

## 4.3 Applying the five disciplines of the learning organization to ITIL

*The question of how to apply abstract theories and models in an organization remains a difficult one for many companies. In this article, Sander Jerphanion and Ivo Kristelijn address this issue. They also discuss the concept of the learning organization and explain why this theory is of so much value to IT service management.*

### INTRODUCTION

The field of IT service management is scattered with theories, models, best practices and guidelines. Every day, people stumble over terms such as COBIT®, MOF, ITIL®, OTAP, ASL and BISL, while terms such as ISO/IEC 20000, SOX, CMMI and SMART are whizzing past their ears. On top of it all, various vendors have interpreted these models differently.

Clearly, there is no lack of ideas. However, how to apply these extensive models in practice is an entirely different matter. This is because adopting a (new) model requires changing the work processes, while these models (such as ITIL) state virtually nothing about roadmaps or maturity models.

In our work with our customers and indeed, within our quickly growing and changing organization, we have noticed that whereas some organizations effortlessly adopt new ideas and carry through changes energetically, other organizations have trouble doing so. This has inspired us to convert our observations into ideas on how organizations can optimally carry out projects such as implementing tools or processes. We have kept in mind that the field of IT service management would hardly benefit from another or more extensive process model, and have therefore focused on a blind spot that has appeared: how can the (existing) theories and models be applied successfully?

In this article we intend to uncover this blind spot, and demonstrate how applying the concept of the *learning organization* can help to successfully apply abstract models and theories such as ITIL.

We will first examine the problem in more detail and explain why these models are hard to put into practice. We will then introduce the concept of the learning organization and explain why this theory is so valuable to service management. This argument will be further developed by applying the concept of the learning organization to the example of ITIL, will be followed by a conclusion and recommendations.

“Do not quench your inspiration and your imagination; do not become the slave of your model” - Vincent van Gogh

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## PROBLEM DEFINITION

Models and theories are not only hard to translate into practice; they also have the (often nasty) tendency to grow in complexity and abstraction. As a result, they become even harder to comprehend and more difficult to apply to daily activities. Well-known examples of this are ITIL and Cobit. Both models have undergone a metamorphosis that has not concretized them, but only made them more abstract and complex.

This development is a logical one; the models are now understood better by a (select) group of people, providing new insights into this matter. In addition, these models are being influenced by many different conditions arising out of actual practice. This may be the result of the introduction of new regulations such as the Sarbanes-Oxley Act or existing rules and regulations that become applicable to service management, because the (primary) company processes are starting to rely more and more on automation. The pharmaceutical industry is an example of this, where automation entered the field of Good Manufacturing Practice (GMP), the European guideline that guarantees the quality of pharmaceutical products.

Although this development is logical and can be explained, it is nevertheless an undesired one. In theory, models can be useful tools to structure and improve current practices. One of the models that is most used in IT service management is ITIL.

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## ITIL ISN'T PERFECT

When looking at ITIL and what it has brought us in practice, there are obviously many advantages. It has provided practical pointers, general terminology and a way of structuring core processes. Yet there are also some significant drawbacks to ITIL, as can be observed from the problems that tend to arise when ITIL is implemented.

For countries such as the Netherlands and the United Kingdom, this can be explained by their status as pioneers in ITIL thinking. After a trial-and-error process, these countries have now generally accepted the ITIL model, whilst realizing that it is still the responsibility of the individual organization to find a way to apply this extensive theory. This is something many organizations struggle with. It often requires external expertise, as the ITIL® books insufficiently describe how or where to start the implementation.

There are more external factors that complicate the ITIL implementation process. In countries such as Germany, where the focus is more on technology than on service, an IT person is generally considered an expert, and a good technological solution to a problem is considered sufficient. This mindset does not directly stimulate the business and IT department to focus extensively on ITIL, nor does it encourage a service-oriented way of thinking.

ITIL is heavily dependent on external factors such as work climate, but there are also weaknesses to be detected in the theory of ITIL itself:

- ITIL is incomplete and contains several gaps.
- ITIL is too extensive and abstract.

These statements are illustrated by the following case:

An IT employee observes that the central hard disks are nearly full. He knows that this will lead to service failure in the near future, which will generate incidents. To prevent these incidents from occurring and to make sure that the service will remain available, the IT

employee takes actions. Are the actions of this person, according to ITIL, a part of problem management, incident management, service level management, capacity management, event management or availability management? Or are they a combination of two or more of these?

The answer to this question is actually not important, just as long as the service is restored. No company has ever gone bankrupt because its employees did not know the difference between problem, capacity and availability management. Not replacing hard disks in time, however, can be fatal. In such situations, it is not always useful to linger over the details of the theory for too long. When applying ITIL it is important to keep in mind that it is a model.

**Models as simplified representations of reality**

Models are, by definition, simplified representations of reality and therefore cannot be directly applied in daily practice. Many organizations have trouble bridging the gap between theory and practice. This is because models have certain limitations:

- Models have a specific field/range of application.
- Models always have to meet certain conditions in order to be applied successfully.
- Every model has its shortcomings and pitfalls.

How these limitations are tackled is crucial and determines the difference between a successful and an unsuccessful ITIL implementation.

When applying a model in practice, it is often adjusted or redefined to suit the daily activities. Although this may seem to work at first, the actual purpose that the model should have served tends to get lost along the way. This results in a model which is even more complex and stands even further away from the reality that it is supposed to represent. An example of this is the set of documents that describes the service management processes and procedures for an organization. Sadly, these documents often end up on a shelf and are almost never consulted, let alone used proactively.

This process can be represented schematically in five steps:

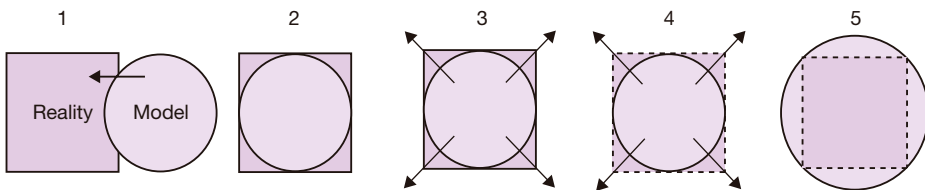


Figure 1 Models and Reality

One selects an existing model and tries to apply it (step 1). It turns out that the model in its current shape can never completely cover reality (step 2). The model is then reformed (or expanded) so that it corresponds to actual practice (step 3). During this process, reality often is lost from sight (step 4), as this process focuses on the aspects of reality that are not covered by the model. The result (step 5) is a model that falls entirely outside the scope of actual practice.

In step 2, the model, although not perfect, still falls within the scope of reality. From this point onwards, it would be more rewarding to focus on the common ground between the model and actual practice instead of on the smaller parts that the model does not cover.

This is easily said, but how do you ensure that the IT employees maintain this focus?

### WHAT IS THE LEARNING ORGANIZATION?

To answer the question in the previous paragraph, we examined existing organizational theories and came across the *learning organization*. In its essence, the learning organization is a modern approach to managing and organizing your business. Before we attempt to define a learning organization, we will first take a look at the historical development of managerial and organizational theories, in order to put the learning organization into context.

Subsequently, we will explain why the learning organization is so effective, and define this type of organization based on the five disciplines of Peter Senge’s “The Fifth Discipline”. In conclusion, we will illustrate why the concept of the learning organization attunes so well to ITIL.

### Background

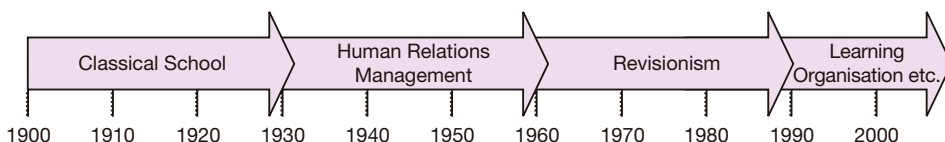


Figure 2 Timeline

#### Classical School

During the Industrial Revolution, much human labor was substituted by machines. Organizations increased in size and became more complex, and as a result operations became more specialized. In order to control these organizations, Frederick Taylor conducted time and motion studies to describe how people used their tools. He tried to optimize this scientifically, which later became known as Scientific Management - one of the most important management movements of the Classical School. In addition to Taylor, Henry Fayol and Max Weber also prescribed effective organizational structures with formal division of responsibilities, clear hierarchies and standardized procedures. In structures like these, the individual was just a cog in the wheel of a well-oiled organization.

#### Human Relations Management

In response to the Classical School, the Human Relations Management movement originated. This movement started with the Hawthorne experiments, where any change in working circumstances, for better or worse, caused an increase in productivity. From this, Elton Mayo concluded that emotional factors were more important to productivity than working methods. Abraham Maslow defined the different human motivations and ordered them in the so-called Maslow’s Hierarchy of Needs. In this model, physiological needs such as sleeping and eating must be met before safety, social and esteem needs. And only then can the most important need of self-actualization be met.

According to Chris Argyris, formal organizations can hinder personal growth because of

specializations and restricting regulations. Argyris pleaded for task expansion and more people-oriented leadership. This theory was more closely defined by Douglas McGregor, who stated that there are two opposite portrayals of mankind: Theory X and Theory Y. According to Theory X, mankind is intrinsically lazy, has to be forced to work and avoids responsibility. Theory Y assumes that mankind is energetic and creative by nature; he sets goals and takes responsibility.

### Revisionism

Rensis Likert created a link between the management movements of the Classical School and Human Relations Management. He described the “linking pin” structure, whereby an organization consists of overlapping groups that are held together by individuals who act as links between the groups. Blake and Mouton developed a new theory called “Managerial Grid”. In this theory the team manager gives full attention to both productivity and the individual employees.

### The learning organization

The emphasis of these models is still on controlling man and machine. This idea of control no longer applies today, as organizations have become more complex and their environment increasingly dynamic. As a response to this trend, smaller and more flexible organizations with clear structures have been set up. The model of growth has become the leading model, and current organizational theories include fractal company, cell structure, virtual organization, agile manufacturing, Kaizen and, of course, the learning organization.

### Introducing the learning organization to service management

The essence of the learning organization is that individuals become motivated when they are given room for personal development and the opportunity to make use of their potential. When individuals are able to continually develop themselves, this will create an intrinsic motivation, which in turn generates a powerful energy.

The key is to integrate individuals into the organization in such a way that their skills will be used in the best possible way. When done successfully, employees are responsible for the tasks they like, while other tasks that they dislike are executed by people that happen to enjoy doing them. In this way, employees complement each other and an energetic organization emerges. As a result, the organization has the ability to adapt to a dynamic environment and, consequently, will achieve better results.

In a learning organization, the people and the organization are attuned to each other. It is obvious that it is more difficult for large organizations to change than it is for individuals, but for organizations it also becomes increasingly important to operate flexibly in a rapidly changing environment. A good example of an organization that has gone through a successful change is Nokia, which transformed itself from a riverside paper mill in south-western Finland to a global telecommunications leader.

In order to attune the individual and the organization to each other, the wishes and possibilities of these two must be defined. Only then is it possible to identify the similarities. A learning organization is then created by integrating the goals of the company with the individual's vision of the future. By doing so, the employees are likely to become more motivated in contributing to the realization of the company goals.

### Peter Senge's "The Fifth Discipline"

Although several initiators of the concepts of the learning organization can be identified, in this article we refer to the ideas of Peter Senge as described in his book "The Fifth Discipline".

Peter Senge describes learning organizations as places "where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole (reality) together". To achieve this, Senge suggests five disciplines (a series of practices and principles).

**Personal mastery** is the discipline of continually clarifying and deepening personal vision, of focusing energy, of developing patience, and of seeing reality objectively. Learning to cultivate the tension between ideas and reality can expand one's capacity to make better choices, and to achieve more of the paths that they have chosen to take. A realistic gap between vision and reality causes creative tension. When the gap becomes too great, chances are this causes negative emotional tension and therefore works counterproductively. A well-defined personal vision feeds intrinsic motivation and is a source of immense personal energy.

**Mental models** are deeply ingrained assumptions, generalizations, or even pictures or images that influence the way we understand the world and how we take action. Individuals act according to the true mental model that they subconsciously hold, and not according to the theories that they claim to believe. The discipline of working with mental models starts by turning the mirror inward; learning to unearth our internal pictures of the world, to bring them to the surface and scrutinize them rigorously. By continually reflecting upon, discussing and reconsidering these internal pictures, individuals can gain more capability in governing their actions and decisions.

**Shared vision** is an image of the future, which is commonly developed and shared by everyone. The more richly detailed and visual the image is, the more compelling it will be. Because of its tangible and immediate quality, a shared vision gives shape and direction to the organization's future. It establishes a focus on mutual purpose. With a shared vision, people will do things because they want to (commitment), not because they have to (compliance). Having a shared vision helps people make correct choices for the organization as a whole, without the need for extensive instructions and procedures.

**Team learning** involves mastering the practices of dialogue and discussion – the two distinct ways that teams converse. Dialogue is the free and creative exploration of complex and subtle issues, a deep "listening" to one another and suspension of one's own views. By contrast, in discussion, different views are presented and defended, and together the best view is agreed upon. Through techniques like dialogue and skilful discussion, teams transform their collective thinking and, in doing so, learn to mobilize their energies and abilities. If this is done successfully, the final result will be greater than the sum of individual members' talents.

**Systems thinking** is a conceptual framework to make patterns clearer and to help us see how to change effectively. This is the ability to see the bigger picture, to look at the

interrelationships of a system as opposed to simple cause-effect chains; allowing continuous processes to be studied rather than single snapshots. The practice of systems thinking starts with understanding a simple concept called “feedback” that shows how actions can reinforce or counteract (balance) each other. It simplifies life by helping us to see the deeper patterns lying behind the events and the details. This fifth discipline shows us that the essential properties of a system are not determined by the sum of its parts but by the process of interactions between those parts.

Peter Senge refers to systems thinking as the fifth discipline. Without systems thinking, each of the disciplines would be isolated and therefore not achieve their objective. The fifth discipline integrates them to form the whole system, a system in which the properties exceed the sum of its parts. However, the opposite is also true - systems thinking cannot be achieved without the other core disciplines: personal mastery, team learning, mental models and shared vision. All of these disciplines are needed to successfully implement systems thinking.

### A combination that works

Why do these concepts of the learning organization fit so well with ITIL? Several decennia ago, the focus of the IT industry was mainly on technology and as a result ITIL V1 was born. The CCTA best practices led to the creation of ITIL V2, which was primarily concerned with processes. In both these approaches, however, too little attention was paid to the human factor, whether as an individual or as a group (represented as the people circle in figure 3). Although ITIL formulated functions, roles and various consultative structures, it did not explain how to implement these successfully or how to ensure that employees make the right decisions. The learning organization does, however, deal extensively with this human factor. That is why we have combined these two theories in the next section and have demonstrated how they complement each other.

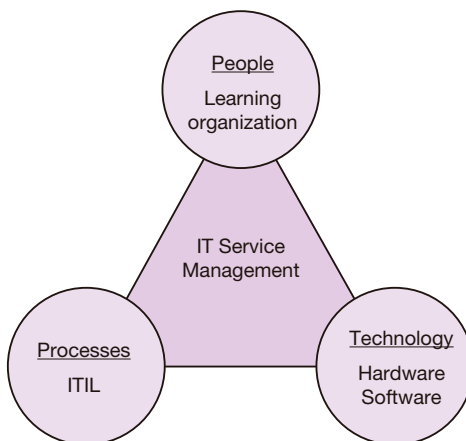


Figure 3 Overview ITSM

## APPLYING THE FIVE DISCIPLINES TO ITIL PROCESSES

### Shared vision

ITIL has divided service management into processes and functions. Senge states, however, that subdividing a larger problem into partial problems and tackling them individually, does not necessarily help in solving the overall problem. When we take a look at cases, Senge's statement seems to ring true. All processes have process managers, and when they do not direct their processes towards one common goal, compartmentalization can arise. These processes can then counteract one other.

#### Case:

Because of its negative image and unsatisfactory results, an IT department has decided to place greater emphasis on ITIL. One complaint was that they often did not answer the telephone when they were called. The employees, therefore, had less faith in the IT department.

In response to this lack of faith, incident management set themselves the target to *increase* the number of incidents (i.e. colleagues should be calling the service desk more frequently). Without discussing this with incident management, problem management decided to aim for a *decrease* in the number of registered incidents.

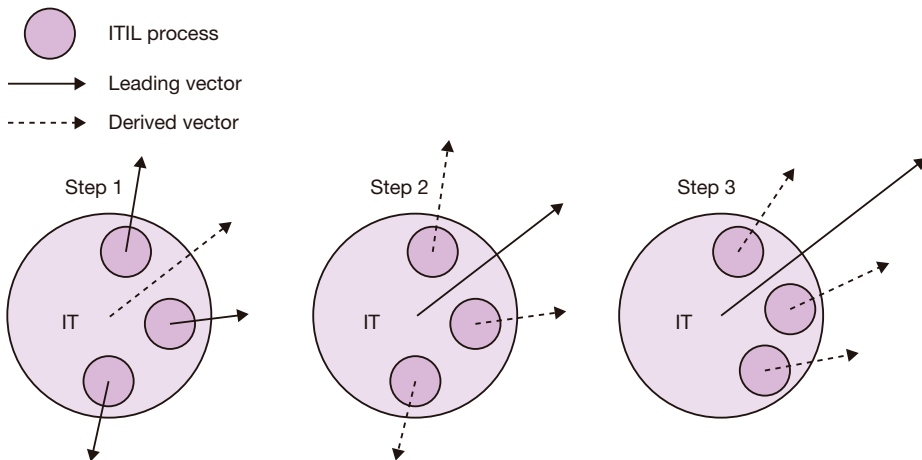


Figure 4 Shared vision & ITIL

When each process is set up individually, the final result is often less effective, because processes can (partially) counteract one another (step 1). It would be better to firstly establish a common goal. The focus of the processes will then be (partially) derived from, and shift towards, this common goal (step 2), which will increase the effectiveness of the whole IT department (step 3).

For this reason it is important to establish specific common goals and values within the IT department. For instance, what is meant by correctly resolving an incident? Does this mean providing a quick solution, or a reliable one? What kind of image does the IT department wish to have? By discussing such topics within the department (instead of being given the

answers by the management), not only will the processes develop more specifically and reinforce each other, but the exercise will also help to create a sense of solidarity.

The latter is an important factor in making employees part of the common goal. This sense of solidarity will encourage them to give their best, as opposed to participating because they are told to do so, or even worse, hindering the process.

### Personal mastery

In an ideal world, an IT department would consist solely of employees who master this discipline. This would mean that all employees know what they want, put this into practice and continually learn from this. Nevertheless, this works differently in practice. Many people are simply discontent with their current work routine and it is hard for them to formulate a personal vision.

All of this shows that, when arranging functions and roles, there is relatively little attention paid to the characteristics and plans of the people involved. Consequently, the functions and roles are being enforced on the basis of seniority or already existing functions. Unfortunately, this offers the employees little opportunity to develop their personal mastery. As mentioned in the previous section, Senge believes that it works best when people are intrinsically motivated. This implies that they devote themselves to a common goal and do not just carry out their work because they are expected to do so.

A good first step to encourage personal mastery is to stimulate employees to formulate their personal goals. For instance, one individual may not be able to understand why another derive satisfaction from maintaining a configuration management database (CMDB), whereas someone else might perceive this as an exciting challenge. The second step is then to take account of these personal goals and preferences when assigning the functions and roles.

These developments can only be realized when the organization has an open working atmosphere. This means that employees should not only be able to say what they want and feel, but also be able to give and receive feedback.

### Mental models

As explained earlier, one cannot work without mental models. They are helpful, but when there is no awareness of them, they can also work against us.

A process manager's, mental model for instance may feel the need to have control over his or her own processes. Based on this mental model, the processes and procedures will then be defined. If the first result of the process is poor, for example when employees feel restricted or patronized, the process manager will respond by including more moments of control and intensifying the procedures (as this response falls within his or her mental model).

#### Case:

In order to be able to better prioritize incidents within the IT department, a service level manager introduces levels of support (and corresponding priorities and durations). After brainstorm sessions and several discussions with clients, he concludes that many aspects have an influence upon the priority of each incident. Including:

- the number of people involved
- the level of function of the people involved

- the organizational location of the people involved
- whether the incident concerns a primary or secondary company process
- whether the employees are merely hindered in their work, or whether their work has been interrupted completely
- whether the incident concerns a direct malfunction, or whether it will surface at a later stage
- the type of service

However, if all these aspects have to be taken into account when prioritizing incidents, the service desk needs too much time for the call intake, and they might no longer focus upon what is actually important.

In this example it would have been better if the process manager had been aware of his own mental model – namely that the support levels should cover all exceptions. Keeping in mind his mental model, and the ultimate goal of being able to prioritize better, he would have become aware of the fact that he has been barking up the wrong tree. This insight will create the opportunity to formulate workable levels of support in conjunction with the service desk and client.

A good first step is to map personal models and subsequently examine them critically. This can be done both individually and in groups.

### Team learning

When people work together, they have to communicate with each other. As Senge points out, this communication can take place by means of either dialogue or discussion. In a discussion people want to be proven right. In a dialogue they want to learn from each other.

#### Case:

The front office often receives incidents that have been returned by the back office. The back office is getting irritated as they are overloaded with incidents for which they are either not responsible, or do not have sufficient information to resolve. In turn, the front office is also getting annoyed, as it receives complaints from callers, who claim that the incidents they have registered remain unresolved for too long. The employees of the front and back offices start blaming each other and their relationship polarizes. Despite the fact that Operational Level Agreements (OLAs) are introduced, the situation does not improve.

Under the guidance of an external trainer, a course is organized in which the problem and incident management processes are reviewed. The two departments then share their views on how these processes effect their daily operations.

This has the following results:

- The back office point out more clearly what additional information they need, and help with the creation of a script for the front office.
- A list of Frequently Asked Questions is composed, which will help the front office to instantly assist callers on the phone.

In this example, it is clear that the two departments have more things in common than they first thought. The first step towards solving the problem was that the discussion shifted from

their own departments to the problem and incident management processes. As a result, the two departments started a dialogue, exchanged their views, and began cooperating.

Another example of this type of tension is the lack of understanding that can exist between the IT department and the business. In many cases, the business is not satisfied with the services provided by IT and feels it takes too long to resolve incidents. The IT department on the other hand, is tired of the special requests from the business, such as non-standard PDA support. Both parties intend to defend their own argument more aggressively. They do not reach an agreement and the service level manager has to intervene. He helps to set up an extensive service level agreement (SLA).

However, the chance that this document will improve relations between the two departments is slim, because the SLA does not focus on the (often minor) misunderstandings from which tensions can originate. For example, the network had been down many times during a certain period, with the consequence that an important quotation could not be sent out. If the relationship continues to evolve negatively as a result of such misunderstandings, there is every chance it may escalate, which in turn could be a reason to outsource the entire IT department. If the business had known the reason for this malfunction, namely that a network migration was taking place, it may well have understood and accepted the increase in network problems. Alternatively, the business could have explained the situation to IT, namely that it would be a bad time to carry out a network migration given their need to put together the quotation. This miscommunication could have been easily prevented by inviting the business to the Change Advisory Board (CAB), at which it is decided which changes will be implemented and when.

**Systems thinking**

In a business, it often happens that decisions are made that have been well thought out, but are not received positively by the employees. They feel something is not right. In such a situation, systems thinking can help to provide better insight into the organization.

Using the archetype models from The Fifth Discipline, we have illustrated two examples below.

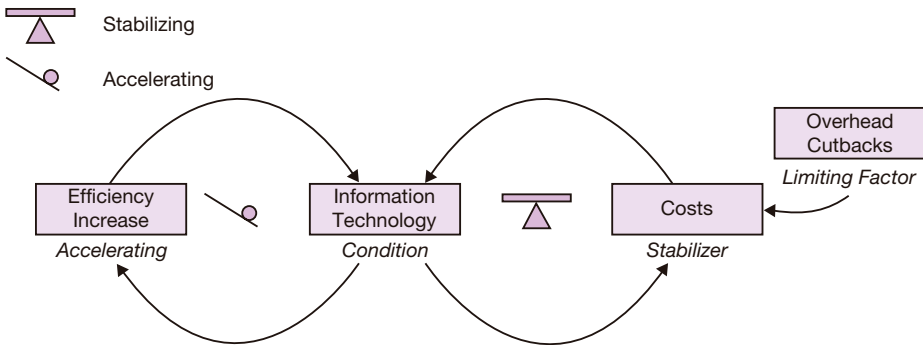


Figure 5 Archetype 1

Information technology is used to automate work processes (condition). This can result in a significant increase in efficiency and, in turn, an increase in the demand for IT (accelerator). This process does not repeat indefinitely. IT requires more and more investment and maintenance costs, which inhibits its growth (stabilizer). Additionally, it becomes harder to define exactly what the contribution of IT to the business is. As a result, the IT costs are considered an overhead. When looking to save money, the business makes overhead cutbacks (limiting factor), as shown in figure 5. Although the costs may appear to decrease, this actually has a negative impact on the business. If the benefits provided by the automation processes had been made clear, this sub-optimization might not have been carried through.

It is of course difficult to pinpoint the exact influence of IT on the business, but it is possible to gain greater insight into this by mapping the causalities within the process. This may create some new perspectives on the matter; a proposed solution that seemed effective at first may turn out to be less useful. In the case mentioned above, IT management might decide to act more proactively in explaining what the automation department is working on.

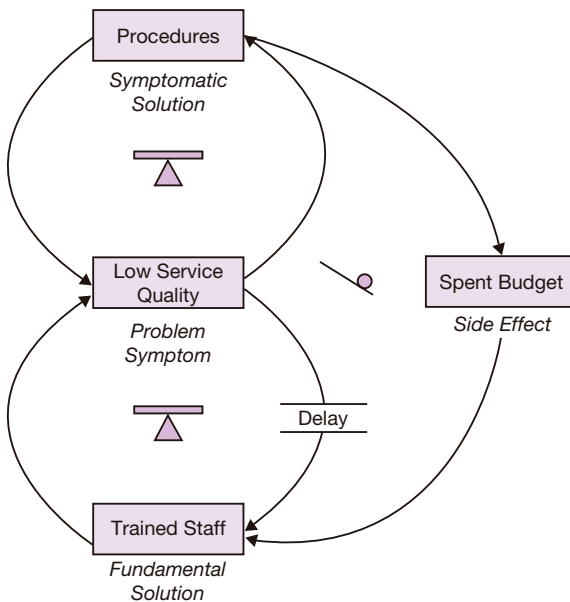


Figure 6 Archetype 2

Unfortunately, it happens all too often that the quality of service is too low, or is perceived as such (problem symptom). It then seems a good idea to put in place procedures and working instructions, only to find that such detailed documents are seldom read and understood, or that procedures have already changed while the documents and being written (symptomatic solution). It tends to be forgotten that service delivery involves people providing a service to other people – and that the service provider needs to be trained (fundamental solution).

It is, of course, inevitable that agreements and procedures exist at a basic level, and that employees are aware of them. Providing insight into the vision of the service department

and involvement in the business helps the service provider to make the right choices when providing the service. These procedures need to be logical, or known throughout the organization, so that manuals are not necessary. In case things go wrong, it is best to resist the urge to redefine the procedures; instead, evaluate the situation and learn from it. When an organization focuses mainly on agreements and procedures, there is no time or money left to train staff (side effect).

## CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

In the section *Problem definition*, we stated that there are many models and theories within the field of IT service management. None of these models are perfect. This is expressed by G. Box, who stated that “essentially, all models are wrong, but some are useful”. Models are “wrong” because they are a simplified representation of reality. As a consequence, the models have to be made applicable for daily practice. This is not an easy task, especially when the model’s weaknesses are dealt with incorrectly.

In our work we often encounter organizations that have difficulty applying models and theories such as ITIL and COBIT. An explanation for this is given by ITIL V3 Chief Architect, Sharon Taylor: “a common mistake made by new adopters of ITIL is trying to *go it alone*. Mistakenly, many new adopters feel that external consulting expertise adds prohibitive costs to their implementation. In many cases, the opposite is the case.”

Taylor is right about this. Dealing with the models’ weaknesses is a real art, and external experts are capable of this. However, this art itself cannot be learned by hiring someone for an ITIL implementation. Although the project will be finished in less time, and costs and expenses will be saved, the chances are that external expertise will be required again for the next project.

In the section *The learning organization*, we investigated whether organizational theories offer a solution that enables organizations to better cope with the weaknesses of existing models. We came across the learning organization. This theory reacts against traditional organizations that have a hierarchical structure. The learning organization states that employees do not wish to have laws and regulations forced onto them and, more importantly, that these regulations prevent them from fully exploiting their potential. It would be better to give employees room to develop themselves, so they feel part of the organization and share the common vision. This way, the individual goals reinforce the common goal. The latter corresponds with our own experiences with our customers and within our organization.

Based on Senge’s five disciplines of the learning organization (Shared vision, Personal mastery, Mental models, Team learning and Systems thinking), we have illustrated that the concept of the learning organization is useful when applying the best practices of ITIL. This is because the focus of ITIL has shifted from technology to processes, while the learning organization pays more attention to the human factor. An additional advantage of the learning organization is that it provides employees with better tools to successfully carry through future projects without external expertise.

In short, we believe that our field would not benefit from yet another process model. In order to take the next step into maturity, the employees need to become the central focus. This

allows for existing ideas to be used better and more effectively. We believe that the learning organization can help organizations to take this step.

### Recommendations

We recommend that every organization is cautious about embracing new or renewed process models such as ITIL V3. This is not because these models lack useful content, but because it is likely that current practices can still be improved upon. By paying more attention to the human factor, we believe that it is possible to use the existing potential of the employees to their full extent. To ensure that employees are prepared for future changes, it is advisable to actively pursue the five disciplines as discussed in this article.

We recommend anyone who is interested in finding out more about the learning organization to read Peter Senge's book "The Fifth Discipline". In addition to the five disciplines, the archetypes of the system theory (frequently occurring patterns in events) and learning disabilities are particularly instructive.

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