

Introduction to contents and use of stdSEM®

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Why the Need for a New SEM?

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Why the need for a new SEM?

SEM was introduced in 1983 and its basic principles have been maintained ever since. PSE can be justifiably proud of the long history behind its development method. Since it was first introduced, however, software development has changed completely. Most people in those days were using mainframes and a few had moved to modern workstations. Virtually no-one was using a PC.

The time had therefore come for a serious revision: It was decided to incorporate new developments alongside the many successful elements which had stood the test of time. A number of important themes are set out below:



You may have asked yourself "What about **prototyping**?". Today modern graphical development environments are making increasing use of prototyping. What method can be used so that the resultant code can be maintained and the product can be further developed? - stdSEM now supports a separate Prototyping "phase".



A further new theme: **Adaptation instead of development**. More than ever before, software is being adapted rather than being developed from scratch. Existing (possibly only half-finished) solutions are being adapted, parameterized or augmented for new purposes and operating environments. This can lead to faster and cheaper products.



A third aspect is the **usability** of SEM: Many staff wanted more tools and checklists for daily practice and also wanted these to be more specific. As a result, all word templates were revised in terms of content and were redesigned into **annotated tables of contents**. There are now also far more **checklists and tips** for activities. In addition, stdSEM is now available in **hypertext form** on the **Siemens intranet**. This has many advantages, e.g. you always have the latest version online and can also access the specific information you require.



An abstract set of rules is now also available in the form of a **process model** (SEM-VM), with several **specific method descriptions** (derived methods) deriving from this. This ensures a general set of rules which is compliant with ISO and helps reduce the gap between the (abstract) development method and the (specific) projects. stdSEM is a **general method description** for SW development and maintenance as well as for non-SW projects (consultancy, services, development of organizational solutions, etc.).

Note: The terms encountered above (SEM-VM, stdSEM, etc.) will be explained in detail on the following pages.

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Derived methods and SEM-VM

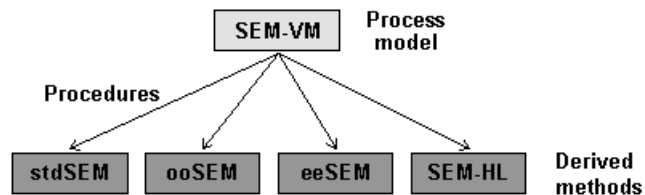
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What are derived methods of SEM?

Derived methods of SEM[®] are ***tailored method descriptions*** based on a uniform process model (SEM-VM). They comply with the specifications of the process model, but are adapted to the requirements specific to the given area or technology, e.g. for the specific descriptions of required activities and for required documents and checklists. This brings SEM much closer to the actual project happenings. The following derived methods are currently supported:

- **stdSEM[®]**: A general model for developing systems
- **ooSEM[®]**: Development of systems based on object orientation methods (in development)
- **eeSEM[®]**: System development method for developing electronics, firmware and ASICs
- **SEM-HL**: Development and/or procurement of software for the Semiconductor Group of Siemens AG Berlin / Munich.

The SEM[®] process model (SEM-VM)



In order to retain consistent general procedures for the various derived methods, the ***SEM process model*** has been developed to provide a basis for specifying the rules to be applied to the derived methods. SEM-VM exists in the form of a printed manual. It was put into operation in April 1996 following comprehensive reviews by PSE QM.

The process model is not envisaged as a manual for the developer but provides specifications for drawing up derived methods and serves as a reference model for certifications!

The Most Important Changes over SEM V 3.0

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- ✓ There is no longer a general EVHB (and the abbreviated version EHB), but rather **different derived methods** which are represented in a uniform form (since all are based on SEM-VM). Unlike earlier traditional "manuals", these derived methods are available in electronic form.
- ✓ There are **fewer phases** than previously (phases grouped together into larger units).
- ✓ The start and end of the project are **more clearly defined** than earlier. The **Initiation** and **Termination** phases form the **frame phases** which cover the two important documents - the 'project decision' and 'final report'.
- ✓ There are various models for the **life cycle approach** - not just the waterfall model recommended so far (spiral model, evolutionary development model, incremental delivery model, prototyping).
- ✓ A number of themes have been given greater emphasis in stdSEM than was previously the case (or have even been newly included). This applies in particular to
 - **Risk analysis**
 - **Drawing up a tender** (separate subphase in the Definition phase)
 - **Domain modeling**
 - **Prototyping** (also in the form of a life cycle approach)
 - **Configuration management** (with a separate CM plan)
 - **Usability**
 - **Reuse** (with separate RR plan)
 - **Use and adaptation of existing software** (separate subphases for Design and Implementation)
 - **Preparation of operations** (introduction planning, process integration, etc.)
 - **Operations** phase
 - Recording and evaluation of **process experiences**.
- ✓ The **degree of obligation** for results has been defined (must - should - may).
- ✓ There is also now a **milestone concept with prespecified milestones** (based on the majority of clients' process models).
- ✓ The **word templates** have been completely redesigned for stdSEM. They no longer consist of pure tables of contents, but rather of comprehensive, annotated tables of contents and examples.
- ✓ The **phase acceptance meetings** and **reports** which were previously unpopular are no longer mandatory in stdSEM.
- ✓ **Hardware development** now has its own derived method **eeSEM**. This means that the general derived method stdSEM is now more streamlined than the earlier SEM V 3.0.

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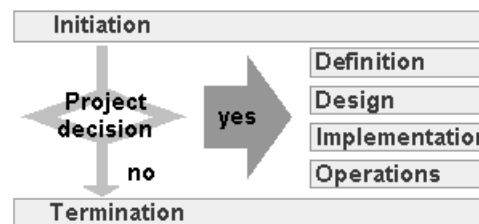
Course of a Project

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What form does an SEM project take?

An SEM project begins with a project kick-off at the start of the **Initiation** phase and always ends with the **Termination** phase.

If a **positive project decision** is made in the Initiation phase, this will be followed by the **Definition** phase, e.g. for producing a tender. This phase will encompass detailed project planning, processing of requirements and drawing up of a software requirements specification. If the project is to be continued, the further phases **Design**, **Implementation** and, if appropriate, **Operations** will be conducted.



Frame phases

The **Initiation and Termination** phases are known as **frame phases**. **These must always be executed.** If the project decision is negative, the Termination phase can be kept short (as a very minimum, the reason for the negative project decision must be documented).

Execution phases

All other phases are **execution phases**. They must be performed using one of the five possible organization forms for phase processing (e.g. waterfall model, evolutionary development model).

Project execution using customer methods

If projects are executed using customer methods (e.g. PEPP, SNI-PHB, etc.), the **frame phases** must be executed **using stdSEM**. The execution phases are processed using the customer method specified, however.

How is a Phase Structured?

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Phases

Each phase is used to reach specific **goals**. These goals are reached by executing activities and the results which these yield.

Subphases

For the majority of phases in stdSEM, related activities are grouped together into appropriate **subphases**. These subphases should be executed if the associated activities make sense (e.g. subphase "Drawing up a tender" in the Definition phase, subphase "Preparation of operations" in the Implementation phase). The subphases can also overlap.

Preconditions, activities and results

Every phase has its required **preconditions**. The phase can only be started if these preconditions are met. There are also required **activities** which are performed during the phase. stdSEM makes a distinction between primarily **technical, project control and quality assurance** activities. Each phase is characterized by results which arise when activities are executed. The degree of obligation of these results is **defined** for each phase in stdSEM (in the "Phase Orientation").

Milestones

Milestones mark significant points during the course of the project which are generally associated with important results. Since they are particularly suitable for **project controlling, prespecified milestones are defined** in stdSEM (these can also be modified on a project-specific basis). For example, "Project plan drawn up and checked" is the project control milestone in the Definition phase.

Phase-Neutral Themes

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In addition to the description of the individual phases, stdSEM also deals with ***phase-neutral themes*** (i.e. themes which apply to all phases and which are separate from the descriptions of the individual phases). The configuration management and reuse themes have been given greater importance in stdSEM than they had in SEM V 3.0

What is more, in each phase the important activities connected with these phase-neutral themes and areas of responsibility are grouped together.

PM	Project management PM covers the key areas of project planning, project checks and project control (effort, deadlines, milestones, etc.). Further important themes include the processing of tenders and commissioning, the commissioning of subcontractors and the procurement of hardware and software.
QA	Quality assurance Quality assurance encompasses all measures for planning and ensuring that the defined product quality is reached. These measures include reviews of documents, tests and checks of client-supplied products. The early detection and identification of problems (quality reporting) is attached particular importance so that appropriate measures can be taken as quickly as possible.
CM	Configuration management CM encompasses all tasks related to the orderly management of all results which occur and the items which are required in this regard (management of documents, sources, program components, error messages, etc.).
RR	Reuse and reusability Reuse can cut project costs considerably. It involves not only the reuse of product parts, but also methods, tools, designs, documents, data and all forms of project experiences. While making these product parts reusable does involve greater effort in the immediate term, careful planning and use pays dividends in the long run.

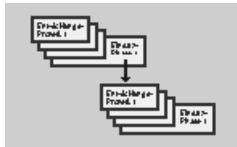
Life Cycle Approaches

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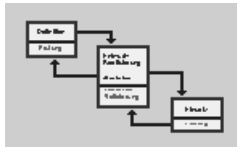
Waterfall model

The waterfall model is a **classical life cycle approach** of software development (SEM V 3.0 is implicitly based on this model). Each phase contains constructive and checking activities (e.g. producing and subsequent reviewing of a software requirements specification in the Definition phase). In principle, all phases are executed sequentially in this model. Only if the results of one phase are available can the next phase be started.

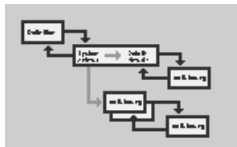
Other models supported by stdSEM:



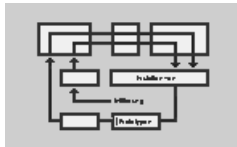
The **evolutionary development model** is used in PSE to execute all maintenance projects and the major version developments. Each follow-up product version is based on the preceding version. The specifications, plans and implementations produced in follow-up versions cover only those features that distinguish the new version from the old one.



While the **prototyping model** is based on a software requirements specification (important for contractual purposes!), the design and implementation are executed using appropriate development tools. Product development can take place in close cooperation with the customer using the resulting prototype (described in stdSEM as a separate Prototyping "phase" in parallel to the traditional Design and Implementation phases).



In the case of the **incremental delivery model**, development is based on a uniform software requirements specification and architectural design specification. The required overall solution is then subdivided into a series of independent subprojects, however (e.g. for deadline reasons, to complete important product parts as early as possible, or to provide support to development teams working in parallel). Each of the subprojects then results in an operational product version.



The SEM **spiral model** is essentially a waterfall model with comprehensive accompanying measures which is useful for very large projects (new goal definition, risk analysis, simulation, etc., after each phase cycle). This model therefore tends to be used rarely in PSE.

Highlights and New Features of stdSEM

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Annotated checklists for producing documents

The new stdSEM encompasses checklists - in the form of *annotated tables of contents* - for producing documents. This allows you to gain a clearer picture of what is actually meant and what is actually important for the project in the particular context.



Examples of documents

Alongside the annotated tables of contents are *examples for possible contents* of documents in order to provide a guide for writing documents using the example of specific texts.



Word for Windows and FrameMaker templates

Word for Windows and FrameMaker templates are available for all documents and can be obtained directly from the stdSEM web. The explanations for the individual sections are set out in a blue, italicized print format (= the annotations familiar from the checklist). The FrameMaker templates can be retrieved from a central location ("Documents").



Activity checklists

Systematically structured checklists are available for many activity descriptions and are intended to help you execute the particular activity.



Activity tips

Practical tips are available for many activity descriptions and are intended to support the particular activity.



Frequently Asked Questions (FAQ)

Separate pages with FAQs (questions and corresponding answers) are provided for the individual descriptions of activities and results. The FAQ pages should become more extensive as we receive further questions from users. If you have any particular questions or ideas, please contact us (e-mail and feedback pages in stdSEM). We will try to answer your questions and incorporate them into the FAQ pages.



Tools

Many activities have their own pages which list suitable tools to facilitate your work (some of these also have links to a more detailed description and to contact persons).



Links to the "outside world" (to the intranet)

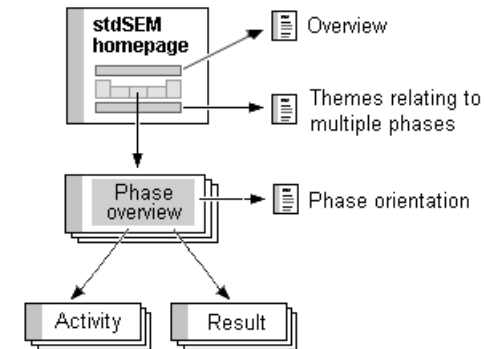
Information on many themes is already available in the Siemens AG Österreich network (e.g. guidelines, information on support centers, bulletins, QA manuals, etc.). While this information does not lie in stdSEM's area of competence, links are supported at appropriate locations to allow you rapid access to the latest information.

Structure of the stdSEM Web

Content areas of stdSEM

The **Home page** is the main entry point for stdSEM. From here you can access the following areas:

- **Overview:** This section describes the principles employed by stdSEM, e.g. goals, scope, structure and overview of the contents of the "electronic manual".
- **Phase-neutral themes:** This section deals with themes which are of significance for all project phases, e.g. project management, quality assurance and configuration management.
- **Description of the individual project phases** (main part of stdSEM): Every project phase has its own overview graphic. From this phase overview you can access
 - the **phase orientation** (what is important in this phase?)
 - descriptions of all **activities** in this phase
 - descriptions of all **results** in this phase



Orientation in stdSEM

The "**Where am I?**" icon in the header of each page is intended to help you find your way around more easily. From this icon, you can access a comprehensive plan of the stdSEM web. This plan has the following features:

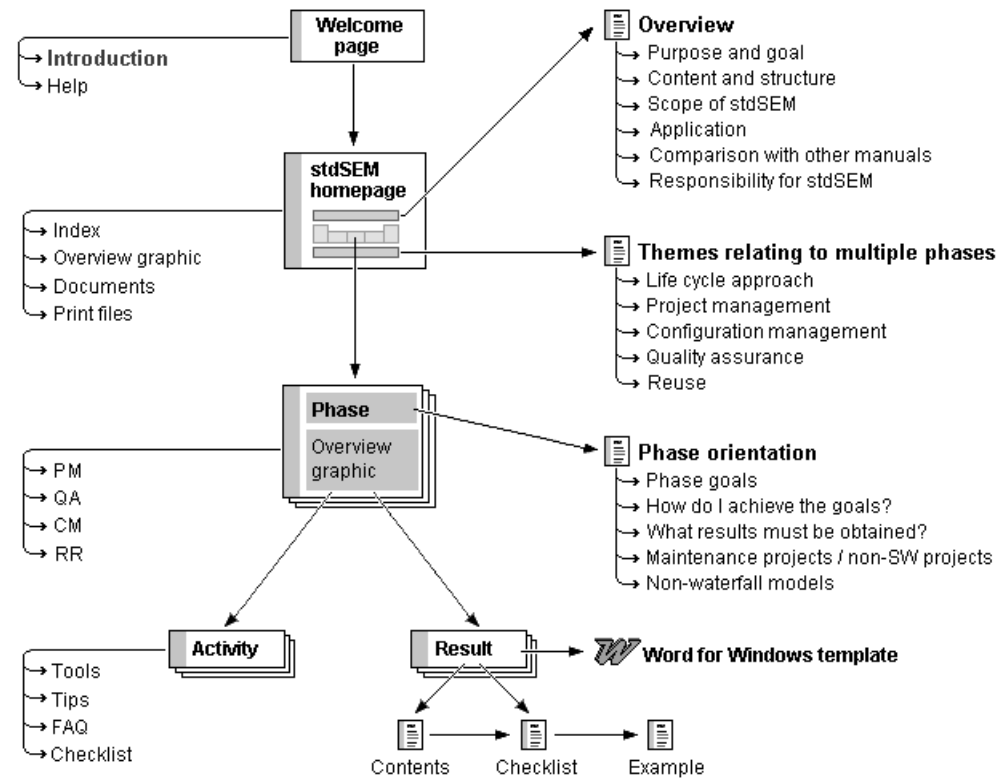


- It describes the current page and indicates important links to other locations which you can access by clicking.
- Your current position is marked in red (if possible).
- You cannot click the graphic since groups of similar nodes are represented by one node.

The entire plan is shown on the next page.

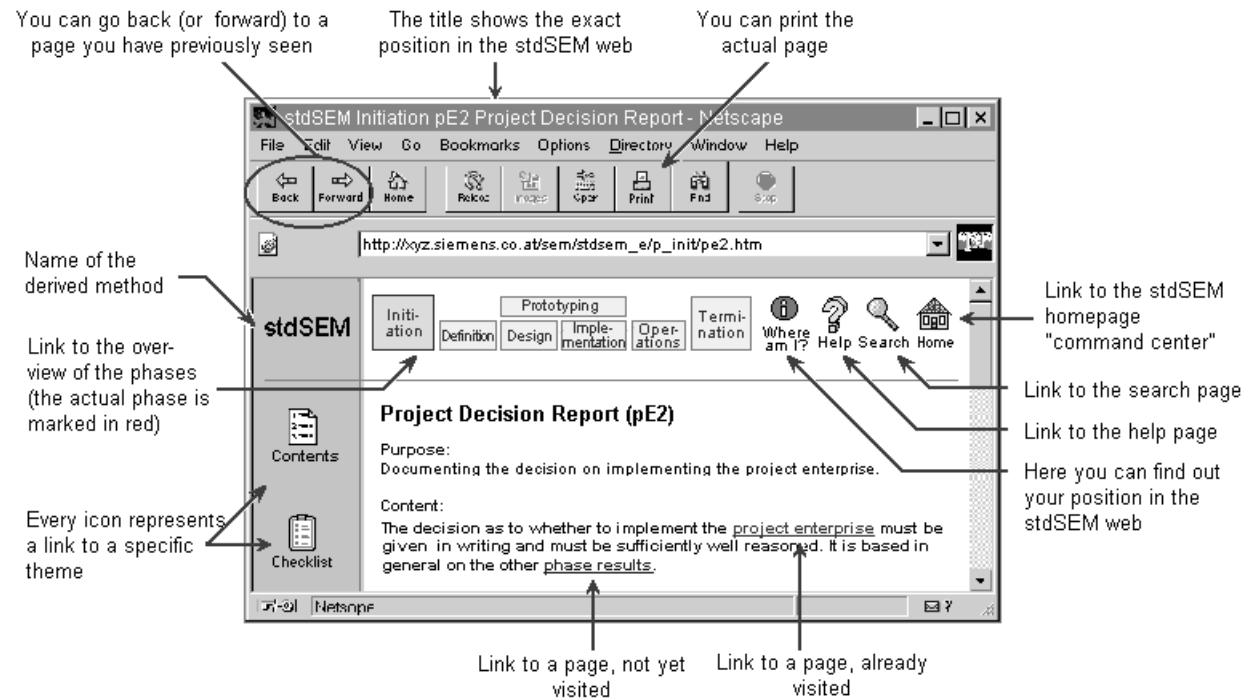
Plan of the stdSEM Web

← Back ↑ End Next →



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Typical Structure of a Page (in Netscape)

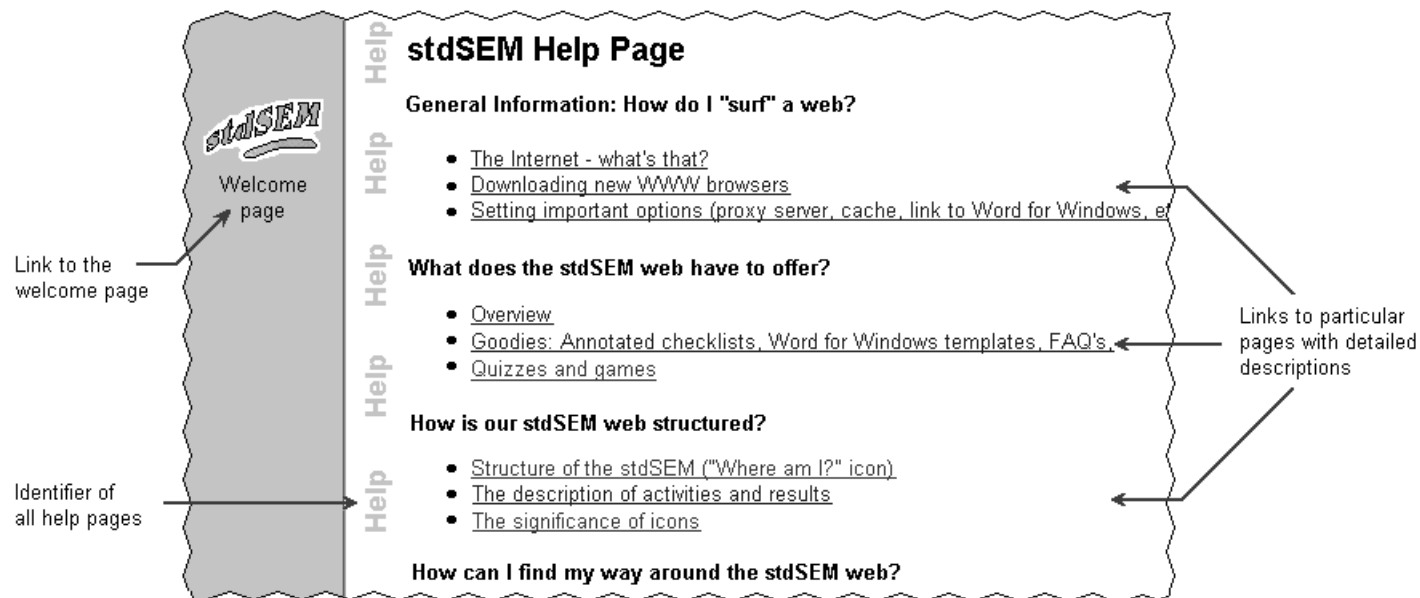


Help Page

← Back ↑ End Next →



This **Help icon** can be found in every header. It leads to a **general help page** from where you can access a whole range of themes. The snapshot below shows part of this page:



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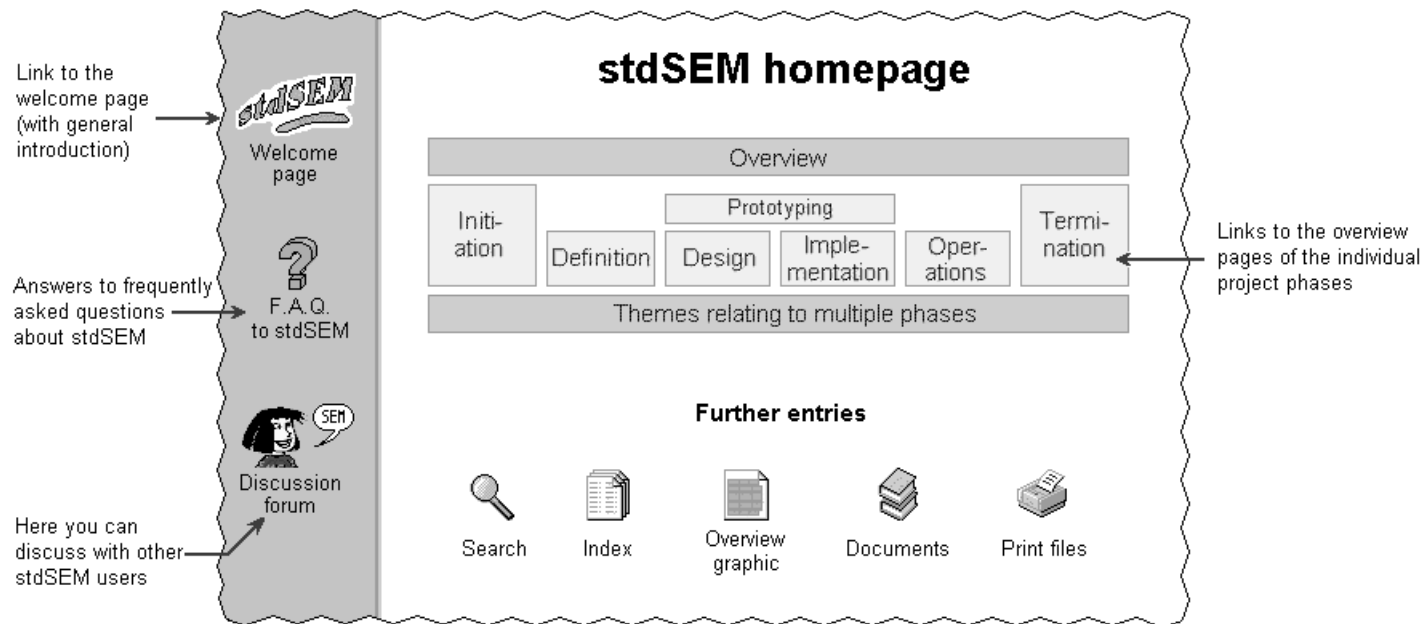
← Back ↓ End Next →

Home Page

← Back ↑ End Next →



This **Home icon** can be found in every header. It leads to the **stdSEM home page** ("Command Center"). From here you have rapid access to all parts of the web. The most important aspects are the links to the **overview pages of the various project phases**. The other parts of the home page will be explained in greater detail later.

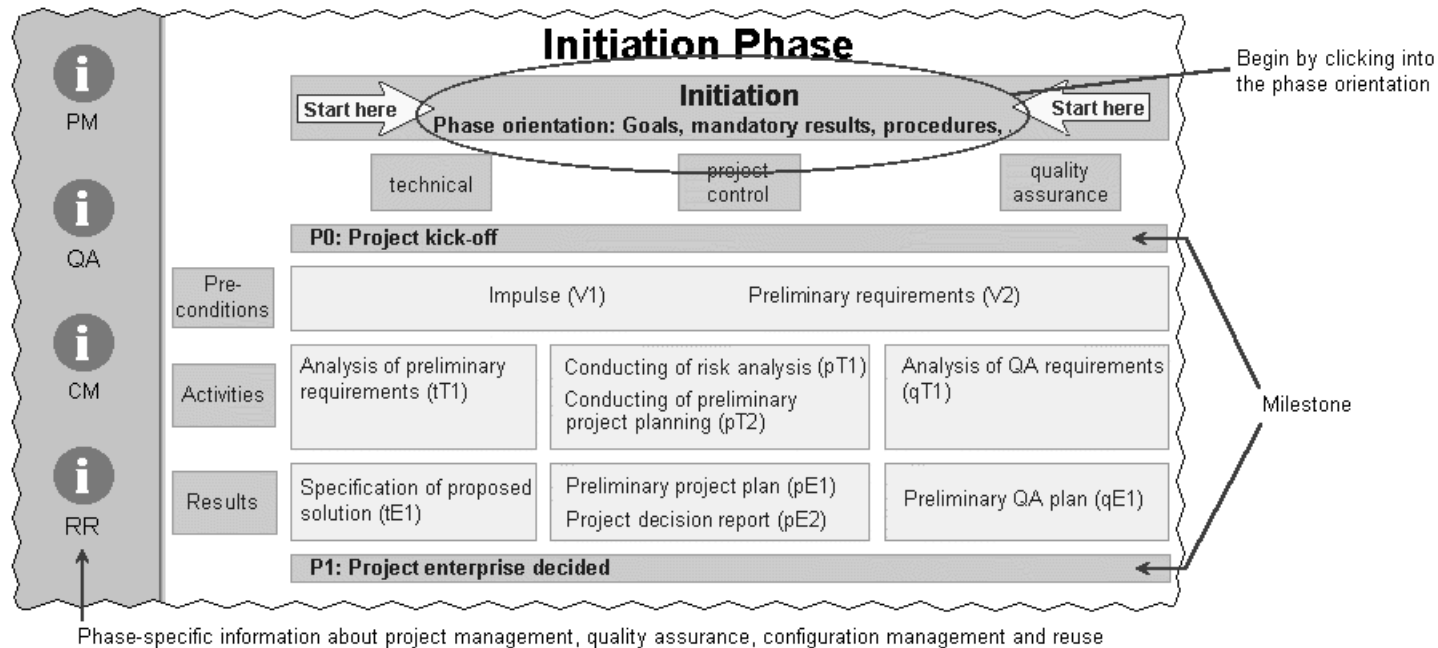


← Back ↓ End Next →

Phase Overview

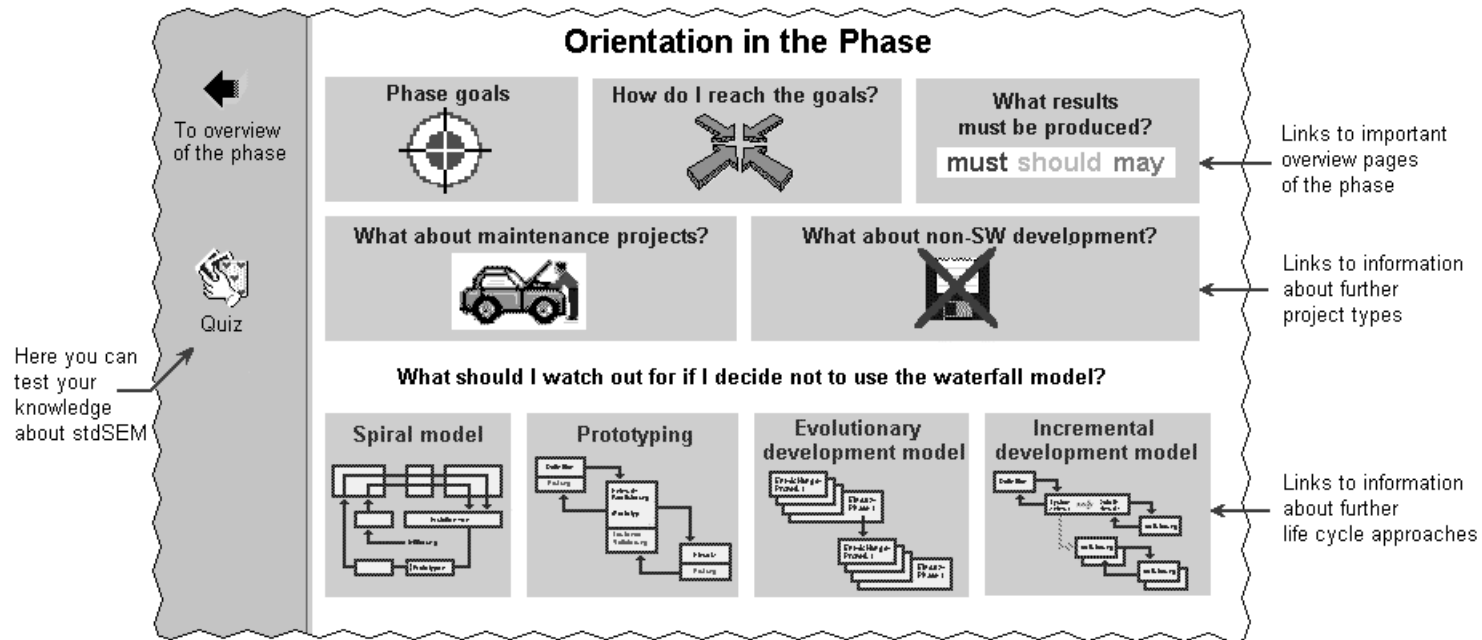
← Back ↑ End Next →

Initiation The phase icon takes you from the home page or any other page to the **phase overview**. The most important of these is the **phase orientation**. The other parts of this page will be explained later.



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Phase Orientation

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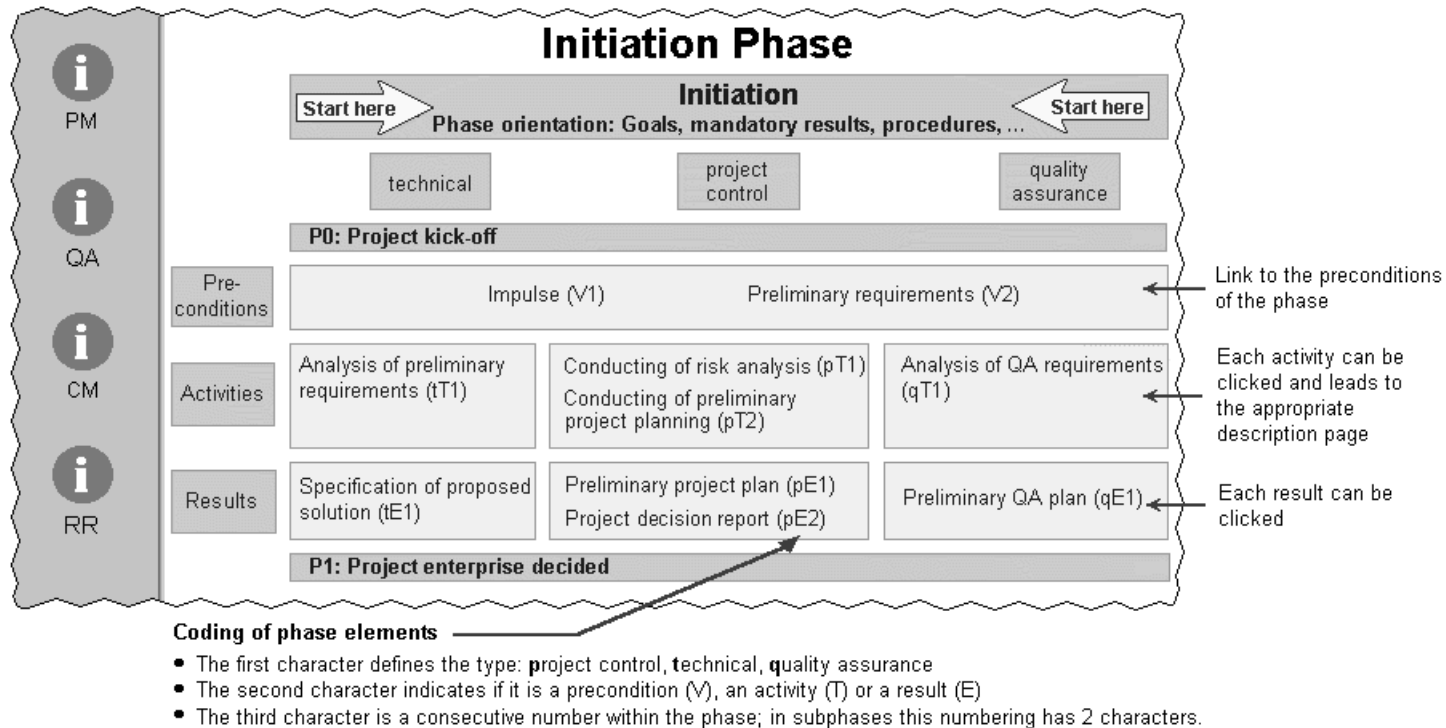
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Phase Overview with Activities and Results

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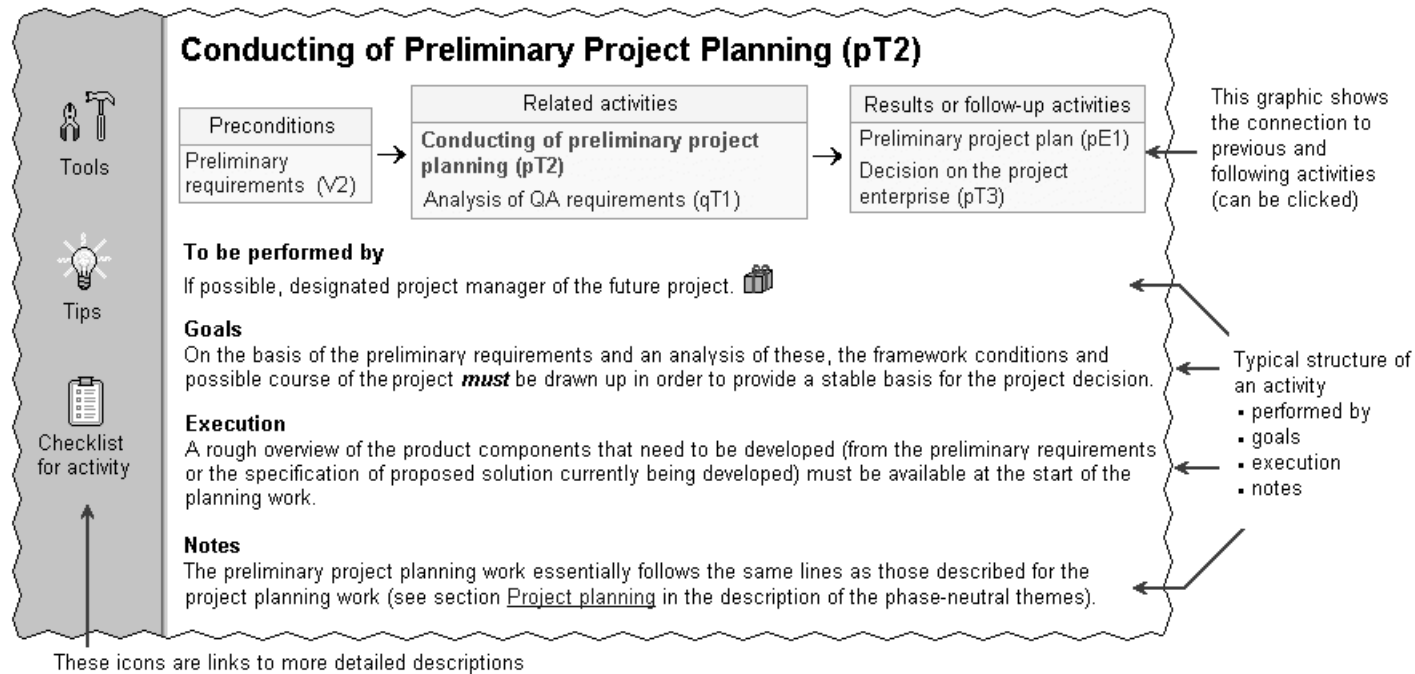
After you have obtained an overview of the phase on the "Phase Orientation" page, you can then take a closer look at the **preconditions**, **activities** and **results**.



Example of an Activity

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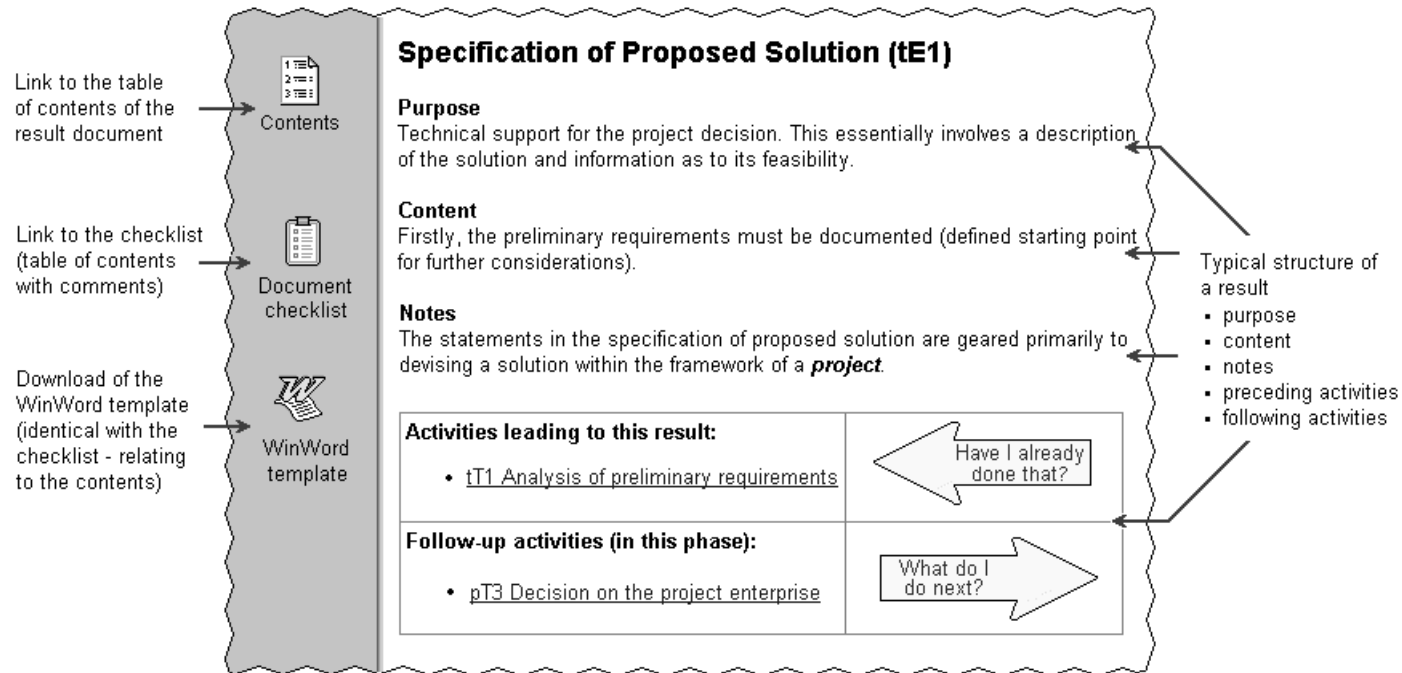
If you click on an **activity** in the phase overview, you will arrive at a page similar to the following:



Example of a Result

← Back ↑ End Next →

If you click a **result** in the phase overview, you will arrive at a page similar to the following:



← Back ↓ End Next →

Example of a Document Checklist

← Back ↑ End Next →



This icon can be found on all results pages where a document is to be generated. The **checklist for a document** has the identical content as the **document template**. An "Example" icon is provided for each section of the checklist. Clicking this icon takes you to the relevant section of an associated example document.

Link to the actual result → Back to the result

Link to the actual place in the example page → Example

Checklist

Checklist for Specification of Proposed Solution (tE1)

1 Introduction

1.1 Purpose of the document

The specification of the proposed solution serves as a technical basis for the project decision report on execution / non-execution of the project and on the type of execution to be performed, which is described in the preliminary project plan and preliminary QA plan.

1.2 Validity of the document

The proposed solution specification is of only limited scope since, in the Initiation phase, it serves as a basis for making decisions on execution / non-execution of the set task as a project.

1.3 Definitions of terms and abbreviations

If necessary, the terms used in the document are to be defined in this section. In particular, important technical terms should be specified.

Every checklist entry has a brief explanation

Every checklist has a pink background

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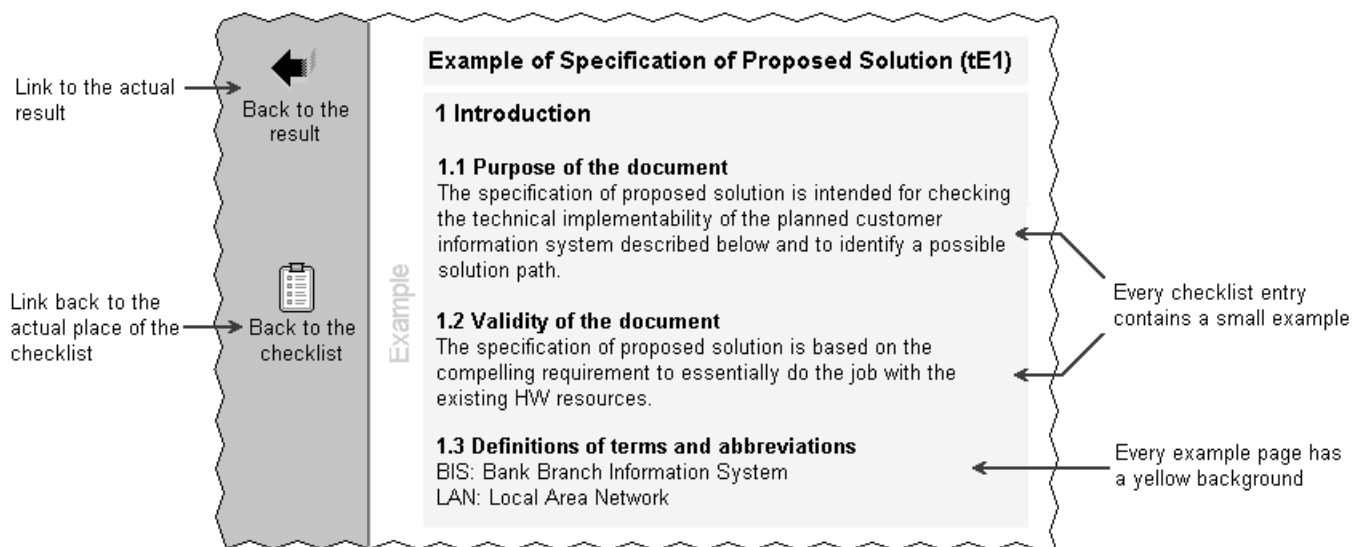
← Back ↓ End Next →

Example Pages for Documents

← Back ↑ End Next →



This icon can be found on the document checklist pages and leads to an **example page for a document**. A brief example is given for each entry. You can return to your current position in the checklist by clicking the "Back to checklist" icon.



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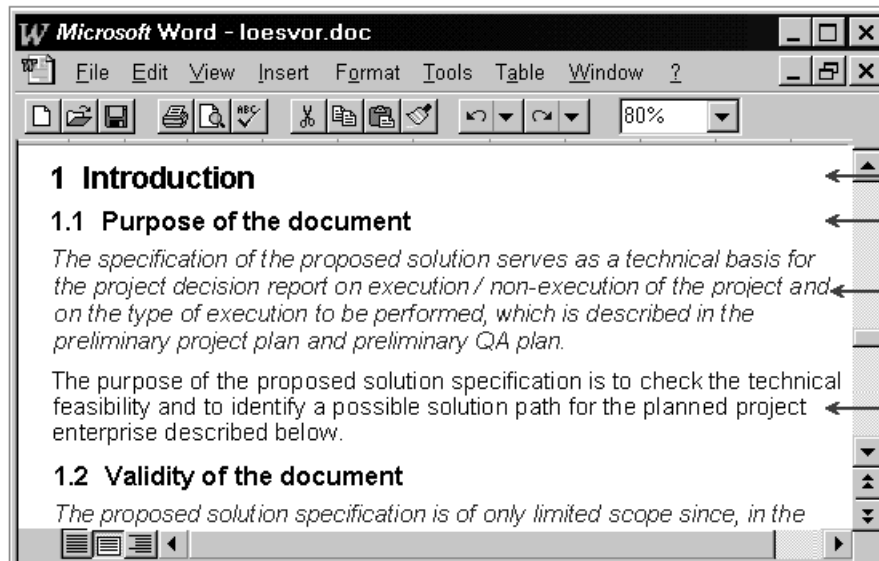
← Back ↓ End Next →

Downloading Word for Windows Templates

← Back ↑ End Next →



You can set your browser to start Word for Windows automatically if you download a document with this icon.
Important: You must immediately save the document with "**Save As**", since the document is only created as a temporary file when loaded and will otherwise be deleted automatically by the browser when Word for Windows is exited.



← The first structure level is mandatory

← The second level is a recommendation

← The blue text in italics style gives hints to the contents of this section

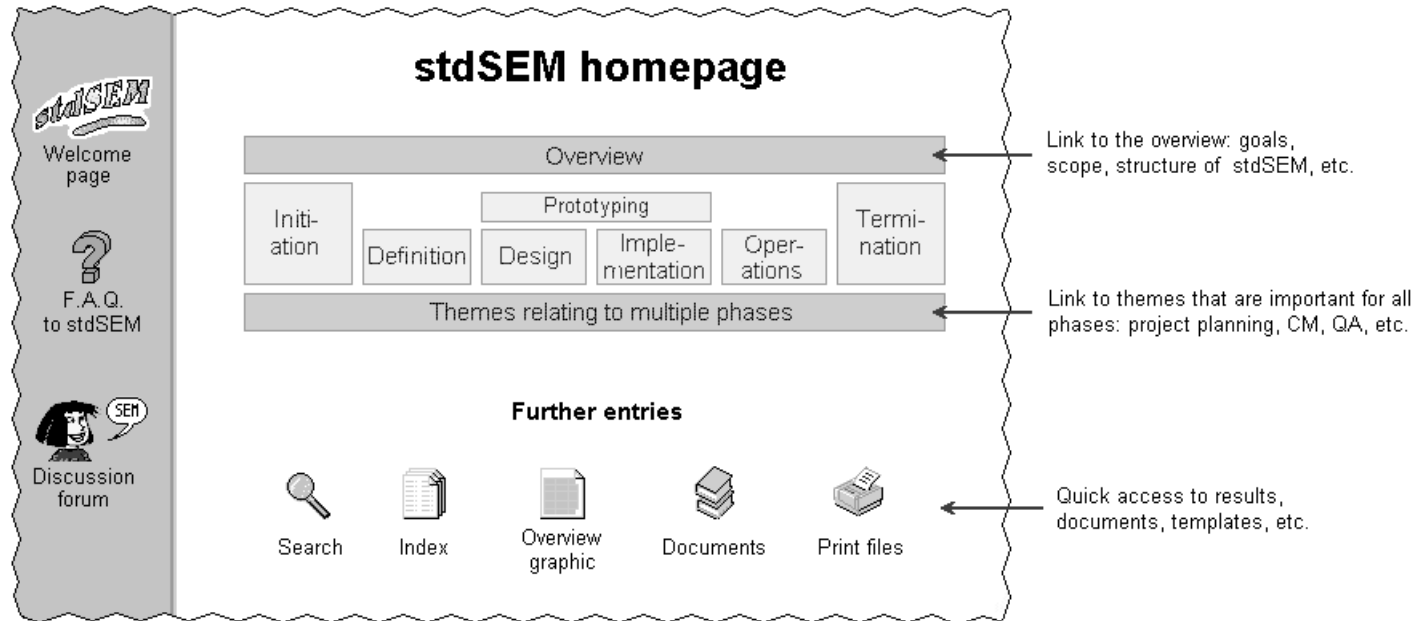
← This text offers a formulation proposal, which you can adopt (changed) into your document

← Back ↓ End Next →

Home Page: Further Important Links

← Back ↑ End Next →

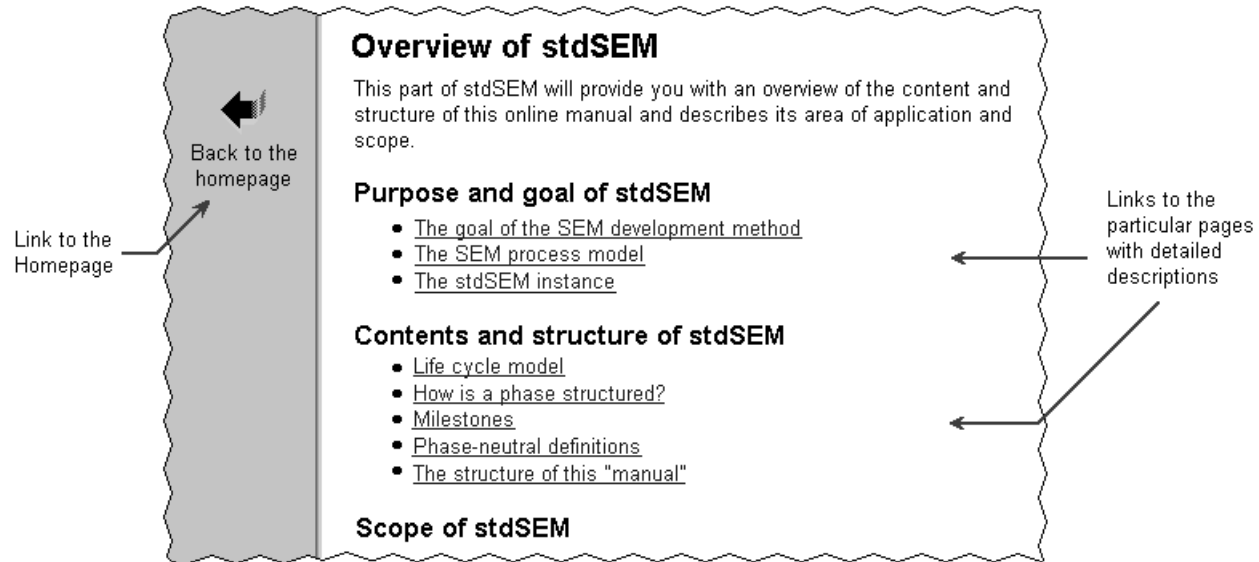
In addition to the links to the phase overviews, the **home page** also contains further important links:



Overview of stdSEM

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From the *home page* you can jump to the *Overview of stdSEM*:

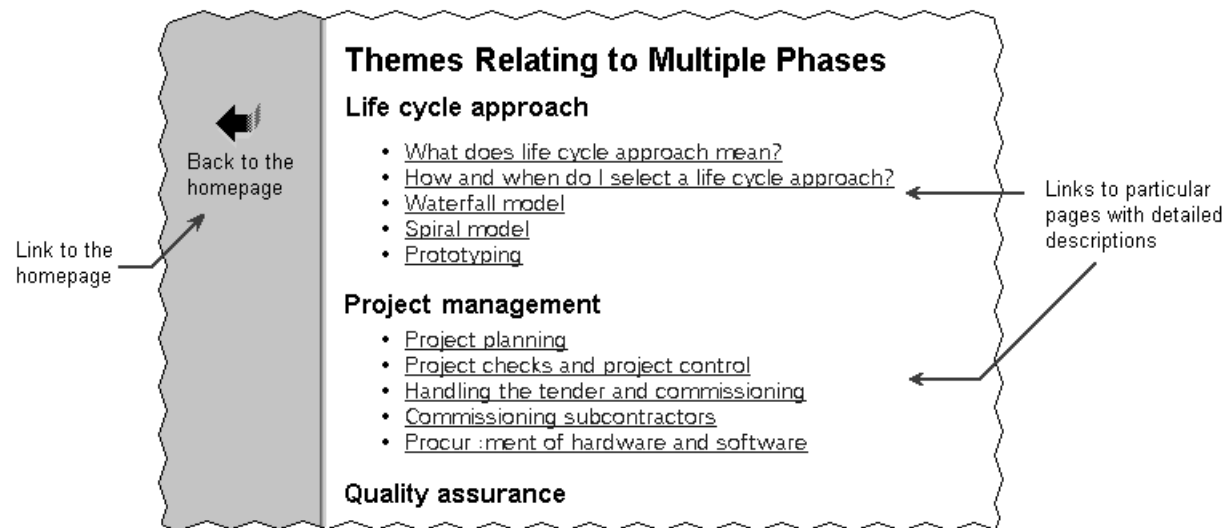


Themes relating to multiple phases

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From the **home page** you can also jump to the overview page of the **Themes relating to multiple phases** (phase-neutral themes). These themes:

- Can relate to working with the phases (e.g. the life cycle approach models)
- Can be significant for all phases (e.g. project controlling or QA reporting)
- May not be unambiguously assignable to a single phase (e.g. checking customer-supplied products or monitoring of suppliers).



Further Fast Entry Options

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Using the **home page** as a base, you have several options of quickly accessing a specific page or document:



Search

Full text search

If you need to search for specific themes quickly, use the **Search page**. The Search page can be accessed from every page of this web by simply clicking the **"Search" icon** on the right-hand side of the header. A full text search will be performed across all the pages of our stdSEM web. You can then click the pages located in order to move to them directly.



Index

Search for the main description of a term

If you wish to search for the main description of the term "project plan", for example, the best solution is to do this via the **Index** of stdSEM. You can access this page from the home page using the **"Index" icon**.



Overview
graphic

Access via the overview graphic

From the home page you can access an overview graphic listing all the results of all project phases. From here you can jump directly to the description of the results.






Documents

Access via documents

From the home page, you can access a list of all documents. From here you can jump directly to the description of the documents and download Word for Windows or FrameMaker templates.

Is stdSEM Also Available in Paper Form?

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	<p>Why is stdSEM on the intranet?</p> <p>stdSEM is available as a hypertext solution on the Siemens intranet. This has a number of advantages, e.g.:</p> <ul style="list-style-type: none"> • You always have the latest version online. • You can find the things you need very quickly. • We provide you with templates for all documents for downloading.
 <p>Print files</p>	<p>Is stdSEM also available in paper form?</p> <p>Unlike SEM V 3.0, stdSEM is not available in paper form, but only online on the intranet. However, you can download parts of the web as pdf or PostScript files for printing. The print page can be accessed from the home page by clicking the "Print files" icon. In every phase you can choose between two print file versions:</p> <ul style="list-style-type: none"> • The Overview contains the overview graphic as well as the phase goals and results. • The full version contains all the phase pages.
	<p>Printing problems</p> <p>You can also print out every page directly with your Internet browser. Unfortunately, the graphics are sometimes printed out so large that parts of the right-hand margin are cut off (depends on the browser, screen driver and printer driver). If this happens to you, use the prepared pdf and ps files (they also contain consecutive page numbering and a table of contents).</p>

Tips for Further Work

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How can I work with stdSEM?

You can use stdSEM in a number of ways:

- As a **reference work** for finding important descriptions.
- As online support when **conducting individual activities** (checklists, tips, tool support).
- For rapid downloading of **document templates**.
- As a **training document** for SEM courses and private **browsing**.





How can I switch from SEM V 3.0 to the new SEM?

- The most simple scenario of course is when you begin a **new project** and do not need to take account of existing documents. You can then simply begin the Initiation phase and conduct the project as set out in stdSEM.
- If you want to or are obliged to use **existing documents**, it is advisable first to compare the document templates of stdSEM and the structure of your existing documents and then to switch over in stages (copying and adapting individual sections).
Important: The SEM V 3.0 and stdSEM documents **do not have exactly the same content** (SEM V 3.0, for example, did not contain separate plans for configuration management and reuse; this naturally affects the content of the project plan and QA plan).

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And Finally...

[< Back](#)
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 <p>How to use the stdSEM</p>	<p>That's all, folks</p> <p>We have now <i>finished our introduction on using stdSEM.</i> We hope you now have a good overview of our web and will be able to work with it quickly and efficiently.</p>
 <p>Quiz</p>	<p>But we shouldn't forget the fun parts too</p> <p>The stdSEM web also contains a number of pages which are not meant to be taken totally seriously. These include quizzes, psychological tests, games, fun pages, etc. These pages are hidden behind the gift boxes . The "<i>Quizzes and games corner</i>" is also an interesting area which you can access from the Help page.</p>
 <p>Your opinion matters</p>	<p>Your feedback is important</p> <p>This electronic development manual should not be regarded as a troublesome regulation, but is intended to provide you with practical support in your work. Help us make this web as good as possible.</p> <ul style="list-style-type: none"> ● Are you having problems in "navigating"? Are you unable to find specific information straightaway? ● Are icons ambiguous? ● Do you need more information on specific themes? ● Do you have any criticisms or suggestions as regards the content? ● Are you happy with the checklists and document templates? <p>Please use our <i>discussion forum</i> (can be accessed from the home page) or send an <i>e-mail</i> to our <i>stdSEM Webmaster</i> (the address is at the foot of each page). We look forward to your comments!</p>

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