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The Implementation of a Data Warehouse in a Firm: A Concrete Analysis

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Abstract

Data Warehouse is a technological tool that allows a better information management of data, trying to solve classical problems that traditional information systems face such as costs, data redundancy, information dispersion, lack of global corporate vision and lack of validity. An adequate implementation of this kind of information technology can make appear improvements in organisational performance, materialised in a cost decrease, a better behaviour of the firm and enforce processes of change in the Organisation.

In this study we have tried to stress, through a concrete case study, the importance of properly implementing a Data Warehouse by taking into account an analysis of needs, diagnosing processes, detailing costs and benefits and risks. It is important to consider that the implementation of a technology like this one implies a group of economical, social and human efforts.

Key words: Data Warehouse, Organisation, Implementation, Information System

1. Introduction

Nowadays the markets, increasingly maturing and demanding, require more than ever quality of service and responses individualised to prompt clients' needs. Furthermore, the reduction of the costs in the storage and information processing has permitted the appearance of potent databases that accomplish information treatments with smaller response times.

The technological advances correct the continuous disagreement that until now has existed between the technology and the business rules. Today, certain technological advances allow to obtain maximum yields in the use of technologies hardware, Managerial Information Systems, Executive Information Systems (EIS), Decision Support Systems (DSS), analytical processing on-line (OLAP), Multidimensional Analysis (MDA), Data Mart (DMK) and Data Warehouse (DW).

Currently, it is still valid the classification that Steven Alter made in 1980 on the necessary systems for the total mechanisation of the needs of companies information provision: systems for the managers (DSS, EIS) versus Systems of Operational Information (EDP).

The introduction of the PC meant the existence of two separate "computer areas". According to that, the application is developed by programming specialists or by user areas, according to the following criteria:

Table 1. Electronic Data processing versus Managerial Decision Systems

	EDP	DSS
Objective	Operative processes mechanisation	Help to the decision making
Utilisation	Passive	Active
Users	Administrative	Managers, analysts, executives
Orientatio n	Effectiveness	Efficiency
Emphasis	Soundness, safety, response	Flexibility, utilisation ad - hoc

Source: Morueco y Álvarez, 1997

Table 2. Specialists of Information Technology versus Users areas

CRITERIA	SPECIALISTS OF IT	USERS AREAS
Expected use	To regulate, systematically in the long run	Applications “kleenex”, use temporary and specific
The information	Shared by the organisation	It is departmental or local
Complexity of the problem to be processed	High (specialised tools)	Low (generic tools of final user)
Presentations level	High: volume, response time	Low or moderate
Urgency	Low	High

Source: own elaborated

Nevertheless, the current processing systems of data present a set of “gaps” that block the users work. It is worthwhile emphasising between them:

- Limited availability to operate with the data.
 - Inconsistency in the information by lack of integration.
 - Lack of flexibility.
 - They have to be guided to the daily operations.
- On the other hand, the traditional information centres present a set of lacks:
They are costly.
- In certain cases they present data redundancy.
 - A high dispersion of the information is produced.
 - There is not a global vision of the corporate information.
 - Lack of reliability.

Before this perspective the concept of Data Warehouse appears as a tool that allows to soften the previously mentioned “lags” in the Organisations

2. Objectives

In this paper we try to analyse the development and implementation process of the Data Warehouse tools in the processes carried out in a concrete real case: an insurance company.

3. Data Warehouse: Concept and Elements

William Inmon, specialised engineer on the basis of data, coined for the first time the term of Data Warehouse to make reference to a thematic information store guided to cover the needs of Decisions Support Systems (DSS) and of Executive Information Systems (EIS), that

permits to access to the corporate information for managing, controlling and supporting the decision making.

Data Warehouse is an information tool based on a heap of information, so much detailed as summarised, that is originated from found data on the basis of operative and other external sources (external data from the own company or ancient data contents in other type of support, etc.). It is a complete solution constituted by a mixture of hardware, software, knowledge of the business, and capacities of systems integration.

In general terms, we can assert that the implementation of the Data Warehouse in the organisational Information Systems produces a series of benefits:

1. Cost reduction. To work with an only data base simplifies the tasks permitting the users to define their own ad hoc queries, unloading in many cases of their programming to the personal of the systems department, that can be reduced. This means a series of tangible and intangible benefits such as: a high reduction of the time invested to obtain an information (if this can represent a competitive advantage) or to react on time before a change in the behaviour of some critical variable; homogenisation of different indexes used in the organisation to know the yield in the key areas of the company; to improve the satisfaction of the executives in the performance of their functions, etc.

2. To improve the behavioural model of the company. The fact of having easy and flexible access to information of all the areas of the company, allows the directors to obtain a nearest information to reality.

3. Encouraging the change processes offering to the managers an analysis less limited of their information permits, frequently, to obtain an in-depth knowledge from the processes from the company. This knowledge facilitates the detection of dysfunctions in the current processes and makes possible to apply the necessary measures for its change or elimination.

The objectives often searched are:

- To convert operative data into related and structured information arriving to generate the “knowledge” necessary for the decision making.
- To centralise and homogenise management information, avoiding different answers to the same question.
- To permit a global vision of the information based on the business concepts the users try.
- To reduce costs avoiding manual extractions, permitting to devote resources to other tasks.
- To improve the quality of management as of relevant information and with a homogeneous meaning.
- To establish an only base of the information model of the companies and organisations.

The data bases belonging to a Data Warehouse are characterised by a set of aspects:

- Thematic: the data are stored by matters or topics.
- Integrated: all the integrated data, as compared to operative data bases, created without taking into account their integration, the same type of data can be expressed of different way in two bases of different operative data.
- Non-volatile: there is no data updating on previous, are gone accumulating data of different periods of time.
- Historical: the stored data keep longer than in an operative data base.

The main differences between the operative data bases and the data base of the Data Warehouse are synthesised in the following table.

Table 3. Operative data bases versus Data Warehouse data bases.

ASPECT	OPERATIVE DATA BASE	DATA WAREHOUSE DATA BASE
Objective	Operations of the day to day	Decision making
Granulate	Detailed data	Purified and summarised data
Orientation	For application or transactions	Thematic, wide categories
Integration level	Variable, not critical for OLTP	Data rationalisation
Temporarily	30-40 days (1 maximum year)	1-5 years on-line (as norm)
Data validity	Valid for "now"	Historical perspective
Users	Administrative / transactions	Managing / analysis
Volatility	Updating	Only accessible once laden
Processing	Repetitious and known	Prompt and not known
Managing	A record every time / few data	Massive data managing
Availability	High	Middle
Normalisation	Fourth normal form	Redundancy
Technology	Transactional	Access and management

Source: adapted from Kinball, 1996

4. Presentation of the Company

An insurance company is, as every enterprise, an economic unit organised to combine a set of productive factors in order to elaborate goods or services intended for its sale or distribution in the market. It can be defined as a set of patrimonial goods and of in fact and organisational relationships necessary to accomplish the economic activity, being cost of powerful management instruments and computer in order to subscribe risks, issue policies, manage assets and debts, record patrimonial management and detect potential clients.

As usually cited, as essential characteristics or features that define insurance companies, are their exclusive performance and the singularity of management. Exclusive performance in the insurer activity, reinsure and investments that compels to them to fulfil certain requirements: submission to an organisation of official control, economic requirements (capital minimal, solvency margin, guarantee fund, etc.) and operations in bulk. Singularity of the insurer management that is concretised in which the insurance is: a services activity and not productive in strict sense, a service with a labelled financial and economic component, international by definition, being the internationalisation the growth route of the large world companies. The payment of the premium (price of the risk), as different from the rest others prices, it is anticipated and provoked an inversion of the productive process: first they earn money for the potential services that may be accomplished in future being the transformation of risks, its reason of existence.

It constitutes a technical and insurer unit that produces safety service upon assuming risks to the persons and to the companies. It obtains benefit or loss according to the accomplished risks acceptance and its financial capacity to pay the claims with collected premiums. The difference between income (premium) and the cost of claims and the others management expenses, if it is positive, means that the company has technical insurer benefit, and if it is negative, it means loss.

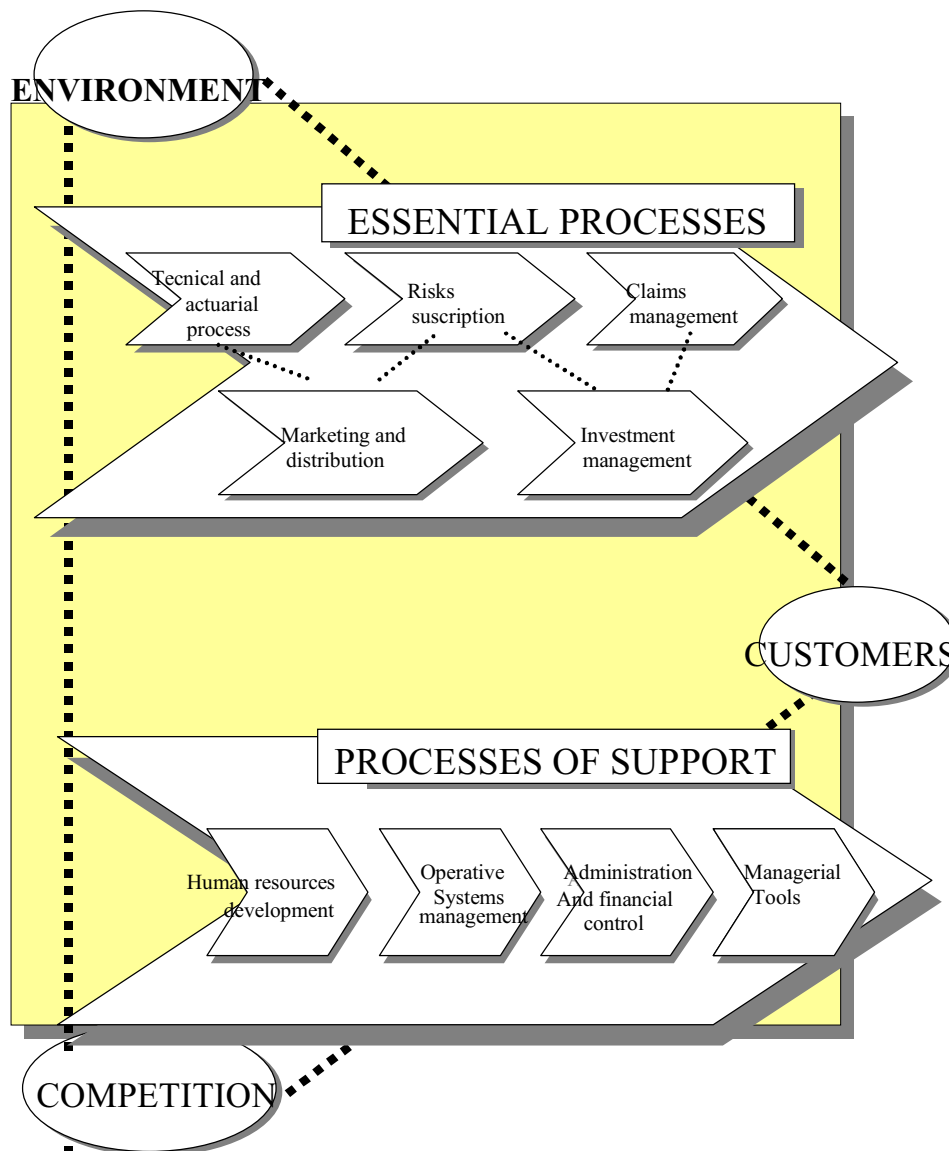
Premiums perceived by underwritten policies must cover the risks origin claim payments and other expenses. The values that these can take are limited to the capital or sum assured in each insurance policy, since it is the maximum responsibility for the company in case of a claim.

The entrepreneur can accomplish different risk coverage in his portfolio. In a given period, the costs of the risk coverages are classified into fixed and variable. Establishing classes of homogeneous risk, subscribed in a high number, permit the compensation of claims without meaningful deviations. Also those other risks whose homogeneity has been obtained through reinsurance because have a stressed degree of statistics stability and are referred, normally, to bulk risks.

The processes that are developed in insurance companies are:

- **Technical and actuarial process** (design and development of products, tariffs calculation, statistic analysis, calculation and control of technical provisions). Technical design of the product is established in the general conditions of the policy (clauses). Once the product is elaborated, the premium must be established (evaluation or calculation of the commercial premium paid in advance to the period of coverage as the mathematical average of future claims: occurrence probability of a claim multiplied by the average cost plus others expenses). Provisions or obligatory economic reserves by law or not are constituted to confront future obligations, to compensate deviations, increase the financial guarantees of the company and so on.
- **Risks subscription** (collection of requests, inspection and risks selection, proposition of insurance and emission of policies; coinsurance and reinsurance).
- **Claims management** (claims withdrawal, personal and material damages, sinister procedure, evaluation and accidents inspection, control of claims and degradations, reparation of services and / or patrimonial damages salvage, medical attention services, legal services, technical of risks and services prevention of telephonic attention / Internet, professional assistance and assistance in trip and accidents liquidation). Claims (debts) as concrete demonstration of the assured risk that produces damages guarantee in the policy until a given quantity. Calculation or appraisal (determination of the necessary quantities so that the assured or beneficiary receive the corresponding compensation).
- **Marketing and distribution** (analysis of the markets, own agent nets, corridors, direct contracting offices and customer services, services of phone sale, internet, financial institutions distribution, marketing, advertising, training and training in commercial nets).
- **Investments management** (analysis of the technical characteristics, financial and real-estate investments).
- **Human resources development** (services of personnel management: administration and lists, professional services to facilitate the personal development: selection, evaluation, training and legal occupational area).
- **Operative systems management** (procedures design and other organisational forms, configuration of new solutions in data processing, maintenance of the information systems, design and maintenance of the communication systems). Very important in the current flowchart of the company due to technologies development and the need of a growing number of data in order to improve processes and to exploit the indispensable information in the decision making.

- **Administration and financial control** (accounting, treasury and other financial activities except investments).
- **Managerial tools** (entrepreneurial planning, control of management legal advising, internal and external audit, other processes).



Source: MARTÍNEZ MARTÍNEZ M.A., 1998.

Figure 1. Processes in insurance companies.

The insurer firm studied has been working in the sector about 80 years. It is devoted fundamentally to Insurance of Death¹ and Complementary (they represent more than 60% of its business) and also other No Life Insurances such as Multirisks and General Insurances,

¹ This modality only exists in Spain covers the expenses derived from funeral and burial and has experimented an annual increase of more than 6% from 1985.

this last with a very scarce development. Also, this company covers Live Insurances and Retirement.

It is important to point out the solid expansion of this company reflected firstly in the annual evolution of premium incomes not only in life insurance but also in not life modalities increasing gradually and surpassing in 1997 the average of the sector. Besides, it has experimented an expansion in the growth of the solvency ratios that improve year after year. This company extends its nets all over the national territory mainly in Andalucia, Madrid and Catalonia.

5. Development and Implementation Process of the Data Warehouse in the Company

Once we have analysed the characteristics of the DW and its data bases, we focus deeply on the insurance company.

It is necessary to prevent the anarchic chaos of the development of internal information systems in order to anticipate some type of control by means of an adequately developed strategy of information systems. This strategy will help to identify the business activities appropriated for the development of information systems and will configure, in wide terms, a plan for the projects development.

The strategy will define the size of the investment to accomplish and the profitability to obtain in the adequate time. It will incorporate new technology developments and the possible needs where they will be necessary. There will be to decide also between accomplishing a centralised or decentralised development of projects seeking local specifications.

Generally, the large organisations will have more than an implementation and development project of information systems at the same time. These projects need an adequate co-ordination and organisation in an internal way. Furthermore, taking into account that the accomplishment of a project can last a number of years and, however, it can be used in a limited time, it is necessary to begin to plan and design its replacement before remaining obsolete or it does not help for the new needs that appear. All these things indicate that a need of controlling and co-ordinating projects as well as of developing a strategy of information systems exists.

5.1. Management Information Systems Promoters

The responsibility of elaborating and proposing a whole strategy for planning and control in the development of a Data Warehouse is normally in the area of management information systems, in collaboration with future owners in the information systems.

Firm Organisation had since first times quite clear that the objective of this group was not only just to take technical decisions. In fact, many of their members didn't have too much technical knowledge. The final user was required to be using the tool above all, once it had been implemented. In this company, this are very valuable words: "User must be the one to make profits with the tool". In this sense, we can affirm that the user is the key element to take into account in the implementation of the tool. Due to this perception in the need of counting on with the user, in this company the Data Warehouse has started to be implemented in the technical area, mainly because user profile is quite suitable for learning to use it.

Main objectives in the management information systems area, have been:

- 1.- To recommend a whole policy for the development of information and data process. Some elements that include some operative aspects must be taken into account. For example, the standardisation of equipment in the company, to decide if implementing centralised or non centralised systems, the method to develop the use of information systems in an organisation, the Acts in relationship with data protection and the management of available resources for projects in information systems.
- 2.- Since the information system must help to organisational needs, the presence of some representatives from the business areas can help to make sure individual and group needs are satisfied. This can assure that user recommendations can be properly articulated.
- 3.- To start, co-ordinate and manage individual projects, that include budget specification, reach and main project objectives; the establishment of a work group; general deadlines to follow, as for example to elaborate periodical reports about the situation of the process of implementation or take critical decisions, for example to stop or keep on concretely with the project.
- 4.- To keep the top management informed about the situation, managers should have data about the way the project is being developed and about present and future costs.

5.2. Reasons for starting the project

Implementation projects are planned in the information systems area, but where does it appear the idea of a concrete development?, What has it caused a recognition about the need to develop this tool?. There are various reasons in this organisation, to say:

The system does not match with actual needs: many systems replace older ones. The previous system was based in the collection of information of different databases for various applications. This caused some data inconsistencies and duplicities due to them.

Cost reductions: one of the most frequent reasons to implement a certain information system is the saving in time consuming. Repetitive processes can be developed in a faster way. This is specially stressed in more operative areas. Now we can see personal savings in these areas and it is strange to find one firm, big or small that has not been computerised. In this organisation we have been unable to find this cost reduction during the process of implementation, but there will be a future cost reduction.

To provide better internal information for the decision making: managers have recognised the ability computers have to offer faster and better information. If the managers consider the requirements of an adequate use in information technology, information systems that allow a better decision making can be designed.

To offer competitive services to customers: faster and clearer services, as for example, individualised invoicing, or automatic delivery. This kind of services, allow complete sectors to mobilise.

The opportunities new technologies make possible: communication networks, the improvements in the tools to keep information, the power of processing and the development of computers and cheaper user software, have opened new possibilities at a cheaper cost.

Technological image: some companies feel that their image is not good enough, unless they are using new technologies in their processes. These companies try normally to employ modern technology, even in the most advanced areas.

Changes in Acts: this kind of changes referred to legal problems in relationship with aspects related to information treatment, as for example, data protection, that can be an enabler element or the development of new systems. Other examples include important alterations in tax changes, or financial account presentations, etc.

In this concrete case for the development and implementation of Data Warehouse the technical area has been chosen. By implementing this tool, the company is searching a general improvement in the procedure of sinister treatment, guarantee coverage and fares, data analysis, fraud detection, the improvement of products, redesign in products, changes in the function of fares in the channel distribution, inclusion of new data in agreements (as size, risk situation, etc.) and to get reports in the Executive Information System (EIS).

Through the EIS it is possible to get reports for the top managers, for business leaders and for a specific analysis of more operative areas such as costs control, budgets, technical analysis and so on.

In a typical SWOT analysis we have identified the following elements,

Threat: lack of use in the system, it is not easy to reach other business area, the fact that users do not use it: “if it is not possible to finish, it will be quite restricted”, Long deadlines have the risk of loss of interest, energy, small and short project selection, and so on.

Weakness: Strong investments to develop, great cost that don't match with good results, at least in the short run.

Strength: a differential factor in the competence in the insurance sector is very important: “although they copy you, it is very interesting to be the first one”.

Opportunity: to be the first ones in Spain in doing it, “better adaptation to market exigencies”

5.3 Main participants in the analysis and design of information systems

Many projects in information systems have been initialised because someone has recognised that there are shortages in the performance of organisational processes. In any case, users in the actual system can give relevant information for its improvement or replacement.. They must also make the requirements of the new system appeared.

In this firm, concretely, the initiative came from the computer systems area, after an analysis in the problems in the provision of information in the organisation, some importance has been given to the implementation of Data Warehouse in the mentioned area.

Programmers have been responsible in the conversion of program requirements. A programmer is a technical person in computers that must be able to understand user needs. In

many cases, the language used by users and programmers is so different that some misunderstandings can appear in the communication. Mainly due to that, in this company since first times, users have been implicated in the system elaboration and, in order to guarantee a biggest initial implication, an area in which a special consciousness exists in the use of information technologies is the technical area.

Any case, system analysts in the company have been the ones chosen to improve the problem. These persons are capable in understanding and communicating with users to establish proper requirements. Analysts will have technical knowledge in computers. They are able to transmit requirements in such terms that programmers may understand. The analyst must be a good communicator and can think about the system since the user's point of view, as it is the case with the programmer.

This process of "translation" is not normally a direct one. A thought in architectures must be practised. The customer (user) has been the one in explaining how a certain software must be developed and which ones are the functions that must be accomplished (implication of user in system requirements). The architect (analyst) has chosen after these intentions and has made appeared a general framework in the architecture that the systems must have (this is the logical model in the system that we try to implement). Once the logical model has been revisited with the customer (user), the architect (analyst) has developed a detail schema for the model (detail specification of the program) since the programmers have been able to work.

The task for the analysts is not only restricted to provide "programmers specifications". The analyst has been also able to accomplish a group of responsibilities:

To search and analyse the old system and to collect new requirements.

To judge the viability of the development of an information system like this in concrete areas.

To design a new system, specifying programs, hardware.

To check and revise the implementation of the new system, generating the proper documentation that enables functions evaluating the performance.

Analysts in the company do have a training based in computers and in business administration capabilities.

The company has stressed as strong points in order to develop the implementation of Data Warehouse, the fact that, apart from having technical qualifications in information systems, the analyst knows about the environment and work practises that are frequent in the area in which the information system is going to be utilised. For this company, knowledge and experience are needed but not enough. The analyst must, above all, be a good communicator in comparison to the rest of the people working in the firm and with technical people too. He must be able to sustain interest conflicts that necessary appear during the project. Main managers, particularly project managers are considered essential assets because they imply the complex interaction of various persons working in tasks that must be properly coordinated to get a better product or service. The design process is not a mechanical one and the analyst must show creativity and the ability of a lateral thinking. Finally, analysts must transmit a controlled trust and enthusiasm. "When things go badly", it should be the analyst the one to be judged to solve problems and soften new actions.

5.4 An structured approach to analysis and design of information systems

In order to develop the system in this organisation, some aspects have been taken into account:

The implemented system is part of a biggest with the one it shares data and processes. Nowadays geographic borders amongst systems are going to be changed to the new system. Although individual systems do work well, all together cannot fit anyway. In this sense, some problems in relationship with information homogenisation have appeared.

The area in which the system has been implemented is part of a biggest one. This way, the redesign of some processes has been required since changes have allowed an opportunity to modify some procedures to some other more efficient ones.

Requirements in the new system also change in time once they have been implemented and data and processes structure can demand some repairs. This has added some more difficulty in the system's design, not only for developing today's processes but to prepare systems to future changes.

Complexity of global changes have required analysts' and programmers' groups to be implied in the project. This has obliged these teams the development of certain capacity of self organisation, self co-ordination and self-management too.

Users and managers need to understand that the new system offers and demands a bigger investment in hardware and software. It is important to develop some communication tools to support this knowledge.

These considerations have allowed analysts to develop a structured approach to analysis and design of information systems.

The studied firm had, as main objective, to develop a data warehouse capable to offer services to business users.

Today information systems in insurance companies are not only requiring better service but also better management.

The starting point in information systems was not the most adequate to provide users this service because software was designed to daily business management. This implied a transactional process, in which a very small data quantity by transaction was utilised, but with many daily transactions and a very quick response time.

The usage of traditional files with an analytical and decisive objective (few transactions but with great data quantities) would impact in yield and response time in daily operations, and consequently in the day to day of firm's activities.

Besides, operative files were not designed and did not have the proper structure for data analysis.

Although there are systems of this nature in the firm (Comander, EIS for the managers) they are designed for high managers needs and give them services, with lots of predefined reports and few flexibility.

For that, there is a special need to develop a great data warehouse that allows business users to access and analyse data.

The main business area to start with would be the technical area for products such as home, commerce, communities and small and medium firms.

In this environment's design it was tried:

To design and evaluate an architecture with an easy interaction that supports and makes it easier the analysis of information and the business decision making.

To design and justify a technological platform.

To determine the access infrastructure and managing to support the environment.

The initial environment of Data Warehouse for the technical area was enough as a congruent reference for a future extension to other business areas, by allowing users an easy access and exploitation of reliable information, that best matches to the supporting needs to the decision of the mentioned business areas.

Actual technological platforms have been taken into account to choose the proper one for the technical area, and particularly it has been taken into account as a preferred one the AS/400 platform, and data analysis and main outcomes for other decision making systems before developed for this same firm.

5.5 Project phases

Phase 1: the data modelling and design in the platform for the technical area comprised:

Analysis and modelling of the information required for users in this area.

Identification of predefined queries.

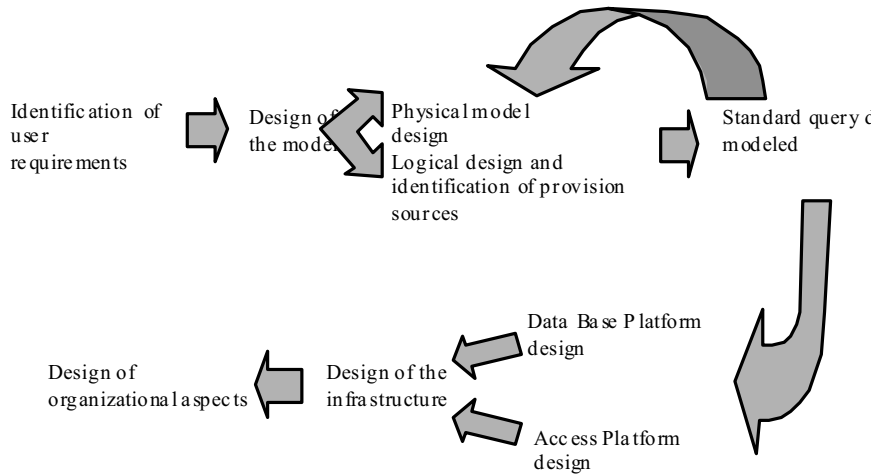
Analysis of access requirements and exploitation of the data base in the technical area, designing an user's interface that provides a proper coverage for functional needed capabilities.

Design of a environment's management infrastructure capable enough to support users in this environment.

Design of a digital technological platform.

Phase 2: the external supporting design for technical area data includes:

Global Vision of the Project



Source: own elaborated

Figure 2. Global vision of the project

The definition of data sources and functional specifications for processes being redefined, improvement and enrichment to incorporate in the provision of information.

The design of main elements in data provision.

Phase 3: Construction and exploitation

In the following figure, main activities developed during the project are indicated, within the proper methodological vision.

Activities
1.0. Planning and definition
1.1. Design an architecture
DATA MODELS AND PLATFORM
2.1. Analysis of users requirements
2.2. Design of data model and source identification
2.3. Design of the physical model
2.4. Design of provision
2.5. Design of parametric queries
2.6. Design of Data Base Infrastructure
2.7. Design of a platform for access
2.8. Design of infrastructure
2.9. Design of organisational aspects
REVISION AND PLANNING
3.1. Positioning the Corporate Data Warehouse
Revision and planing

Source: own elaborated

Figure 3. Activities in the project

5.5 Technical Architecture

As a result of the project a Data Warehouse was built with an architecture in three levels:

Level 1: Data Base Server

AS/400 (two processors and 512 MB)

Warehousing: 200 GB

DBMS: DB2/400

Data base has two levels (by using Cobol programs data are extracted in the first level and they go to a second level).

First centralised level: Entity-Relationship normalised model.

Out of normalisation levels for different business areas: data model in star

Technical area

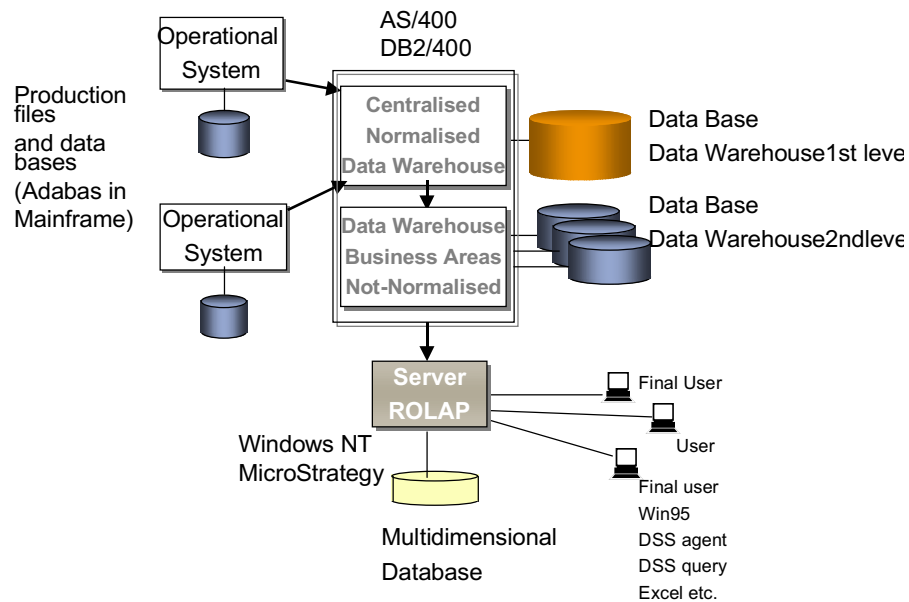
Sinister area

Marketing area

Etc.

Level 2: Application's Server

Windows NT



Source: own elaborated

Figure 4. Technical architecture

By ODBC it is communicated with DB2/400

Micro strategy tools (part of ROLAP server for multidimensional consults)

Data mining tools: SAS, etc. (Intelligent Miner of IBM, it can run in the AS/400 server)

Level 3: access to data by users

Windows 95

DSS agent

DSS query + excel

Reporting tools

SQL/400

6.- COSTS BENEFIT ANALYSIS AND RISK MANAGEMENT

6.1. Cost-Benefit Analysis

The implementation of Data Warehouse is an investment and in this sense is subjected to evaluation in time. As any other project that an organisation entails, there will be economical costs and benefits. There must be a comparative analysis to check if benefits justify costs. If this does not happen, the project has few possibilities to be developed.

Very often a cost-benefit analysis is very complicated due to the difficulty to estimate benefits beforehand. Costs estimated on starting the project, in the viability phase are after revised in every phase. The study has been documented and a cost methodology that makes the work easier has been utilised. Amongst considered costs in the Data Warehouse project, it is worth to stress that the project has cost one hundred and fifty five millions of pesetas. At first sight fifty five million pesetas were established. In cost sharing we can affirm that eighty million pesetas have been utilised for the development of interfaces and data charge. Eighty million of files and many charge and checking programs have been specified. Tools have been about twenty and twenty five millions, hardware AS/400, servers and work places.

In this concrete case, it has been evaluated as really high the cost of hardware; and very specially the cost of consultants and implementation.

In the design there has been a participation from the company of four users and three computer men, two project managers and a manager of development, in the part of the consultants, three persons and in the implementation four analysts and programmers have taken part: that is to say, 14 persons.

From the consultant firm a consultant of Data Warehouse tools, a data base designer and a specialist in documentation have been participating.

Benefits that are tried to be achieved with the implementation of this tool in the long run are mainly:

Individualised reports of different participants in the decision making.

A common language: definitions of concepts in data base must be unique. In this sense the implementation of Data Warehouse has been utilised as an opportunity to homogenise and clean traditional data bases in the company, and this has precisely delayed the development and implementation for one year. Some differences found in the original data have been corrected, specially in traditional databases that the company made use of.

To make a better profit of business opportunities, through the use of more profitable contracts.

These tools have been tried to be used for the analysis of information and its distribution, what it is a priority objective in the utilisation of a Data Warehouse in other organisations.

An optimisation in the company has been achieved due to an increase in the value produced by certain processes more than for an appropriate management in costs. The implementation of a Data Warehouse has not been materialised in a decrease in operative costs, but the area

in which it has been implemented has been considerably improved: “now we have better information and of a high quality”.

6.2. Risk management

It has been identified the risk as the degree of uncertain results, deviations of budgets or a lack of reached results against planned ones.

Amongst the factors that, in this concrete case, have moderated the project risk we can stress the fact that as first area of implementation and usage, one area with a high level of knowledge, implication and use of communication and information technologies, concretely the technical area, has been chosen. The choice has been made in relationship with the area user profile. Users in this area were accustomed to using information technology tools to develop typical tasks in the processes they usually develop: forecasts and simulation with great numbers of data.

In other hand, we can stress the elements that have influenced the level of risks in this organisations, concretely:

1.- There were specific difficulties to select a proper tool. Because no experience in the utilisation of the tool was found and some reference points were unknown in other companies

2.-The project size in costs and needed time for its development, and the exigency of an exclusive dedication for a very important part of implied people, in view of the organisation and the consultant firm that has been participating.

3.- The complexity in the data base design; some already developed models are used, and they have inconsistencies in the information they have. A special effort on trying to homogenise the inconsistent information has been made.

To know the risk in a project of Data Warehouse implementation in a explicit way is important since it helps to evaluate in a periodic way the risk actors in the project in any phase. By knowing success factors one can act over them.

For this company, concretely the introduction of the data warehouse could be an opportunity for data mining: “It is impossible to do data mining if we do not have a data warehouse”.

Risks analysis is important due to the dimension of the project. To reduce risks, some files with certain physical dimensions have been tried to be introduced, looking for a conventional data base structure and choose the most utilised tool in the market. The user has a knowledge level medium-high; he is able to use it easily.

Amongst problems that could be avoided by using this tool, it has been considered: a non-operative tool, with an incomplete design, hard to use and a lack of specific disposition to make the effort.

7. CONCLUSIONS

Demanding and mature markets require today a better customer knowledge to offer them a more individualised response. Technological advances allow today to get optimal returns in

the usage of information systems for the managers. Data Warehouse appears mainly as a tool for organisations that tries to solve classical problems in traditional information systems, costs, data redundancy, information dispersion, a lack of global vision and lack of reliability.

Through the present work we have tried to analyse the process of implementation and development of this kind of tool in firm processes through the explanation of a concrete real case in an insurance company. The dynamic of this sector joint to the intense movement of information have been essential elements in our choice.

The introduction of Data Warehouse in this Organisation as a tool that allows a detailed and resumed information, coming from internal and external data in the company, makes it easier to achieve some benefits, as for example, to improve the model of behaviour in the firm, or to enhance change processes.

Through a concrete case, it is stressed the importance of developing a proper analysis in the needs and top develop the process of implementation by following a costly methodology, only returned in the long run.

It is specially relevant to consider the implementation of a tool of this kind as an investment and evaluated through the years. It should be interesting to develop a comparative analysis to check in improvements and justify costs. If not, the project has few possibilities to be developed.

To finish, it is also important to know the risk associated with the implementation of a Data Warehouse, in an explicit way, due to the fact it is going to help to evaluate in a periodical way risk factors in the project in every phase.

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