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# Why Business Demand Driven Information Systems Development Approaches Don't Work

Exposing the assumptions and weaknesses in  
business demand-driven IS development approaches  
and their consequences for the company

Version 1.01

20/05/2010

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## **What is at stake?**

Information is vital to a company and so are its information systems. The detection of information needs is problematic. Essential prerequisites to engineer solid conceptual solutions are not satisfied. The common general approach of software development contains various weaknesses. This approach and the organisational arrangement are based on unjustified assumptions. Consequently, only a part of the whole potential IT can offer is exploited. A lot of opportunities, time and resources are wasted. The collaboration between business and IT is difficult. Much people, especially the competent ones, are frustrated and discouraged. The gap in the business-IT alignment is widening. By localising the root causes and understanding their effects, a rebalanced organisational arrangement may lead to more effective, manageable and evolutive information systems more aligned with the business information needs and built in a more anticipatively, organised, planned and cost-effective way.

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## Executive Summary

Information systems are the internal organs within the body of the company. They process and provide information needed to the functioning of this body. This is why the information solution must be aligned on the company's information needs. But these organs must be conceived and constructed to support efficiently and effectively the company's activities. Later, they must be adapted to evolve together with the company.

No alignment can be achieved when the identification of information needs is problematic. The commonly followed approach is often reactive and based on the concept of problem-solution. It responds to a short term vision. This approach creates a permanent pressure and generates a difficult relationship between business and IT. The conception of a solution requires business knowledge and competencies in business informatics. The role of the latter is often reduced to less than a minimum. The roles and responsibilities of the business stakeholders and of the IT actors are not defined in a very optimal way. These factors characterising the commonly followed software development approaches can be somewhat softened. This creates the illusion that these aspects are satisfactory. Nevertheless, it is very hard to build appropriate information solutions in these circumstances. The consequences and costs will come later in a diffused and hidden ways.

This analysis reveals that several underlying beliefs and assumptions, upon which the general approach relies, are unjustified. For example, IT is mainly about technologies and its role is to support the business. Such ideas limit the role of IT and, consequently, they limit the delivered value. Only by correcting these ideas, we can break through these limitations. It becomes possible to exploit the whole potential of domains like ICT and informatics to the benefit of the company.

The present analysis indicates the issues and weaknesses. But it explains also consequences, relations, principles, mechanisms, influences and tendencies. It is a source of inspiration to find new solutions that contribute to the business-IT alignment, to the business-IT collaboration, to the work environment of the IT projects and to the efficiency and effectiveness, as well as to other qualities, of the enterprise wide information solution. It's an excellent opportunity for profound improvements.

### The Author

Axel Vanhooren started his career in 1992 in IT as analyst-programmer. His interests were more oriented to conceptual matters, rather than to technological ones. He has been interested in how to improve the software development process and how to develop software applications that better serve the organisation over its whole lifetime. For a few years, he studied project management. This widened his view to the whole company. The combination of his knowledge area of systems analysis, information systems and a basis in organisational development lead to the idea that a company, as socio-technical system, can be engineered. This idea triggered his interest in enterprise engineering, enterprise architecture frameworks and other subjects related to the functioning of a company as a system. In 2008, he became a freelance consultant in IT.

## Document History

Version	Location	Change
V 1.01 13/05/10		Revision of box on cover page; Revision of Executive Summary; Chapter 11: Graphical summary added
v1.0 06/05/10		First Version.

Source : <http://www.taurus-ee.com/Publications/TEE - Why Business Demand-driven IS Development Approaches Dont Work.pdf>

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## 1 Introduction

In the early years of IT, the EDP department initiated projects to automate the business. Software development projects were executed with little or even without involvement of business stakeholders. The business community discovered the software application only when it was made available through deployment. Lessons have been learned from this approach.

Today, the pendulum has swung to the other edge. Often, the business community has the opportunity to express its needs and to describe the solution it would like to have operational in a demand to the IT department. The business demand constitutes the trigger and input that forms the foundation of the future software development project. The definition of the content and objectives of the project are in the hands of the business community.

The arguments supporting this position in the relation with the IT community and with the project are the following ones:

The business community

1. has knowledge of the business domain.
2. has field experience.
3. knows the context of the demand, its intentions and the objectives.
4. knows its own needs.
5. is more familiar with IT than in the past.
6. is the client. The client must be served and IT community is the supplier that has to serve the business. The client asks what he wants or needs. He is the one who pays.
7. When you can ask what you need, it is more likely that you will get what you asked for.
8. IT must not tell how the business must operate.

Notwithstanding the business community has the opportunity to formulate its demand and they are often well involved in the projects, the results still remain rather worrisome.

1. The delivered software doesn't deliver the expected results or, worse, it doesn't solve the needs as expected. Some difficulties remain or new issues appear or are created.
2. Most solutions come late. Meanwhile, the needs exist and the consequences are felt. Additionally, projects are under a permanent pressure.
3. Incessantly, new needs are detected.
4. There are many corrections and changes after the delivery of the software application. Some of them may concern a large part of the logic, fundamental concepts or having an impact on the architecture or on the choice of technologies.
5. The Agile community, which tries to cope with the changes by embracing them, is growing.
6. The Business-IT alignment-movement has also a growing number of adepts.

These are strong indicators that the execution of a project is still troublesome. At a more global level, the gap between the company's information needs and the implemented enterprise-wide information solution is also still a serious preoccupation.

Many companies are familiar with the following global approach. The business community identifies an information need. Business domain expert formulate a demand to get this need solved. This demand is

transmitted to the IT community. Based on this document, a project is initiated to develop and implement a solution. In essence, this is the general idea of the process by which many companies develop their IT solutions.

Presently, the achievement of the business-IT alignment is one of the most important objectives commonly cited. But does this process based on business demands lead to a better alignment? At glance, it seems logical that it should. The present analysis reveals that it isn't that simple at all. Responding to information needs through the means of business demands and expecting to have these needs solved and to obtain a business-IT alignment may be ineffective at best, and extremely harmful at worst.

In "The Art of War", Sun Tzu learns us that as war can bring prosperity to a state or ruining it, it should be studied thoroughly. Similarly, information is of vital importance to the company. This resource is an essential substance to survive, to evolve, to grow and to prosper. But when it is missing, it may lead to decline and to economical failure. The company's information is stored, managed and used by means of an enterprise-wide information solution. This solution requires to be built. Because of its importance, it is imperative to study this domain thoroughly.

In general, we can assume that the business community and the IT community have the common desire of having effective and well-managed information systems serving the purpose of the company.

The present analysis focuses on the global approach, its organisational arrangement and the relationship between the business community and the IT community. As they are essential in the development of information solutions, their improvement contribute to more effective information solutions.

Before starting to look for improvements, the root causes must be identified and understood, and insight is needed in the various mechanisms, in the active forces and tendencies and in how they affect the process, the future information solutions and the human resources. A useable insight can only be acquired through an impartial view and an open mind. Major improvements can be realised when we have the courage to go behind the obvious, beyond the visible, digging under the surface and dare to question our assumptions and our belief system. This is what this analysis tries to do. The new insight aims to be a basis for inspiration for improvements.

The analysis is divided in three major parts. The first part starts with mapping the complaints on the global approach. A part of this global process is identified as problematic. This part of the process is based on three major assumptions, which rely on a few thoughts of our underlying belief system. These assumptions are investigated more closely.

The second part explains the weaknesses of the global process in greater detail.

The leader has a major role in how things unfold. As it has been established that the business community has a preponderant role, be it by directing the course of actions or by having a more implicit influence, still with the intention of improvements in mind, it seems essential to investigate its position. This question is handled in the third part.

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### **Important Remarks**

1. The present analysis describes mechanisms, principles, tendencies, causes and consequences. Some weaknesses and forces lead to lower quality and ineffectiveness. But these forces may be softened or countered by the organisation, by the followed methodology, by the competencies and by the human intelligence. Therefore it is not easy to be inclusive and to take all nuances into account. However, it is more effective to avoid creating these weaknesses and negative forces in the first place. The general tendencies, inclinations, principles and mechanisms presented here remain valid as concept and their understanding may lead to more efficient approaches and solutions.
2. Companies are different. Each has its own culture, competencies, organisation and approach to develop information systems. Each company has its analysts, architects, engineers and follow their own methodology. But, this may well be a curtain of smoke. We should be careful with appreciations based on function titles and roles, methodology and used terms. What matters are not the function titles, responsibilities and activities, but what is beyond them. The essence here is what knowledge and principles are really applied and how they are applied.
3. This analysis doesn't discuss the responsibilities for the weaknesses and ineffectiveness. They have been introduced through a gradual evolution, specificities of human nature and some wide spread beliefs. Although this can be interesting to avoid similar mistakes in the future, it would necessitate a more profound debate to avoid premature and prejudicial conclusions. Such a debate can easily turn out to be very subjective and endless. The intention of the present analysis is to contribute to better information solutions in the company.
4. In the present context, it is important to remain aware of the difference between "*driven by*", "*based on*", and "*oriented to*". Some other terms like "*triggered by*" and "*guided/directed by*" can be added. These terms can be combined with the following terms: "*business*" (as a field of knowledge and activities), "*business needs*", "*business objectives*", "*business demand*" and "*business community*". Each combination has a different meaning. The various terms express a various degree and one doesn't necessarily imply another. For example, an approach driven by business needs is not (necessarily) the same as one that is driven by business demands.

#### **Note:**

A few terms should not be confused: conception and construction; system life cycle and system development life cycle; information system and software application (although this document assumes that an IT project develops an information system based on (a) software application(s)).

A graphical summary can be found at the end of the document. This may support the lecture of the analysis.

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## 2 Problem Identification

The business community has complaints about the services and products delivered by the IT department. But conversely, the IT community has also its complaints about the business community.

### 2.1 The Complaints

Typical complaints of the business community about the IT community are:

- It takes too long before we get a solution to our needs.
- A software development takes a lot of time and is costly.
- IT people are making things very complex while things can be solved so easily.
- IT people don't know the business domain.
- IT people don't understand the business needs and priorities.
- IT people can't provide a clear and straightforward answer.
- IT people speak a different language. They don't speak our language.
- IT people have badly interpreted our demand, requirements or specifications.
- Some fundamental and obvious features have not been developed.
- This part of the logic is so obvious. They didn't understand it correctly or ignored it. Do we need to explain them everything (every time) ?
- What the IT project delivered doesn't solve our problems or satisfy our needs.
- Everything works quite fine, as long as we don't meet an exception. Then we're stuck.
- This has worked. Since the implementation of the new release, it doesn't work anymore.
- Their solution creates more new problems than it solves existing ones.
- IT people don't know (and control) their systems, technologies and solutions anymore.

Typical complaints of the IT community about the business community are:

- Their estimations of time and resources are too short to develop an appropriate solution.
- The business community thinks they can drop a demand and have the solution tomorrow. They always would like to have the solution for today. They think we can develop a solution in a wink.
- The business community always comes up with, what they call "small changes", "small or simple additional features", new interpretations of their own specifications, new rules and new exceptions at the last minute.
- They come up with solutions that are
  - ambiguous, inconsistent and incomplete. Many things are not specified.
  - not well-thought, not efficient, won't work or are simply impossible.
  - valid for a very short period (like temporary solutions).
- The explanation of their demand remains fuzzy.
- The business community comes up with a different interpretations, new requests and ideas in the middle of the project even though an agreement has been made.
- The business community asks to change a feature over and over again. The business community doesn't know what they want or need. Or, they still don't know how they want to work.
- The business community has no idea of the feasibility and impact of their demand on the solution and on the project.

- Although we built what they asked, it seems not to work as they expected and they are still not satisfied.
- It's always the fault of IT. And whoever fault it really is, in the end IT can solve it anyway.

Both, the business community and the IT people, know the implemented information solution could support the company and its business activities much more effectively. Both communities cope with problems.

As long as the many complaints exist it will be very hard for the two communities to trust each other, to collaborate and to obtain excellent results.

When we consider the type and the severity of the complaints, we can already conclude that this very common approach in software development is not very successful.

## 2.2 The Global Collaboration Process

The following is a general common collaboration approach:

1. Some indications of present or future information issues or needs are noticed.
2. The needs are identified, interpret and evaluated.
3. Business domain experts conceive a solution.
4. A demand reflecting the desired solution is formulated.
5. The demanded solution is refined and then it is translated into technologies by the IT project.
6. The business community evaluates and validates the software application.
7. The software product is made operational. It is expected to solve the issues and to satisfy the needs.

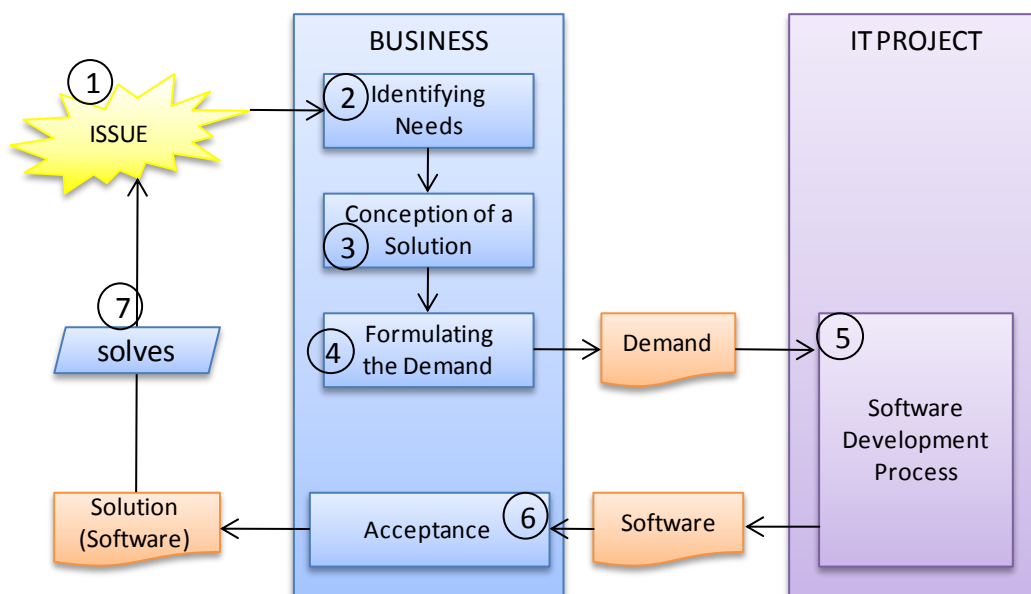


Fig. 1: Global picture of the collaboration process between business and IT Project

This process is also called the global or general approach or process.

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Let's review this process in greater detail.

The business community becomes aware of the existence of an information issue. Its symptoms or consequences become apparent through measurements, complaints, difficulties or bad results. Future information issues are identified by considering new ideas, objectives, plans, agreements or new laws.

The business community investigates the issue to get a clearer idea. Their understanding of the issue will increase. They will interpret and evaluate the situation, its context and the problem. Information needs can now be defined. The business community will define the boundaries of the problem area. It selects the set of needs that will be solved by the current initiative or at least further investigated. Other identified issues and needs may be part of another demand or be postponed.

The business community, as customer, communicates its needs to IT community, who will build a solution. At least, this is how it is assumed to be. In reality, very often, the business demand doesn't describe needs.

The business experts envision a conceptual solution which is expected to satisfy the business needs. The business demand reflects this solution.

A conceptual (functional/logic) solution expresses what the tangible solution should do. It explains its structure, functions, rules and behaviour in a logical way only. Although, it may take the existence of some technological capabilities or concepts into account, normally, it is independent from any specific technology. This picture of the future solution can still be fragmented, vague or uncertain. But it may be more detailed and stable as well. The business domain expert may have a picture of the future solution in mind. Or the solution can be written down in a very formal and detailed way. The business demand reflects the conceptual solution conceived by the business domain experts.

A project is initiated. This project will develop the software application or extend or adapt an existing one. The conceptual solution is further refined by analysts. The conceptual phase of the project, which ends here, determines the whole content and, mainly, the maximal potential value of the future system (see fig. 3). The conceptual solution is then transformed into a technology-dependent design, which represents the final solution. The solution is completely defined and is ready to be built. At this point, it is merely a matter of translating the still intangible solution with the set of chosen technologies into a concrete working system. This translation makes the potential value of the conceptual solution tangible.

The new software application has to pass several tests. One of those tests is the user acceptance test. The purpose of this test is to verify that the software application corresponds with the business demand. Each software application that passed successfully the user acceptance tests met the business demand. It can be validated, deployed and put in production to solve the intended needs and issues.

## 3 Selection of the Area of Investigation

### 3.1 Mapping of the Complaints

#### 3.1.1 Sequence of Complaints

The IT community complains about the quality and volatility of the business demand. Both, the business community as well as the IT community, complain about the resources and time, but both have an opposite opinion on this matter. Both complain also about each other's behaviour. The business community complains about the solution the IT project delivered. As business people are disappointed by the product, new issues must be solved promptly by the IT community. The IT community complains about these consequences and about this way of working.

The complaints about the needed resources and time and about each other's behaviour are related to a lack of knowledge of each other's domain and way of functioning.

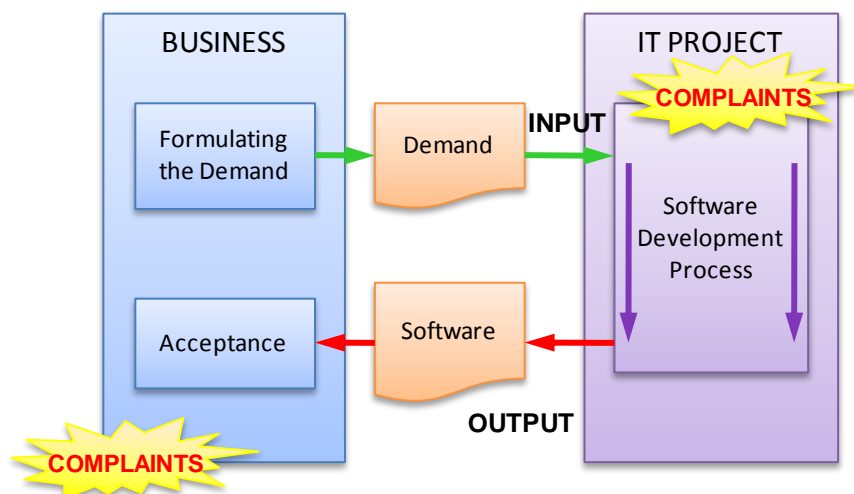


Fig. 2: Mapping major complaints in the general approach

#### 3.1.2 Selected Area of Investigation

The complaints about the demand and the product are mapped in the process. When the process flow is followed step by step, the complaints of the IT project about the demand are encountered before the complaints of the business community. If the demand and information (input) provided by the business to the IT project would suit the needs of the IT project, then, probably, the IT project would be able to deliver better results and, maybe, we can expect that many subsequent complaints about the product (output) will disappear. Therefore, the focus of the investigation concentrates on the area of the process from its very beginning until the communication of the demand.

### 3.2 Acceptance Test Validates the Product

If the selection of the process area that should be investigated based on the complaints doesn't convince, another logic can be applied to come to the same conclusion.

The function of the acceptance test is to verify whether the delivered product matches the demand or not. A software application that passed the acceptance test successfully corresponds exactly to the demand expressed by the business community.

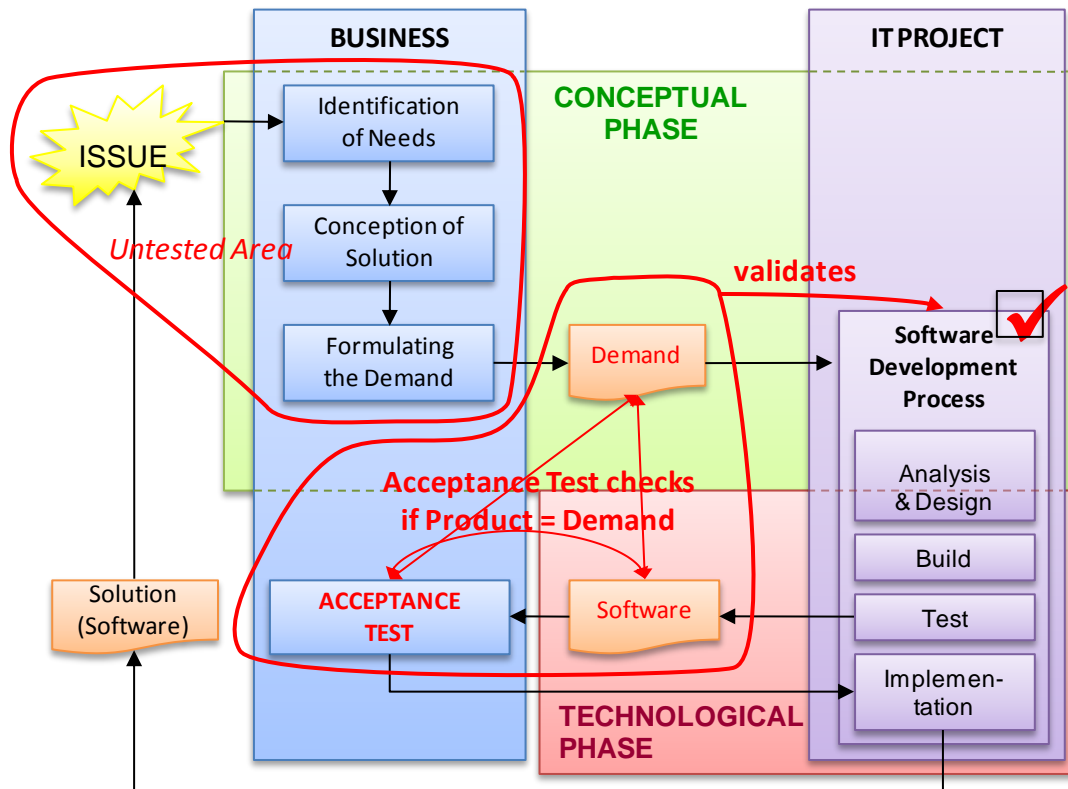


Fig. 3: Collaboration process: Definition of area to be investigated

The software has been built by the IT project as specified in the business demand. Thus, from the perspective of the product, it validates the whole execution of the software development process (the IT project). This means that if the delivered software application still doesn't solve the problem or doesn't satisfy the needs, the causes won't be found inside the software development process itself. Consequently, the software development process (or IT project) can be excluded from the investigation. The root causes have to be found in the part of the process that precedes the project. Additionally, this is the only part of the whole process that hasn't been tested and validated. Presently, the real test is the actual solution of needs. This happens in the operations and doesn't appear as being very satisfying. This selected part of the process must be investigated. It must be noted that we assume here that the acceptance test fulfils its role correctly.

### 3.3 Process Area under Investigation

The process area selected for further investigation can be reduced to the following steps:

1. the insight in the real problem and real needs,
2. the conception of a solution
3. and the formulation of the demand.



Chris Argyris and Donald Schön teach us, in the double-loop-learning-theory, to question our underlying beliefs. Every belief that is found to be untrue is an opportunity for new and often more fundamental improvements and may even lead to a paradigm shift. Since we have to accept that some of our beliefs can be incorrect, this investigation requires a mind open to any question and to any conclusion. Such beliefs are, often already for some time, strongly anchored in a set of core beliefs. Our social environment has the same beliefs which support and confirm them. Therefore, questioning our beliefs and accepting different ones may encounter a fierce resistance.

## **4.1 Base Role of the Business Community**

It seems to be incontestable that the business community has the following to offer:

- Business domain knowledge (theoretical)
- Knowledge of the market and the broader business context and environment
- Knowledge of how the business is implemented, how it is functioning and managed
- Knowledge of products and services
- Field experience
- Knowledge about problems, complaints, issues, preoccupations, consequences or symptoms
- The opportunities, constraints and priorities of the business
- Business plans, objectives and intentions
- Knowledge of the business and the company's history

The most fundamental, minimal and fully legitimate position and role of the business community is to provide this information as input to the IT project. It seems quite safe to assume that this role can be extended with recognising the ability to evaluate and provide an input about the applicability of the future solution.

We may be tempted to expand this basic role with some more authority, influence, additional responsibilities or activities. There are different ways to consider and to deal with the input. A kind of obvious intuitive logic may lead us to know that it is normal and beneficial to expand the business expert's role and to fully rely on this input. Unfortunately, this "knowing" can be wrong. Every addition to this basic role should be carefully questioned.

## **4.2 The 3 Assumptions**

In the process area on which we focus, the business community performs three tasks which lead directly to the formulation of the demand. These activities concern aspects beyond the basic role of the business community as previously defined. And with regard to the complaints emanating from the IT community about the input they receive, it is justified to consider the following three assumptions and to question them.

### THE 3 ASSUMPTIONS

- ① **The business community is able to identify information needs correctly.**
  - ◆ to identify all the needs ( as much as reasonably possible )
  - ◆ to identify the needs in time.
  - ◆ to identify understand, evaluate and prioritise needs correctly.
- ② **The business community is able to conceive an appropriate functional solution.**
- ③ **The business community is able to formulate a demand.**
  - ◆ that reliably reflects the intended solution
  - ◆ that is suitable (meeting the required level of quality) to allow the development of a software that correspond to the intended demand.

These are the three assumptions that will be investigated.

#### **What are the consequences if these assumptions are found to be untrue?**

It will be an illusion to expect that by responding correctly to the business demands:

- ◆ the business information needs will be solved,
- ◆ the business community will be satisfied
- ◆ and the "business and IT can be aligned".

It would be strongly advisable to **rethink the whole collaboration model** between the business community and the IT community based on the new beliefs. It wouldn't be surprising if this paradigm shift would lead to a new major improvement in the provision of information solution for the business.

We may find here the causes of the difficult relation between the business community and the IT community. Rethinking this relationship leads possibly to a more balanced relation and a smoother collaboration.

In good faith, the business community's answer on the assumptions will probably be positive. But, we must also ask the questions: What is a correct identification of needs? What does it mean to identify needs in time? What is an appropriate solution? What is a correctly expressed demand? Maybe the business community uses inappropriate criteria and norms which are too low to answer these questions. The correct answer can be found through the purpose of the input and in the consequences caused by unsuitable input. This input serves to develop an information system, or, at a more global level, to develop an enterprise wide information solution. This is why the IT experts need this information. Consequently, as a specialist, it is up to the IT experts to determine, to some respect, the type of needed information, the required level of quality and to determine the way this input is provided.

The various complaints point out that the input of the business community doesn't reach the required quality level. We can try to solve this quality issue by doing a greater effort to get a better input. And the business community is certainly motivated to work out its demand with as much care as it can. But if we want to find solutions that really solve this issue, it is crucial to know exactly what is wrong and why these assumptions are untrue. The answers these questions provide key insight to make a real breakthrough. This question will be addressed in the next chapters.

## 5 Preliminary Thoughts

A software application is known to most of its users through its user interface. The interface allows the user to input data and offers features to manipulate this data. The software application will process the information and store it. This information can then be retrieved, transported and used. This is the way software satisfies the business information needs.

It is the role of the IT community to program the software, test it and deploy it. They implement an IT infrastructure in which the software can function and maintain it. They make sure the data is secured and everything keeps running well. Various support services are offered to the users. From time to time the IT community has to adapt the software to new situations and needs.

Although this picture is valid, it is rather extremely simplified. It is vital to consider software application and its development, during this kind of discussions, in a more down-to-earth perspective and in a broader and more appropriate context. The following thoughts draw a more realistic and complete picture.

The following topics will be discussed:

1. Information System / Software Application is a System
2. An Information Solution Is an Enterprise-Wide Topic
3. An Information Solution's Life Cycle
4. Role of IT: Technology or Provisioning of an Information Solution
5. Business and Information Systems Engineering: A Different Profession

### 1. Information System / Software Application is a System

An information system is a complex multifaceted dynamical system which consists of people, procedures and processes, information and an infrastructure (hardware, technologies). Most often, information systems are, partly or completely, automated. For these information systems, software and the IT infrastructure are important components.

Information describes some objects, concepts or attributes of the real world. These information elements are, like in the real world, related to each other. They are in a specific state or situation. Changes happening in the real world are recorded. The information stored in the information system reflects the real world and changes accordingly.

The software application is a predetermined script and configuration defining and describing every process, every step, every case, every behaviour, every input and output and every information element in a very detailed, consistent and formal way. This describes a large part of the system's behaviour. The hardware and technologies have, of course, also an impact on the behaviour. Cases, processes and behaviours that have not been foreseen and programmed can't be handled by the computer. Everything must be foreseen and described in advance.

A software system has many qualities like learnability, usability, attractiveness, reliability, capacity, operability, maintainability, scalability, recoverability, testability, interoperability, installability and a capability to evolve.

The complexity is formed by the levels of detail – the lowest layer is extremely detailed -, the huge number of specific cases, the states and the interaction between technologies, processes and information. Consistency must be guaranteed at all time. Concepts and objects proper to the solution and the many different technologies add up to the complexity.

An information system may consist of several (sub-)systems. Usually, it consists of one or more software applications, which in their turn can be broken down in different components developed in, using or running on different technologies. As software components run, they interact with each other through inter-process communication mechanisms, network connections, shared databases or simply by transferring files. Most of the software is connected one way or another to other software.

The architecture usually concerns user interfaces and navigation, information, processes, security and technology. The business logic spread over a portfolio of software systems, as well as the logic that is implemented within a single software system or within its individual components, must be organised. This can be based on aspects like functional meaning, purpose, technology, security, geographical aspect, status or even origin and destination. Various types of architectures do exist. The architecture is also responsible for some qualities of the information system. The quality of the internal organisation, the degree of standardisation at various levels, the cohesiveness, the genericity, the reusability and flexibility are some of the qualities of software applications. These qualities are not always visible to end users. The lacks of such qualities, as well as fragmentation, overly complex logic and unnecessary source code, have an adverse effect.

A software application is a very complex system. It is best developed by following a systematic approach. Analysis and design methods have been developed especially to be able to cope with this complexity. Developing such systems is a very labour-intensive endeavour.

## **2. An Information Solution Is an Enterprise-Wide Topic**

The company's ensemble of information systems supports the activities of the whole company. Software systems capture, store, process and transfer information. Today, it is rare to find a system that is in complete isolation of other systems. They are connected to each other and exchange or share information. Information travels, over the network, from system to system across the company. Some systems provide services to each other.

Clients of a system can be found anywhere in the company, at any level in the hierarchy. These clients can be people, other information systems or machines. A client can even be another organisation.

Together, these systems form the global enterprise wide IT solution, or at another level, the enterprise wide information solution that supports the activities of the whole company. Information systems don't have the same boundaries as the company's organisational divisions. They extend beyond the boundaries of a single service or department or outside the enterprise. Adapting one part of the system may have effects elsewhere in the company or outside.

### **3. An Information Solution's Life Cycle**

Information systems are born through IT projects. After their birth, they have a lifetime of a few years up to several decades. During their life, they may have to mature. Also, they will still undergo many changes to respond to environmental changes, changes in the company and changes in the way business is practised. They can be upgraded, adapted, expanded and connected with other systems. Their building blocks may change as well as the technologies they are built with. Information systems are influenced by the events in the life of the company, like expansion of business shares, rightsizing, delocalisation, mergers and acquisitions. In the end, the system will be decommissioned and possibly it will be replaced with a brand new system.

### **4. Role of IT: Technology or Provisioning of an Information Solution**

A company needs information. It allows the company to produce goods and to offer services. Information is present everywhere throughout the company in many forms. Information makes the operations and the management of the company possible. This information must be stored, managed, controlled, distributed and used appropriately. Therefore, information within the information environment or sphere, must be identified, organised and its usage regulated.

This environment is mainly an aggregate of information, actors, information systems, software applications, tools, information storage, policies, procedures, information processes, methodologies, standards and ICT infrastructure. The list is not exhaustive. The internals of the information environment must be defined, organised, developed and managed.

The information environment is not an isolated environment. The role of IT has to be perceived as being connected to disciplines like management, product development, enterprise engineering, industrial engineering and organisation development. Their purpose is to conceive and to create or to transform parts or aspects of the socio-technical system, which is the company. IT is a logical extension of these domains. But IT also overlaps partly with some of these disciplines.

"IT" is often considered as the collection of technologies and the knowledge and practice related to them. A set of various disciplines related to information, information processing and information systems should also be covered by the term "IT".

Fields of expertises included or closely related to IT are information science, business informatics, computing science and software engineering. They are all concerned by information or the creation of (information) systems.

#### **Objective 1: Automation:**

The role of IT is to make sure the needed information can be captured, stored, processed, secured, transported, made accessible and presented in a useable way.

The main tools to achieve this are software and the IT infrastructure. The IT department develops and maintains software applications and installs and manage the IT infrastructure.

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### **Objective 2: Effectiveness:**

The objective of IT is to increase the effectiveness of business activities.

Ineffectiveness's of IT solutions are solved. The design of systems and databases are reviewed. The organisation of the information is enhanced and the quality improved. Attention is focused on standardisation, harmonisation and integration. More systems are connected with each other and more information is shared among systems. Opportunities to improve the capturing, the processing and the distribution of information are searched for. More services and processes are automated and optimised.

IT produces documents and models. They offer a better insight of the functioning of the companies. They ease, among others, communication, optimisation, analysis of impacts of changes and detection of risks.

### **Objective 3: Exploitation of Information**

IT contributes to the exploitation of information.

Much more information can be more easily captured, processed, shared and exploited. To improve the exploitation of information, its quality must increase. Usually larger volumes of information are consulted. The unpredictable information needs requires more flexible ways to query and process information. Specific tools are implemented. A more effective exploitation of the information improves the overall efficiency, the flexibility and the effectiveness of the company. Business intelligence is a domain that gets more attention.

Actually, "Information Department", "Information Resource Department", "Business Informatics Department" or "Information and Automation Department" are more suitable names for an IT department. These names put the focus more on the real objectives.

### **Objective 4: Support of the Business Objectives**

But the objective of IT can be raised to a higher level. IT can directly contribute to business objectives like cost reduction; decreasing delivery time or increasing sales, customer loyalty or levels of quality.

More business knowledge, especially related the management's perspective, is brought into the IT management and development. And business decision makers consider IT as a contributor to their plans and objectives.

### **Objective 5: Innovation**

IT can contribute to the innovation of products, services and activities.

IT can contribute to innovation. Through new concepts and technologies, IT allows the creation of new products and services, which can be proposed to the clients. Products



can be manufactured by using new techniques. IT offers new ways of delivering these products and services. IT makes new organisational structures, new relations, new ways of working and new forms of collaboration with clients, partners or colleagues possible. The whole functioning of the company is changing and new ways of doing business can be possible.

#### **Objective 6: Full exploitation of the potential of IT & Company's long term future**

The company should benefit a maximum of the real potential of IT.

IT within a company is mainly concerned by the organisation of information, its processes and usage and the provision of tools to manage the information. IT contributes, or should contribute, to the efficiency, effectiveness, quality and cost minimisation. IT is a factor that impacts the characteristics and the strengths of the body of the company. As IT pervades the organisation from top to bottom and because it allows new forms of internal organisation and processes, it plays a very important role in the formation of the company, its strategy, its business models and its products and services.

If a company wants to maximise the exploitation of IT, it should consider the knowledge and the competencies offered by IT. Instead of using needs as starting point and using IT to respond to the needs, it is more interesting to consider the potential IT has to offer and to try to exploit these opportunities. IT can contribute to the conception of the internals of the company and play an active role and share responsibility in the support of the long term future of the company.

IT is a diverse and very dynamical domain. The knowledge domain is continuously expanding. New concepts and technologies are invented. As a source of inspiration for innovation, IT can offer opportunities to the company to reinvent itself.

IT can increase the adaptability of a company and in this way support the company's evolution. Indeed, the implemented IT solution may have to cope with all events that may occur in the lifetime of a company like the introduction of new products or product changes, changes in business models, market changes, expansion of business shares, internal reorganisations, physical expansion of the company, externalisation of services, rightsizing, changes in distribution channels, changes in collaboration and in partnerships, changes in geographical localisation, technological changes, mergers and acquisitions.

This last objective necessitates very important responsibilities of IT. Clearly, the mindset, norms, competencies, approach and position of IT required for this last objective will be different from those suitable for the first objective.

IT influences its evolution and its growth. IT can positively contribute to a flexible organisational structure and a smooth functioning, better management, increase of competencies and better products and services. IT is a force that can move the company ahead and plays an active role in the company's long term future. IT must

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participate in the conception of the company's internals in such a way that unlock its full capabilities in a sustainable way.

## **5. Business and Information Systems Engineering: A Different Profession**

We can recognise two distinct types of roles: the system-creator role and the system-usage-oriented role.

Usage-oriented roles are more concerned with steering, using and maintaining the system. The car owner will drive and maintain his car and the car mechanic repairs it. A property owner will arrange the interior of his house and maintain it. The pilot will fly the airplane and the air crew and passengers have their own way of using the airplane. Managers will manage a company, while employees will use it to produce and to sell products and services.

The system will help these people to reach their goals. The part of the system the user is interacting with is only the emerged part of the iceberg. In some cases, users can make small changes. Most often, the understanding of its internals and structural qualities are missing. Therefore, it is not advisable to make changes that impact the core of the system, its internal structure or its purpose.

The system-creator-roles, like that of an engineer or an architect, are fundamentally different. Engineers and architects are building cars, planes, houses or factories. Their goal is to contribute to the higher objectives by conceiving and building a system that will help others to reach their objectives. They play a major role during the creation of the system and during more profound changes. The knowledge and competences of engineers and architects, their intentions, the aspects they take into consideration, their priorities are very different. They are concerned about many more aspects and qualities of the system, like the structure, the construction, the maintenance, the environment and the whole life cycle of the system. Engineers and architects have a way of thinking, a state of mind, and a relation with the system that are a pole apart from that of users and people who steer or maintain the system.

There is a fundamental difference in perception, competencies, way of thinking, attitude, approach and decision making between the people that conceive and build a system and those who use it. It isn't different with information systems.

The primarily reason business people are employed by a company is to make sure the business is running. This is their full time job. Their objectives, their responsibilities, their activities and their whole work environment, all are oriented to support this purpose. This has influences on the perception of the world, the habitual thinking patterns, the values and the attitude. All these aspects are adapted to fit in this work environment and role and to support the business objectives.

Similarly, IT people are hired to conceive and build information systems. Their objectives and work environment influences their way of thinking.

Not respecting this difference between the two types of roles may lead to disasters.

## 6 Examination of the Three Assumptions

In this chapter the three assumptions will be analysed.

1. The business community is able to identify its information needs
2. The business community is able to conceive a solution
3. The business community is able to formulate a demand

### 6.1 Assumption 1: Identification of the Information Needs

The business community may notice an opportunity to automate an existing system, to rebuild, expand, adapt or re-engineer an existing software system or to develop a new system. These opportunities may be related to information, services and processes, performances, efficiency, cost and profits, controls and security, technological issues and to obligations like contractual agreements, legal requirements and market agreements (PIECES Framework).

Ultimately, it mainly boils down to information and how information is treated. A company can't function without it. It is obvious that if information needs are not well identified and understood, it is simply impossible to obtain a solution that solves the needs. Identifying, understanding and evaluating the information needs correctly are the first and most important steps in the process of conceiving and constructing a solution. Is the business community able to identify its information needs?

#### 6.1.1 Information Needs

Information needs may concern a lack of information, the quality of information, a lack of context, meta-information, standardisation, processing, accessibility, usability, reliability and time related issues.

Information needs are discovered in different ways. Some needs are known in advance, well before they materialise. They are often generated by objectives, plans, legal obligations and agreements. The understanding of how markets, products, the company's organisation and the present information systems evolve are also a valuable source to identify future information needs.

But some needs are detected only once they exist. Most of them are detected through their adverse outcomes or through limitations they created. They could have been detected through an investigation. An information need or issue may be sleeping. There is no impact yet or it remains unnoticed. Imperceptibly, under the surface, the issue grows gradually. The need may already exist for a while before it is detected. It may even remain unnoticed as well.

Symptoms, or consequences, with small and local impact may easily be misinterpreted or ignored. They may be confused with glitches that happen in the functioning of a company and accepted as such. Possibly, these symptoms are corrected during the operations. The incident is not recognised as a symptom. Some symptoms may remain invisible. The consequences may already exist before they are experienced. The impact can appear "miles away" from the problem. The symptoms may pop up across the company and be observed by different people in a different forms and contexts.

As the issue grows, its symptoms or consequences become apparent. It starts to wake up the awareness. People are dissatisfied. They feel there is something around that isn't right. But the issue hasn't been identified yet. Meanwhile consequences are accepted and dealt with.

The link between a consequence and an issue is not always a clear and direct one-to-one relation. One symptom can be caused by one or more underlying issues. And one single issue can generate several symptoms. The symptoms may seem to be very different and appear at different places in the organisation. A combination of factors may play a role. Symptoms may provide information about the nature of the issue, but they may also be nothing more than just a signal.

As the issue gets bigger, the frequency of the consequences may increase or the impact becomes more important. There is a clear acknowledgement that something isn't right.

It appears as if the information need emerged unexpectedly. The need is identified. The information issue may still be surrounded by some clouds containing unknowns. This is especially true when the outcomes aren't a direct result of the need.

Still more time may pass before the information issue is understood.

The information needs of some non-repetitive activities, especially in management, are very difficult to describe and to forecast precisely. Additionally, it may turn out that these information needs require the capture of information at different places of the operational level, or at other levels in the company, much time ago long before the information need became apparent.

Information doesn't mean a lot without its context. Information is connected with other information elements. One information element can be shared and used by different users in different way for specific purposes. Moreover, solving one information need may generate new information needs. Consequently, an information need isn't necessarily something isolated and well delineated. And an information need doesn't concern only the information itself, but also aspects like its place, format, usage, purpose, time, validity, restrictions and security.

Undetected information needs are inefficiencies in the company. Information needs can be quite complex and confusing. As long as the causes, the conditions, the motivations, the limits and constrains and the mechanisms aren't clear, the need may be identified but certainly not yet understood. Solving a need that is only vaguely understood is risky.

### **6.1.2 Identification of the Needs**

#### **▪ Business Objectives**

The objective of the business community is to manage the business and to keep the daily business operations running. The information needs must be detected and understood through investigation and analysis. The identification and investigation requires an effort. These activities contribute only indirectly to the business objectives. Employees are more likely to perform activities related to the primary goals of their role and which directly contribute to their objectives, like delivering a service to a client or closing a new deal. It is very likely that there are no incentives in place to instigate the business community to investigate accurately its information needs.

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- **Locally Thinking**

Companies are often organised in units based on a common objective, on similarity in the work or on a common business area or knowledge. Often, the insight of a business domain expert about the functioning of a company and its information needs is mainly limited to his department. His knowledge even of adjacent services or departments can already be vague and uncertain. The information needs and issues of organisational units beyond his perimeter may well be unknown. Same information needs that are shared by different departments are therefore difficult to be recognised as such. Moreover, issues of another department do not belong to the responsibilities of his service, his department or his business unit and, generally speaking, they don't contribute to its objectives. In a similar way, information needs are more likely to be recognised within a single horizontal layer of the organisation's pyramid. Needs of higher or lower levels are unknown and not considered. The conditions are not favourable at all to consider information needs from a broader and more inclusive perspective. There are no incentives to do so.

- **Focus on Time Span**

Software development requires insight in the information need at a detailed level well in advance.

At the operational level, specific information must be available at an exact point in time to allow the execution of an activity or process to happen.

The information need can be clear, detailed, concrete and well understood. Unfortunately, the operational level of the business component tends to focus more on the present or on a very near future. Because of the objectives and the short term, the information needs are hardly anticipated. They are often identified through the consequences of their existence.

At a higher level in the organisation, the managers prepare the more distant future of the business through visions, strategies and plans. Their decisions will create future information needs. As they elaborate plans, they have a vision on future changes. This may appear ideal to anticipate future information needs. However, at that level, the picture is very global. Investigating the information need in detail is not one of the priorities. There is little enticement to spend effort on it.

- **Profession - Attitude**

The difference between system-usage-oriented roles and engineering roles has an effect on the way needs and issues are being searched for, identified, analysed and evaluated and on the quality of the obtained results. Because of this difference, it is quite likely that it won't happen methodically and thoroughly. As a consequence, there is little chance to obtain a relatively complete, clear, consistent and reliable picture of the present and future needs.

- **Profession - Competencies**

Principles and techniques used in process analysis and design and in information modelling, concepts of computing science, the understanding of information systems and their life cycle and understanding the software development process are very useful to deal correctly and

effectively with an information need and to appreciate it rightly in the context of the conception of information systems and automation.

### **6.1.3 Conclusion**

Information needs may be nebulous and complex. Identifying and getting the right insight in information needs requires a due effort. The exploration of these needs isn't an ad hoc activity that can be improvised and intuitively executed. Many information needs may remain hidden, detected late or misunderstood. This is not favourable for the elaboration of a fitting solution of a reasonable quality.

A broader view, as well vertically as horizontally, and an insight in the past and expected future of the company are essential to investigate its information needs. This avoids local solutions with short lifespan. It decreases the risk of negative impact later or elsewhere in the company. And it will facilitate the integration of the solution.

Usually, information needs aren't simple. Developing a solution which must be integrated and be able to serve for several years, isn't simple. Besides business knowledge, specific competencies in systems analysis, and other related fields, are well advisable.

Aligning the objectives, incentives and responsibilities of the business experts with the investigation of information needs would have a positive influence on it. But is this their primary goal?

The following questions come to the mind.

- What is the importance assigned to the detection of information needs?
- How important do we consider the identification of future information needs? Do we act accordingly?
- What effort and competencies are deployed in these investigations by the business community?
- Are such investigations sporadic or regular, formal and embedded in the usual functioning of the company?
- Is it possible to detect future information needs?
- What may hinder the detection of (future) information needs and how can we remove these barriers?

These questions go beyond the purpose of this document.

However, we shouldn't throw out the baby with the bath water. The business community has business domain knowledge and field experience. Possibly they experienced the consequences and have noticed the symptoms of an information need. They can put the need, once identified, in relation to the business objectives. As they devised the plans and set the objectives, business people know the intention and higher goals behind future needs. The input of business people is a very good basis for further investigation, their knowledge is vital and their collaboration precious.

## **6.2 Assumption 2: Envisioning a Solution**

The business community rarely expresses its objectives, complaints and needs. Rather, it expresses a demand with requirements and specifications that reflects a solution envisioned by business domain experts. This solution can be a collection of features or processes that handle information and manipulations of information on a graphical user interface. The solution they have in mind can be

limited to the main lines, to some essential features and some screens. The description may depict only some fragments of the future solution. But it may already be quite complete and detailed as well. Some areas or aspects of the solution may still be vague and superficial and contain uncertainties. A strategy to cope with these uncertainties is to solve them with temporary solutions.

The following perspectives are considered: the input, the cross-functional perspective, the vertical view, the time perspective, the main stakeholder's perspective, subjectivity, the competencies, and the attitude.

#### ▪ **The Input**

A thorough insight in the situation and a reliable and complete understanding of the needs is a prerequisite to conceive an effective solution. The input is provided by the identification and analysis of the needs. This aspect has been discussed as the first assumption.

#### ▪ **The Cross-Functional Perspective**

Information is often shared by many stakeholders and organisational units within the company. Business processes run across different departments. Information systems extend beyond the boundary of a single department. A broader and more inclusive understanding is essential to devise a global solution or to ensure a seamless integration of the solution.

The insight of a business expert is often limited to his own perimeter of expertise and responsibility and to his service or department. His knowledge about the needs and functioning of adjacent departments becomes quickly vague and uncertain. The issues of these other organisational units do not belong to his responsibility and they don't contribute to his objectives. The issues, for which he will devise a solution, will be limited to the area he is familiar with and for which he is responsible for.

Solutions designed from a local perspective may negatively impact the functioning of the company in other departments and be a source of sub-optimisation. The new solution may also impose an adaptation on other parts of the company. The functional silos may be reflected in the information systems resulting in 'automation islands'. Additionally, it can be interesting to group similar needed improvements from other departments and systems and solve them together. This kind of opportunities may not be seized. Other departments or systems may have solution elements that may facilitate solving the needs. These opportunities can also remain unnoticed.

#### ▪ **The Vertical View**

Business people are interested in automated solutions which either implement business processes, entirely or partially, or support them. Software applications contribute to the objectives, ease the work and make higher throughputs and shorter cycle time possible. They have to function reliably and consistently. Users are more concerned with the input and output, the interaction with the user interface, the response time and the features that directly helps them in their daily work. These are the most essential aspects the business community is familiar with.

But this represents only the thin emerged part of the iceberg. They don't feel concerned by the other layers of the iceberg. This isn't about technologies. But it concerns the structures, the concepts, the mechanisms and the rules expressed with the technologies. What is behind the user interface, which is, roughly speaking, detailed implemented business logic, remains a black-box.

- **The Time Perspective**

The business community is mainly concerned by the availability of information and the ability to capture it and to process it when needed. In other words, at the moment the information serves the business activities. If we don't know whether we will need an information element tomorrow, why should we care about it today? At the same time, they rely on the assumption that, as the information needs evolve, systems will evolve together. This is only true if the solutions have been well designed.

A conceptual solution designed with the short term benefits in mind leads to a solution that will function effectively today. During its lifetime, the solution will have to cope with changes. These changes aren't only different business logic or expansions of it. It concerns also all the events happening in the life of the company. The requirements, the priorities and the circumstances of the project aimed to build as soon as possible a system solving today's needs, are different from the prerequisites and conditions needed to build a system that is able to ensure good services for many years. By falling short in considering future changes or at least the capability of adaptation and expansion, the lifespan of the solution is shortened. Either the software will have to be reengineered or new or additional systems will have to be built. Or, short term priorities and hurry makes the future life of the system risky and more expensive.

- **The Main Stakeholder's Perspective**

The solution is conceived by a group of business experts. They draw the main lines of the solution accordingly to their perspective. But the future system will probably share information with other systems spread across the company and at different levels in the hierarchy, like management or business intelligence systems, serving a great variety of users.

The system itself is also used, maintained, managed and adapted by the IT community. The IT community has responsibilities during the whole lifespan of the application. The IT community is also a stakeholder.

The future solution is not a solution on its own. It is a part of the enterprise wide information solution that serves the whole company in an effective and cost efficient way. This global solution, including the future solution, has to evolve accordingly to the changes within the company. Therefore, the company, as a whole, has its own requirements. It may be useful to consider the company as the principal and dominant stakeholder, be it an abstract one.

There are plenty of other objectives, stakeholders and perspectives that may easily be ignored.

- **Subjectivity**

The perception of an individual tends to be influenced by its objectives, by those aspects on which he is controlled and evaluated. He may experience some annoyances or perceive some

work as with little or without added value. And he may have his own preferences and likings. His perception can also be influenced by his former experiences. An individual may see the demand as an opportunity to solve these personal issues. It isn't easy to have an objective and balanced perspective on a problem area. This may constitute a risk when a solution is put forward by one or by a very few individuals.

#### ▪ **The Competencies**

The conceptual design of a solution requires business knowledge and knowledge of information systems, as a theoretical knowledge area. The business expert doesn't possess the latter. This has consequences.

- Business people have difficulty in judging what information is important for the future solution. They have difficulties in setting priorities, estimating what it takes to develop a solution or the impact of a decision on the development process and on the future solution. In fact, this is one of the key elements that create the misunderstanding in the relation with the IT community.
- Often a solution seems to be inspired from processes that typically can be found in classic paper offices. As the business community is used to these thinking patterns, its solutions will reflect a comparable way of working and similar concepts. Consequently, business people are more inclined to automate the existing processes. Developing a new information system is an ideal opportunity to innovate and to rethink the entire way of working.
- Some business people may devise a solution which, from their point of view, seems to be logical and feasible. In fact, conceptually or technically it isn't, or it doesn't respect the "best practices" or even elementary principles of information systems design. Others ascribe some surprising capabilities to computer systems, like mind reading, guessing, interpreting, thinking, improvising or taking decisions like humans would do, which would make them able to act accordingly to the user's desires on all kinds of unforeseen situations. These solutions are characterised by the assumption that the computer "knows" that it has to do something in circumstances that have to be interpreted. A sound and consistent logic to explain the computer's behaviour can't be provided.

Various fields like information science, computing science and software engineering provide insight in how to deal with information, processes and systems. They explain principles, concepts, mechanisms and structures that, when well integrated in the thinking patterns of the solution designer, allow designing better systems using new ways of working and new concepts. Knowledge need to be fully mastered to serve (safely) as a useful source of inspiration. Only when they are mastered they inspire him. As this is not the primary field of activities of the business, they do normally not possess this knowledge and their skills in these fields are not trained. We can expect that they will make similar mistakes as a junior systems analyst would make.

#### ▪ **The Attitude**

Information systems are complex man-made systems. They have to be engineered. The difference between the systemic and methodical approach of an engineer and the more

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informal and improvised approach of someone who is not familiar with information systems has a serious impact on the quality of the solution.

### **6.2.1 Conclusions**

The business experts can conceive a solution to solve their needs. Their lack of broader vision and their lack of a number of competencies will translate itself into difficulties during the development, lower quality, unsatisfied needs, risks and probably a higher total cost of ownership of the information system.

The identified needs may be solved inappropriately. The solution can be not feasible, not very innovative and may implement inefficiencies as they exist in the present organisation. Information needs, required changes, opportunities and solution elements existing in other systems or elsewhere in the company may be ignored. Not all opportunities have been detected and fully exploited. Other potential risks are sub-optimization, duplication and difficulties in integration. Standardisation and commonality may not be encouraged. We may expect a lot of rework and changes. The solution may be difficult to manage, to adapt and to expand.

## **6.3 Assumption 3: Formulating the Demand**

After the business experts have conceived a solution, they will formulate a demand. This demand reflects the envisioned solution that is expected to satisfy the needs and meet the expectations. The business demand is the foundation for the set up of the project and for the development of a software solution. The business people may estimate their demand to be well formulated. But people responsible for the project and for building the solution may come to a different conclusion.

Why? It can easily be explained by a hypothetical metaphor. Let's imagine that a customer can describe the car he needs or desires. He can do this by describing the car. Then, the car manufacturer builds the car accordingly to the customer's demand. An administration employee, an engineer, a transport security specialist, a rally pilot, a poet, a car mechanic, a nurse, a poet and a fashion designer, who all excel in their job, wants to buy a car. Each of these customers describes the car he or she needs. The way each of these persons will describe their desired car will differ tremendously. Some customers won't even think on some requirements. Differences like size, cost, type, model, colour or additional features of the car aren't important here. The car mechanic will have more requirements concerning the maintenance of the car. The pilot will talk more about performances and driving qualities. The poet will describe the car in a more poetical way. How many of them will ask to have breaks on each wheel or specify the standard of the tire valves? They may ignore the existence of some essential characteristics or modern technologies or concepts. If the car manufacturer builds and delivers the cars exactly as they have been described by the demands, without adding any of the assumed or necessary features and characteristics that haven't been specified in the demand, we may expect that most of the drivers will have some very unpleasant surprises.

The environment in which the future solution will have to operate and the software systems itself are complex and multifaceted. The construction of a software solution is a challenge. A methodical approach and specific techniques allow mastering this complexity and help to achieve better results. The produced requirements and specifications have to be correct, complete, cohesive, clear, consistent, detailed, feasible, mandatory, verifiable and valid for at least a reasonable period time.

The business experts may have uncertainties, information that should be verified, aspects that should be further investigated, assumptions, decisions that still has to be taken or a solution that still has to be found. To cope with these issues, the business expert may leave a gap in the demand. He may remain vague about it or he may fill this gap with temporary or unverified information. The information may be communicated as if it is definitive.

The business demand can be incomplete without the business community being aware of this. Some information may be omitted because, at glance, it is of no interest to the business. Nevertheless, it can be essential to the IT people. The business community may easily have forgotten some features, specific cases that should be processed or information that should be captured. Some aspects or characteristics of the system may have been overlooked. It is easy to inadvertently omit aspects that are too obvious or which belong to the very basics of the business. There are many aspects and attributes, which are important for offering a good service to the business, a business domain expert isn't aware of and thus to be taken into account. The demand may contain inconsistencies or may even not be feasible.

The business expert doesn't know which information must be provided and when it must be provided. He isn't familiar with the extreme detailed level of information to be provided. Probably he will focus on features and some capacity attributes. The information passed on the IT project should meet a certain level of quality. Usually, he knows much more than the information provided in the demand.

The business experts may provide the information in a way they judge well enough. Or, they can try to provide all the information they can think of that might be useful to the IT project. Neither approach will work. The information communicated by means of a demand has a specific purpose: building a software application that solves information needs. Or, the specialists who will conceive and build the solution must have a clear understanding of the problem area, the issue itself and the subject matter. This information must be communicated in a way that it makes sense to the solution builders. To achieve this communication successfully, the understanding of what information is, how it can be organised and processed, what information systems are and how they are build is essential. Unfortunately, the business community is not familiar with these subjects. Therefore they can't judge whether the transmitted information is appropriate or not and communicate purposely.

Business demands are valuable. They can't be perfect and, as the analyst has still a role to play; this is not a big issue. But it may become a serious issue when an inaccurate demand is considered for more than it really is. A chapter is dedicated to communication issues.

## **6.4 Conclusion**

There are weaknesses in the detection, investigation and evaluation of information needs. Business knowledge doesn't suffice to conceive a solution. The communication has also to face several weaknesses. Globally, spoken the conditions are not favourable to perform these three activities. These activities produce a business demand. The business demand as basis for the information system development process and the information solution is rather a fragile foundation.

## 7 Weaknesses of Business Demand Driven Approach

A business demand can be considered with various degrees of importance and handled in different ways. Business demands can be considered as a trigger, an objective, requirements, a blueprint or as potentially valuable information for the development of the IT solutions determines. The role assigned to the business demand determines, among others, the authority, the responsibilities and the activities of the involved actors. Hereby, it has an effect on the timing and pace of change, on the future solution and on the quality of the products. The work environment, the attitude of these actors, the relationship and collaboration between the business community and the IT community and the competencies of the IT community will be heavily influenced also.

Commonly, the business demand is considered as requirements or blueprint. The objective is to build a product that fully complies with it. This provides a lot of weight to the demand. Because of the importance of this document, the whole approach and the organisational arrangement are adapted to match the way the business demand is considered and handled. The weaknesses of this process are investigated in this chapter.

### 7.1 The Process Chain

Although the process is only a small chain, it is interesting to have a closer look at it.

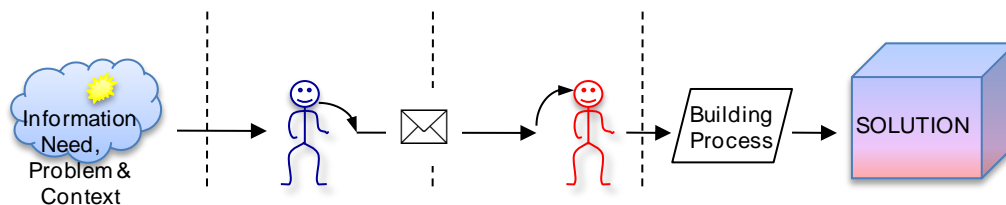


Fig. 5: Process Chain

An information need, which may exist or which is expected to happen in the future, triggers the attention of the business community. The information need is not simply a fact. It is related to a whole context of objectives, purpose, rules, business knowledge, practical processes and organisational resources. This list is not exhaustive.

Once the business community is aware of the need, they will gather information about it and pass a demand to the IT community. The IT community is here most likely represented by architects or analysts. Of course, the business experts provide additional information as needed. The IT community will build the solution.

This process is a sequence of steps performed by different actors. They pass the result of their work to the next actor. Although, there is dialogue and some collaboration between the actors, when we consider the steps, basically, the process is sequential and compartmentalised. This has very important consequences. This will be clarified in chapter 7.4.4.

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## 7.2 Execution of the Process

### 7.2.1 Need Identification

In the presented process, the business community is the main actor that discovers information issues.

Some needs are easy to identify either because they are created by a formal and controlled change; like new plans, objectives, agreements or regulations; or because they concern evident issues, like poor system performances or the outdated or limiting technologies.

But the objectives, the organisation, the operational environment and the functioning of a company change inexorably. The company's business environment evolves also. And new ideas or possibilities for optimisation or improvements may appear. These changes may evolve very slow and nearly imperceptibly. First, it causes needs that are so tiny that they are not easy to be noticed. These needs will grow gradually. Therefore such needs may remain unknown for a long time. Most often business people detect information needs only once they face rather severe consequences.

A user may have to handle a case that hasn't been foreseen in the software application. Due to exceptional circumstances the system may face a performance issue. The system may present wrong information to the user. Or, a user may notice a case of data inconsistency. These are just a few examples of information needs that may easily be interpreted as a faulty operation. The functioning of the company, its organisation and its systems are not perfect and mistakes may happen. The user may correct the incident. He may find a work-around for that particular incident. He may bypass some controls, change the order of operations, leaving unnecessary fields blank, coding the information differently, omitting to correct unused information or inputting information in a field that is not important or not used. Once resolved, the business can continue. Other users will find their own ad hoc work-around when they encounter an issue.

The incident won't prevent the company or the department to achieve its objectives. It didn't even really disrupt the operations. It has been considered as an exception with very local consequences and the effort and time required to solve it were rather negligible. It will be quickly forgotten. The symptom hasn't been noticed. The information need has been confused with a glitch in the company's functioning and it has been solved as such. Meanwhile, the information needs remains hidden and continue to grow imperceptibly; the work-arounds proliferate. Slowly, they continue contaminating one of the company's most vital resources.

The user's behaviour is motivated by his objectives and his responsibilities: keeping the business running. Verifying whether similar issues do exist, the real importance of it or the consequences of his work-around are not within his scope. An information issue didn't appear as important to the person that noticed the incident. But as information is set in relation with other information, as it is treated by various processes, used in different cases, on various places, by different persons for different purposes, it can be important for others, now or in the future.

Similar incidents happen more frequently. Information may become unreliable because of the work-arounds. The increase in dysfunctions of the system creates dissatisfaction. Because incidents are experienced by an increasing number of users, they become the subject of discussions among the users. These conversations confirm their dissatisfaction and leads to complaints. Thrust in the system and in the information contained in the system declines rapidly. The incidents and the consequences of the

work-arounds may become apparent in statistics and in reports. The company becomes aware that things don't work as well as they should.

A threshold is reached and it becomes clear that something has to be done about it. There may already have been damages, like clients who had a bad experience with the company or bad decisions taken based on erroneous data. There is no other option left other than to deal with the issue and preferably very quickly.

The information need exists and has been detected very late. Resources have been wasted with work-around. Now, the company has to solve the need and its consequences as well as clean-up the work-arounds and their consequences.

## **7.2.2 Dealing with Needs**

### **7.2.2.1 *Alternative to a Project***

A project is the main tool to build and implement a solution to a substantial information need. A project is often started by means of specific procedures. Demands must be formulated. Approvals are needed. Budgets must be allocated. This requires a cumbersome administrative process which takes time.

Much office automation software is very versatile, flexible and user-friendly. These software applications are used daily by many people. These tools allow scripting and even programming. Business people will appeal to their resourcefulness and use the possibilities offered by these software applications. They will choose to conceive and develop their own solutions. It's faster and cheaper. It is an opportunity to learn a lot. It is also a sure way to obtain exactly what they need and want. They show a sense of initiative and emphasise their interest in their job. Developing a solution gives a lot of satisfaction. It saved the cost of a project to the company.

Information need is experienced by different users across the company. But each of them uses the information in a different way. It is very likely that each of them may develop his own solution. These solutions are often separated software solutions equipped with their own database. This means that data is duplicated. It is harder to keep information up-to-date and more difficult to ensure the consistency with information stored elsewhere in the company. Possibly these applications exchange information among each other in various formats. Time is spent in transferring information, updating it and finding out what the correct and most recent information is. Finally, no one has a set of data that is complete and up-to-date.

As the user's solutions exchange data with each other, a change in one of the solutions may cause other solutions to fail. Such impacts are not under control.

The business community will have to maintain these solutions themselves. Often, only the author knows how the internals of the solution. He is the only one able to maintain it. His departure constitutes a risk since it would leave an important gap of knowledge.

These systems or solutions remain unknown to the IT department. Technology upgrades, back-ups and security are not guaranteed. In this case, such aspects are implicitly of the responsibility of the business community. But this may well be ignored.

The flexibility of developing one's own solution undermines the control, the standardisation, the reuse, the security, the reliability and the availability, the compliance with legal requirements and other regulations and the integration in the work environment and in the global information solution. Best practices are not applied.

After a while, the business community may find out by itself that their own solutions are not appropriate.

In the end, these solutions will probably have to be cleaned-up and integrated in the enterprise wide solution. They will be analysed and a definitive solution will be engineered. The data stored in the different user's solutions will have to be verified, corrected, merged and migrated to this final solution. In the long run, solutions developed by the business community may generate much more work. Nevertheless, in some cases this type of solution may suffice. But this must be judged very cautiously.

### **7.2.2.2 Trial and Error**

The detection of some information needs happened late. First, the business community dealt with the symptoms. After a while, they realised that the issue had to be solved. Maybe attempted to solve it by themselves. In the end, they decide to solve it by means of an IT project. They realise that a lot of time has passed. The business community may become impatient to get this need, which already exists for quite some time, to be finally resolved properly.

Information is gathered and the situation needs to be analysed. After a while, the business community may judge that these activities of gathering information and analysis took enough time. The situation is known for quite a while already. There is no more time to waste. The project must progress. These reasons are based on impatience. Instead, the decision to end these activities should be based on the quality of the obtained results.

The elicitation of needs, the gathering of information and the analysis may be executed too swiftly. The analysis won't be as thorough as an analysis performed by a professional analyst. The lack of competencies in the domain of information system development will affect the quality of the work. Probably, some areas still remain fuzzy, some aspects uncertain and some issues may not have been addressed yet.

Software development requires precise specifications. The produced software solution will have to comply with the business demand. It is quite possible, and sometimes acceptable, that the business expert doesn't have all the decisive answers or that his picture is not crystal clear yet. As an expert, he is expected to know his domain and to be able to provide precise answers. He doesn't want to slow down the process of elaborating the solution. He wants to come up with a demand as quickly as possible. He feels the obligation to have answers and solutions and to deliver a clear and precise demand. As an expert, he will do a lot to avoid having to admit that there are still unknowns or uncertainties. Under time pressure and under the pressure of the assumed obligation and expectations, he will find strategies to deal with this.

If the software application doesn't suit, it can always be adapted. With this idea in mind, he may fill in the gaps of uncertainties and unresolved issues by choosing for a simplified or temporary solution. He may try a solution. He may take decisions of which he knows they will have to be changed later.

The uncertainty and fuzzy areas may persist, but at least, the project can start. During the project execution, information can be confirmed, new information may become available, investigations are done more thoroughly, issues are resolved, agreements are reached, firm decisions are taken or directives become definitive. Much of this had to be settled before or during the analysis and design, or even before communicating the business demand.

Once the information system is in production, an evaluation may show what needs have been solved and which haven't been yet and what the new issues are. It will show where new changes are necessary. New needs may appear. The software application will, of course, not be satisfying, although it perfectly corresponds to the business demand, and it will have to be adapted.

Although it's not their real intention, the business experts may unwittingly engage in a kind of "trial and error"-approach.

### **7.2.2.3 *Maturing Insight***

When an information need has been detected, the insight is often still very limited. Much time can pass between the detection of the need and the construction of its solution.

The analysis is a methodical investigation and learning process. As the analysis progress, so will our understanding. This has to go on until we acquired sufficient insight. This is a maturing process.

If the analysis is an improvised process or if it is ended too early, e.g. because impatience or because of a lack of time or budget, lesser will be learned during the analysis phase. What hasn't been learned at this point is pushed forward in the process. It will have to be learned later in the process. This maturing process will go on during the construction phase and even during its use in operations. This will generate a lot of changes during and after the project execution.

A methodical approach in the investigation and the application of systems analysis techniques, combined with the right competencies, may speed up this learning process a lot. It should result in more complete, consistent and stable requirements.

### **7.2.2.4 *Design in Demand***

The demand should express needs. As the business community expects a solution that will solve its needs, it may be very tempted to express its needs by formulating the solution itself. However a need is not the same as a solution. This is an important confusion.

We wouldn't be surprised to get as demand, for example, the addition of a field on a screen, a feature that does a specific computation, some additional information in a report or some information to be transferred to another system.

Expressing a solution is already a step closer to the desired outcome. Maybe a need is a more abstract concept. A solution is more concrete and maybe it can be expressed with greater precision. Maybe it is a matter of trust. Maybe it is more rewarding to be able to conceive a solution. When we express a need, we can't know what we will get as solution. On the other hand, when we express the solution, we increase the chance to get what we asked for. We have some more certainty and control over the outcome.

The demand is transmitted to an analyst. He will do the analysis and the design as prescribed by the methodology.

A demand that describe a solution, or parts of it, automatically, contains some functional design. This design has been done even before the analysis started. Or, some aspects are already designed while not all needs and requirements, i.e. non-business requirements, have been identified and analysed. Although the official methodology has been followed, its underlying philosophy hasn't been respected.

### **7.2.3 Communication of the Demand**

An information system can't be developed based on information that is too vague, unstable, incomplete, temporary, inconsistent or not enough detailed. Such a development initiative requires about the issue, the context and the subject matter. If the information delivered by the business community doesn't suit the expected level of quality, the produced software won't match the expectations of the business community. Several cycles may be needed before the correct software is built. More about the communication of the demand in the chapters about the influence of the business community (chapter 7.3 & 7.6) and in the chapter dedicated to some communication issues (chapter 7.5).

### **7.2.4 Changes and New Needs**

Changes may occur during the whole lifetime of the software solution. They may occur from the very beginning of the global process, during the project execution as well as when the solution is deployed in production. An error detected during the analysis is often much easier to correct than when it is detected during the test phase. The earlier an error is detected in a software development process, the faster and easier it can be corrected.

In many cases, a company can't wait until all the information and knowledge about an issue is available, the insight fully matured and the requirements are complete and frozen.

The requirements determine or influence the decisions concerning the design of the solution, its architecture and the choices of technologies. For example, changes in the design of one database may impact different other databases, interfaces and different information systems. Possibly, the set of technologies, which have been chosen based on previous requirements, are not suitable to implement a solution that satisfies the changed or new requirements. This may force the solution to be redeveloped with another set of technologies more suitable to implement the new solution.

It can be necessary to adapt a software solution that is already in operation. This means that an effort in analysis, design, programming, testing, documentation and deployment has been spent on a faulty logic. This is a waste of valuable resources and time. Having faulty or inappropriate logic running in operations may impact the production and the business.

At each change, the IT community sees a part of its work, which may have been performed under pressure and in less than optimal work conditions, to be thrown away. The work must be redone. There was not enough time to do it right a first time. Now, they will have to do it over. The wasted effort could have been spend to more useful work. This is very frustrating and discouraging. Work that must be redone undermines the trust and credibility of the business community. This makes the collaboration between both parties difficult.

Changes have to be accepted. However, some late changes are due to a lack of understanding of the issue and the consequences of the solution. Once the software application is operational, new needs may appear. Some of these “new needs” are not new at all. They existed already before the project was started. They were not yet identified or they were postponed. These two kinds of changes are due to a lack of investigation and analysis. They are likely to generate a waste of time and resources. Such changes should be avoided. Not all changes are acceptable.

A better understanding of a problem and its context allows to define more stable and clear requirements. The succeeding and most costly activities can then be executed on a more solid basis. This is one of the “raison d’être of systems analysis and design”.

## **7.3 Importance and Influence of the Business Demand**

The business demand is the trigger and major input of the project. It forms the foundation of the future solution. The business demand influences the project directly in at least the following areas: business domain, problem area, objectives, conceptual solution, time, constraints and resources.

### **7.3.1 Subject and Problem Area and Objectives**

The business community determines the subject area concerned by the demand. Inside of this area, they delimit the problem area. They decide which needs have to be solved by the present initiative. Other needs can be solved later or by another project. This defines the nature of the problem and the objectives for the product and for the project.

### **7.3.2 Conceptual Input**

The business demand lays the conceptual foundation for the future solution. It determines the nature of the solution and defines its boundaries. Possibly, the business demand describes only a vague and uncertain solution. It may already indicate solution elements that have to be used, impose specific requirements on the future solution or describe parts of the finale solution. Or it may depict a well-thought, very detailed solution formally written down. Most likely, the business demand draws the main lines of the solution. In essence, the project follows the proposed solution and will only refine it. The conceptual work defines the largest and most important part of the future solution. It determines the maximal potential value of the future system. Once the business demand is ready, the conceptual foundation is already determined.

This input, together with the constraints, may have a major influence in the architectural design of the future solution and in the choice of technologies.

### **7.3.3 Time**

There are various points in time that are important:

- The point in time the need or issue can be detected
- The point in time the issue or need materialises
- The point in time of becoming aware of the issue or need
- The point in time of the decision to handle the issue or need through an IT project
- The point in time the demand is communicated
- The point in time the product is desired to be operational (delivery target date).

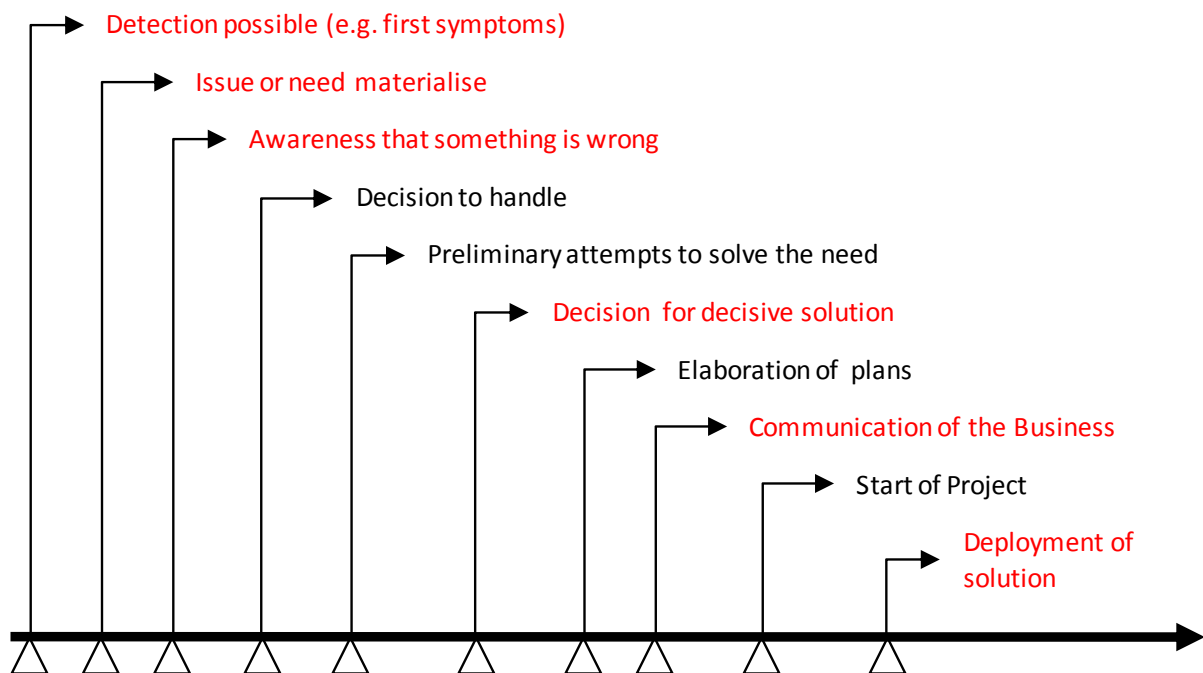


Fig. 6: Timeline from possible detection of need until its solution

Becoming aware of an information need is not necessarily something that happens by accident. Vigilance and an appropriate response to symptoms of information needs and complaints may make the detection to happen sooner. Formal initiatives to search for information needs in the present organisation can be planned. Ideally, needs should be anticipated by investigating the plans, objectives and evolutions.

Once the awareness of a need exists much time may be wasted before the decision is made to solve the need by means of an IT project. We may want to get more certainty and clarity about the need. There are some other issues with a greater priority to be solved first. Informal and brief attempts to solve the issue are made. Some stakeholders have to agree about solving it, about its solution, about the demand or about the budgets. Meanwhile the present need may have grown and become more urgent. Its priority will have risen.

This may create a cycle in which solutions on future needs are postponed. First, present needs have to be solved. While present needs are solved, the future needs materialise and become present needs. New future needs appear. Their solutions are postponed.

Then, some actions are needed to elaborate a demand, to get the necessary approvals and to communicate it officially. These are activities can be planned and executed in a controlled way by the business community.

A desired delivery target date may be determined by an agreement or may be imposed by a law, a regulation or by another external party. The date can have been determined by a decision of the business community, e.g. when it is based on plans. When the business community has to deal with an existing need that has a considerable impact on the business, the sense of urgency is great. This will

probably exercise a huge pressure on the project to have the solution implemented as early as possible. Possibly, lesser time than needed to develop will be assigned. If the need is well anticipated, the pressure on the project may be much lighter.

The earlier the business community is aware and the faster the demand is communicated, the more time is available to build the solution. Higher pressure in projects may lead to a lower quality and to increased risks. The chances to have an appropriate solution will decrease. A development process can be optimised, and thus shortened. It doesn't suffice to declare that the project must be finished sooner, to put some more pressure or to shuffle with budgets and tasks. Such an operation requires a throughout understanding of software development and of the specific situation of the project. It takes still a certain amount of time to cook a decent meal. By allowing lesser cooking time, the meal won't be better. There is an amount of time that is absolutely needed to build the solution. Trying to shorten the process beyond this needed amount of time will always lead to a lower quality, higher risks or higher cost, even though it is not always noticed. This doesn't mean it is insignificant. An additional cost or a lower quality may remain unnoticed; it is there and has an effect on the company's performances.

Anticipating an information need is not a matter of being aware or having taken a decision before the need materialises and the business suffers from the consequences. A need is only well-anticipated when the solution can be put in place before the need materialises. Time needed for all the preliminary activities, like the analysis, the preparation of the demand, its communication and the decision making process; time for the different delays and a reasonable amount of time needed to develop, test and deploy a decent solution properly must be included. The time wasted, for whatever reason on whatever place in the whole process, must also be taken into account or, if possible, avoided.

#### **7.3.4 Constraints and Opportunities**

It is obvious that the business community will formulate in its demand some constraints. The demand may also provide elements that have to be respected by the future solution or which may not be impacted. It may also present solution elements, choices and opportunities.

#### **7.3.5 Resources**

The constraints may limit the budget made available for the solution. Or they may put restrictions on the access of information sources, like documents, business people, managers and business experts. This may concern the collaboration as well.

#### **7.3.6 Conclusion**

The activities, performed from as early as before the discovery of the needs to the communication of the business demand, are under control of the business community. The effectiveness in the discovery of the needs, the depth of the investigation and the promptness of the decision to take expeditious measures are crucial to anticipate the needs.

The business demand triggers the set up of a project. The business community, through its demand, has a strong influence over the point in time of project start. It has also an influence on the content, the progress of the project and the final product and its quality. It's the whole course of the project that is influenced.

The business community has control over the following elements of the business demand or has at least some influence on them:

- the subject area covered by the demand
- the nature of the problem and the problem itself or the set of needs to be answered by one demand
- the boundaries
- the nature of the future solution
- and the major conceptual aspects, if not the detailed functional definition,
- the objectives of the future solution,
- the timing,
- the priorities and the constraints,
- the allocated budget and thus the resources.

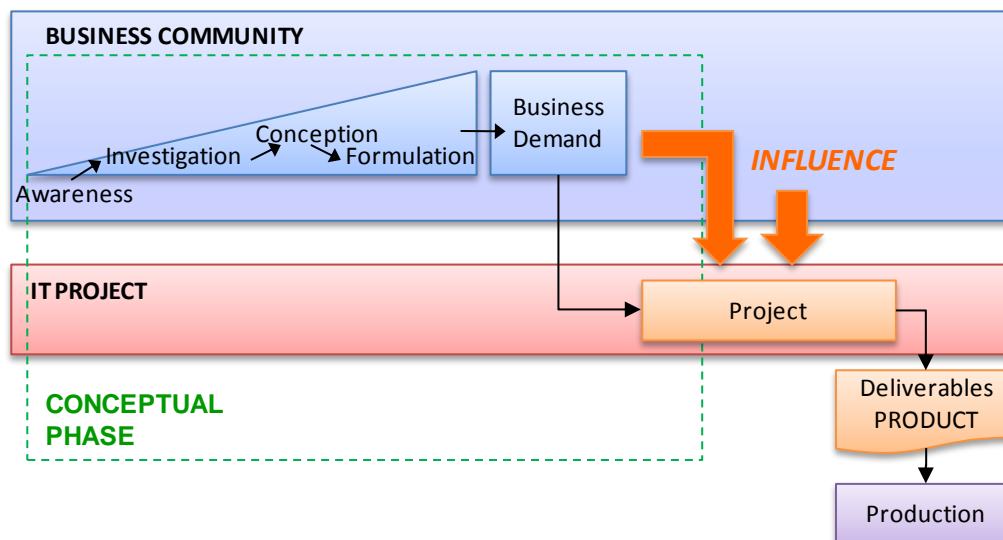


Fig. 7: Influence of the business community on projects

This influence goes well beyond the legitimate minimal role as previously defined. Furthermore, the business community influences the project through its position and its authority. This will be discussed in a following chapter.

## 7.4 Sequence of the Knowledge in the Global Approach

In the pre-project part of the global process, information about the issue or need is captured by the business experts. They process this information and elaborate a demand. This demand transferred to the analysts and architects, who will analyse the demand and conceive a solution. The result of their work is passed to people with a technological background like systems designers and programmers to build the system.

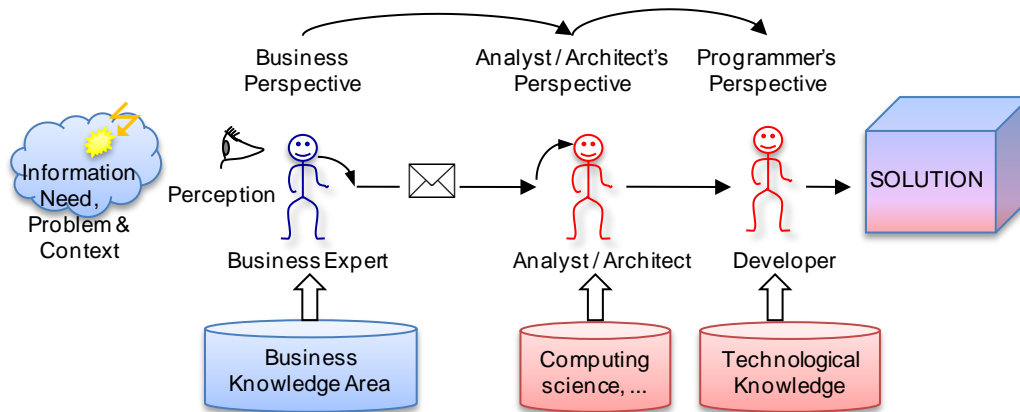


Fig. 8: Sequence of actors

There are a few weaknesses in this chain concept.

#### 7.4.1 Sequence of Roles, Knowledge, Perspectives and Objectives

Information and work transit from actor to actor through this chain. The output of one actor is the input of the next actor. Each actor plays a role in this chain. He or she is a part in the conception and building of the final solution.

Each actor has his competencies, his knowledge, his objectives and responsibilities and his perception. The information, as it transits from actor to actor through the chain, it is successively considered in a different context, from a different perspective and for different purposes. Each of the actors applies his field of expertise and transforms the information, develop it and add new information.

In this process the knowledge is brought in rather sequentially. But the process of information system development is not comparable with, for example, the assembly of a car. This is a creative process based on knowledge. It is about solving a problem by conceiving a solution. The solution, the information system, is a complex multifaceted dynamic system. Different aspects are intermingled. Nevertheless, its content has to be consistent and harmoniously organised. The information system itself is a part of the global information solution.

A chain of several actors increases the risk that information is considered by the individual actors from a narrow perspective or that, as it transits from actor to actor, information gets lost. An actor, by ignoring the rationale of a preceding actor, may spoil parts of his work. And by ignoring the reasoning of the future actors, he may hinder their work. Transiting information and work through a chain of experts of different domains may put the suitability of the final solution at risk. One of the questions is whether allowing the actors to work sequentially will lead to a suitable and integrated solution and in harmony within the solution itself.

In practice, the chain is short and information is formalised, organised and centralised. It is checked several times. The development process isn't a real chain. It is more a series of collaborative interventions of different experts. The effects and risks may well be attenuated.

### 7.4.2 Sequence of Competencies

At each step in the chain a specific expertise is brought into the process. A first stage is based solely on business knowledge. Then, through the business demand, the result of this stage is passed to a second stage in which analytical and conceptual competencies are applied. This is followed by a stage in which technological knowledge come into play.

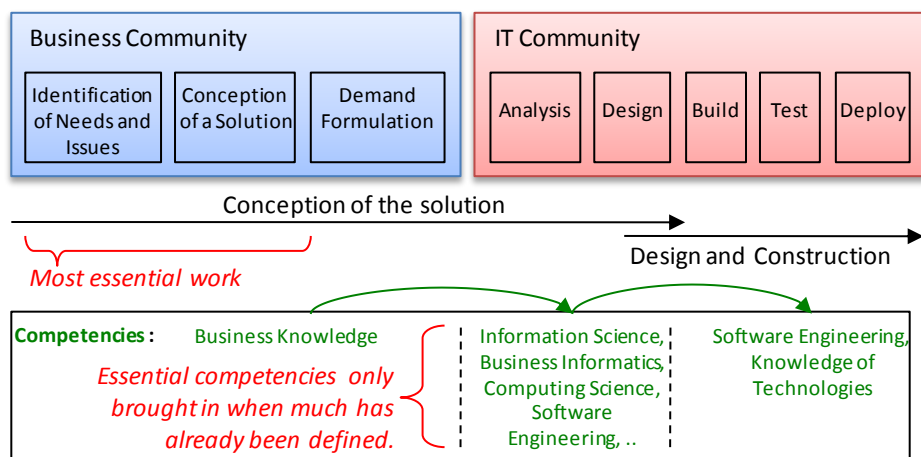


Fig. 9: Introduction of conceptual competences

In the first stage, a lot of fundamental work is performed. This work is analytical and conceptual in nature. The importance of the conceptual work can't be emphasised enough. Nevertheless, real conceptual competencies, based on established knowledge areas like computing science, and knowledge of information systems are brought in only later in the process.

The business community is mainly interested in the information that will be handled by the solution, in the features on the user interface and a few systems characteristics. This interest and business knowledge is not sufficient to ensure an appropriate and well-thought conceptual solution. The conceptual IT competencies are not fully exploited causing missed opportunities and inefficiencies. This can even be more damaging.

### 7.4.3 Communication Issues

Such a chain, consisting of very different types of actors bringing in their own competencies, is prone to communication problems. A whole chapter is dedicated to communication issues.

### 7.4.4 Compartmentalisation and Collaboration

For each phase, a specific group of individuals has the responsibility to produce the deliverables. Such a group has its own domain of expertise, their own objectives and their own perspective. Often they belong to the same organisational unit. When their deliverables are finished, it is passed to the next group. When something doesn't work out correctly, each group may defend its position, possibly leading to conflicts among groups. This whole framework stimulates the formation of groups. The process chain reinforces the compartmentalisation.

Groups of individuals are formed by dividing a population. Usually it is based on differences. These differences will be emphasised. Barriers are created. When everyone has his responsibilities or when the

same limited amount of resources are shared by the different groups or they have to be distributed over the groups, e.g. budgets, the risk of conflicts increases. The level of collaboration will rapidly decline, especially under pressure or when things don't work out as expected. This is not favourable to projects. It is even in contradiction to the essence of a project, which is to achieve together a common goal.

In some companies, the approach may appear as being lesser sequential since persons collaborate. They exchange information, discuss issues and provide information as input. Often this concerns two adjacent actors, the provider and the receiver within the chain. But mainly the compartmentalised sequence remains. The authority of each actor, the nature of the communication and collaboration, the discussed subjects, the information that is passed and how this is considered determine whether the chain is respected or not. This sequence is not without consequences.

## 7.5 Communication Issues

Because the business experts formulate the demand, which is already the conceptual foundation of the future solution, and the business community is the main source of information for the IT project, the communication from the business community to the IT people is a crucial aspect.

The global approach is a sequential process in which different actors play successively a role. They receive information, process it and pass it to the next actor. The role, the perspective, the objectives, the domain of expertise and the experience of each actor differs. The receiving actor will interpret and judge the information from within his situation and with his background. This arrangement of the process is prone to communication issues.

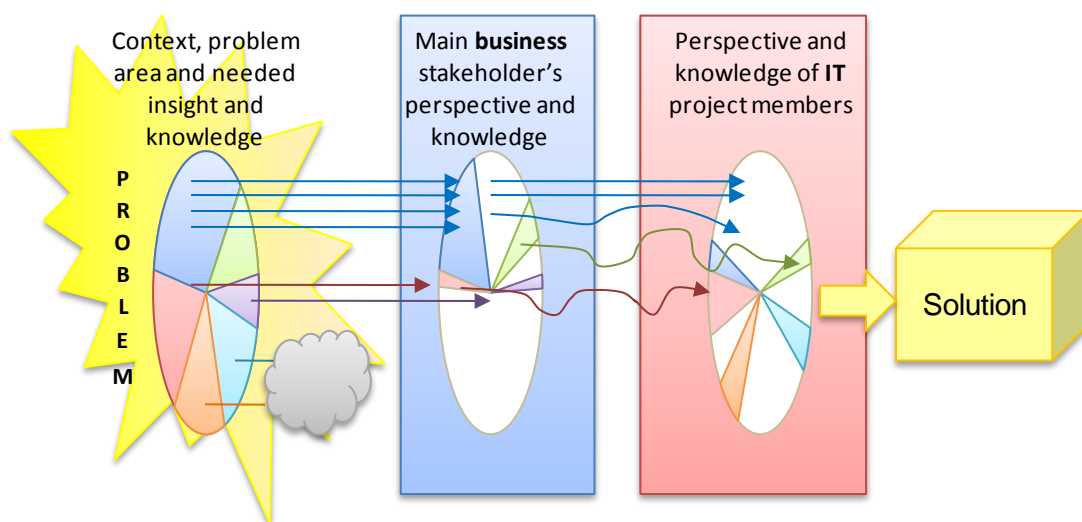


Fig. 10: Communication Issues: ignoring, filtering, distortion, change of importance or priority, addition

The attention of an individual is more focused on aspects that belongs to his field of expertise, and is feeble, or even absent, when it concerns aspects beyond his knowledge, his objectives and his responsibilities. These are reasons why some elements may remain undiscovered.

Once the solution has been imagined by the business domain expert, the importance will shift from the problem area to the imagined solution. The objective now is to build the information solution. It is assumed that once the demanded information solution is built and implemented, the problem will be

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solved and the needs will be satisfied. The business domain expert will be more inclined to communicate about the solution. Information about the problem area may be withheld. Unwittingly, the business domain expert may omit to communicate information to the IT people.

In the real world and in the general business knowledge area, mechanisms, structures, principles, rules, processes and relations can be found. These are natural concepts. The business community may have adapted or simplified these original concepts to suit the company's way of functioning. Some of these original concepts are not used today by the business organisation. Often the existing concepts, those which are currently in use in the company, do not suffice to constitute a solution. New concepts need to be invented and introduced in the new solution. Since the demand depicts the solution as it should be implemented, the business community may easily withhold the information describing the original concepts and communicate only the adapted versions as they are in use or desired in the future solution. Unused concepts aren't communicated either. The difference between general concepts and the new concepts may be indistinguishable. It is valuable for the IT community to have clear and thorough understanding, and thus information, about the problem area.

Some information may be considered as unimportant by the business community. Or, business people may simply not be aware of its importance for the development of the information system. This information is likely to be inadvertently ignored.

The knowledge of experts is often vast. They are used to reflect on advanced topics. They handle very elementary aspects in a very natural way. The mind takes it automatically into account without really being aware of it. Very obvious aspects are often assumed to be known by others. As a result, such basic information may easily be missed out in the communication.

Issues on which the business has no clear view yet or about which they still have to take decisions may also be omitted from the demand.

If no definitive solution has yet been found, the business domain expert may choose for a first simplified or for a temporary solution. This solution will be expanded or adapted later. This distorts the image of the need and solution that is communicated to the IT community.

A business expert may be inclined to communicate his vision or his opinion. This opinion is not necessarily shared by others. It may be inconsistent or unaligned with the position, direction, philosophy or interests of the company.

Some aspects may be very important to the business community. They can be of no or little importance for the development of the future information solution. And conversely, some aspects that are not important to the business stakeholders can be of vital importance to the solution builders. The meaning, importance or priority of some information can be changed or diffused.

A demand can contain unrelated or unimportant information, and even be overloaded by it, while essential information is, be it unintentionally, omitted.

Mainly due to the nature of the general approach, a lot of important information won't reach the IT community as it should. Some information can be withheld, distorted or its communication can be delayed. Communicated information can be vague, ambiguous, irrelevant or inconsistent. Some areas can be discussed only superficially. Not enough details are provided. Specific cases can be omitted.

Unimportant information can be overemphasised while the meaning and importance of other information elements is blurred. The information doesn't represent the real intentions or objectives. Vital information and meta-information can be missing. Too much information can be provided. It can be unverified or too temporary. All the communicated information can be presented in a confused and unorganised way. And, last but not least, information communicated by the business can also change during the course of the project. Stable information is preferable by far.

## 7.6 Influence by Successive Demands

The business demands are triggered either by new needs or by existing needs that have been discovered. Basically, information needs are triggered by:

- External changes. (e.g. new regulations)
- Business strategy, plans or other types of decisions related to the steering of the company
- The awareness of existing problems or opportunities for improvement

As one of these events occurs, and the need is judged significant, the business community will formulate a demand to build, adapt or further develop a software application. Over the years, the IT department will receive a succession of demands from the business departments.

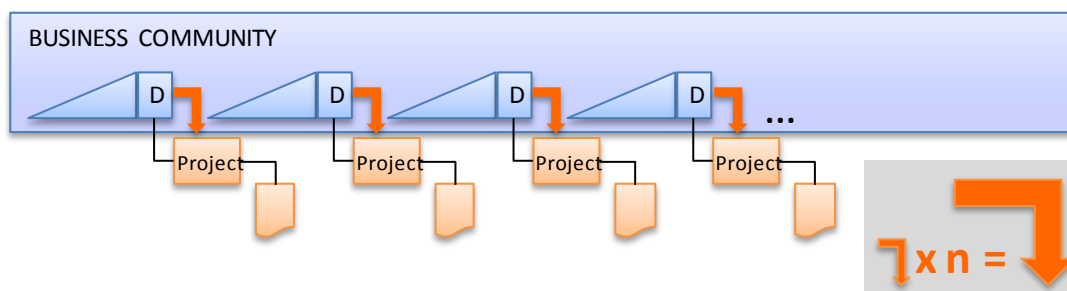


Fig. 11: Repeated influence on individual projects

The global information solution is developed by means of several projects triggered by business demands. Each business demand represents a conceptual part of the global information solution of the company. The IT community receives a succession of business demands. The business community has a huge influence on every individual project. In this way, the business community has a considerable influence on the company's global information solution.

Various domains, perspectives, aspects, concepts and technologies are entangled within automated information systems. These systems are interconnected to form a single large tentacular system that pervades the whole company. Obviously, having this whole well-organised system has some advantages. This organisation should be based on some logic. The ontology of the subject matter is a very useful source of inspiration for defining the systems and organising the processes and information. And the development approach should also be based on a well-thought methodology.

The detection of the needs happens mainly by an improvised way when the needs materialise. It happens indiscriminately. There is little control over the content, the order or the time at which the needs are detected. The subsequent projects are, in some respect, dependent of the detection of the needs.

Some information needs and issues require a large solution and lead to large and complex projects. A large project takes more time, is more difficult to manage and is more risky. A huge project requires a lot of money to be found and budgeted. Without it, the project can't be started. It requires a lot of other resources as well. Larger projects have more "work in progress" during their execution. The business community will have to wait until the end of the project to benefit from its investment.

It is often interesting to divide the project into several smaller portions, which can be smaller projects, subproject, iterations, releases or phases as parts of a larger approach. Each requires lesser resources. As their execution can be spread over time, the usage of resources will also be spread over time. Smaller funds are often easier to be found. A smaller project, or any other form of smaller software development process, can be started sooner. Smaller budgets are easier and lesser risky to manage and they offer a greater flexibility. They can be managed independently from each other. As soon as such a smaller project is finished, the business community can take advantage of its resulting products.

The business experts prioritise the business needs and group them accordingly. They have to define the scope for the different projects, the order of execution and determine a timetable. They may take financial aspects or resource issues into account. Some solutions may be estimated to be easy to execute and are candidates of quick wins. Some needs are identified, but they are not yet sufficiently investigated. They are still unstable or some decisions have still to be taken.

While the division of the large project into smaller portions is often advisable, the method used to define the content of the different projects and to plan their order of execution can be questioned. This order can be based on criteria others than those which lead to an organised and systematic development. Possibly, we may end up in a situation comparable with building already the bathroom on the second floor of the house because we have a clear view about it or because it has a higher priority, while the construction of the fundament and the first floor is postponed because some decisions have still to be taken.

The possibility exists that the IT community is not informed about the definition of the smaller projects to come and their intended order of execution<sup>2</sup>. They may be informed only about the first projects that are planned. As a result the IT community is kept blind, be it unintentionally, while much more information that may well be very important to them already exists.

As the demands emanate from business departments, they will reflect their span of responsibilities and their objectives. Consequently, the organisational boundaries may be reproduced in the underlying IT systems ("automation islands"). A "stove pipe" effect and a local optimisation may lead to a sub-optimisation at the company level. It may hinder enterprise-wide initiatives, or at least treating the issue from a global perspective.

We have seen that the process to come to a demand contains some weaknesses that reduce the quality of the demand. Some uncertainties about the demand may rise.

The development of information systems is considered by the business community as a black box. This is understandable. It isn't their job. Nevertheless, many decisions are taken by the business community even before the project starts and this without understanding of the information system building process, its prerequisites and the potential implications and impacts.

## 7.7 Reactive & Problem-Solution-oriented Approach

A business community that doesn't engage in planned and methodical initiatives to search for information needs and to investigate them appropriately will automatically have to respond much more often to information needs that seemingly appeared suddenly. As the business community becomes aware of a need or issue, it reacts to this event by elaborating a demand. The needs and issues are transferred to the IT department as they occur. This approach is, basically, a reactive approach. Demands are triggered by events that have no relation with a systematic construction approach. There is no logic in the sequence of the demands. Their content doesn't fit in a methodical approach needed, or at least that would be very beneficial and thus preferred, in developing a global information solution. A house is built from its foundation up to the roof. It is not because it is suddenly raining, that the roof should be built first.

A "business-demand-driven"-approach is not only reactive, it is also based on the "problem-solution" concept. The problem is present. The attention is focussed on the problem and on getting it solved. This defines the scope. The need or issue is considered in a local context, based on a single perspective and with an emphasis on the present. This approach leads to a heap of solutions, which, at the level of the company, result in a chaotic and ineffective environment.

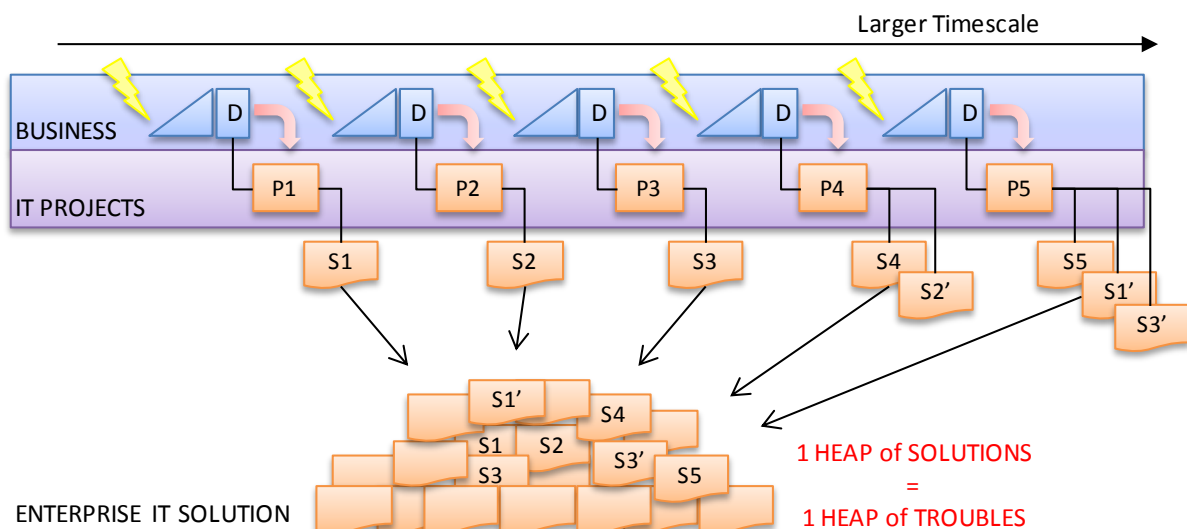


Fig. 12: Repeated process of reactions to needs and events resulting in a 'heap of solutions'

Equipping a company with an enterprise-wide information solution (which doesn't mean it should be one single monolithic system) is not a matter of solving series of distinct problems as they appear. It is a matter of developing methodologically a whole system to respond to the ensemble of all the company's needs. The difference between both is huge.

A house isn't built room by room accordingly to the order of appearance of needs of the property owner. It is built as a whole and by considering all his future needs. This way a solid and coherent house can be built.

With a problem-reaction approach, no sound strategy is possible.

## 7.8 Difference in Speed of Evolution and Lagging Position

### 7.8.1 Dependency

Most required information needs and changes find their origin in the business or in its environment.

#### • Content Dependency

Usually, the business model, the products and services, the organisation and major business processes at a high level have to be defined before the information needs and the concrete information processes can be defined. They determine the content of information systems. Once these aspects have been established and clarified, the information solutions can be conceived.

#### • Event & Process

Information needs are discovered by the business community. They are communicated by means of a business demand to the IT community. The needs are insufficiently anticipated. Between the awareness of a need and the communication of the demand, a lot of time can be wasted. The IT community is dependent of this part of the global process executed by the business community.

As well from the perspective of the content (dependency of the content), as in the process flow, the IT comes at the end. IT is dependent of what precedes in these sequences.

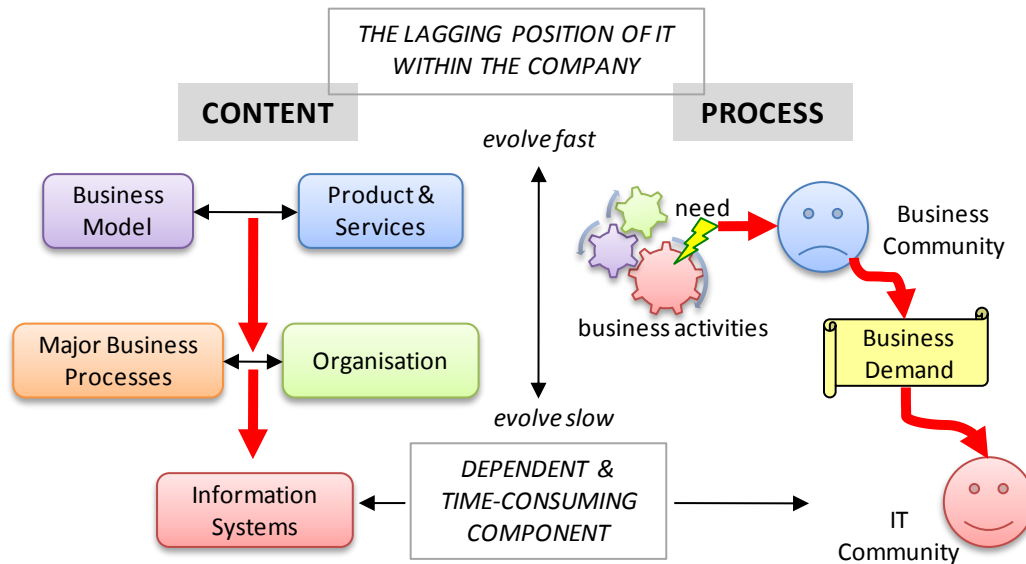


Fig. 13: The lagging position of IT within the company

### 7.8.2 Speed

Due to the nature of the work, software development requires more effort and time than most changes in the business organisation. The speed of change of the software component is often slower than the speed of change of the organisational component of a company.

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Consequently, "IT" is in this configuration and approach always lagging. Pressure is often transferred to the last link of the chain. And an excess of pressure undermines the quality, the manageability and capability of the IT solution to evolve and to grow in the long term.

The company may be continuously trying to catch up with the identified existing needs. And it can be running its business while suffering from undetected needs.

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## 8 Post-project Situation and Afterthoughts

### 8.1 IT's Job!

It is the core business of the IT department to develop a well structured IT solution, to apply standards and best practices. Why didn't they do their job?

"IT has to support the business. The business community, as client, must be served. To be sure the business community gets what it wants, it expresses its needs or desired solution. This is the best way to ensure that its needs are satisfied. The business community defines its needs, elaborates a blueprint of a solution and formulates it in a demand. The business community is not concerned by the IT domain. How the IT community works is a black box to them. It is not of their responsibility. It is up to the IT community to build the solution. Of course, the business community will continue to provide information and explanation regarding their demand. They will participate on the acceptance tests. The demand corresponds to a solution that should support the business and contribute to reaching business objectives. If the IT community has additional requirements or if they have specific needs, they are free to add them. As they are the system builders, they can easily build what is necessary to satisfy their own needs." This idea seems to be common sense. Unfortunately, expecting that his approach would lead to superior results and that it allows the IT department to function rightly and to assume its responsibility is a misconception.

The business has a strong influence on the work executed by the IT community. The business demand is the trigger and the driving force for software projects. It contains conceptual requirements and determines the objectives. The demand is one of the main inputs of IT projects. The succession of demands functions like a global guideline that the IT community has to follow. The business community is in a favourable position for regulating the course of activities of the IT community through their demands.

The business, as a client, has a strong position. The main priority of the IT project is to respond to the demand of the client by building the desired solution. The business demand defines the objectives of the project. The work is planned accordingly. Controls will take the objectives into account. These controls are designed to verify if the project's product matches the demand, not if it solves the needs. These controls will motivate people in that direction. The project is evaluated based on the objective of scope, time and budget. The ability to reach these objectives is also taken into consideration during the evaluation of the individual team members.

By regulating the content and the desired delivery date, the business community can easily regulate the pressure. Sufficient data exist showing that IT projects are often over time. Or, said otherwise, the duration has been underestimated. The business community complains that development projects take too long and are too costly. But spending some more time and money during the first construction may save a lot of time and money during the production life of the software system.

But the business community don't want to wait. The greater the pressure on the projects, the more the IT community will focus on the main priority: satisfying the business demand. The needs, requirements, policies, standards and best practices of the IT community are relinquished to a background position. Satisfying these necessities appropriately would take more time. It isn't sure the business would like to

wait and to pay. When the pressure is high, they can even be neglected. And under very high pressure, the focus will further narrow. The objective shifts. Developing a software application that supports the business activities is not the objective anymore. The new objective is reduced to getting the product passed the acceptance test successfully. The norm is lowered to that point. In these conditions there is no room to satisfy the needs or requirements of IT.

The IT community needs to be able to keep the information systems operational. The systems must be reliable and responsive. The IT community maintains and manages the systems. They need to secure the data and ensure fast recovery procedures. They also need to make sure the IT solutions can continue to evolve in order to support future needs of the business. This should be possible swiftly and at the lowest possible cost. Systems qualities like configurability, reusability, maintainability, scalability, evolvability, manageability, interoperability, standardisation and quality of architecture are important. Although they are not defined as features by the business community, they contribute significantly to the quality of services offered to the business, as well as to the cost and speed of delivery of these services. As the needs of IT are deduced from these objectives, they largely benefit to the business community.

In this relationship, the IT community is expected to adopt an obedient attitude and to execute the demands of the business community. The business community is the expert in their domain and they are the client. They know what they need. It is easy for the IT community to rely on the business demand without questioning it. Questioning their demand would require additional time and effort. It goes against the well-anchored mainstream ideas. It can be considered as putting a suspicion on the position and expertise of the business community. Possibly, an investigation would show that the problem is larger and more complex or that the task is larger. New solutions may need to be elaborated. Such conclusions would disturb the expectations, the estimations and the plans that have been made so far. An investigation may shift some of the responsibilities from the business community to the IT community. It will all delay the delivery of a solution. Developing a product that matches the business demand is one of the general expectations and criteria for evaluating projects and their members. The members of IT projects naturally follow these rules. Once the solution, which has been built to match the demand, is in production the business community may experience consequences. If the business demand was not appropriate, the business people will find out by themselves what is really needed, even if they have to do several attempts, iterations or cycles before getting it right. The awareness of the real need or the real solution comes late.

The idea that the role of the IT community is to respond to the business demands implies also that the business community has a major responsibility about company's IT solution. Since the business community is steering the evolution of the IT solution, it is then quite easy for the IT community to move into a position in which it is purely dependent of the business community. From this position and within the created context, it will be difficult, if not impossible, for the IT community to provide a quality service to the business community and to equip the company with a sustainable efficient global IT solution. The expectation of the IT of responding to business demands may be in conflict with the broader role the IT community can and should play.

## **8.2 House Construction**

The construction of an information system can be illustrated with the construction of a house.

Especially Sarah William Winchester's Mystery House is a perfect illustration of a badly executed global approach executed over years. Sarah Winchester, the widow of gun magnate William Wirt Winchester, built her mansion for 38 years. It was built from-the-ground-up and the construction proceeded around-the-clock, without interruption. Sarah Winchester's assured the day-to-day guidance. She made hand-sketched plans for the individual rooms. Each morning she met with her foreman to discuss the sketches for the day's work. She worked without any master building plan. The plans were often chaotic. When they would not work out the right way, Sarah always found a quick solution. They would just build another room around an existing one. The house has 160 rooms, approximately 950 doors, 47 fireplaces, corridors and staircases leading nowhere. The building reached a height of 7 stories high. Today, the mansion is a tourist attraction. The house contains many inconsistencies and features that are unusable. Guides are needed not to get lost.

### **8.3 Resulting Solution**

The company will end up with a collection of distinct solutions. Each has been conceived and built in a hurry with a local problem in mind. The internal logic of the solutions is disorganised. They haven't been built accordingly to best practices or standards. Their logic may be correct but overly complex and awfully expressed. As they have been subjected to several changes and additions, their internal organisation is weakened. Temporary solutions became permanent. The existing architectures and logic have not been designed to integrate these new features. Old concepts have been twisted unnaturally to reflect a new form of the concept. New logic is intertwined with old logic. Old logic may still be present while not being in use anymore. Additional technologies and logic are needed to make different systems, software components or technologies functioning and communicating with each other. This adds even more complexity. The IT solution is a patchwork of solutions, components and technologies and a labyrinth of logic. Completeness, correctness and consistency can't be assured. Because of the pressure, features to support its maintenance and management are missing. Time and effort required to implement future changes will increase over time. The control over the software application will decrease. This chaos leads to increased risks and, in the end, paralysis.

The data hasn't been organised to be connected with other data, to be used for different purposes or to be shared. Relations between information elements may become unstable. Solutions are based on data duplication requesting additional efforts and increasing the risks in matters of data management and consistency and reliability of the data.

## 9 The Position of the Business Community

We may be still struggling with a seemingly obvious logic. The business community has the expertise and has field experience in the subject to be solved by the IT project. The business community is best positioned to understand the issues and to determine its needs. It is up to the business community to determine how the business should work. The role of IT is to support the business. The business community is the customer. They pay for the development of an information system. It is rational that the business community is in charge of the identification and definition of the needs and the outlining of the needed solution.

Rationally, these arguments provide authority to the business demand. Unfortunately, these arguments are only one-sided.

### 9.1 "IT Supports the Business"

"IT supports the business." Although this statement is largely true, it is also very ambiguous.

IT solutions should facilitate and foster the business activities of the company. There is no doubt about it. This interpretation is true.

But there is a confusion in the semantics. The terms "business" and "IT" have many meanings. "Business" can be understood as the business area of knowledge and expertise, as the business activities deployed by the company or as the business community or parts or members of this community. "IT" may refer to the technologies, to the implemented IT solutions, to the domain of knowledge and expertise or a part of it, to the activities and responsibilities deployed by the IT department as well as to the IT department itself or groups or individuals belonging to this community. It is not because one specific interpretation of the statement is true that all the interpretations are true.

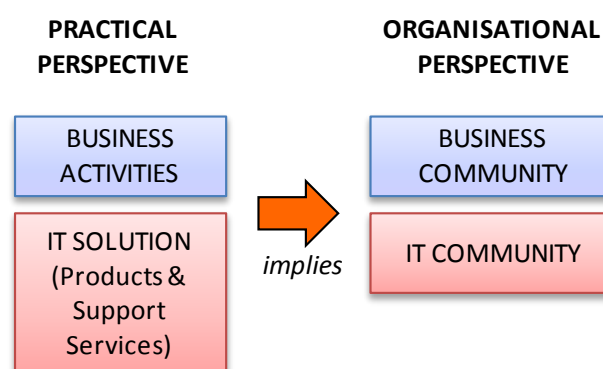


Fig. 14: Business layer on top of IT-layer

Another and more pragmatic reasoning is possible. All the IT solutions support the business activities. IT offers services to the business. The business layer is on top of the IT-layer. To get optimal services of the IT solutions, the IT community has to build the IT layer accordingly to the way the business functions. The business community has to communicate how they want it to function. The role of some members

of the business community is to demand a specific solution and to provide guidance about how this solution should be. The members of the IT community execute the demand and follow the given directives. This implies the idea that the IT people are at the service of the business community. This is the most simple and logical reasoning.

The client is king. The business community provides the budgets. The demand concerns the activities of the business and; it is the business community's domain of expertise. These ideas reinforce the reasoning.

Business people benefit of the support of IT people concerning the information and the IT technologies needed for their job. Or, the IT people have to automate the business activities or providing tools supporting the business activities. These interpretations are very appealing for individual members of the business community.

However, the general statement expresses the purpose of the IT within the company: supporting the business activities. It doesn't say anything about the role and position of the IT department or its members in this relationship. We can't deduce from this interpretation whether the business community or the IT community should give direction and who should be in a subordinate, obedient position and follow the directives. Making a deduction about this relation should be done very thoughtfully.

This interpretation considers IT as a domain that has to satisfy the business needs. It doesn't take the real potential of IT into account. Actually, it is far more beneficial to reverse the reasoning. First, the maximum potential of IT must be determined. Then we can think about how this potential can be exploited to the benefit of the business. This determines the future position of IT within the company. If we ignore the potential of our resources, then only a fraction of it will be exploited.

The implemented global IT solution supports the business by facilitating the company's activities. The IT department builds this IT solution and offers services related to its usage. But IT has a much greater potential. The IT department must strive for the interest of the company, as a whole, in a long term perspective.

As it has been discussed in the chapter about the role of IT, the supporting role of IT is only a tiny fraction of what IT, in a broader sense, has to offer.

## **9.2 Different People – Different Perceptions**

The metaphor about a few customers who describe the car they want to buy is very interesting. The main purpose of the car is probably rather common to all the customers: transporting by road a few persons and small amounts of goods. Nevertheless, each customer will describe the car they desire in their own particular way. The reason is that because of their specific background, they have different a perception of the same reality. Each one of them masters only a part of the aspects. It is doubtful whether they would succeed in getting the car they need. Probably, only engineers specialised in this domain can describe a car in such a way that the description is suitable for the manufacturing of the car.

The stakeholders of information systems have different responsibilities and different jobs. They will use the information in completely different ways, for different purposes and for different objectives. The business community has a user-oriented perspective. This perspective focuses on business objectives,

features, information and usage. Each group of business stakeholder has its own specific perspective and each of them emphasise different aspects.

### **9.3 Different Jobs**

The business community may prefer or like to direct the development of the global information solutions through its demands and through other mechanisms that influences the project and its final product. The whole subject concerns the creation of solutions. These solutions are systems. The difference between system-creation-roles and system-usage-roles has been described earlier.

Both roles have their own purpose, weaknesses and strengths. The difference between the two types of roles should be reflected in the role and in the position of the business community and the IT community and in their relationship.

### **9.4 The Client's Position in the Client-Supplier Relationship**

The position of a client in a client within a client – supplier relationship may vary.

We may consider different suppliers: a candy shop, a supermarket, a clothes shop, a hardware store (do-it-yourself store), a doctor, an architect, a lawyer, a heart surgeon, an accountant, a notary, an embassy.

An individual, as a client of a supermarket or pastry shop, will adopt a particular behaviour. As future property owner, the same individual may adopt a totally different attitude towards the architect. Most individuals will adopt a different behaviour depending on the type of supplier.

In a candy shop, the client will take all the decisions. Then most patients will carefully listen to their family doctor. Probably, they will even listen to their heart surgeon. They thrust them. Authority is an important factor.

An experienced handyman in a hardware store (do-it-yourself store) will decide what products to buy. An individual, who is inexperienced in these matters, may request the help of the vendors. While the doctor listens to the complaints of his patient, he does his own investigation to make a right diagnosis.

Clients have different decision processes. The degree of collaboration may also vary depending on factors like the expertise of both parties, the degree of delegation and the responsibilities of the parties.

Usually the business community provides a demand and some input. But there are different ways to deal with this input. It can be taken into account. It can be prudently trusted and verified. Or, the most input may come from the expert.

In many domains, specialists are able to serve, and to offer an even better service, from an independent or even from a superior position than they would be able to do from a subordinate position. A subordinate position would limit the usage of their competences. The party occupying the superior position may not be aware of his influence and the appearance of these limitations. This is even more unlikely when it concerns specific domains unfamiliar to him.

People get bad teethes from eating too much candy. Alcohol may ruin our health, family life and career. We may buy wrong products in the hardware store or buy a car or house that we can't afford. But we can't always complain for this to the supplier. A client takes decisions and has some responsibilities. He

has a responsibility about the demand he formulates, about the quality of the input he provides, about his attitude and about the quality of his collaboration.

## 9.5 The Client's Responsibility

### 9.5.1 The Business Demand

The business demand is elaborated by business experts. Often it contains major guidelines concerning the desired conceptual solution and serve as foundation for the start up of the project and for the further conception and construction of the solution. In the context of the described global approach, it is obvious that the business community has a great responsibility in the correspondence between the information needs and the demanded solution, and thus in the business-IT alignment.

### 9.5.2 The Influence

The roles of members of the business community and the activities performed by them influence the project. This has been discussed. The business community has responsibilities in the influence it exercises, intentionally or not, on the project and on the succession of the projects. This influence impacts the quality of the enterprise-wide information solution.

### 9.5.3 The Environment and input

The IT project is a temporary environment in which a small human organisation executes a process to produce a unique product. A project doesn't pop out of nothing. The whole project environment is mainly created with resources from the company. A project is not completely independent from the company. The business community and the IT community have some responsibilities in the creation of the project. Generally, the business component and the IT department form the environment surrounding the IT project within the company. This environment has many influences on the project.

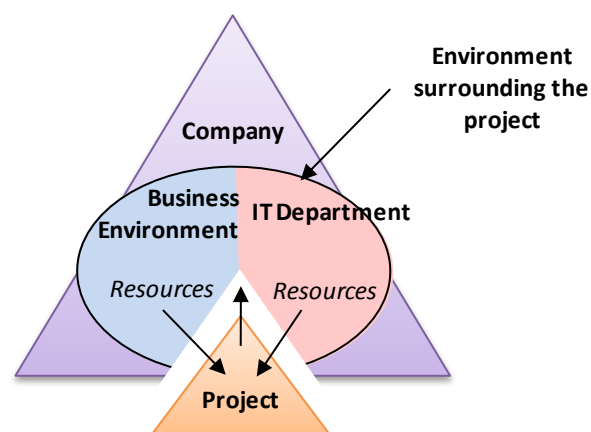


Fig. 15: The project and its environment

If aspects like the objectives, the authority, the responsibilities, the information, the constraints or the resources are inappropriate, be it for example because they are variable, insufficient, unreliable or unclear, then the project will have great difficulties to be successful.

A few factors that may hinder the project execution:

- Information of low quality

- Not respecting the authority of the project leader
- Frequent changes
- Decisions taken late, changed decisions or conflicting decisions
- Unreliable availability of resources, late confirmation of the availability, low quality of resources
- Difficult collaboration
- Excessive control
- Excessive formalism and rigidity

The role of the client, the business community and the IT department is to support the project correctly. This will increase the chances of the project to be successful. But they can also exercise a very destructive influence on the project and cause its failure.

#### 9.5.4 The client is king

The idea “the client is king” provides some authority to the business community. As it has been discussed, authority supposes the needed competencies in the development of information systems.

It is impossible to conceive and express a solution when the problem area and the concepts and tools that allow the definition of a solution, aren't mastered. Similarly, you can't conceive and manage what you don't understand. Everything that impacts the conception, direction and management of the manufacturing process of the global information solution and which emanates from an actor that is not in charge or doesn't know and understand this manufacturing process should be refrained.

### 9.6 Client or Supplier?

The IT department is the supplier of IT solutions that aims to help solving the information needs of the business community. However, to execute its mission, to reach its objectives and to build effective information solutions, the IT department needs information. This information has to be supplied by the business community. In this very early stage of the solution construction, the IT department is a client that has a need in information. The business community has to solve this information need. This community is the supplier of this information. If this information need of the IT community is not correctly satisfied, it will be impossible for the IT community to construct a solution suitable to the business.

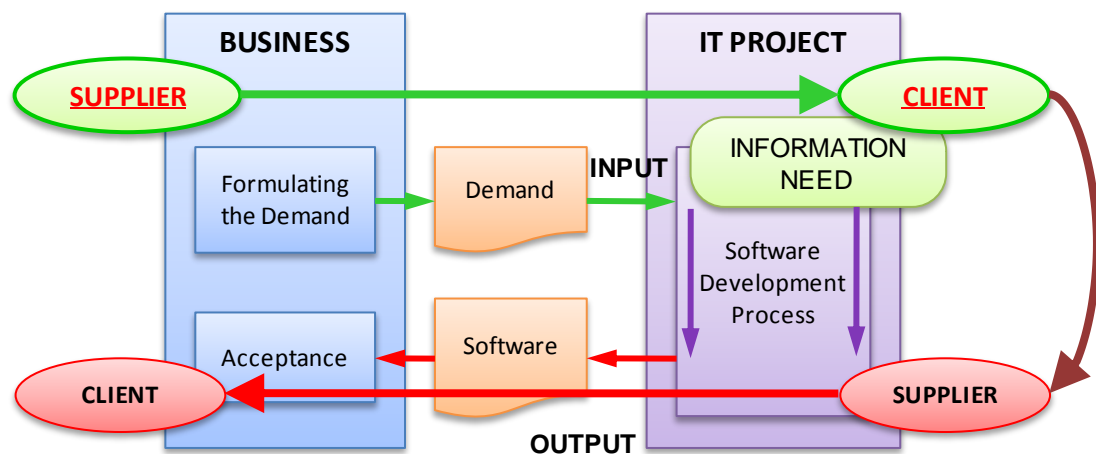


Fig. 16: Double inverse supplier-client relation

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When we consider the relationship as a simple client-supplier relationship we may define the position and responsibilities in one way. But this may be different when we consider this relation as a double inverse relationship. A client can define the product quality he finds acceptable.

## **10 Conclusion**

A general approach to develop an information solution, or, considered more globally and over a longer period, the company's global information solution, that is heavily based on and driven by business demands assumes that by developing the solutions as they are described by the business demands or which responds to the requirements of the business, the company's information needs will be solved. The business demand is considered as the foundation for the development of information solutions.

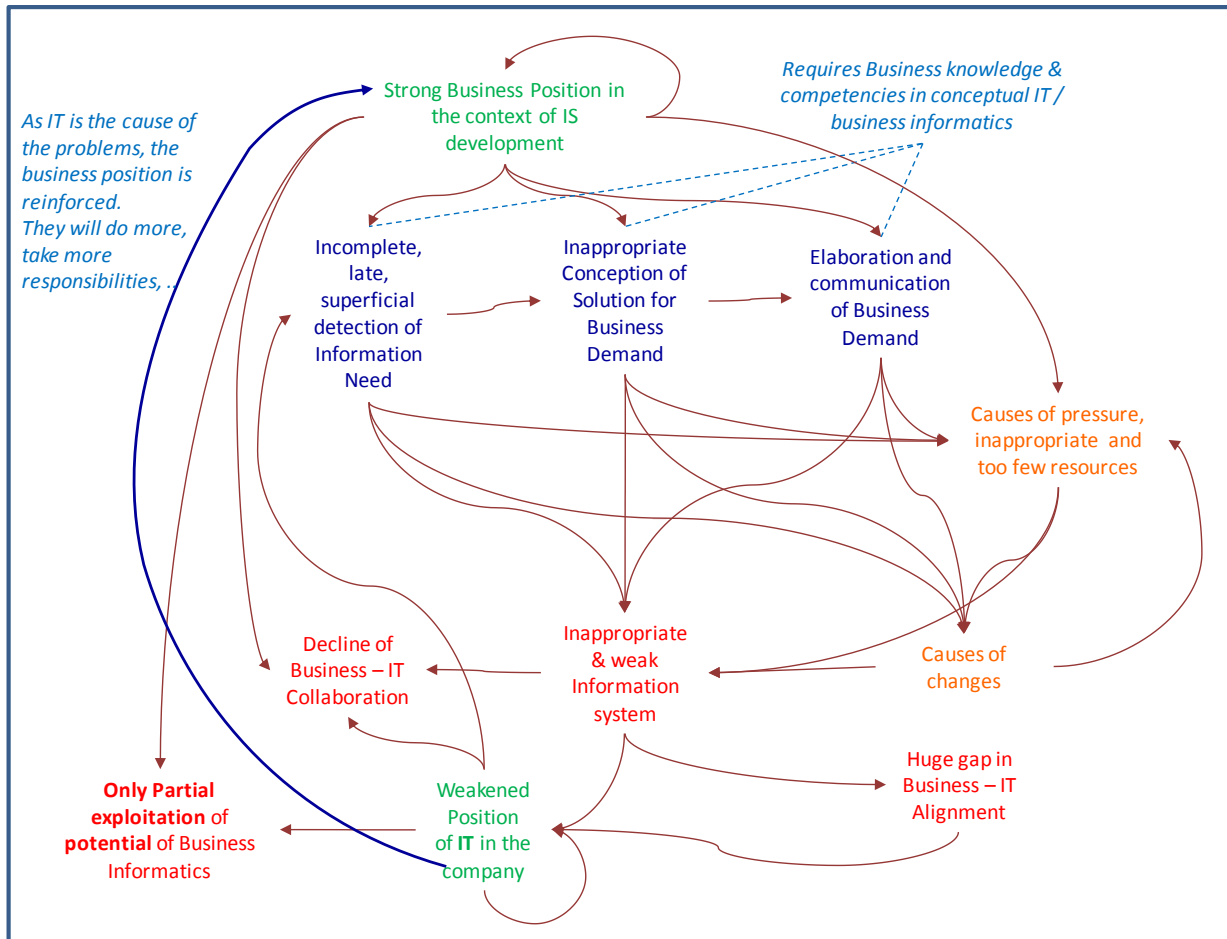
This approach assumes that the business community has the capability to identify its information needs rightly and in time, to understand them, to conceive an information solution and to communicate all the information useful to the development of the solution. The complaints, the arguments and the described mechanisms presented in this analysis show that these assumptions are not justified. Roles, competencies and work environment are not favourable to perform these activities successfully. Business knowledge is not sufficient to perform these activities. More competencies are needed.

Several weaknesses of this general approach are revealed. It is reactive, problem oriented and compartmentalised. It puts IT in a lagging position in the development of solutions and discharges IT from some essential responsibilities. We shouldn't be surprised that needs are still only partially solved and new issues continuously appear. The company tries to catch-up with its information needs. IT projects are under constant pressure and subject to frequent changes. The global information solution may be disappointing. This leads to distrust, frustrations and conflicts.

Both, as well the business community as the IT community, desire to have an efficient, effective, well-managed and evolvable global information solution. As long as IT is considered as a support to the business, the whole potential of IT won't be exploited.

Since this analysis exposed weaknesses in the general approach and it also explains various mechanisms, it may be an excellent source of inspiration to profound improvements, which may include changes in activities, responsibilities, competencies and positions, and maybe then we can have more motivating work environment for IT, a more efficient collaboration between the business and IT community, a better global information solution and increasing the IT alignment.

## 11 Graphical Summary



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## 12 Appendix

### **PIECES Framework**

<http://www.scribd.com/doc/7298188/PIECES-Framework>

### **Sarah Winchester's Mystery House:**

<http://www.winchestermysteryhouse.com/>

[http://en.wikipedia.org/wiki/Winchester\\_Mystery\\_House](http://en.wikipedia.org/wiki/Winchester_Mystery_House)

### **Definitions at Wikipedia:**

Enterprise Engineering	<a href="http://en.wikipedia.org/wiki/Enterprise_engineering">http://en.wikipedia.org/wiki/Enterprise_engineering</a>
Industrial Engineering	<a href="http://en.wikipedia.org/wiki/Industrial_engineering">http://en.wikipedia.org/wiki/Industrial_engineering</a>
Organisation Development	<a href="http://en.wikipedia.org/wiki/Organisation_development">http://en.wikipedia.org/wiki/Organisation_development</a>
Information Science	<a href="http://en.wikipedia.org/wiki/Information_science">http://en.wikipedia.org/wiki/Information_science</a>
Informatics	<a href="http://en.wikipedia.org/wiki/Informatics">http://en.wikipedia.org/wiki/Informatics</a>
Business Informatics	<a href="http://en.wikipedia.org/wiki/Organisational_informatics">http://en.wikipedia.org/wiki/Organisational_informatics</a>
Information Technology	<a href="http://en.wikipedia.org/wiki/Information_technology">http://en.wikipedia.org/wiki/Information_technology</a>
Computing Science	<a href="http://en.wikipedia.org/wiki/Computer_science">http://en.wikipedia.org/wiki/Computer_science</a>
Software Engineering	<a href="http://en.wikipedia.org/wiki/Software_engineering">http://en.wikipedia.org/wiki/Software_engineering</a>
Information System	<a href="http://en.wikipedia.org/wiki/Information_system">http://en.wikipedia.org/wiki/Information_system</a>