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# The IT Alignment Guide

A Lean Framework for IT Strategic Planning
to Increase Value and Competitive Advantage

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## ABOUT THIS PUBLICATION

The *IT Alignment Guide* is a lean and effective framework for IT strategic planning to accomplish and sustain consistency between business and IT strategies. It describes management practices, processes, phases, events, and artifacts for effective application in enterprises.

Features of the IT Alignment Guide:

- It includes best practices for IT strategic planning.
- It is a state-of-the-art framework based on recent scientific findings.
- It is complementary, i.e., it closes gaps and matches other guides (e.g., PMBOK, TOGAF, COBIT, and ITIL).
- It provides flexibility and simplicity in implementation.

The IT Alignment Guide is value-focused to improve the financial performance of an enterprise and increase its competitive advantage. It integrates recognized concepts from strategy management science and the newest research about IT business value, IT alignment, and IT architecture management.

This framework connects five management practices: innovation management, strategy management, enterprise architecture management, project portfolio management, and project management.

By using the *Digital Architecture Model*, the IT Alignment Guide helps understand and plan the digital transformation of enterprises.

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The IT Alignment Guide
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The content of the IT Alignment Guide is the original work of the author, Christof Gellweiler, PhD. All sources used have been referenced.

Comments and ideas for improvement are wanted (info@italignment.org). Improvements from practitioner feedback will be incorporated into the upcoming releases.

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## INTRODUCTION

The improvement of information technology (IT) planning and business-IT alignment have been one of the most critical matters in IT management science for more than 40 years. There is broad consensus that IT alignment is fundamental for creating business value, achieving competitive advantage, and increasing enterprise performance.

Although there is high awareness of the importance of strategic alignment among theorists and professionals, there is no established course to achieve it. So far, process models and procedures for IT strategic planning and IT alignment have been vague in practice. There are no industry standards or methodologies that address IT alignment in depth. Recognized and wide-spread practitioner frameworks used in the IT area describe IT alignment superficially so that awareness, understanding, and adaptation are limited in businesses.

The IT Alignment Guide provides suggestions to mitigate these deficiencies. It is a lean and effective framework for IT strategic planning to accomplish IT alignment in enterprises—that is, consistency of business and IT strategy. The IT Alignment Guide describes management practices, processes, phases, events, and artifacts for turning IT investments into business value.

The IT Alignment Guide complements relevant IT management frameworks, i.e., it closes the alignment gap and fits to other frameworks and standards, in particular the standard for project portfolio management (PMI), The Open Group Architecture Framework (TOGAF), and overarching IT management frameworks (COBIT, ITIL).

In contrast to these prevalent IT management frameworks, the IT Alignment Guide integrates central concepts from the academic field of strategy management, including state-of-the-art research about IT-business value, business-IT alignment, and IT architecture.

The suggestions from this framework are grounded in scientific findings that have recently been published in renowned IT management journals after passing double-blind peer reviews. More than 600 scientific sources about IT strategy from four decades were examined. These studies employed manifold research methods, including interviews, surveys, and focus groups with IT managers and other stakeholders from global enterprises.

This framework has synthesized major concepts and been verified in practice. For ease of applicability, it concentrates on the principal aspects of IT alignment and provides sufficient space for implementation in enterprises of different sizes within diverse industries.

The IT Alignment Guide is value-focused and concentrates on profit-oriented organizations in competitive settings. It supports mastering the digital transformation of enterprises.

The main target groups of this framework are C-level executives, business strategists, IT

managers, enterprise architects, project portfolio managers, and IT management consultants.

This document is organized into three sections. Section 1 introduces basic business and IT strategy concepts; Section 2 presents notions that are needed to connect business and IT strategies; and Section 3 constitutes the core of this document, the recommendations of IT alignment for application in practice. The appendices delineate established methods for strategy analysis and the relationships among digital architectures. Further, it is shown how the IT Alignment Guide complements other IT management frameworks.

# SECTION 1: BUSINESS AND IT STRATEGY ESSENTIALS

## 1    BUSINESS STRATEGY CONCEPTS

**Business strategy definition**

A business strategy is a long-term plan for an enterprise to grow and improve its performance. It describes how an enterprise is going to create more value for customers than its competitors.

A business strategy presents a set of goals and initiatives within a timeframe of up to five years to move from the current competitive position to the target position of increased performance.

**Business strategy goals**

The paramount business goals of an enterprise are providing value, achieving competitive advantage, and improving profitability above the industry average.

The strategic business goals describe how an enterprise is going to compete and include target metrics for growth, market share, effectiveness, etc. The value proposition should be unique, i.e., different from competitors.

An effective business strategy includes offensive and defensive actions in order to reach these higher business goals. There are various choices that can be made to achieve strategic business goals and defend against competitive forces:
- Seize opportunities from emerging (information) technologies and digital innovations.
- Leverage the existing resources, skills, capabilities, and intangible assets of the enterprise.
- Adapt or change value delivery.
- Exploit industry change and new markets.
- Target new customer segments.
- Launch new products or improve existing ones.
- Lower vulnerability against substitutes and threats in the environment.
- Acquire other enterprises or merge with them.
- Integrate forward, i.e., extend the enterprise's value chain.
- Establish joint ventures or other types of strategic alliances.
- Modify marketing and sales channels.
- Withdraw resources, assets, or products.

For sustainable competitiveness, high product/service quality and high data security are mandatory preconditions and, therefore, enduring business goals.

## Business strategy management

Business strategy management means organizing the move from the current competitive position to the defined target position to increase value, competitive advantage, and enterprise performance (Figure 1).

Business strategy management includes

- analyses of the current position (as-is) and the strategic options,
- a definition of the target position (to-be) by business goals and the target business architecture, and
- a high-level schedule for achieving the target position, i.e., the roadmap.

Projects are initiatives to implement business strategies—that is, to move to the strategic target position according to the roadmap.
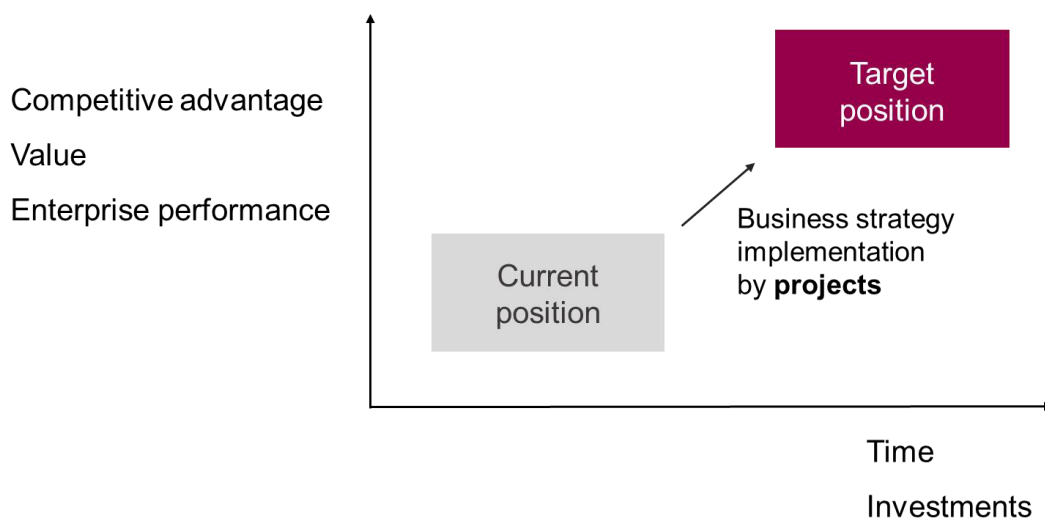
Figure 1: Strategic move of an enterprise

## Business strategy frameworks

Business strategy science comprises manifold areas, viewpoints, levels, and phases. There are more than ten different schools of strategic thinking, and about 200 strategy theories have been published. None of them can cover all the factors influencing strategy.

This IT Alignment Guide recommends Porter's five-forces analysis [4], resource-based analysis, PESTEL, SWOT, and the customer-value disciplines from Treacy and Wiersema

[6, 7]. These analytical frameworks complement each other and are interdependent.

Other strategy frameworks, such as 'The Business Model Canvas' (Osterwalder & Pigneur, 2010) or 'The Balanced Scorecard' (Kaplan & Norton, 1992), are built on comparable ideas and are also suitable.

Recommended analytical frameworks are presented in Appendix A: Tools for strategic analysis.

### Internal and external perspectives

Regardless of the preferred strategy framework, business strategy formulation must balance internal and external considerations.

- *Internal strengths and weaknesses*; what the enterprise *can* do in view of its resources, skills, capabilities, and intangible assets, i.e., the business architecture, including value-generating processes and management practices.
- *External opportunities and threats*; what the enterprise *might* do in view of the macro-environment and the competitive forces, including customers' needs, competitor products, suppliers, and partners.

### Functional areas

The business strategy includes all functional areas of the value chain:

- marketing and sales strategy (channels, communication, etc.),
- customer service strategy,
- production strategy,
- sourcing strategy,
- research and development strategy,
- organizational strategy (mergers, acquisitions, outsourcing, governance, etc.),
- finance strategy, and
- human resource strategy.

IT alignment concerns all functional areas. That is, the IT strategy of an enterprise must be consistent with all strategies in functional areas.

### Roles and management practices

Various roles can be engaged in business strategy formulation: C-level executives, board members, business analysts, external strategy consultants, internal strategists, business unit managers, and functional managers.

Project portfolio managers and enterprise architects play key roles in IT alignment and are therefore involved in strategy formulation. Project portfolio managers ascertain

business strategy implementation.

The IT Alignment Guide emphasizes management practices rather than specific roles. Roles denote stakeholders with defined tasks and responsibilities within management practices. Management practices are areas within an enterprise that organize people and tasks towards specific objectives.

## 2 ENTERPRISE PERFORMANCE

**Enterprise performance significance**

The overall goal of an enterprise is to grow and improve its performance. Improvement of enterprise performance means increasing profitability by lowering costs and/or enhancing revenues. Superior enterprise performance means significantly higher profitability than the industry average.

Enterprise performance can be presented in various numeric indicators such as sales growth, returns on sales, returns on investments, return on assets, reduction of costs, increase in revenues, profits, net present value, or payback period.

**Enterprises in scope**

Enterprises in the scope of the IT Alignment Guide are organizations in competitive environments that strive to maximize their profitability in the long term. These enterprises can operate in any industry and be of any size.

Organizations out of scope are IT equipment suppliers, IT service providers, and non-profit institutions.

**Enterprise IT**

IT systems contribute to value delivery and enterprise performance if they are aligned with business strategies. Enterprises use their IT systems for internal and external purposes. The IT architecture of an enterprise comprises all its IT systems and can be subdivided into the following categories:
- IT infrastructure, e.g., networks, firewalls, load balancers, servers, storage systems, and IT management systems;
- IT platforms, e.g., middleware, runtime environments, hypervisors;
- internal IT applications, e.g., ERP systems, SCM systems, systems for production, CRM systems, data-analytics systems;
- external IT applications, e.g., applications used by customers of the enterprise;
- data, i.e., all kinds of data that are being collected, stored, or processed;

- user devices: desktop PCs, notebooks, tablets, smartphones, and other computers.

# 3  IT VALUE

## Customer value

"Value is what buyers are willing to pay, and superior value stems from offering lower prices than competitors for equivalent benefits or providing unique benefits that more than offset a higher price." Michael Porter [5].

The creation of customer value is vital to each enterprise since customer value is a precondition for cash inflows and enterprise performance as a result.

The customer-value disciplines from Treacy and Wiersema [6, 7] have gained high recognition in strategic marketing science and management practice. They generally describe three different ways to offer high value to customers:

- *Product leadership* means delivering new products with outstanding features, functions, design, innovation, etc.
- *Customer intimacy* concentrates on customer relationships by solving complex client problems or by being highly responsive to customer requests.
- *Operational excellence* provides cost advantages through process efficiency, economies of scale, excellent production capabilities, etc.

An enterprise should be superior in one customer-value discipline and good in the other two.

A value proposition is a brief description of why customers buy the enterprise's products or services instead of its competitors ones. A value proposition should be unique, i.e., distinguished from the ways in which competitors provide customer value.

Please refer to Appendix A, Figure 15: Customer-value disciplines.

## Organizational value

Monetary performance indicators do not encompass all types of value that IT can deliver. IT can also provide intangible value. For example, process improvements, supplier relationships, data, and knowledge are types of intangible IT value. Most IT valuation approaches in practice do not cover non-monetary value and therefore ignore a significant part of IT value.

Organizational value includes intangibles and is needed for production (e.g., flexible IT infrastructures, intellectual assets). Organizational value is non-monetary and is a prerequisite for customer value. Organizational value indirectly impacts enterprise performance.

## IT value definition

IT value has been discussed in IT management science for several decades, but there is no generally accepted definition of IT value (synonyms: benefits, IT business value). Although IT management frameworks increasingly point up the significance of IT value creation, their definitions of IT value are vague (e.g., ITIL 4: 'the perceived benefits, usefulness, and importance of something').

Based on a recent literature review about IT value and its categories [3], the following definition of IT value is suggested:

IT value results from IT investments that provide benefits to customers and to the organization (i.e., the enterprise).

Categories of customer value [6, 7]:

- *Product leadership* provides functional benefits characterized by superior products, high quality, novel features, innovative functions, and early market launches.
- *Customer intimacy* provides benefits from relationships characterized by specific solutions to customer problems, responsiveness to customers, and customization.
- *Operational excellence* provides economic benefits characterized by the lowest costs, process efficiency, organizational effectiveness, and high productivity.

Categories of organizational value [3]:

- *Strategic planning and informed decision-making*: data and process flows for strategic planning and informed decision-making, including business development (i.e., growth opportunities), artificial intelligence, and IT alignment.
- *Flexibility and agility*: ability to quickly adapt the business architecture to change the product offering, e.g., as a response to changes in the environment (flexibility) or modification of the competitive position (agility).
- *Strategic alliances and supplier relationships*: business linkages to other firms that are part of the value chain (inbound and outbound).
- *Enhanced skills and capabilities*: increased skills among human resources or improvement of organizational capabilities.

## IT value model

IT investments are to improve the financial performance of an enterprise. Value from IT investments can have direct or indirect effects on enterprise performance.

IT value consists of two complementary facets (Figure 2):

- Customer value from cash inflows has direct effects on enterprise performance.
- Organizational value is non-monetary and has indirect effects on enterprise performance.

Organizational value is needed for production and is a precondition for generating customer value.

IT infrastructure, IT platforms, internal IT applications, and data provide organizational value. External IT applications and data provide customer value.

IT investments to create organizational value cannot be justified by revenue calculations, in contrast to customer value. Organizational value must be verbally described to defend the investments.
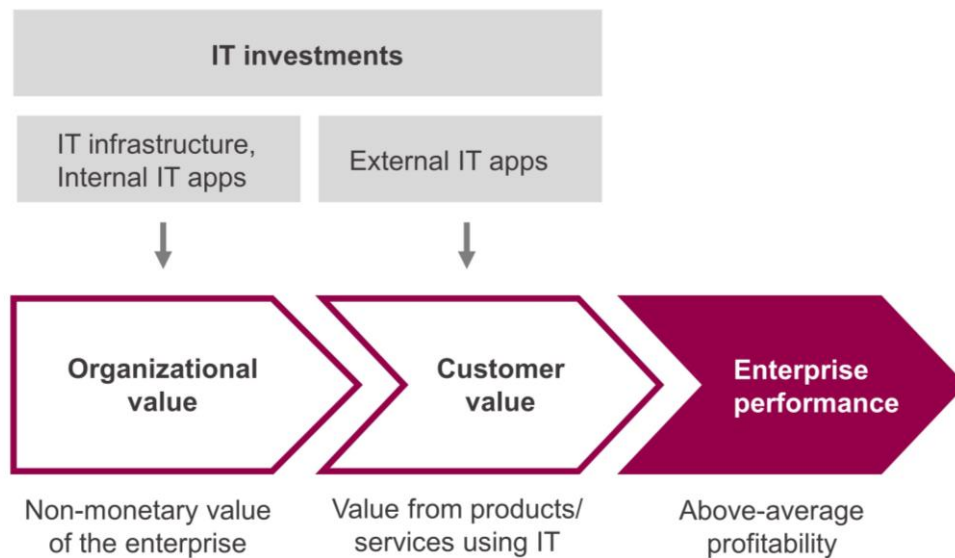


Figure 2: IT value model [3]

## 4 COMPETITIVE ADVANTAGE

Competitive advantage is a state of superior performance in which an enterprise creates more customer value than its competitors. It depends on the higher value that customers perceive from an enterprise's products relative to its competitors' products. Valued products come from differentiation strategies. The corresponding customer-value disciplines are product leadership and customer intimacy.

If there are numerous comparable products from competitors on the market, then there is a high level of competition for prices. In this situation, cost pressures on enterprises are high, and customers receive economic advantages that stem from low prices. Operational excellence is required to compete and survive on the market. Successful enterprises must pursue a cost leadership strategy and produce at the lowest costs; business process flows must be highly efficient.

Superior enterprise performance and competitive advantage result from either pursuing a differentiation strategy (high customer value delivery through unique products or customer relationships) or cost leadership (lowest prices for customers through operations excellence) (Figure 3).

Further information is given in Appendix A (generic strategies, customer-based view).
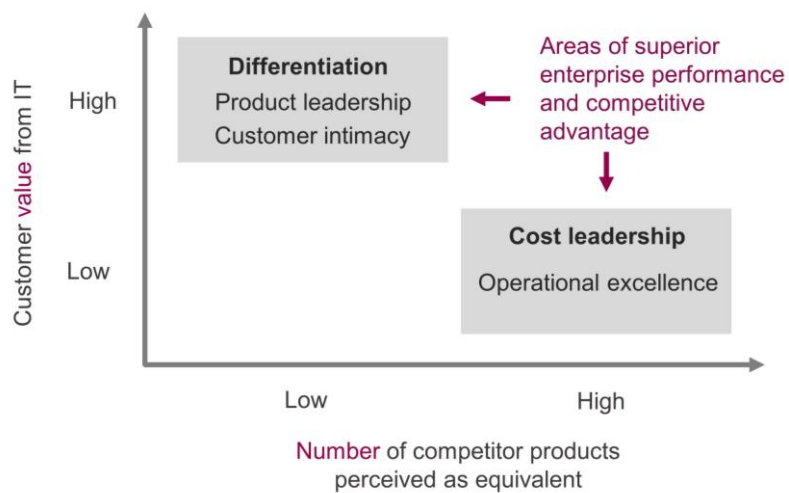


Figure 3: Competitive advantage and superior performance from customer value [3]

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# SECTION 2: IT ALIGNMENT CONCEPTS

## 5   IT ALIGNMENT VIEW

### IT alignment needs

Business strategies and IT strategies are interdependent. IT strategies must follow business strategies (e.g., business processes must be supported by IT). From the other direction, IT investments enable and extend business strategies (e.g., new business models through digital technologies). Both directions must be adequately considered in IT strategic planning (Figure 4).

| Business strategy | | IT strategy | |
|---|---|---|---|
| Business goals and limitations | IT alignment | IT goals and limitations | |
| Target business architecture | | Target IT architecture | |
| ▪ Competitive advantage<br>▪ Customer value<br>▪ Products / services<br>▪ Value chain<br>▪ Resources, capabilities, intangible assets | IT enables / enhances business strategies<br><br>IT must support / follow business strategies | ▪ Data<br>▪ Digital applications<br>▪ Internal / external IT applications<br>▪ IT platforms<br>▪ IT infrastructure | |

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Figure 4: Alignment of business and IT strategy

### IT alignment definition

IT alignment is a capability of IT strategic planning and designates the degree to which the IT investments of an enterprise directly enable and support the business strategy. The objective is to achieve and maintain consistency between business and IT strategies.

Many synonyms of IT alignment exist in the literature, e.g., IT-business alignment, business-IT alignment, and strategic IT alignment. Accordingly, various acronyms are used, e.g., BITA, ITBA.

### IT alignment purpose

The principal objectives of IT alignment are the improvement of enterprise performance (i.e., increased profitability) and competitive advantage through IT. It implies

congruence of links between business and IT strategies, including correspondence of the goals derived from these strategies, so that all parts of the IT architecture are consistent with the business strategies. Strategic planning outputs from both business and IT strategies must match the business and the IT architecture. IT alignment is the extent to which a firm's IT goals are in line with the enterprise's long-term business goals to increase IT value (Figure 5).
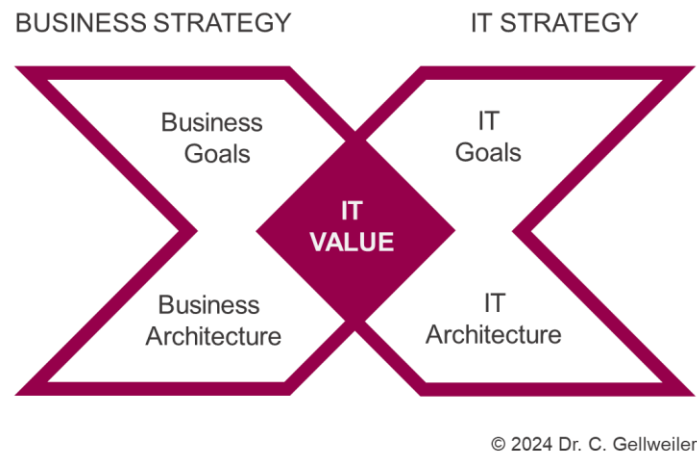
Figure 5: IT value results from the alignment of business and IT strategies

The IT Alignment Guide helps IT and business professionals achieve IT alignment objectives. It is a value-centric framework that integrates views from strategy management science into IT management practice. The IT Alignment Guide is complementary to leading IT frameworks and embraces management practices, processes, phases, events, and artifacts to support the business strategy of a firm.

**IT alignment principles**

This IT alignment framework is grounded on the following principles:
- Customer value and competitive advantage are central to strategic plans.
- Strategic plans are based on thorough analyses and need regular reviews.
- The roadmap is the sole source of truth for strategy implementation.
- Projects are the major means to implement strategies.
- Ideas and demands are essential inputs and are systematically checked.

## IT planning significance

IT planning has been one of the most critical matters among IT managers in practice. IT planning is vital because IT can potentially impact the position of a firm in its competitive environment.

The aim of IT planning is to create business value and extend competitive advantage through the use of IT. Effective IT planning processes and their results may provide superior enterprise performance. However, the effective and consistent translation of IT investments into business value remains a challenge within academia and in practice. There are no studies that explain the processes of IT strategic planning. In practice, there is no established industry standard and no common methodology for IT planning. The IT Alignment Guide addresses this gap.

## IT planning levels

There are two levels of IT planning: IT strategic planning and IT tactical planning. IT strategic planning concerns thought-out IT investments in the long term to support and extend the business strategy. IT tactical planning concerns the organization of IT projects, including requirements, system and solution design, and application development.

Projects are the initiatives for realizing strategies. So, the outcomes of IT strategic planning are central inputs to IT tactical planning.

IT strategic planning
- Inputs: collected ideas and needs from various stakeholders, demands from IT operations
- Processes: evaluation of ideas, demands, and project proposals; project selection and approval; IT alignment processes
- Outputs: roadmap with selected IT projects; allocation of budget and resources
- Main practices: strategy management (SM), project portfolio management (PPM), enterprise architecture management (EAM)

IT tactical planning
- Inputs: selected projects (including analytical data from the according project proposals), start and end points from the roadmap, project budget, various resources
- Processes: project initiation, predictive project planning, change management during project execution, agile development
- Outputs after implementation: value-generating IT products

- Main practices: business analysis; predictive project management for IT infrastructures, including requirement engineering and solution architecture; agile development of IT applications (e.g., by Scrum)

Project portfolio management (PPM) and enterprise architecture management (EAM) are key practices in the IT planning chain. Both management practices connect to business strategy management (SM) and govern the tactical practices of IT project management and solution/software architecture. Three alignment processes associate EAM and PPM (Figure 6).
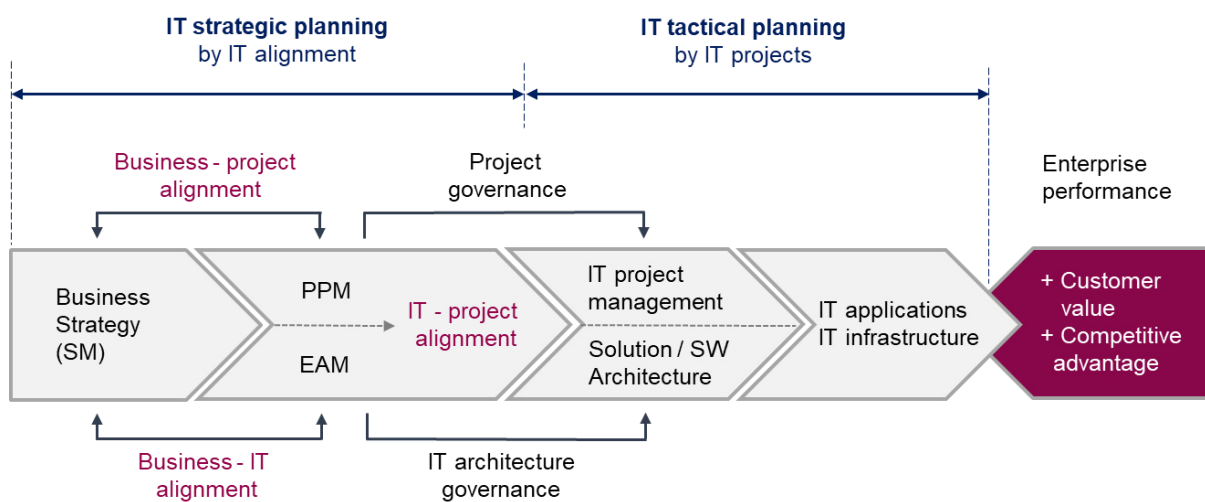


Figure 6: The IT planning chain, including IT alignment processes

IT strategic planning (including IT alignment by PPM and EAM) and IT tactical planning (by IT project management and solution/software architecture) provide a seamless IT planning flow for value creation, competitive advantage, and increased enterprise performance.

# 6 FROM STRATEGY ANALYSIS TO ENTERPRISE PERFORMANCE

Strategic management concerns three major stages of decision-making: strategy analysis (evaluating the situation, identifying chances and risks), strategy choice (deciding what to do), and strategy implementation (achieving results). Strategy analysis, together with strategy choice, is also denoted as strategy formulation. Activities of strategy formulation are carried out at the strategic level, whereas strategy implementation is performed at the tactical level. The benefits of strategic management are realized at the operational level, i.e., value delivery, competitive advantage, and enterprise performance.

Figure 7 depicts the stages, levels, and steps from strategy analysis to enterprise performance.



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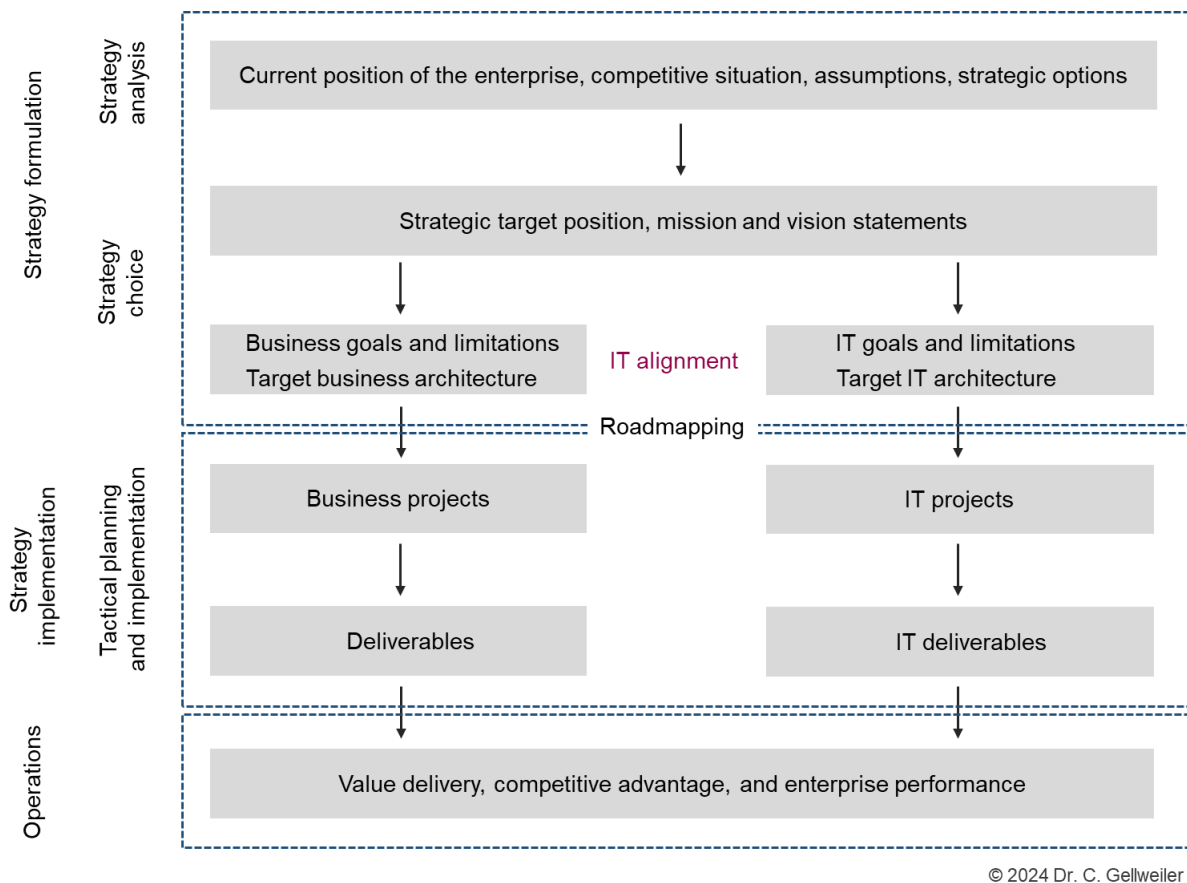
Figure 7: From strategy analysis to enterprise performance

## Strategy analysis

Strategy analysis means understanding an enterprise's current position, e.g., its explicit or implicit current strategy, current business architecture, and other conditions as-is. Strategy analysis comprises competitive forces, product lifecycles, industry structures, the macro-environment, customer needs, and the enterprise's goals, resources, capabilities, and assets.

SWOT is a useful analytical tool for the evaluation of the strengths and weaknesses of an enterprise's resources and capabilities, as well as the opportunities and threats of the external environment (see Appendix A: SWOT).

A strategy analysis should make assumptions about

- the enterprise's relative position in the competitive field (e.g., cost structures, value delivery, product uniqueness, business architecture, IT architecture, etc.), and
- future development of competitive aspects, including their implications (e.g., changes in the industrial landscape and technological developments over time; future demands; societal and buyer trends; market conditions; regional variances).

Strategy analysis includes various strategic directions and options that the enterprise can choose, i.e., alternative long-term approaches to provide customer value different from competitors.

A variety of tools for strategic analysis exist; recommended frameworks are mentioned in Appendix A.


## Strategy choice

Strategy choice signifies the definition of the strategic target position based on the findings from strategy analysis, including assumptions and strategic options.

Mission statements describe how the enterprise is competing at present or in the near future; vision statements outline how the enterprise will compete in the long-run.

Deriving strategic goals from the target position within the given limitations is also part of strategy choice. They are defined for both business and IT. The complete set of strategic business goals determines the target business architecture; the complete set of strategic IT goals defines the target IT architecture. If necessary, subsets of goals and corresponding intermediate architectures can be specified.

Goals should contain measurable numerical indicators. Business goals can embrace indicators for profitability, market share, revenue growth, etc. IT goals can comprise numbers for high availability, storage capacities, server performance, incident or problem resolution times, user ratings, etc.

At the stage of strategy choice, IT alignment as a framework is needed to

- connect business planning and IT strategic planning,
- select the 'right' projects in accordance with the strategic business and IT goals,
- identify dependencies, and
- find the best places for business and IT projects on the long-term timeline (i.e., the roadmap).

The selection of projects and their placement on the roadmap are key outcomes of IT alignment and strategy formulation.

A roadmap contains all projects to implement the target architecture and marks the border between the strategic and tactical planning levels.

## Strategy implementation

Strategies are implemented by a variety of projects. Projects use temporary organizational structures that deliver valuable outcomes in the strategic direction. Project planning and execution are carried out at the tactical level.

Project goals are to achieve strategic goals. The project team plans the deliverables (goods, services, results, or combinations) and the tasks needed to provide these deliverables. At project closure, the deliverables are handed over to operations. The deliverables are used at the operational level and provide value.

Note: Business strategy implementation is different from continual improvement. Continual improvement refers to measures and tasks at the tactical level that operations management organizes. However, continual improvement should go along with the strategic direction for value creation.

The meanings of the logical boxes in Figure 7 are explained under the upcoming headlines.

## 7  MISSION AND VISION STATEMENTS

Mission and vision statements constitute the highest level of strategy plans. Mission statements describe the current or short-range position in the competitive environment, in particular, what value is provided and how it is accomplished. Vision statements are concise definitions of the long-range target position and describe the way to it. Powerful vision statements shall articulate strong convictions about the future position and provide guidance for setting business strategy goals and selecting projects. Mission and vision statements can be combined.

## 8   GOALS AND LIMITATIONS

Based on the strategic choice, an enterprise formulates roughly its *goals*, i.e., desired outcomes to reach the strategic target position. These goals are used for analyzing and filtering project proposals to ensure IT alignment.

*Limitations* are existing rules, facts, or conditions that restrict what can be done. They constitute boundaries within which action can be taken. Limitations must be ascertained from business and IT perspectives.

Goals and limitations are defined for both the business and the IT architecture. Although interdependent, business goals are different from IT goals and are pursued by different organizational units within an enterprise.

### Business goals and limitations

*Business goals* encompass all the strategically wanted outcomes, such as geographical expansions, new product introductions, structural redesigns, acquisitions of firms, location moves, outsourcings, changes in supplier or partner relationships, or targeting of new customer segments.

*Business limitations* refer to available budgets, human resources, skills, assets, and risks. Further, internal and external dependencies must be considered, such as supplier conditions, lead times, policies, contractual obligations, and logical dependencies from and to other projects. Laws and regulations are also relevant business limitations.

### IT goals and limitations

*IT goals* denote significant mid- and long-term changes in the IT architecture. IT goals must be broken down into functional and non-functional IT requirements at a high level (ITIL-terms: utility and warranty). Functional requirements depend on the target architecture (e.g., a new or modified business model) and include features and functions that provide organizational value or customer value. Examples of non-functional high-level requirements are scalability for future expansions, high service availability, business continuity, performance, manageability, data security, and accessibility.

*IT limitations* refer to characteristics of the existing IT architecture that constrain freedom of action and choice. IT limitations include lifecycles of existing IT systems (e.g., legacy hardware), ongoing provider contracts, ongoing IT projects, platform compatibility, interoperability (protocols, interfaces), bandwidth, or other technical dependencies.

## 9 BUSINESS AND IT ARCHITECTURES

Business and IT architectures are structured descriptions and depictions of the enterprise's current and future environments. They help provide a common understanding between stakeholders and are useful for identifying the transition from present to future architecture.

These architectures describe current (as-is) and target (to-be) conditions. Thus, four types of architectures are in the scope of IT alignment:

- current business architecture ('business as-is'),
- target business architecture ('business to-be'),
- current IT architecture ('IT as-is'), and
- target IT architecture ('IT to-be').

Business and IT architectures are interdependent. Every change in the business architecture impacts the IT architecture. Changes in the IT architecture will likely affect the business architecture.

### Business architecture

The business architecture signifies the enterprise's operations in terms of its resources, capabilities, and assets, including the organization, management practices, main processes, main activities, and products to create customer value. Interfaces with suppliers, partners, and customers are mandatory parts of a business architecture. Figure 8 illustrates the components of a business architecture along an enterprise's value chain.

The business architecture of an enterprise should be diverse from competitor architectures in the way customer value is provided. A business strategy is mirrored in the configuration of the business architecture components and their interrelationships. These components should match and support each other.

A *business model* is a rough description or an abstract of a business architecture.

### IT architecture

The IT architecture of an enterprise includes all infrastructure, platform, and software components and their relationships, interoperability, functions, features, non-functional characteristics, use cases, users, and system administrators. IT architectures shall be presented in structured ways using descriptions, tables, and graphical overviews. The IT architecture must integrate into the business architecture and support value creation.
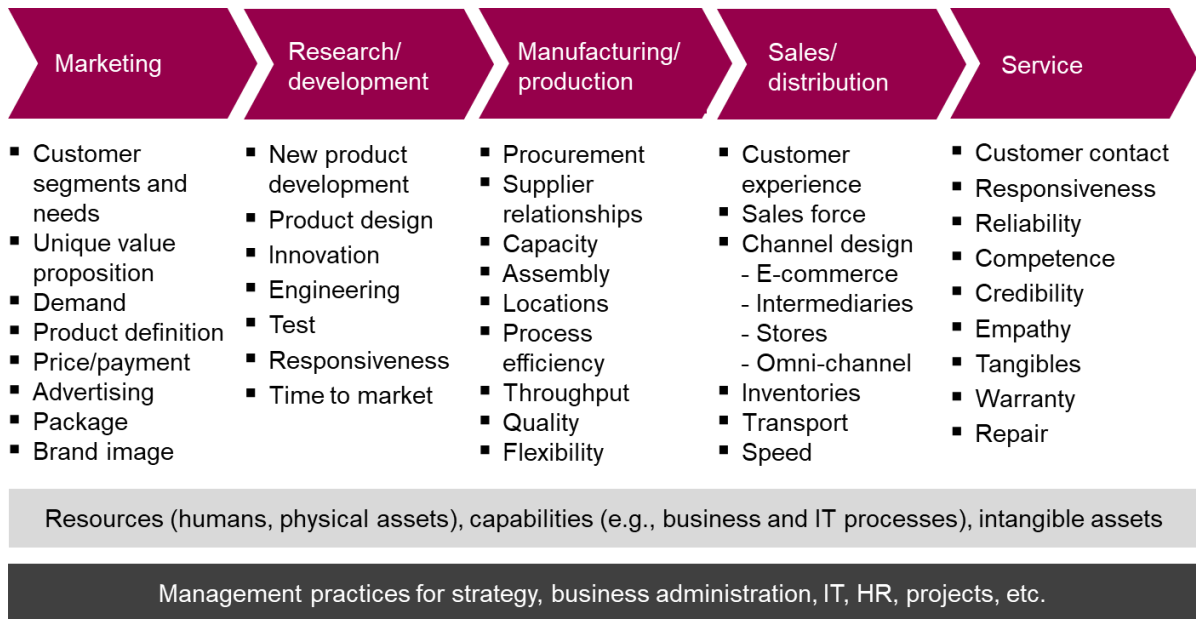
Figure 8: Business architecture components

## 10 BUSINESS AND IT PROJECTS

### Project significance

Projects are a major means of implementing strategies. All running and scheduled projects, that is, the project portfolio, constitute the strategy execution and the way from the current situation to the strategic target position. Selecting the right projects is critical to strategic success and a central goal of IT alignment.

Business projects change the business architecture towards the business goals that are derived from the business strategy within the given business limitations. IT projects change the IT architecture towards the IT goals within the given IT limitations. Alignment between business projects and IT projects is needed for efficiency and effectiveness in strategy implementation.

### Business projects

Business projects are to accomplish strategic business goals. Business projects focus on non-IT deliverables. However, every business project impacts the IT architecture quantitatively or qualitatively. The IT departments need to understand the impacts and dependencies and prepare accordingly. Examples of business projects are:

- open a new branch;

- acquire and integrate a competitor;
- change a supplier and modify the supply chain;
- merge the sales and marketing departments;
- develop a new service;
- enter a new geographical market;
- replace the manufacturing equipment;
- move to another office building; and
- outsource HR services.

**IT projects**

IT projects strive to realize IT goals and provide IT deliverables. These IT deliverables can have a direct (creation of customer value) or indirect (creation of organizational value) business impact. Examples of IT projects are:

- replacement of local area network equipment;
- installation of a new monitoring system for service level management;
- introduction of an intrusion detection system;
- rollout of new notebooks for employees;
- change the virtualization platform in the data center;
- migration to another platform for enterprise resource planning;
- switching the service provider for long-distance connectivity;
- substituting storage systems with cloud services; and
- development of an application for customers.

**Transition to practice**

In the following Section 3, the IT Alignment Guide presents
- three management practices,
- three processes,
- four phases for project proposal processing,
- four events, and
- seven artifacts for strategic planning

that help manage the achievement of IT alignment.

# SECTION 3: IT ALIGNMENT IN PRACTICE

## 11 IT ALIGNMENT MANAGEMENT PRACTICES

### Project portfolio management

Project portfolio management (PPM) denotes a central practice of IT alignment. Enterprises apply PPM to meet business strategies and achieve strategic goals. The overall objective of PPM is to maximize value from the total investment budget of an enterprise. The realization of business value is a measure of portfolio success. Business value increases with the effective and efficient application of portfolio and project management processes. PPM controls and guides projects at the tactical layer to ensure consistency between strategic planning and tactical implementation as well as effectiveness and efficiency.

### Enterprise architecture management

Enterprise architecture management (EAM) is another crucial practice in the IT alignment model. EAM refers to creating and managing frameworks, policies, and processes in the IT architecture. It also comprises techniques, standards, and patterns to further develop the IT architecture. Enterprise architects define 'reusables' as blueprints, references, or functional blocks.

EAM has a strong strategic orientation and is key for business-IT alignment [2]. EAM advises stakeholders from both the IT and business sides on technology matters. Enterprise architects shape long-term IT architectures and draw high-level technology plans. EAM plans IT systems over their lifecycles, from introduction to phase-out.

At the tactical level, EAM guides solutions and software architects for consistency, effectiveness, and efficiency. Principles, guidelines, and standards formulated by EAM provide solution architects and design engineers with directions in IT tactical planning.

### Comparing and contrasting PPM and EAM

PPM and EAM are comparable management practices but are different in their areas of responsibility. PPM is more business-oriented, whereas EAM is focused on technology.

Similarities between PPM and EAM:
- Both practices connect to business strategy management at the strategic level.
- Both practices identify, analyze, and align goals and limitations at the strategic level.
- Both practices lead and control other practices at the tactical level for the effectiveness of strategy implementation.

- Both practices define guidelines and set standards for efficiency and consistency at the tactical level.

Main differences between PPM and EAM:

- At the strategy level, PPM concentrates on *business* goals and limitations, whereas EAM focuses on *IT* goals and limitations.
- At the tactical level, PPM guides project managers, whereas EAM guides solution and software architects.
- At the tactical level, PPM controls *all* projects, whereas EAM focuses on *IT* projects only.

Because of these similarities and differences (Figure 9), both management practices complement each other and are central functions in the IT alignment model.

| | Project portfolio management | Enterprise architecture management |
|---|---|---|
| **Strategic scope** | • Business goals and limitations, business architecture<br>• Business-project alignment<br>• Fund and resource allocation | • IT goals and limitations, IT architecture<br>• Business-IT alignment<br>• Technology lifecycles |
| **Tactical scope** | • Consistency of project management<br>• Controlling of programs/projects<br>• Definition of guidelines, principles, approaches, etc. | • Consistency of IT architecture<br>• Controlling of solution design<br>• Definition of guidelines, principles, 'reusables', etc. |
| **Project focus** | • Business projects (e.g., mergers, acquisitions, outsourcing, new products, new sites, moves, process changes) | • IT projects (e.g., IT infrastructure changes, IT app development) |

Figure 9: Comparison of PPM and EAM [1]

**Strategy management**

The strategy management (SM) practice is responsible for the business strategy, specifically for strategy formulation, including analysis, mission, vision, target position definition, and decision-making. In contrast to PPM and EAM, the roles of SM are not specified. They vary by the organizational designs, governance principles, and decision-making structures of the enterprises. Typical roles in the SM practice are individuals or groups with high formal power, such as presidents, C-level managers, business unit leaders, board members, or other executives. Alternatively, committees that comprise various top-level roles may take responsibility for the SM practice to achieve IT alignment. Further, management consultants may support business managers in analytical ways.

For ease of readability, the IT Alignment Guide uses the generic role of the 'business manager', who fulfills the tasks and bears the responsibilities of the SM practice, regardless of who really takes on this role.

The main tasks and responsibilities of business managers in view of IT alignment are to

- formulate the enterprise strategy (mission, vision, strategic target position),
- decide on business and IT goals,
- provide funds for the whole project portfolio,
- raise demands derived from strategy,
- review and accept or reject project proposals,
- set priorities for approved projects, and
- review business and IT strategies with PPM and EAM, respectively.

# 12 IT ALIGNMENT PROCESSES

The IT alignment model (Figure 10) depicts three main IT alignment processes of the IT alignment management practices PPM, EAM, and SM:

- *Business-project alignment* between PPM and SM. PPM is involved in the strategic business planning process for analytical reasons (foremost value creation, costs, dependencies, and risks) and to help filter and prioritize project proposals based on business needs.

- *Business-IT alignment* between EAM and SM. EAM links the business architecture (e.g., capabilities, organization, processes) and the IT architecture (e.g., IT infrastructure, IT applications, data) and must ensure their consistency for the current state (as-is) and the target position (to-be). EAM also inspires the business strategy in view of new technologies and digital innovations.

- *IT-project alignment* is the process of harmonizing strategic plans between EAM and PPM into a collective roadmap to meet both business and IT goals. The analytical results from PPM and EAM are combined to prioritize and schedule all projects. Scheduled projects receive budgets and resources for implementation. PPM and EAM draft together a long-range timescale, which is referred to as a roadmap. It harmonizes priorities, considers dependencies, and places IT projects accordingly.
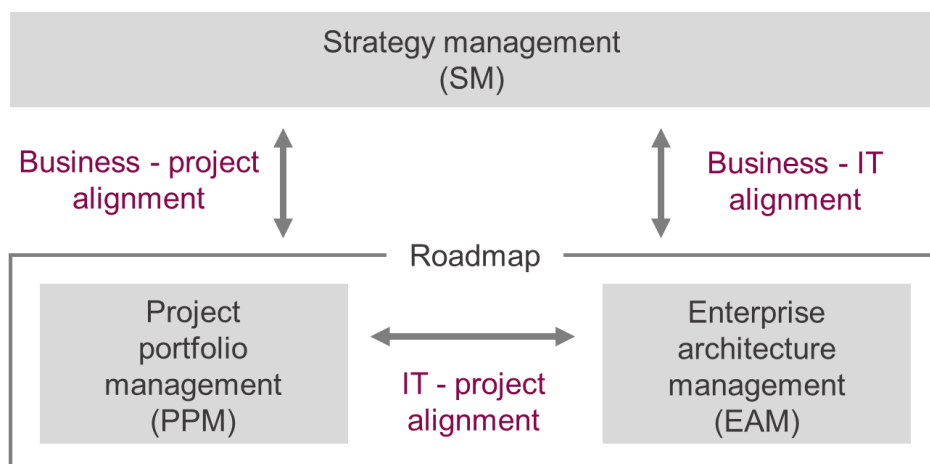


Figure 10: IT alignment model including processes [1]

Roadmapping closes the strategic alignment loop. The roadmap is the main outcome of IT alignment and strategy formulation.

# 13 IT ALIGNMENT PHASES

The IT alignment procedure is subdivided into four repetitive phases.

-   The phase of *innovation* is for screening and collecting new ideas and identifying external or internal business opportunities or other chances for improvement.

-   The phase of *project proposal creation* is for filtering and structuring ideas, demands, and needs for projects.

-   The phase of *analysis and project selection* is for evaluating project proposals and deciding on their further processing.

-   The phase of *project prioritization and roadmapping* is for setting priorities, identifying dependencies between the selected projects, and placing these on a schedule.

Figure 11 depicts the four IT alignment phases along with the three main processes and management practices: PPM, EAM, and SM.
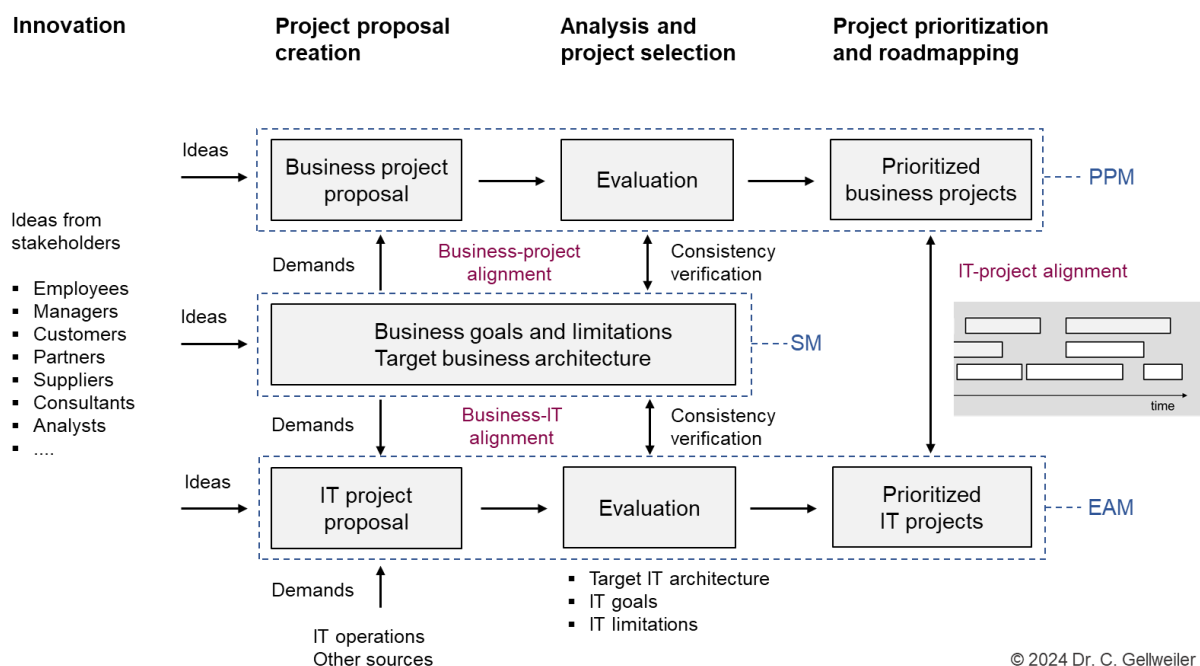


Figure 11: IT alignment phases

Figure 12 illustrates the fourth phase of *project prioritization and roadmapping,* which contains the process of *IT-project alignment.* EAM prioritizes projects based on technology needs (e.g., severe problems, technology risks, needed capacity expansions, IT administration functions); PPM prioritizes projects based on business needs as agreed with SM. The analytical results and scores from the previous phase can be used for prioritization.

PPM and EAM jointly identify dependencies between the selected and prioritized business and IT projects. Further, mutual impacts are identified to find the best order of all projects (project sequencing).

PPM and EAM agree on placing each project on a timescale (i.e., the roadmap). Duration estimation for each project can be taken from the previous analysis phase. When scheduling business and IT projects, limitations must be considered (e.g., resource availability, available funds for the current fiscal year).
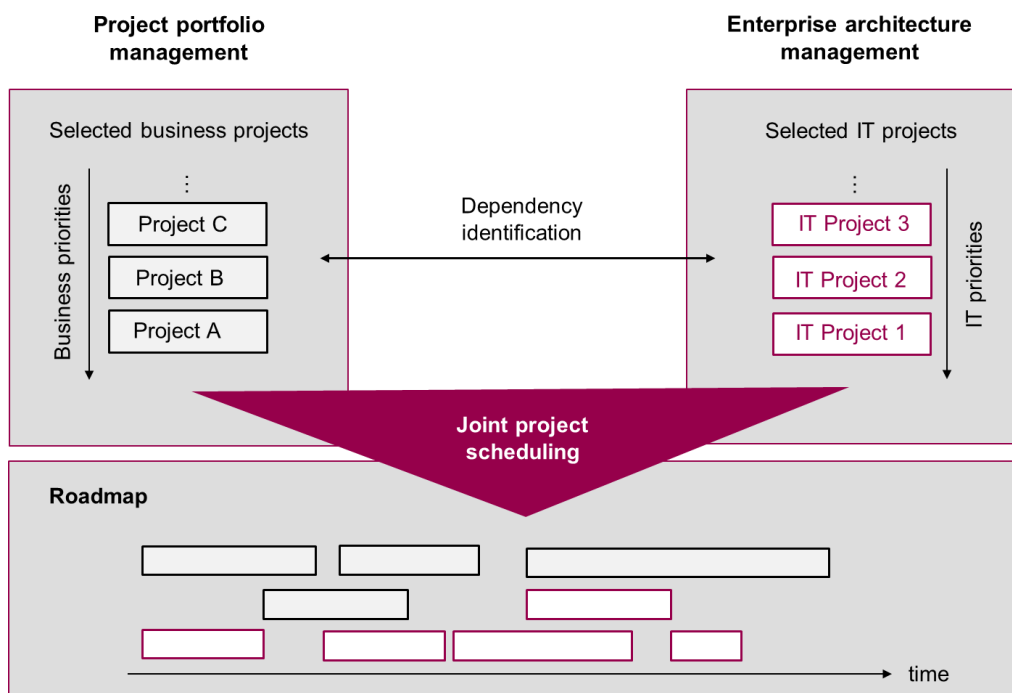


Figure 12: Roadmapping by PPM and EAM as part of IT-project alignment [1]

# 14 IT ALIGNMENT EVENTS

The IT Alignment Guide suggests four events that are structured meetings with representatives of the management practices SM, PPM, and EAM to provide major artifacts.

- A *project selection session* is a monthly or bimonthly meeting with SM, PPM, and EAM to view evaluations of project proposals and approve, reject, or store them.

- A *roadmapping session* is a monthly meeting between PPM and EAM to check the dependencies of new approved projects and place them on the roadmap. Existing roadmap items (i.e., selected and scheduled projects) are reviewed. Changes in durations, postponements, or cancellations are updated on the roadmap.

- A *business strategy review* is a meeting to reassess the target business architecture and the business goals and limitations set by SM and PPM. Significant changes in the business, its environment, or dynamic forces may lead to updates. Tools for strategic analysis (SWOT, PESTEL, customer value, five forces, lifecycle, etc.) can be applied.

- An *IT strategy review* is a meeting conducted by SM and EAM to reassess the target IT architecture and the IT goals and limitations. Technology changes or severe technical problems can lead to updates.

The strategy review meetings help gain a mutual understanding among SM, PPM, and EAM. They take place on a quarterly basis or spontaneously on demand. The meetings for the business and IT strategy reviews can be combined.

## 15 IT ALIGNMENT ARTIFACTS

Key artifacts of the IT alignment processes and events are

- Business goals and limitations—see headline 8
- IT goals and limitations—see headline 8
- Business architecture (current, target)—see headline 9
- IT architecture (current, target)—see headline 9
- Business project proposals—see below
- IT project proposals—see below
- Roadmap—see below

**Project proposals**

*Project proposal definition and purpose*

A project proposal is a structured document based on an idea or demand that is processed in the IT alignment phases.

The purpose of a project proposal is to capture unstructured ideas and demands and translate them into an organized format so that they can be processed for analysis, acceptance or rejection, prioritization, and scheduling.

A project proposal shall contain rough information about the project objectives, the link to strategic goals, the intended value, the main requirements, and the main deliverables. Besides, data on the idea or demand source, the creator, date, and process state (e.g., draft, analyzed, on hold, rejected, accepted) shall be given.

*Project proposal creation*

Project proposals are created based on project ideas or demands from any stakeholder source. For example, demands can be raised from an enterprise's incentive or problem management, risk management, business strategy, or operational business units.

Business project proposals are managed by PPM; IT project proposals are managed by EAM.
EAM and PPM translate unstructured or differently formatted ideas and demands into a project proposal layout. Project ideas can be discarded by PPM or EAM if substantial content for proposals cannot be provided or if an idea does not obviously meet the characteristics of a project. EAM and PPM may also create project proposals based on their own ideas.

*Analysis and project selection*

Project proposals are systematically evaluated by PPM/EAM, considering business and IT architectures, goals, and limitations. An evaluation of a project proposal includes organizational/customer value, cost estimations, time estimations, feasibility and risk

analyses, and a strategic consistency check (i.e., verification of project compatibility to target business/IT architecture and the business/IT goals). Scoring models with main categories, sub-categories, weighting factors, and coded scales are recommended to compute a numeric indicator that can be used for project selection and prioritization.

Decisions about the analyzed project proposals are made at the project selection session. Based on analytical outcomes and consultation with PPM and EAM, SM will decide about acceptance or rejection of each proposal. Setting a project proposal 'on hold' can be an option for later consideration. A selected project means that the project proposal has been accepted.

*Project prioritization and roadmapping*

PPM and EAM review selected business and IT projects. A review encompasses the refinement of estimations and other evaluation data. Based on the score and known critical factors, PPM and EAM prioritize or rank the selected business and IT projects.

At the roadmapping session, EAM and PPM find dependencies and put the projects in the best timely order on the joint roadmap. PPM must allocate or reserve resources and funds for scheduled projects. If necessary, the roadmap must be adjusted so that resource and budget availability are guaranteed.

## Roadmap significance

The roadmap is a reasoned master plan that shows the projects on the way to target business and IT architectures. It integrates business and IT strategies, harmonizes priorities, considers interdependencies, and presents selected projects accordingly on a timeline.

The roadmap denotes the key outcome of the IT-project alignment process. The roadmap constitutes the logical border between IT strategic planning and IT tactical planning. Strategic planning finishes with the roadmap.

The roadmap is an instrument for a common understanding of the strategy. The roadmap makes strategic planning transparent and raises awareness. Sharing the roadmap with internal stakeholders is desirable to foster their engagement and to assure that everyone is on the same page regarding long-term planning of business and IT.

## Roadmap updates

The roadmap must not be arbitrarily changed by a business manager or any other role. Changes in the roadmap driven by business circumstances (e.g., budget cuts) or technical emergency cases must always be agreed upon with SM, PPM, and EAM.

Updates of business/IT goals, limitations, and architectures are discussed in strategy review meetings. Resulting roadmap modifications are carried out at the next roadmapping session.

Project progress and delays must also be reflected in the roadmap. The impacts of project delays must also be discussed at the roadmapping session.

## Roadmap items

Roadmap items are business and IT projects, either in progress or not started yet. Future roadmap items represent projects that will be started at the planned point on the roadmap. A roadmap item should refer to the data of the project proposal so that information about cost, time, risk, value, etc. is available as essential input to project initiation. Further data can be added as needed (e.g., the chosen project management approach: predictive, agile, or hybrid).

Roadmap items that have reached the planned start point will enter the project initiation phase and then be organized by a dedicated project manager that is governed by PPM. PPM will regularly monitor project progress and collect forecasted project end dates from all project managers.

## Secured access

All IT alignment artifacts shall be stored and updated in a secured database as the sole source of truth. Privileged access to the database must be provided to the IT alignment management practices PPM, EAM, and SM.

## Project proposal lifecycle

Figure 13 shows the different states that a project proposal can go through during its lifecycle. The transition from one state to the next requires actions from IT alignment management practices.

| **Actions** | **State** | **Notes** |
|---|---|---|
| | Idea or demand | |
| Proposal creation by PPM, EAM | ↓ | Structured or unstructured inputs from innovation management, operations, or other stakeholders |
| | Project proposal created | |
| Proposal analysis by PPM, EAM | ↓ | Evaluation includes: <br> - Cost and value analyses <br> - Duration estimation <br> - Feasibility and risk analyses <br> - Strategy consistency check <br> - Score |
| | Project proposal evaluated | |
| Project selection by SM, PPM, EAM | ↓ | Rejected project proposals are stored in a project proposal register |
| | Project proposal accepted (i.e., project selected) | |
| Roadmapping by PPM and EAM | ↓ | All accepted projects proposals need to be scheduled |
| | Project scheduled | |
| Initiation of the project by PM | ↓ | The planned start date on the roadmap had been reached |
| | Project started | Tactical planning |

Figure 13: Lifecycle of a project proposal

# APPENDICES

## APPENDIX A: TOOLS FOR STRATEGIC ANALYSIS

**Industry view**

*Generic strategies*

Michael Porter [4] has defined three types of competitive strategies to achieve above-average performance and presented their characteristics and requirements in view of organization, skills, and resources.

Differentiation

- Strong brand image, special services, etc.
- Superior design, advanced product features, new technologies
- High-quality levels

Overall cost leadership

- Competing for the lowest price
- Maximum efficiency in all business operations for the lowest possible costs
- Economies of scale, low overhead

Focus

- Overall cost leadership or differentiation for a narrow target segment
- Satisfaction of customer needs in a small and specific market

Porter's generic strategies require appropriate resources, specific skills, and capabilities that an enterprise must develop internally or acquire through strategic alliances (e.g., partner, merger, supplier). A cost leadership position, for example, would require low-cost distribution networks, highly efficient processes, modern production technologies, lean management skills, etc. In contrast, a differentiation strategy would need strong marketing and product engineering capabilities.

The generic strategies are useful for identifying risks and strategic options. An enterprise should select one of the three generic strategies to achieve a distinctive position in the industry.

## Five-forces analysis

The five-forces analysis from Michael Porter [4] offers a structured way to assess the industry and the key factors that drive or hinder competition (Figure 14). The five forces relate to

- bargaining power of suppliers and buyers,
- potential new entrants and the barriers to entry into an existing market,
- threats of new products that substitute for existing ones, and
- competition among existing enterprises.

The five-forces analysis is useful to identify

- type and extent of forces in the competitive environment of the enterprise,
- forces that limit enterprise performance, and
- options to react or defend against these forces or make use of them.

An enterprise should select a strategic target position where the forces are weak or balanced and where it can best defend against the five forces. The target position should be in accordance with the enterprise's internal strengths.
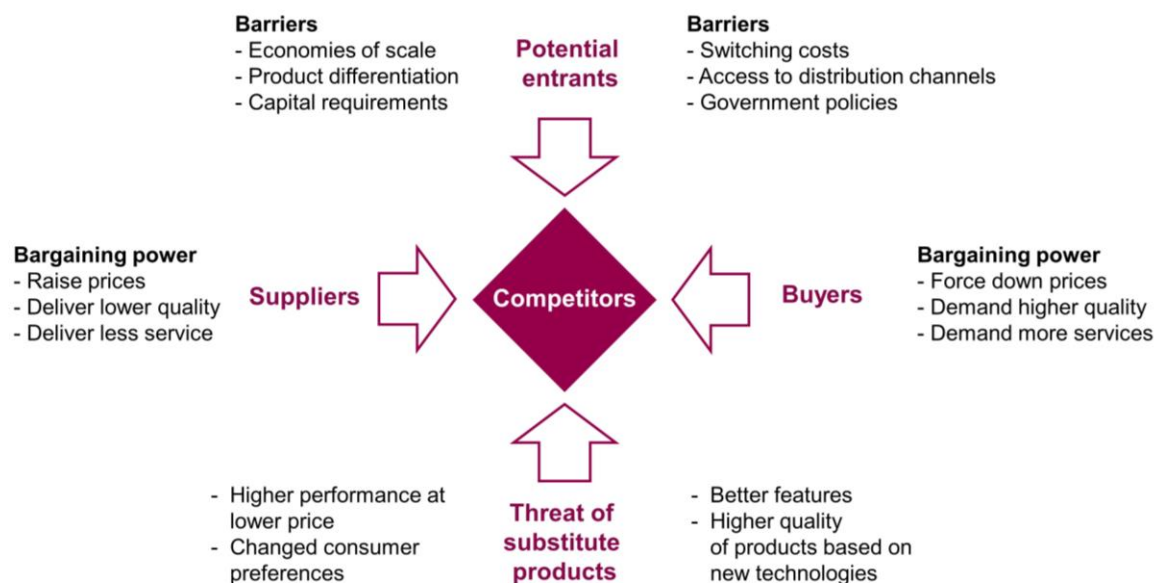


Figure 14: Five-forces analysis [4]

### Product lifecycle

The product lifecycle [4] denotes a model of four distinguished phases of a product's lifespan: introduction, growth, maturity, and decline. Various significant business aspects change by phase (e.g., quality, risks, competition). Table 1 outlines how several business factors vary from phase to phase.

The purpose of the product lifecycle is to identify demand and predict profitability and competitive forces. Depending on the phase, business architectures must be adapted.

Instead of products or product groups, the lifecycle model may be applied to a whole industry.

| Lifecycle phase | Introduction | Growth | Maturity | Decline |
|---|---|---|---|---|
| Buyer | Few early adopters | Many adopters | Mass market, saturation | Drop-off in usage |
| Product change | Frequent design changes | Improvements | Minor changes | No changes |
| Product differentiation | Very high | High | Less | Little |
| Product quality | Poor | Good | Superior | Mature |
| Advertising needs | Very high | High | Lower | Low |
| Strategic goals | Increase market share | Change price and quality image | Hard to increase market share | Milking |
| Key function | Engineering | Marketing | Cost efficiency | Cost control |
| Competition | Few competitors | More competitors | Heavy price competition | Few competitors |
| Risk | High | Moderate | Low | Low |
| Demand / supply | Demand unknown | Demand > supply | Demand = supply | Demand < supply |
| Price | High | High | Falling | Falling |
| Profits | Low | High | Lower | Low |

Table 1: Product lifecycle analysis [derived from 4]

## Customer-based view

The customer-based view relates to the enterprise's value proposition, i.e., the value that the enterprise offers to its customers through its products or services.

Treacy and Wiersema [6, 7] proposed a general, not IT-specific, typology for customer value that has gained recognition in marketing theory and in the IT strategy literature. To date, the related Harvard Business Review article [6] from 1993 has been cited more than 2150 times, according to Google Scholar.

The customer-value disciplines broadly describe three different ways for enterprises to offer extraordinary value to customers: product leadership, operational excellence, and customer intimacy. Excellent enterprises should be superior in one customer-value discipline and pretty good in the other two [3, 6, 7].

The customer-value disciplines of *product leadership* and *customer intimacy* correspond to Porter's competitive strategy *differentiation,* whereas operational excellence matches the *cost leadership* strategy [3, 4].

Figure 15 shows the advantages that customers can gain from each discipline. Further, it displays how Porter's generic strategies fit each discipline [4, 6, 7].

| Customer-value discipline | Customer advantage / characteristics | Competitive strategy |
|---|---|---|
| Product leadership | *Functional* customer advantage<br><br>• 'Best' product/services on the market<br>• Outstanding features and functions<br>• New, innovative products or services<br>• High quality<br>• Early time-to-market | Differentiation |
| Customer intimacy | *Psychological* customer advantage<br><br>• Exceptional customer experiences<br>• Customer-specific solutions and services<br>• High responsiveness to customers<br>• Close customer relationships<br>• Great brand image | Differentiation |
| Operational excellence | *Economic* customer advantage<br><br>• High productivity at lowest costs<br>• Superior operational capabilities<br>• High degree of standardization<br>• Optimal process flows without waste<br>• Organizational efficiency, lean management | Cost leadership |

Figure 15: Customer-value and competitive strategies [adapted from 4, 6, 7]

The customer-value disciplines are helpful for reflecting what type of value customers currently perceive from an enterprise's products relative to the products of its competitors. An enterprise can set different priorities for the value disciplines and adapt its resources, capabilities, and assets accordingly, i.e., adjust the business or IT architecture for more value in one or two disciplines.

## Resource-based view

The resource-based view (RBV) represents an inside-out approach to strategic planning that is dominant in IT management science but has barely been applied in practice. It is useful to comprehend an enterprise's internal strengths and their importance relative to competitors and develop appropriate strategic goals.

The RBV says that an enterprise achieves sustainable competitive advantage and superior performance if it possesses valuable and rare *resources, capabilities*, and *assets* (e.g., knowledge, experiences, relationships, production technologies, processes, and patents) that are hard to copy, hard to imitate, or hard to substitute by competitors.

*Resources* can be acquired on the market. For example, skilled human resources (e.g., experts and managers) can be employed or contracted on labor marketplaces. Physical resources, such as manufacturing facilities and engines, can be purchased or leased. Office buildings can be constructed or rented.

An enterprise's *capabilities* are linked activities that resources provide in efficient and organized ways for delivering a differentiated product. *Resources* are skilled human resources and physical objects that are used for production. Capabilities can be compared to the primary and support activities of the generic value chain from Porter [5], e.g., research, product development, procurement, operations, marketing, sales, IT services, and the associated management functions.

In contrast to resources, capabilities cannot be simply obtained on the market. They are unique and immanent to an enterprise and must be developed internally, which takes considerable time and money. Alternatively, strategic alliances, mergers, and acquisitions allow fast integration and the use of capabilities that other enterprises have already built. Strategic partnerships enable value co-creation.

*Assets* can be tangible or intangible. Tangible assets are either physical resources needed for production (e.g., buildings, machines, hardware) or inputs to production (e.g., raw materials, supplied components). Intangible assets are protected intellectual properties (e.g., patents, copyrights, trademarks, confidential documents, software) and organizational assets (e.g., brand image, high-quality reputation, customer loyalty). All types of assets can be monetarily valued and entered on balance sheets. Some intangible assets (e.g., intellectual property rights, software applications) can be gained through licensing models.

The *dynamic capabilities* theory advances the RBV for flexible reconfigurations of resources, capabilities, and assets in relation to conditions that can be analyzed from an

industry perspective.

**Macro-environment (PESTEL)**

PESTEL, i.e., political, economic, socio-cultural, technological, environmental, and legal factors, denote macro-environmental forces that can impact an enterprise's business architecture, competitive conditions (Porter's five forces), and/or customers' requirements.

PESTEL analysis helps recognize tendencies and movements in the broader environment to prepare for and respond to them faster than an enterprise's competitors.

Examples of PESTEL factors:

Political factors

- Government stability
- Tax rate
- Subsidies

Economic factors

- Availability and costs of skilled workers
- Availability and cost of energy
- Economic growth rates, inflation, and disposable income
- Interest rates, exchange rates, and money supply

Socio-cultural factors

- Population demographics and income distribution
- Lifestyle changes
- Attitudes toward work and leisure
- Consumerism

Technological factors

- New discoveries, emerging technologies
- Digitalization, artificial intelligence
- Network infrastructure
- Speed of technology transfer

Environmental factors

- Environmental protection culture and policies
- Sustainability
- Climate and the risk of natural disasters

Legal factors

- Trade regulations and duties
- Data protection policies
- Employment laws

**SWOT**

The SWOT framework (strengths, weaknesses, opportunities, and threats) links internal and external views. Strengths and weaknesses refer to the analyses of internal resources, capabilities, and assets (i.e., the business/IT architecture); opportunities and threats designate evaluations of external factors (e.g., supplier power, competitor power, substitution risks, partners, and customers' needs).

SWOT is useful to understand the current internal and external situation of an enterprise (as-is). The strengths and weaknesses of the current business/IT architecture can be identified by comparing it to competitors' current business/IT architectures or by conducting gap analyses.

SWOT helps enterprises' strategists define strategic goals and find suitable target business architectures. The target business architecture should match external opportunities.

## A combined strategy framework

IT strategic planning is a spanning capability between internal and external processes for creating value and achieving competitive advantage. An IT strategy connects inside (e.g., business and IT architectures) and outside (e.g., new technologies, partnerships) processes.

Two considerations should be brought into an optimal equilibrium:

- Outside-in: what an enterprise might do regarding the chances and risks in the environment, including customer needs, market aspects, and the macro-environment.

- Inside-out: what an enterprise can do regarding its resources, capabilities, and assets, i.e., its current business architecture.

Strategic target positioning must balance both outside-in and inside-out considerations. The suggested framework combines concepts from dominant strategy views and tools. It integrates the resource-based view (RBV), the customer-based view (CBV), the competitive strategies, and the five forces from Michael Porter, PESTEL, and SWOT. These views and tools complement each other and are interconnected. Together, they provide a holistic framework for strategic analysis (Figure 16).
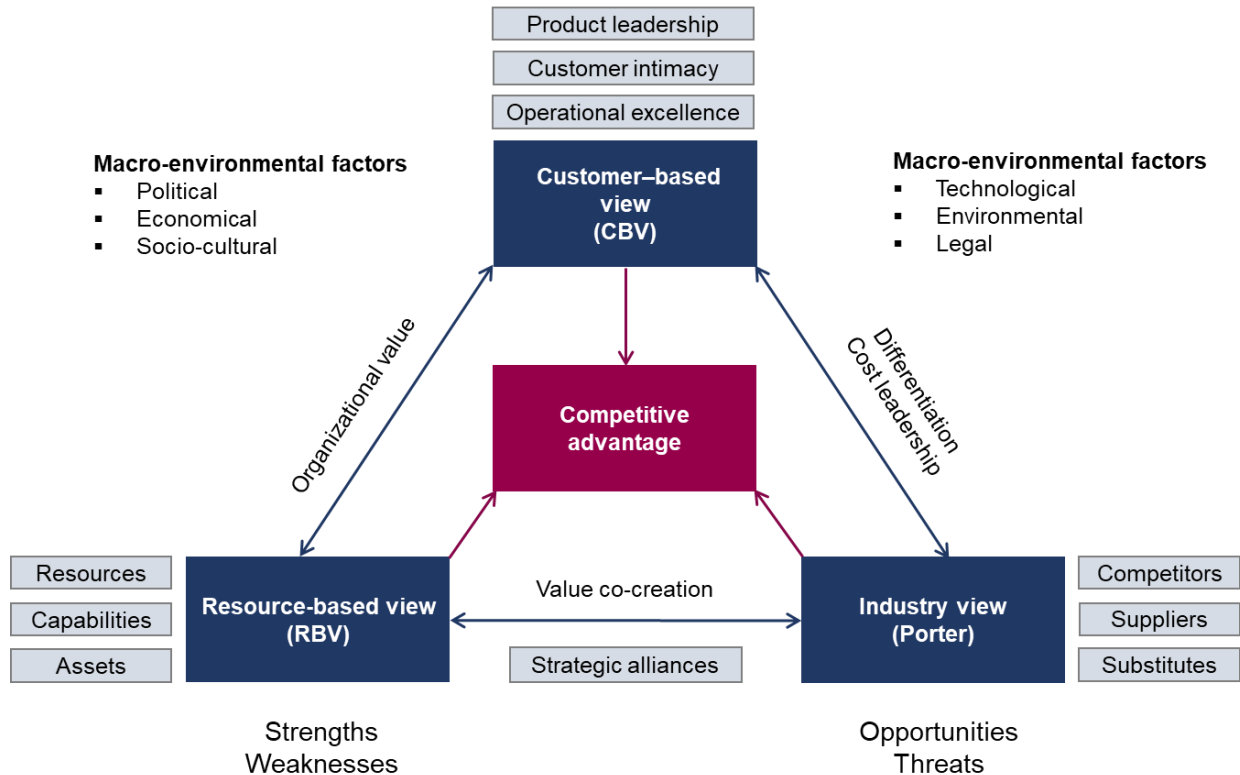
Figure 16: A holistic strategy framework of combined views

## Balanced scorecard

The balanced scorecard (BSC) from Kaplan and Norton (1992) is a management tool regarding the enterprise's power from both monetary and non-monetary views (Figure 17). Beyond the financial perspective, the BSC includes views on customers, internal processes, and organizational learning. The BSC is beneficial for defining and monitoring business goals with related metrics. These metrics can be designated as *key performance indicators* (KPI). The BSC can be combined with *critical success factor* (CSF) analysis or the concept of *objectives and key results* (OKR).

The BSC has raised attention in the field of strategic management and is used alongside other strategy tools. However, the BSC tool is limited for strategic analysis because it does not include competitive influences and macro-environmental factors.



Figure 17: The balanced scorecard [derived from Kaplan and Norton, 1992]

## APPENDIX B: THE DIGITAL ARCHITECTURE MODEL

### Digital architecture significance

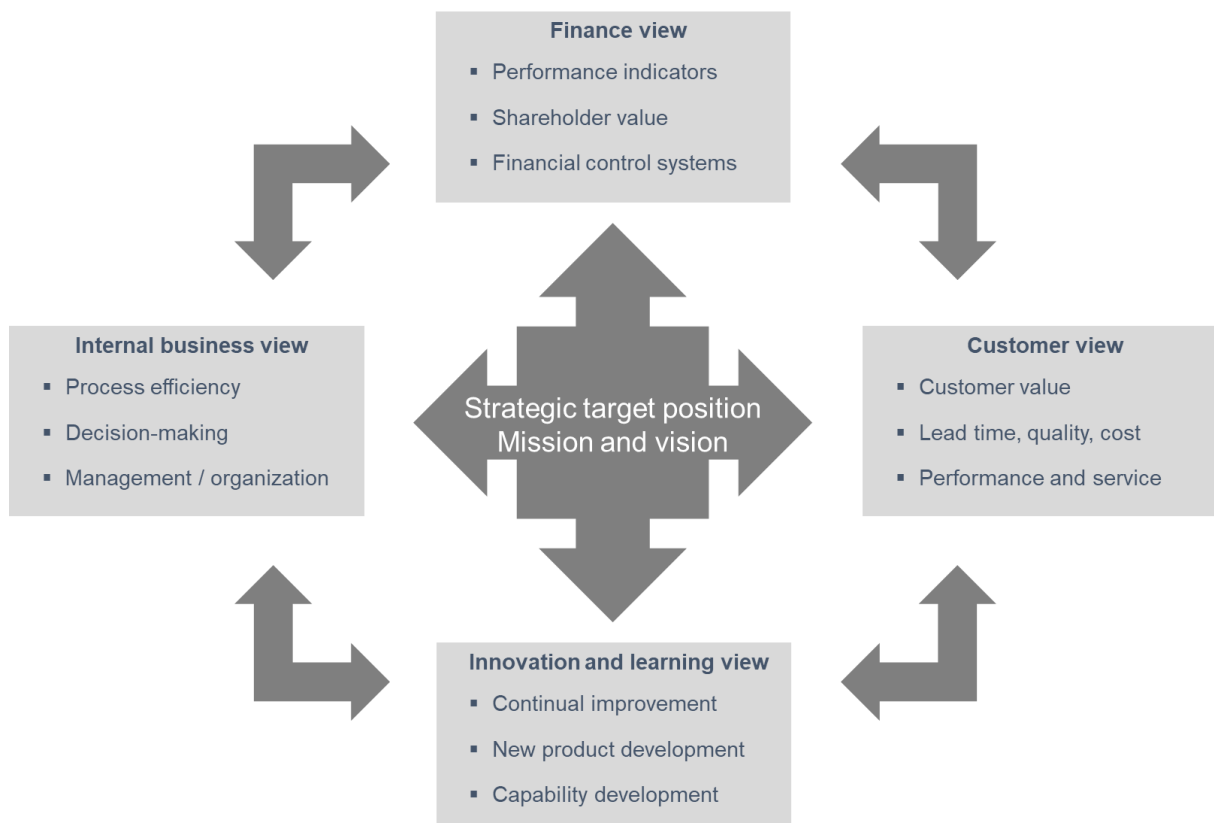The digitization of the physical world enables and extends business strategies, with immense implications for diverse industries. Digitization influences established business models and changes the rules of competition. There is a strong awareness of the importance of digitization in every industry. However, it is still unclear how the so-called digital transformation of companies should be implemented and how digital architectures differ from conventional IT environments. This appendix describes a model that shows the essential components of digital architectures and their relationships. This model helps understand the connections and structures required for the digital transformation.

### Digital architecture definition

Digital architectures of enterprises are IT structures in which innovative digital components are used that emulate human abilities such as feeling, learning, thinking, and decision-making. In digital architectures, data is generated from the physical world, transported over various networks, and stored in repositories as needed. The digital raw data is converted into applicable information that is integrated into business processes to add business value.

Conventional IT architectures concern essential enterprise IT infrastructures (e.g., workplaces, LAN, WAN, WLAN, data centers) and IT applications (e.g., office communication, ERP, SCM, CRM, e-commerce). Digital architectures complement and extend classic IT architectures. Both traditional IT architectures and digital architectures must align with the business strategy and are intended to increase business value and enterprise performance.

Attributes of digitization and digital architectures are

- data generation by users, data collection from sensor-equipped things, user devices, and servers,
- data transport via access and backbone networks using advanced technologies,
- data processing in real-time and/or use of storage data, either structured (databases) or unstructured (big data),
- data processing by using human-imitating technologies (machine learning, artificial intelligence), and
- the use of gained information in business processes to realize business value.

These characteristics are displayed in The Digital Architecture Model (Figure 18).

## The Digital Architecture Model

The Digital Architecture Model aims to extend our understanding of digital value creation. It presents the relationships between the key concepts of digitization in the business context. The four structural components of a digital architecture—data sources, networks/clouds, artificial intelligence, and business processes—and the intended value creation are described in the following paragraphs.
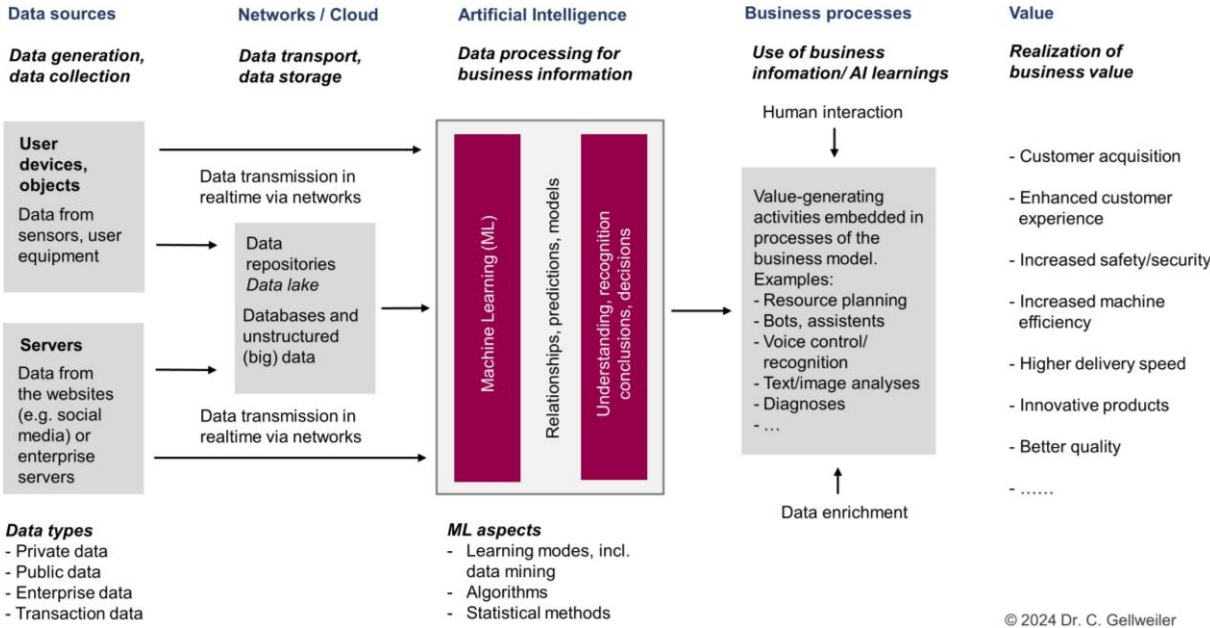


Figure 18: Value through digitization: The Digital Architecture Model

## Data sources

Major categories of data sources are user devices, sensor-equipped objects, and servers for both private and business purposes. Digital devices provide artificial abilities to see, hear, locate, touch, feel, taste, smell, and move; they send significant data via networks for evaluation and application in business processes.

User devices are communication and computing equipment from private users or employees, such as smartphones, notebooks, desktop PCs, or workstations. Connected peripherals with sensors, e.g., smartwatches, can gather sensitive personal data (e.g., health status) generated by users. Very small, intelligent, embedded systems can be integrated into connected tools or other user objects (e.g., glasses).

Sensor-equipped endpoints collect data from natural and man-made objects (i.e., the 'Internet of Things'): living beings (people, animals, plants), vehicles (cars, bicycles, scooters), buildings (offices, factories, private houses), household appliances, and industrial machines (Industry 4.0).

Various types of data can continuously be collected from endpoints: audio (through microphones), video (through cameras), GPS data (geographical location, altitude, time, speed), and physical data through sensors (e.g., temperature, barometric pressure, humidity, brightness, chemical data of substances). In addition, tracking tools on user devices (e.g., cookies) help collect data about users and their behavior.

The other category of data sources is servers. These can be public web servers connected to the Internet or enterprise servers in secure environments and encrypted networks (e.g., demilitarized zones). Servers can be operated by private individuals, companies, government agencies, or other organizations. Data from public servers (e.g., social media, private websites, company pages, e-shops) can be retrieved by internet bots that simulate human interaction with the websites for analytics purposes. Web crawlers collect data from websites and index them to make their content accessible.

The enterprise servers contain sensitive data for all kinds of business functions. These data are stored on application servers or central databases. The company's managers decide what types of data are collected and processed.

## Networks and cloud storage

Networks are the transport systems for digital data. They link data sources and systems for data analysis (machine learning, artificial intelligence) and use (business applications). Networks move digital data streams between data sources, databases, and application servers, independent of time and place.

Networks are divided into access and backbone networks. Access networks (e.g., 4G/5G Radio Access, LAN, WLAN) bridge data sources to the backbone networks (the public internet or private networks, for example: MPLS WAN, site-to-site VPN). Networks also include short-distance wireless communication systems between user devices, e.g., RFID, NFC, Bluetooth, and ultrasonic.

Networks allow digital data to be transmitted and processed in real time. If real-time data processing is not required or not possible, unstructured raw data is stored for later analysis in voluminous data stores, so-called data lakes (big data). Data storage can also be structured databases (e.g., a data warehouse). The data is stored in company-managed data centers (private cloud) or at service providers (public cloud).

## Artificial intelligence

Artificial intelligence (AI) is the centerpiece of a digital architecture. AI gives meaning to the raw data collected. AI translates data from various sources into information that is valuable to the business.

AI strives to replace human cognitive abilities such as learning, thinking, and decision-making. The integration of AI with artificial sense organs (e.g., cameras or sensors) and human movement forms the basis of robots, i.e., simulated humans.

Machine learning (ML) is part of AI and is used to analyze patterns and relationships in data sets. The goal is to learn from experience and improve prediction accuracy over time through the use of models and algorithms. Data mining refers to ML learning methods for examining unstructured data sets, e.g., using regression analysis or clustering. Based on the ML results, alternative solutions can be suggested and/or decisions can be made that affect business activities.

## Business processes

The information obtained through AI can be used for primary or supporting activities of the generic value chain [5] to optimize various business functions (e.g., engineering, production, marketing, and service). This business information may cause changes in product features, distribution, communication, pricing, etc. Business models can be changed in whole or in part through the use of digital technologies. Examples of use cases are chatbots in customer communication, personalization in sales, or automation in production. When changing business models and processes due to digitization, however, the focus must always be on value creation. The goal remains to increase customer benefits through products and services and thus improve profitability and competitive position.

## Value generation

The effective use of digital data increases the value of the enterprise (e.g., decision-making, process efficiency, supply chain optimization, understanding of customer needs and buying behavior, new marketing channels). Customer value results from advanced product or service quality and easy purchase and delivery processing. Further, the effective integration of digital data into business processes leads to enhanced shopping experiences, e.g., tailor-made offers, simplified product searches, secure and fast payments, or additional services. Customers thus perceive economic, functional, or psychological advantages.

Enterprises that neglect digitization today are likely to lose market share and risk disappearing entirely from the markets. On the other hand, companies that create new customer benefits with digital architectures can use it to expand their competitive advantage. An enterprise achieves a sustainable competitive advantage when its digital architecture is unique and difficult to imitate. In addition, the resulting products and services must generate more customer benefits than those of the competition.

## APPENDIX C: CONNECTIONS TO OTHER IT FRAMEWORKS AND STANDARDS

### Overview

There are various frameworks, standards, and best practices available for IT management. These provide guidance on specific subsections of IT management (e.g., project management, enterprise architecture) or provide overall, integrative views (e.g., COBIT, ITIL). The IT Alignment Guide is compatible with other pertinent standards and frameworks. The compatibility of the IT Alignment Guide means that it does not repeat the contents of other standards; it is complementary and not in contradiction to other frameworks. Statements might be equal in meaning; definitions of terms may vary.

The IT Alignment Guide inserts into the following frameworks, expands the strategic view, and adds an integrative IT value perspective:

- The Standard for Portfolio Management (PMI, 2017), 4th edition, approved by the ANSI;
- Project Management Body of Knowledge (PMBOK Guide, 6th edition, PMI, 2017), including the Standard for Project Management accredited by the ANSI;
- COBIT 2019 (ISACA, 2018);
- The TOGAF standard V9.2 (The Open Group, 2018);
- ITIL 4 (Axelos, 2019);
- IT4IT Standard V.3.0 (The Open Group, 2022);

### ITIL 4

ITIL 4 is a framework for IT service management. The update from version 3 to 4 included strategy management, architecture management, and portfolio management in the collection of ITIL management practices. ITIL 4 emphasizes the importance of IT value by presenting the service value system and the service value chain. ITIL 4 shows the contributions of each management practice to the service value chain by using heat maps.

However, the ITIL management practices of strategy management, architecture management, and portfolio management are insufficiently connected in ITIL 4. Strategic IT alignment is still a gap in ITIL 4. Further, although IT value is regarded as a central concept, its definition is imprecise. Also, the concept of performance remains vague. Competitive advantage has not been regarded at all.

The IT Alignment Guide extends the understanding of IT value, particularly in context with performance and competitive advantage. The IT Alignment Guide shows in detail the relationships and processes between the three management practices described in ITIL 4, namely, strategy management, architecture management, and portfolio management.

**COBIT 2019**

Control Objectives for Information and Related Technologies (COBIT) from ISACA is a framework for the management and governance of enterprise IT. COBIT 2019 describes goals, processes, structures, policies, skills, and more for IT governance.

COBIT 2019 defined two management areas, five domains, 33 roles, 41 objectives, and 1202 activities allocated to 230 practices.

COBIT 2019 has defined a set of enterprise goals (EG) related to the balanced scorecard (BSC) dimensions to realize business strategies. The IT Alignment Guide helps achieve the following enterprise goals from COBIT:

BSC dimension *financial*

- EG 01: Portfolio of competitive products and services

BSC dimension *customer*

- EG 05: Customer-oriented service culture

BSC dimension *growth*

- EG 11: Managed digital transformation programs
- EG 13: Product and business innovation

Further, COBIT 2019 presents *alignment goals* (AG) to meet the business objectives. The IT Alignment Guide helps achieve the following alignment goals:

- AG 03: Realized benefits from I&T-enabled investments and services portfolio
- AG 05: Delivery of I&T services in line with business requirements
- AG 06: Agility to turn business requirements into operational solutions
- AG 08: Enabling and supporting business processes by integrating applications and technology

From the COBIT core model, the following governance and management objectives are addressed in the IT Alignment Guide:

EDM – Evaluate, direct, and monitor

- EDM 02: Ensured benefits delivery
- EDM 04: Ensured resource optimization

APO – Align, plan, and organize

- APO 01: Managed I&T management framework
- APO 02: Managed strategy
- APO 03: Managed enterprise architecture
- APO 04: Managed innovation

- APO 05: Managed portfolio
- APO 06: Managed budget and costs

BAI - Build, acquire, and implement

- BAI 01: Managed programs
- BAI 02: Manage requirements definition
- BAI 03: Managed solutions identification and build
- BAI 11: Managed projects

In COBIT 2019, it is not clear how PPM is involved in APO 03 and how EAM is engaged in APO 05. That is, collaboration between PPM and EAM seems underrated.

## IT4IT

The standard IT4IT from The Open Group in its current version 3.0 presents seven value streams: *evaluate, explore, integrate, deploy, release, consume*, and *operate.* Evaluate can be considered a strategic planning practice, whereas the latter five value streams concentrate on tactical and operational topics. *Explore* can be viewed as a transitional stage between strategic and tactical planning.

*Evaluate* includes the alignment of strategic business and technology goals. The primary stakeholder in the evaluation is the portfolio manager. Among other stakeholders, enterprise architects are pertinent to evaluating and exploring value streams.

The value streams 'evaluate' and 'explore' use functional components from the IT4IT 'plan' functions as part of 'strategy to portfolio'. The main outputs are the final architecture roadmap, resource needs, and allocated budgets.

The IT Alignment Guide is similar to IT4IT regarding the outputs and main stakeholders of strategic planning aligned with the business. However, the IT Alignment Guide underlines the importance of EAM and PPM practices and their collaboration.

## The Standard for Portfolio Management

The functions, tasks, and goals of PPM as presented in the Standard for Portfolio Management from PMI are fully compliant with those of the IT Alignment Guide. PMI also emphasizes value creation as the primary focus of PPM and the need to constantly align with the organizational strategy to meet strategic objectives and cope with dynamic influences. However, the PMI framework has some shortcomings. First, it does not show ways to align IT with business strategies. Second, it does not present relationships to enterprise architecture (except that the stakeholder role of the architects exists and that it can be partially taken by portfolio managers). Third, it does not consider IT as a strategy or an enterprise function; it provides only generic views. The IT Alignment Guide mitigates these weaknesses.

## TOGAF

The Open Group Architecture Framework (TOGAF) from The Open Group (2018) is the most widely used and best-known framework for IT architecture (version 9.2). It categorizes IT architects with different responsibilities for design and documentation (The Open Group, 2018, pp. 473–474). The IT Alignment Guide is in line with the TOGAF architect definitions. Enterprise architects need to understand business and customer requirements for translation into IT architecture specifications. Enterprise architects guide solution architects, who concentrate on products, components, systems, and technologies for a subject matter, for example, security, data management, or networks.

TOGAF identified the links of EAM and PPM to strategic business planning and to the tactical project/solution level (The Open Group, 2018, p. 62). It also depicts a link between EAM and PPM ('structured direction'). Thus, TOGAF recognized the links between the three alignment processes but has not provided more information about them.

The 'Architecture Vision' of TOGAF corresponds to the strategic target position of the IT Alignment Guide. The definition of 'business architecture' is the same in TOGAF and the IT Alignment Guide. However, the latter distinguishes between the current business architecture (as-is) and the target business architecture (to-be).

TOGAF 9.2 lacks value and customer orientation, as well as relatedness to project portfolio management (PPM). TOGAF 10, released in 2022, still underrates the PPM practice. It perceives more governance of projects by PPM ('responsibility for management and oversight of strategic initiatives').


## Project management

The IT Alignment Guide fits to any framework for project management (e.g., PMBOK Guide, Prince2, Scrum) and to any approach (predictive, agile, hybrid). Projects are important means to implement strategies. So, the results from IT alignment are critical inputs to project initiation and planning.

## Business analysis

According to the Business Analysis Body of Knowledge (BABOK Guide; IIBA, 2015), business analysts conduct feasibility studies and analyze the costs and benefits of new products and projects. Strategy analysis as part of business analysis provides context for requirements analysis and product design. Business analysts verify the strategic compatibility of projects before or during the project initiation phase. They can be involved in the project selection and prioritization processes of EAM (feasibility studies) and/or PPM (business value analysis).

The focus of business analysts is on systems, solutions, and value generation at the tactical level (PMI Guide to Business Analysis, p. 308; ITIL 4 Foundation, pp. 114–116). Business analysts are not part of business strategy formulation.

## GLOSSARY

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| Analysis and project selection | The IT alignment phase in which project proposals are analyzed, scored, and selected or discarded. |
| Business architecture | All elements and interactions of an enterprise's value chain, including external relationships to stakeholders that contribute to value creation. It includes an enterprise's resources, capabilities, assets, and management practices. |
| Business as-is | The current business architecture of an enterprise. |
| Business goals | Business goals are derived from the mission/vision statements and represent milestones for the strategic target position. The strategy management practice is responsible for defining the business goals. |
| Business-IT alignment | The IT alignment process between SM and EAM involves reviewing the IT strategy and updating the IT goals and limitations. |
| Business limitations | Constraints on financial budgets, resources, and capabilities. Further, risks and dependencies are business limitations. |
| Business model | A rough description or an abstract of a business architecture. |
| Business project | An initiative to implement strategic business goals through a temporary organizational structure that delivers unique products of value (goods, services, results, or combinations of these). |
| Business-project alignment | The IT alignment process between SM and PPM involves reviewing the business strategy and updating the business goals and limitations. |
| Business strategy | An enterprise's long-term plan to grow and improve its performance. This plan includes a portfolio of projects within a time frame of up to five years to move from the current competitive position to the target position. |

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| Business strategy review | An IT alignment event: a quarterly or on-demand meeting with SM and PPM to verify business goals and limitations and update them as needed. |
| Business to-be | The target business architecture of an enterprise. |
| Capabilities | Linked activities or bundles of them that (human) resources provide to deliver value. Capabilities must be developed internally or acquired from external organizations. |
| CBV | A theoretical strategy perspective that concentrates on value perceived by customers (customer-based view). |
| Competitive advantage | A state of superior performance in which an enterprise creates more customer value than competitors. |
| Competitive position | The place of an enterprise in a competitive environment, which is defined by customer value creation, competitive advantage, and performance. |
| Competitive threats | Two of the five forces in Porter's analytical framework concern rivalry amongst existing competitors and the threats of new entrants. |
| Cost leadership | A generic strategy suggested by Porter that focuses on low-cost production. It corresponds to the customer-value discipline 'operational excellence'. |
| Customer intimacy | One of the three customer-value disciplines from Treacy and Wiersema, which stresses high customer orientation and close relationships. |
| Customer power | One of the five forces in Porter's analytical framework concerning the bargaining power of customers. |
| Customer value | The product price paid by the customer plus the intangible value that is created ('consumer surplus'). |
| Customer-value disciplines | A recognized general typology for customer value that has been suggested by Treacy and Wiersema. |
| Deliverable | A verifiable project outcome that meets at least one project requirement. |

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| Demand | A request from internal stakeholders founded on business or technology requirements to change a product, process, or system. |
| Differentiation | A generic strategy suggested by Porter that focuses on distinctive, high-value products. It corresponds to the customer-value disciplines 'product leadership' and 'customer intimacy'. |
| Digital architecture model | A visual presentation of essential components of digital architectures and their relationships. It helps understand the structures required for the digital transformation. |
| Enhanced skills and capabilities | One of four types of organizational value from IT investments. |
| Enterprise | An organization that strives to achieve profits from selling its products. Synonyms: firm, business, company, corporation. Enterprises can be of any size. |
| Enterprise architecture management | The management practice that is responsible for IT strategy and related alignment processes. It manages the standards, policies, processes, and content of the IT architecture. |
| Enterprise performance | A measurable numerical economic indicator of an enterprise that can be presented in various financial terms (e.g., profits, returns on sales, returns on investments, net present value, payback period). |
| Five forces | A strategy framework from Michael Porter (1980) for analyzing forces that impact the industry in which the enterprise acts (industry view). |
| Flexibility and agility | One of the four types of organizational value that comes from IT investments. |
| Generic strategies | Strategic ways suggested by Porter to achieve competitive advantage. |
| Governance | Guiding an organizational unit within an enterprise using formal and personal power, including control of goal achievement and decision-making. |

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| Idea | A thought or suggestion that can be converted into a project proposal. |
| Innovation | The IT alignment phase, in which new ideas are posted and business chances are checked. |
| Intangible assets | Protected intellectual properties (e.g., patents, copyrights, trademarks, confidential documents, software) and/or organizational assets (e.g., tacit intellectual assets, reputation, loyalty). |
| IT alignment | A capability of IT strategic planning for consistency of business and IT strategies. |
| IT alignment artifacts | Documents used to manage the IT alignment processes and present the alignment results. |
| IT alignment events | A set of four structured meetings among IT alignment management practices to ensure alignment and update artifacts. |
| IT alignment management practices | Management practices that are relevant for IT alignment are strategy management, project portfolio management, and enterprise architecture management. |
| IT alignment phases | There are four phases in which useful ideas are converted into project proposals and then evaluated, prioritized, and, if the result is positive, scheduled on the roadmap. |
| IT alignment processes | A set of three processes that ensure communication between SM, PPM, and EAM to achieve and sustain IT alignment. |
| IT architecture | A structure of connected IT components and other elements to coherent systems in accordance with the resources and capabilities of an enterprise. Examples of IT components are software, data, hardware, services, processes, procedures, facilities, materials, and skilled human resources. |
| IT as-is | The current IT architecture of an enterprise. |

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| IT goals | IT goals must be aligned with business goals and support the way to the strategic target position. The enterprise architecture management practice is responsible for defining IT goals.<br>The strategy management practice reviews IT goals. |
| IT limitations | IT limitations refer to the features of 'IT as-is', i.e., technical conditions and dependencies that hinder or constrain the course of actions to move to 'IT to-be'. |
| IT planning | A rational, cognitive, and structured process in view of the tasks needed to accomplish the IT goals within the limitations, including requirements, deliverables, dependencies, preconditions, resources, risks, times, and costs. |
| IT project | An initiative to implement strategic business goals through a temporary organizational structure that delivers unique IT products of value (systems, services, results, or combinations of these). |
| IT-project alignment | The IT alignment process between PPM and EAM includes checks of project dependencies and roadmapping. |
| IT strategic planning | A rational, cognitive, and structured process in view of the actions needed to accomplish long-term IT goals within the limitations, including requirements, deliverables, dependencies, preconditions, resources, risks, times, and costs. |
| IT strategy | A long-term plan for an enterprise's IT architecture that is aligned with the business strategy. This plan includes a set of IT projects within a timeframe of up to five years to realize the target IT architecture. |
| IT strategy review | An IT alignment event: a quarterly or as requested meeting with SM and EAM to verify the IT goals and limitations and update them as needed. |
| IT tactical planning | A rational cognitive and structured process in view of the tasks needed to accomplish the IT project goals within the limitations, including requirements, deliverables, |

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|  | dependencies, preconditions, resources, risks, times, and costs. |
| IT to-be | The target IT architecture of an enterprise. |
| IT value | Non-monetary organizational value plus monetary customer value from using and providing IT products. |
| IT value model | A model illustrating the direct and indirect effects of IT investments on enterprise performance. |
| Macro-environmental factors | Circumstances and conditions outside the enterprise and the industry that can impact the business. |
| Management practices | Areas within an enterprise that organize people and tasks towards specific objectives. |
| Mission statement | A description of the enterprise's current or short-term competitive position, including value delivery. |
| Operation excellence | One of the three customer-value disciplines from Treacy and Wiersema, which underlines high process efficiency and low-cost production. |
| Opportunities | Part of SWOT analysis: business chances from external conditions and trends (markets, new technologies, suppliers, etc.). |
| Organizational value | Non-monetary value from IT investments and precondition to generating customer value. |
| Perspective | Considerations, perceptions, and opinions that form a particular standpoint. Synonym: view. |
| PESTEL | A strategy framework for analyzing the macro-environment (politics, economics, society, technology, environment, legal) that can influence markets, customers, alliances, and/or internal structures. |
| Priorities | An indicator of importance and urgency is assigned to a selected project before it is scheduled on the roadmap. |

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| Product | A good, a service, an outcome, or a combination of these is offered by enterprises to customers. |
| Product leadership | One of the three customer-value disciplines from Treacy and Wiersema that emphasizes innovative products and high product quality. |
| Project portfolio management | The IT alignment management practice maximizes value from the total investment budget. It allocates budgets and resources to projects and monitors them. |
| Project prioritization and roadmapping | The IT alignment phase, in which selected project proposals are prioritized and placed on the roadmap. |
| Project proposal | A structured document based on an idea or demand that is further processed in three IT alignment phases. |
| Project proposal creation | The IT alignment phase, in which project proposals are formulated based on substantial inputs from ideas, demands, and needs. |
| Project selection session | An IT alignment event: a monthly or bimonthly meeting with SM, PPM, and EAM to select analyzed project proposals. |
| Project sequencing | The process of taking projects in the timely order in which they will be performed. |
| RBV | A theoretical strategy perspective that concentrates on an enterprise's internal resources and capabilities to achieve competitive advantage. |
| Resources | Physical objects used for production (e.g., plants, equipment, raw materials) or skilled human resources of an enterprise (e.g., employees, contractors). |
| Roadmap | A visual presentation of all business and IT projects for which start and endpoints are planned on a timescale. The roadmap is the sole source of truth for strategy implementation. |
| Roadmap items | Business and IT projects (closed, running, or not started yet) are on presented on a roadmap. |

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| Roadmapping session | An IT alignment event. A monthly meeting with PPM and EAM to discuss the priorities of selected projects, identify interdependencies, and find the best project placement on the roadmap. |
| Score | A numeric indicator of an evaluated project proposal that has been computed based on a scoring model. The score helps select and prioritize projects. |
| Scoring model | Scoring models with main categories, sub-categories, weighting factors, and coded scales can be applied in the phase 'analysis and project selection' for the evaluation of project proposals. |
| Strategic alliances and supplier relationships | One of the four types of organizational value that comes from IT investments. |
| Strategic planning and decision-making | One of the four types of organizational value that comes from IT investments. |
| Strategy management | The IT alignment management practice is responsible for strategy formulation, including analysis, positioning, and decision-making. |
| Strengths | Part of SWOT-analysis: strengths of enterprise-internal resources, capabilities, and assets. |
| Substitutes | One of the five forces in Porter's analytical framework concerns the threat of substitute products. |
| Supplier power | One of the five forces in Porter's analytical framework concerns the bargaining power of suppliers. |
| SWOT | A strategy framework for analyzing enterprise-internal strengths and weaknesses as well as external opportunities and threats. |
| Target position | An enterprise's intended future place in its competitive environment with the strategic goals of providing greater customer value, expanding competitive advantage, and delivering higher performance. |

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| Threats | Part of SWOT analysis: threats from external conditions and trends (substitute products, new entrants, high supplier power, etc.). |
| Value | Monetary and intangible benefits from delivering products. Synonym: benefit. |
| Value proposition | A brief description of why customers choose the enterprise's products or services instead of its competitors ones. |
| View | Considerations, perceptions, and opinions that form a particular standpoint. Synonym: perspective. |
| Vision statement | A description of the enterprise's target position, including value delivery. |
| Weaknesses | Part of SWOT analysis: weaknesses of enterprise-internal resources, capabilities, and assets. |

## ACRONYMS

| | |
|---|---|
| AG | Alignment Goals |
| AI | Artificial Intelligence |
| ANSI | American National Standards Institute |
| APO | Align, Plan, Organize |
| BABOK | Business Analysis Body of Knowledge |
| BAI | Build, Acquire, Implement |
| BITA | Business-IT Alignment |
| BSC | Balanced Scorecard |
| CA | Competitive Advantage |
| CBV | Customer-Based View |
| COBIT | Control Objectives for Information and Related Technologies |
| CRM | Customer Relationship Management |
| CSF | Critical Success Factors |
| EAM | Enterprise Architecture Management |
| EDM | Evaluate, Direct, Monitor |
| EG | Enterprise Goals |
| ERP | Enterprise Resource Planning |
| IIBA | International Institute of Business Analysis |
| ISACA | Information Systems Audit and Control Association |
| IT | Information Technology |
| ITBA | IT-Business Alignment |
| ITIL | IT Infrastructure Library |
| KPI | Key Performance Indicators |
| LAN | Local Area Network |
| ML | Machine Learning |
| MPLS | Multiprotocol Label Switching |
| OKR | Objectives and Key Results |
| PC | Personal Computer |
| PESTEL | Political, Economic, Social, Technological, Environmental, and Legal Factors |
| PMBOK | Project Management Body of Knowledge |
| PMI | Project Management Institute |
| PPM | Project Portfolio Management |
| RBV | Resource-Based View |
| RFID | Radio-Frequency Identification |
| SCM | Supply Chain Management |
| SM | Strategy Management |
| SWOT | Strengths, Weaknesses, Opportunities, Threats |
| TOGAF | The Open Group Architecture Framework |
| VPN | Virtual Private Network |

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| WAN | Wide Area Network |
| WLAN | Wireless Local Area Network |
| 4G/5G | 4th/5th Generation Mobile Networks |

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# END NOTES

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