POLITECNICO DI MILANO
Facoltà di Ingegneria dei Sistemi

POLO REGIONALE DI COMO

Master of Science in
Management , Economics and Industrial Engineering

Business Process Reengineering and New Information Management Systems: an application in Sistemi Ufficio

Supervisor: Prof. Emilio Bellini
Assistant Supervisor: Prof. Rami Shani

Master Graduation Thesis by: Alessandro Silocchi
Student Id. number 736670

Academic Year .2009/2010

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SOMMARIO

Riorganizzazione dei processi aziendali e nuovi sistemi di gestione dell'informazione: una applicazione in Sistemi Ufficio s.r.l.

Oggetto della tesi è l'analisi dell' organizzazione di un azienda lombarda che commercializza e studia soluzioni informatiche per piccole e medie imprese: Sistemi Ufficio s.r.l.
L'implementazione di un software per la gestione delle informazioni e dei processi aziendali è solo l'ultima delle innovazioni adottate dalla società in continua evoluzione.

La tesi dopo aver introdotto i concetti alla base del process management, dell'organizzazione e del project management analizza l'evoluzione dell'azienda attraverso cambiamenti radicali e miglioramento continuo dei processi.

Il Business Process Management è l'insieme di attività necessarie per definire, ottimizzare, monitorare e integrare i processi aziendali, al fine di creare un processo orientato a rendere efficiente ed efficace il business dell'azienda.

Il BPM è una via intermedia fra la gestione d'impresa e l'Information Technology, ed è riferito a processi operativi, che interessano variabili quantitative e sono ripetuti su grandi volumi quotidianamente. Un processo del genere è adatto all'automazione, mentre i processi di carattere strategico-decisionale utilizzano la tecnologia come un supporto che difficilmente può sostituire l'attività umana.

Il BPM differisce dal BPR (Business Process Re-engineering), che raggiunse la sua massima diffusione negli anni novanta, perché mira ad un miglioramento incrementale dei processi, mentre il secondo ad un miglioramento radicale.

I software di BPM dovrebbero velocizzare e semplificare la gestione e il miglioramento dei processi aziendali. Per ottenere questi obiettivi, un software di BPM deve monitorare l'esecuzione dei processi, consentire ai manager di fare analisi e cambiare tecnologia e organizzazione sulla base di dati concreti, piuttosto che in base ad opinioni soggettive.

Tali operazioni sono talora svolte da software differenti che comunicano tra loro, da programmi che misurano i dati e altri che contengono la descrizione dei processi "aggiornabile" con i dati dell'operatività. I programmi che si occupano della rilevazione degli indicatori di prestazione chiave (KPI) forniscono dei resoconti sintetici sull'operatività dei processi, e consentono un dettaglio dell'indicatore che può arrivare dal globale della società al singolo operatore/macchina.

I maggiori software di Business Process Modeling consentono di modellare i processi definendo i relativi attori, attività e applicazioni coinvolte. A questi oggetti possono essere aggiunte grandezze quantitative come indicatori di rischio e misure dell'efficienza dei relativi controlli, oppure indicatori di performance i cui valori sono alimentati da applicativi esterni.

Tanto maggiori sono il numero e la varietà di attori coinvolti nei processi tanto lo è il beneficio che trae l'azienda da una definizione strutturata e puntuale dei medesimi.

Dopo una presentazione delle aziende coinvolte nel progetto questa tesi analizza le dinamiche della gestione aziendale , della gestione di processi ,del miglioramento e della riorganizzazione di questi ultimi.

Vengono analizzati I cambiamenti organizzativi e le innovazioni che si sono susseguite in Sistemi Ufficio , in particolare , degli ultimi tre anni da quando l'autore è diventato collaboratore dell'azienda. La riorganizzazione degli ultimo due anni ha coinvolto l'area tecnica, la divisione vendite e la gestione amministrazione con la creazione di un nuovo ufficio per la gestione dell'assistenza tecnica e una nuova struttura commerciale.

Ultima di queste innovazioni è l'implementazione di un software documentale per l'archiviazione sostitutiva di tutti I principali documenti dell'azienda e della sua agenzia dedicata alla telecomunicazione , partner di Vodafone .

Un ampia sezione viene dedicata all'analisi , alla progettazione e all' implementazione della soluzione in azienda sia per quanto riguarda l'archiviazione sostitutiva dei documenti sia per la gestione informatizzata dei processi aziendali. Vengono presentati risultati e costi dell'implementazione del sistema e gli obiettivi futuri dell'azienda per questa soluzione.

L'elaborato evidenzia come l'Information Technology sia in grado di fornire strumenti utili ed indispensabili per la gestione e la riorganizzazione dei processi aziendali e per prendere decisioni riguardo alle dinamiche dell'organizzazione aziendale.

ABSTRACT

Business Process Reengineering and New Information Management Systems: an application in Sistemi Ufficio

Subject of the thesis is the analysis of the organization of Sistemi Ufficio s.r.l. and the implementation of a software for information management and business processes management in the company.

The project analyzes the key concepts of corporate structure and process management ,process modeling comparing them with what has been done in recent years in Sistemi Ufficio s.rl..

Business Process Management is the set of activities needed to define, optimize, monitor and integrate business processes in order to create a process oriented towards an efficient and effective business.

BPM is a middle ground between business management and information technology, and refers to processes that affect the quantitative variables and large volumes repeated on a daily basis.
Such a process is suitable for automation, while the processes of strategic decision- use technology as a medium that can hardly replace the human activity.

BPM differs from BPR (Business Process Re-engineering), which reached its peak in the 90's, because it aims for an incremental improvement of processes, while the second to a radical improvement.

The BPM software should speed up and simplify the management and improvement of business processes. To achieve these objectives, a BPM software has to monitor the implementation of the process, enabling managers to do analysis and change technology and organization on the basis of hard data, rather than on the basis of subjective opinions.

Such operations are sometimes carried out by different software communicating each other , from programs that measure and other data that contain the description of the processes "update" with the data operations.

The software that deal with the detection of key performance indicators (KPIs) provide summary reports on the operation of the process, and provide a detailed indicator that can come from the global society to the individual operator / machine.

Major Business Process Modeling software allows you to model the processes by defining the relevant actors, activities and applications involved. These objects can be added to the quantitative variables as indicators of risk and measures the efficiency of its controls, or performance indicators whose values are supplied by external applications.

The greater number and variety of actors involved in the process so it is the benefit

that the company derives from a structured and precise definition of the same.

After a presentation of the companies involved in the project this thesis analyzes the dynamics of business management, process management improvement and reorganization .
The project analyzes the organizational changes and innovations that have taken place in Sistemi Ufficio s.r.l. , in particular, during the last three years since the author has become employee of the company.

Last of these innovations is the implementation of a document storage software for all the main documents of the company and its telecommunications agency, which is a partner of Vodafone Italia.

A large section is dedicated to the analysis , design and implementation of the software in the company both in terms of the substitute storage of documents and in terms of Business Process Management.

The project presents the results and the costs of system deployment and the future goals of the company for this solution.

The paper highlights how information technology is able to provide useful and essential tools for the management and reorganization of business processes and to make decisions about the dynamics of the company organization.

Ringraziamenti

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Notation

Test organization

The thesis is divided into chapters, sections, subsections and sub-subsections
During the discussion, these four divisions will be recognized for
the character of their title and the number that appears on the left of the latter
(Except in the case of sub-subsections).
The identification number of the current paragraph may consist of one, two
or three elements. Evidently, the first number indicates the Chapter, the second,
if present, the Section, the third, when present, the Subsection. The sub-subsections
are considered as a tool to organize the text on the bottom, so do not have any ID
number . The paragraph you are reading is a Subsection.

Quote

Citations can appear after a figure or a text field.
In the case of the figure, indicate the resource from which the figure has been
extracted.
If missing, it means that the figure was produced by the authors of the thesis. To
As regards the quotations embedded in the text, they indicate the means by which
They have come to the information given above. Depending on the level of
depth structure of the text takes on a particular context, the quote
can be queued to a chapter, a section or a subsection. The quotation is valid until the
first game back

Obviously, if the quotes were absent, the text would be the result of the mind
Authors and their inspirations are so many and such that it cannot appear in a
bibliographic reference only.

Index

Chapter 1

Presentation

1.1   Introduction

Efficiency and optimization of business processes are the key to create value in the company.

The necessity to reorganize and eliminate not value adding activity from the processes of Sistemi Ufficio s.r.l. has created the conditions for including a figure in the company who study the internal processes and business organization to find new solutions and improvements to management and organization.

Sistemi Ufficio s.r.l is an informational technology multiservice company operating in Lombardia, located in Lurago Marinone (Como) .

The project of dematerialization of the documents is only the end point of a path that the company has followed trough the last years ,growing and moving in a continue changing market.

I have analyzed and studied the organizational changes , the reorganization of the business units and the methodologies applied to increase the effectiveness and efficiency of the company.

I will describe the most important passages of the evolution of Sistemi Ufficio , particularly the reorganization of the last 3 years ,since I started working there .

The focus of the project is on the documentary and business process management software implemented in the company .

The project has started on June,2010.
After many courses for the people involved the implementation of the software has been followed with the collaboration of Opensign , which is the company that has developed the software : Koros.

1.2 Sistemi Ufficio s.r.l.

Sistemi Ufficio operates in the office market since 1950.During the years it has evolved according to the increasing importance of Information Technology.

It offers solutions for the small medium enterprise essentially in Lombardia (ITALY).

The experience and the competences support Sistemi Ufficio in the creation of competitive advantages for the customer. The main goal of Sistemi Ufficio is to create advantage for the customer creating cooperative strategies.

Since 2007 after the moving on the new site in Lurago Marinone (CO) Sistemi Ufficio is reorganizing his structure assuming people who has different technical/organizational competences.

Sistemi Ufficio has a partnership with Esa software that guaranteed high results in terms of presence on the customer .This partnership has bring Sistemi Ufficio to develop new competences and markets. It has an annual sales of about 5M € divided in 40% for the TLC activities(partnership with Vodafone) and 60% on the Information Technology Area.

Sistemi Ufficio is a multi service company and has the possibilitiy to solve each customer request from the furniture for the office to the CRM.

Fig 1.1 The site in Lurago Marinone

1.3 Opensign

Fig. 1.2 Opensign Logo

OpenSign S.p.A. Italia comes from years of experience as a team of specialists who have achieved significant success in providing fast to implement solutions dedicated to archiving of documents and organizational flows.

This specialization has made it possible to create a revolutionary business process management system that includes:

• Storage media
• Legalization of the same
• Security encryption
• Organised access
• Content management
• Project design management
• Collaboration
• Workflow management
• Certified E-Mail

Thanks to innovative performance solutions OpenSign Italia SpA immediately scored significant successes and achievements and now can be counted in both the main Italian public administration and in private companies , banks, insurance, etc.. implementations.

Italy OpenSign S.p.A. provides a comprehensive service to its customers:

• Analysis
• Design
• Advance
• Commercial
• Supervision
• Help
• Maintenance
• Update

Our users can count on the highest level of quality through the adoption of procedures ISO9000: 2000 that have always characterized our work.
Opensign operates in partnership wit InfoCamere

1.3.1 Infocamere

Fig 1.3 InfoCamere Logo

InfoCamere, shareholders' consortium of Italian Chambers of Commerce, ensure the implementation and management of applications necessary to operate the chamber system and its "dialogue" with governments, businesses and citizens.

He has developed and operates the computerized system connecting the 103 Chambers of Commerce, 300 branch offices.

Since April 2000 InfoCamere is Certifying Body for the digital signature, writing in the public required by law. Since August 2005 is the National Certification Authority issuing certificates of digital tachograph cards, and was listed in December 2005 by Public Managers of certified electronic mail.

InfoCamere designs, develops and delivers services according to quality standards ISO 9001, having first obtained the certification in 1997 (ISO 9001:1994), then to the standards Vision 2000 (ISO 9001:2000). The quality system of InfoCamere was extended in 2003 to subsidiaries IC and IC Technology and Service and in 2004 to the subsidiary InfoBusiness.

Chapter 2

Business Process Management

2.1 BPM: Business Process Management

Business process management (BPM) is a management approach focused on aligning all aspects of an organization with the wants and needs of clients. It is a holistic management approach that promotes business effectiveness and efficiency while striving for innovation, flexibility, and integration with technology. Business process management attempts to improve processes continuously. It could therefore be described as a "process optimization process." It is argued that BPM enables organizations to be more efficient, more effective and more capable of change than a functionally focused, traditional hierarchical management approach. An empirical study by Kohlbacher (2009) reveals that BPM helps organizations to gain higher customer satisfaction, product quality, delivery speed and time-to-market speed.

A business process comprises a "series or network of value-added activities, performed by their relevant roles or collaborators, to purposefully achieve the common business goal." These processes are critical to any organization: they may generate revenue and often represent a significant proportion of costs. As a managerial approach, BPM considers processes to be strategic assets of an organization that must be understood, managed, and improved to deliver value added products and services to clients. This foundation is very similar to other Total Quality Management or Continuous Improvement Process methodologies or approaches. BPM goes a step further by stating that this approach can be supported, or enabled, through technology to ensure the viability of the managerial approach in times of stress and change. In fact, BPM is an approach to integrate a "change capability" to an organization - both human and technological. As such, many BPM articles and pundits often discuss BPM from one of two viewpoints: people and/or technology.

Roughly speaking, the idea of (business) process is as traditional as concepts of tasks, department, production, outputs. The current management and improvement approach, with formal definitions and technical modeling, has been around since the early 1990s. Note that in the IT community, the term 'business process' is often used as synonymous of management of middleware processes; or integrating application software tasks. This viewpoint may be overly restrictive - a limitation to keep in mind when reading software engineering papers that refer to "business processes" or to "business process modeling".

Although the initial focus of BPM was on the automation of business processes with the use of information technology, it has since been extended to integrate human-driven processes in which human interaction takes place in series or parallel with the use of technology. For example (in workflow systems), when individual steps in the business process require human intuition or judgment to be performed, these steps are assigned to appropriate members within the organization.

More advanced forms such as human interaction management are in the complex interaction between human workers in performing a workgroup task. In this case, many people and systems interact in structured, ad-hoc, and sometimes completely dynamic ways to complete one to many transactions.

BPM can be used to understand organizations through expanded views that would not otherwise be available to organize and present. These views include the relationships of processes to each other which, when included in a process model, provide for advanced reporting and analysis that would not otherwise be available. BPM is regarded by some as the backbone of enterprise content management.

Because BPM allows organizations to abstract business process from technology infrastructure, it goes far beyond automating business processes (software) or solving business problems (suite). BPM enables business to respond to changing consumer, market, and regulatory demands faster than competitors creating competitive advantage.

As of 2010technology has allowed the coupling of BPM to other methodologies, such as Six Sigma. BPM tools allow users to:

- Define - baseline the process or the process improvement
- Model - simulate the change to the process.
- Analyze - compare the various simulations to determine an optimal improvement
- Improve - select and implement the improvement
- Control - deploy this implementation and by use of User defined dashboards monitor the improvement in real time and feed the performance information back into the simulation model in preparation for the next improvement iteration.

This brings with it the benefit of being able to simulate changes to business processes based on real-life data (not assumed knowledge). Also, the coupling of BPM to industry methodologies allows users to continually streamline and optimize the process to ensure that it is tuned to its market need.

BPM life-cycle

Business process management activities can be grouped into five categories: design, modeling, execution, monitoring, and optimization.
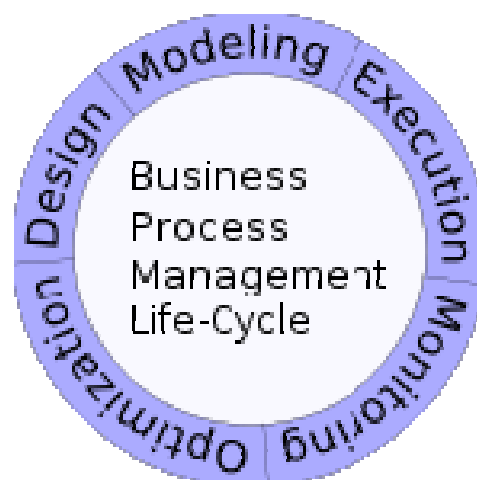

Fig. 2.1 BPM Life cycle

Design

Process Design encompasses both the identification of existing processes and the design of "to-be" processes. Areas of focus include representation of the process flow, the actors within it, alerts & notifications, escalations, Standard Operating Procedures, Service Level Agreements, and task hand-over mechanisms.

Good design reduces the number of problems over the lifetime of the process. Whether or not existing processes are considered, the aim of this step is to ensure that a correct and efficient theoretical design is prepared.

The proposed improvement could be in human-to-human, human-to-system, and system-to-system workflows, and might target regulatory, market, or competitive challenges faced by the businesses.

Modeling

Modeling takes the theoretical design and introduces combinations of variables (e.g., changes in rent or materials costs, which determine how the process might operate under different circumstances).

It also involves running "what-if analysis" on the processes: *"What if I have 75% of resources to do the same task?" "What if I want to do the same job for 80% of the current cost?"*.

Execution

One of the ways to automate processes is to develop or purchase an application that executes the required steps of the process; however, in practice, these applications rarely execute all the steps of the process accurately or completely. Another approach is to use a combination of software and human intervention; however this approach is more complex, making the documentation process difficult.

As a response to these problems, software has been developed that enables the full business process (as developed in the process design activity) to be defined in a computer language which can be directly executed by the computer. The system will either use services in connected applications to perform business operations *(e.g.* calculating a repayment plan for a loan) or, when a step is too complex to automate, will ask for human input. Compared to either of the previous approaches, directly executing a process definition can be more straightforward and therefore easier to improve. However, automating a process definition requires flexible and comprehensive infrastructure, which typically rules out implementing these systems in a legacy IT environment.

Business rules have been used by systems to provide definitions for governing behavior , and a business rule engine can be used to drive process execution and resolution.

Monitoring

Monitoring encompasses the tracking of individual processes, so that information on their state can be easily seen, and statistics on the performance of one or more processes can be provided. An example of the tracking is being able to determine the state of a customer order *(e.g.* ordered arrived, awaiting delivery, invoice paid) so that problems in its operation can be identified and corrected.

In addition, this information can be used to work with customers and suppliers to improve their connected processes. Examples of the statistics are the generation of measures on how quickly a customer order is processed or how many orders were processed in the last month. These measures tend to fit into three categories: cycle time, defect rate and productivity.

The degree of monitoring depends on what information the business wants to evaluate and analyze and how business wants it to be monitored, in real-time, near real-time or ad-hoc. Here, business activity monitoring (BAM) extends and expands the monitoring tools in generally provided by BPMS.

Process mining is a collection of methods and tools related to process monitoring. The aim of process mining is to analyze event logs extracted through process monitoring and to compare them with an *a priori* process model. Process mining allows process analysts to detect discrepancies between the actual process execution and the *a priori* model as well as to analyze bottlenecks.

Optimization

Process optimization includes retrieving process performance information from modeling or monitoring phase; identifying the potential or actual bottlenecks and the potential opportunities for cost savings or other improvements; and then, applying those enhancements in the design of the process. Overall, this creates greater business value .

Operation

Whilst the steps can be viewed as a cycle, economic or time constraints are likely to limit the process to only a few iterations. This is often the case when an organization uses the approach for short to medium term objectives rather than trying to transform the organizational culture. True iterations are only possible through the collaborative efforts of process participants. In a majority of organizations, complexity will require enabling technology (see below) to support the process participants in these daily process management challenges.

To date, many organizations often start a BPM project or program with the objective to optimize an area that has been identified as an area for improvement.

In financial sector, BPM is critical to make sure the system delivers a quality service while maintaining regulatory compliance.

Currently, the international standards for the task have only limited to the application for IT sectors and ISO/IEC 15944 covers the operational aspects of the business. However, some corporations with the culture of best practices do use standard operating procedures to regulate their operational process. Other standards are currently being worked upon to assist in BPM implementation (BPMN, Enterprise Architecture, Business Motivation Model).

BPM technology

Some define the BPM System or Suite (BPMS) as "the whole of BPM." Others will relate the important concept of information moving between enterprise software packages and immediately think of Service Oriented Architecture (SOA). Still others limit the definition to "modeling... to create the 'perfect' process," (see Business modeling).

These are partial answers and the technological offerings continue to evolve. The BPMS term may not survive. Today it encompasses the concept of supporting the managerial approach through enabling technology. The BPMS should enable all stakeholders to have a firm understanding of an organization and its performance. The BPMS should facilitate business process change throughout the life cycle stated above. This will assist in the automation of activities, collaboration, integration with other systems, integrating partners through the value chain, etc. For instance, the size and complexity of daily tasks often requires the use of technology to model efficiently. These models facilitate automation and solutions to business problems. These models can also become executable to assist in monitoring and controlling business processes. As such, some people view BPM as "the bridge between Information Technology (IT) and Business. In fact, an argument can be made that this "holistic approach" bridges organizational and technological silos.

There are four critical components of a BPM Suite:

- Process Engine – a robust platform for modelling and executing process-based applications, including business rules

- Business Analytics — enable managers to identify business issues, trends, and opportunities with reports and dashboards and react accordingly
- Content Management — provides a system for storing and securing electronic documents, images, and other files
- Collaboration Tools — remove intra- and interdepartmental communication barriers through discussion forums, dynamic workspaces, and message boards

BPM also addresses many of the critical IT issues underpinning these business drivers, including:

- Managing end-to-end, customer-facing processes
- Consolidating data and increasing visibility into and access to associated data and information
- Increasing the flexibility and functionality of current infrastructure and data
- Integrating with existing systems and leveraging emerging service oriented architecture (SOAs)
- Establishing a common language for business-IT alignment

Validation of BPMS is another technical issue that vendors and users need to be aware of, if regulatory compliance is mandatory. The validation task could be performed either by an authenticated third party or by the users themselves. Either way, validation documentation will need to be generated. The validation document usually can either be published officially or retained by users.
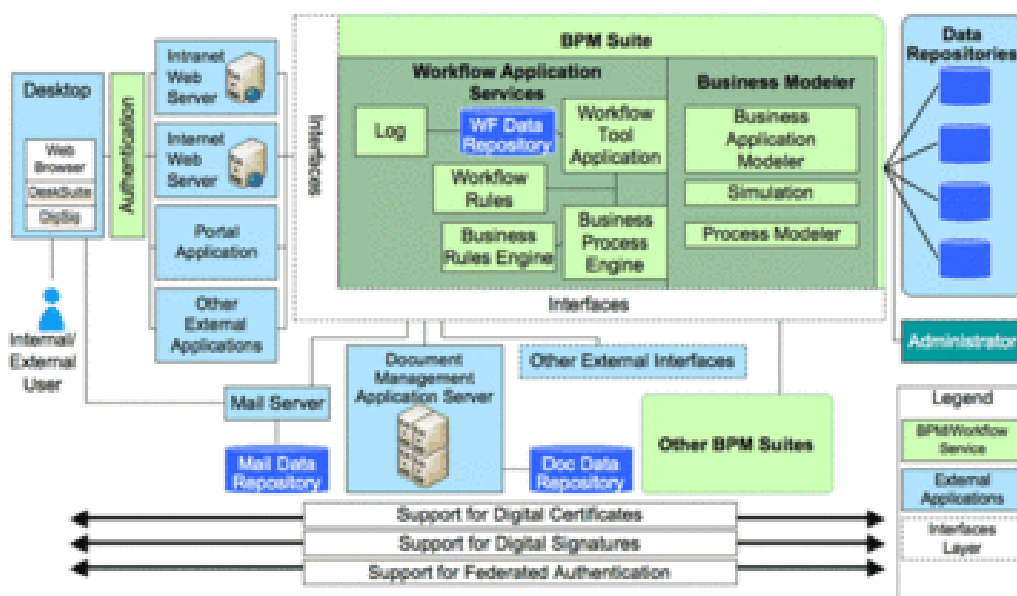

Fig. 2.2 Example of Business Process Management (BPM) Service Pattern: This pattern shows how business process management (BPM) tools can be used to implement business processes through the orchestration of activities between people and systems

The 9 principles of process-based management

1. **Spreading the "process culture"**. It is necessary to identify the principal business processes, habitually assess their contribution to value creation, focus overall performance on this and learn to define Process objectives. <u>Techniques</u> Recognizing and mapping processes, identifying customers and measuring performance. <u>Obstacles</u>: structural vision, hypersensitivity to economic aspects. <u>Implications</u>: measuring BP performances aligning incentive systems, continuous improvements into interfunctional teams

2. **Activating internal chains of customer-supplier.** This involves considering downstream functions and departments as real customers. It is necessary to be quick and flexible in serving internal customers and to learn to work for the customer, not for the department. Real suppliers must be involved in a partnership logic. <u>Internal customers/external customers</u> (work for the customers and not just for the boss.<u>Definition of Q,T,C</u> and simulation, increase in the speed of response.
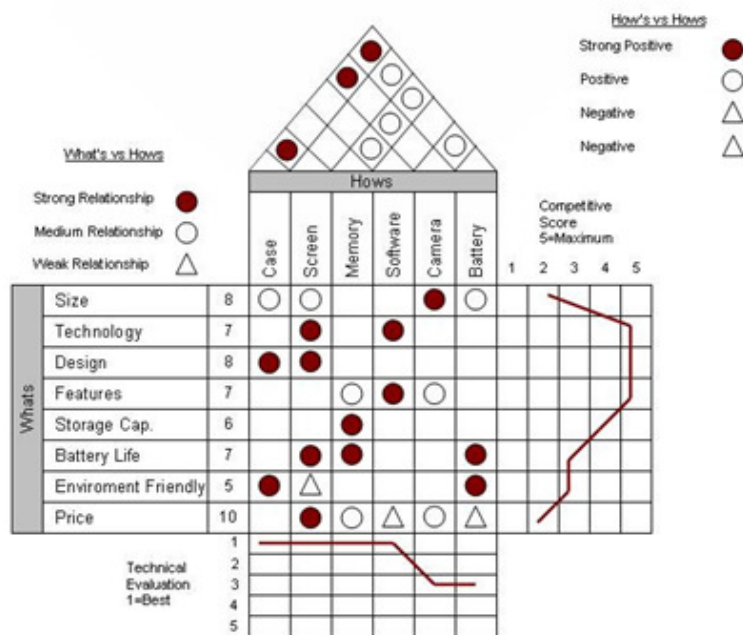

Fig. 2.3 QFD matrix

Quality Function Deployment

Quality Function Deployment (QFD) is the systematic translation of the "voice of the customer" to actions of the supplier required to meet the customers' desires, based on a matrix comparing what the customer wants to how the supplier plans to provide it. This basic matrix can be expanded to provide additional insight to the supplier, and cascaded to identify process parameters that must be controlled to meet the customer requirements. There are many varieties of QFD, and many variations of the charts used. Following is an illustration of the basic theory, and some references for further study.

3. **Identifying the process owner**. It is necessary to identify a "process owner" who will be in charge of the process and supervise overall effectiveness and efficiency.**.**

STRATEGIC PROCESS OWNER	OPERATIONAL PROCESS OWNER
Responsible for the AVERAGE performance of the process	Responsible for the SPECIFIC performance of each entity crossing the process
Responsible in front of the customer and top management of process performance	Responsible in front of the customer and Strategic Process Owner of single process crossing
Evaluates performance and promotes STRUCTURAL improvement to the process	Evaluates performance and promotes SPECIFIC improvement actions to each single process crossing
Competence on specific process content	Relational and leadership competences

Fig. 2.4 Comparison between strategic process owner and operational process owner

Project manager: new product/service development, Job order manager: customer order management/production and assembly and Case manager: customer service, complaint management.
Delegating, supporting, coaching, directing

4. **Balancing the use of "pull" and "push" logics, defining appropriate decoupling point.** According to the pull logic, activities are initiated only when a customer effectively requests the output of a process (and not before). According to the push logic, activities are advance. It is necessary to recognize planned and activated in advance. when to use one and when the other, managing the decoupling points. Anticipation versus flexibility

5. **Decentralizing support processes and information management.** It is necessary to ensure that information is managed and processed as much as possible by those who operate within the primary processes .

6. **Using information and communication technologies to redesign processes, improve coordination and accelerate problem solving**. This differs greatly from using technology simply to reduce work content and to control people's behavior from above. Horizontal communication and process integration BPM. ICT! ERP, CRM, EDI, workflow

7. **Recomposing fragmented activities.** It is not enough to increase integration capacities. It is also necessary to reduce the need to integrate by recomposing activities which are excessively fragmented, due to their being performed by different organizational units and individuals**.**

8. **Introducing delegation**. A certain degree of decision delegation is necessary in it favors rapid problem solving at local level avoiding the continual need to apply to the line of command. Delegation is necessary at single person level as well as at work team and interfunctional team level. EMPOWERMENT: process that leads people/groups to take on responsibility, operate autonomously, search for improvement, having clear business needs and boundaries of own performance

9. **Achieving a lean organization**. It is necessary to modify the organizational structure, by introducing concise, flat structures and by reducing staff.

2.2 Process Modeling

Business process modeling (BPM) in systems engineering and software engineering is the activity of representing processes of an enterprise, so that the current process may be analyzed and improved. BPM is typically performed by business analysts and managers who are seeking to improve process efficiency and quality. The process improvements identified by BPM may or may not require Information Technology involvement, although that is a common driver for the need to model a business process, by creating a process master.

Change management programs are typically involved to put the improved business processes into practice. With advances in technology from large platform vendors, the vision of BPM models becoming fully executable (and capable of simulations and round-trip engineering) is coming closer to reality every day.

History

Techniques to model business process such as the flow chart, functional flow block diagram, control flow diagram, Gantt chart, PERT diagram, and IDEF have emerged since the beginning of the 20th century. The Gantt chart were among the first to arrive around 1900, the flow charts in the 1920s, Functional Flow Block Diagram and PERT in the 1950s, Data Flow Diagrams and IDEF in the 1970s. Among the modern methods are Unified Modeling Language and Business Process Modeling Notation. Still these represent just a fraction of the methodologies used over the years to document business processes. The term "business process modeling" itself was coined in the 1960s in the field of systems engineering by S. Williams in his 1967 article "Business Process Modeling Improves Administrative Control". His idea was that techniques for obtaining a better understanding of physical control systems could be used in a similar way for business processes. It took until the 1990s before the term became popular.

In the 1990s the term "process" became a new productivity paradigm. Companies were encouraged to think in processes instead of functions and procedures. Process thinking looks at the chain of events in the company from purchase to supply, from order retrieval to sales etc. The traditional modeling tools were developed to picture time and costs, while modern methods focus on cross-function activities. These cross-functional activities have increased severely in number and importance due to the growth of complexity and dependencies. New methodologies such as business process redesign, business process innovation, business process management, integrated business planning among others all "aiming at improving processes across the traditional functions that comprise a company".

In the field of software engineering the term "business process modeling" opposed the common software process modeling, aiming to focus more on the state of the practice during software development. In that time early 1990s all existing and new modeling techniques to picture business processes were considered and called "business process modeling languages." In the Object Oriented approach, it was considered to be an essential step in the specification of Business Application Systems. Business process modeling became the base of new methodologies, that for example also supported data collection, data flow analysis, process flow diagrams

and reporting facilities. Around 1995 the first visually oriented tools for business process modeling and implementation were being presented.

Business model

A business model is a framework for creating economic, social, and/or other forms of value. The term 'business model' is thus used for a broad range of informal and formal descriptions to represent core aspects of a business, including purpose, offerings, strategies, infrastructure, organizational structures, trading practices, and operational processes and policies.

In the most basic sense, a business model is the method of doing business by which a company can sustain itself. That is, generate revenue. The business model spells-out how a company makes money by specifying where it is positioned in the value chain.

Business process

A business process is a collection of related, structured activities or tasks that produce a specific service or product (serve a particular goal) for a particular customer or customers. There are three main types of business processes:

1. Management processes, the processes that govern the operation of a system. Typical management processes include "Corporate Governance" and "Strategic Management".
2. Operational processes, processes that constitute the core business and create the primary value stream. Typical operational processes are Purchasing, Manufacturing, Marketing, and Sales.
3. Supporting processes, which support the core processes. Examples include Accounting, Recruitment, Technical support.

A business process can be decomposed into several sub-processes, which have their own attributes, but also contribute to achieving the goal of the super-process. The analysis of business processes typically includes the mapping of processes and sub-processes down to activity level. A business process model is a model of one or more business processes, and defines the ways in which operations are carried out to accomplish the intended objectives of an organization. Such a model remains an abstraction and depends on the intended use of the model. It can describe the workflow or the integration between business processes. It can be constructed in multiple levels.

A workflow is a depiction of a sequence of operations, declared as work of a person, work of a simple or complex mechanism, work of a group of persons, work of an organization of staff, or machines. Workflow may be seen as any abstraction of real work, segregated in workshare , work split or whatever types of ordering. For control purposes, workflow may be a view on real work under a chosen aspect.

Business process modeling tools

Business process modeling tools provide business users with the ability to model their business processes, implement and execute those models, and refine the models based on as-executed data. As a result, business process modeling tools can provide transparency into business processes, as well as the centralization of corporate business process models and execution metrics.

 Modeling and simulation

Modeling and simulation functionality allows for pre-execution "what-if" modeling and simulation. Post-execution optimization is available based on the analysis of actual as-performed metrics.

Business process modeling diagrams are:

- Use case diagrams created by Ivar Jacobson, 1992. Currently integrated in UML
- Activity diagrams, also currently adopted by UML

Some business process modeling techniques are:

- Business Process Modeling Notation (BPMN)
- Cognition enhanced Natural language Information Analysis Method (CogNIAM)
- Extended Business Modeling Language (xBML)
- **Event-driven process chain (EPC)**
- ICAM DEFinition (IDEF0)
- Unified Modeling Language (UML), extensions for business process such as Eriksson-Penker's

Programming languages tools for BPM

BPM suite software provides programming interfaces (web services, application program interfaces (APIs)) which allow enterprise applications to be built to leverage the BPM engine. This component is often referenced as the engine of the BPM suite.

Programming languages that are being introduced for BPM include: Some standards:

- BPMN
- Business Process Execution Language (BPEL),
- Web Services Choreography Description Language (WS-CDL).
- XML Process Definition Language (XPDL),

Some vendor-specific languages:

- **Architecture of Integrated Information Systems (ARIS) supports EPC**,
- Java Process Definition Language (JBPM),

Other technologies related to business process modeling include model-driven architecture and service-oriented architecture.

Architecture of Integrated Information Systems (ARIS)

ARIS (Architecture of Integrated Information Systems) is an approach to enterprise modeling. It offers methods for analyzing processes and taking a holistic view of process design, management, work flow, and application processing.

The ARIS-approach not only provides a generic and well documented methodological framework but also a powerful business process modeling tool.

ARIS started as the academic research of Prof August-Wilhelm Scheer in the 1990s. It has an industrial background, and has sold very well, and in this way widespread.

ARIS varies three main perspectives of techniques. ARIS uses a modeling language known as Event-driven Process Chains (EPC), which is an important aspect of the ARIS-model. EPC is the center of the House of ARIS and connects all other views, as well as describes the dynamics of the business process.
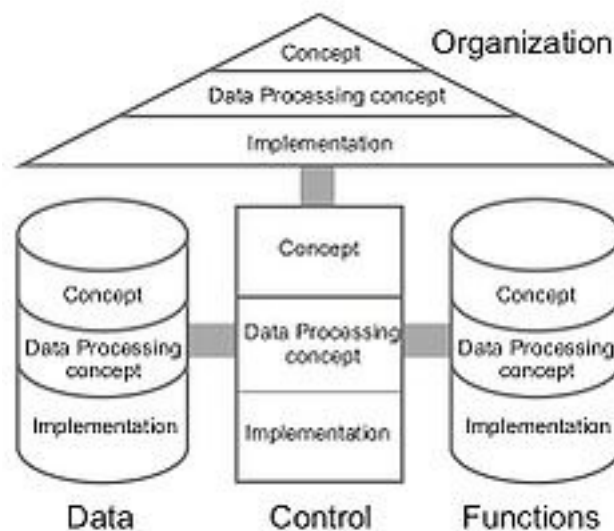
Fig. 2.5 Model of the Aris Framework

It differs from swimlane because it is process oriented and swimlane is function oriented. On the other hand, based on the conceptual description, ARIS can model and structure Business Process Models.

Furthermore, ARIS House has been developed to implement business models in information system.

Business reference model

A business reference model is a reference model, concentrating on the functional and organizational aspects of an enterprise, service organization or government agency. In general a reference model is a model of something that embodies the basic goal or idea of something and can then be looked at as a reference for various purposes. A business reference model is a means to describe the business operations of an organization, independent of the organizational structure that perform them. Other types of business reference model can also depict the relationship between the business processes, business functions, and the business area's business reference model. These reference models can be constructed in layers, and offer a foundation for the analysis of service components, technology, data, and performance.

The most familiar business reference model is the Business Reference Model of the US Federal Government. That model is a function-driven framework for describing the business operations of the Federal Government independent of the agencies that perform them. The Business Reference Model provides an organized, hierarchical construct for describing the day-to-day business operations of the Federal government. While many models exist for describing organizations - organizational charts, location maps, etc. - this model presents the business using a functionally driven approach

Business process integration

A business model, which may be considered an elaboration of a business process model, typically shows business data and business organizations as well as business processes. By showing business processes and their information flows a business model allows business stakeholders to define, understand, and validate their business enterprise. The data model part of the business model shows how business information is stored, which is useful for developing software code. See the figure on the right for an example of the interaction between business process models and data models.

Usually a business model is created after conducting an interview, which is part of the business analysis process. The interview consists of a facilitator asking a series of questions to extract information about the subject business process. The interviewer is referred to as a facilitator to emphasize that it is the participants, not the facilitator, who provide the business process information. Although the facilitator should have some knowledge of the subject business process, but this is not as important as her mastery of a pragmatic and rigorous method interviewing business experts. The method is important because for most enterprises a team of facilitators is needed to collect information across the enterprise, and the findings of all the interviewers must be compiled and integrated once completed.

Business models are developed as defining either the current state of the process, in which case the final product is called the "as is" snapshot model, or a concept of what the process should become, resulting in a "to be" model. By comparing and contrasting "as is" and "to be" models the business analysts can determine if the existing business processes and information systems are sound and only need minor

modifications, or if reengineering is required to correct problems or improve efficiency. Consequently, business process modeling and subsequent analysis can be used to fundamentally reshape the way an enterprise conducts its operations.

2.3 EPC : event driven process chain

An Event-driven Process Chain (EPC) is a type of flowchart used for business process modelling. EPC's can be used for configuring an enterprise resource planning (ERP) implementation and for business process improvement.
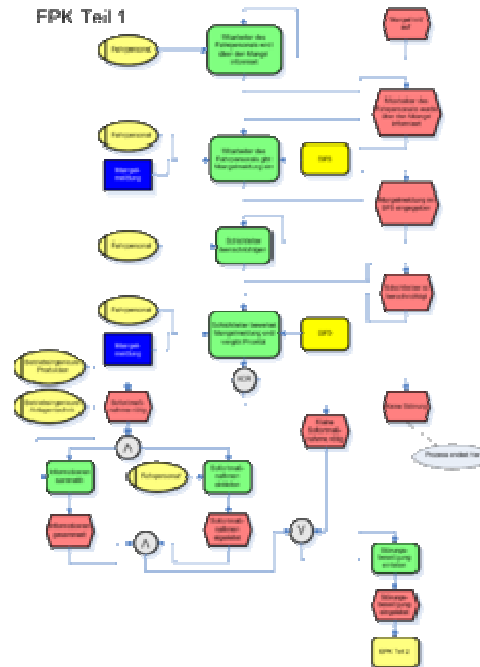

Fig. 2.6 example of a complex EPC diagram

Businesses use EPC diagrams to lay out business process work flows, originally in conjunction with SAP R/3 modeling, but now more widely. There are a number of tools for creating EPC diagrams, ARIS Toolset of IDS Scheer AG, (Now taken over by Software AG), free modeling tool ARIS Express by IDS Scheer AG , ADONIS of BOC Group, Mavim Rules of Mavim BV, Business Process Visual ARCHITECT of Visual Paradigm, **Visio of Microsoft Corp**., Semtalk of Semtation GmbH, or Bonapart by Pikos GmbH. Some but not all of these tools support the tool-independent EPC Markup Language (EPML) interchange format. There are also tools that generate EPC diagrams from operational data, such as SAP logs. EPC diagrams use symbols of several kinds to show the control flow structure (sequence of decisions, functions, events, and other elements) of a business process.

The EPC method was developed within the framework of ARIS by Prof. Wilhelm-August Scheer at the Institut für Wirtschaftsinformatik at the Universität des Saarlandes in the early 1990s. It is used by many companies for modelling , analyzing, and redesigning business processes. As such it forms the core technique for modeling in ARIS, which serves to link the different views in the so-called control view, which will be elaborated in section of ARIS Business Process Modeling.

To quote from a publication on EPCs: "An EPC is an ordered graph of events and functions. It provides various connectors that allow alternative and parallel execution of processes. Furthermore it is specified by the usages of logical operators, such as OR, AND, and XOR. A major strength of EPC is claimed to be its simplicity and easy-

to-understand notation. This makes EPC a widely acceptable technique to denote business processes."

The statement that EPCs are ordered graphs is also found in other literature, but is probably a misformulation: an ordered graph is a(n undirected) graph with an explicitly provided total node ordering, while EPCs are directed graphs for which no explicit node ordering is provided. No restrictions actually appear to exist on the possible structure of EPCs, but nontrivial structures involving parallelism have ill-defined execution semantics; in this respect they resemble UML activity diagrams. Several scientific articles are devoted to providing well-defined execution semantics for general EPCs. One particular issue is that EPCs require non-local semantics , i.e., the execution behaviour of a particular node within an EPC may depend on the state of other parts of the EPC, arbitrarily far away.

In the following the elements used in EPC diagram will be described:

Event
: Events are passive elements in EPC. They describe under what circumstances a function or a process works or which state a function or a process results in. Examples of events are "requirement captured", "material on stock", etc. In the EPC graph an event is represented as hexagon. In general, an EPC diagram must start with an event and end with an event.

Function
: Functions are active elements in EPC. They model the tasks or activities within the company. Functions describe transformations from an initial state to a resulting state. In case different resulting states can occur, the selection of the respective resulting state can be modeled explicitly as a decision function using logical connectors. Functions can be refined into another EPC. In this case it is called hierarchical function. Examples of functions are "capture requirement", "check material on stock", etc. In the EPC graph a function is represented as rounded rectangle.

Organization unit
: Organization units determine which person or organization within the structure of an enterprise is responsible for a specific function. Examples are "sales department", "sales manager", "procurement manager", etc. It is represented as an ellipse with a vertical line.

Information, material, or resource object
: In the EPC, the information, material, or resource objects portray objects in the real world, for example business objects, entities, etc., which can be input data serving as the basis for a function, or output data produced by a function. Examples are "material", "order", etc. In the EPC graph such an object is represented as rectangle.

Logical connector
: In the EPC the logical relationships between elements in the control flow, that is, events and functions are described by logical connectors. With the help of logical connectors it is possible to split the control flow from one flow to two or more flows and to synchronize the control flow from two or more flows to one flow.
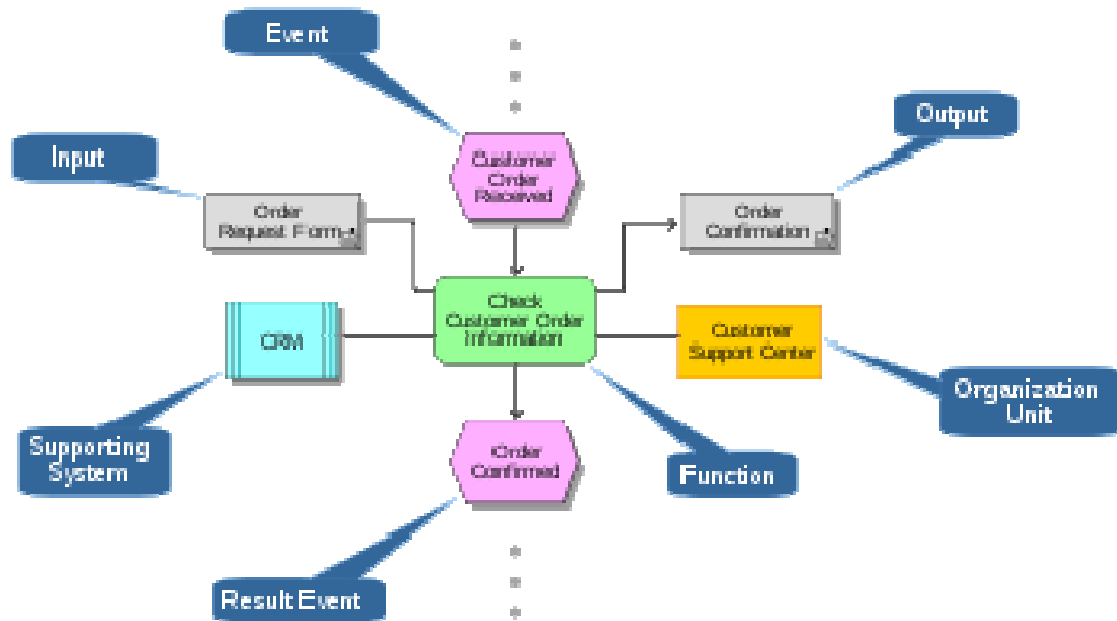
Fig. 2.7 Elements of an event driven process chain

<u>Logical relationships</u>

- There are three kinds of logical relationships defined in EPC:
    - Branch/Merge : Branch and merge correspond to making decision of which path to choose among several control flows. A branch may have one incoming control flow and two or more outgoing control flows. When the condition is fulfilled, a branch activates exactly only one of the outgoing control flows and deactivates the others. The counterpart of a branch is a merge. A merge may have two or more incoming flows and one outgoing control flow. A merge synchronizes an activated and the deactivated alternatives. The control will then be passed to the next element after the merge. A branch in the EPC is represented by an opening XOR, whereas a merge is represented as a closing XOR connectors.
    - Fork/Join : Fork and join correspond to activating all paths in the control flow concurrently. A fork may have one incoming control flow and two or more outgoing control flows. When the condition is fulfilled, a fork activates all of the outgoing control flows in parallel. A join may have two or more incoming control flows and one outgoing control flow. A join synchronizes all activated incoming control flows. In the EPC diagram how the concurrency achieved is not a matter. In reality the concurrency can be achieved by true parallelism or by virtual concurrency achieved by interleaving. A fork in the EPC is represented by an opening 'AND', whereas a join is represented as a closing 'AND' connectors.
    - OR : An 'OR' relationship corresponds to activating one or more paths among control flows. An opening 'OR' connector may have one

incoming control flow and two or more outgoing control flows. When the condition is fulfilled, an opening 'OR' connector activates one or more control flows and deactivates the rest of them. The counterpart of this is the closing 'OR' connector. When at least one of the incoming control flows is activated, the closing 'OR' connector will pass the control to the next element after it.

Control flow
> A control flow connects events with functions, process paths, or logical connectors creating chronological sequence and logical interdependencies between them. A control flow is represented as a dashed arrow.

Information flow
> Information flows show the connection between functions and input or output data, upon which the function reads changes or writes.

Organization unit assignment
> Organization unit assignments show the connection between an organization unit and the function it is responsible for.

Process path
> Process paths serve as navigation aid in the EPC. They show the connection from or to other processes. The process path is represented as a compound symbol composed of a function symbol superimposed upon an event symbol. To employ the process path symbol in an EPC diagram, a symbol is connected to the process path symbol, indicating that the process diagramed incorporates the entirety of a second process which, for diagramatic simplicity, is represented by a single symbol.
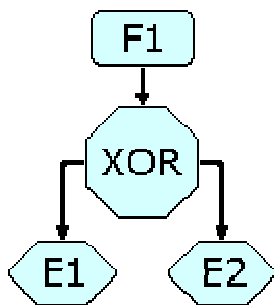
If function F1 completes, either events E1 or E2 occur
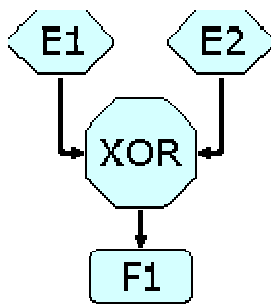
If either events E1 or E2 occur, function F1 starts

2.4 Business process reengineering

The analysis and design of workflows and processes within an organization. A business process is a set of logically related tasks performed to achieve a defined business outcome. Re-engineering is the basis for many recent developments in management. The cross-functional team, for example, has become popular because of the desire to re-engineer separate functional tasks into complete cross-functional processes. Also, many recent management information systems developments aim to integrate a wide number of business functions. Enterprise resource planning, supply chain management, knowledge management systems, groupware and collaborative systems, Human Resource Management Systems and customer relationship management.

Business Process Reengineering is also known as Business Process Redesign, Business Transformation, or Business Process Change Management.
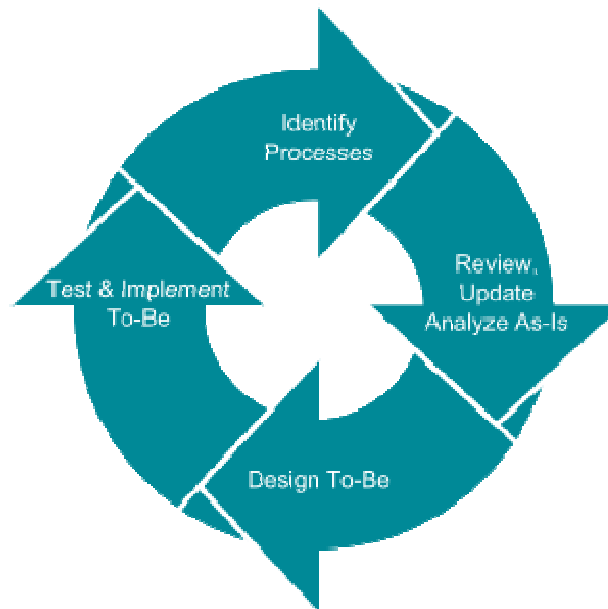
Fig. 2.8 Business Process Reengineering Cycle

Business process reengineering (BPR) began as a private sector technique to help organizations fundamentally rethink how they do their work in order to dramatically improve customer service, cut operational costs, and become world-class competitors. A key stimulus for reengineering has been the continuing development and deployment of sophisticated information systems and networks. Leading organizations are becoming bolder in using this technology to support innovative business processes, rather than refining current ways of doing work.

Business Process Reengineering (BPR) is basically the fundamental rethinking and radical re-design, made to an organizations existing resources. It is more than just business improvising. It is an approach for redesigning the way work is done to better support the organization's mission and reduce costs. Reengineering starts with a

high-level assessment of the organization's mission, strategic goals, and customer needs. Basic questions are asked, such as "Does our mission need to be redefined? Are our strategic goals aligned with our mission? Who are our customers?" An organization may find that it is operating on questionable assumptions, particularly in terms of the wants and needs of its customers. Only after the organization rethinks what it should be doing, does it go on to decide how best to do it.

Within the framework of this basic assessment of mission and goals, reengineering focuses on the organization's business processes—the steps and procedures that govern how resources are used to create products and services that meet the needs of particular customers or markets. As a structured ordering of work steps across time and place, a business process can be decomposed into specific activities, measured, modeled, and improved. It can also be completely redesigned or eliminated altogether. Reengineering identifies, analyzes, and redesigns an organization's core business processes with the aim of achieving dramatic improvements in critical performance measures, such as cost, quality, service, and speed.

```
        Mission
Defines  ▼  ▲  Accomplish
     Work Processes
Execute  ▼  ▲  Guide
       Decisions
Consider ▼  ▲ Supports
      Information
Employs  ▼  ▲  Processes
       Technology
```
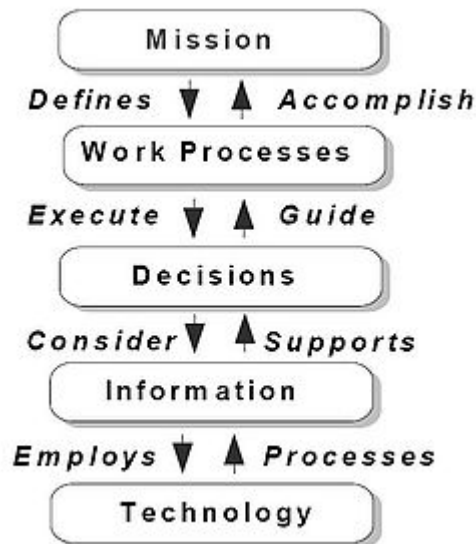
Fig 2.9 Reengineering guidance and relationship of Mission and Work Processes to Information Technology

Reengineering recognizes that an organization's business processes are usually fragmented into subprocesses and tasks that are carried out by several specialized functional areas within the organization. Often, no one is responsible for the overall performance of the entire process. Reengineering maintains that optimizing the performance of subprocesses can result in some benefits, but cannot yield dramatic improvements if the process itself is fundamentally inefficient and outmoded. For that reason, reengineering focuses on redesigning the process as a whole in order to achieve the greatest possible benefits to the organization and their customers. This drive for realizing dramatic improvements by fundamentally rethinking how the organization's work should be done distinguishes reengineering from process improvement efforts that focus on functional or incremental improvement.

The role of information technology

Information technology (IT) has historically played an important role in the reengineering concept]. It is considered by some as a major enabler for new forms of working and collaborating within an organization and across organizational borders.

Early BPR literature identified several so called disruptive technologies that were supposed to challenge traditional wisdom about how work should be performed.

- Shared databases, making information available at many places
- Expert systems, allowing generalists to perform specialist tasks
- Telecommunication networks, allowing organizations to be centralized and decentralized at the same time
- Decision-support tools, allowing decision-making to be a part of everybody's job
- Wireless data communication and portable computers, allowing field personnel to work office independent
- Interactive videodisk, to get in immediate contact with potential buyers
- Automatic identification and tracking, allowing things to tell where they are, instead of requiring to be found
- High performance computing, allowing on-the-fly planning and revisioning

In the mid 1990s, especially workflow management systems were considered as a significant contributor to improved process efficiency. Also ERP (Enterprise Resource Planning) vendors, such as SAP, JD Edwards, Oracle, PeopleSoft, positioned their solutions as vehicles for business process redesign and improvement.

Critique

Reengineering has earned a bad reputation because such projects have often resulted in massive layoffs]. This reputation is not altogether unwarranted, since companies have often downsized under the banner of reengineering. Further, reengineering has not always lived up to its expectations. The main reasons seem to be that:

- Reengineering assumes that the factor that limits an organization's performance is the ineffectiveness of its processes (which may or may not be true) and offers no means of validating that assumption.
- Reengineering assumes the need to start the process of performance improvement with a "clean slate," i.e. totally disregard the status quo.
- According to Eliyahu M. Goldratt (and his Theory of Constraints) reengineering does not provide an effective way to focus improvement efforts on the organization's constraint.

There was considerable hype surrounding the introduction of Reengineering the Corporation (partially due to the fact that the authors of the book reportedly bought numbers of copies to promote it to the top of bestseller lists).

Abrahamson (1996) showed that fashionable management terms tend to follow a lifecycle, which for Reengineering peaked between 1993 and 1996 (Ponzi and

Koenig 2002). They argue that Reengineering was in fact nothing new (as e.g. when Henry Ford implemented the assembly line in 1908, he was in fact reengineering, radically changing the way of thinking in an organization). Dubois (2002) highlights the value of signaling terms as Reengineering, giving it a name, and stimulating it. At the same there can be a danger in usage of such fashionable concepts as mere ammunition to implement particular reform. Read Article by Faraz Rafique. The most frequent and harsh critique against BPR concerns the strict focus on efficiency and technology and the disregard of people in the organization that is subjected to a reengineering initiative. Very often, the label BPR was used for major workforce reductions. Thomas Davenport, an early BPR proponent, stated that:

"When I wrote about "business process redesign" in 1990, I explicitly said that using it for cost reduction alone was not a sensible goal. And consultants Michael Hammer and James Champy, the two names most closely associated with reengineering, have insisted all along that layoffs shouldn't be the point. But the fact is, once out of the bottle, the reengineering genie quickly turned ugly."

Michael Hammer similarly admitted that:

"I wasn't smart enough about that. I was reflecting my engineering background and was insufficient appreciative of the human dimension. I've learned that's critical."

Other criticism brought forward against the BPR concept include

- It never changed management thinking, actually the largest causes of failure in an organization
- lack of management support for the initiative and thus poor acceptance in the organization.
- exaggerated expectations regarding the potential benefits from a BPR initiative and consequently failure to achieve the expected results.
- underestimation of the resistance to change within the organization.
- implementation of generic so-called best-practice processes that do not fit specific company needs.
- overtrust in technology solutions.
- performing BPR as a one-off project with limited strategy alignment and long-term perspective.
- poor project management.

2.5 Process enterprise

The most visible difference between a process enterprise and a traditional organization is the existence of process owners.
Senior managers with end-to-end responsibility for individual processes, process owners are the living embodiment of a company's commitment to its processes.
To succeed, a process owner must have real responsibility for and authority over designing the process, measuring its performance, and training the frontline workers who perform it. A process owner cannot serve just as an interim project manager, active only while a new process design is being developed and put in place.

Process ownership has to be a permanent role, for two reasons. First, process designs need to evolve as business conditions change, and process owners need to guide that evolution.

Second, in the absence of strong process owners, the old organizational structures will soon reassert themselves.

The advent of process owners is a dramatic change for most organizations because it separates the control over work from the management of the people who perform the work.

Traditionally, a geographical or functional manager oversees both the work and the people who do it. In a process enterprise, the process owner has responsibility for the design of the process, but the various people who perform the process still report to the unit heads. That kind of split in authority may be hard for many executives to imagine, but there are companies that are making it work today.

One example is Duke Power, a true pioneer of the process enterprise. The electric utility arm of Duke Energy, Duke Power serves nearly 2 million customers in North and South Carolina.

In 1995, with deregulation looming, it realized that it had to do a much better job of customer service if it was to survive the onslaught of competition. But the existing organizational structure of Customer Operations, the business unit responsible for delivering electricity to customers, was getting in the way of service enhancements. The unit was divided into four regional profit centers, and the regional vice presidents, overwhelmed by an endless stream of administrative duties, had little time for wrestling with the details of service provision. And even if they had, there was no way to coordinate their efforts across the regions. No one, in short, was responsible for how the company was delivering value to customers.

To solve the problem, Duke Power identified five core processes that together encompassed the essential work that Customer Operations performed for customers: Develop Market Strategies, Acquire and Maintain Customers, Provide Reliability and Integrity, Deliver Products and Services, and Calculate and Collect Revenues. Each process was assigned an owner, and the five process owners, like the four existing regional vice presidents, reported directly to the head of Customer Operations.

In the new structure, the regional vice presidents continue to manage their own workforces—the process units have only small staffs— but the process owners have been given vast authority over how the company operates. First, they are responsible for designing their respective processes.

They define how work will proceed at every step, and the regions are expected to follow those designs. Second, and just as important, the process owners are responsible for setting performance targets, establishing budgets, and distributing those

budgets among the regions. In other words, while the regions continue to have authority over people, they are evaluated on the basis of how well they meet the targets set by the process owners, and their budgets are in large part roll-ups of the monies disbursed by the

process owners.

The regional vice presidents have no choice but to work in partnership with the process owners. The new structure has proven to be a great success, focusing the entire organization much more directly on the customer.

Virtually every activity involved in serving customers has been redesigned from the ground up.

 For example, the process owner for Deliver Products and Services, Rob Manning, has worked with the regional units, with suppliers, and with his own ten-person staff to devise a
new way to organize warehouse facilities. Parts that will be required by installation crews, for example, are laid out the night before for easy pickup in the morning, so that the crews can load their trucks and be on the road in 10 minutes, a fraction of the 70 minutes it used
to require. The crews can do more installations in a day, so customers don't have to wait as long to get service.
Manning has also revamped the way the company works with its building-contractor customers. As recently as late 1996, Duke Power was meeting only 30% to 50% of its commitments to those customers—laying cables by a certain date, for example. That created difficulties, as those customers based their construction schedules around Duke Power's promised dates.
The problem was that the people making the commitments did not have an accurate picture of the availability of individual field-workers.
They could not ensure, therefore, that the required skills would be in the right place at the appointed date. Manning and his team deployed a new scheduling
system that provides much more detailed information about the availability of field personnel, enabling more specific and accurate assignments.
They also designated people to negotiate commitment dates with contractors and keep them apprised of changes. Finally, they underscored the importance of meeting commitments to customers by measuring the percentage of deadlines met and by publicizing each region's results on a daily basis. Duke Power now meets 98% of its construction commitments.

A New Style of Management

Duke Power has learned that becoming a process enterprise is more than a matter of establishing new management posts and rejiggering responsibilities. As lines of authority become less clear-cut, the way managers interact with one another and with workers
also has to change. Style is as important as structure. Process owners, for example, can't simply order process workers to do their bidding. They have to work through the unit heads—the regional VPs, in Duke Power's case.
Manning says that his role requires "three critical skills: influence, influence, and influence." Unit heads, for their part, have to negotiate with the process owners to ensure that the process designs are sound, the process goals reasonable, and the resource allocations fair. The split in authority, in other words, makes cooperation unavoidable. If you don't work together, you fail.

Duke Power's managers, like those of most companies, were not accustomed to such a collaborative style. At first, the process owners and regional VPs tended to act more as rivals than as partners. The problem wasn't resolved until all the managers sat down together and developed a document they called the "decision rights matrix." The matrix specified the roles the different managers would play for each of the major decisions made in the organization, such as changing a process design, hiring people, setting a budget, and so on. It detailed, for example, which managers would actually make the decision, which had to be consulted beforehand, and which had to be

informed afterward. In effect, the matrix was the organization's road map for managerial teamwork.

Today, the managers rarely have to consult the matrix—they've internalized it. But the specificity and clarity of the matrix gave the managers a concrete sense of how the
new organization would work, and the very process of creating it gave them an appreciation for the new, more collaborative style of management.

The five process owners also had to learn to collaborate closely with one another. Processes, after all, aren't islands onto themselves.

They overlap, since the same workers are often involved in several processes, sometimes simultaneously. At Duke Power, for example, the same group of field personnel installs lines (part of Deliver Products and Services) and maintains them (part of Provide Reliability and Integrity).

Initially, that overlap created a conflict. Installations almost always had hard deadlines, reflecting customers' need for precise commitment dates, but maintenance jobs often did not. As a result, maintenance kept getting pushed to the back burner.

The two process owners got together to work out a new arrangement: certain field personnel would be dedicated to each process, and the rest would form a floating pool available to work on either process. The Provide Reliability and Integrity process owner also agreed to schedule routine maintenance in the spring and fall whenever possible, creating greater installation capacity during the summer, when demand was highest. In addition to meeting informally to solve particular process conflicts, the five process owners meet regularly in formal sessions with their boss, the head of Customer Operations, to review and coordinate operational plans, budgets, performance
measures, and the like.

If a company is going to make itself over into a process enterprise, it needs to change not only the way its managers interact with one another but also the way they relate to frontline workers. Process teams composed of individuals who have broad process knowledge and who are measured on process performance have little need—or room—for traditional supervisors.

The teams themselves take over most of the managerial responsibilities usually held by supervisors. Supervisors, in turn, become more like coaches, teaching the workers how to perform the process, assessing their skills, overseeing their development, and providing assistance when requested.

At Duke Power, in fact, the once ubiquitous foreman position has disappeared entirely, replaced by a new role—the process coordinator.

Because the coordinator coaches rather than controls the people who perform the process, Duke's traditional ten-to-one span of supervisory control has widened dramatically; the typical process coordinator supports 30 to 40 people. (In some companies, the number is as high as 70.)

There are also now far fewer managerial levels at Duke; instead of six levels between the front line and the regional vice president, there are only three. And as the process owners have taken over some of the former responsibilities of the regional vice presidents, the VPs, too, have become more focused on training and developing their people. One Duke Power executive calls them "super coaches."

The process owners also play an important, if indirect, role in managing frontline workers. They act not as coaches but as, to use Manning's word, "evangelists," promoting the process designs and representing the interests of customers. As Manning puts it, "My job
as a process owner is to convince the people who operate within my process that there is no greater calling for them than to do what the customer needs them to do and that the best tool they have is the process we have given them." Manning performs this role by
designing and delivering training programs to process workers; by setting performance targets; and by regularly talking with them, keeping them informed of changing customer needs and listening to their concerns and ideas.

Traditional styles of management, to sum up, have no place in a process enterprise. Managers can't command and control; they have to negotiate and collaborate. They can't wield authority; they have to exert influence. Any company hoping to turn itself into a process enterprise needs to understand the changes in managerial style that will be required and their implications for staffing and training.

Few managers will be able to make the transition easily, and some may not be able to make it at all.

The Question of Process Standardization

Companies made up of many different business units will face an important strategic question as they make the shift to a process enterprise: Should all units do things the same way, or should they be allowed to tailor their processes to their own needs? In a process enterprise, the key structural issue is no longer centralization versus decentralization—it's process standardization versus process diversity.

There's no one right answer. IBM, Duke Power, and Progressive Insurance, for example, have opted for standardization. They designate a single owner for each process, and that person develops and installs the same process design throughout the company.
American Standard, in contrast, has different process owners and process designs in each of its major business units.

Process standardization offers many benefits. First, it lowers overhead costs, since the process requires only one owner with one staff, only one set of documentation and training materials, and only one information system. Second, a company with standardized
processes presents one face to its suppliers and customers, reducing transaction costs both for them and for itself. By standardizing its procurement process across all its business units, IBM has been able to create a single list of approved vendors, enabling the company to aggregate its purchases and giving it much more leverage over suppliers. Owens Corning has standardized its order fulfilment process across all its divisions, which share many of the same customers. That's great for customers—they only have to submit one order, receive one invoice, and pay one bill. It's also great for Owens Corning, which has saved millions in logistics costs by consolidating shipments from different divisions.

Third, and perhaps counterintuitively, process standardization can increase organizational flexibility. When all business units are performing a process the same way, a company can easily reassign people from one unit to another to respond to shifts in demand. Its
organizational structure becomes much more plastic.

As compelling as the arguments for standardization are, process diversity offers one big advantage: it allows different kinds of customers to be served in different ways. The industrial customers who buy Texas Instruments' digital signal processing chips to put in
their cameras and cellular telephones require rapid responses to design changes, whereas the retailers who sell calculators demand fast replenishment of standard products. Trying to serve both groups with the same order fulfillment process would backfire, leaving each
dissatisfied. Recognizing that fact, Texas Instruments allows its business units to design and manage their own order fulfilment processes.

Some companies have decided to standardize certain processes but not others. Hewlett-Packard, for example, standardizes procurement to gain leverage with vendors, but it allows a variety of product development processes, reflecting the wide variation in its
products and in the customers who buy them. Johnson & Johnson has largely standardized its R&D processes throughout its pharmaceutical business units to encourage them to share people and ideas and to enable all R&D projects to be managed as a single coherent portfolio. At the same time, different units go their own ways in designing sales and manufacturing processes tailored to the unique characteristics of their products.

The Infrastructure of the Process Enterprise (Located at the end of this article)
Our rule of thumb is that companies should standardize their processes as much as possible without interfering with their ability to meet diverse customers' needs. However, we have learned that it's usually harder to impose standardized processes than to allow
diversity. A corporate executive proposing standardization will almost certainly be met with a chorus of "but we're different" from divisional general managers. Some of the resistance may reflect legitimate concerns about whether a standard process can meet the
needs of different units and different customers—and in those cases standardization may indeed be a mistake. But the resistance may simply be the death rattle of divisional autonomy. General managers are accustomed to seeing themselves as entrepreneurs running their own businesses; the corporate center is supposed to give them resources and demand results but otherwise keep out of their way.

While corporate executives should be prepared for this reaction, they should not give in to it. The rewards of standardized processes are great, and they're worth fighting for.

Making the Transition

Making the shift to a process enterprise involves much more than just redrawing an organizational chart. The changes we've discussed are fundamental ones,

representing new ways of managing and working, and they are not easy to make. They require the full attention and commitment of the organization. Unfortunately, most companies today are swimming—or sinking—in a sea of change programs. The proliferation of change efforts causes harm in many ways: it consumes resources, creates confusion, and encourages cynicism. Before launching a process enterprise initiative, management needs to take a hard look at all its change programs, pruning those that aren't relevant to process management and merging those that are.

Distractions must be kept to a minimum. The move to a process enterprise should be connected with an overarching strategic initiative. At American Standard, for instance, the
building of a process enterprise was positioned as a way to achieve the company's long-term goal of reducing working capital by slashing cycle times and inventory levels. At Owens Corning, the effort was linked with the ERP implementation. At Duke Power, it was
tied to deregulation, and at IBM, it was connected to creating a truly global business. Other companies have linked their programs to a move into electronic commerce, the implementation of a merger, or the integration of a supply chain.
One particularly effective way to underscore the importance of the effort—and to help ensure its success—is to appoint high-profile, respected executives as process owners. By putting its best people in these positions, management emphasizes the high priority it
places on process management and ensures that the process owners will be taken seriously.

In addition to being focused on the transition, organizations need to have a realistic sense of the sacrifices and disruptions it will entail.

A shift to a process enterprise isn't a quick fix; it doesn't happen overnight. American Standard announced its transformation into a process enterprise on January 1, 1995, but it hasn't yet completed its journey. IBM, Duke Power, and the other companies we have discussed are also still working on aligning some aspects of their businesses with their processes. Executives need to prepare themselves for years of effort and set the organization's expectations accordingly.

Not everything needs to be done at once, of course. Process owners should be appointed immediately, as they will guide the entire effort. A process-based measurement system should be established at the outset to track the effort's progress. But expenditures on
employee-training programs, compensation systems, and other costly or complex infrastructural elements can often be deferred.
Instead of trying to build a companywide infrastructure at the start, it's best to focus first on achieving some tangible benefits quickly. Without clear early signs that the desired gains will materialize, people will grow anxious and begin to resist the changes, and the entire effort will lose momentum.
At Texas Instruments, for example, the success of the product development process helped convince the organization of the virtue of process management, and the company is now extending the approach into supply-chain, retailer-engagement, and other processes.

Companies with many business units have sometimes found it useful to designate one unit to take the lead. That unit becomes a kind of organizational prototype. Through its experience, the company as a whole can identify and rectify problems, promote benefits, and set a course for others to follow. At John Deere, for instance, two divisions have taken the lead in becoming process organizations: John Deere Healthcare and one of the equipment-manufacturing units, the Worldwide Construction Equipment division. Other divisions within the company now have the opportunity to learn from their experiences and build on their best practices.

Because the changes involved in becoming a process enterprise are so great, companies can expect to encounter considerable organizational resistance. We have found, though, that it's rarely the frontline workers who impede the transformation. Once they see
that their jobs will become broader and more interesting, they are generally eager to get on board. Rather, the biggest source of resistance is usually senior functional executives, division heads, and other members of the top management team. These senior
executives will often either resent what they see as a loss of autonomy and power or be uncomfortable with the new, collaborative managerial style. If allowed to become visible, their reluctance will soon be amplified throughout the rest of the organization. CEOs,
therefore, need to take particular care in communicating to unit heads, involving them in the change effort, and gaining their full commitment. They should be prepared to dismiss anyone who steadfastly refuses to support the initiative. In our experience, it is not uncommon for anywhere from a quarter to a half of the senior team to leave— voluntarily or otherwise—during the changeover.

The infrastructure of the process enterprise

Traditional ways to measure performance, determine compensation, provide training, and even organize facilities are tailored to
vertical units, not processes, and to individuals, not teams. Companies making the shift to a process enterprise will need to take a fresh
look at many of the basic elements of their organizational infrastructure.

Measurement
Most businesses lack rigorous measures for their processes. They may know their manufacturing costs and their product sales down to the penny, but they don't know exactly how often they fill orders flawlessly or precisely how long it takes a new product to go from conception to profitability. Indeed, they're usually not even sure what aspects of their processes they ought to be measuring.
Their measurement systems conform to the very organizational boundaries that their processes transcend.
In moving to a process enterprise, therefore, managers need to conduct a thorough analysis to determine what aspects of process
performance are most directly linked to achieving the organization's overall objectives. Duke Power has conducted such an analysis. It identified its overarching strategic goals—such as providing reliable and competitively priced electric power and hassle-free customer service—and has determined how each of its processes would affect those goals. It then established relevant process performance measures. For the Deliver Products and Services process, the measures include the

percentage of projects completed by the date promised to the customer, the percentage of installations done correctly the first time, and the time it takes the call center to respond to
a customer's inquiry. Measures for the Provide Reliability and Integrity process include the number of outages, the number of outages lasting more than two hours, and the accuracy of restoration times given to customers who have lost power. Process owners not only use the metrics to track the status of a process and guide improvement efforts, they also disseminate them
throughout the organization to reinforce people's awareness of the process and to focus them on its performance. Since the same process measures are used to gauge the performance of everyone involved in the process, the metrics also help to reinforce teamwork.

Compensation
If frontline personnel and managers are to focus on processes, their compensation should be based at least in part on how well the processes perform. All process teams at Allmerica Financial have concrete performance goals set by the process owners, such as targets for the time required to process applications and the percentage of contracts issued without errors. The team members receive bonuses based on achieving those goals, and the process owners can award additional bonuses to members who make outstanding contributions. At American Standard, the compensation of process owners is based on three factors: process performance, business sector performance, and corporate performance. The heads of regional business units at Duke Power are assessed not only on the bottom line of their regions but also on how well they meet their process goals.

Facilities
In most companies, people are housed in vertical departments, according to their function, their region, or their business unit. But because processes cut across those vertical divisions, process workers need to be drawn from them into a new location where they can
work as a team. At Owens Corning, for instance, many different employees are involved in filling an order, from customer service representatives to transportation coordinators to accounting personnel. In the past, each of those people worked in a separate location,
surrounded by others in the same functional specialty. Now all those involved in order fulfillment are located together. By sharing the same facility, they get a better view of the entire process, and they are able to exchange ideas easily. American Standard has undertaken
a radical program of co-location, creating shared spaces for all of its process teams. When all work is process work, all space becomes process space.

Training and Development
In traditional organizations, many people have relatively narrow jobs and need to know little outside the scope of their own department. For a process team to succeed, however, all the members must understand the whole process and how their individual efforts contribute to it.
Usually, workers will need to be trained to take on their broadened roles. Duke Power, for instance, puts all its linemen through a class called "Thriving in a Process Organization," which gives them a basic grounding in the electric power industry, covering such topics as deregulation, utility cost structures, and customer

requirements. It also gives them an appreciation of the concept of a business process, a detailed understanding of their own process, and training in the personal skills needed to work
collaboratively.

Career Paths
There is less need for middle managers in a process organization than in a traditional one. Process owners design and measure the process, and process teams carry it out, overseeing their own work and making all the day-to-day operating decisions required to keep things moving smoothly. As a result, most of the rungs on the traditional managerial career ladder disappear. A process enterprise therefore needs to develop new career models that are not based on traditional hierarchical advancement. Allmerica Financial, for
instance, offers employees two new career models. One is based on mastering a specific insurance discipline, such as claims handling.
Claims personnel who develop greater knowledge and skills are assigned more complex claims and get a higher base pay—without a formal change in level. The other model offers a career path through many parts of the company—from claims to IT to underwriting, for instance.

2.6 Organizational purpose and structural design

Organization design is a process for improving the probability that an organization will be successful.

More specifically, Organization Design is a formal, guided process for integrating the people, information and technology of an organization. It is used to match the *form* of the organization as closely as possible to the purpose(s) the organization seeks to achieve. Through the design process, organizations act to improve the probability that the collective efforts of members will be successful.

Typically, design is approached as an internal change under the guidance of an external facilitator. Managers and members work together to define the needs of the organization then create systems to meet those needs most effectively. The facilitator assures that a systematic process is followed and encourages creative thinking.

Hierarchical Systems

Western organizations have been heavily influenced by the command and control structure of ancient military organizations, and by the turn of the century introduction of Scientific Management. Most organizations today are designed as a bureaucracy in which authority and responsibility are arranged in a hierarchy. Within the hierarchy rules, policies, and procedures are uniformly and impersonally applied to exert control over member behaviours. Activity is organized within sub-units (*bureaus,* or departments) in which people perform specialized functions such as manufacturing, sales, or accounting. People who perform similar tasks are clustered together.

The same basic organizational form is *assumed* to be appropriate for any organization, be it a government, school, business, church, or fraternity. It is familiar, predictable, and rational. It is what comes immediately to mind when we discover that ...*we really have to get organized!*

As familiar and rational as the *functional hierarchy* may be, there are distinct disadvantages to blindly applying the same form of organization to all purposeful groups. To understand the problem, begin by observing that different groups wish to achieve *different outcomes.* Second, observe that different groups have *different members*, and that each group possesses a *different culture.* These differences in desired outcomes, and in people, should alert us to the danger of assuming there is *any* single best way of organizing. To be complete, however, also observe that different groups will likely choose *different methods* through which they will achieve their purpose. Service groups will choose different methods than manufacturing groups, and both will choose different methods than groups whose purpose is primarily social. *One structure* cannot possibly *fit all*.

Organizing on Purpose

The purpose for which a group exists should be the foundation for everything its members do — including the choice of an appropriate way to organize. The idea is *to create* a way of organizing that *best suits* the purpose to be accomplished, regardless of the way in which other, dissimilar groups are organized.

Only when there are close similarities in desired outcomes, culture, and methods should the basic form of one organization be applied to another. And even then, only with careful fine tuning. The danger is that the *patterns* of activity that help one group to be successful may be dysfunctional for another group, and actually inhibit group effectiveness. To optimize effectiveness, the form of organization must be matched to the purpose it seeks to achieve.

The Design Process

Organization design begins with the creation of a strategy — a set of decision guidelines by which members will choose appropriate actions. The strategy is derived from clear, concise statements of purpose, and vision, and from the organization's basic philosophy. Strategy unifies the intent of the organization and focuses members toward actions designed to accomplish desired outcomes. The strategy encourages actions that support the purpose and discourages those that do not.

Creating a strategy is planning, not organizing. To organize we must connect people with each other in meaningful and purposeful ways. Further, we must connect people with the information and technology necessary for them to be successful. Organization *structure* defines the formal relationships among people and specifies both their roles and their responsibilities. Administrative *systems* govern the organization through guidelines, procedures and policies. Information and technology define the *process(es)* through which members achieve outcomes. Each element

must support each of the others and together they must support the organization's purpose.

<u>Exercising Choice</u>

Organizations are an *invention* of man. They are *contrived* social systems through which groups seek to exert influence or achieve a stated purpose. People choose to organize when they recognize that by acting alone they are limited in their ability to achieve. We sense that by acting in concert we may overcome our individual limitations.

When we organize we seek to direct, or *pattern*, the activities of a group of people toward a common outcome. How this pattern is designed and implemented greatly influences effectiveness. Patterns of activity that are complementary and *inter*dependent are more likely to result in the achievement of *intended* outcomes. In contrast, activity patterns that are unrelated and *inde*pendent are more likely to produce unpredictable, and often unintended results.

The process of organization design matches people, information, and technology to the purpose, vision, and strategy of the organization. Structure is designed to enhance communication and information flow among people. Systems are designed to encourage individual responsibility and decision making. Technology is used to enhance human capabilities to accomplish meaningful work. The end product is an integrated system of people and resources, tailored to the specific direction of the organization.

2.8 Change management

Change management is a structured approach to transitioning individuals, teams, and organizations from a current state to a desired future state. It is an organizational process aimed at empowering employees to accept and embrace changes in their current business environment. In project management, change management refers to a project management process where changes to a project are formally introduced and approved.

Examples of Organizational Change

1. Strategic changes
2. Technological changes
3. Structural changes
4. Changing the attitudes and behaviors of personnel

As a multidisciplinary practice, Organizational Change Management requires for example: creative marketing to enable communication between change audiences, but also deep social understanding about leadership's styles and group dynamics. As a visible track on transformation projects, Organizational Change Management aligns groups' expectations, communicates, integrates teams and manages people training. It makes use of metrics, such as leader's commitment, communication effectiveness, and the perceived need for change to design accurate strategies, in order to avoid change failures or solve troubled change projects. An effective change management plan needs to address all above mentioned dimensions of change. This can be achieved in following ways:

1. Putting in place an effective Communication strategy which would bridge any gap in the understanding of change benefits and its implementation strategy.
2. Devise an effective skill upgrading scheme for the organization. Overall these measures can counter resistance from the employees of companies and align them to overall strategic direction of the organization.
3. Personal counseling of staff members (if required) to alleviate any change related fears.

Project teams

A team used only for a defined period of time and for a separate, concretely definable purpose, often becomes known as a project team. Managers commonly label groups of people as a "team" based on having a common function. Members of these teams might belong to different groups, but receive assignment to activities for the same project, thereby allowing outsiders to view them as a single unit. In this way, setting up a team allegedly facilitates the creation, tracking and assignment of a group of people based on the project in hand. The use of the "team" label in this instance often has no relationship to whether the employees are working as a team.

2.9 Project management

Project management is the discipline of planning, organizing, securing and managing resources to bring about the successful completion of specific engineering project goals and objectives. It is sometimes conflated with program management, however technically that is actually a higher level construction: a group of related and somehow interdependent engineering projects. A project is a temporary endeavor, having a defined beginning and end (usually constrained by date, but can be by funding or deliverables),] undertaken to meet unique goals and objectives, usually to bring about beneficial change or added value. The temporary nature of projects stands in contrast to business as usual (or operations), which are repetitive, permanent or semi-permanent functional work to produce products or services. In practice, the management of these two systems is often found to be quite different, and as such requires the development of distinct technical skills and the adoption of separate management.

The primary challenge of project management is to achieve all of the engineering project goals and objectives while honoring the preconceived project constraints. Typical constraints are scope, time, and budget. The secondary—and more ambitious—challenge is to optimize the allocation and integration of inputs necessary to meet pre-defined objectives.

The traditional approach

A traditional phased approach identifies a sequence of steps to be completed. In the "traditional approach", we can distinguish 5 components of a project (4 stages plus control) in the development of a project:
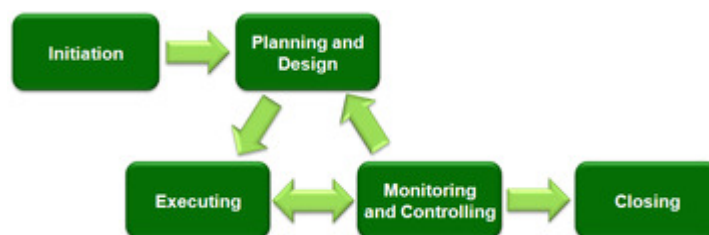
Fig. 2.10 Typical development phases of an engineering project

- Project initiation stage;
- Project planning and design stage;
- Project execution and construction stage;
- Project monitoring and controlling systems;
- Project completion.

Not all the projects will visit every stage as projects can be terminated before they reach completion. Some projects do not follow a structured planning and/or monitoring stages. Some projects will go through steps 2, 3 and 4 multiple times.

Many industries use variations on these project stages. For example, when working on a brick and mortar design and construction, projects will typically progress through stages like Pre-Planning, Conceptual Design, Schematic Design, Design Development, Construction Drawings (or Contract Documents), and Construction Administration. In software development, this approach is often known as the waterfall model, i.e., one series of tasks after another in linear sequence. In software development many organizations have adapted the Rational Unified Process (RUP) to fit this methodology, although RUP does not require or explicitly recommend this practice. Waterfall development works well for small, well defined projects, but often fails in larger projects of undefined and ambiguous nature. The Cone of Uncertainty explains some of this as the planning made on the initial phase of the project suffers from a high degree of uncertainty. This becomes especially true as software development is often the realization of a new or novel product. In projects where requirements have not been finalized and can change, requirements management is used to develop an accurate and complete definition of the behavior of software that can serve as the basis for software development. While the terms may differ from industry to industry, the actual stages typically follow common steps to problem solving — "defining the problem, weighing options, choosing a path, implementation and evaluation."

Initiation

The initiation processes determine the nature and scope of the project. If this stage is not performed well, it is unlikely that the project will be successful in meeting the business' needs. The key project controls needed here are an understanding of the business environment and making sure that all necessary controls are incorporated into the project. Any deficiencies should be reported and a recommendation should be made to fix them.

The initiation stage should include a plan that encompasses the following areas:

- Analyzing the business needs/requirements in measurable goals
- Reviewing of the current operations
- Financial analysis of the costs and benefits including a budget
- Stakeholder analysis, including users, and support personnel for the project
- Project charter including costs, tasks, deliverables, and schedule

Planning and design

After the initiation stage, the project is planned to an appropriate level of detail. The main purpose is to plan time, cost and resources adequately to estimate the work needed and to effectively manage risk during project execution. As with the Initiation process group, a failure to adequately plan greatly reduces the project's chances of successfully accomplishing its goals.

Project planning generally consists of

- determining how to plan (e.g. by level of detail or rolling wave);
- developing the scope statement;
- selecting the planning team;
- identifying deliverables and creating the work breakdown structure;
- identifying the activities needed to complete those deliverables and networking the activities in their logical sequence;
- estimating the resource requirements for the activities;
- estimating time and cost for activities;
- developing the schedule;
- developing the budget;
- risk planning;
- gaining formal approval to begin work.

Additional processes, such as planning for communications and for scope management, identifying roles and responsibilities, determining what to purchase for the project and holding a kick-off meeting are also generally advisable.

For new product development projects, conceptual design of the operation of the final product may be performed concurrent with the project planning activities, and may help to inform the planning team when identifying deliverables and planning activities.

Executing

Fig.2.12 Executing Process Group Processes

Executing consists of the processes used to complete the work defined in the project management plan to accomplish the project's requirements. Execution process involves coordinating people and resources, as well as integrating and performing the activities of the project in accordance with the project management plan. The deliverables are produced as outputs from the processes performed as defined in the project management plan.

Monitoring and controlling

Monitoring and controlling consists of those processes performed to observe project execution so that potential problems can be identified in a timely manner and

corrective action can be taken, when necessary, to control the execution of the project. The key benefit is that project performance is observed and measured regularly to identify variances from the project management plan.
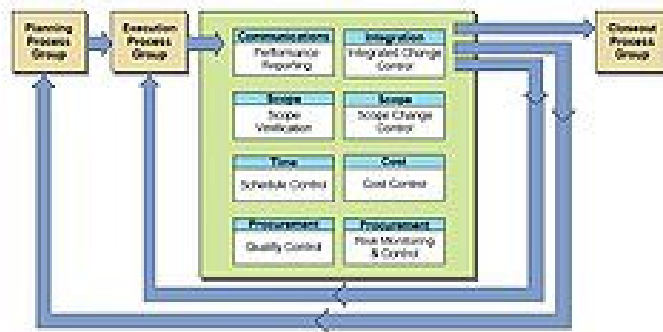
Fig. 11 Monitoring and Controlling Process Group Processes

Monitoring and Controlling includes:

- Measuring the ongoing project activities ('where we are');
- Monitoring the project variables (cost, effort, scope, etc.) against the project management plan and the project performance baseline (where we should be);
- Identify corrective actions to address issues and risks properly (How can we get on track again);
- Influencing the factors that could circumvent integrated change control so only approved changes are implemented

In multi-phase projects, the monitoring and controlling process also provides feedback between project phases, in order to implement corrective or preventive actions to bring the project into compliance with the project management plan.

Project Maintenance is an ongoing process, and it includes:

- Continuing support of end users
- Correction of errors
- Updates of the software over time

Fig. 2.13 Monitoring and Controlling cycle

In this stage, auditors should pay attention to how effectively and quickly user problems are resolved.

Over the course of any construction project, the work scope may change. Change is a normal and expected part of the construction process. Changes can be the result of necessary design modifications, differing site conditions, material availability, contractor-requested changes, value engineering and impacts from third parties, to name a few. Beyond executing the change in the field, the change normally needs to be documented to show what was actually constructed. This is referred to as Change Management. Hence, the owner usually requires a final record to show all changes or, more specifically, any change that modifies the tangible portions of the finished work. The record is made on the contract documents – usually, but not necessarily limited to, the design drawings. The end product of this effort is what the industry terms as-built drawings, or more simply, "as built." The requirement for providing them is a norm in construction contracts.

When changes are introduced to the project, the viability of the project has to be re-assessed. It is important not to lose sight of the initial goals and targets of the projects. When the changes accumulate, the forecasted result may not justify the original proposed investment in the project.

Closing

Closing includes the formal acceptance of the project and the ending thereof. Administrative activities include the archiving of the files and documenting lessons learned.

This phase consists of:

- Project close: Finalize all activities across all of the process groups to formally close the project or a project phase
- Contract closure: Complete and settle each contract (including the resolution of any open items) and close each contract applicable to the project or project phase.

Project control systems

Project control is that element of a project that keeps it on-track, on-time and within budget. Project control begins early in the project with planning and ends late in the project with post-implementation review, having a thorough involvement of each step in the process. Each project should be assessed for the appropriate level of control needed: too much control is too time consuming, too little control is very risky. If project control is not implemented correctly, the cost to the business should be clarified in terms of errors, fixes, and additional audit fees.

Control systems are needed for cost, risk, quality, communication, time, change, procurement, and human resources. In addition, auditors should consider how important the projects are to the financial statements, how reliant the stakeholders are on controls, and how many controls exist. Auditors should review the development process and procedures for how they are implemented. The process of

development and the quality of the final product may also be assessed if needed or requested. A business may want the auditing firm to be involved throughout the process to catch problems earlier on so that they can be fixed more easily. An auditor can serve as a controls consultant as part of the development team or as an independent auditor as part of an audit.

Businesses sometimes use formal systems development processes. These help assure that systems are developed successfully. A formal process is more effective in creating strong controls, and auditors should review this process to confirm that it is well designed and is followed in practice. A good formal systems development plan outlines:

- A strategy to align development with the organization's broader objectives
- Standards for new systems
- Project management policies for timing and budgeting
- Procedures describing the process
- Evaluation of quality of change

Project managers

A project manager is a professional in the field of project management. Project managers can have the responsibility of the planning, execution, and closing of any project, typically relating to construction industry, engineering, architecture, computing, or telecommunications. Many other fields in the production engineering and design engineering and heavy industrial also have project managers.

A project manager is the person accountable for accomplishing the stated project objectives. Key project management responsibilities include creating clear and attainable project objectives, building the project requirements, and managing the triple constraint for projects, which is cost, time, and scope.

A project manager is often a client representative and has to determine and implement the exact needs of the client, based on knowledge of the firm they are representing. The ability to adapt to the various internal procedures of the contracting party, and to form close links with the nominated representatives, is essential in ensuring that the key issues of cost, time, quality and above all, client satisfaction, can be realized.

Chapter 3

Sistemi Ufficio s.r.l.

3.1 Brief story of Sistemi Ufficio in the XX century

3.1.1   1959

In the 60's , in the middle of the reconstruction, Como and province are transforming and two young brothers, Angelo and Gigi, start selling calculator machines Olivetti to the shops of the downtown. Immediately the focus move to the manual writing machines.

Self made man how the Americans say and maybe this is the truth not only for the Cattaneo brothers but also for many little entrepreneurs and crafts of yesterday .

In 1959 Cattaneo Ufficio born in Rovellasca and five years later a new site in Fino Mornasco.

Fig 3.1 Como sightseeing

3.1.2   1980

In 1980 born Sistemi Ufficio in Guanzate to follow closer and with competences the information technology market that was start move the first steps. This is a big evolution for Sistemi Ufficio that since then start operating on the information technology market that nowadays is the most important business for the company.

Fig 3.2 Sistemi Ufficio '80s Logo

1985 New site in Rovellasca.

Growing on the market and on the territory companies need more sites and soon in 1985 born the new site in Rovellasca.

Fig 3.3 1985 new site in Rovellasca presented on a newspaper

Ten years later also in Guanzate is inaugurated the new site, 1994 , and then in Fino Mornasco , 1997.
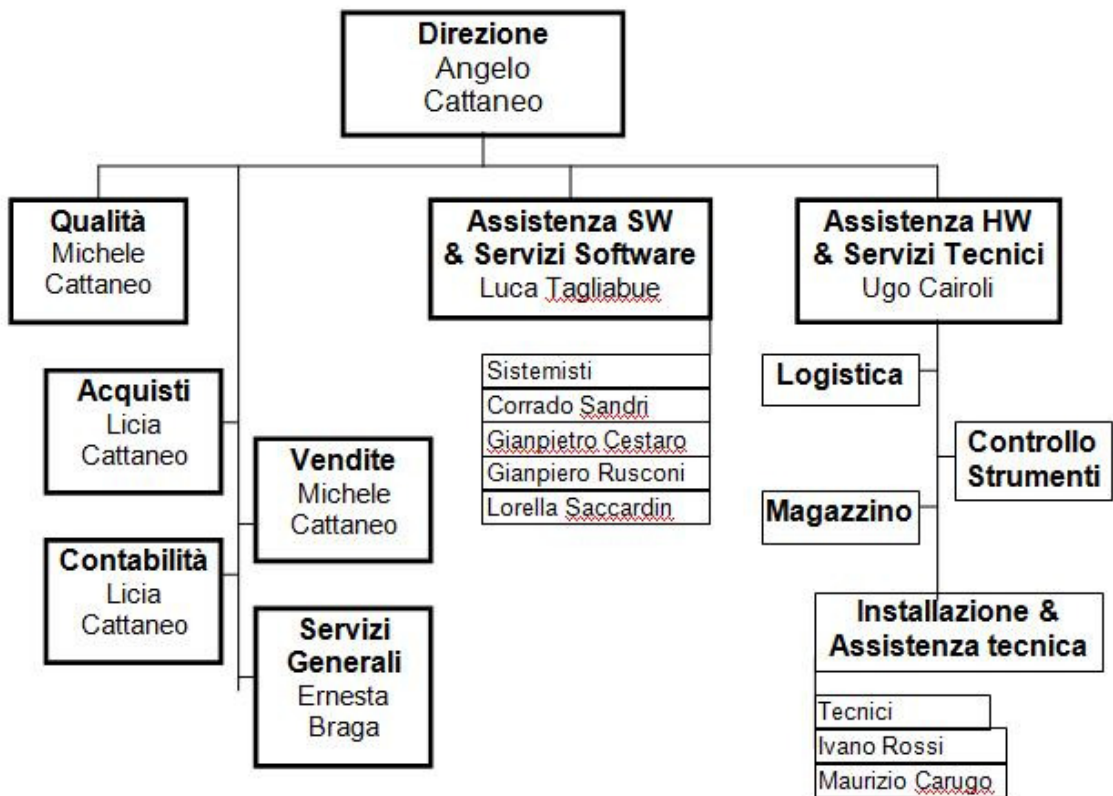
Fig. 3.3 Sistemi Ufficio organizational chart, Guanzate 1996.

Fig. 3.4 Technical laboratory in Guanzate.

In the last years technology has transformed many companies , changing them from the foundations, transforming business models and the target markets.

To follow new markets and new technologies new people are needed .

In 1999 Angelo left the company in the hands Roberto and Michele Cattaneo while Gianluigi Cattaneo stay to give experience to the new generation. In the organizational chart below it can be seen the two different companies: Sistemi Ufficio and Cattaneo Ufficio.

Sistemi Ufficio was directed by Roberto and Michele Cattaneo while Cattaneo Ufficio remained over the supervision of Gianluigi Cattaneo.

The organization of the company was hybrid because even if the company had different division for the main categories of products (TLC,IT,OFFICE) , administration & purchasing and the sales division were shared .
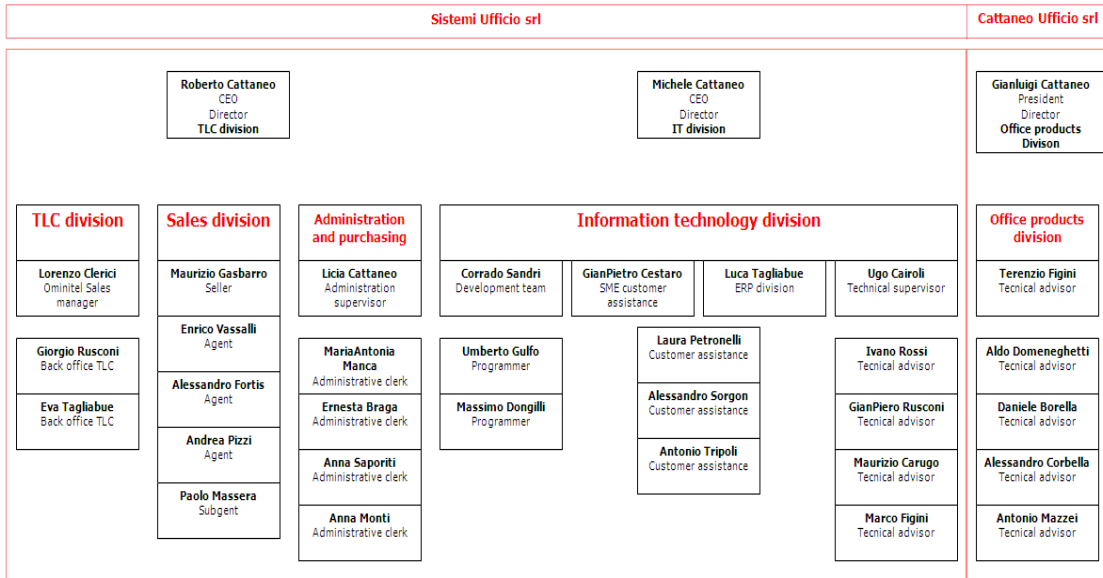
Fig. 3.5 Sistemi Ufficio and Cattaneo Ufficio organizational chart.April 2000.

3.2 Sistemi Ufficio s.r.l. – multi service company

In 2001 , with the significant coincidence of the beginning of the new millennium , Sistemi Ufficio change again.

A new team that continue with tenacity a work of 40 years.

It incorporates the competences of Cattaneo Ufficio (furniture, office products) with its competences (information technologies and communication) creating an unique company: Sistemi Ufficio multiservice company.
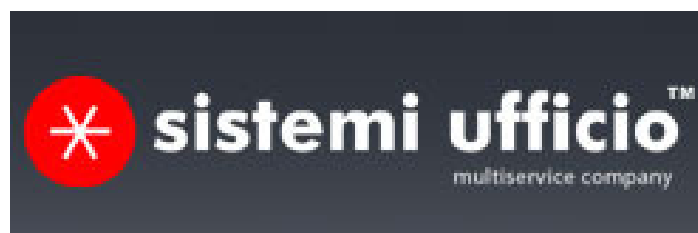
Fig.3.6 Sistemi Ufficio multiservice company Logo

3.2.1 Organizational model

Sistemi Ufficio continued organizing its staff in divisions using a functional structure where we can identify Top management, Administration & accounting , Sales division , Technical division and logistic division.

After the creation of an unique company the management find really hard maintaining control over the technical assistance because the range of customers and their problems was increasing with the new competences of the company.

For this reasons it were immediately identified the areas in which divide the customers of Sistemi Ufficio .

The first division concerning IT hardware & Office products and the second one concerning Software.

In the technical division each area has its supervisor who organize the assistance on the customer and who agreed with the sales division and with the logistics division concerning delivery and installation of the products.

The supervisors refers to the Management of the company directly, Sistemi Ufficio at that time had about 30 employees.

In 2002 also furniture and communications were divided from IT & Office and starts operating with their own specialists and supervisors.

3.2.2 Order process management

The company started to analyze its internal processes to increase efficiency and effectiveness.

The core business of Sistemi Ufficio is the selling of IT products and software.

In the process below it is represented the management of orders for both software and hardware products.

As it can be seen the process interests all the functions of the company.

In the beginning there is the offer made by the agent that must be approved from the sales director .

After the customer order confirmation , the commercial office insert the order in the software that manages the accounting (e/).

If the product is not available the logistics division make an order to the supplier .

If the product is available it will be immediately assigned to the customer and prepared for the delivery by a courier or directly by a technician of the company depending on the kind of product and on the competences required. If the offer concerns for example software installation or software implementation it could be necessary plan a series of activities to the customer.

Depending on the kind of product the IT division and the software division analyses the activities required and prepare a GANNT project. In the end the technical division give information about the project to the administration and accounting for the billing of product and services.
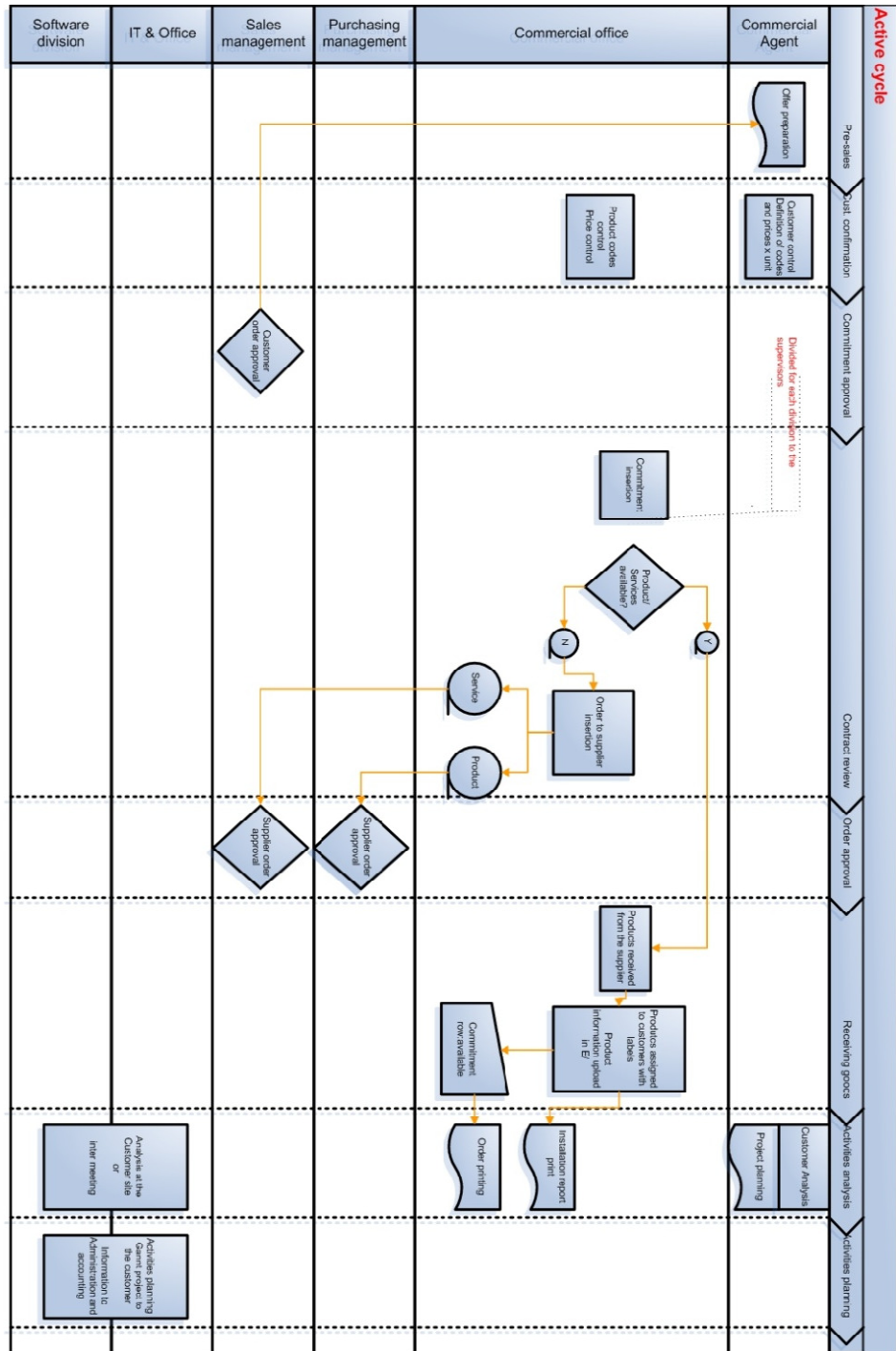
Fig. 3.8 Active Cycle

3.2.3 Software as a Service

As we have seen after 2001 the company was growing . Growing means increasing in the number of customers and of employees and this create the exigency to have the right software in support.

Since from the begin of the '90 the company utilized management software , one of them was web support created internally for the assistance to the customer.

Sistemi Ufficio became partner of ESA software, a company with site in Rimini that produce different kind of software product for the management of every kind of company.

Fig. 3.9 ESA software and e/ready logo.

The main realization of Esa is E/,that is a management software that follow the billing for every kind of enterprises.

Today e/ has evolved in E/ready for the small enterprises and E/ for the medium and big enterprises.

In the first years of the XXI century Sistemi Ufficio utilized E/ for the billing management and E/CRM for the customer relationship management.

3.2.3.1 Geronimo

Sistemi Ufficio had the need to control and manage the assistance to the customer and the focus of e/ was in the accounting.
For these reasons a team of programmers and advisors was made to create a vertical assistance management software: Geronimo.

The program was conceived and designed with the goal of managing any business that would need the following macro:

• Management of technical assistance contracts and warranties
• Handling of products with serial code or serial
• Management of technical operations / activities in the laboratory and / or at the Customer
• Connecting to and / add: and of management accounting /

The program was fully integrated with E/, which you can manage the sales cycle, passive cycle, accounting, production, etc. ...

Brief description of the software.

There were two modules of Geronimo:
• Geronimo client / server; technology developed: Net Windows Forms ; for the management of technical assistance contracts
• Geronimo web; developed technology: Net web; for the management of technical operations (opening and closing assistance tickets), all serial numbers of customers reporting on the park

The tables have the ending XXX_ Geronimo and are in the same instance of the company that has enabled the module "Geronimo."
Geronimo is fully integrated with e/.

Fig 3.10 e/ mask shows that the owner of the machine is LOCAT and the user is FOTOINCISIONE NUOVA ZENITH.

The numbers that appear within the "range of products" are those products moved according to the causes of stock in e/.
A machine can be owned by company B but in use to the company A. E/ shows this difference allowing Geronimo to understand where the machine is located and who is the owner and who is the user.

The software identified every machine of the customer giving a unique code. Different machine can be associated to one contract of the customer . Searching the customer (For example Foto Incisione Nuova Zenith) Geronimo display the machines owned by the customer.

Fig. 3.11 Geronimo –customer research mask.

Technical Support Contracts

Default data.

For each new contract, Geronimo loads the default data in the table default contract. The data uploaded are:

• start date
• Automatic renewal
• Duration in months
• schedule for invoices
• code number and document type that should be generated and / billing
• item number in case assistance should be billed for the students to list the contract, with a unique product code (example: "technical assistance Vs annual installed base")
• days notice for cancellation
• whether that contract should be managed each year ISTAT adaptation
what percentage increase applied Istat series contract

Each contract type has a beginning and an end date of validity. It can then be establish that KIND of CONTRACT is valid for a certain period of time.

Test data.

Client: the contract is payable to a customer selected from the registry, and Customer /. E 'can specify different subjects to which bill the contract date to date, while the

contract is still held by the same person.
Select the client, the program offers automatic, agent, and the payment type/.
Contract number and revision means any agreement (and proposal) has a number and a revision level assigned automatically by the program. The revision is indicated by the number following the / ex: contract number 10 / 1 means a revision number 10.
At a time when, having accepted and signed the contract, you can not change it. If you require a change in the amount, the range of products, duration, etc. ..., is generated with a review of the special function "create revisions". In this way you can track all the revisions that were made to the original contract. Please note that according to the Civil Code, when a change of the characteristics of the contract, you must issue a new one to replace the previous one and submit it to the customer for acceptance.

Contract type: a register can be created to differentiate contracts under the default data.

State contract and contract means any contract may have been different document. You can write a simple proposal for assistance "to calculate an estimate, when the proposal is accepted (and signed) by the client, with" approve "the contract was changed and become" accepted the contract. " This moment is also created in the order and / add the holder of the Customer Agreement. The contract will set the default specified in the contract and sequence number (first available for that series).

Cancellation: indicates the reason for which the customer sent the cancellation of the contract, for statistical purposes.

% Discount: head in agreement you can enter the discount percentage agreed with the customer will assume the total assessment of the document.

Date of competence: the competence opening date is the date of commencement contract. Under the "Term months" is determined as a result the contract end date.

Fig. 3.12. Geronimo: Contract management mask.

TAG

Tag List Serial Number:

Schedule for invoices: according to this field you choose the number of invoices to be issued for the contract

Tag Management Bills:

Schedule for invoices: according to this field you choose the number of invoices to be issued for the contract

In the tag management bills, according to the frequency invoices, all invoices are generated for the duration of the lease or, in the case of automatic renewal, until a date specified by the user. The function "Generate Rows" is just to launch the document generation.

The invoice documents are generated in a table of Geronimo in "temporary". The function generates the document and / "generates the document type specified in the contract (usually DDT or invoices) and change the status to" delivered. "

The "save and consolidation" is used to store the program does not generate invoices up to a certain date. And 'necessary for example when for the first time you enter into contracts Geronimo already invoiced and /. If a period is established, the program will not generate documents and / to the doc. No indicated by the user. Launching the function, the program enables the drop-down box that lists the documents of the grid, so that you can "consolidate" the records.

By doing so the next generation lines, the program puts the date as early-generation lines, the date of the final consolidated document, to avoid overwriting or modifying lines already generated invoices or already connected to and /.

The records should have an indicator that C is equivalent to the "consolidated". If you delete a record, the program does not physically delete the records from db grid bills, but puts the indicator and the scope of the table so that it no longer appears on the grid.

3.3 2007 :the company move to a new site.

In 2007 the big change , the company moves from Guanzate (Co) to Lurago Marinone (Co) in a new site on 2 floors in the industrial area.

Fig. 3.13 New site in Lurago Marinone, via della Cerca 20

New site big opening.

Fig. 3.14 Grand opening brochure

The grand opening of the new site of Sistemi Ufficio was divided into three days.
In addition to the local authorities were invited representatives of the various partners
of the company, such as EPSON and ESA, to give seminar and presentation of new
and historical products. Some example of seminars during the inauguration days:
ESA workshop "e/ ready: for small and medium enterprise".
Workshop: video surveillance integrated with the corporate information system.
ACER seminar:"Corporate Security: Storage & c."
The opening was designed as a marketing campaign and involved hundreds of
clients over the three days of his life.
In those three days were recorded more than 200 sales opportunities.
Thanks to the advertising achieved by the event Sistemi Ufficio was enriched with
many new customers and historical customers increase their confidence in the brand.

Fig. 3.11,3.12,3.13The spaces were filled with informational brochure about partners
of Sistemi Ufficio and their products; agent and technical advisors gave explanation
to the customers. In the courses room there were presentations of software products:
in the picture there is the presentation of e/ by ESA software.

3.3.1 Layout of the company

The turnover of the beginning of the new millennium bring Sistemi Ufficio to the choice of investing and moving in a new structure. The old site was becoming too small for the number of employees and more spaces were needed to stock the increasing number of IT products and office products.

In the plant below we can see the organization of the spaces at the moment of the moving.

Fig. 3.15 First floor plant
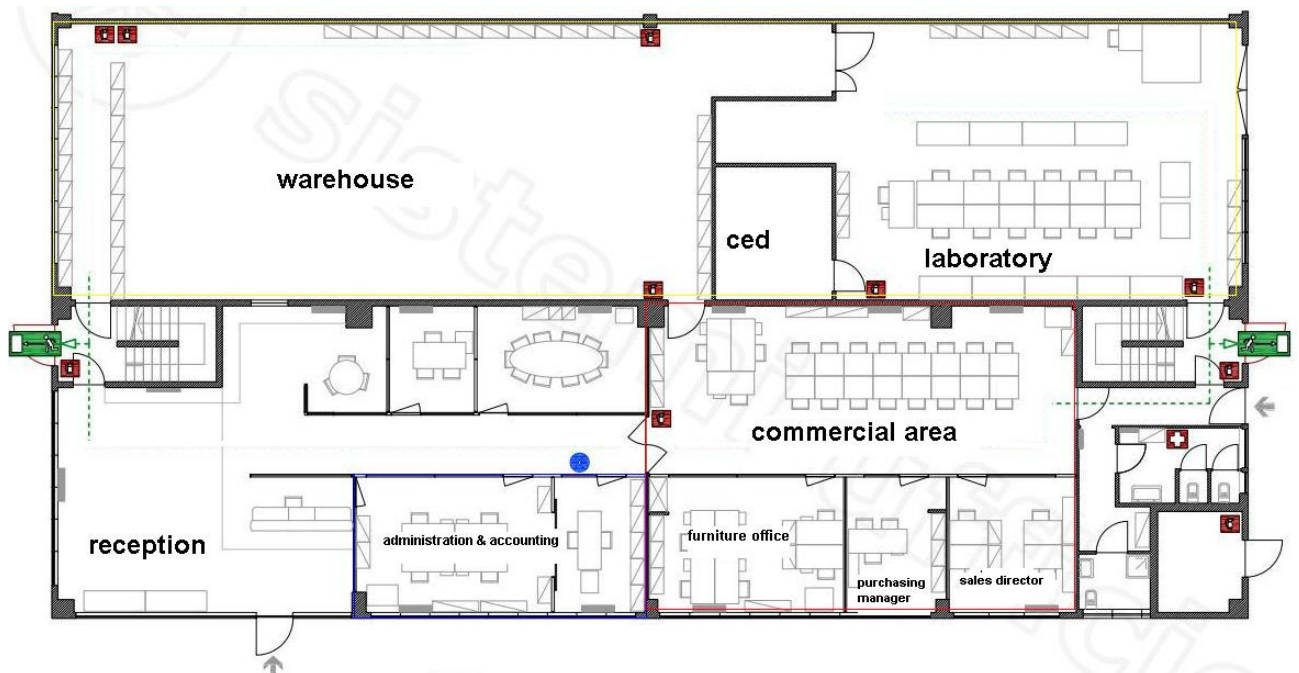
Fig. 3.16 Ground floor plant

In Yellow are represented the Technical areas; in Blue: CEO, administration & accounting and in red Commercial areas

3.3.2 Business area

The offer of Sistemi Ufficio is divided into 6 major categories . Sistemi Ufficio objective is to became the customer's partner to help him grow its business."To make grow your business" is the central point of the corporate culture of the company.

SOLUTIONS
Through partnerships with leading companies offering software ,Sistemi Ufficio offers packaged management solutions for small, medium and large enterprises,
accountants, payroll and attendance studies.
Specific solutions are custom built by the internal development team.

TECHNOLOGY
Hardware supplies and services systems. Servers, networks, cabling, special ITC products, accessories, etc..
Networking, backup, storage, security, virtualization, IP telephony, rentals, contracts maintenance.
Every request of the customer is assigned to a team of technicians and certificate systems engineers.

OFFICE
Broad product offering multi reprographic and printing digital.
Cost per copy and rental operating efficiency and cost analysis management, optimization of your printing needs.
Sistemi Ufficio has a catalogue with more than 12.000 items of registry.

INTERNET
Creation of sites through the use of evolved technology and the adoption of high standards of quality.
Hosting, Housing and domain registration services are ensuring the web presence of the customer 24 hours 24.

FURNITURE
Study and design of furniture solutions, sales and installation of office operational, executive, contemporary or classic, reception, wall and partitioning, seating and design, furnishings measure and supply "turnkey" solutions.

TELEPHONY
Focusing only on the business market: many product pricing and services that adapt to different needs.
Voip and switchboards, fixed and mobile telephony, mobile Internet, PDAs,
ADSL, HDSL, connectivity, systems.

3.3.3 The growth of the company

Fig. 3.17 2008 Sistemi Ufficio is partner of the year of Esa Software

In 2007 Sistemi Ufficio register an increment of 30% in the sales of software products ,particularly ESA.

With the acquisition of Silcri Informatica Sistemi Ufficio became one of the bigger partner of ESA software in Italy.

 The increasing number of customer managed and the consistent increment of the revenues by ESA products made the company partner of the year of ESA software for the year 2007.

The company registered increments in all the business areas:

    +20% IT
    +27% VODAFONE
    +15% OFFICE PRODUCTS.

3.3.4 Introduction of Myway (ERP)

The number of customers was increasing and Geronimo didn't fit well the exigency requested by Sistemi Ufficio in the management of the technical assistance.
The assistance to the customer was one of the main problems of the company at that time.
 In the picture below there is the process of ticket assistance managed by Geronimo.
As we can see the process was very complex and often assistance requests were loose or solved late due to the absence of a real ERP (Enterprise resources planner) who can manage the SLA and the priority to action.
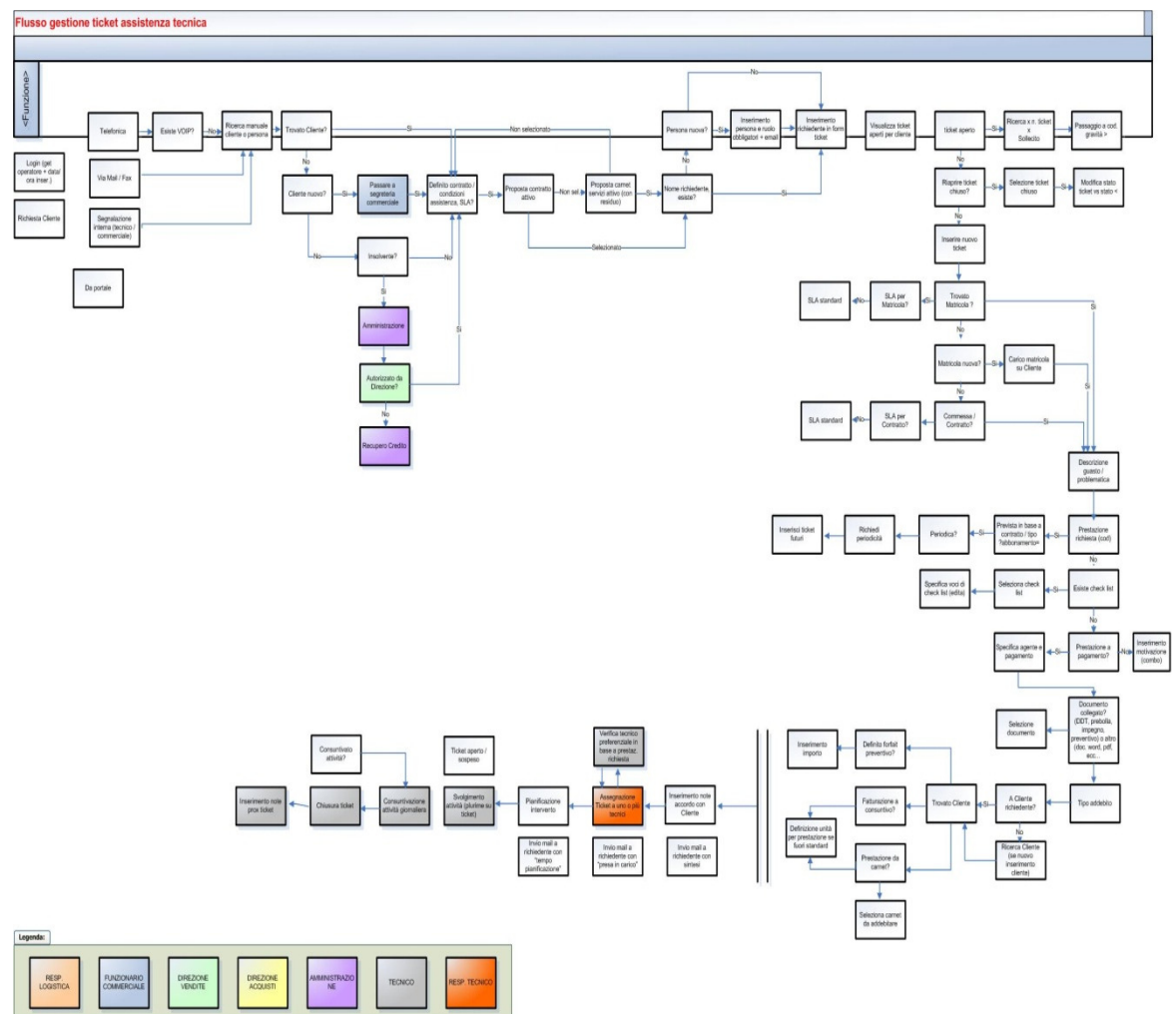
Fig. 3.18 Technical assistance to the customer process

The company decided to implement a new ERP.
The name of the software was Myway by LaraSoftware and it is the actual ERP of Sistemi Ufficio.
The implementation of an ERP in Sistemi Ufficio increased the efficiency on the organization of the assistance to the customer.

The reasons that bring Sistemi Ufficio to this choice can be described in a fishbone diagram:
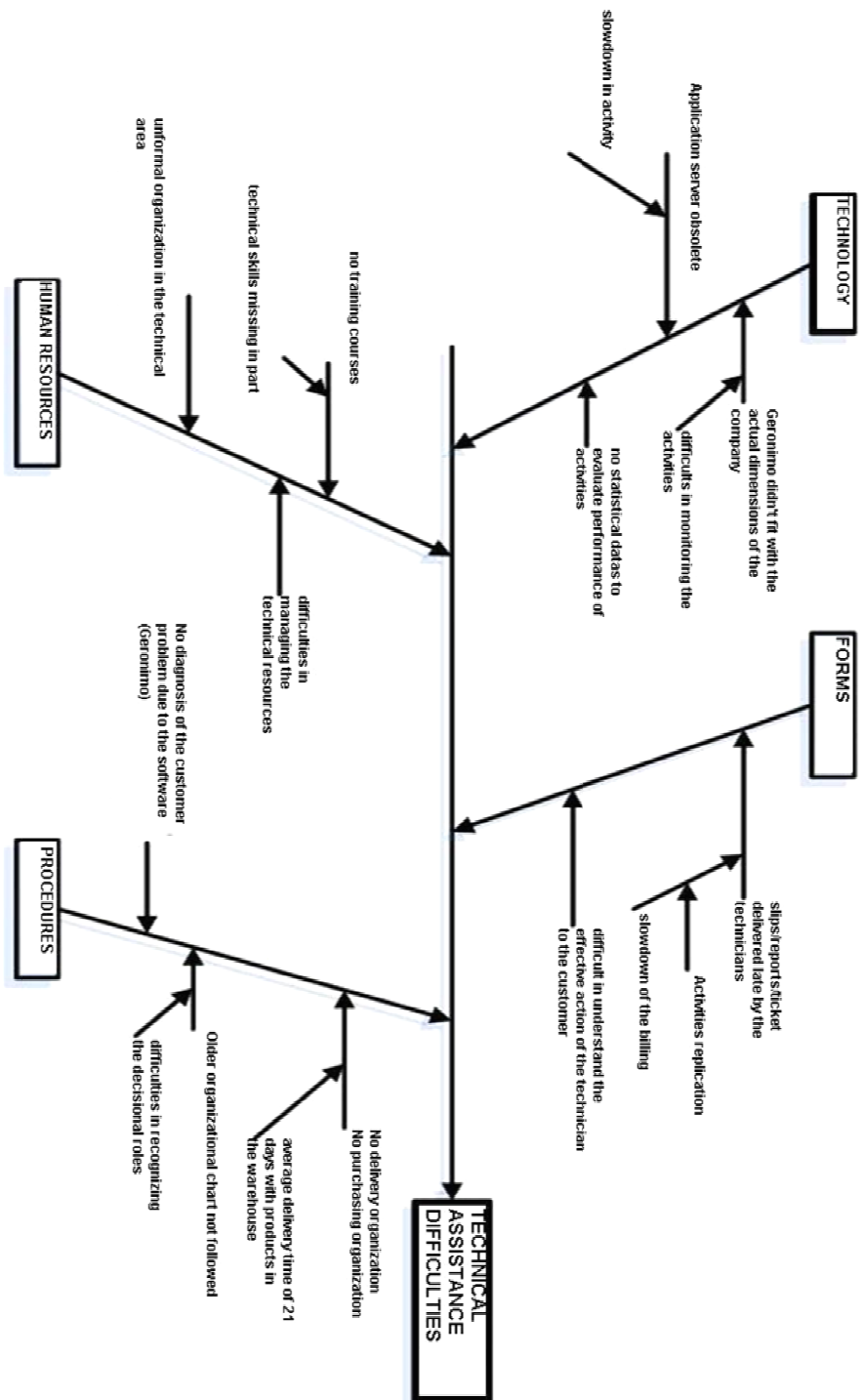
Fig. 3.19 Technical assistance fishbone diagram.

During the installation phase the technical advisors understand that the server utilized for the applications of the company was obsolete and not adapted for the

management of an increasing company with even more employees working on the same applications.

The analysis bring to adopt a new server.

This caused an increment on the cost of the project but increase the efficiency of the employees reducing time of computation during the activities with the internal software.

In the past without an instrument to analyze the effective time of the activities, managers had to assume the data and make incorrect previsions about time and costs of the activities.

With Myway each activity to the customer is registered with indications about:

-technical advisors who participate

-machines, cars and materials utilized

-time of the activity

With these data and opportune configurations the manager can understand the real cost of each activity and calculate the net gross.

The activities are planned in order to solve the customer problem. If the technician when he is at the customer's company , understand that the activity isn't finish he can open another LOG (request of assistance of the customer) an plan new activity. This is possible utilizing a server terminal connection on a notebook with internet key for mobile connection. Statistical data derived from MyWay can also be used to evaluate the effective skills of the technicians.

In Myway is possible to define the skill for each human resource. This means that when a customer request assistance , the activities can be planned sending ' the right technician at the right time'.

The intent of the company was offer a better service to the customers and increment the whole quality of the technical assistance.

At the same time understand the problem and organize the assistance basing on the skills of the technicians means reduction of time to solve the problem and reduction of costs.

For example if the problem is related to the emails a junior technician is sufficient while if the problem concerns the application server of the customer a senior technician has more experience and technical skills to manage and solve the problem.

Another relevant problem was the management of the SLA (Service level agreement).

With Myway the SLA are inserted in the contracts and are shown when the activities are planned. This allow to offer a better service, in time for special customers that purchase technical assistance contracts .

The delivery times wher 21 days even the products were in the warehouse. Utilizing myway the delivery times were reduced to 15 days.

For what concerns the management of the billing: The reports of the activities were bring by the technician to the administration who controlled costs and formal aspects and then proceeded to the billing.

The activities managed by myway can be explained with the following diagram.

Processes in MyWay

Processes in e/

```
                                          START
         DB Myway
         syncronized
                                      New customer
                                      insertion in e\
         New model
         insertion
                                      e\ DB uploaded
         New MIF of the
         customer
         uploaded

Contract insertion    no
on the MIF       ←——      Contract?
                            │ yes

         LOG opening

         LOG planning

         Activities planning

Complete the     no    The activities
activities on the ←——  are finished?
customer                  │ yes

         LOG close

         Billing of the
         activities

         FINISH
```

Fig. 3.20 Flow chart of the technical assistance managed by Myway.

How it can be seen the new process was more simple and the reduction of time is evident.

Technical assistance activity cycle.

Business or technical assistance means any operation can be carried out on the park of a customer, such as installations, interventions, deliveries or others such advance, quotes, orders to the supplier.

The activities requested from a customer can be of different kind and can required different times to be solved.

Some activities required the support of materials or specific software application. For these and other reasons the costs can be different.

With Myway is possible to analyze each activity in terms of time and costs and so manage in the best possible way the assistance to the customer.

The activity cycle can be divided in 3 phases:

LOG opening: the request of the customer is registered in the software .

LOG planning: the request has to be managed:

The technical advisor who can solve the problem is chosen basing on his technical skills. The advisor contact the customer to fix a data for the intervention. The intervention report is printed with the data of the customer and his request.

Activities planning. The intervention may last for different days with more than one single activity For this reason the activities are planned day by day till the problem is solved.

Each activity concerning a LOG is registered with unclosed state till the last activity has done. For each of them it can be registered description of the activities, resources utilized , time and if the machine manage counting indicators , the number of the counter(For example multifunctional printers).The advisor or an administrative operator register also the cost of the activity that can be calculated automatically , basing on the configuration of the software , or modified automatically by the operator.

Using this software is possible to understand the effective saturation of each resource .

Brief descripiton of MyWay.

My way is a vertical software for the management of the technical assistance to the customer , which can be interface with any management software as well as Esa.
It is not strictly intended for use in a computer company, but in all those dimensions which provide services.
It 'been installed, for example in a company that produces and supports rollers for the sorting of parcels.
It was also presented at a company that manufactures and rents cranes.
This software manages information in order not to create duplication of data but streamline and speed up the loading of data with integrated management.

It 'was designed and implemented by a software vendor partner of ESA software: Lara Software. This company is vendor of Konica Minolta printers machines.
 The company, based in Trecate (LE) also has a large development department.

The design and implementation of this platform has cost 12 years Lara Software Working Man (calculated on the actual use of 4 persons for 3 years each design) ,
The intent of this solution is to provide a software for companies that are not satisfied of only the pure management aspects.
Moreover, this "software package" has joined the list Esa Software in September 2007.

Fig. 3.21 Myway Logo

Myway architecture.

MyWay has been developed with Microsoft Visual Basic 6.0, some components have been developed with Microsoft technology. NET 2.0 (Visual Studio 2005) and therefore have been equipped with wrappers.
MyWay consists of an executable that is launched at startup, which provides a series of menus, each menu then go to call an ActiveX DLL that handles the real (as is the case in e /).
Even the architecture is similar to that of logic and / (3-levels, with data services, business services and user service).
The database contains a part of registry that needs to be synchronized with that of e / (eg: update Customer Master MyWay, MyWay, or in invoicing contracts e /), this synchronization takes place through the use of business and / which are provided by eSDK : in this way, the manipulation of the data is safe because the business will take care of a number of consistency checks and data integrity that are passed before going to do the actual writing on the basis of data e /. Likewise, you must synchronize the database of MyWay if changes are made on the e / (eg: update your customers).This synchronization is handled through the interception of rescue events by the e\ VBA .
The RDBMS reference of MyWay are SQL Server and SQL 2000/MSDE SERVER2005/EXPRESS.

3.3.5 Reorganization of sales division : the account

In the last months of 2008 the company decided to change the organization of the sales division.

In the past there were 2 different commercial areas: one dedicated to the selling of Vodafone products and one for what concern information technology, office and furniture.

The idea was make an unique sales division .The reasons for this choice were :

1) Moving the customer attention to the whole offer of the company
2) Better sharing of information and commercial opportunity between the accounts.
3) Direct supervision on the customer assigned

This choice required a great cost for what concerns education and training of the accounts..

The agents that usually sell only Vodafone project now had to learn how to sell information technology products, printers and furniture.

The action on the customer had to be in team. The account present the specialist to the customer and then received a commission on the sale.

Another reasons to adopt this strategy was the excellent results of the Vodafone agency with an increment of the 43% on the sales in the first semester of 2008:the Vodafone sales force and its big number of customer were a potential source of sales.

After the reorganization there was a sales manager and all the accounts at the same level selling products of all the business area of the company.

3.3.6 Economical crisis affects the market

The economical crisis began in the United States in December 2007 and ended in June 2009 (as determined by the U.S. National Bureau of Economic Research) It spread to much of the industrialized world, and has caused a pronounced deceleration of economic activity. This global recession has been taking place in an economic environment characterized by various imbalances and was sparked by the outbreak of the financial crisis of 2007–2010. In July 2009, it was announced that a growing number of economists believed that the recession may have ended.

The financial crisis was linked to reckless lending practices by financial institutions encouraged by the government and the growing trend of securitization of real estate mortgages in the United States. The US mortgage-backed securities, which had risks that were hard to assess, were marketed around the world. A more broad based credit boom fed a global speculative bubble in real estate and equities, which served to reinforce the risky lending practices. The precarious financial situation was made more difficult by a sharp increase in oil and food prices. The emergence of Sub-prime loan losses in 2007 began the crisis and exposed other risky loans and over-inflated asset prices. With loan losses mounting and the fall of Lehman Brothers on

September 15, 2008, a major panic broke out on the inter-bank loan market. As share and housing prices declined, many large and well established investment and commercial banks in the United States and Europe suffered huge losses and even faced bankruptcy, resulting in massive public financial assistance.

A global recession has resulted in a sharp drop in international trade, rising unemployment and slumping commodity prices. In December 2008, the National Bureau of Economic Research (NBER) declared that the United States had been in recession since December 2007. Several economists have predicted that recovery may not appear until 2011 and that the recession will be the worst since the Great Depression of the 1930s. Paul Robin Krugman , who won the Nobel Memorial Prize in Economics, once commented on this as seemingly the beginning of "a second Great Depression." The conditions leading up to the crisis, characterized by an exorbitant rise in asset prices and associated boom in economic demand, are considered a result of the extended period of easily available credit, inadequate regulation and oversight, or increasing inequality.

Fig. 3.22 Economical crisis

The effects on Sistemi Ufficio.

Sistemi Ufficio like many Italians companies suffered this situation.

The only way to came out from a reduction of the sales that was bringing the company to lost profit was a reorganization to increase efficiency in the internal processes and efficacy on the assistance to the customer.

3.4 The reorganization of the company. 2009 -2010

The reorganization of the company has touched all the departments, in the following paragraphs I will analyze the changes in the technical area, sales division and management control.

3.4.1 Technical area

3.4.1.1 Customer Care

The customer care office was created to centralize the collection of customer assistance requests.

In the past years the requests were collected directly by the technicians and managed individually by them.

After the implementation of Myway, the ERP software of the company emerged the problem to register the activities done , register the customer requests , manage the customer products , maintain updated the data warehouse.

To complete these activity I was appointed to create a special office : the customer care office. The analysis of the new office taken 3 months form the end of 2008 till the beginning of 2009. I analyzed the main activities of the assistance to the customer and I developed different procedures and process . I created different documents , like the following one , to present the analysis to the employee of the company.
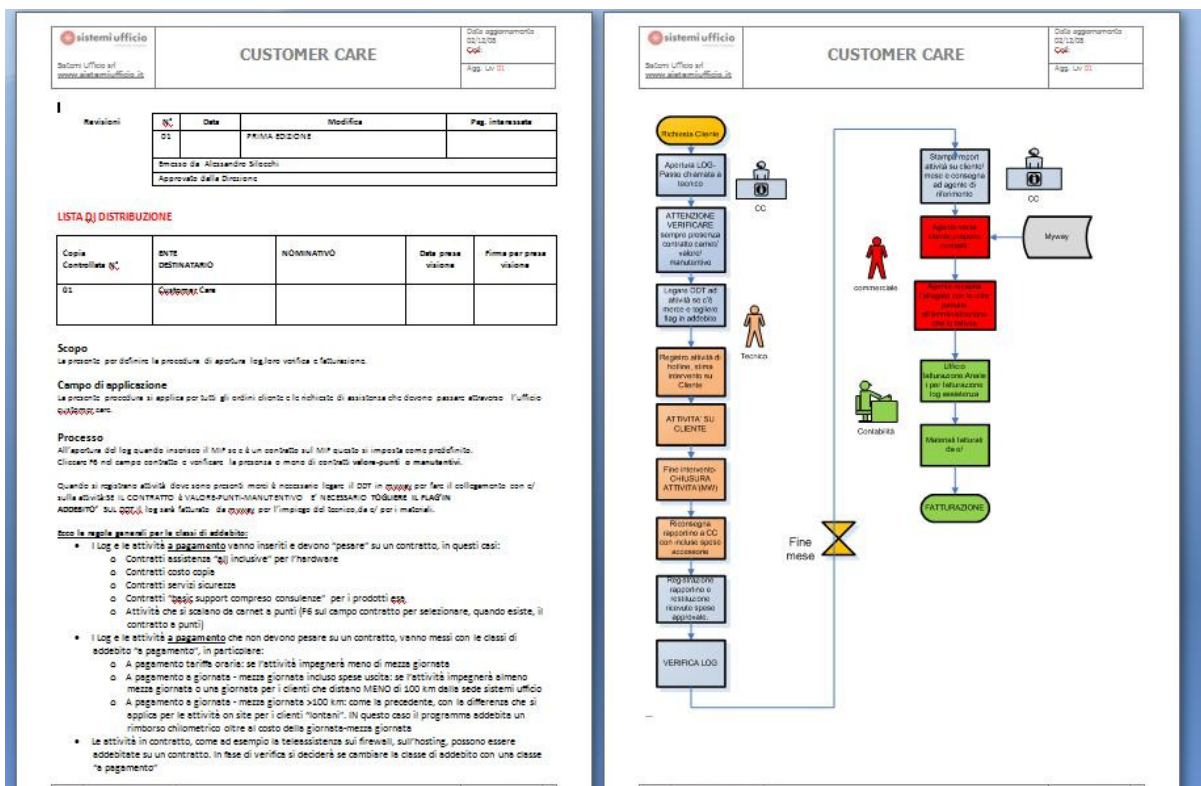
Fig 3.23 Customer care flow analysis

I divided in steps the activities that the customer care office had to do.

The first step concern the managing of the assistance to the customer.

I identified in agreement with the CEO the people to educate for the job of the customer care office.

From the beginning of January till the end of March (2009) the operators were trained on the use of Myway .

In April 2009 the office was operative and managed all the activities on the customer.

The assistance to the customer follow the process below , the customer care operator use Myway to plan and register the activities.

When the customer call Sistemi Ufficio the call is managed by one of the 3 operators of the customer care office. The request is registered in Myway . The operator analyze the saturation of the technicians and decide who will get the activity basing also on the technical skills requested for the activity.

The technician goes to the customer and solve the problem, if the problem needs another activity the customer care office will plan another day.

When the activities are finished the technicians reports to the customer care that close the request and passed it to the administration and accounting office for the billing.

For some request the ability of the operator to understand the problem of the customer is not sufficient so the call is passed to a technician who is doing online assistance . Every day there is a technician who stay inside the company to manage the high complex activities .

It was no simple to train the operator on the use of Myway. Since when the customer care office began to use Myway it became a real powerful instrument for the company.Now data are about activities, resources , products, customers are insert and it was possible to make analysis and budgets .

Using Olap cubes the data are extracted from Myway and area avilable on Microsoft excel sheets .

Every month there was and there is a meeting of the customer care operators to anlyze strategies in the assistance to the customer .In 2 years many things have changed basing on the experience acquired from the activities.

All the changes in the management are defined and written on papers available to all the employees.

The main problem faced with the creation of the office has been the unwillingness of the technicians to follow the customer care plans.Even if the activities are planned in agreement with them. This because the office was seen as a way to control their work.

Nowadays this Is already matter of debate in the company.
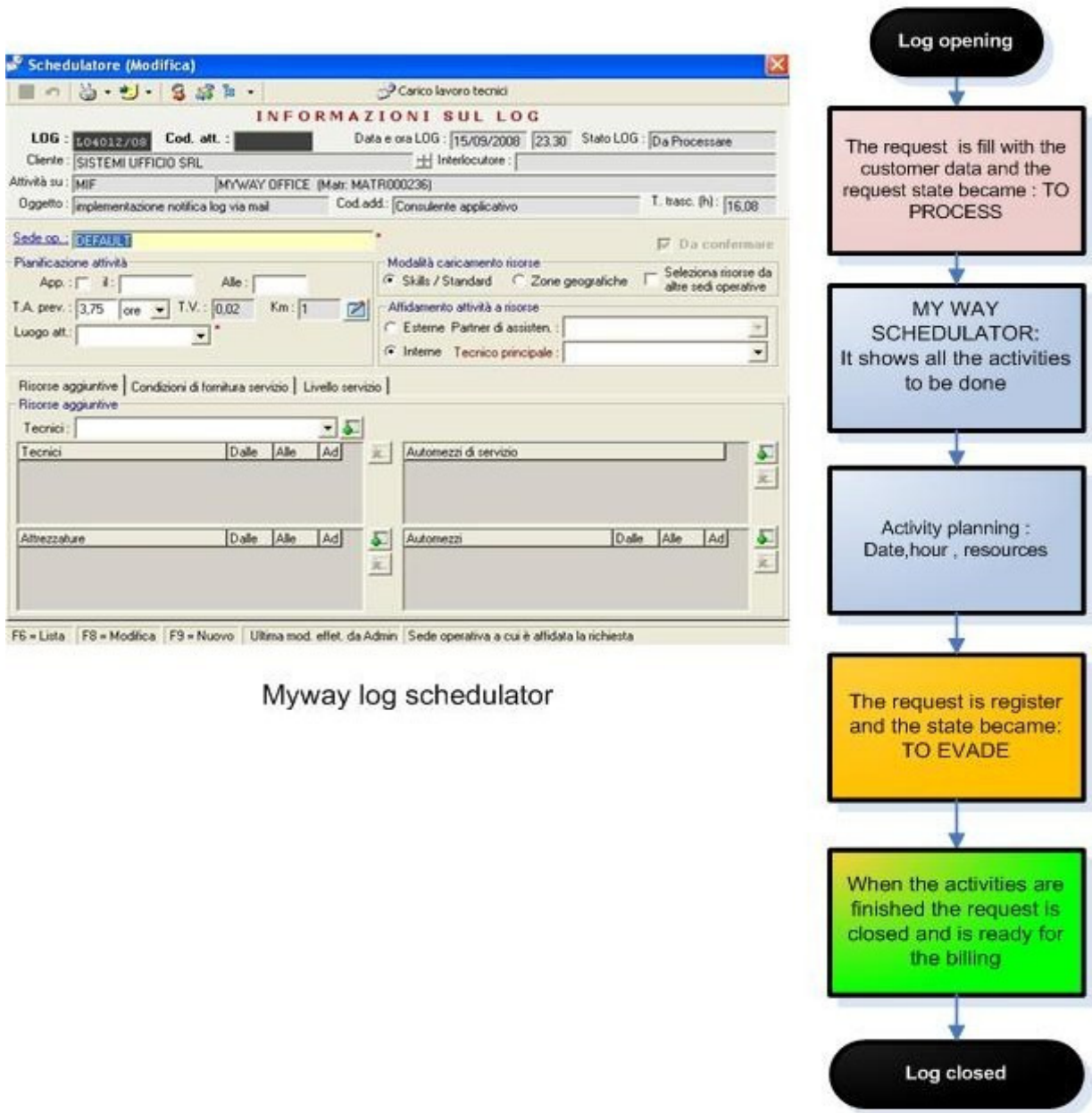
Fig 3.24 The assistance to the customer managed by Myway.

The second step was the management of the suppliers bills. Sistemi Ufficio offer different services in collaboration with suppliers like McLink (connectivity) , ESA (software support) and so on.

These bills arrive to the company and have to be check looking in Myway if they are invoiced to the customers.

The customer care office collects also all the calls of the customers and pass the opportunity to the sales division.

3.4.1.2   Logistic :reorganization of the warehouse

The reorganization of the company concerned also the spaces of the company. The new sales division organization allow to utilize different spaces . The technicians and the customer care were moved into the old sales division office and a logistic area is created.

To better organized the movements inside and outside the warehouse we analyzed different competitors company and we finally decided to create 3 different areas:

Red Area now contains all the broken products retired from customers that have to be repaired .Yellow area contains the used working products that can be sell or utilize forklifts in place to the customer during the assistance of their products. Green Area contains the new product. It is divided in outbound logistic and inbound logistic.

When entering the logistic area on the right there are inbound products while on the left the outbound products. Going towards the warehouse we see the inbound products and going towards the exit the outbound products. The areas are identified also by colors on the walls and on the pavements to follow the quality specifications. The areas are also codified in the ERP so we can know from the software the current state of any product. The movements of the products are registered even if they happen inside the company.
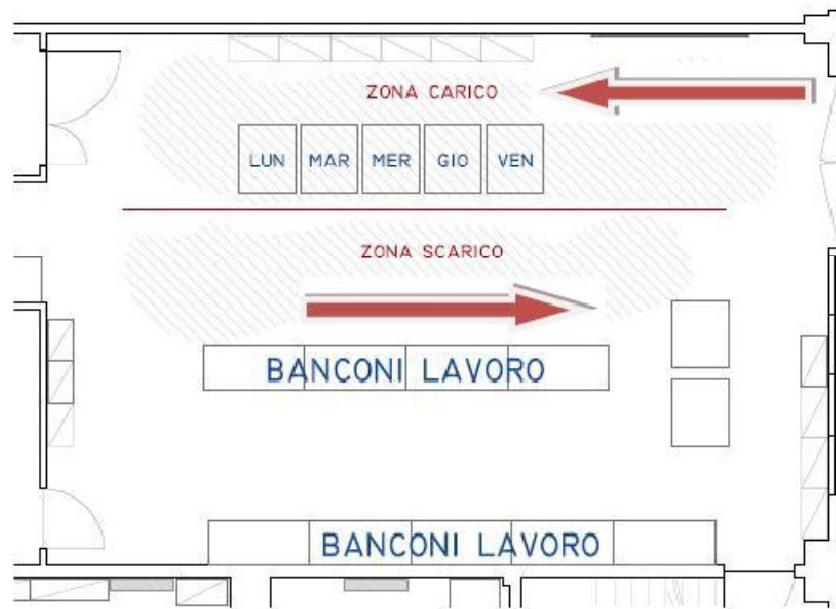
Fig. 3.25 Logistic area plant

Fig. 3.26 Inbound and Outbound logistics products area

3.4.2 Administration and accounting

3.4.2.1   Management control

The management of a company is based on numbers (costs and values).

To monitor the trend of the company an annual balance is insufficient.

Using Olap cubes we monthly extract the data of : sales, employee costs , operative costs and we put everything together to have a monthly balance of the company.

The data about the sales are obtained by the software that manages the billing : e/ .

The data about employee are extracted from a report given to us by a business consultant.

Operative costs are extracted by the ERP of the company that manages products, materials and even cars of the technicians.

We identified the macro area of business :

IT – informational technology: computers, printers, scanner ,monitor…

SOFTWARE – Esa products , ERP , CRM …

INTERNET – hosting, housing , websites , web marketing , voip(Voice over IP) products..

FURNITURE- office furniture

COMMUNICATION – Vodafone products , ADSL…

The macro area are divided in almost five subarea which are the products codes inserted in e/.

Using Myway we can understand where a technician or a consultant have worked(On which business area). In this way we identify for example that Technician A1 has worked for x % of this time (and we translate in cost) on the different areas:

Period	Technician	cost	IT	SW	INTERNET	FUR	COMM
Oct- 2010	A1	2000 €	20%	30%	35%	10%	5%

We can easy create a report containing all the employees of the company , if the activities are not registered in the ERP (for example the ones concerning secretaries or administrative clerks) we can make an estimate of their time utilization.

These data are extracted from the reports of the assistance to the customer where is identified the area of business of the nature of the assistance and we register time of assistance, machines utilized and so on.

In the same way we can analyze the sales division cost , that are the commissions:

The commissions are extracted from the single bills automatically, so we know exactly what an agent has sell and where he dedicated his time.This matches are possible using Olap cubes. These ave been developed internally by our programmer and so they answer to any exigent of the decision maker.

Using pivot tables in Excel the dta are represented in different way and is possible to understand the trends of the company.

The data are joined with the other information about overheads to make a quarterly balance of the trend of the company.

3.4.2.1.1   Olap cubes and data warehouse

Applications or programs behind operational systems are known as OLTP (On-line Transaction Processing).

OLAP (On-line Analytical Processing) are systems intended to business intelligence and DSS(Decision support systems). Hence data warehouses supply input data to OLAP applications.

A data warehouse is essentially a deposit of data that are subsequently made available for business intelligence activities.

It is a subject-oriented, integrated, time-variant and non-volatile collection of data in support of "decision making processes" where:

Subject Oriented: Data that gives information about a particular subject instead of about a company's ongoing operations.

Integrated: Data that is gathered into the data warehouse from a variety of sources and merged into a coherent whole.

Time-Variant: All data in the data warehouse is identified with a particular time period. (continua)

Non-Volatile: Data is stable in a data warehouse. More data is added but data is never removed. This enables management to gain a consistent picture of the business.

Data Warehousing

Data Warehousing is a complex of activities involving the design, realization and use of a data warehouse.

It is the process of creating, populating, and then querying a data warehouse and can involve a number of discrete technologies such as data mining tools, data query tools, B.I, data visualisation tools, etc.

•There are 3 main types of data: Internal, External and Personal data.

Internal data

Internal data are, by and large, the data concerning or pertaining to the operative systems of the enterprise.

This data is collected via the management and applications software that govern the operations within the organization or enterprise such as: Administration, Accounting, Production, and Logistics.

There is a tendency to group these activities of data warehousing and programs under the title of ERP (Enterprise Resource Planning).

Data concern the: Customers, Products, Sales, Personnel, Suppliers and there originate from:

•Back office systems: Such as the records of orders, billing, production, logistics data and inventory.

•Front office systems: Such as call-centre data, customer care and assistance marketing management.

•Web based systems: Such transaction of sales as in E-commerce, website visits monitoring, information requests, click-stream analysis…

External Data

External data are essentially the data concerning or pertaining to the extension and externalization of the operative systems of the enterprise. There are some services companies that collect for examples: sales data, mkt share data, mkt forecasts, economics and financial indicators.

Other operators (e.g. agencies) collect market analysis data or customer opinions from questionnaires.

Another significant source of external data comes from GIS (Geographic Information Systems) that aspire to acquire, manage, store and present data from other geographic regions. Each part being identified geographically and other elements such as attributes that depend on where and for what systems are used.

Personal Data

In many cases the decision maker that conducts business intelligence activities possesses information and personal evaluations with spreadsheets or local databases; the scope of knowledge management is to make available such personal data and information to the rest of the organization.

Characteristics of Data Warehouses

Entity oriented:

A data warehouse (DW) is focused on the entities for which they exist e.g.products, customers, orders, sales. On the contrary an operational system focuses on operative functionality and therefore applications. Due to this separation it is easier to measure and monitor company performance.

Integrated:

Data is integrated and unified within the data warehouse.

Timed:

DW data are identified by a tag that identifies the relative temporal reference. As can be imagined the time reference of data in a DW is therefore fundamental otherwise trend analysis is impossible.

Persistent:

In general data in a DW remain unmodified so as to facilitate "read only" access of the data and avoid the issue of data updating that are typical of operational systems.

Consolidated

Sometimes DW data are obtained from the sum of basic operational systems data. This provides two tangible advantages:

1.The need for storage space is reduced;

2.Information corresponds better to B.I. Needs.

Denormalized

With respect to operational systems the data in a data warehouse may NOT be structured in a "normal" or rational way but may, for example, be replicated so to provide quicker access especially for complex queries.

The degree of granularity of the data (also known as "atomic data") is an indication of the level of detail of the data.

As can be expected the level of detail cannot exceed the original data (because of storage space limitations).

3.4.3 Sales Division

Organizational model
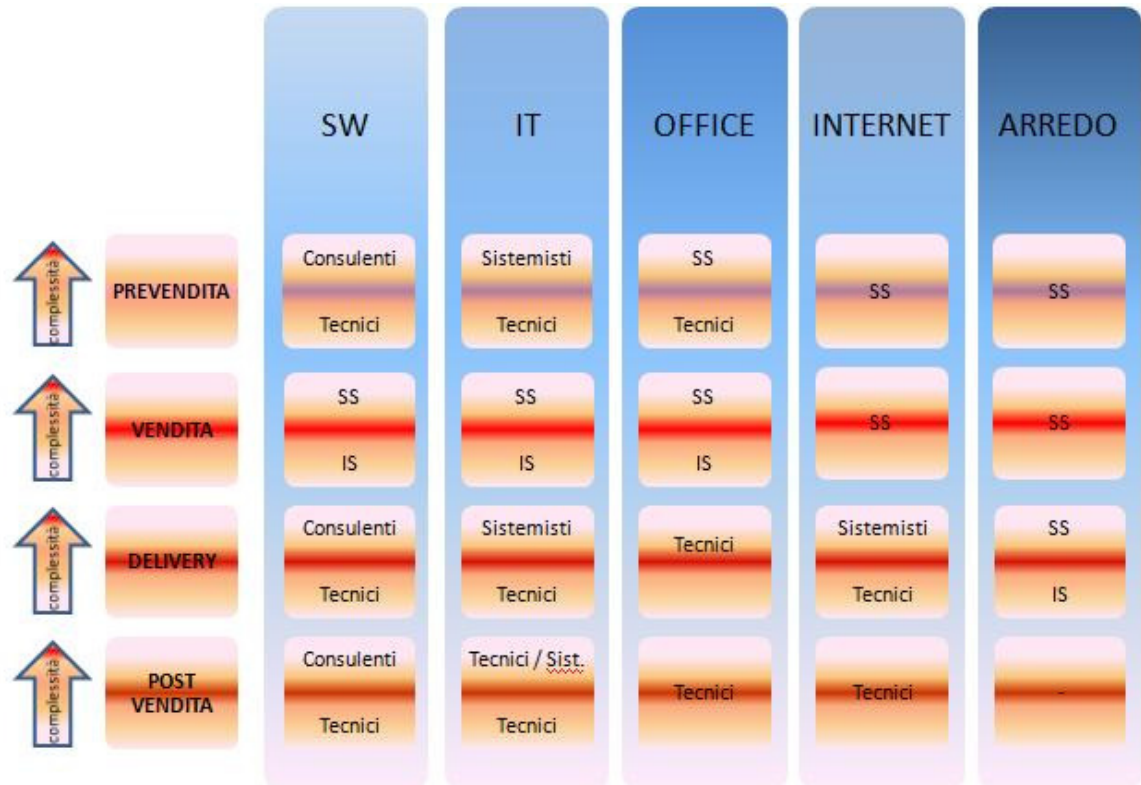
Fig. 3.27 New organizational model of the sales division

The real change in the sales division was the abandonment of the account system.

In the picture we can see the new model organization of the function.

On the left are represented the main activities of the value chain for the company: advance sale(Prevendita) , sale , delivery and after sales services(post vendita).

On the horizontal axis there are the main business area.

The complexity of the sale is defined from low to high. For the advance sale the more complex activities are done by the consultant while the other from technicians.

The sale is managed by the sales specialist of the area or by the inside sales office.

The delivery and the after sales services are managed by consultants or technicians basing on the complexity of the single activity.

For each business area the main activities have their supervisors.

A supervisor have the responsibility on the process. During a presentation of the new structure the following picture was presented to the operators of each area defining supervisors and roles.

Fig. 3.28 Analyzing the single business unit we can see that each activity has its supervisor.

The organization of the sales division has the following organizational chart .The sales manager has responsibility on the sales specialist while there is a supervisor for the inside sales office.
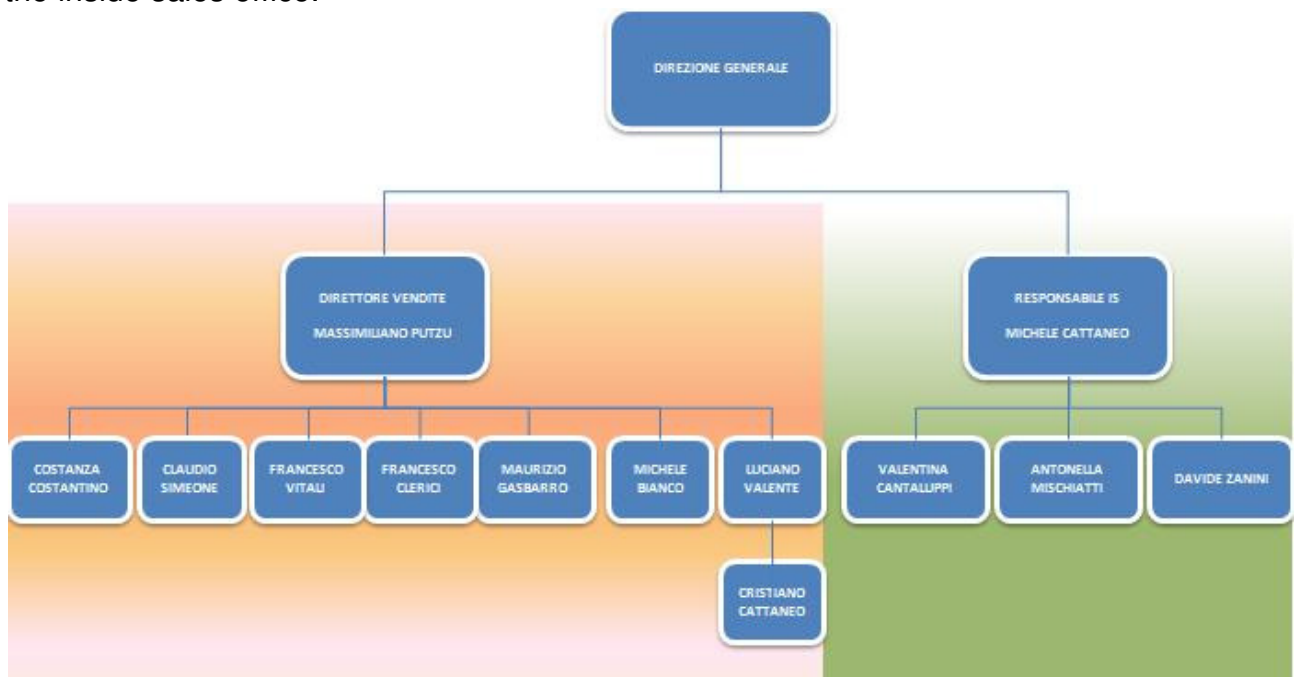
Fig. 3.29 Sales division organizational chart.

3.4.3.1   Sales Areas and supervisors

The supervisor

Approves offers with technical high complexity .
-Ensures that the process of his responsibility is carried out in accordance with the procedures and policies;
- has full responsibility for the process: including interfacing with colleagues or third parties to ensure that the process is done with the least expense in terms of economic and organizational effort;
- Even if delegated, the responsibility is entirely his (ie presales, sales, delivery, service ... etc.)
- Interfacing with the CEO of Sistemi Ufficio, with the Vendor, with the office "Inside Sales" and the presale for the study of new marketing campaigns and for the preparation of templates offer .

3.4.3.2   Sales Director –

Responds to the CEO on the objectives of sales management team
formed by the Commercial Sales Specialist;
-Coordinates the team of Sales Specialists and supports them in the sales process on the client;
-Make sure about the interaction between different business areas: CROSS SELLING!
-Speeds up the closing of negotiations;
-Collaborate, but does not define the business strategies for the marketing campaigns of Inside Sales;
-Collaborate with Management to define the commissions and the target for the SS;
-Authorize the settlement process and makes the calculations of variables of Sales Specialist, administration.
-Decide who gets to the commercial opportunities and alerts;
- Assign the talks sent from Inside sales office and distributes the workload among the same shopping area;
-Approve all commercial sales.

3.4.3.3   Sales Specialist

-Is a specialist in sales for his business area;
-Reports to the sales director for the management and closure of negotiations and for the achievement of the budget;
-It interfaces with its area of technical supervisor for the technical assessment of the bid;
-Process deals independently and records in CRM the deals
-Decide whether to delegate the negotiation .

3.4.3.4   Inside Sales

The main goal of the inside sales office is the selling of solutions with low complexity and assistance contracts by telephone;
-It is the reference point for customers with lower spending power where it is impractical to assign a Sales specialist commercial;
-When necessary sets S.S. opportunity to close the meeting;
-Work closely with the team and SS but is no longer a commercial office;
-Develop an ongoing relationship with customers;;
-Perform operational marketing campaigns, telesales, telemarketing, agreed with the supervisor and the head Inside Sales;
-50% of the time should be dedicated to inbound calls to those outbound 50%;
-Collects orders and make sure there is documentation before passing to the Customer Care for delivery.

The supervisor of the inside sales office :

-Coordinates the activities of the Inside Sales and monitor the progress and achievement of goals;
- It gives direction to the Sales Director for the definition of marketing campaigns;
-Provides support for preparation of bid and contract template = business strategies.

3.5 Next Steps

In the future Sistemi Ufficio wants to became one of the first 3 Vodafone agencies in Italy. To accomplish this objective Sistemi Ufficio is expanding on the territory and one new site has just been opened in Piacenza.

Open an office in Piacenza means going deep in the territory with onsite agents and operators to reach more customers. The office of Piacenza is totally linked with Sistemi Ufficio to guaranteed an high efficient exchange of information.

Now the agents have to deliver the new contracts to the main site in Lurago Marinone but in the next months an Openbox will be install also there to insert directly from Piacenza the documents about the new customers.

In the information technology area the business is changing . One of the politics of Sistemi Ufficio will be the assistance on the customer only with an assistance contract.

A customer with an annual assistance contract guarantees sure economical entries at the beginning of each year and allow to manage the assistance on time by offering monthly onsite check by the advisors and technicians of the company.

The customers with an annual contract will have a special assistance telephone number and different online services like a web assistance portal: Myway web. Using this website the customer can see all the historical activities done on his products and can request assistance. The request will be automatically insert in Myway and process by the customer care office.

Now there are only two customers active with this service but in the future any customer signing a contract will have the access to the website.

Fig 3.30 Myway web : insertion of a new request by the customer

Chapter 4

- KOROS -

4.1 Introduction

4.1.1 Koros presentation

Koros is a web platform that can handle the automation of business without the use and conservation of paper.

It can be integrated with administrative and management applications of the company. It is realized by Open Selex , a consortium created by Opensign and Selex communication.

With the availability of a series of specialized modules, Koros supports the following services:

Process Management
Document Management
Knowledge Management
Extended Enterprise (B2B Collaboration upstream and downstream)
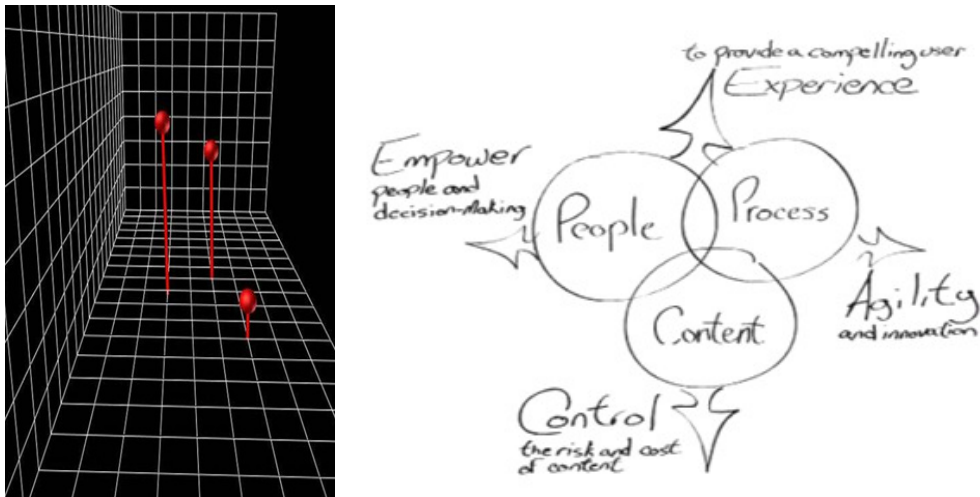
Fig.4.1 Koros has a multidimensional view of the company

Koros has a multidimensional vision of the company activities.

All the organizational events of the company are view like a mix of the three different components.

Adaptive Technology has the ability to deal with heterogeneous organizational aspects, taking into account the different models proposed by any AOO, each office and / or each operator and how they relate, even with the special needs specific to the general model "fit" automatically general organizational criteria.

Fig. 4.2 Adaptive technology

Certification of documents and substitution archive
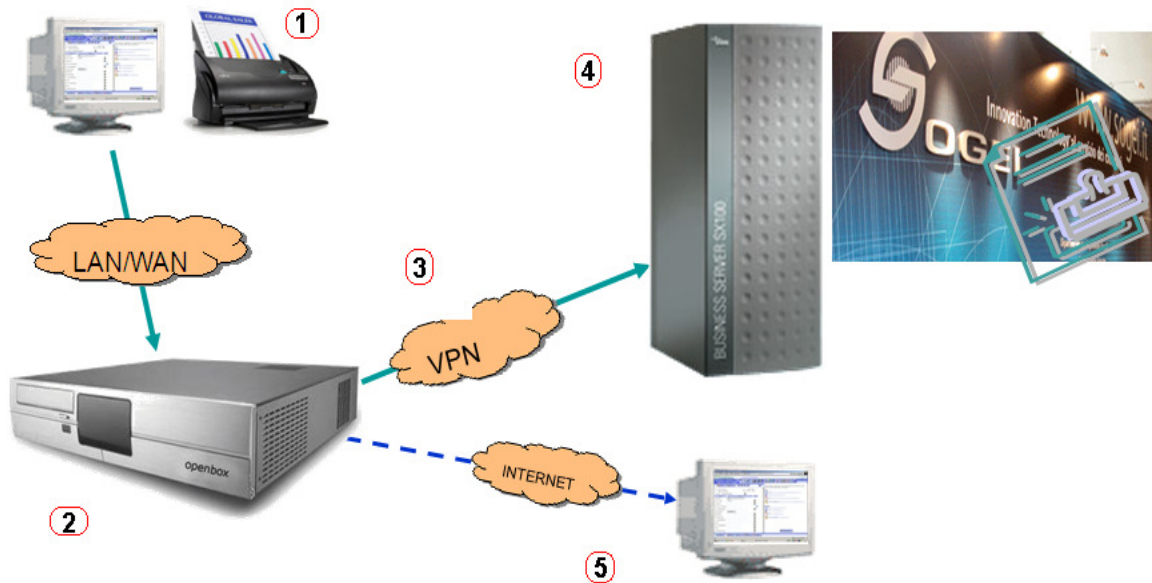
Fig. 4.3 Certification cycle

1. Protocol on the web portal with automatic recognition and classification of documents.
2. The digital document is recorded, digitally signed, timestamp and fully authenticated by SOGEI security infrastructure.
3. The protocol data and the footprint (hash) of the document are transmitted to the infrastructure assurance (CA) Certification Authority for authentication, time stamping and storage .
4. The Certification Authority stores the data protocol and the footprint of the document and is the guarantor (in the face of "security" local archiving) of the authenticity of the digital file. Leave the details to the competent administrative organizations.
5. Requests for services, payment, access to documents and the progress of the practices can be made directly from the portal.

Safe and secure access.
In order to ensure that access to data and documents is actually performed by authorized personnel ,several strategies have been developed:

Full encryption of documents
LDAP Authentication, Single Sign On SSO People
Smart Card or biometric recognition systems
Login and password to access WEB
Differential access to user profile
Contextualization of the shares by status and permission
Access logs of all transactions
Profiles between different configuration, maintenance and use

Koros manages the complete profiling common operating environment and is able to define:
Master Data
Qualifications
Roles
Skills
Working Groups
Authentications
Granular rights on the item
General Information.

Characteristics of the environment:

Classification classes

Multi-level sorting

Managing attachments and links

Change management with check-in check-out

Automatic handling of revisions

Controlled distribution

Background documents and practical automatic and programmable

Searches for the keys and full text

Research themes and key access

Statistical summary
Interactive reports

WEB Access to information and documents controlled and secure

Digital transmission and reception of secure documents registered with other government

Thanks to the dematerialization of paper documents or integration with management systems, files are automatically stored and indexed by multiple criteria (date, number, type, customer, ...).
Are digitally signed and time stamped by the certification system of OpenBox
They are automatically sorted according to the criteria and user needs
Automatic link between the contract documents (order, delivery note, invoices)
The user profiling to provide assign different access rights (ACL).

Automatic management of documents

Wizard of interactive documents
Automatic generation in iterating the
document "template"
Reading values from the DBMS
Update DB fields filled in
Management menu compilation
Managing the active depending on the user
Undo and reject the activities
Application of a self-Iter
Managing approvals and electronic signatures
and digital
Storage and automatic classification
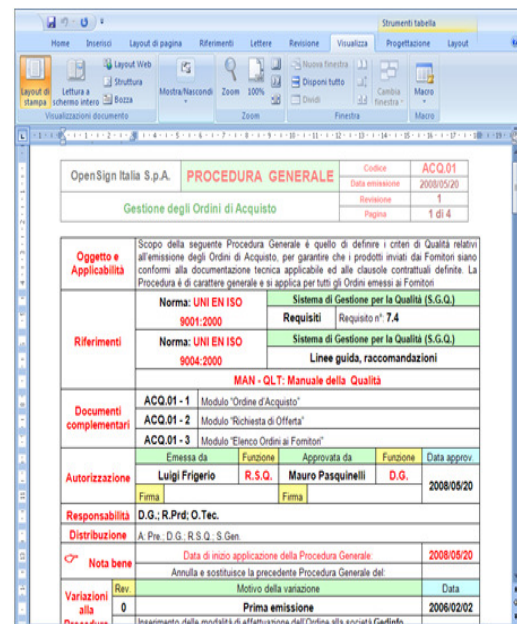
Fig 4.4 Automatic management of documents

Recovery, control and data validation

Thanks to the KReader technology, which recognizes, collects and evaluates
information from scanned documents or text documents (Word, PDF, txt), Koros is
able to meet the great challenges of the digital lifecycle management of documents.

This capability allows you to automate most of the burdensome administrative
management of the company. The functions that KReader, made available to
operators by Koros, allowing the massive digital reproduction of works on paper
directly driving the scanner.
Optimize digital copy of the file, organize the distribution of documents even if
scanned consecutively and immediately proceed to the capture of the SMART text
content.

Without any pre-education KReader is able to push reading and validating the
content of almost 100%. The algorithms that perform searches and inspections of the
values associated with fields required by the forms of accounts, offer accuracy and
reliability until now unthinkable.
In addition to research and data capture accounting system is specialized for the
verification and balancing of the amounts of total / partial digitalized content on the
invoice.

Terminate the processing system provides to the store (also in a replacement where
applicable) a PDF / A color code (as specified CNIPA) that includes a layer
containing the XML standard and recognized fields. The file is compressed and
optimized weight up to 80 kb per page (approximately 500 KB instead of market
solutions).

The document is then digitally signed by system protocol OpenBox, encrypted and stored in Koros.

Coordination of different databases and applications
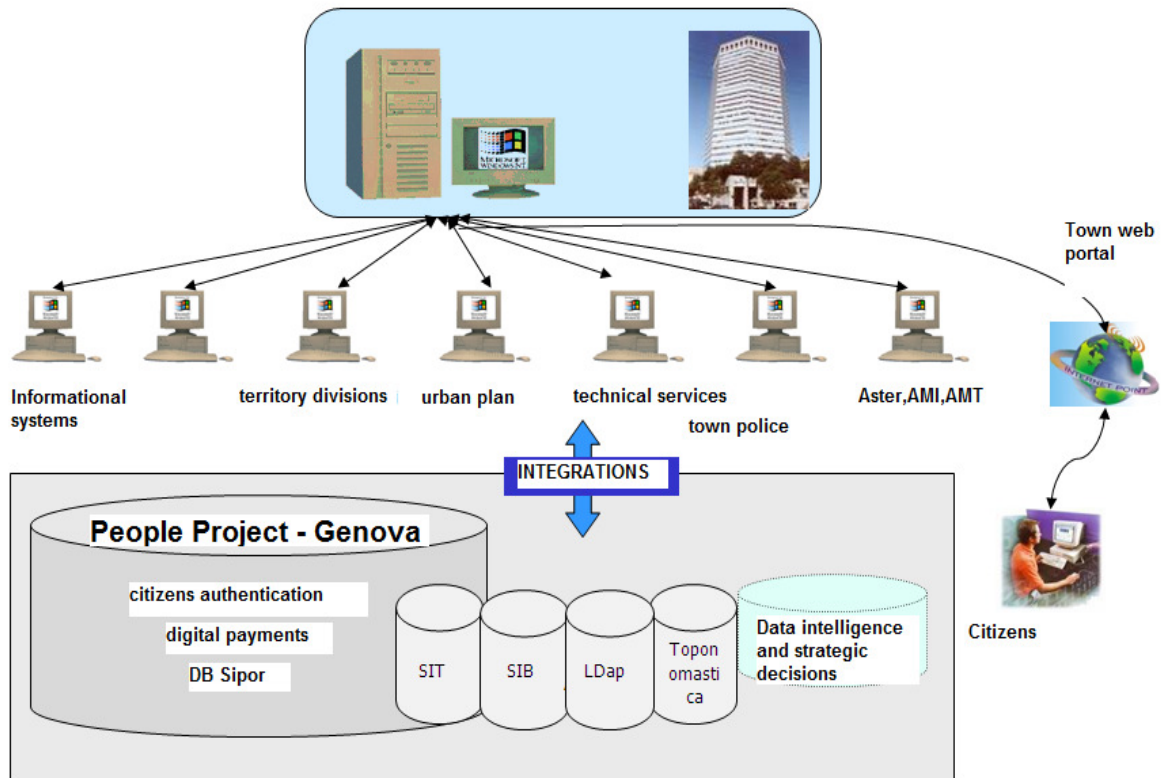
Fig. 4.5 Example of the coordination of different systems with Koros

One of the best example of coordination of different database is the project realized for Genova town administration. All the services to the citizens are now available from an unique web portal that manages all the resources from the police to the technical services.

The citizen can authenticate himself on the portal and then join all the services of the town including digital payments.

Koros can share DB business applications company. Without the need for any duplication ,platform, where possible, treats the data structures of the environment to use the information to organizational processes.
It is also possible to generate a common integration environment where applications replicated and shared, read-only or update, the information allowing full automation of the functions used.
 The data become available and organized in similar queries, and reports of dynamic interactive decision-making stages.

Process management system

The main feature of the sub-process management is the ability to automatically distribute tasks and information among the stakeholders involved and to trace transactions.
The automatic management of organizational processes provided by Koros is responsible for on-screen activities of each actor to play "Just on Time" .
Koros Is able to coordinate events as a function of flow established.
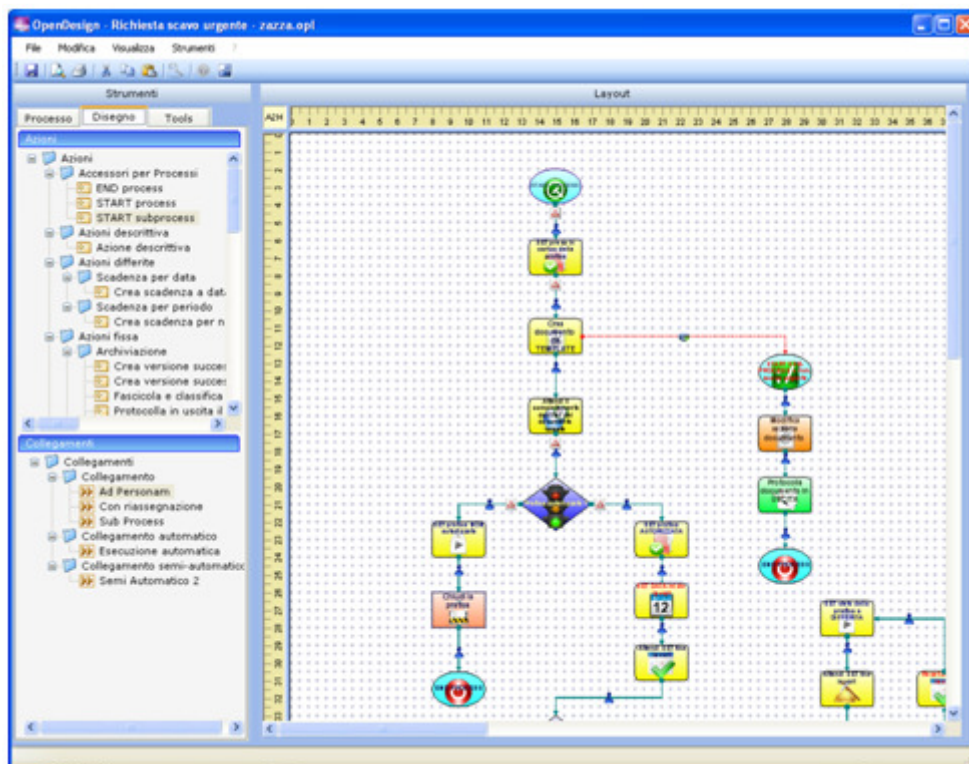
Fig. 4.6 process modelling with Koros

Koros has subverted the critical nature of this discipline creating a design environment easily, quickly and effectively.
Instead of starting from the manual of procedures for designing processes, thanks to Designer Koros can map processes and obtain operational and simultaneously prepare the handbook of procedures.

Data intelligence and strategic decisions

With the ability to process mapping, integration with database management, recording and storage of complex information documents, Koros can serve as a repository of corporate knowledge.
This filing is accessible by users in respect of roles and security profiles
Koros can be drawn from the thematic report that management wants to decision making and performance evaluation.
These reports can be automated and scheduled.

Extended enterprise

Koros processes are not limited to the perimeter, but may also extend to suppliers and customers.
Koros processes in support complex transactions in which the work is done by outside entities.
Partners can still access the database to collaborate and access information for their expertise in order to save the data entry and administrative management.
Koros allows you to open the enterprise perimeter to the "community" by defining common areas of exchange of information and events.

Substitutive storage

The service allows the archiving replacement of documents, including tax, in accordance with laws and regulations CNIPA.
CD production of documents filed for the ten-year conservation.
No expiration of validity of the conservation.
Archive protected and armoured.

Fig.4.7 Certification authorities logos

Passive cycle
Automatic passive cycle storage and integration with management procedures
Retrieval, validation and control of administrative data and accounting.
Thanks to KReader, which recognizes and collects information from digital documents, Koros is able to deal with the automatic management of administrative documents.
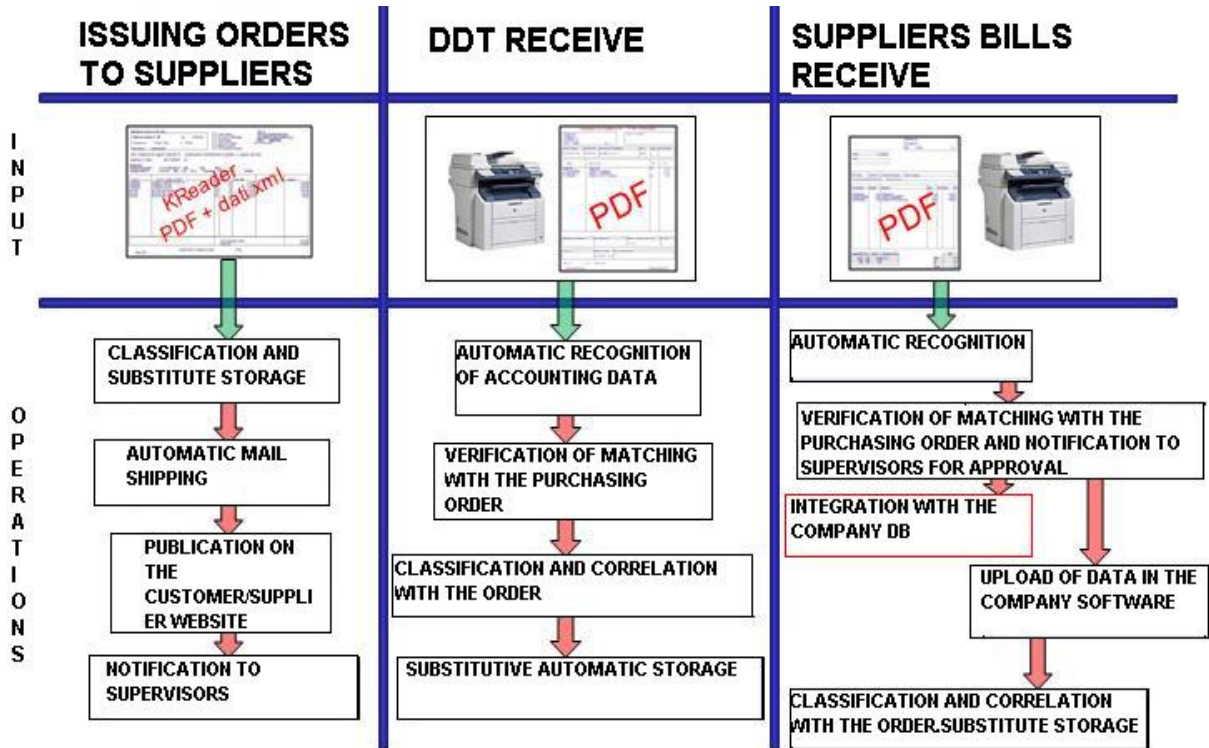
Fig. 4.8 Passive cycle main processes managed by Koros

Operational and functional flow of the passive cycle.
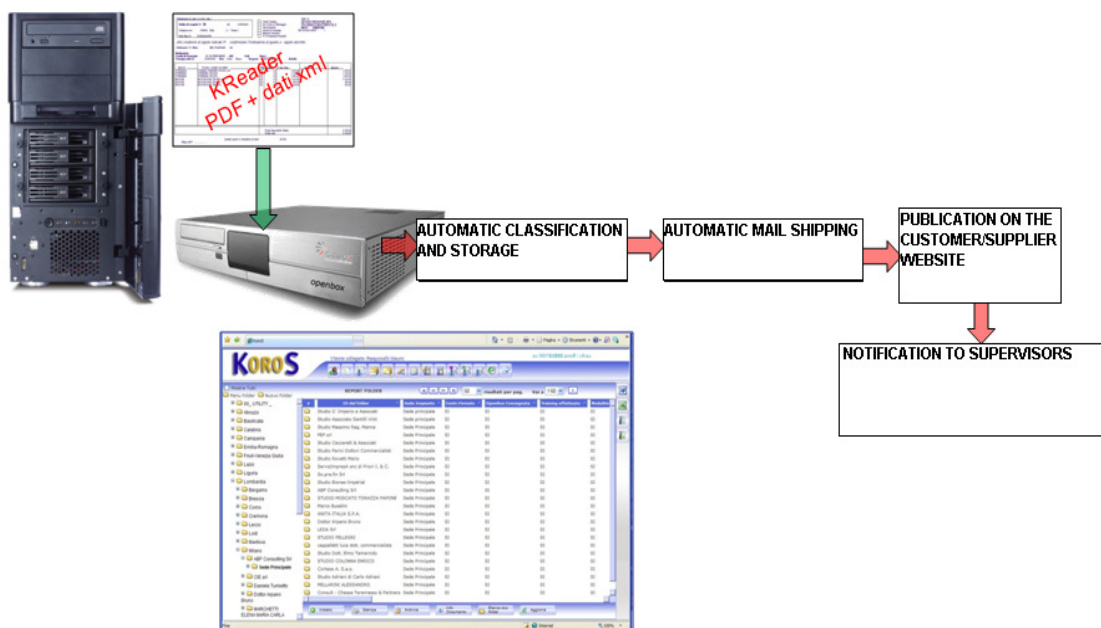
Fig. 4.9 Order to supplier management
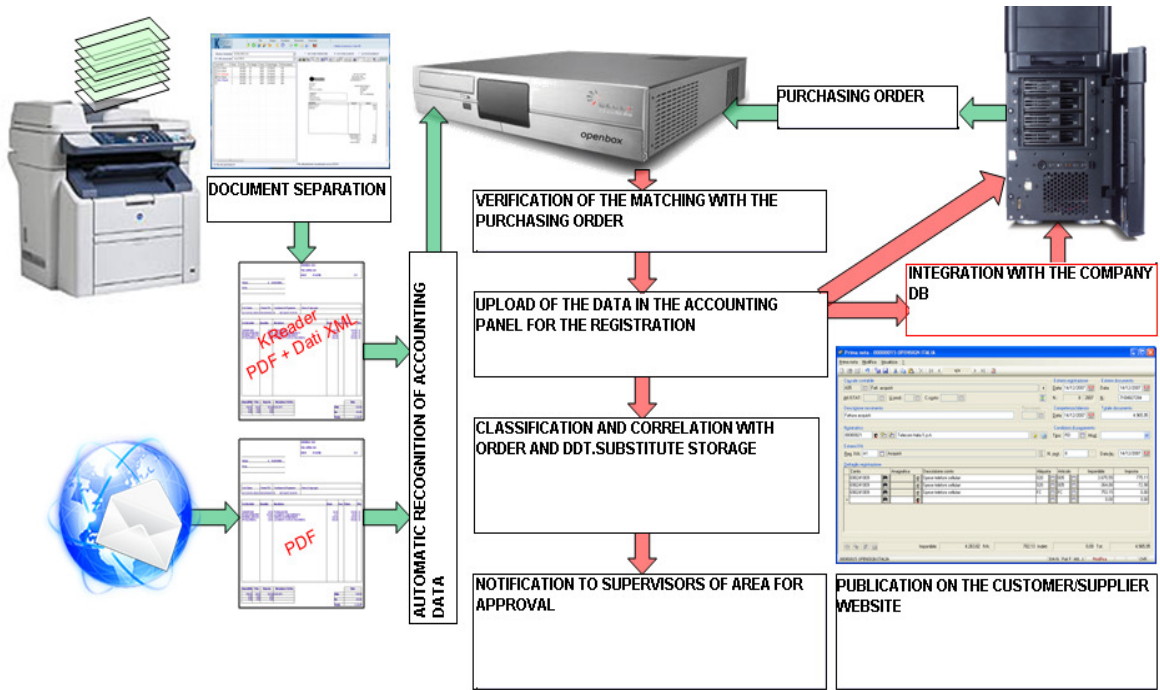
Fig. 4.10 Supplier bills receive

Active cycle
Automatic archiving of the sales cycle and integration with management procedures

Thanks to KReader that recognizes and collects information from digital documents, Koros is able to meet the great challenges of managing documents automatically.
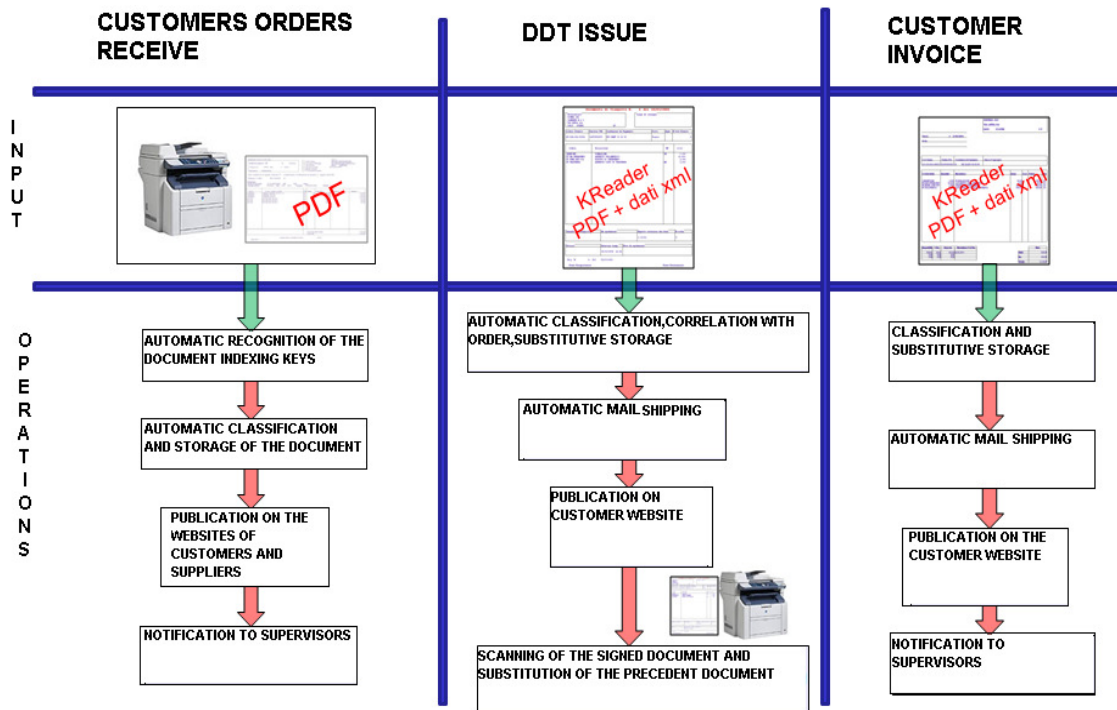
Fig. 4.11 Operations for the main sales cycle processes.
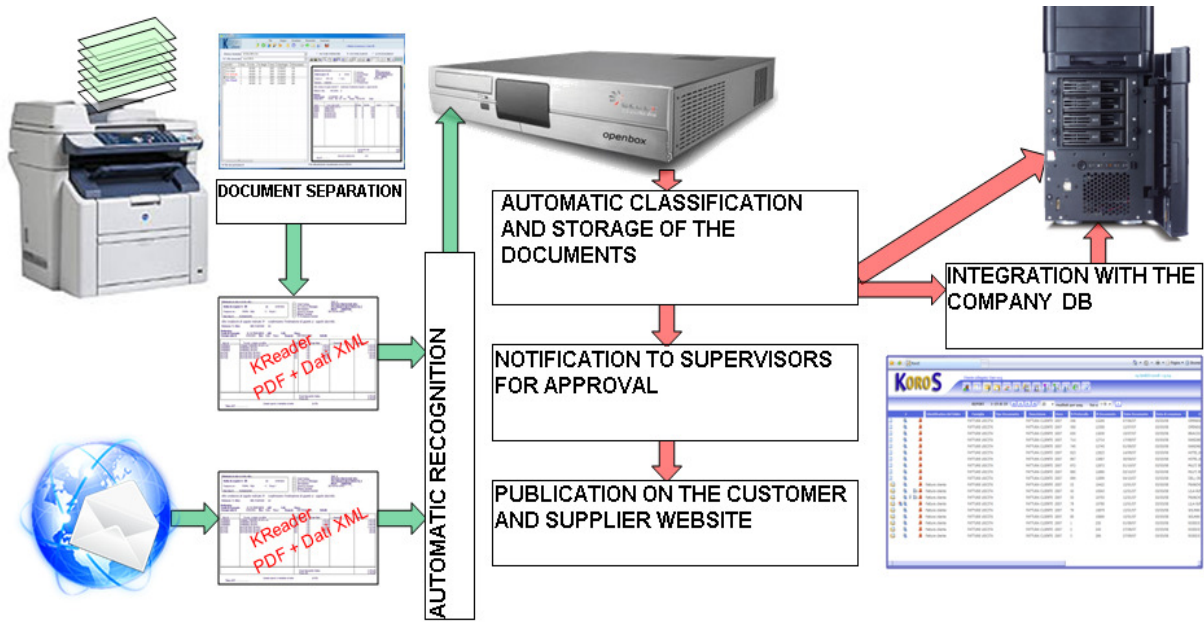
Fig. 4.12 Active cycle(1)-Order receive
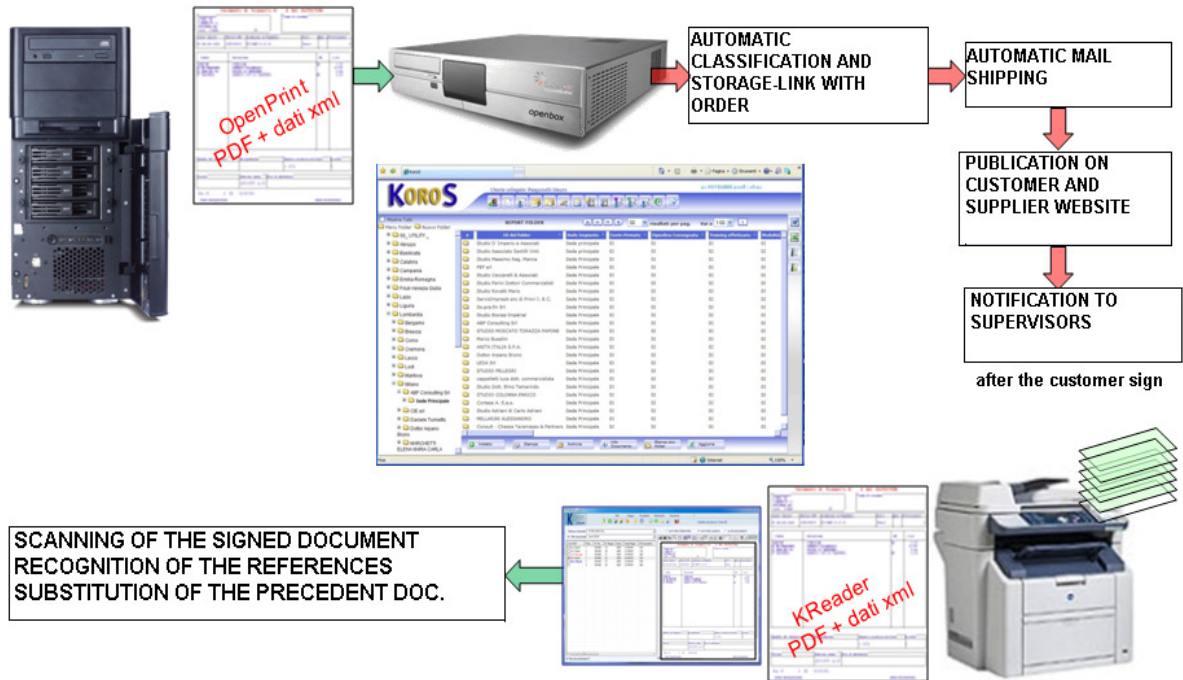
Fig. 4.13 Active cycle (2)-DDT issue

Automatic issue of the electronic bill

Koros is able to provide full functionality for the issue, certification and delivery of electronic invoices according to international standards without the need to update their management procedures.
Address the form KReader instead of the printer you automatically get the invoice and all the automatic process of certification which includes:
Implementation of PDF / A (in accordance with CNIPA)
Layer structured accounting data in XML format
Automatic Digital Signature
Timestamp decade
Document Storage and protocol
Submitting evidence to the Certification Authority for the Conservation
Auto Shipping in Certified E-Mail
Storing log reception

4.1.2 The objective of the solution

During the past Sistemi Ufficio have always faced the problem of the storage of the documents and the management of information flows.

This is a problem that interest every kind of company.

The paper penetrate in every place of the company and often documents are missing.

'Companies and public administrations seems to be ready to leave paper and star working digitally. There are many process of digital innovation looking to the main countries of the world. The management of digital documents and substitution archive is the innovative process of the century.

Perhaps there are many dubs about the topic. Which are the step to implement a fiscal archive of documents? Software are ready to follow and respect the high number of norms and lows? Are we going to create a unique qualitative standard accepted at Europe level?' 1/06/2008

Now there are many ways to dematerialized in an organized way using different software and systems .This new technology guaranteed right conservation of documents, fast time of search and stop wasting of paper. Companies (in Italy) have to maintain in their archives fiscal documents for 10 years. Dematerializing them we can reutilize hundreds of meters of space.

Fig. 4.14 The management of documents is changing

Opensign is one of the company that have identified the problem and implemented a solution to the fiscal and not fiscal storage of documents: **Koros**.

In May 2010 Sistemi Ufficio has signed a partnership with Opensign .

The main point of the partnership were:

1-Sistemi Ufficio will implement the solution inside the company and will serve as beta tester

2-Sistemi Ufficio will sell the solution to his customer

3-Opensign will guarantee assistance and help during the development of the project in Sistemi Ufficio.

The request of Sistemi Ufficio was to manage the storage of the documents of the 2 main areas of business of the company: information technology and communication(Vodafone).

In a second time manage the internal information flows related to IT area.

In the future (when the solution will be implemented) we can stop printing documents. We can save them in a database shared by all the employees , inform an employee trough the software about an order and send by email the bill to the customer, that means saving in time and costs and increasing the company performances.

The final objective of this project is to sell a simple and efficient solution for the management of documents and informational flows to the customer .

4.2 The process to the implementation
4.2.1 Analysis

Since when the company decided to implement Koros a team was created to follow the project. My role is project manager.In the team there is also a programmer and a technical advisor.

We have studied the software using the documentation given by Opensign.

The documentation about the software was not sufficient to understand the real potential of Koros so in agreement with Opensign we follow a 6 days training course which will be described in the following paragraphs.

After different meetings with the advisors of Opensign we understand that the implementation of the software had to be divided into 2 different main process:

The project was divided IT project and VODAFONE project.

The objective of the IT project was to digitalize all the contracts with the customer of the area.

The objective of the VODAFONE project was to digitalize the historic archive of documents related to activation, variations ,renewals and customer documents related to Vodafone communication products and services.

This essentially for 3 reasons:

1-The number of Vodafone documents was extremely bigger than the one of the IT area.

2-IT documents have a reference record in the ERP of the company while there has never been a software that manages the Vodafone area.(For example : Hardware Maintenance contract XXX in the archive is registered in Myway as XXX with all the information related to customer, machines and billing conditions.

3-The Vodafone documents dated before Jan-2010 are insert in wallets divided for customers that have to be 'cleaned' from unnecessary documents.

Vodafone project.

The management of Vodafone document storage has to be divided into 2 main categories:

1-new documents

2-historic documents

For what concern the historic documents we have identified 4 main categories of documents:

-activations

-variations

-renewals

-customer documents

We had to find the resources necessary for the 'cleaning' of the wallets.

For the new documents the classification is the same but is managed day by day directly from the back office operator.

The number of Vodafone documents to be insert in Koros is around 50000.For the Vodafone project will be necessary at least 4 people.

IT project.

The documents interested for the storage are the contracts.Sistemi Ufficio stipulate different typologies of contracts with his customers and has the necessity to maintain copy of the signed document to verify conditions of payment or for any legal necessity. The typologies of IT contracts managed by Myway are:

SYSTEMS MAINTENANCE	VOIP TELEPHONE TRAFFIC
OFFICE MAINTENANCE	SPEAKER INSURANCE ALLIN
SAP AND HOT LINE VOIspeed	ALLIN INSURANCE OFFICE
CARNET VALUE	ALLIN INSURANCE SYSTEMS
SAP AND CONSULTATIONS WITH HOT LINE VOIspeed	TECHNICAL SUPPORT SYSTEMS
	BS BEDIN
	BS ericsoft
	BS ericsoft INCLUDING OUTPUT
CONTRACT 00 TONER	BS HOT LINE EDISON
SECURITY SERVICES	BS LARA HOT LINE SOFTWARE
SYMANTEC MAINTENANCE	BS ESA HOT LINE CONSULTING
WEB MARKETING	BS ESA HOT LINE
CARNET HOURS	BS INTERNET ESA
CARNET POINTS	BS LIGHT ESA
CASES MAINTENANCE	BS SYSTEMS
CONNECTIVITY	
MICROSOFT SOFTWARE ASSURANCE	SAP HOT LINE AND CUSTOM
HOUSING	SOFTWARE
HOSTING	CHARTER FINANCIAL IT
EPOINT	CHARTER FINANCIAL OFFICE
COPY COST	RENT AND COST OF COPY
PAY PER PAGE	

BS means basic support. Each contract has an unique code which identify him in Myway. The contracts have to been scanned and inserted in Koros.For this project we will need to hire 2 resources.

Each project will be analyze in details in the following paragraphs.

4.2.2 Organization of the project

I have identified the main activity necessary to implement the solution in the company

Step for the application of the solution

We can see in this summary the main activities related to the implementation of the solution in Sistemi Ufficio and the necessary activities related to the selling of the solution to the customers of Sistemi Ufficio.

STEP1- ANALYSES AND FIRST IMPLEMENTATION

- software installation
- creations of document classes
- scanning of IT documents

STEP2-ADVANCED IT IMPLEMENTATION
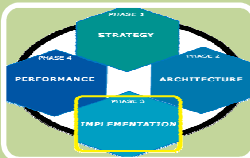
- operators training
- analyzing and insertion of IT document
- linking Myway and Koros for IT documents
- start of daybyday insertion of IT documents

STEP3-VODAFONE PROJECT

- training of the operators
- preparation of the documents
- study of the barcode labels for automatic insertion of documents in Koros
- barcode labels and scanning for the insertion in Koros

STEP4-INTERNAL INFORMATION FLOWS MANAGEMENT
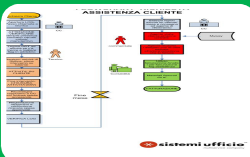
- analysis of the processes of the company
- development of the processes in Koros
- training and use by the Customer Care operators

STEP5-CRITICAL MANAGEMENT OF FISCAL DOCUMENT-SUBSTITUTE STORAGE

- analysis of the document object of the substitute storage
- implementation
- training and use by administrative operators

STEP6-PRESENTATION OF THE SOLUTION TO THE CUSTOMER

- analysis
- implementation
- linking existent software
- training and use by customer operators

Fig. 4.15 Step for the implementation of the solution

4.2.3 Training on the software

The training was define in 6 days. On 27 and 28 of May the target of the course were technician and RDBMS managers. A technical advisor of Opensign , Luigi Frigerio show us how to configure the Openbox on the server of our company and how to make Koros available to the operators of Sistemi Ufficio. Koros is web based so it is only necessary to 'open' the specific gates of the company server to make the software available to the users of the network.
In the same days they present the Openbox which is the hardware system where Koros run. It works with an Oracle DB .

On 3 and 4 of June the teacher was Marco Parravicini who is a software consultant. He presented us Koros and the possible use of it which I described in the precedent paragraphs.

On 9 and 10 of June engineer Marco Cattaneo show us the management of processes using Koros. That was the most interesting course because he explain us how to define processes with Koros .How to define classes of documents, users and substitute storage. I will explain the use of the platform and the configurations in the chapters related to the software implementation.

4.2.4 Technical and human resources

For the development of the solution in Sistemi Ufficio we have identified the necessary resources.

For the IT project 2 operators were hired to scan all the documents and insert them in Koros. This has taken 2 months from July to August 2010.

For the Vodafone project ,started in September, we identified the necessity of 5 resources to prepare the documents, print the barcode and scan the documents that will automatically be inserted in Koros.

For what concerns the technical resources:

-we have purchased 5 label printers for the barcode labels

-5 personal computer, one for each operator for the 'Vodafone activities'

-2 multifunctional printers for the scanning of the documents.

-1 scanner for the customer care office for the daily activity of digitalization.

One of the office of the company was reorganized to be used from the operators.

Here there is a plant of the office.
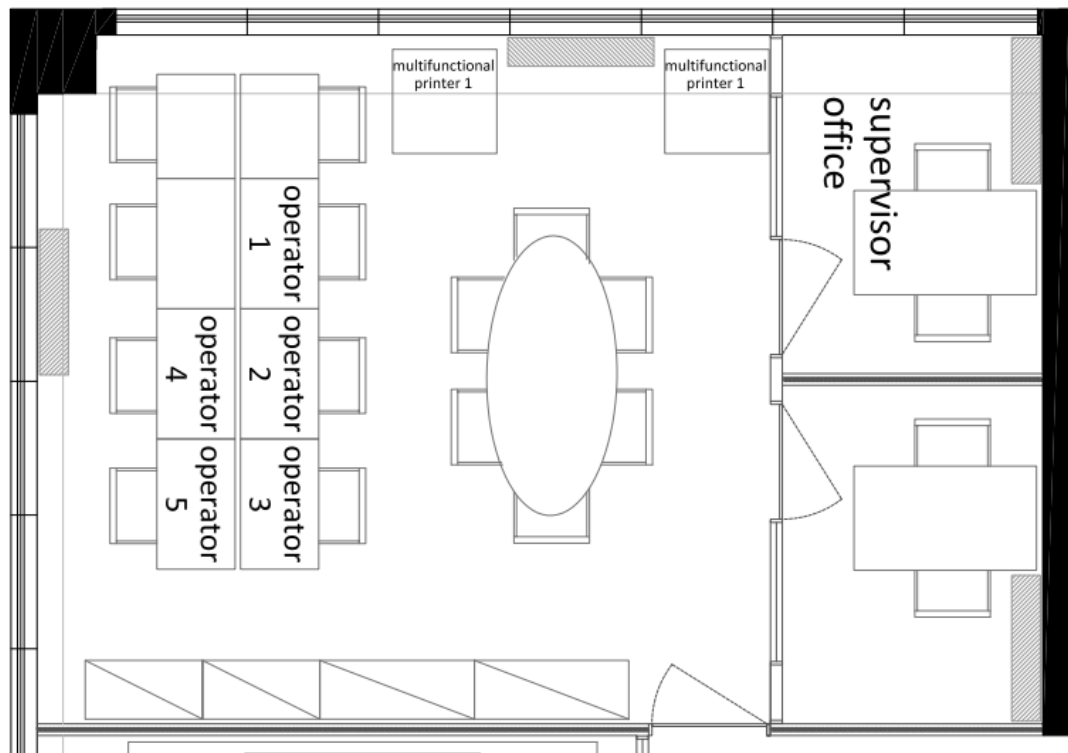
Fig. 4.16 documentary office

Fig. 4.17 Barcode labels printer and scanner for daily digitalization

4.2.5 Software installation

During the training we got the competences to install the Openbox in our company.

Fig. 4.18 The Openbox

The Openbox is the hardware part of the system. It has been developed by Opensign and contain the database of Koros. It has to be install on the company network making some devices about network gates and firewall settings.

On 18 of June the Openbox was operative in our CED.

It was and it is available at the address:

http://192.168.0.17:8081/KCOMM/

On this address ,available only internally in Sistemi Ufficio , using a user login is possible to access Koros.

We immediately found some criticisms like for example the impossibility to modify the initial structure of the reports and the masks of the software, the document classes and the preexistent processes.

After 2 weeks of collaboration with Opensign we were ready to insert documents in Koros.

On 24 of June we installed Ksetup on my Personal Computer.With that application I can modify document classes, create new processes and configure users on the platform.

On 28 of June two people were hired to start inserting the contracts related to the IT area in Koros.

After a training course on the program and on the others applications of the company , Claudio Z. and Michele U. were able to use the platform. The details of the operations done in the IT project will be explain in the following paragraphs.

On 13 of July I created a PEC address to be used in the future for the issue of bills and documents to the customer.

The certified electronic mail (PEC) is a tool, active in Italy, which allows you to give to an e-mail the same legal value as a traditional mail with return receipt. The PEC can also add the certification of the contents of the message only if combined with a digital certificate. The PEC does not certify the identity of the sender or the message turns into "electronic document" if the sender fails to use its digital signature.

Using Ksetup I have modified the layout of the window where users can see the documents. The research masks have been simplified and each operator of Sistemi Ufficio received its login to access Koros.

Ksetup

Using Ksetup is possible to manage users of Koros, create document classes and define characteristics of the documents.

The use of Ksetup is absolutely restricted to the supervisor of the process.
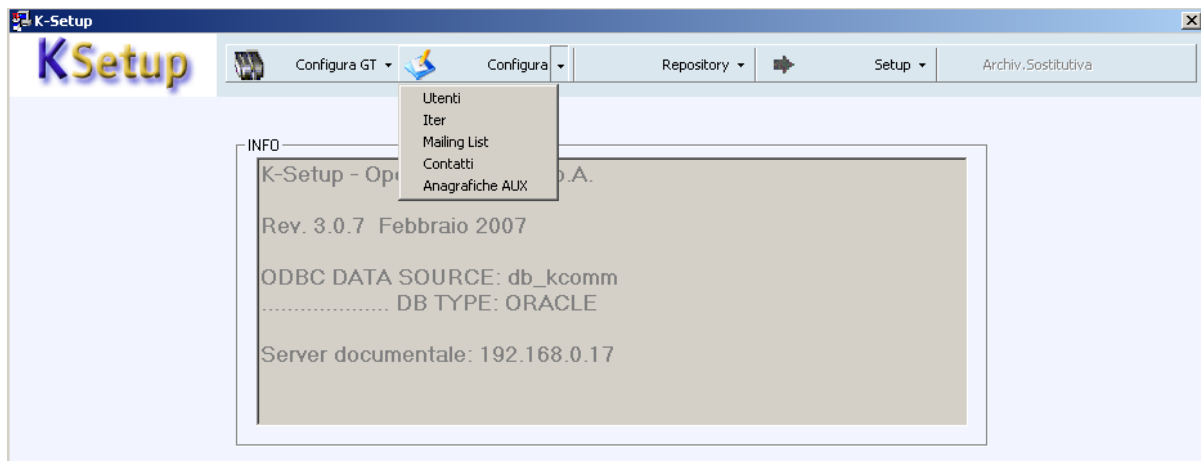
Fig. 4.19 Ksetup: home menu'

4.2.6   IT PROJECT

The IT project was divided in 2 main activities: one related to the <u>scanning and the insertion</u> of the documents in Koros and one related to the <u>synchronization</u> of the internal DB managed by Myway and the Koros DB.

4.2.6.1 Scanning and insertion.

To insert documents in Koros it is necessary to create document classes.

The different types of documents that can be loaded into the database are defined using classes.
A class identifies a group of document types. For example in the case of Sistemi Ufficio Contracts document class is used to store various types of contracts with individual customers of the company.
The data for each contract are essentially the same so it is only necessary to change the document type when we upload a document.

For IT project I created the contracts class.

This class have the same attributes of a contract record of Myway .

To create the contract class I utilized the Ksetup utility .This utility make the operator available to modify Koros configuration.
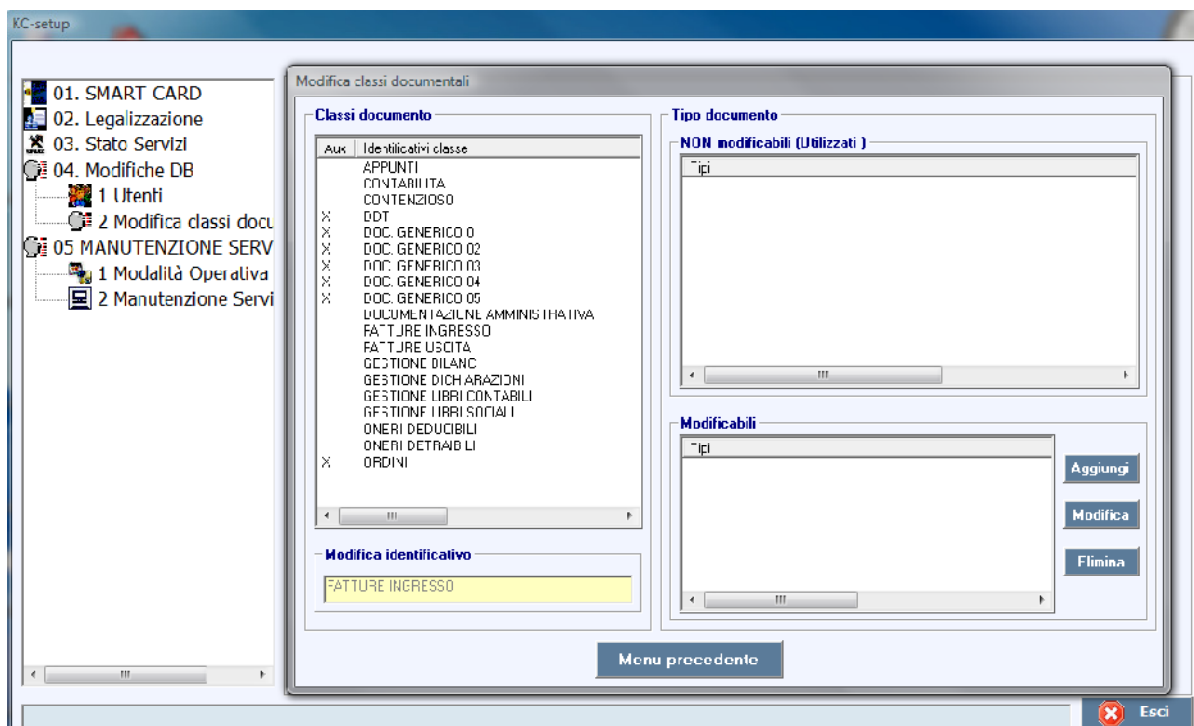
Fig. 4.20 Ksetup :definition of types of document

Using Doc classificatory is possible to create document classes and define attributes, research masks for the documents and reports .
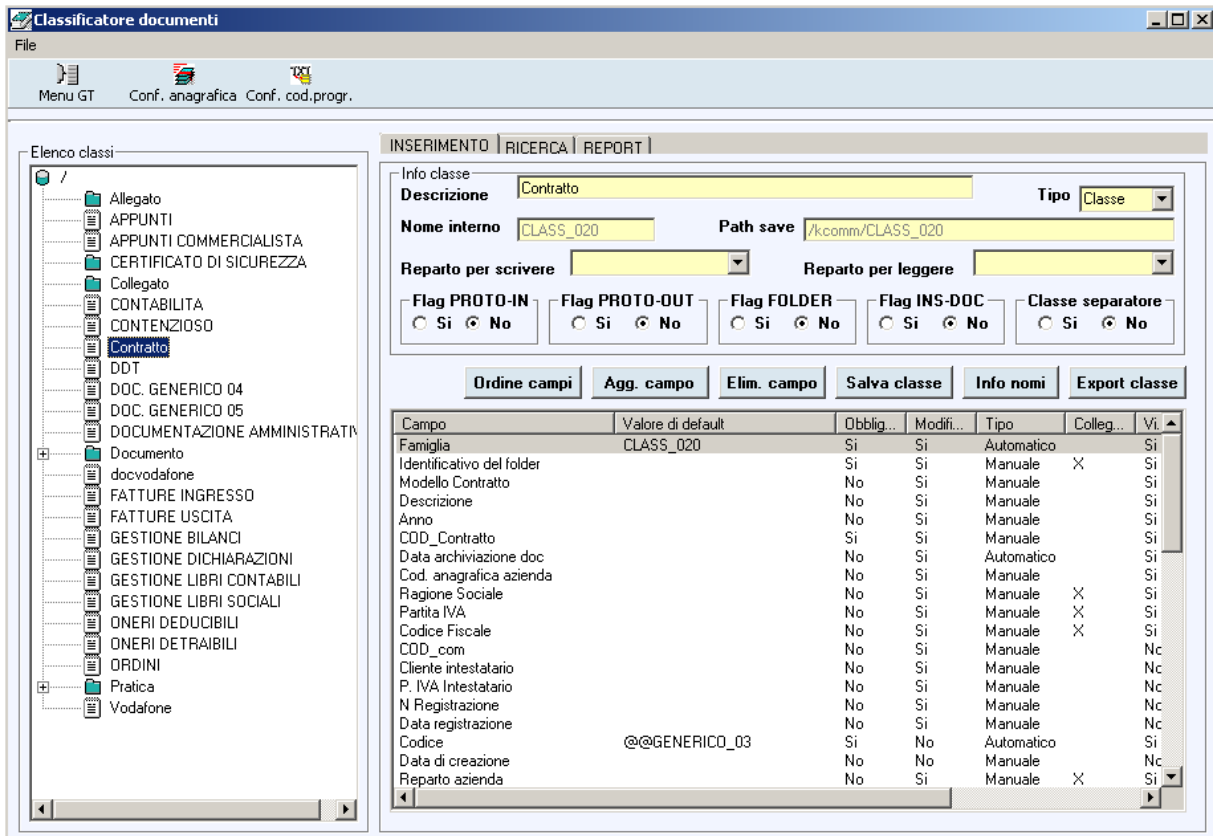
Fig. 4.21 Ksetup: definition of the document classes

Starting from a preexistent class (generic document 01) I defined the contract class and then I defined the typologies of documents of the contract class, which are the typologies of contract of Sistemi Ufficio.

Changing the document type
After defining the class of document (contract) it is possible to define in detail what kind of document we will store (telephone support, cost copy ...)
In the case of Sistemi Ufficio for the contract document class we have 23 types of contracts.
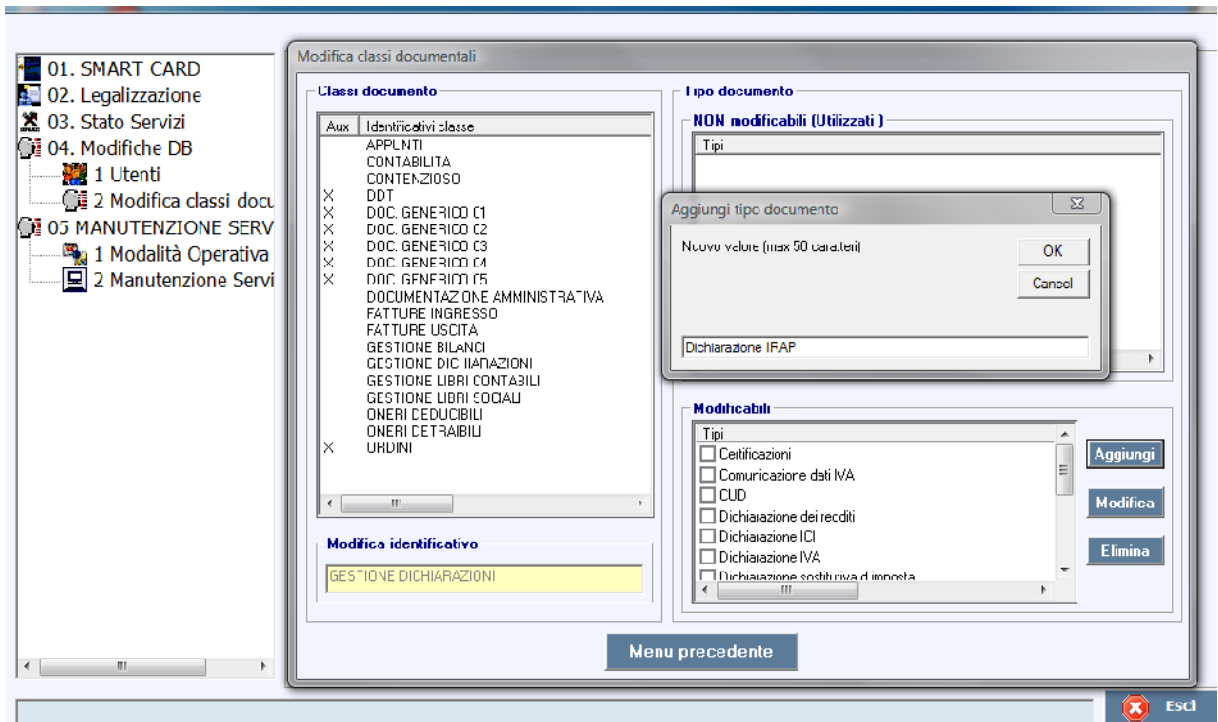
Fig.4.22 changing document type

The number of contracts related to IT area was around 1200. The operators had to extract the physical documents from the archive , scan the document making a PDF file and the uploading the document and the main information on Koros.

To speed up the insertion we had to reduce the number of information input by the operators.

For this reason we identified the primary key of each document which is the **contract code**.

The operator will insert in Koros a record of the contracts class indicating only the contract code.
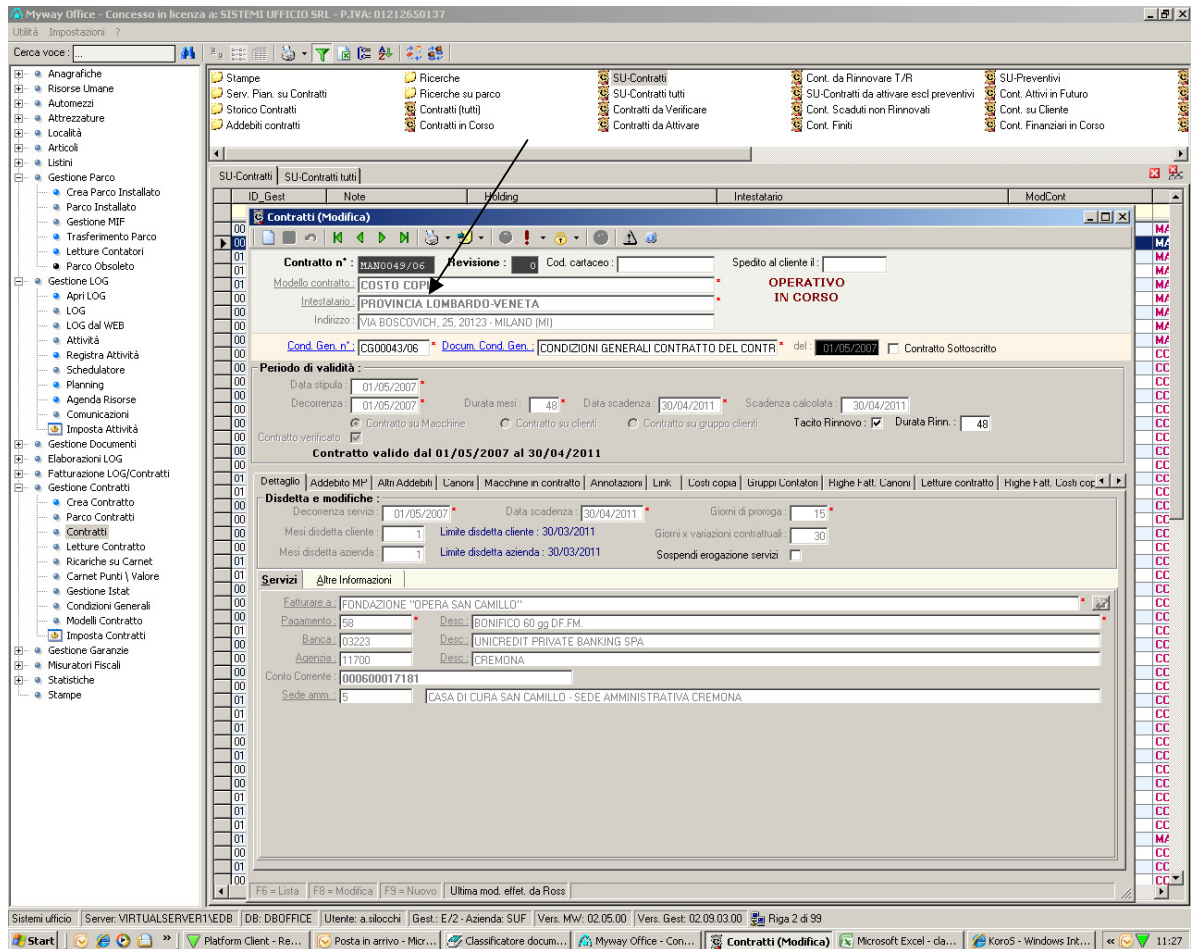
Fig. 4.23 contract in Myway with indication of the contract code

The scanning and insertion of the documents related to IT area take about 2 months.

At the end of this first phase we can see in Koros the folder of the customer with its documents identified by the contract code.

In the picture below we have for example the customer A.B office systems s.r.l. with its contracts.

BS0885/08 is the contract code of the basic support contract for ESA software of the customer.

We can see that this is the only information registered for the contract. The other will be uploaded with the synchronization with the DB of Myway.

Fig. 4.24 Example of contract inserted in Koros.

4.2.6.2 Synchronization

To upload the other information related to the document we create a query that check the Myway DB and upload the information like Company name, PIVA, stipulation date, expiration date…

This query check the Myway DB every day and upload the data of the contracts inserted. This contributes to maintain refresh the archive .

To obtain this connection we have first extracted the data from the Myway DB .

Here there is an example of the query, SU contratti extract all the contracts present in Myway and their data:

SU_Contratti
SELECT SU_VW_CON_Contratti.ID_Contratto AS ID_Contratto,
SU_VW_CON_Contratti.COD_Contratto AS COD_Contratto,
SU_VW_CON_Contratti.Revisione AS Revisione, SU_VW_CON_Contratti.DataStipula AS
DataStipula, SU_VW_CON_Contratti.Decorrenza AS Decorrenza,
SU_VW_CON_Contratti.DurataMesi AS DurataMesi, SU_VW_CON_Contratti.DataScadenza
AS DataScadenza, dbo.xxx_getAnnoMese(SU_VW_CON_Contratti.DataScadenza,'M') AS
ScadMese, dbo.xxx_getAnnoMese(SU_VW_CON_Contratti.DataScadenza,'A') AS ScadAnno,
SU_VW_CON_Contratti.Intestatario AS Intestatario, SU_VW_CON_Contratti.Indirizzo AS
Indirizzo, SU_VW_CON_Contratti.Comune AS Comune, SU_VW_CON_Contratti.ModCont AS
ModCont, SU_VW_CON_Contratti.Doc_CondGen AS Doc_CondGen,
SU_VW_CON_Contratti.StatoGen AS StatoGen, SU_VW_CON_Contratti.Stato AS Stato,
SU_VW_CON_Contratti.DataFineVal AS DataFineVal, SU_VW_CON_Contratti.DataInizioVal
AS DataInizioVal, SU_VW_CON_Contratti.Contratto_su AS Contratto_su,
SU_VW_CON_Contratti.Cod_Sla AS Cod_Sla, SU_VW_CON_Contratti.SLA_Codice AS
SLA_Codice, SU_VW_CON_Contratti.Descrizione AS Descrizione,
SU_VW_CON_Contratti.Note AS Note, SU_VW_CON_Contratti.Cod_Agente AS Cod_Agente,
SU_VW_CON_Contratti.Agente AS Agente, dbo.GetBloccato (

SU_VW_CON_Contratti.ID_Gest) AS Cliente_Bloccato, dbo.GetAgente (
SU_VW_CON_Contratti.ID_Gest) AS [Agente e/], SU_VW_CON_Contratti.DurataMesiRinn
AS DurataMesiRinn, SU_VW_CON_Contratti.Piva AS Piva,
SU_VW_CON_Contratti.Flg_Sottoscritto AS Flg_Sottoscritto, SU_VW_CON_Contratti.Sede
AS Sede, dbo.SaldoCarnet (SU_VW_CON_Contratti.COD_Contratto) AS [Saldo Carnet],
SU_VW_CON_Contratti.Flg_TacitoRinn AS Flg_TacitoRinn,
SU_VW_CON_Contratti.COD_CliFattSer AS COD_CliFattSer,
SU_VW_CON_Contratti.AnnoDecorrenza AS AnnoDecorrenza,
SU_VW_CON_Contratti.MeseDecorrenza AS MeseDecorrenza,
SU_VW_CON_Contratti.ValCanoneTOT AS ValCanoneAnnuo, dbo.xxx_getzona (
SU_VW_CON_Contratti.COD_Intestatario) AS Zona, SU_VW_CON_Contratti.ID_Gest AS
ID_Gest, dbo.xxx_getHolding (SU_VW_CON_Contratti.Sedi_Cod_Com,
SU_VW_CON_Contratti.Intestatario) AS Holding
FROM SU_VW_CON_Contratti AS SU_VW_CON_Contratti

ORDER BY SU_VW_CON_Contratti.Decorrenza ASC, SU_VW_CON_Contratti.DataScadenza
ASC

After the extraction we make a match between COD_Contratto (primary key of the contracts in myway) and COD_Contratto in Koros and we upload the data.

4.2.7 Vodafone project

During the implementation of the IT project we found that the software could be useful also to the Vodafone agency.

Since the born of the agency in Sistemi Ufficio the customers documents have been stored in wallets . When an operator have to check the customer document he have to extract the information from the archive manually. This is a real loose of time and cause sometimes the missing of documents.

To solve this problem we started to think how to store also the Vodafone documents in Koros.

On 23 of July I met Francesca Papaluca who is an operator of the Vodafone Agency in Sistemi Ufficio.

We identified 4 documents type: activations, renewals, variations and customer document(identity card…).

I presented the solution for the storage of the documents but the number of documents was extremely major than the one of IT so we started thinking about a more efficient way to store the documents.

On the 4 of August I met in Sistemi Ufficio Mr Pasquinelli who is the CEO of Opensign. With this meeting where there were also Michele Cattaneo and Roberto Cattaneo , CEO of Sistemi Ufficio, Riccardo Salafia ,CEO of NGI and Michele Enzo sales manager of Vodafone, we identified different solution to solve the problem

We agreed for another training course with Ing. Claudio Cattaneo on September.

On 8 of September I met Claudio Cattaneo .We analyze the problem and we found 2 solution.

For the historical storing of the old documents we decided to utilized barcode labels on the documents.

The operator will use a software that extract information from a customer list given by Vodafone where we can see all the active customers.

Then I print a barcode label and he attach it on the document. In the same time the software create a property file with all the information given by the operator: Name of the company, PIVA, type of document and year.

The operator will scan the document .Using and OCR software the barcode is read and the PDF file renamed with the barcode and associated with the property file of the document.

At the end of the scanning a web service implemented by Opensign will analyze the files and insert them in Koros.

For what concerns the new documents we try to connect with the Vodafone management software to catch the data and associate them with the scanned

document .This solution is complex and increase the operator work load so we decided to utilize barcode for all the documents in the Vodafone agency.

4.2.7.1   Technical analysis and implementation

As for the IT documents I created a Vodafone document class for the insert of this kind of document in Koros.

The information registered with the Vodafone documents are less than it documents.

We only had to register the company name, PIVA, customer code (which is a code given directly from Vodafone) , year of the document , type of document (activation..) and current state of the customer (active , inactive) basing on the monthly customer list given by Vodafone who manage our customers.

The Vodafone class is represented in the following picture.

Fig 4.25. Vodafone Class attributes

The attribute 'Famiglia' identify the document class(In this case Vodafone document).

'Identificativo del folder' represents the folder of the customer which the document refers.

After PIVA there are the attributes related to the storage in Koros. These are attributes defined by Opensign which are automatically filled during the insertion of documents.

The attribute 'reparto azienda' identify the level of authorization for the visualization of the document.

As i explain in precedence the following passage was to create a software that will print the barcode labels. The objective of the software was also to check and upload data about the documents insert in Koros every time we had a new customer list.

For this reason we created a second database where store data received from the customer list. Every time we will have a new list we will upload it . If for example a customer insert in the database have changed his company name then the software will upload the data. If we will not found a customer in the new list that is already inserted in the database that means that this customer is from now inactive and the state will change. The uploading will be traced with an attribute date that is identified by the data of the customer list .
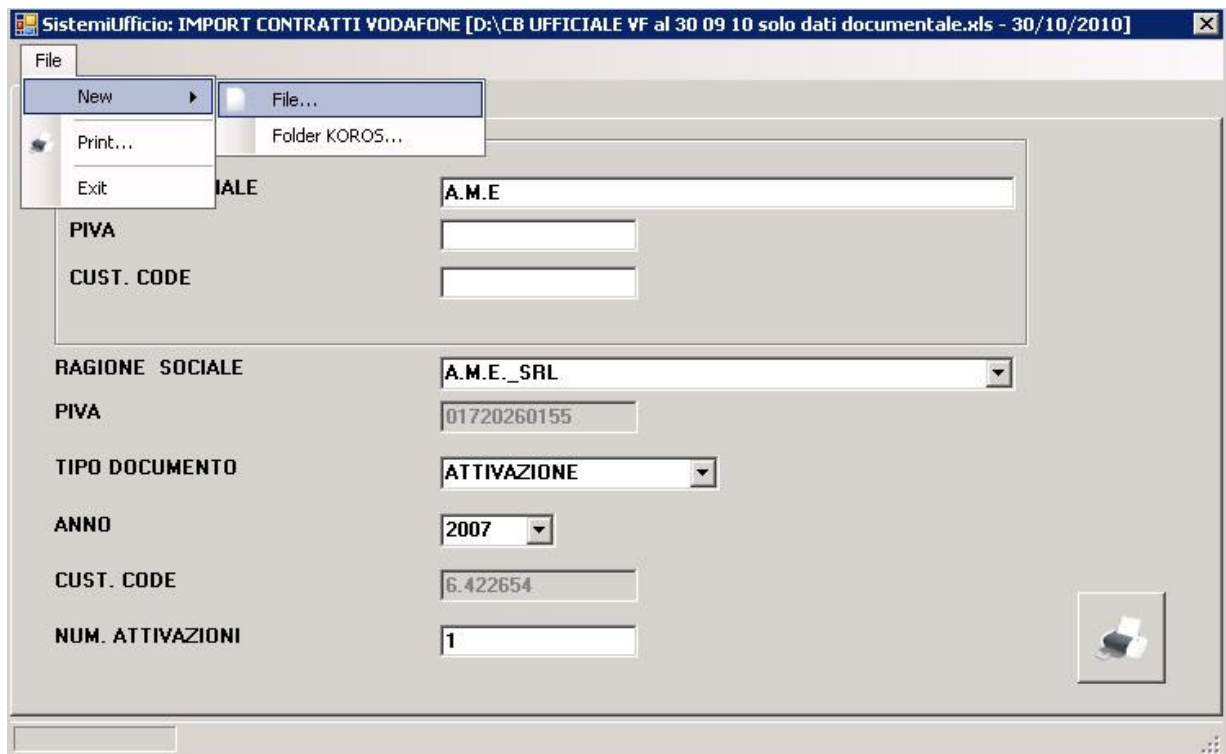
Fig. 4.26 Choice of the customer list file

When the customer file has been chosen and the database is uploaded , the operator is ready to print a barcode label. As we can see in the following picture, the operator has first to verify if the customer is already present in the database. He can utilize 3 different filters :

Company name , PIVA and customer code. This essentially for two reasons:

The first is to avoid double insertion of customers in the database even if there are controls that don't permit to the operator to insert a PIVA already present.

The second reason is related to the documents, often they indicate only company name or PIVA so could be impossible to associate them with a customer without different filters to identify the customer.

At the end of the selection of the customer some data are automatically filled and the operator has only to select the type of document and the number of labels to print.
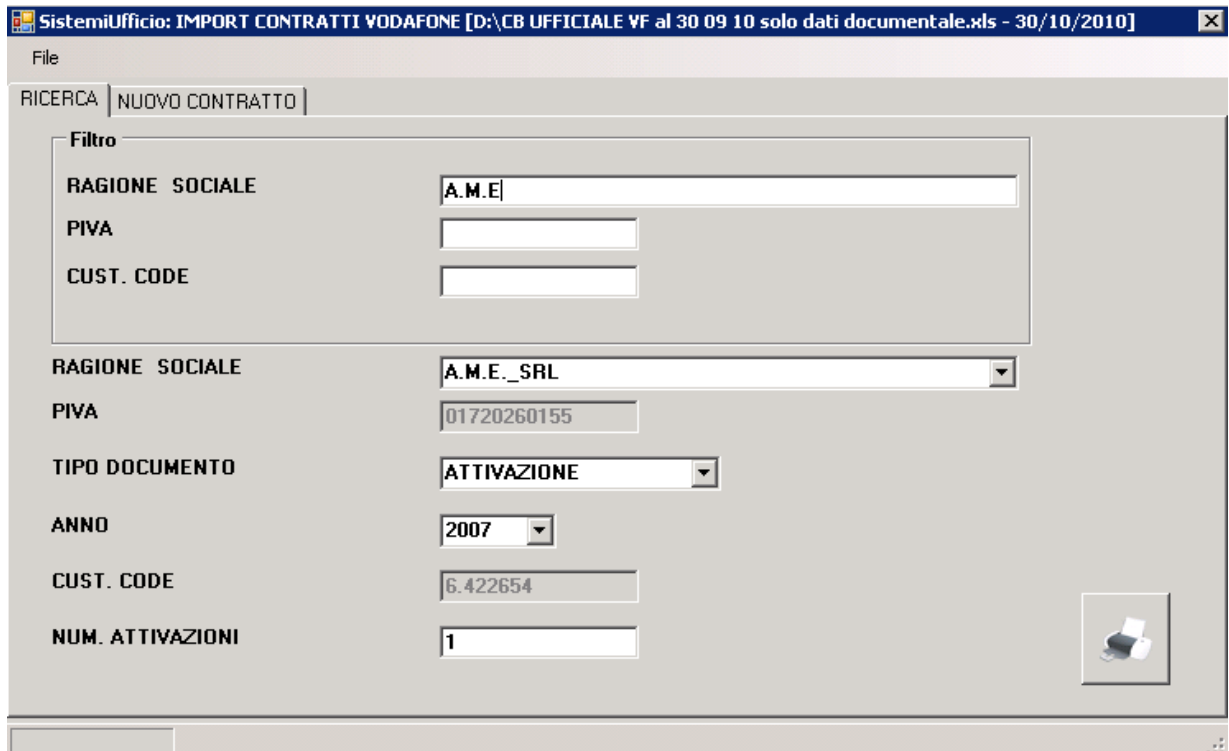
Fig. 4.27 Insertion of new customer document

When the operator print the label the software create a properties file with indication about the document. The information have to be passed using the same name of the attribute of the Vodafone class in Koros.

DESCRIZIONE=ATTIVAZIONE   *Example of Properties file for label*
VVV0000000086

ANNO=2007

C_TESTO_03=6.717241

RAG_SOCIALE=2R DI RUZZA

P_IVA_CF=0211326000202

DATA_DOCU=30/10/2010

C_TESTO_02=NON ATTIVO

C_TESTO_01=VVV0000000086

CODICE_DA_GESTIONALE=BRC-VVV0000000086

Now we are ready to scan the document. We have done different test to find the best resolution making a trade off between quality and dimension of the file. At the end we find that the best resolution was 300 dpi , TIFF image , black and white.

The operator attach the barcode label on the document and scan it obtaining a TIFF file.

Fig.4.28 example of TIFF obtained from a document with barcode label

The scanner identify different documents basing on the presence of the barcode label.

The work of the operator ends here.

The web service implemented by Opensign analyze every TIFF image generated from the scanner with his barcode label and create PDF documents .

Each document is identified by the presence of the barcode label. When the service find another barcode label knows that this is a new document and repeat this passages till it find the END bar code label ,which is a label named VVV99999999.

Then the service associate the documents with the corresponding properties file and upload them together in Koros.

4.2.7.2   Operation

The work on the Vodafone project started in September with two operators working to prepare the documents for the scanning.

In the phase of preparation the operators eliminated copies and documents without legal value like offers or competitors documents.

In October looking to the number documents we decided to hire 5 new operators substituting the original 2.I made different interviews ,we were looking for autonomous people with high competences in the computer use.

We designed a new office for the operators and on 15 of November the team finished to prepare the documents. On 16 of November I presented the Koros solution to the operators.

Since them they are working to create the barcode labels, attach them on the documents, scan the document and check on Koros the correctness of the insertion.

The operative flow of this activity can be resume as follow. In red are presented the activities done by the software that we have implemented.

This software allow to create a barcode label basing on the customer data contained in a database (monthly uploaded) .This database contain the main data about all the active customers of the Vodafone agency.

Second, this software create a properties file named with the barcode number of the printed label.This allow to make a relation between data and the physical document which has the barcode label attached.

When the document and the properties file are in the same folder, a web service created by Opensign , using an OCR service analyze the document, find the barcode number and insert in Koros a record with the data of the documents (from the properties file) and the physical document.

At the end the operator has only to check randomly the right insertion of the documents.

In the process it can be seen the operators activities in blue and the parallel software activities in red.
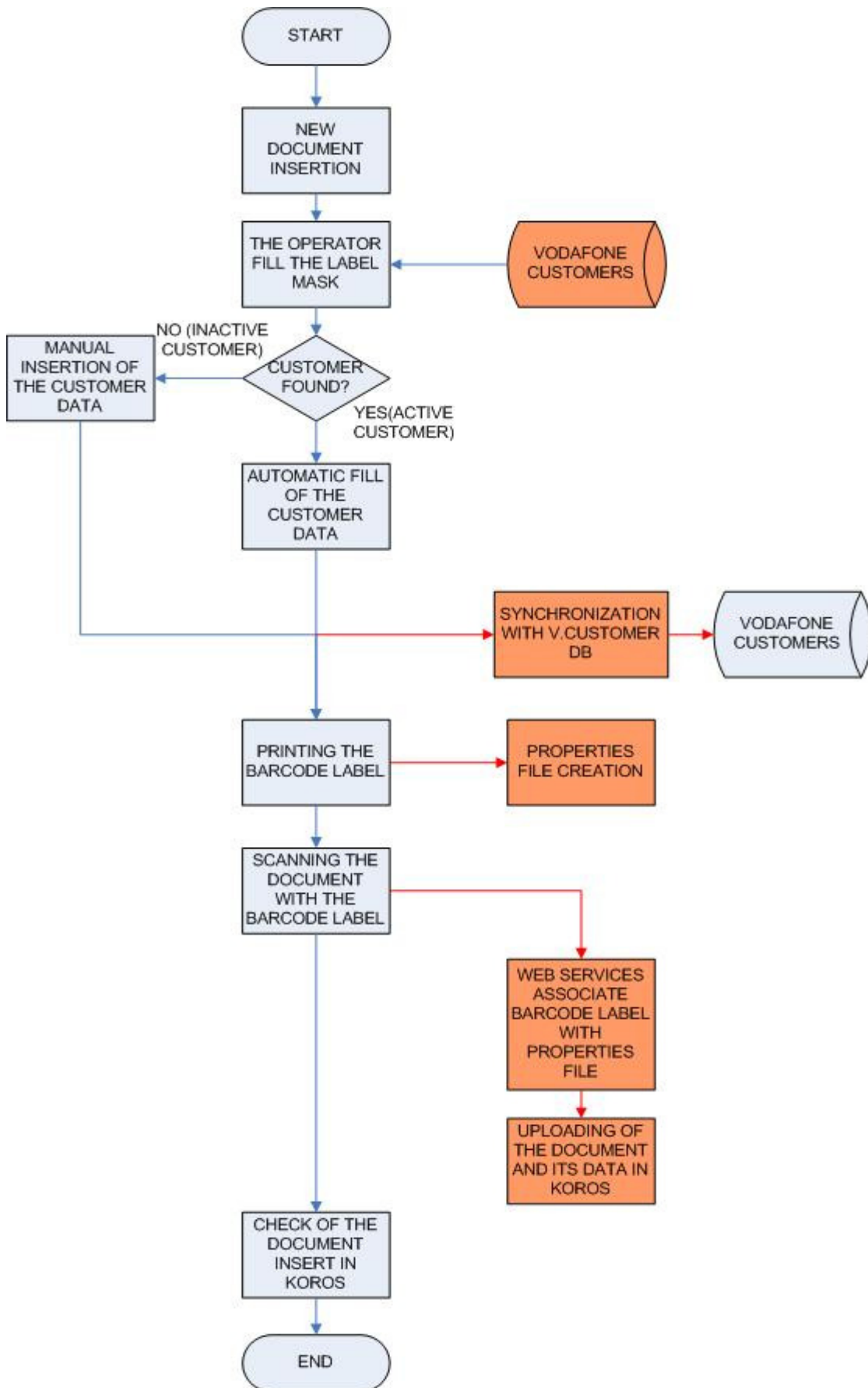
Fig. 4.29 Process of insertion of Vodafone documents in Koros.

At the end of the insertion of the document the operator can log into Koros to check the document and the data.

Fig. 4.30 View of the document in Koros.

OCR

Optical character recognition, usually abbreviated to OCR, is the mechanical or electronic translation of scanned images of handwritten, typewritten or printed text into machine-encoded text. It is widely used to convert books and documents into electronic files, to computerize a record-keeping system in an office, or to publish the text on a website. OCR makes it possible to edit the text, search for a word or phrase, store it more compactly, display or print a copy free of scanning artifacts, and apply techniques such as machine translation, text-to-speech and text mining to it. OCR is a field of research in pattern recognition, artificial intelligence and computer vision.

OCR systems require calibration to read a specific font; early versions needed to be programmed with images of each character, and worked on one font at a time. "Intelligent" systems with a high degree of recognition accuracy for most fonts are now common. Some systems are capable of reproducing formatted output that closely approximates the original scanned page including images, columns and other non-textual components.

4.2.8 Order approval process management

The objective of the solution is also manage the processes of the company.

Koros give the possibility to define a process , using a visual interface , where the users of the software can receive notification, information and can verify the current state of the activities.

For example imagine the order approval.

In Sistemi Ufficio when there is the necessity to order a product for the resolution of a customer problem, the technician alert the logistic office. The logistic office makes a request to the supplier that has to be approved by the supervisor of the technical area.

This exchange of information happens by emails and the confirmation order is a physical document that move from a desk to another.

Imagine this process implemented in a software solution.

The Technician who has an user login in Koros send a request to the logistic office.

The logistic office prepares the order and sends it to the supervisor of the it area. The supervisor digitally sign the order and send back to the logistic office.

The logistic office makes the request to the supplier by email using the digitally signed order.

This allow to maintain traceability of the activities done.

Every people involved in the activity have the vision of the whole process but can operate only on the activities assigned to him.

We can implement every kind of process in Koros.

The process have to be defined using Ksetup with specification of:

-operators involved

-activities of the process

-decision points

The user of Koros views the progress of the process and the actual activity that he have to do to proceed. Every activity is subordinated with the precedent one. We have just started to analyze the customer order process .

This process involved all the function of the company: logistic, sales division, administration and technical area/customer care.

As explained in the precedent paragraphs the customer care is the office that organize the activity of the technical area and manages the assistance to the customer.

In the diagram below is described the whole process. It starts with the customer request by email or by phone.

In the case represented the request of the customer is concerning goods.

If the request concerns only services it is managed only by the customer care and doesn't need commercial approval because all the customer of Sistemi Ufficio have a annual assistance contract defined in agreement with the sales division.

The customer care operator starts the process in Koros.

The request is registered in Koros by the customer care office. The logistic office receive a notification about the order and have to register the customer order in Koros. The logistic office upload information about prices and supplier.It submit the finished offer to the technical area supervisor that have to confirm the rightness of the order in terms of technical specification. If the solution is approved form the technical area pass to the commercial that decides the final price.
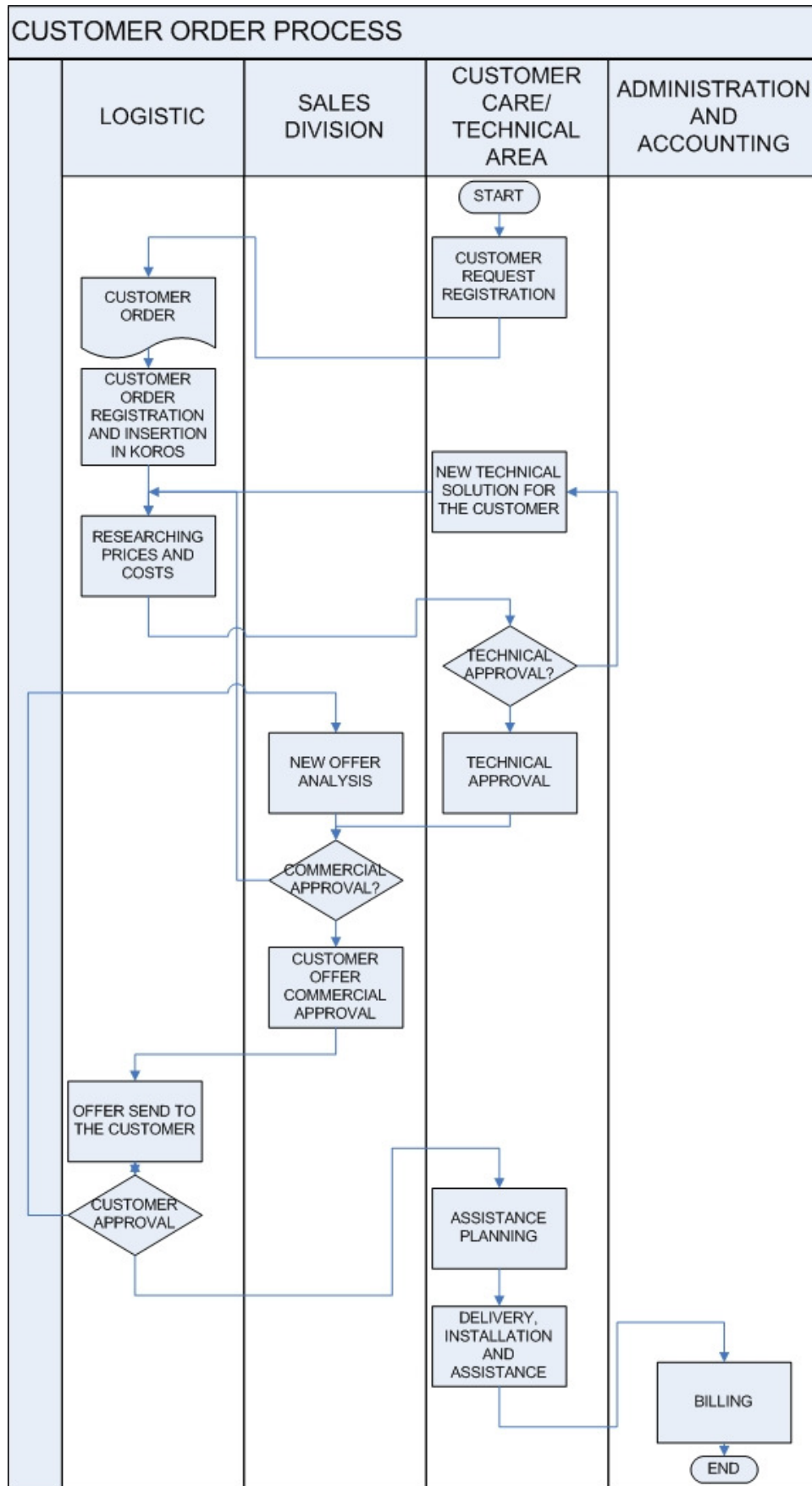
Fig. 4.31 Customer order process

If the sales division doesn't approve the offer ,different products are researched and the offer is remade.

The final offer is sent to the customer using a certificated mail including the digital signs of the supervisors. If the customer confirm the order the request is then managed by the customer care that plan the activities of the technicians.

When the activities are finished the administration and accounting office manages the billing.

Using Koros the whole process is traceable , everyone can see who give the confirmations , who manages the activities and on which dates.

Koros helps the operator to complete the activities assigned to him.

No more post on the desk with activities to be done but a real personal work organizer.

4.3 Future steps

The objective of Sistemi Ufficio is to sell the solution ,implemented inside the company, to its customers.

Now it has the technical and the organizational competences to implement a document storage software in customer companies.

The medium customer of Sistemi Ufficio is a Small/Medium Enterprise.

Sistemi Ufficio supplies the customer with every kind of solution in terms of Information Technology.

Adding this offer it continues and amplifies its mission to the customer: to make grow its business.

Substitute storage is the solution for the elimination of paper and the digitalization of the information.

A digital information is fast to find , easy manageable and secure.

The management of digital information can start a process management reengineering in the customer company.

Fig. 4.32 Partnership

In the future Sistemi Ufficio wants to implement also the business process management tool on the customer but first this solution has to be tested and researched inside the company.

Chapter 5

Presentation of the solution and analysis of the first results

5.1 Document management by the customer care

The result of the project related to IT documents is a digital archive .

This archive is accessible from everywhere thanks to the web based technology .

Everyone inside or outside the company can access the archive using its user id.

The security of the data is guaranteed by the Openbox which is connected to the company server and protected by the firewall of the company.

The only way to access the encrypted archive is Koros.

Fig. 5.1 Koros Login

Koros is accessible at the web address : documentale.sistemiufficio.it:8081/KCOMM

Now every contract with the customer is digitally inserted in Koros and it is manageable in an easier way than the one of the physical document.

The operator can search documents using different filters:company name , PIVA , type of contract , stipulation date ,expiration date and so on. The same information inserted in the ERP of the company are now inserted in Koros with the digital document.

This solution reduce time for searching documents, avoid waste of paper and is changing the way of work of the company. In the future we want to eliminate completely the paper storing every kind of document in Koros:DDT , bills and even assistance reports.After the login the homepage of Koros is the following in the picture.

Depending on the authorization the user can do different activities with Koros:

-    Insert a new document

- Search customer folders
- Search document using fast research with filters
- Manage an 'Iter'

An' Iter' is a process defined in Koros.

We have created the users and their authorizations basing on the activities done by the operators.

A customer care operator has full access because he have to insert document, searching them and manage activities while an agent or an operator of the sales division at the moment has only to search document and manage Iter but cannot insert new documents.

Fig. 5.2 Koros menu'

For every document inserted in Koros the user of the software can see the information contained in the document in a report.

Selecting the document is possible to view a PDF scanning of the original document : it is possible to download the document, send it by email or attach new file related to the document.
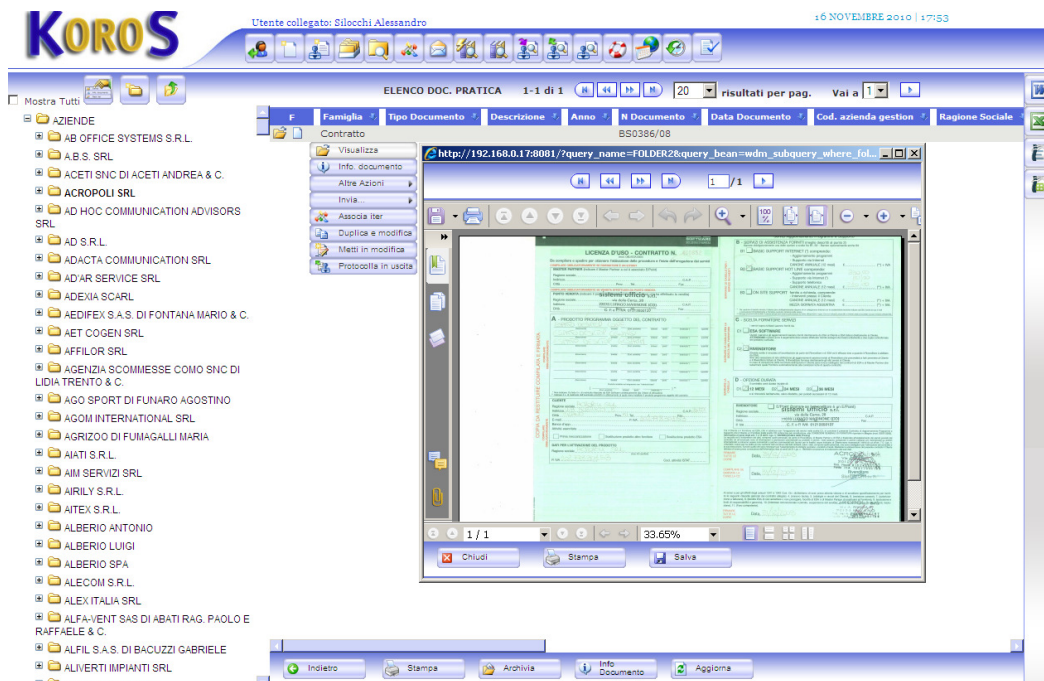
Fig. 5.3 Looking in the folder of the customer Acropoli srl we can see the scanning of the original basic support contract : BS0386/08
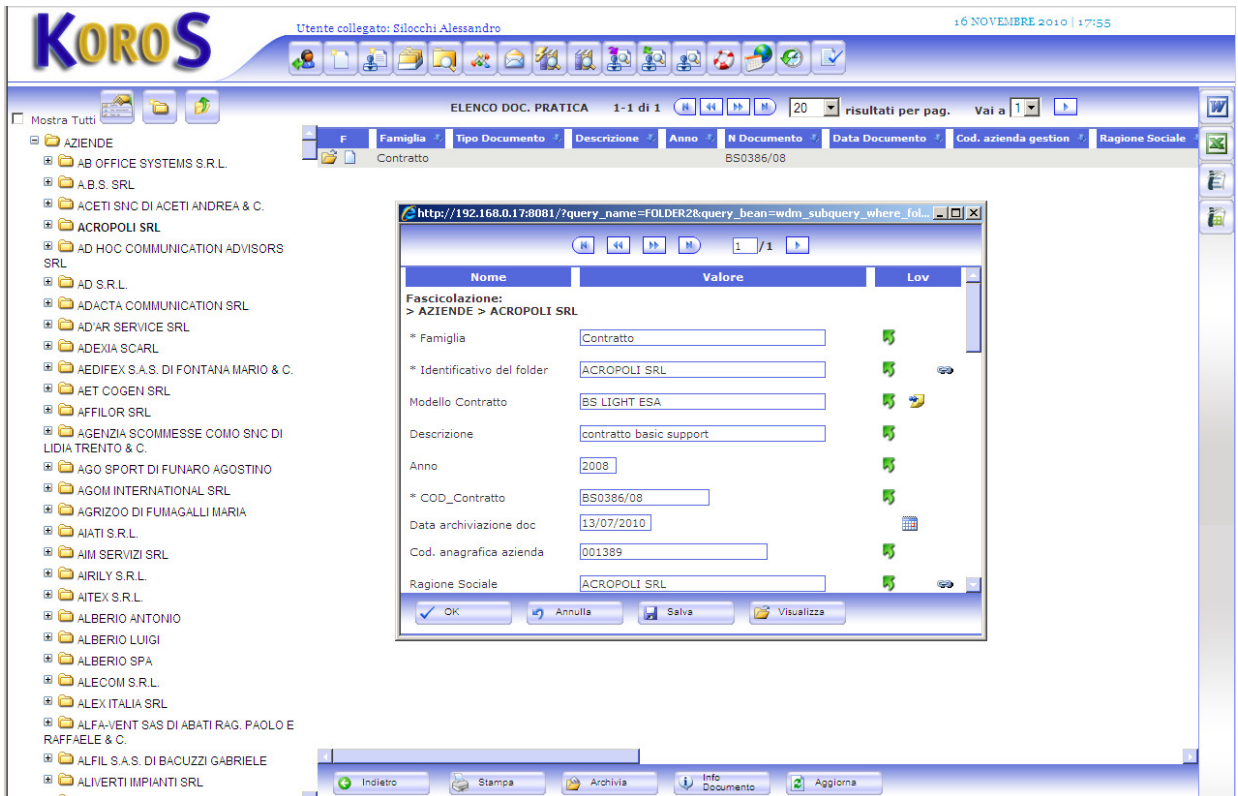
Fig. 5.4 The information related to the contract BS0386/08

In the picture we can see the data related to the contract BS0386/08.As explained before the data are uploaded directly from the database of the ERP of the company.

Insertion of new documents

The insertion of the IT documents is very simple.

The user has to create or select the customer folder.

The synchronization with the ERP database allow the operator to insert only the contract code which is the primary key of the contract in the ERP.

Second he has to select the document to upload and confirm the insertion.

The document will be uploaded in Koros with all the relative information contained in the ERP. These information can be used to search documents. For example searching only the basic support contracts of all the customers of Sistemi Ufficio.
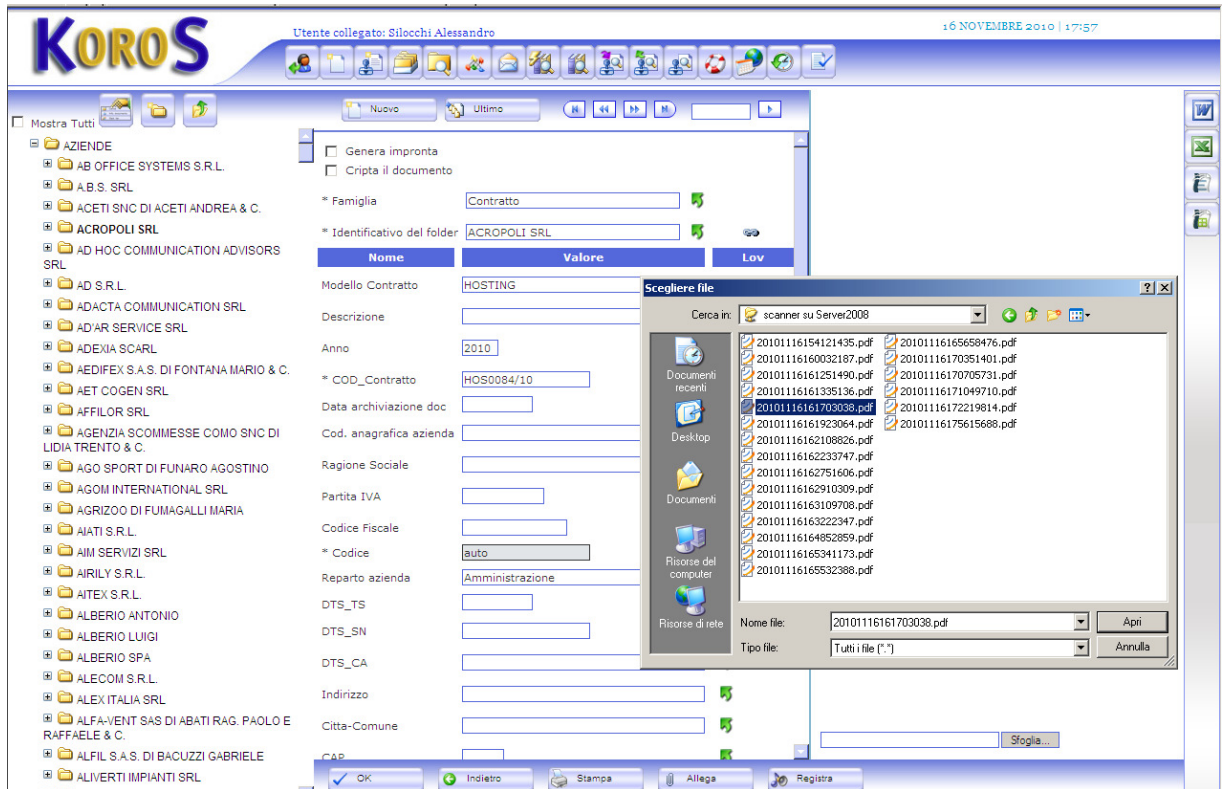
Fig. 5.5 the user have to select the document to upload after the insertion of the data.

5.2 Document management by the Vodafone Agency

The implementation of the barcode labels to store the Vodafone agency documents has been done to face the high number of the practices to archive.

In the daily use of Koros the operator of the Vodafone agency can insert new documents in the same way of IT documents.

The operator has only to change the document class and fill the information related to the document that he is uploading.

To speed up the activity is also possible to continue use the barcode label system.

The operator has to create a barcode label and to scan the document.

The web services catch the documents scanned and the properties files and insert the practice in Koros. This second way allow the user to upload the document together for example at the end of the day.

Fig. 5.6 Vodafone document view.

5.3 Costs of the project

The project is already in progress but we can estimate the costs of the project.

Considering :

The employ of a programmer for about 80 hours for the implementation of links with the internal ERP and barcode software management.

The employ of a project manager for 6 months.

The purchasing of the software (Koros) and the hardware (Openbox, label printers , labels , scanner , personal computers).

The employ of 5 collaborators for the digitalization of the physical archive (which is in progress).

The training on the software and the technical assistance on the solution by Opensign.

The total cost of the project is around 12000 €.

Considering that now we have the competences to sell this kind of solution to other customers to solve a very common problem we can quickly amortized this cost.

5.4 Conclusions

The use of a document substitute storage software guarantee the security of the documents. It allow to destroy the physical archive because the documents have legal value. This is possible thanks to the technology of Koros and of the Openbox.

The digital document is recorded, digitally signed, timestamp and fully authenticated by SOGEI security infrastructure.

The protocol data and the footprint (hash) of the document are transmitted to the infrastructure assurance (CA) Certification Authority for authentication, time stamping and storage .

The Certification Authority stores the data protocol and the footprint of the document and is the guarantor (in the face of "security" local archiving) of the authenticity of the digital file. Leave the details to the competent administrative organizations.

Information technology is essential to make a change inside any company and to improve organization efficiency.

Every significant change in the management of Sistemi Ufficio has been related to a new software implementation : the result in Sistemi Ufficio demonstrate how the company continue to propose high quality management solution to his customers.

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