult appendix Analysis, part 2 and complete	PM
	Advise PM on all learning environment related issues	CR/SC
<b>MILESTONE</b>	Appendix Analysis, part 2	PM/PI/CR

## 2.3 Learning tasks

Often, e-Learning projects focus on the delivery of knowledge and skills to master a set of very specific tasks. These tasks must be known in detail in order to derive relevant learning objectives and cost-efficient products. In more general educational projects, however, the focus on specific tasks may be replaced by an orientation towards a field of potential activities.

For task-specific trainings it is highly recommendable to draw a flowchart of all tasks, including all steps and decisions to be undertaken. Defining clearly, where the performance starts and where it ends, as well as which entry skills are expected.

*Key question:*

**Which tasks must learners be able to master at the workplace/in the field?**

Analysis of the learning tasks includes:

- Defining the exact tasks (fields of activity) that the e-Learning project should support
- Defining the tasks (fields of activity) that are definitely outside the learner's responsibility

Note:

Subject matter experts sometimes tend to add interesting background information to the content of a course that is not really relevant to the training project being developed. To avoid this, a thorough analysis of the tasks, ideally done together with the subject matter expert, is invaluable when streamlining the content to the learners' needs.

RESPONSIBLE		
<b>REQUIRED ACTION</b>	Consult appendix Analysis, part 3 and complete	PM
	Advise PM on all learning environment related issues	CR/SC
<b>MILESTONE</b>	Appendix Analysis, part 3	PM/PI/CR

## 2.4 Resources

It is essential in the early stages of project planning to check for available subject matter expertise and resources upon which the course can be built. Available resources will lower production time and costs significantly, as well as improve consistency with existing training and information material.

*Key question:*

**On which basis that is, resources and subject matter expertise is the course built?**

Analysis of the available resources comprises:

- Defining who and what may support the production of the intended content
- Defining which factors may negatively affect the course of the project

		RESPONSIBLE
<b>REQUIRED ACTION</b>	Consult appendix <i>Analysis, part 4</i> and complete	PM
	Advise PM on all learning environment related issues	CR/SC
<b>MILESTONE</b>	Appendix Analysis, part 4	PM/PI/CR

### 3. Design Phase

The *design phase* defines the didactical structure of the course - learning objectives, test/self-assessment items and course outline. It covers all aspects of the course down to the SCO level.

The aim of the design is to produce a course that: prepares and motivates learners; enables them to apply and practice learning; and assists them in retaining and transferring information.

#### 3.1 Define learning objectives

The first step in content production is to determine the learning objectives. Learning objectives are the cornerstones of all courseware. They state the intended learning outcome, i.e., what the course learner should be able to perform or know after completing a section of material.

The learner must master the learning objective in order to gain competency in the content. The content is structured in small chunks of instructionally sound learning content. The technical term for these instructional chunks, sections or modules is Sharable Content Object (SCO). The course comprises of an array of SCOs. Each SCO must have exactly one learning objective.

RULE: One learning objective per Sharable Content Object (SCO) is required.

Learning objectives have a four-fold purpose, they:

- Guide the intended learning process of course participants
- Guide the content production process by strongly influencing the course's structure, as well as didactical and pedagogical approach and methods used in the course
- Govern the preparation of self-assessment items
- Ensure efficient re-use of both the individual course and the SCO

For details on how to formulate learning objectives see appendix *Guidelines for Formulating Learning Objectives*.

		RESPONSIBLE
<b>REQUIRED ACTION</b>	Consult appendix <i>Guidelines for Formulating Learning objectives</i> and formulate learning objectives in cooperation with SME Fill in <i>List of Learning Objectives Form</i>	ID
	Advise/consult ID on the formulation of learning objectives from a subject matter perspective	SME
<b>MILESTONE</b>	Completed <i>List of Learning Objectives Form</i>	ID

#### 3.2 Develop test/self-assessment items

The primary purpose of self-assessment items in a course is to allow learners to obtain feedback on whether or not they have actually learned what they were supposed to. Self-assessment items serve four principal purposes in a course:

- Provide feedback on course participant's level of objective mastery
- Direct attention/focus on quintessence of course
- Motivate course participants' interaction with course material
- Promote instructors' accountability for student learning

Since the primary purpose of self-assessment items is to measure and test learners' knowledge of the learning objective of a SCO, it is vital that the self-assessment items are written in close alignment with the learning objective. All generated self-assessment items have to assess if a learner has actually mastered the given objective.

As a rule of thumb, three self-assessment items per SCO are required. The self-assessment items should be of similar difficulty.

RULE: Three test/self-assessment items per Sharable Content Object (SCO) are required.

RESPONSIBLE		
<b>REQUIRED ACTION</b>	Consult appendix <i>Guidelines for Writing Test/Self-Assessment Items</i> and formulate assessment items in cooperation with SME  Fill in <i>Test/Self-Assessment Items</i> form	ID
	Aid/consult ID on writing test/self-assessment items	SME
<b>MILESTONE</b>	<i>Test/Self-Assessment Items</i> form	ID

### 3.3 Define course outline

To ensure a sound instructional course design it is necessary to first aggregate the course content into a sensible information architecture, as well as outline the basic didactics of the course.

In this step the course structure and primary didactical elements are defined down to SCO level.

#### Information architecture

The information architecture that is, course hierarchy comprises a number of structural elements namely chapters, SCOs and pages. As a rule of thumb:

- A **course** consists of one or more chapters
- A **chapter** consists of one or more SCOs
- A **SCO** consists of one or more pages.

Example of a course structure:

**Course** → Building Defence Institutions

**Chapter 1** → PAP-DIB Objective 1: Democratic control of the defence sector

**SCO 1** → Defining democratic control of defence

**Page 1** → Democratic control of defence

**Page 2** → Democracy preservation

**Page 3** → Use of military force abroad

**SCO 2** → State agencies and defence

**Page 1** → Institutionalisation

**Page 2** → Parliamentary arrangements

**Chapter 2** → PAP-DIB Objective 2: Civilian participation in defence & security

Each SCO should be able to be a stand-alone that is, have a discrete beginning and end. A well-designed SCO should serve numerous audiences and thus be fit for re-use beyond the current project being undertaken. The SCO should contain sufficient detail so that the learner is able to understand the information with some precision.

To ensure that the learner is able to easily navigate through the course, it is recommended to structure the SCOs in a consistent manner. See the appendix *Recommended SCO Content Structure* for more details.

RULE: Five (+/- two) pages per Sharable Content Object (SCO)

### Didactical elements

The primary didactical elements of a course comprise:

- **Introduction** - that is, course introduction/chapter introduction/SCO introduction
- **Learning** - 'Need to know' information
- **Additional Information** – 'Nice to know' information
- **Exercises / Test/Self-Assessments** – Test results for the end user. These results are NOT used for grading and certification and so forth, and subsequently not stored.
- **Assessments** – Test results used for grading and certification and so forth. These results are stored.

These didactical elements are part of the aforementioned information architecture.

RESPONSIBLE		
<b>REQUIRED ACTION</b>	Consult <i>Course Outline Checklist</i> Define course outline down to SCO level from (i) architecture/content perspective and (ii) didactic perspective	ID
<b>MILESTONE</b>	Course outline	ID

### 3.4 Design review meeting

The purpose of the *Design Review Meeting* is to critically check the quality of the course outline that was prepared during the design phase. All project members are summoned to participate in a real or virtual workshop for the final review of:

- The quality of the learning objectives
- The quality of the test/self-assessment items
- The quality of the alignment of the learning objectives with the self-assessment items
- The quality of the course outline from a content/information architecture perspective
- The quality of the course outline from a didactical perspective

All shortcomings, missing items and errors should be listed and amended accordingly. Upon completion of these amendments, the course outline is to be signed off by the PM and SME.

After sign-off, the development phase may commence.

		RESPONSIBLE
<b>REQUIRED ACTION</b>	Consult the appendix <i>Design Review Meeting Agenda</i>  Moderate <i>Design Review Meeting</i>	PM
	Present the course outline to all project members i.e., (i) learning objectives, (ii) test/self-assessment items (iii) course structure/ information architecture and (iv) didactics	ID
	Critically review the course outline and provide constructive feedback	All project members
	Amend (i) learning objectives, (ii) test/self-assessment items (iii) course structure/ information architecture and (iv) didactics where necessary	ID
<b>MILESTONE</b>	Sign off of Design Review phase	PM/all project members

## 4. Development Phase

The *development phase* defines the production of the course from content outline, to storyboard, multimedia components and integration of content into the authoring tool. It covers all aspects of the course down to the single PAGES of each SCO.

The aim of the development phase is to produce a course that: prepares and motivates learners; enables them to apply and practice what they have just learned; and assists them in retaining and transferring information.

### 4.1 Define content outline

The *define content outline* phase defines and describes the instructional design of the course further that is, content, didactics, multimedia elements and page layout. It covers all aspects of the course down to the single PAGES of each SCO.

- **Content** defines which content is used on which pages
- **Didactics** defines which didactical elements are used on which pages (for example, questions)
- **Multimedia** defines which multimedia elements are used on which pages (for example, interview as video)
- **Layout** defines the formation of each page that is, how the page looks

In short, the content outline defines and describes EACH single page of the course in detail and offers an outline of all course content.

The content outline serves as an optimal guide for scripting that is, writing the storyboard, whereby ensuring early control of the overall learning time of the course. It also provides a basis for discussing the overall content of the course early, thus reducing revisions to the storyboard at a later date.

The appendix *Content Outline* provides a template for outlining the content of a course.

		RESPONSIBLE
<b>REQUIRED ACTION</b>	Consult the appendices <i>Content Outline Checklist</i> and <i>Didactic Design Guidelines</i>  Refer to the completed <i>List of Learning Objectives</i> and <i>Test/Self-Assessment Items</i> <u>then</u>  Define and describe EACH single page of the SCO that is, course in detail (i) Content, (ii) Didactics, (iii) Multimedia elements and (iv) Page layout  Complete the appendix <i>Content Outline</i> in detail	ID
	To check the <i>Content Outline</i> for completeness of content	SME
<b>MILESTONE</b>	Documented <i>Content Outline</i>	ID/SME

## 4.2 Storyboard

The purpose of the storyboard phase is to write instructional content that is well aligned with the learning objectives, test/self-assessment items and detailed content outline.

The appendix *Guidelines for Writing Content* highlights the specific requirements necessary for writing optimal instructional online content geared towards vocational education and training.

ATTENTION: To ensure efficient and effective content production, it is imperative that the Subject Matter Expert (SME) and Instructional Designer (ID) cooperate at all times.

The role of the SME is to provide specialist subject matter expertise, whilst the role of the ID is to provide specialist knowledge in the field of pedagogy and didactics. If the SME and ID do NOT cooperate at all times, the success of the project will be severely jeopardized.

		RESPONSIBLE
<b>REQUIRED ACTION</b>	Provide materials in line with the appendix <i>Content Outline</i>	SME
	Consult the appendix <i>Didactic Design Guidelines</i> and <i>Guidelines for Writing Content</i> Refer to the completed <i>List of Learning Objectives, Test/Self-Assessment Items</i> and <i>Content Outline</i> then <u>then</u> Write instructional content using materials provided by the subject matter expert Complete the appendix <i>Storyboard Form</i> in detail	ID
	Aid/consult Instructional Designer on the scripting of content for the storyboard from a subject matter perspective	SME
<b>MILESTONE</b>	Documented <i>Storyboard Form</i>	ID/SME

## 4.3 Production of multimedia components

Developing the multimedia concept includes preparing interactions, creating the look and feel of the course and integrating multimedia elements such as audio, video, graphics and animation. Each multimedia object has to directly support the learning objective.

To be effective, multimedia should be used uniformly and consistently. Furthermore, it should direct the student's attention and not distract from the material. It is important to bear in mind that users with little bandwidth will be unable to the multimedia elements.

Decisions on the degree of interactivity and complexity of design are based on the relative importance of the content, budget, timeline, resources for maintenance and audience size.

		RESPONSIBLE
<b>REQUIRED ACTION</b>	Consult the <i>Guidelines for Multimedia Design</i> and <i>Copyright Guidelines</i> Develop the multimedia design concept and deliverables Check copyright issues	ID/MM

	Ensure timely production of deliverables by third parties	
<b>MILESTONE</b>	All multimedia components	ID/MM

#### 4.4 Development review meeting

The purpose of the *Development Review Meeting* is to critically check the quality of the storyboard prepared during the development phase. All project members are summoned to participate in a real or virtual workshop for the final review of:

- Quality of the storyboard
- Quality of the multimedia concept including deliverables (when available)

All shortcomings, missing items and errors should be listed and amended accordingly. Upon completion of these amendments, the development phase is to be signed off by all project members.

After sign-off, the content is released to the ID to be integrated into the authoring tool.

		RESPONSIBLE
<b>REQUIRED ACTION</b>	Consult the appendix <i>Development Review Meeting Agenda</i> Moderate <i>Development Review Meeting</i>	PM
	Present the (i) storyboard (ii) multimedia concept	ID
	Critically review the (i) storyboard (ii) multimedia concept and provide constructive feedback	All project members
	Amend (i) storyboard (ii) multimedia concept where necessary	ID
<b>MILESTONE</b>	Sign off of the Development Review phase	PM/All project members

#### 4.5 Integrate

The *Integrate* phase is the actual build phase of the course, i.e., the stage in the project during which course materials are entered into the authoring tool.

The Instructional Designer integrates the content into the editing tool that is, learning objectives, test/self-assessment items, content visuals, multimedia objects and so forth, into the authoring tool.

		RESPONSIBLE
<b>REQUIRED ACTION</b>	Develops the learning object according to the signed-off <i>Detailed Storyboard</i> and <i>Content Outline, Content Storyboard</i> and <i>Multimedia Concept</i> .	ID
<b>MILESTONE</b>	Learning object development	ID

## 5. Implementation Phase

The *Implementation Phase* encompasses the actual employment of the courseware in the Learning Management System (LMS) so that learners can use the course. This phases encompasses course deployment including metadata, the testing and accepting of the course, followed by sign-off and go-live.

### 5.1 Deployment on LMS

The course when completed is uploaded into the LMS for deployment along with the corresponding metadata.

Metadata is information that describes the content of the course; for example, author, keywords, copyright and so forth. The purpose of metadata is to enhance information retrieval, management of information resources, document ownership and authenticity of digital resources as well as interoperability. Thus all SCOs must be annotated with metadata.

		RESPONSIBLE
<b>REQUIRED ACTION</b>	Fill in the <i>Metadata Form</i> with metadata (ONE form per SCO) Insert metadata into authoring tool and/or Learning Management System	ID
<b>MILESTONE</b>	Metadata annotated learning object	ID

### 5.2 Testing and accepting

The purpose of testing and accepting the learning object is to sign-off the final learning object from a technical, instructional and subject matter perspective. The signing-off is based on three so-called *walkthrough tests*.

It is important that the learning object passes all three tests:

- Technical quality to be tested by the ID
- Subject matter quality to be tested by the SME
- Instructional design quality to be tested by the CR or a target audience member

During the *walkthrough test*, a simple form of peer-review, the testers systematically work through the course assessing the quality of the learning object i.e., rating the quality, listing errors, recording comments and so forth. The appendix supplies testers with methods and instructions on how to carry out walkthrough tests.

Once feedback from the walkthrough tests has been accumulated and assessed, the project manager, providing quality expectations are met, signs off on the learning object acceptance phase. If expectations are not met, the learning object is referred back to the project team for further rework.

RESPONSIBLE		
<b>REQUIRED ACTION</b>	Assign testers for testing the course Initiate and monitor test and rework phase	PM
	Consult appendix <i>Technical Quality Report, Testing and Accepting Learning Object Form</i> Test learning object and provide feedback	ID
	Consult appendix <i>Subject Matter Quality Report, Testing and Accepting Learning Object Form</i> , Test learning object and provide feedback	SME
	Consult appendix <i>Instructional Design Quality Report, Testing and Accepting Learning Object Form</i> , Test learning object and provide feedback	CR/ target audience member
	Rework course content, if necessary	ID/SME
	Approve and give final sign-off for learning object	PM
<b>MILESTONE</b>	Signed-off learning object	PM

### 5.3 Sign-off

The purpose of the *Sign-off* phase is to give the final approval before the official activation of the course that is, go-live.

RESPONSIBLE		
<b>REQUIRED ACTION</b>	Sign appendix <i>Final Approval Form</i>	PM/SC
<b>MILESTONE</b>	Sign-off of course	PM/SC

### 5.4 Go live

The purpose of the go-live step is to make the learning object available online. After the course goes live, learners can use the course. Technically, the *go live* step comprises making the course accessible to the intended audience by exporting the learning object from the authoring tool and importing it into the LMS.

RESPONSIBLE		
<b>REQUIRED ACTION</b>	Export the course from authoring tool Import into ILIAS and activate	ID
<b>MILESTONE</b>	Course go-live	ID/ST

## 6. Evaluation Phase

The *Evaluation Phase* comprises the evaluation steps necessary to obtain feedback on the course usage and course quality. It includes the after action review, the tracking of course usage and course evaluation.

### 6.1 After Action Review

The After Action Review (AAR) is a process to help project teams learn from their experience and share their lessons learned with other teams. AAR involves conducting a structured and facilitated discussion after a project has been completed to review:

- What should have happened
- What actually happened
- Why it happened

This allows project members to learn how to sustain strengths and improve on weaknesses in subsequent projects. An AAR is about learning, and not about finger pointing or even fixing a problem. Conducting AARs should be done with the focus on improving processes and recycling lessons learned from past projects so as not to 'reinvent the wheel.'

		RESPONSIBLE
<b>REQUIRED ACTION</b>	Consult the <i>After Action Review Form</i>	PM
	Conduct the After Action Review (AAR) meeting	
	Participate in AAR meeting	Project team
	Write AAR report	PM
	Report necessary production process-related findings to ISN per <a href="mailto:e-learning@sipo.gess.ethz.ch">e-learning@sipo.gess.ethz.ch</a>	
	Check feedback on production process and amend production process documentation if necessary	ISN
<b>MILESTONE</b>	Documented <i>After Action Review Form</i>	PM

### 6.2 Track course usage

Course participants work self-paced through the course, whilst the LMS tracks data created by the learners' activity. This data may be obtained, upon request, and analysed by the institution(s) running the course.

This tracking data allows course tutors and/or owners to easily monitor course participants' activity. The data may be needed to either facilitate tutoring the course or assessment processes. In order to obtain the tracking data, request permission rights from the system administrator ([pfp@ethz.ch](mailto:pfp@ethz.ch)). Once the access rights have been granted, access to the Learning Progress tab in the course is provided. The Learning Progress tab details the data/status of all course participants and their learning activities. It provides data on:

- Total number of participants
- Names of participants and their e-mail addresses

- Learning progress of participants i.e., completed, in progress, not attempted and failed.

Important: Please bear in mind that tracking data means *data privacy issues* are adhered to. As a result, access to this data should be limited to a restricted number of persons who handle this data in a responsible manner. Students should be notified that their activity is being monitored and analysed.

RESPONSIBLE		
<b>REQUIRED ACTION</b>	Write to system administrator (pfp@ethz.ch) requesting access rights to the Learning Progress tab	CR/Tutor
	Support team to track learners' data	ST
<b>MILESTONE</b>	Tracking data on course usage	CR/Tutor

### 6.3 Conduct course evaluation

The evaluation of the course takes place by attaining feedback from the course participants on the ADL courseware.

To obtain course feedback one may either employ the standard ADL survey or compile one's own specific survey using the survey tool. Both methods enable evaluation of the course. An advantage of the standard ADL survey is that data can be compared with other courses.

*The Quality Evaluation Tool for Computer- and Web-Delivered Instruction* report (2005-002) provides further high-quality reading material on evaluation methods and processes.

RESPONSIBLE		
<b>REQUIRED ACTION</b>	Consult the <i>Course Evaluation Form</i> and provide feedback to ISN	Institution deploying course
<b>MILESTONE</b>	User feed-back on the learning object	Institution deploying course

## 7. Maintain/Update Course Phase

During the kick-off meeting (step 1.2 *Project kick-off meeting*) the course life cycle review dates, tasks and appointed responsible person(s) are set and allocated by the project members. The *Lifecycle Management Form* is updated accordingly.

The aim of the life cycle review is to ensure that the course is successfully maintained and/or updated on a regular basis. This is achieved by conducting a revalidation of the course that is, checking the correctness of content from both a technical and content perspective, and then maintaining/updating the course as required.

### 7.1 Conduct revalidation of course

Revalidation of the course is a key factor to the success of e-Learning content. As once valid content may sooner or later, due to the world being in constant change, differ from reality.

Outdated content results in:

- Increasingly incorrect instruction
- Declining acceptance of the learning object by attentive learners
- Potential risks

To ensure validity of content it is imperative that the content is regularly revalidated as stipulated in the appendix *Lifecycle Management Form*. To revalidate the course means firstly assessing whether the educational and training needs have changed. For example, is there a change in the learning objectives? Is there a change in the primary or secondary target audience? The *Lifecycle Management Form* outlines necessary questions that need to be addressed during this assessment.

The results of the *course evaluation* (step 7.3) by the course participants provides very important feedback on the course and need to be taken into consideration during the assessment process. Equally important is the *tracking data usage* (step 7.2) statistics which provide valuable information on course participants' activity. For instance, what was the average time a student took to complete the course? Did many students fail the course etc?

Once this assessment has taken place, it is possible to determine the scope of necessary changes to the course that is, revalidation measures and subsequent resources. Revalidation measures vary from:

1. Continue deploying course and maintain – no updates necessary ➔ see 7.2
2. Continue deploying course and maintain – minor updates necessary ➔ see 7.3
3. Stop deploying course – major revision necessary ➔ see 7.3
4. Archive/decommission course immediately ➔ see 7.4

		RESPONSIBLE
<b>REQUIRED ACTION</b>	Ensure regular revalidation of learning object as stipulated in the <i>Lifecycle Management Form</i>	PM/institutions deploying course
	Analyse and evaluate correctness of learning object from both a technical and content perspective	SME/ID
	Complete/revise <i>Lifecycle Management Form</i> Initiate specified revalidation process	PM/institutions deploying LO
<b>MILESTONE</b>	Completion of <i>Lifecycle Management Form</i> Assessment of scope of revalidation measures : <ul style="list-style-type: none"> <li>- Maintain</li> <li>- Update minor</li> <li>- Update major</li> <li>- Archive/decommission</li> </ul>	PM

## 7.2 Maintain course

The revalidation measure *continue deploying course and maintain* means no updates are required. Institution(s) deploying the course are to inform support team if they require ad hoc maintenance.

		RESPONSIBLE
<b>REQUIRED ACTION</b>	Institution using course to inform support team of required maintenance	Institutions deploying course
	Maintain the learning object	ST
<b>MILESTONE</b>	Course maintenance	ST/Institutions deploying course

## 7.3 Update course

Once the assessment of the educational and training needs has taken place, the scope of the revalidation measures and resources can be determined. This can vary from:

- Minor updates ➔ continue deploying course and maintain
- Major revision necessary ➔ stop deploying course

The scope of changes determines in which phase of the production process the update process commences. In the worst case, the update requires starting with the analysis phase again.

		RESPONSIBLE
<b>REQUIRED ACTION</b>	Ensure designated tasks are adhered to as specified in the <i>Lifecycle Management Form</i>	PM
	Update course as specified in the <i>Lifecycle Management Form</i>	SME/ID/MM
	Sign-off of updated course	PM/SC
<b>MILESTONE</b>	Course updated	Project team

#### 7.4 Archive/decommission course

Even the most durable course needs to be archived or decommissioned at some point during its life cycle. An existing learning object may ONLY be archived or decommissioned, once all contributory institutions have agreed on the archiving/decommissioning of the course. As a rule of thumb courses produced collaboratively should only be archived. Thus facilitating possible reactivation, should a third party at a later date, express interest in the archived course.

		RESPONSIBLE
<b>REQUIRED ACTION</b>	To assess, amongst original contributory institutions, whether the course may be archived or decommissioned Write to <a href="mailto:e-learning@sipo.gess.ethz.ch">e-learning@sipo.gess.ethz.ch</a> requesting archiving or decommissioning of learning object	PM/SC/Instituti on deploying course
	To archive or decommission course	ST
<b>MILESTONE</b>	Archive or decommissioning of course	ST