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Work breakdown structures for project and programme management

Organigramme des tâches en management de projet et de programme



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 258, *Project, programme and portfolio management*.

Introduction

The purpose of this document is to provide guidance on work breakdown structure for those individuals working in project and programme management, and who are involved in developing and using a work breakdown structure. This document incorporates practices to provide benefits for project or programme planning and control, and provides guidance on work breakdown structure concepts, composition and relationships with other structures.

It complements ISO 21500 and ISO 21504.

The target audience of this document includes, but is not limited to, the following:

- a) managers and those individuals involved in sponsoring projects or programmes;
- b) individuals managing projects or programmes and work breakdown structure practises;
- c) individuals involved in the management of or performance of project management offices of project or programme control staff;
- d) developers of national or organizational standards.

The application of this document may be tailored to meet the needs of any organization or individual, so they may better apply the concepts, requirements and practice of developing and using work breakdown structures.

Work breakdown structures for project and programme management

1 Scope

This document provides guidance for work breakdown structures for organizations undertaking project or programme management. It is applicable to any type of organization including public or private and any size of organization or sector, as well as any type of project and programme in terms of complexity, size or duration.

This document provides relevant terms and definitions, concepts, characteristics, benefits, uses, integration and relationships related to work breakdown structures. It does not provide guidance on the use of processes, methods or tools in the practice of developing and using a work breakdown structure.

[Annexes A](#) and [B](#) provide examples of work breakdown structures and relationships to other breakdown structures.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

100 % rule

concept concerning the entire work required to be accomplished to achieve the project or programme scope captured in the *work breakdown structure* ([3.13](#))

Note 1 to entry: The 100 % rule applies to the parent and child elements. The child level of decomposition of a work breakdown structure element represents 100 % of the work applicable to the parent level.

3.2

functional breakdown structure

decomposition of the functions necessary to perform the work elements of a project or programme

3.3

hierarchical decomposition

process of dividing project or programme scope into successively smaller *work breakdown structure elements* ([3.15](#))

3.4

management information system

hardware and software used to support the compilation of information, analysis and reporting of project and programme metrics

3.5

organizational breakdown structure

decomposition of the management team of an organization, or decomposition of the management team that performs the work of a project or programme

Note 1 to entry: The organizational breakdown structure can include partnering or subcontracting. It is used to illustrate the relationship between project and programme activities and the organizational units that will manage or perform the work activities.

3.6

parent element

work that is decomposed into two or more lower level elements of work

Note 1 to entry: The lower elements of work are called child elements.

3.7

product breakdown structure

decomposition of the product into its components

3.8

progressive elaboration

iterative process to incorporate increased level of details identified during the life cycle of a project or programme

Note 1 to entry: Also known as progressive decomposition.

3.9

resource breakdown structure

decomposition of personnel, equipment, material or other assets

3.10

responsibility assignment matrix

documented structure that shows the allocation of delegated work responsibilities designated for delivery of scope or benefits

3.11

risk breakdown structure

decomposition of threats and opportunities for project or programme

3.12

rolling wave planning

form of *progressive elaboration* ([3.8](#)) where planning is accomplished in phases or time periods

3.13

work breakdown structure

decomposition of the defined scope of the project or programme into progressively lower levels consisting of elements of work

3.14

work breakdown structure dictionary

document that describes each element in the *work breakdown structure* ([3.13](#))

3.15

work breakdown structure element

work at a designated level that is either a parent or a child

4 Work breakdown structure concepts

4.1 General

A work breakdown structure is a decomposition of the entire scope of work that should be completed in order to achieve the project or programme objectives. The work breakdown structure is used throughout the project or programme, to establish the framework for the management of the work. The structure should provide a logical framework for decomposing 100 % of the work defined by the project or programme scope.

NOTE Currently, most work breakdown structures are hierarchical, and this document will focus on this type of structure. New software models are presenting options to the hierarchical decomposition structure. See [Annex C](#).

Each descending level of the work breakdown structure should provide a more detailed definition of the work. Work may be product-oriented, deliverable-oriented or result-oriented; and, additionally, may be focused on project or programme phases, disciplines or locations. The entire scope of work of the project or programme should include work to be done by the project or programme management team or team members; subcontractors; and other stakeholders.

4.2 Purpose

The purpose of using a work breakdown structure should be to enhance and support the management of a project or a programme by enabling, but not limited to, the following:

- a) planning of the project or programme;
- b) decomposition of the scope of the project or programme into smaller elements of work to enable the management and control of the project or programme scope, resources and time;
- c) enhancement of project or programme communication by providing a common framework for stakeholders to use when describing and analysing the scope and performance of the project or programme;
- d) communication on the benefits resulting from various project or programme elements;
- e) summarization of project performance data for strategic level reporting;
- f) performance analysis across projects or programmes for particular work breakdown structure elements with common identifiable characteristics, such as codes, to allow identification of areas of concern and opportunities for improvement; and,
- g) alignment of tasks and activities of the schedule to the work breakdown structure elements.

NOTE A work breakdown structure can in some cases be referred to as product breakdown structure, which can have additional restrictions in its use. A product breakdown structure generally describes the resulting output of a project, but can also refer to an existing product and its hierarchical breakdown of elements. The use of the term can vary from one organization to another organization.

4.3 Context

The work breakdown structure is a flexible concept, and its design and overall structure should be adapted to the requirements of the project or programme. The work breakdown structure should be dependent on the industry, type of project or programme, and other factors such as project phases, major deliverables, scope, organization performing the work, and location of resources. The work breakdown structure should be flexible enough to accommodate alternative ways of organizing and representing the work.

4.4 Hierarchical decomposition

The work breakdown structure should provide a hierarchical decomposition of elements to the level necessary to plan and manage the work to meet the project or programme objectives.

The hierarchical decomposition should include 100 % of the work contained in the scope of the project or programme. Where an element is decomposed to child elements, the aggregate of work defined by the lower level elements should represent 100 % of the work contained in the parent element. The parent-child convention describes a relationship with a hierarchy in which a single element may simultaneously be the parent of a number of child elements and the child of a higher-level element.

Within a programme, the projects, other programmes and other related work should be decomposed in a similar manner. The programme becomes the highest level of the work breakdown structure. The same parent-child convention should apply to the logical relationships in the hierarchy. Each project, programme or other related work element under a programme may develop a stand-alone work breakdown structure that may be represented as a separate work breakdown structure or as part of the combined programme work breakdown structure.

Some projects or programmes may not have a fixed scope; therefore, any unknown or undefined scope will not be included in the work breakdown structure. These projects may use agile, progressive elaboration, or rolling wave planning techniques, where the scope is defined as the project progresses. In this case, the work breakdown structure represents 100 % of the scope of work known at the time of development of the work breakdown structure. As changes of scope are identified during the life of the project or programme, the identified scope should be taken into account within the work breakdown structure, while maintaining the logic flow of the levels of the work breakdown structure and the parent-child relationship.

4.5 Parent-child relationships

There are various options to create parent-child relationships, depending on the type of project or programme and the work breakdown structure developed. There are different ways of representing scope, which means that there are various options for developing the structure of the work breakdown structure. The following is a non-exclusive list of parent-child relationships.

- a) Child elements belong to the parent element. The relationship reflects the final segment of the output, product or result of the project or programme that may be physical or conceptual.
- b) Child elements belong to a category defined by the parent. Categories may be based on time, phase, relationship, location, priority or discipline.
- c) Child elements are part of the same state described by the parent. States may be interim versions of the product, such as drafts, preliminary, prototype, mock up or final versions.
- d) Child elements are products or services needed to complete the parent. These products or services may include tools, prerequisite products or services, or documentation on procurement, contracts, engineering, construction, commissioning, and project or programme management.
- e) Child elements are objectives needed to complete the parent. These child elements may refer to the project or programme objectives, change of behaviours or impact of organizational change.

These parent-child relationships may be combined to create a comprehensive decomposition of the scope of the project or programme into the work breakdown structure.

4.6 Progressive elaboration

Progressive elaboration is especially useful when the detailed scope is unknown, undefined or subject to change. Such progressive addition of detail to the work breakdown structure should produce a more accurate work breakdown structure and enhance the use of the structure to manage the project or programme. Progressive elaboration may entail one, concurrent or successive modifications to the work breakdown structure. Rolling wave planning is a form of progressive elaboration that is time-based.

5 Work breakdown structure characteristics, development and relationships to other structures

5.1 Characteristics of a work breakdown structure

The characteristics of a work breakdown structure should be related to the scope of the project or programme for which it is being composed. The following are typical characteristics of a work breakdown structure.

- a) A work breakdown structure may be represented by a variety of formats. The most common formats for a work breakdown structure are graphical, outline and tabular.
- b) Not all elements of the work breakdown structure need to be decomposed to the same level, but should be decomposed to the level needed to manage the project or programme component.
- c) Each work breakdown structure element may be assigned to one person, entity or function to be responsible.
- d) A work breakdown structure should reflect the technical complexity, size and other information, as deemed necessary for the scope.
- e) A work breakdown structure defines the structure of the work and not the processes involved in accomplishing the work.
- f) A work breakdown structure should provide a hierarchical decomposition of elements, applying the 100 % rule, to the level necessary to plan and manage the work to satisfy the project or programme objectives.
- g) The content of the elements into which the scope is decomposed may be related to, but not limited to, considerations such as industry standards, organizational procedures, or contract terms and conditions.
- h) Each element on the work breakdown structure should be assigned a unique identifier to distinguish one element from another.

The 100 % rule should provide that if one can associate a work breakdown structure child element with its parent element, it should be included with the associated parent element in the work breakdown structure. Each parent element may have zero child elements or at least two child elements.

The work breakdown structure should represent collective inputs of the project or programme team and relevant stakeholders. The work breakdown structure should be an agreed upon decomposition of the work to be performed by the project or programme management team. Each change made to the work breakdown structure should also be reviewed with the project or programme management team and the identified performing organization and performers within that organization and relevant stakeholders.

Examples of work breakdown structures can be found in [Annexes A](#) and [B](#).

5.2 Development

5.2.1 General

The work breakdown structure should be developed early in a project or programme. Depending upon the project or programme, a conceptual work breakdown structure may be created during the business case process, which may be re-evaluated or further decomposed once the project or programme is authorized. Once developed, the work breakdown structure:

- a) may provide a basis for gathering cost data across projects and programmes and may correlate with the cost management system,

- b) should serve to maintain the breakdown of the scope,
- c) should allow for project and programme status to be continuously visible and integrated,
- d) should serve to facilitate communication among project or programme team members, as well as with both internal and external stakeholders,
- e) may be used for allocation of resources accordingly to the work breakdown structure elements identified, and
- f) should be maintained and updated, as needed, until the final deliverables have been completed, delivered or transitioned to the customer.

5.2.2 Creation

The work breakdown structure should be based on approved requirements of the expected deliverables of the project or programme or the benefits of the programme.

Certain work breakdown structure elements may be defined to a lower level than others under conditions such as: high-cost, high-risk, high-visibility, or when involving multiple stakeholders.

The creation of a work breakdown structure may be accomplished by using one of three approaches in conjunction with the appropriate organizational procedure governing work breakdown structures:

- a) top-down identification of the end deliverable, followed by successive subdivision of the work breakdown structure elements into detailed and manageable units;
- b) bottom-up identification of elements of scope and merging, categorizing and ordering those elements in a hierarchy;
- c) a combination of top-down and bottom-up approach.

The level of detail provided by the initial work breakdown structure may vary. When using progressive elaboration, a review of the work breakdown structure may be conducted to check that each element represents sufficient detail.

A prior work breakdown structure can be helpful in identifying the scope of work for a new project or programme, where similar work has been done in the past.

5.2.3 Description of the project or programme work breakdown structure elements

Work breakdown structure elements can become the project or programme control points and can be further defined by one or more individual activities or tasks. The development of project or programme control points in an appropriate level of detail should enable the following:

- a) definition of activities in the schedule;
- b) elimination of overlaps by providing that a deliverable is represented in only one work breakdown structure element;
- c) identification of the person responsible and their direct manager;
- d) identification of the person to facilitate or initiate communication about the work breakdown structure element;
- e) allocation of work to the project or programme team by dividing work breakdown structure elements to provide for accountability and control.

5.2.4 Composition of the work breakdown structure dictionary

A work breakdown structure dictionary describes each element of the work breakdown structure. It may accompany or be integrated with the work breakdown structure. The information for each element should provide a description of each element and may also include, but is not limited to, the following:

- a) description of the element;
- b) responsible organization;
- c) responsible individual performer;
- d) start and end dates and timescales for the deliverables;
- e) resources required to perform the work of the element;
- f) unique identifier;
- g) definitions and technical references;
- i) list of key deliverables;
- j) assessment of risks;
- k) performance measurement and completion criteria;
- l) costs by element;
- m) relationships and dependencies with other work breakdown structure elements or groups of work breakdown structure elements.

Along with the work breakdown structure, the work breakdown structure dictionary should serve as the basis for developing the activity list for each work breakdown structure element.

The benefits of using a work breakdown structure dictionary may be, but are not limited to, the following:

- providing both the project or programme management team and performing members sufficient detail to enable them to produce the deliverables of each work breakdown structure element;
- providing further detail for the scope;

NOTE Work breakdown structure dictionary element descriptions can describe the technical baseline at a high-level, contrasting the work breakdown structure to the design or functional specifications.

- assisting in definition of and responsibility for scope of work associated with interfaces;
- avoiding ambiguity or misunderstanding of the work breakdown structure elements;
- supporting communications with project or programme management stakeholders.

5.2.5 Integration of multiple work breakdown structures

Programmes and major projects may have a need for a number of work breakdown structures to be arranged in a hierarchal structure consisting of two or more levels. For example, a programme work breakdown structure under the control of the programme manager may define the need for a series of project work breakdown structures, each of which should be under the control of a project manager.

To create alignment among the various work breakdown structures in a hierarchy, and facilitate the transfer of information required for control and reporting purposes at among the levels, there should be consistency of work focus between the higher and lower level work breakdown structures.

See [Annex B](#) for related examples.

5.3 Work breakdown structure relationships

5.3.1 General

In project and programme management there may be many different types of breakdown structures. Some breakdown structures may be developed and maintained at the organizational level, while others are being developed and maintained within projects and programmes (see [Annex B](#)).

Breakdown structures may be related to subject groups and allow the project or programme manager and the team greater insight into the subject group and how it relates to the work of the project or programme. A work breakdown structure may be directly related to or integrated with other breakdown structures, such as an organizational breakdown structure, cost account breakdown structure, risk breakdown structure, or other structures used by the project or programme to track or analyse various aspects of the project or programme. The use of other breakdown structures in relationship to the work breakdown structure may be based upon, but not limited to, the following:

- a) complexity of the project or programme;
- b) geographical, locational and functional aspects of a project or programme;
- c) contractual relationships developed to accomplish the work of the project or programme;
- d) realization of benefits from a project or programme;
- e) requirements of the project or programme management office;
- f) other organizational considerations such as structure, culture and process maturity.

5.3.2 Relationship to organizational breakdown structure

An organizational breakdown structure should be a decomposition of the project or programme organization that represents management responsibility of the performing organization. The work breakdown structure may be integrated with the organizational breakdown structure. The integration, if done, should be completed such that the lowest level of the work breakdown structure contains elements for which unique and unambiguous responsibility for delivery can be assigned and creates project or programme control points.

5.3.3 Relationship to contracts

With projects or programmes for which contracts are used to accomplish the work, a contract work breakdown structure may also be used. The contract work breakdown structure may be depicted as part of the work breakdown structure by integrating it into the primary performing organization's work breakdown structure, or as a subordinate work breakdown structure for a particular work breakdown structure element.

The purpose of the contract work breakdown structure may be to assist in the preparation of a request for information, request for proposal, request for quote, or other contracting document prior to the award of a contract. Other uses for the contract work breakdown structure may be the same as a work breakdown structure, such as integration with the project or programme risk breakdown structure or with a responsibility assignment matrix. See examples in [Annex B](#).

5.3.4 Relationship to functional areas

In projects and programmes a functional breakdown structure may be used to map the work to be performed to the functional areas within the organization or organizations doing the work. The functional breakdown structure may reflect discipline units such as mechanical or electrical engineering, accounting, procurement or testing. Mapping the work from the work breakdown structure may provide information for activities such as schedule negotiation, human resource planning, or supplementing budget estimates for the work to be performed.

Mapping to functional areas may enhance communication for the project or programme manager, especially in the area of resource management in areas of functional specialities. Functional breakdown structures may be used in projects and programmes with standard or recurring activities. For example, potential uses may be to highlight significant resource requirements and potential risks associated with resource usage when integrated.

Further, if used along with the risk breakdown structure and the work breakdown structure, the project or programme manager may be able to highlight areas of risk resulting from issues of resource restrictions in functional areas. See example in [Annex A](#).

5.3.5 Relationship to other structures

The relationship to other project or programme structures may be determined by integrating the information of the work breakdown structure with the other structures. Some of the other structures with which the work breakdown structure may be integrated are, but are not limited to, the following:

- a) cost breakdown structure;
- b) schedule;
- c) risk breakdown structure;
- d) communication breakdown structure;
- e) product breakdown structure; and,
- f) resource breakdown structure.

Integration may be two-dimensional or multi-dimensional depending upon the needs of the project or programme.

Some examples of links between work breakdown structures and with other breakdown structures can be found in [Annexes B](#) and [C](#).

5.4 Control of work breakdown structure

A work breakdown structure should be maintained to provide ongoing usefulness throughout the life cycle of the project or programme. The work breakdown structure dictionary should also be correspondingly maintained. Further, if progressive elaboration is used to enable capturing changes in the scope of the project or programme, those elements that have been added to or deleted from the scope should be documented in the work breakdown structure.

The type of documentation used to capture the changes to scope should be aligned with the organizational governance procedures for project or programme management scope changes. Changes should be validated and verified, then integrated with the work breakdown structure and the work breakdown structure dictionary with the appropriate document version control system.

5.5 Uses and benefits of the work breakdown structure

5.5.1 Uses of the work breakdown structure

The use and communication of the work breakdown structure includes, but is not limited to, the following.

- a) *Project or programme schedule development* may provide a clear understanding to the stakeholders about what is expected to be delivered, when it is expected, and how many resources it will take to provide the identified deliverable. The work breakdown structure should provide the logical decomposition of the work to aid in identifying these elements. During implementation, the work breakdown structure should provide the common framework for planning, executing, controlling, managing, communicating and monitoring a project or programme.

- b) *Responsibility assignment matrix* may be created by integrating the organizational breakdown structure and the work breakdown structure. The integration may provide information on work to be accomplished and delivered, essential work elements to be done, and individuals or organization responsible for accomplishing and delivering the work breakdown structure element, as well as individuals who should be consulted and kept informed.
- c) *Work breakdown structure element scheduling* may provide the estimated effort and duration for its completion.
- d) *Cost estimating* should use the work breakdown structure to estimate the cost to complete for each work breakdown structure element.
- e) *Risk breakdown structure* should be integrated with the work breakdown structure to assist in the development of risk mitigation strategies.
- f) *Resource allocation* may be integrated with a functional breakdown structure or the organization breakdown structure for the work breakdown structure elements.
- g) *Management information system* may be structured using the work breakdown structure to aid in collecting cost, schedule and technical scope data. The information collected by the management information system can provide a view of what work has been accomplished within the project and programme. The management information system should be organized to reflect the work breakdown structure elements, as well as detail provided by other breakdown structures. The work breakdown structure should be capable of providing detailed information that may be rolled up to the summary level depending upon the report and the requirements of the stakeholders using or receiving the reports.
- h) *Controlling scope* to capture changes in the scope of the project or programme. Using a configuration management approach should enable control of changes to the baseline and maintenance of the work breakdown structures.
- i) *Project or programme status reporting* may be accomplished using the elements of the work breakdown structure as the elements of the reporting structure. The level of detail for each project or programme status report should be reflected in the work breakdown structure.
- j) *Reuse of project assets* of the work breakdown structure as templates for future projects provides an opportunity for learning from previous projects.

5.5.2 Benefits from the work breakdown structure

The benefits of creating, using and controlling the work breakdown structure may be, but are not limited to, the following enabling factors:

- a) segregation of a project or programme into work breakdown structure elements, and clarification of the relationship among the elements;
- b) estimation of work breakdown structure element costs, risks and durations;
- c) facilitation of planning and assignment of management and technical responsibilities;
- d) facilitation of tracking technical performance, durations, risks, resource allocations and costs;
- e) communication with stakeholders including management, customers and suppliers;
- f) provision of information and structure for the earned value management system;
- g) provision of a link to the integrated master plan and the integrated master schedule for consistency, and analysis and assessment;
- h) facilitation of a project budget by providing a structure for allocation;
- i) facilitation of configuration management of the work breakdown structure elements.

Annex A (informative)

Work breakdown structures — Examples

Figures A.1 to A.6 and Table A.1 illustrate common work breakdown structures in various formats.

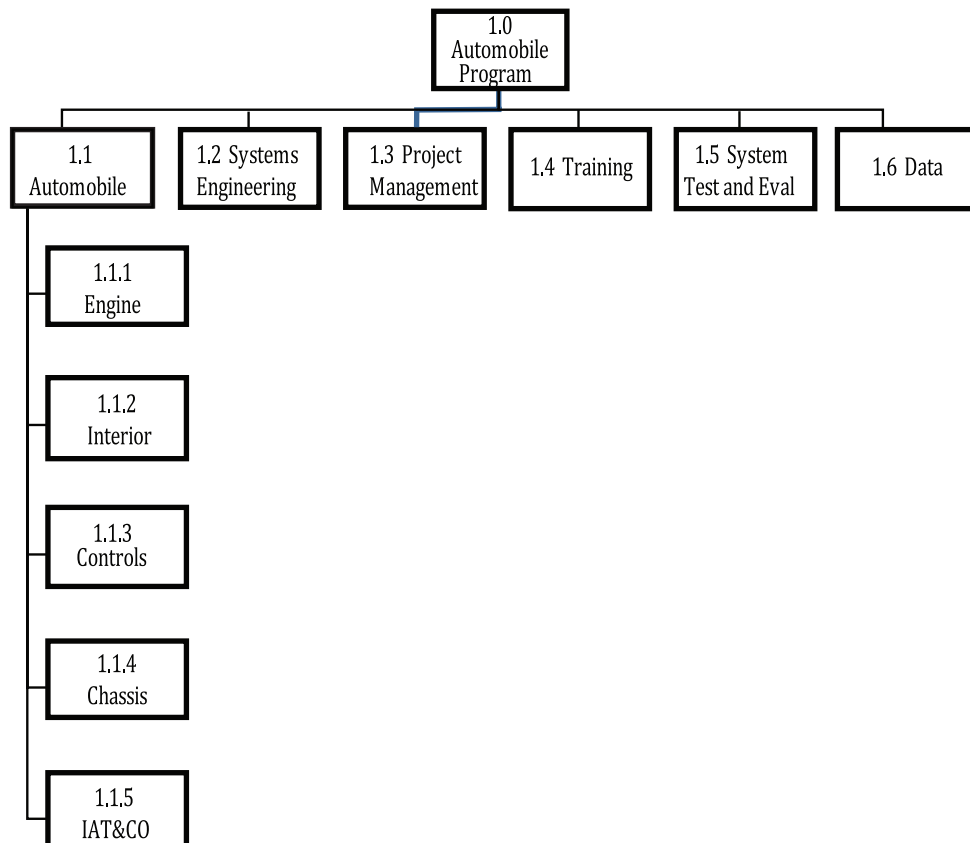


Figure A.1 — Work breakdown structure — Example for automobile programme (“graphical” example and “product and service oriented”)

NOTE Only the first element of the second level is decomposed to the third level. The other elements on the second level would normally be decomposed at least to the third level.

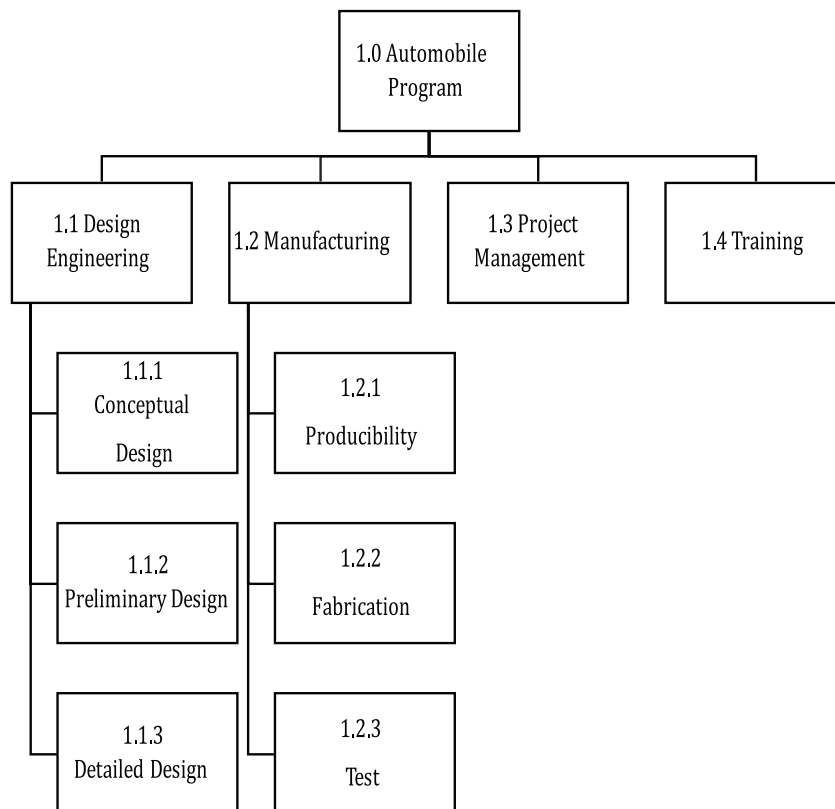


Figure A.2 — Work breakdown structure — Example for automobile programme (“graphical” example and “function oriented”)

Figure A.3 shows a work breakdown structure example for an online shopping system using agile development that has a strong user focus, as it breaks down the software based on features (1.1.), and also includes actual results like changed behaviours (3.).

1. Online Shopping System
 - 1.1. Software
 - 1.1.1. Epic Feature: Buy product
 - 1.1.1.1. Sub-feature: Browse products
 - 1.1.1.2. Sub-feature: Add to shopping cart
 - 1.1.1.3. Sub-feature: Register as user
 - 1.1.1.3.1. User story: Sign-up
 - 1.1.1.3.2. User story: Validate email
 - 1.1.1.3.3. User story: Add credit card
 - 1.1.1.4. Sub-feature: Check out
 - 1.1.2. Epic Feature: Administrate orders
 - 1.1.2.1. Sub-feature: View orders
 - 1.1.2.2. Sub-feature: Manage orders
 - 1.1.3. Epic Feature: View Statistics on usage

- 1.1.4. Epic Feature: Easy to find site (Search Engine Optimization)
- 1.2. Platforms
 - 1.2.1. Development environment
 - 1.2.2. Versioning system
 - 1.2.3. Build environment
 - 1.2.4. System test environment
 - 1.2.5. Production environment
- 2. Governance
 - 2.1. Processes
 - 2.1.1. Support processes
 - 2.1.2. Order processes
 - 2.1.3. Reporting processes
 - 2.2. Roles and responsibilities
 - 2.2.1. Maintenance
 - 2.2.2. Administration
 - 2.2.3. End user support
 - 2.2.4. Other roles
- 3. Changed behaviours
 - 3.1. Educated users
 - 3.1.1. Marketing campaign
 - 3.1.2. Usability feedback
 - 3.2. Educated support staff
 - 3.2.1. Courses
 - 3.2.2. Information material

**Figure A.3 — Work breakdown structure — Example for an information technology system
("outline" example and "deliverable oriented")**

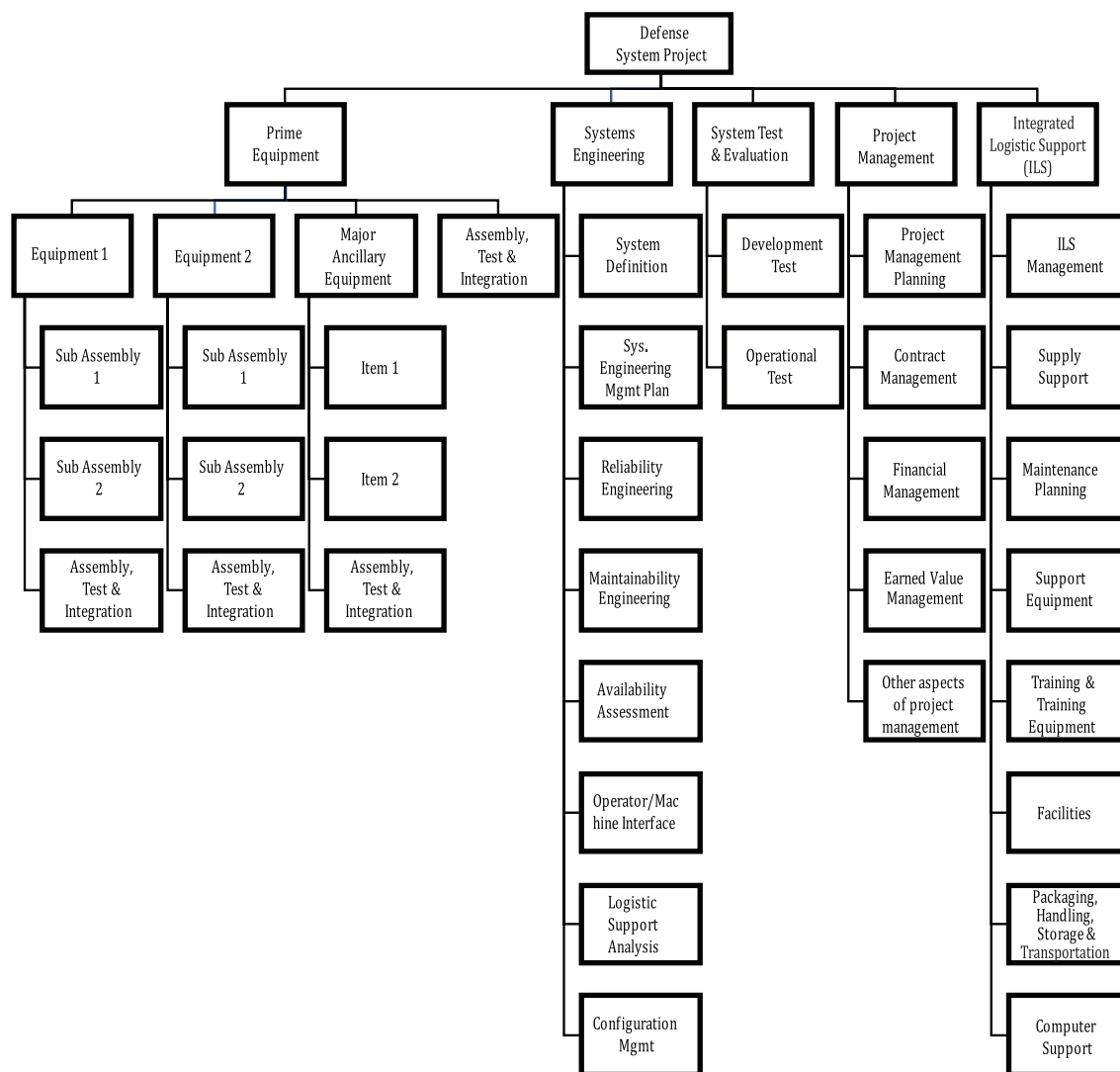


Figure A.4 — Work breakdown structure — Example for a defence system project (“graphical” example and “product and functions oriented”)

Level 1	Level 2	Level 3
Facility	Facility	
	Facility Structure	
		Substructure & Foundation
		Superstructure
		Walls and Finishes
	Facility Utilities	
		Electrical Systems
		Heating, Ventilating, Air Conditioning (HVAC) Systems
		Plumbing
		Conveying
		Fire Protection
		Communication Systems
		Monitoring, Detection & Access Control Systems
	Furniture, Fixtures & Office Equipment	
	Process/Scientific/Technical Equipment	
		Process/Scientific/Technical Equipment 1...n

Figure A.5 — Work breakdown structure — Example for a facility construction (“tabular” example and “product oriented”)

[Table A.1](#) shows a work breakdown structure example for a building that includes work from third parties, the procurement of work and project management (“tabular” example and “product oriented”).

Table A.1 — Building decision gate based work breakdown structure (“tabular” example and “product oriented”)

Level 1	Level 2	Level 3	Level 4
Building project	Project management	Project start-up	
		Project coordination	
		Project control	
		Project closure	
	Planning and management		
	Verification and validation		
	Connections	Connection, water and sanitation	
		Connection, electricity and district heating	
		Broadband	
		Television	
		Phone	

Table A.1 (continued)

Level 1	Level 2	Level 3	Level 4
	External	Land acquired	
		External plumbing	
		Roads	
		Garden	
		Foundation	Excavation
			Concrete
			Other foundational work
	Main Building	Ground floor level	Slab work
			Inner walls
		First floor level	Slab work
			Inner walls
		Frame/steel erection	
		External	Walls
			Windows
			Roof
		Internal	Walls and finishes
			Flooring
			Lighting
			Furniture and interior design
		Installations	Ventilation
			Heating/sanitation
			Electricity
			Fire protection
	Garage and additional buildings		
	Architecture	Procured architect	
		Contract	
		Sketches	
		CAD	
	Contractors	Procured contractors	
		Contracts	
	Other	Financing	
		Permits	

Figure A.6 illustrates only part of the project work breakdown structure for the super structure of a building. This figure also illustrates the way repetition of location is typically embedded into the work breakdown structure.

B01 Residence building project

...

B01.4 Construction

...

B01.4.3 Super Structure

B01.4.3.1 Ground Floor Level
 B01.4.3.1.A.1 Part 1 Slab Work
 B01.4.3.1.A .1 Column
 B01.4.3.1.A .2 Shear Wall
 B01.4.3.1.A .3 Slab
 B01.4.3.2 First Floor Level
 B01.4.3.2.A Part 1 Slab Work
 B01.4.3.2.A .1 Column
 B01.4.3.2.A .2 Shear Wall
 B01.4.3.2.A .3 Slab
 B01.4.3.3 Second Floor Level
 B01.4.3.3.A Part A Slab Work
 B01.4.3.3.A .1 Column
 B01.4.3.3.A .2 Shear Wall
 B01.4.3.3.A .3 Slab
 B01.4.3.3.B Part 2 Slab Work
 B01.4.3.3.B .1 Column
 B01.4.3.3.B .2 Shear Wall
 B01.4.3.3.B .3 Slab
 B01.4.3.4 Third Floor Level
 B01.4.3.4.A Part 1 Slab Work
 B01.4.3.4.A .1 Column
 B01.4.3.4.A .2 Shear Wall
 B01.4.3.4.A .3 Slab
 B01.4.3.4.B Part 2 Slab Work
 B01.4.3.4.B .1 Column
 B01.4.3.4.B .2 Shear Wall
 B01.4.3.4.B .3 Slab

Figure A.6 — Multi-level building part work breakdown structure (super structure) (“outline” example and “product oriented”)

Annex B
(informative)

Links with other breakdown structures — Examples

Figures B.1 to B.4 illustrate some typical relationships between the work breakdown structure and other types of breakdown structures.

Figure B.1 illustrates the relationship between a project work breakdown structure and a prime contract work breakdown structure with a corresponding example sub-contract relationship illustrated in Figure B.2.

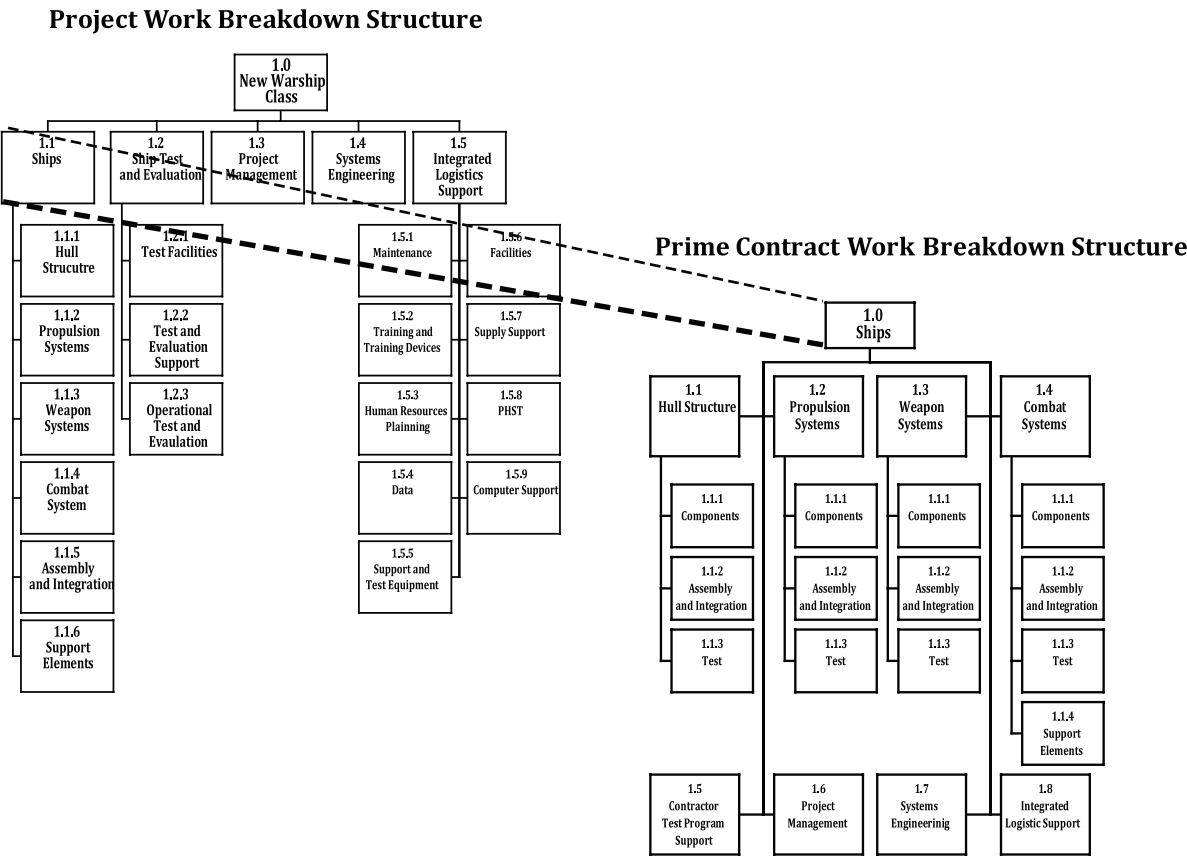


Figure B.1 — Contract work breakdown structure (from project breakdown structure)

Figure B.2 illustrates the relationship between a programme work breakdown structure and a prime contract work breakdown structure with a corresponding example sub-contract relationship illustrated in Figure B.2.

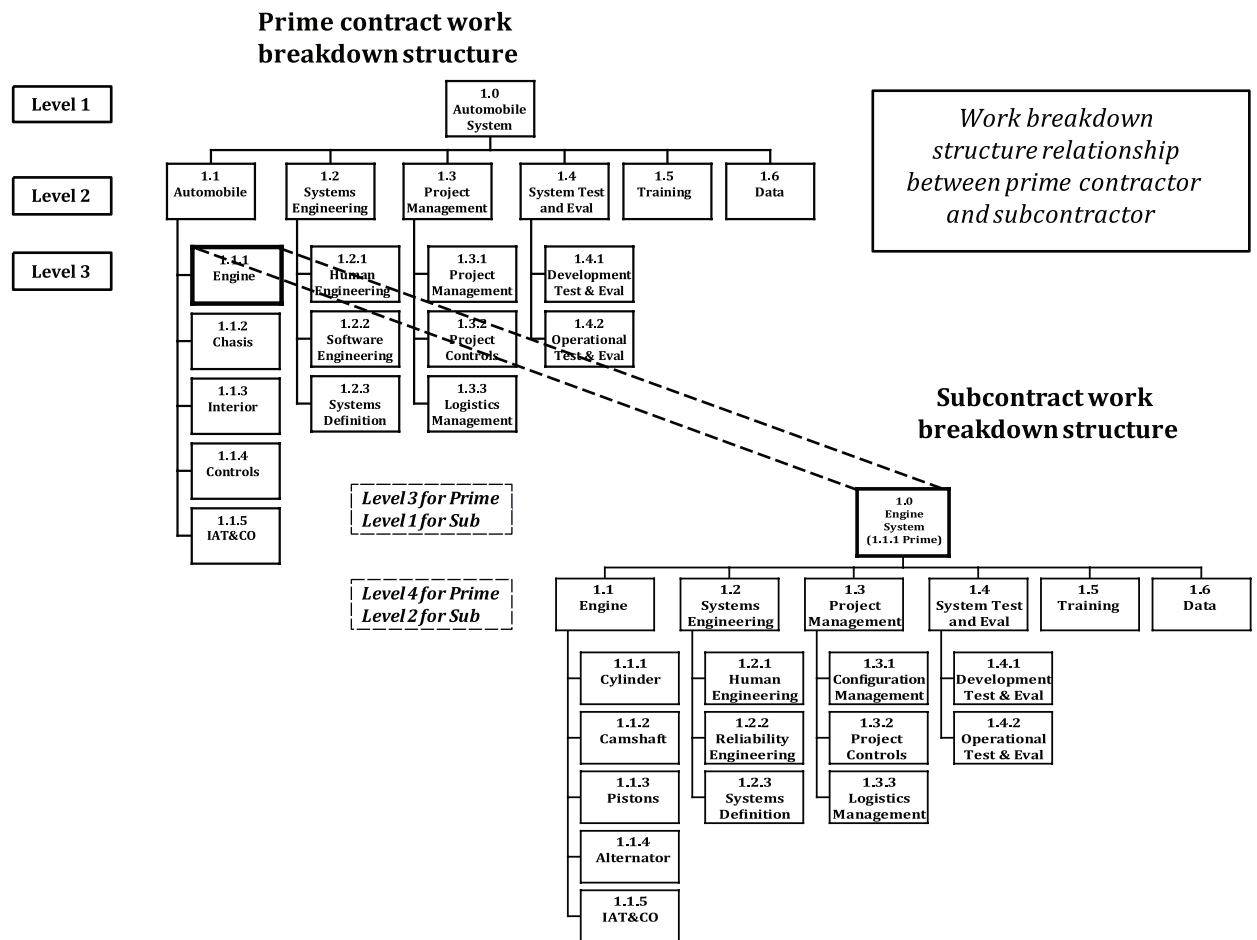


Figure B.2 — Work breakdown structure relationship between a prime contractor and a subcontractor

[Figure B.3](#) presents the work breakdown structure using the system engineering requirements analysis that drives the project statement of work, the integrated master plan and the integrated master schedule.

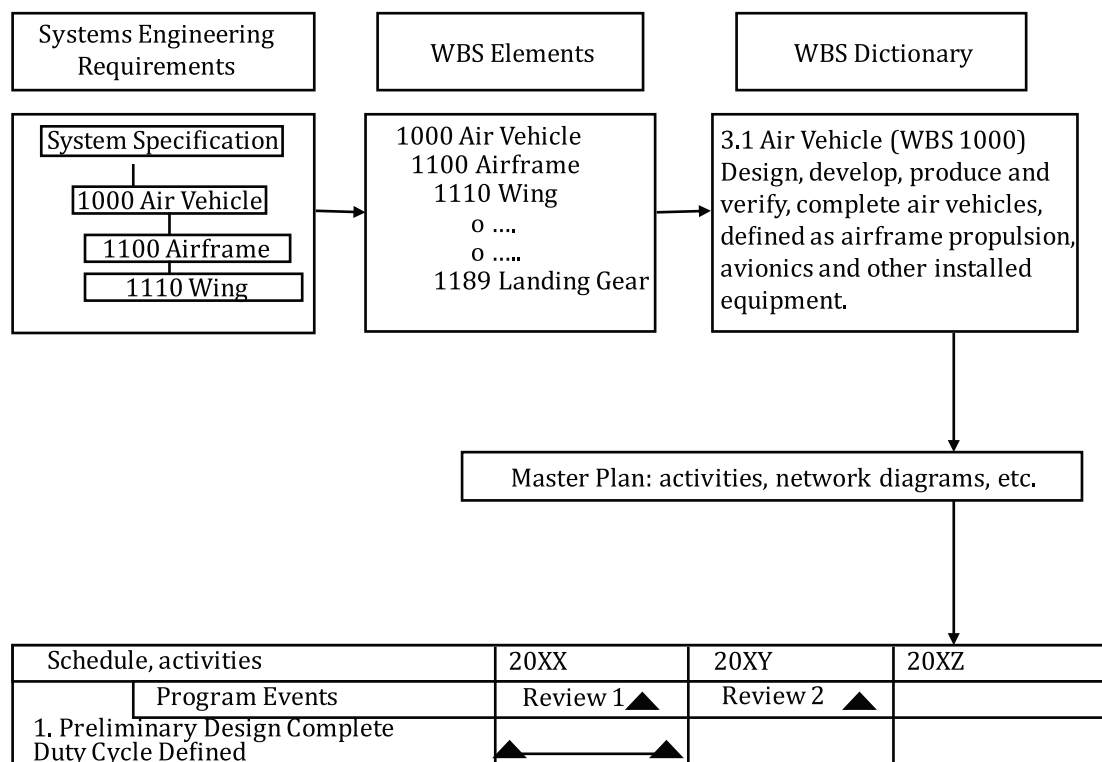


Figure B.3 — Work breakdown structure inter-relationship among project requirements, work breakdown structure dictionary, project planning and scheduling

[Figure B.4](#) presents the intersection of the work breakdown structure with the organization breakdown structure. This intersection illustrates the placement of control accounts at each intersected point.

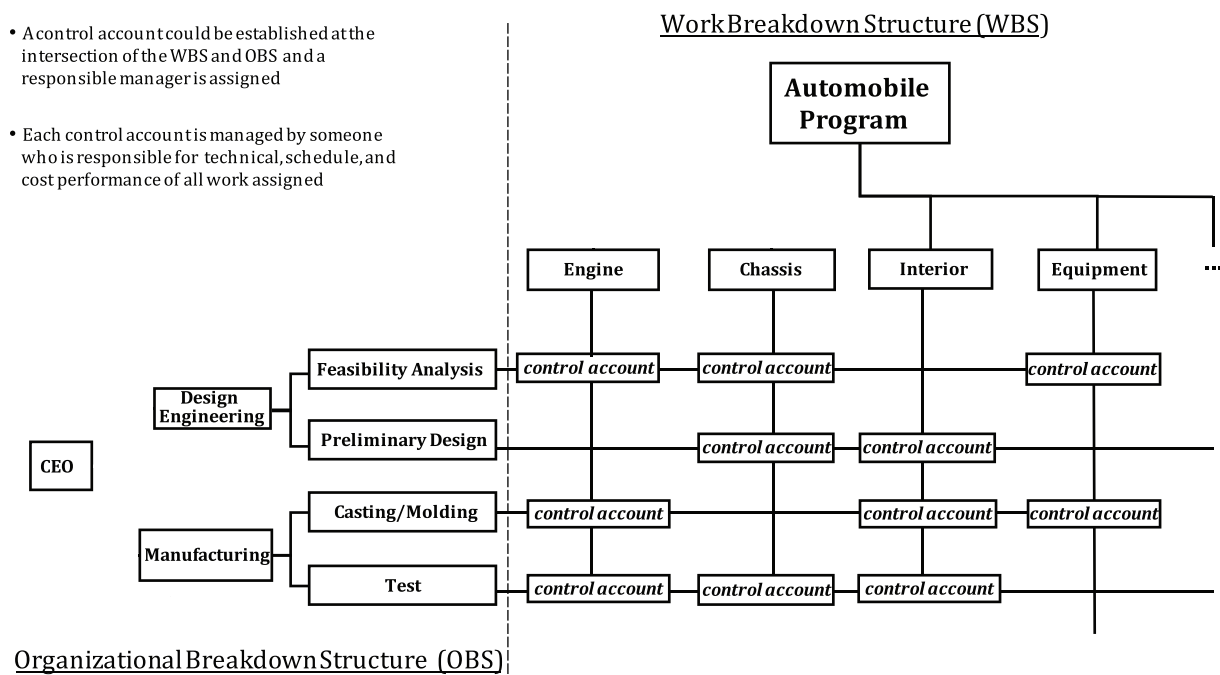


Figure B.4 — Organization breakdown structure (OBS) intersects the work breakdown structure (WBS)

Annex C (informative)

Alternatives hierarchical work breakdown structures

Advances in computing allow other representations than the hierarchical representation of the work breakdown structure. The underlying data model enables multiple independent views of the work breakdown structure elements and their relationships.

Data models for work breakdown structures may use relational or object-oriented data structures. These data models include 100 % of work scope.

[Figures C.1](#) and [C.2](#) illustrate views of alternative work breakdown structures.

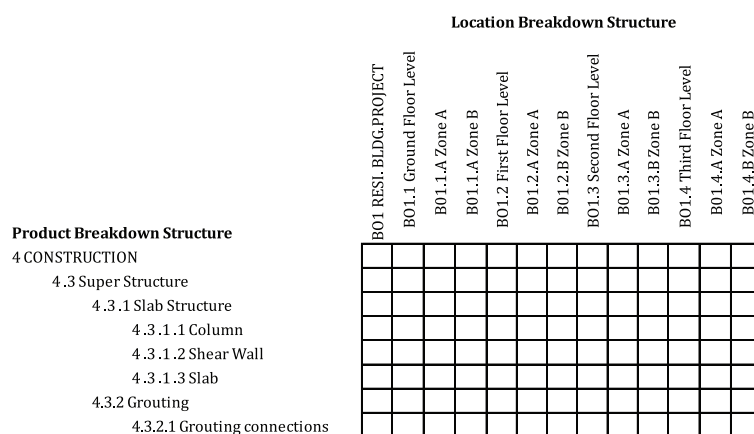


Figure C.1 — A two dimensional model view of work breakdown structure

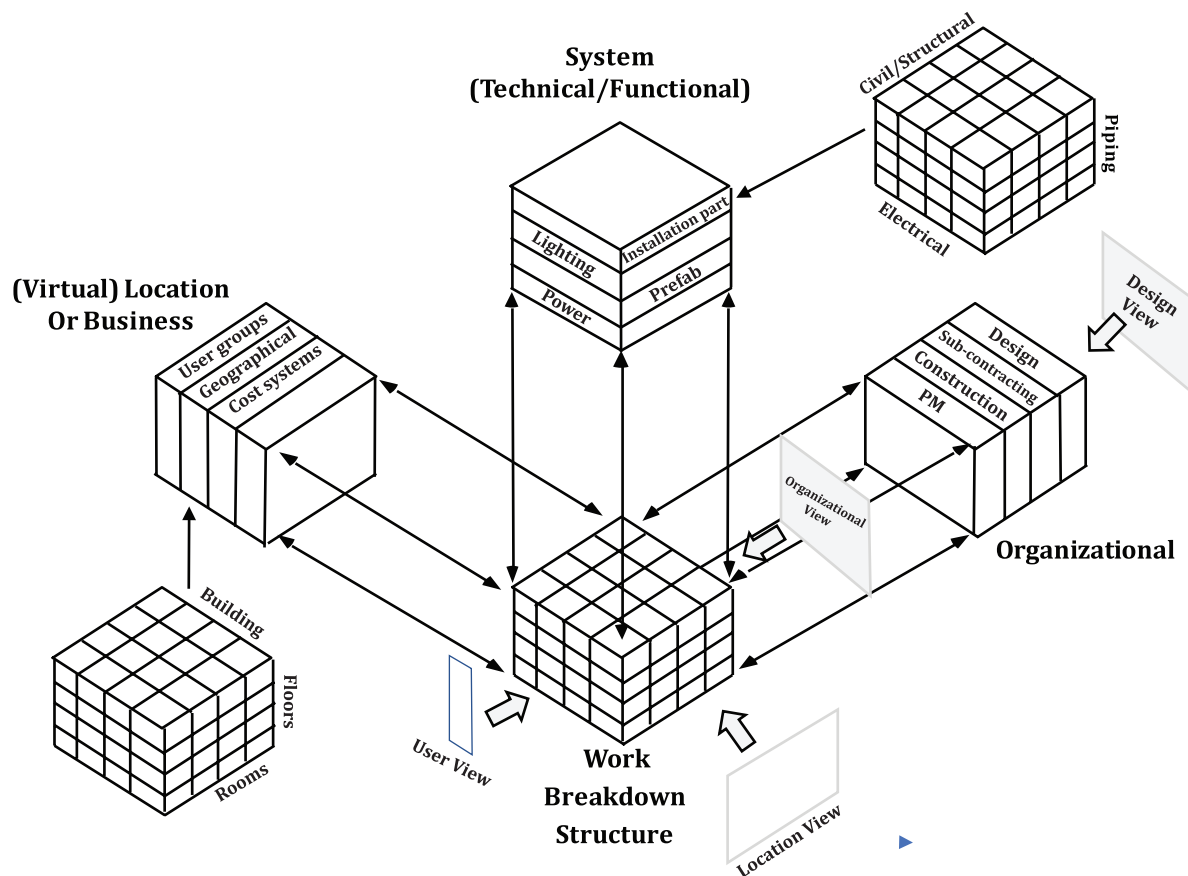


Figure C.2 — A three dimensional model view of work breakdown structure

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- [3] MIL-STD-881C: Oct 2011, Work Breakdown Structures for Defense Materiel Items
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- [5] NASA/SP 2010-3404: Jan 2010, NASA Work Breakdown Structure (WBS) Handbook

