

# Seven principles for managing IT solutions from a provider's perspective

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# Seven principles for managing IT solutions from a provider's perspective

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## ABSTRACT

*IT solutions are a way to differentiate between competitors and to meet new customer expectations. For organizations transforming into IT solution providers, it is still unclear how to manage IT solutions. Based on literature on IT solutions and a multiple case study, we derive seven principles for managing IT solutions from the provider's perspective. Main principles include that IT solution providers should have a modularized offering portfolio in place to ensure cost-efficient IT solution delivery for each customer and that IT solution providers should learn from each customer engagement to attune their offering portfolio constantly to market needs. As a result from our management principles, we argue that becoming an IT solution provider requires more effort than just changing the offering portfolio to include service.*

## Keywords

IT solutions, management principles, IT alignment framework

## INTRODUCTION

To differentiate themselves from competitors, software manufacturers are transforming their business models from offering a single product or service to providing solutions (Tuli, Kohli, and Bharadwaj 2007). IT solutions combine hardware, software and service components to fulfill customer-specific needs (Baines, Lightfoot, Evans, et al. 2007). Both the provider and the customer integrate resources, such as knowledge, people, and systems, into the IT solution and cooperate in developing and operating the IT solution throughout the IT solution lifecycle (Herzfeldt, Schermann, and Krcmar 2010). An example of an IT solution is the design, implementation, and operation of an e-commerce application consisting of hardware, software, and service components where the provider integrates a customer legacy system.

The new business model presents challenges for future IT solution providers. On one side, in order to fulfil customer-specific needs, future IT solution providers need to forego the “sell-and-forget” mentality and restructure their organization to account for customer-relational activities (Tuli et al. 2007). On the other side, customers demand low prices for services rendered. IT solution providers, therefore, need to have a cost-efficient IT solution delivery model in place to stay competitive in the IT solution market (Da Rold and Young 2010).

In this paper, we develop principles for managing IT solutions from the perspective of IT solution providers. Management principles serve as guidelines for decisions and actions of managers (Fayol 1970). Our approach to developing management principles is threefold: First, we analyze existing literature on IT solutions to identify solution-specific characteristics and trends in the IT solution market. Second, as many researchers claim that future IT solution providers do not only need to change their portfolio of offers, but also their organization (Baines et al. 2007), we summarize the characteristics of the inter-organizational IT alignment framework which is an extension of the IT alignment framework suggested by Reynolds (2009) and Reynolds, Thorogood, and Yetton (2010). The inter-organizational alignment framework supports a platform-based approach for the cost-efficient delivery of IT solutions. Lastly, we present the results of a multiple case study on IT solution procurements. From these three backgrounds, we have developed seven principles for managing IT solutions from the perspective of the provider.

As research in the IT solution domain is nascent (Baines et al. 2007, Brady, Daview, and Gann 2005), deriving principles for managing IT solutions would represent a major contribution to this field. Among others, we find the following management principles important in our research: First, IT solution providers should have a modularized portfolio in place: modularizing IT solutions ensures cost-efficient delivery for the customer. We find that IT solution providers should learn from each customer engagement and use this knowledge to constantly fine-tune their portfolio to better meet market needs.

The remainder of the paper is organized as follows. In chapter 2, we elaborate on IT solutions, the inter-organizational IT solution framework, and present selected results of our multiple case study. In chapter 3, we present and discuss the seven management principles. We end with a brief summary of opportunities for future research.

## **BACKGROUND**

### **IT solutions**

According to the literature, compared to traditional software or service providers, organizations transforming into IT solution providers face at least six challenges.

First, IT solutions integrate hardware, software, and service components. Customers are not interested in single products or service per se, but in a solution to their problem (Tuli et al. 2007). In fact, the customer is often not particularly interested in how the IT solution provider solves their problem, as long as the solution works. Therefore, an IT solution provider needs to bundle the components in a way that best fulfil the customer's expectations (Tuli et al. 2007). Nonetheless, handling IT solutions is complex because not only should hardware and software integration and service components be considered, but also to be considered are the interfaces and interdependencies among the components and the service-organization.

Second, IT solutions need to be considered over the entire solution lifecycle (Brady et al. 2005). Customers frequently lack resources or do not have the expertise in provisioning and operating the IT solution themselves and rely on the provider for support. Activities during the lifecycle include requirements definition, customization, implementation and integration, as well as deployment and support (Tuli et al. 2007). From the perspective of the provider, these activities are often highly interwoven. For example, a requirements change in later lifecycle activities might require the provider to return to the customization or implementation activity (Herzfeldt et al. 2010).

Third, IT solutions involve a close customer-provider business relationship (Tuli et al. 2007). Both parties integrate resources including knowledge, people, and systems into the IT solution (Lusch, Vargo, and O'Brien 2007). Customers often, for example, require integrating legacy systems. Resource integration requires coordination and control activities from both the provider and the customer. The "sale-and-forget" mentality of some traditional commodity providers is not applicable in the IT solution context (Tuli et al. 2007).

Forth, IT solution providers face strong competition in regard to market trends. With a reported worth of \$820 billion in 2010, the solution market is increasingly attracting more providers (Da Rold and Young 2010). To establish a competitive advantage, researchers recommend reverting to traditional strategies (Porter 1980) such as cost leadership through industrialization or differentiation through individualization. Industrialization includes the automation, relocation, and standardization of service (Karmarkar 2004). Individualization of solutions stresses the importance of customer-relational activities. As competition is fierce and to protect the profit margin, several researchers propose the adoption of a modularization approach which allows providers to offer customer-individual front-end service while industrializing back-end service that is behind the line of visibility for the customer (Böhmman, Langer, and Schermann 2008, Moeller 2008). Back-end service is also often described as industrialized service (Da Rold 2011).

Fifth, customers have high expectations for IT solutions. Often, IT solutions include service that is critical for the strategic or operational processes of the customers, e.g., when providing and operating enterprise resource planning (ERP) or customer relationship management (CRM) systems (Hyötyläinen and Möller 2007). Interestingly, customers are demanding that IT solution providers dramatically lower the rates they charge although IT solutions are oftentimes critical to the success of the customer (Da Rold and Young 2010).

Sixth, authors from both theory and practice (Baines et al. 2007) argue that organizations transforming into IT solutions providers should not only change their portfolio, but also change their entire organization to meet customer-specific business needs. With this in mind, we briefly summarize characteristics for the inter-organizational IT alignment framework in the following sections. .

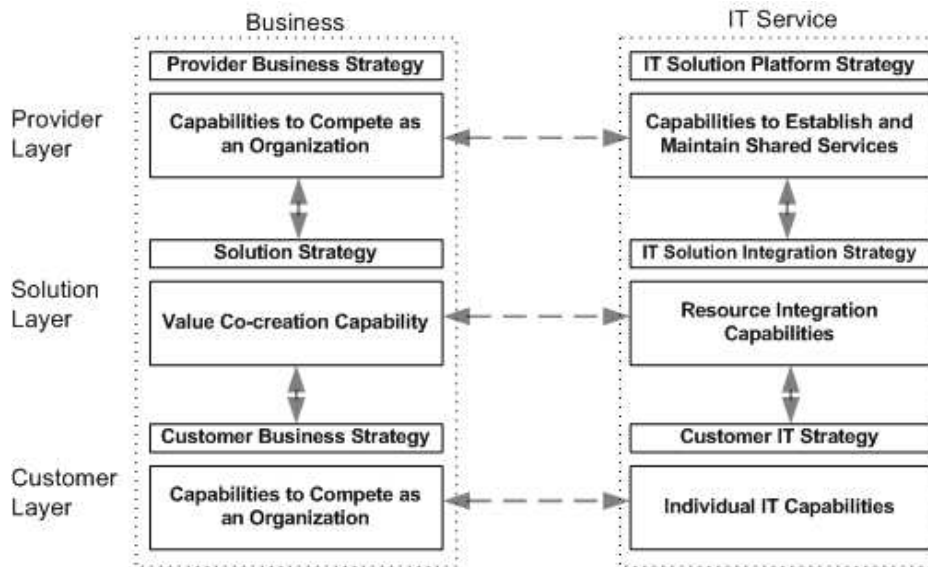
**The inter-organizational IT alignment framework**

The inter-organizational IT alignment framework, which was developed by the authors in the same research project as this paper, is an extension of the IT alignment model by Reynolds et al. (2009; 2010) and suggests an organizational approach to structure the delivery of IT solutions from the perspective of both the provider and the customer (Figure 1). The model consists of three layers: a provider layer, a solution layer, and a customer layer. The provider layer comprises the IT solution provider’s business strategy, which defines the capabilities required to compete in the IT solution market. The business strategy is supported by an IT solution platform strategy that represents the current and future IT assets and IT management and technical skills of the IT solution provider. Similarly, in the customer layer, the customer has a business strategy that defines its capabilities to compete. The customer has an IT strategy that represents current and future IT assets and capabilities. On the newly proposed solution layer, the customer and the IT solution provider co-create value. The solution strategy represents the joint agreement between the IT solution provider and the customer on how the provider’s capabilities support the customer’s business strategy. The IT solution integration strategy represents the desired mix of assets and capabilities, which are then integrated by the provider and the customer to meet the objectives of the solution strategy.

The organizational structure for the IT solution provider remains stable throughout its dealings with customers. For each new customer engagement, the IT solution provider chooses modules from its IT solution platform. A modularization approach, such as the SCORE method (Böhmman et al. 2008), can help IT solution providers to structure their platform. At this step, the provider needs to choose those modules that best support its own business and IT strategies as well as the customer’s business and IT strategies. In times of fierce price competition, choosing the modules is largely determined by cost-efficiency (Da Rold and Young 2010).

The provider needs to stay attuned to customer expectations and learn to dynamically adapt its platform. With each new customer engagement, the provider decides whether the customer engagement was successful or not and whether to transform parts of the customer-specific IT solution into standardized modules. Böhmman et al. (2008), for example, suggest four module types varying in their degree of standardization. The four module types allow the provider to choose the ideal degree of standardization. Modules that are requested by only a few customers can be transferred into semi-standardized modules, while those modules that are frequently requested can be maximally standardized. Based on cost considerations, the provider can identify successful and unsuccessful customer engagements to select modules suitable for standardization.

**Figure 1. Inter-organizational IT Alignment Model**



**Insights from a multiple case study**

In order to better understand the IT solution provision among multiple customers, the authors performed an exploratory multiple case study. The goal of the multiple case study was to find out how procurement processes in the IT solution context are performed and how to address customer expectations and cost-efficiency in the provision of service. A multiple case study was chosen as, according to Benbasat, Goldenstein and Mead (1987), case research in information research is clearly useful when a natural setting and contemporary events are in focus.

### Setting

The case study was carried out in cooperation with a German mid-sized consulting firm, TURBO AG<sup>1</sup>. Participants were three managerial-level employees of the consulting firm with at least ten years of experience. The objects of the research were six procurement processes that took place between 2008 and 2011 for which TURBO acted either as provider or consultant. The procurement processes took place at six customers: two DAX-listed car manufacturers (3 procurements), a European aerospace company, an in-house mid-sized IT solution provider for a bank, and a German public authority (1 procurement each). For purposes of this paper, we focus on two cases, ALPHA (a car manufacturer) and BETA (an in-house IT solution provider for a bank). ALPHA and BETA were chosen as they combine typical aspects of the IT solution delivery commonly found in this situation.

The participants were asked to detail activities typically occurring in their organization when procuring IT solutions. Because there is little guidance from the literature as to how to structure the organization of IT solution providers, and because customers demand low charges for IT services, we present details on the organizational structure of the IT solution providers and how costing was calculated from the perspective of the provider.

Our data stem from twelve semi-structured interviews with the participants. Interviews typically lasted between 60 and 90 minutes. Some of the interviews were recorded and transcribed and the content of others was documented using written notes. TURBO provided us with a variety of documents including service level agreements, a framework contract template, contracts with the customers, bids, annual business reports, an overview of TURBO's sales process, and organizational charts.

### Results from two IT solution engagements

**ALPHA** tendered the installation, integration, and operation of an event management system. ALPHA extracted requirements from an old event management system it had in place and then invited potential providers to tender an offer. The providers submitted their proposals and the project was awarded to the provider with the lowest bid which was TURBO.

With regard to organizational structure, both ALPHA and TURBO had project organizations in place. For the operational phase, ALPHA planned to host the event management software in its own data processing center and purchase maintenance service from TURBO when necessary. TURBO had no special organizational structure in place to capture cost synergies among multiple customers or to revert to industrialized service delivery. One consultant explained that after completion of a project the team records its "lessons learned". There was no comparison, unfortunately, of "lessons learned" for various projects. Costs for service, licenses, and external staff were included in the project proposal. The IT solution provider included a risk premium added for unforeseen risks to the originally calculated costs as a best guess. For the operational phase, ALPHA and the IT solution provider agreed to base costs on time and materials. What was not included in the cost calculation of the IT solution provider were the costs of software licenses for the development environment and the costs to train the IT solution provider's personnel. The consultants stated that transaction costs, such as coordination costs, control costs, and change costs as well as search and information costs and negotiation costs, are not usually charged to the customer. This makes it difficult to determine the net margin per project.

**BETA** had a structured procurement process in place to tender purchase contract management software and maintenance service. BETA first elicited requirements in an "as-is"- and "to-be"-analysis on its own and then elaborated on those requirements with potential providers. Based on the requirements, the potential providers then engineered IT solution concepts and submitted their proposals. Due to the structured process and the low complexity of the procurement, BETA could easily make a comparison of the proposals they received and compare prices in groups, namely, acquisition costs, operating costs and development costs. BETA then chose a suitable provider by making a trade-off between price and features. TURBO acted as a consultant for BETA during the bid and the project phase.

From an organizational point of view, one finds that both BETA and the IT solution provider had set up a project organization. Although the complexity of the tender was relatively low, problems occurred on the customer side during the implementation phase. BETA had several projects in place simultaneously and resources had to be shared across projects. While the cooperation in developing requirements with potential providers led to a successful IT solution, the cooperation during the project phase was more time-intensive than assumed. Further, the provider developed additional customer-individual software features which subsequently increased cost.

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<sup>1</sup> Name changed due to reasons of anonymity.

## SEVEN PRINCIPLES FOR MANAGING IT SOLUTIONS

Principles for managing IT solutions have not yet been suggested in literature.

We suggest that IT solution providers consider hardware, software, and service components and their interfaces and interdependencies simultaneously. Customers are interested in a solution to their problems. Providers, therefore, need to bundle components in a way that best meets customer expectations. We propose “Bundle hardware, software, and service components” as management principle 1.

From our case studies we deduce that the provider needs to have a lifecycle perspective on IT solutions. Customers frequently purchase IT solutions as they lack resources or expertise to provision and operate IT solutions themselves. Therefore, IT solution providers need to support activities during the entire engagement with the customer, e.g., requirements definition, customization, integration, deployment and operations. We propose “Consider the whole IT solution lifecycle” as the second management principle.

Using literature on service-dominant logic (e.g. Lusch et al. 2007), we believe that IT solutions are not a standard product but fulfill customer-specific needs. In IT solutions both the provider and the customer jointly integrate resources including knowledge, people, and systems. Resource integration strongly depends on the capabilities and willingness of the customer to co-operate. IT solution providers, therefore, need to be able to manage customers and to integrate customer and provider resources into the IT solution. Management principle 3: “Manage resource integration”.

Reynolds suggests (Reynolds et al. 2010) that providers do not have to consider each customer engagement as a separate event, but need instead to build a platform-based IT solution delivery architecture. Although IT solutions are almost always customer-specific, they often include standardized modules. A platform-based approach containing the four module types proposed by Böhm et al. (2008) would help to cost-efficiently provide modules that can be implemented by and are appropriate for multiple customers. We suggest the fourth management principle: “Implement platform-based delivery architecture”.

From our research on the inter-organizational IT alignment framework, we found that it is important to learn from each engagement with a customer. Through the analysis of customer engagements in, the IT solution provider can identify trends which require the development of new competencies and identify components that are common to multiple customers, and then use this information to develop standardized modules. Learning from multiple customer engagements helps the IT solution provider to increase cost-efficiency in the provision of IT solutions. This leads to the fifth management principle “Learn from multiple customer engagements”.

When planning the delivery of IT solutions, providers need to perform coordination and support activities. These activities are related to the co-ordination and control of the customer’s involvement in the IT solution delivery. Administrative activities such as the management of bids, contract management, and employee training, also need to be addressed. As a consequence, we propose the sixth management principle: “Consider coordination and support activities when planning the IT solution”.

Finally, as we observed in all cases, IT solution providers need to pay special attention to risks occurring over the entire lifecycle of the IT solution. While software manufacturers tend to focus on risks during software development and marketing, IT solution providers need to account for any new risks occurring during the integration and operational phases. Each customer potentially presents its own set of customer-specific risks. The seventh management principle is “Include consideration of risks”.

A short explanation and the rationale for each of the seven management principles are presented in Table 1.

#	Management principle	Explanation	Rationale	Source*
1	Bundle hardware, software, and service components	Providers need to bundle hardware, software, and service components into an IT solution.	Customers are interested in a solution to their problems and not in the single components of the IT solution. The IT solution provider needs to choose a combination of components that best fulfills the customer expectations.	L, C
2	Consider the entire lifecycle of the IT solution	Providers should address all activities occurring during the IT solution lifecycle.	Customers frequently purchase IT solutions as they lack resources or expertise to provide and operate the IT solution themselves. Customers therefore require providers to support them	L, C

			during various IT solution lifecycle activities.	
3	Manage resource integration	In IT solutions, the provider and the customer integrate their resources: IT solution providers need to manage the integration.	IT solutions are not standard products but fulfill customer-specific needs and are often integrated into the customer's environment. In the process of resource integration, both the customer and the provider integrate knowledge, people, and systems into the IT solution. The provider needs to manage the resource integration process.	L
4	Implement platform-based delivery architecture	IT solution providers should have a platform-based delivery architecture in place to cost-efficiently provide standardized modules.	Although IT solutions are customer-specific, they most often also include standardized modules. A platform-based approach standardizes modules that recur in multiple customers thus reducing costs for developing IT solutions.	L, A
5	Learn from multiple customer engagements	The IT solution provider should identify recurrent modules and trends resulting from engagements with multiple customers.	By analyzing outcomes from multiple customer engagements, an IT solution provider can identify new trends requiring new competencies and identify components that are common to various customers. Learning through experience helps providers to improve the cost-efficiency of providing IT solutions.	L, A
6	Consider coordination and support activities when planning the IT solution	IT solutions require providers to not only perform lifecycle activities, but also perform coordination and support activities.	The provision of an IT solution requires providers to perform coordination and control tasks. Administrative activities (bid management, contract management, and employee training) also need to be addressed and should be taken into account when planning the IT solution.	C, L
7	Include consideration of risks	IT solution providers need to be aware of lifecycle and customer-specific risks.	In contrast to software manufacturers, IT solution providers face risks in the later lifecycle phases of a project, e.g., during integration and operation. Each customer has his own unique risk profile. Consequently, it is important to consider risks in regard to the lifecycle and the customer when planning the IT solution.	C
*Source: L - Literature on IT solutions; A - Inter-organizational IT alignment framework - C: Multiple Case Study				

**Table 1. Seven principles for managing IT solutions**

We recommend that these seven principles should be addressed from the provider's perspective when managing IT solutions. Our case study participants found the management principles useful.

## DISCUSSION

In our paper, we analyzed characteristics of IT solutions to develop management principles that separate IT solution providers from traditional software or service providers. We found that organizations transforming into IT solutions providers need to not only change their portfolio, but also change their organization to meet customer-specific needs. While early transformers were able to build their business model on the provision of individual service which the customer was willing to pay for, customers nowadays demand cost-efficient IT service delivery (Da Rold and Young 2010).

For this reason, we analyzed the inter-organizational IT alignment framework. The framework is an initial contribution to helping IT solution providers build their organization and IT solution delivery model while facilitating a cost-efficient

delivery using a platform-based approach. The inter-organizational IT alignment model is built on the model by Reynolds et al. (2009; 2010) who were the first to present an IT alignment model that accounted for dynamics in time. Their model (2009; 2010), however, does not consider inter-organizational settings. Although authors have begun to design general structures for delivering solutions (Galbraith 2002; Oliva and Kallenberg 2003), there exists little guidance on how to handle IT solutions.

We propose seven principles on managing IT solutions, two of which are based on the inter-organizational IT alignment framework. We found that building platform-based architecture and learning from lessons gleaned from multiple customer engagements are important management principles. There is evidence from the literature on the importance of these management principles. There are advanced contributions on how to modularize IT service (Böhmman et al. (2008) and Moeller (2008) and a recent discussion on industrialized service delivery (Da Rold 2011) which showed that these two proposed management principles (numbers 4 and 5 of our principles) tackle important trends in the field.

We acknowledge several limitations of our work. Although we know from other case studies that some IT solution providers have implemented an industrialized IT solution delivery, many providers still hesitate to change their organization. One consultant from our case study told us that changing the organization would be equivalent to open-heart surgery as the case study partner could not just stop the IT solution provision to implement a new organizational structure.

Our seven management principles are mainly derived from literature on IT solutions and the inter-organizational IT alignment model. It might be useful to perform more case studies to verify and enlarge the number of management principles. Further, it might be useful to implement the inter-organizational IT alignment model in practice to gain new insights. The next logical step would be to generate a theory on managing IT solutions.

## CONCLUSION AND FUTURE RESEARCH

We analyzed characteristics of IT solutions, discussed the inter-organizational IT alignment framework, and presented the results of a multiple case study. Seven principles for managing IT solutions from the provider's perspective were developed from an integration of what is known from the literature and our case study. We anticipate that these principles for managing IT solutions will contribute to the growing body of research in this field.

In our opinion, two of our principles may be of greater importance than the other five. We believe that IT solution providers should have a modularized portfolio in place: a modularized portfolio allows cost-efficient delivery for each customer. IT solution providers should analyze and learn from their engagements with customers to fine-tune and expand their offering to better meet customer needs and be ready for new developments in the provision of IT solutions. Further case study research might be useful to identify and understand the challenges confronting providers of IT solutions and their customers. It might be useful to implement the inter-organizational IT alignment framework and our proposed management principles to test their applicability in the practice setting.

This contribution is intended to fill the gap where principles for managing IT solutions are missing. We hope that practitioners find our principles useful when managing IT solutions in their organization. Researchers might use the management principles as a starting point to design new or enhance existing organizational frameworks to account for the characteristics of IT solution providers.

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