INTRODUCING   INTRANET/EXTRANET
Some   practical   case   studies

Synopsis

When a Firm decides to introduce Intranet/Extranet in its working structure it has a number of alternatives to select: it may directly purchase, on its own, equipment (hardware + software) and have them installed by the Supplier; it may ask the consultancy of an experienced Provider to carry out, jointly, an implementation plan of the new tool; it may apply a Provider of Intranet/Extranet services and rent the system whose quality and efficiency are at full charge of the supplier.

Whatever the decision is, one can easily perceive that, to produce a consistent solution, it involves many organisational aspects to check: from final objectives to working procedures in use and to behaviour of labour forces. The detailed analysis of Firms/Organisations' activity is necessary to understand the best way by which the new technology has to fit in with the production activity (goods, services, research), the current working process, the interaction with the market, the budget available. Some main reference concepts are recalled at the beginning of this paper which should help the Firm to envisage a general frame for the new system to install. When moving into a practical project to implement the system, more details about the needs of the Firm are required: it will help Firm and/or Provider to properly assess the requirements for the site and consists in a document calling for consultancy.

The rest of the paper includes five case studies to illustrate different interesting solutions that can show the flexibility of Intranet/Extranet and the qualitative results they might provide.
Per each case the presentation is divided, mainly, into 5 sections: original situation to start with, the solution envisaged, technical implementation according to the plan, the advantages declared by clients.

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1. Deciding the installation of Intranet/Extranet

When the management of a Firm/Organisation thinks for the first time to install an Intranet/Extranet system, it usually refers to a consultant with whom it carries on direct analysis of features it expects from the new tool. The survey should account for the structure of the Firm (Organisation), its actual organisation, its actual working procedures, its productive processes, its present and future objectives. The consultant has to return back a public image of the Firm/Organisation to face actual and potential clients, to re-design the internal circulation of information, to estimate the operating cost, to show the possible benefits. Since the new technology will significantly impact over the labour organisation and over the working culture, the management should evaluate carefully the feasibility of the solution either from technical and operating point of view.

*Objective*s. The decision of features to demand to an Intranet system depend upon the complexity of applications wanted: it is, therefore, necessary to define, in details, short and medium term objectives that the Firm wants to achieve. For instance, it should be clear to consultant whether the server is intended for internal and/or external communications; whether it must be connected to corporate database; whether it will be shared by part or by all departments of Firm; etc

Content. An Intranet server is intended to catch the attention and the interest of users: web pages need, then, to be constantly changed as to provide new and updated content. So the Server must be designed, already from the beginning, with the necessary flexibility to vary content frequently. The Management should decide to appoint a special team, using internal resources, for this purpose, so that the responsibility of changing/updating content might be assigned to different departments or individuals. Alternatively, the team might be external.

Maintenance. Again, a decision is necessary to appoint a special team to be ready to face all critical conditions of the system. In case of calling for internal resources, selected people should be sufficiently skilled as to be able to make changes to the server's configuration if needed. Different solution can be explored as to ask the Provider of the system to train internal team or to take over part or all maintenance activity.

Capacity. The size and the structure of the Firm/Organisation are essential indicators that help decide the number of users who will benefit from the new technology. The management should foresee the expansion of labour within the lifetime of the system to ensure that organisation of work will not suffer unwanted shortages. Equally important is, in this case, to estimate

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whether it will be necessary to add or increase processor, memory and disk components according to the expected volume of work over time.

2. **Starting the planning process**

The first step to start the planning of Intranet is the request of a company seeking bids from potential suppliers. Like any complex project, the design of a web site requires clear communication between the client and web provider in order for the client to receive accurate bids. In the following an outline is given of typical components for a web design project.

In order to have a successful site at the end of the process, both client and provider must first start with a solid understanding of the client's goals for the site, in other words, a clear list of features must be developed. It serves as a base line of project requirements on which competing vendors may prepare their offers. The more detailed are the requirements, the more accurate will be the solution that a provider can submit to client. In this respect, a possible set of requirements should be taken into consideration.

2.1 - The general frame

As a preliminary information, a Firm/Organisation supplies to potential Provider a brief presentation of its ongoing production, its present objectives, its actual position in the market and the operating tools actually used. Firm/Organisation which want to re-design their current functionality, expect from the introduction of Intranet an economic return in terms of operating benefits and, for that, they are ready to dedicate to the project a provisional budget..
When calling for bids, then, Firm/Organisation ask, together with the Provider references, for a provisional design of Intranet structure, a consequent implementation plan, a rough cost estimate. A deadline is given for the completion of the project.

2.2 – The capacity of the system

To enable the Provider to make an appropriate design of the system Firm/Organisation should provide the number of actual employees/users to address in short run as well as their expected number in the medium run. Equally important is the level of knowledge of actual users and their ability to use the tool; personnel belong to different professional level and have different tasks to perform, so the functionality of Intranet should be such as not to raise great resistances to the new facility.

2.3 – Promotional requirements

The corporate image or representative logo of Firm/Organisation are important to users and clients, especially in case of Extranet, so that it is reasonable that Firm/Organisation want the image to reproduce the corporate style in the Web. Especially in case of Extranet (Banks, Services, Manufacturing) the site, as a first impact with clients, should appear professional in a way that users get the feeling they are dealing with a sound and stable institution with years of experience and that can receive personalised attention. To give the users the sense that the

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site is designed to serve them, the Firm/Organisation should:

- Give general guidelines for the front page
- Precise the Company identity to be translated into appropriate image
- Require pagination that facilitate communication with users
- Possibly show provisional drafts for the site

2.4 - Technical infrastructure

To position and complete the analysis of Provider, Firm/Organisation have to inform about the applications they would like to include into the main platform. So they should specify, for instance, software, operating system, applications, database wanted. Important, in this context, the specification of the characteristics of final users (production, research, services).

2.5 - Project management

Firm/Organisation have to appoint the counterpart of consultant, who is responsible for taking technical decisions, is involved in the selection of the contractor and has the duty for completing the project with the Provider. Responsibility for maintaining efficient the system can be taken over by skilled staff of Firm/Organisation or shared/entrusted with Provider.

Some case studies

In the following there are reported some examples to illustrate solutions taken in different cases and under different actual scenarios. It is an opportunity to perceive, if necessary, how flexible Intranet/Extranet can be and to explore qualitative features experimented by Firms & Organisations with different production processes and final objectives.

3. **General Hospital Agostino Gemelli**

The General Hospital Agostino Gemelli in Roma is a University Hospital belonging to the Catholic University of Sacro Cuore in Roma, and is one of the most important Health Italian Organisation that can accommodate more than 70000 patients per year.

All 2400 nurses have access to a system called "Bedside Florence" (in memory of the nurse Florence Nightingale who founded a nurse school for women) by which they are enabled to measure and record on handsets, in real time, data and parameters (body temperature, blood pressure, others) of patients standing beside the beds. Data can be directly transferred, wireless from the handsets, to a Central Unit so avoiding either the intermediate procedure of recording them on paper and the need of keying them, subsequently, in the workstation of department.

3.1 – Original situation

Nurses used to take records of medical data on paper support standing close to the bed of patients. They could, afterward, store all valuable information using a terminal station located into the ward. The manual transfer of information involved the risk to make mistakes or to

store data in a wrong position; further, the duplication of the work was one of the main reason by which data were frequently incomplete or inconsistent. The process itself was slow as, being a single PC available, there was a queuing of nurses waiting.

The decision was taken of making available a new tool with the objectives of reducing the number of paper documents, of avoiding the problem of duplication, of speeding up the process of recording and of making available to all personnel, in real time, all data registered.

3.2 - Solution

The health sector is a sector characterised by great mobility of personnel and by great volumes of information: then installing workstations for the whole Hospital would have been expensive and might have given service interruptions. Because of that the Hospital Gemelli decided to adopt solution of software wireless end-to-end.

The project, which was called "Bedside Florence" transfers the power of a desktop PC into a portable hand set which could have provided, at the same time, permanent access to millions of record relevant to patients to the health staff. Further, it let the personnel to perform their duties beside the bed of in-patients without keying data twice in the workstation.

The mobile system accessible in the wards is integrated with the operating system, to which it connects through a wireless LAN that has an access point in every department of Hospital.

3.3 - Implementation

The project Bedside Florence started in February 2001. The solution wireless was based upon Microsoft Visual Basic CE and was implemented on Microsoft PocketPC. It is built up by an environment Web based on Microsoft Windows 2000 and SQL Server; it is connected with remaining computerised system in the Hospital through the middleware DHE (Distributed Healthcare Environment). Personnel uses the system for recording notes, interviews to patients and parameters like temperature, blood pressure, heart beats etc. The system helps to manage the assignment of beds to patients, to build the agenda of activity in Departments/Sectors and to interact with other Hospital services like radiography and diagnosis.

3.4 - Advantages

Easy to use, the system assures to nurses freedom of moving and has the necessary flexibility to provide connections to the remote hospital network from any location and at any moment. The system avoids duplication data and assures more accurate and complete records. As information on patients are updated in real time, Bedside Florence is extremely useful to doctors who are able to get the "anamnesis" of patients either in advance, before going into the wards for visiting or, in case of need, during their visits to patients.

3.5 - Future perspectives

After a pilot project the management of the Hospital is on its way to expand the system to all the wards included in the building, assigning an iPaq individual to all nurses that need for their

activity. Other application envisaged go from the database of medicines to the menu of patients without requiring the expansion of existing network.

4. NAMSA (NATO Maintenance and Supply Agency)

NAMSA, a NATO Agency, is an international co-operative organisation, not for gain, which has information that military sector would never share with private Firms.
When NAMSA decided to create a system to manage the supply of arms and apparatus, used one of the first release of Microsoft Commerce Server 2000. Now NAMSA is implementing new solutions based on Web to the advantage of defence industry and of NATO itself.

4.1 - Situation

As responsible of management for logistic support, the Agency NAMSA is in charge of supply, maintenance, calibration, stocking, technical assistance, special services and management for configuration of about 30 arm system and apparatus. NAMSA is located in Capelen (Luxembourg) and has a labour resource of about 1000 people separated into 21 programmes or divisions with responsibility ranging from radio communications to missiles. Even if the Member NATO Nations do not have any obligation to use NAMSA for own arm systems, it was obvious that the co-operation with other Member-States could provide significant advantages rather than purchasing and maintaining military apparatus individually.
NAMSA objective was to reduce or eliminate manual activities, through automation of processes. Under support of NATO a pilot system was implemented using basic equipment to connect suppliers and clients. The success of the test came either from suppliers and from clients, so it was decided to go on with the project.

4.2 - Solution

NAMSA decided to carry out an Internet solution business-to-business, based on the operating system Microsoft Windows 2000 Server and upon the family of Microsoft server applications to create, distribute and manage the new solutions Web integrated.
The project started in September 2000 and was ready for service after three months, in December 2000. The system enables qualified suppliers to make business with the Agency 24 hours per day, 7 days per week, in a simple and safe way.
All bids for spare parts, almost 3000 per month, are sent into the system and concern almost all kind of parts. The suppliers must register themselves in a Web site and, if qualified, receive a user ID and a password. From the site a provider can access the system, analyse requests and prepare an offer; the research is complete and flexible: bids can be prepared, revised, updated, modified.

4.3 - Implementation

After the success of pilot experiment NAMSA decided to implement a complete system to manage on line the expected traffic. The protection of the system is based on open standard IPsec (IP Security Protocol), on the use of services Windows 2000 Active Directory and

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Distributed Security. To let communication and transfer of data with other systems, the facilities XML and XSL (standard Internet) are used to transform the working language. This characteristic is very useful when transaction are carried online, as it lets transfer an enormous quantity of information (name and address of suppliers, information about payments, etc) without requiring a conversion of data. The various phases relevant to supplying process are defined and connected by the Business Processing Pipelines System of Microsoft that, in addition, lets personalise procedures of preparing orders. In particular, for relatively small amount, the transaction is directly performed by the system itself that selects the best offer and prepare a contract. Profile System of Commerce Server simplifies the management of information about clients and defines a process of authenticity to access authorised areas.

4.4 - Advantages

The system improves the transactions as it replaces expensive activities with completely automated processes. The saving is more evident especially for little orders (simple pieces well known): in these cases there is, in fact, no need to analyse and evaluate price, it is sufficient purchase the piece. Time spent before to sent fax and follow manually the process is over; NAMSA thinks it can save almost 44520 Euro per month as labour savings and 110 Euro as reduced cost for fax and telephone; the estimate says that the investment can be repaid within 5 months.

5. **Bologna University**

The Bologna University attaches great interest to Web as it is the way to establish a positive relationship with its actual and potential users: students, teachers, administrative personnel, ex students, as well as scientific community, local Authorities and Firms in the Region Emilia. This objective was the main concern when re-designing the site of the University characterised by a central unit where are concentrated organisational and technological contents. The expansion of system was gradual as it moved, in successive phases, from the Centre to periphery, up to the entire Academic structure. Microsoft shared this approach supplying its own experience and consultancy.

5.1 - The history

The Bologna University is considered as the oldest in the World: it was set up at the end of XI century when Masters of Grammar, Rhetoric and Logic started studying the law; in 1158, Frederic I promulgated the Costitutio Habita by which the University became, by law, a place of research independent by any other power. To day the University of Bologna is the second University in Italy by size, with 23 Faculties, 70 Departments, about 180 degree courses, a system of libraries and museums, about 6000 teachers and administrative personnel and 100000 students regularly registered (more than 50% coming from other Italian Regions). The University houses some branches of American Universities and almost 1500 foreign students every year and recorded more than 80000 access to its site in 2001.

5.2 - A new strategy for Web

The University aims to become a reference point for automated services with the creation of a new own portal. Being focused upon academic contents, the portal is intended as a starting point to expand and create direct relationship with users by supplying general information and services. The objective of the portal is the settlement of a closer and advanced relationship between the University in Bologna and the World: it can supply to students, graduates, teachers and technical-administrative personnel the tools to perform at the best their tasks.

5.3 - Selecting principles

When selecting the Providers, one of the major concern was the evaluation of the organisational impact that Intranet would have taken to the operating structure of the University. To start, a tool was necessary which might be, at the same time, powerful and easy to use: in other words, it should have not required a strong engagement in terms of knowledge, formation and transfer of know-how. The package offered by Microsoft appeared to be an interesting solution as it could have facilitated not only the re-design of organisational rules and of working tools but would also have provided the optimisation of processes relevant to production, filing, management and publishing of contents.

The agreement with Microsoft included the supplying of technical infrastructure, of consultancy, of implementation of the project, of management of project and of training technical personnel. The system includes a centralised structure (Management) and a set of peripheral structures (Faculties, Departments, Institutes, Administrative Sectors). The system works according to the operating model ASP (Application Service Providing) where the Central structure is able to take to any point of the system, even unattended, updated information, know-how, methodologies, contents or applications.

5.4 - Technological infrastructure

A central server provides to all Faculties technological services based on operating system Microsoft Windows 2000 Advanced Server. A Microsoft AQL server 2000 is used as searching motor, Microsoft Content Management Server for the management of contents, Microsoft Commerce Server for the functions of outline and targeting, Microsoft Share-Point Portal Server for the management of project documents and other components of searching engine.

The technology ASP used in the site is supported by Microsoft-Net while contents of pages Web are included in database. The advantage of having only one Data Centre is that all Faculties, participating to the project, can divert the use of previous computers (purchased to manage the site) to other services.

In addition to the technological advanced structure, the project has a key factor in human resources. Depending from the close co-operation with the consultant, local team reached in short time significant results. That was thanks to a model of training on the job and knowledge transfer with Microsoft Consulting Service.

5.5 - Advantages

The use of a system of Web sites of different typology drove to a new organisational identity by which people take active part to innovate the University's operating structure.

Microsoft package could help implement the sites of the University in short time, making easier the process of re-designing organisational rules and contents. The internal team reached promptly its autonomy since Microsoft transferred its own know-how to the personnel.

Eventually, the fact that the site is centralised, assures a greater ease of management, economy of scale and organisational saving.

6. **The NSTDA Intranet**

Thailand **N**ational **S**cience & **T**echnology **D**evelopment **A**gency (NSTDA) is an autonomous funding and research Organisation established in 1991. Located in Bangkok it operates under the policy guidance of its Board, chaired by the Minister of Science, technology and environment of Thailand. Three national Centres operate under NSTDA: National Centre for Electronic and Computer Technology; National centre for Metal and Material Technology; National Centre for Genetic and Biotechnology.

NSTDA was established to be the main "driving force" for rapid science and technology development in Thailand. In this context NSTDA has the dual role of both supporting and implementing such development. Support is given to both public and private sectors and includes research funding, information services, institutional strengthening and other activities that lead to harnessing of appropriate S&T for social and economic benefits. Human resources are developed through a substantial number of scholarships, both local and overseas.

A tripartite co-operation among private sector (technology user), the academic institutions (technology generator) and NSTDA (facilitator) is the main aim of these activities.

6.1 - Products and services

NSTDA develops research to give support to the three main areas: biotechnology, metal and material technology, electronic and computer technology. Frequently the research is made on demand from Industry and services are provided to meet industry's needs. The benefits generally provided by NASTDA involve: promoting and supporting activities which allow for technology transfer with international organisations in an effort to develop local technologies in Thailand. Conducting exploratory research for the establishment of science & technology policy and planning in Thailand. Providing scholarships and fellowships to Thai scholars who wish to study or conduct research abroad. Even though the main offices (300 people) are located in Thailand, NSTDA has set up a research co-operation framework which encompasses several Universities and research Centres throughout Thailand as well as with many international institutions.

6.2 - The situation

Most of computers were, originally used as standalone tool. They were connected to a network but mainly to run department specific workgroup applications and to access Internet

through a server. The personnel rarely used shared documents over the network and groupware were non-existent. Moreover, as the Information System was heterogeneous (Unix, Windows, Macintosh) the users suffered from hardware/software interoperability.

So it was easy to realise that internal communications and collaboration could greatly be enhanced if all computers could become nodes of an organisation-wide network. Looking for a solution the idea was to comply with Open Standard whatever the provider might have been.

6.4 - The objectives

The Intranet was designed to satisfy 4 main objectives:
- to provide access to information from all sources, the Intranet could help the staff become aware of all events occurring in the Organisation
- To gradually get rid of the existing internal routing slips and use e-mail communication to exchange ideas and solve problems
- To brake geographical and departmental barriers through group-scheduling, on-line conferences, etc
- whatever was the operating system in use the staff would be able to dynamically access databases and information.

6.5 - The solution

NSTDA was so happy of Netscape that wanted to use Netscape products. First of all there was Netscape Navigator which was intended to be replaced by Netscape Communicator as multipurpose intranet front-end tool. The introduction of Collabra Server not only provided document sharing facility to reduce manual document routing process but, also let set up "ad hoc" groups to help people collaborate on-line in managing specific project.

From management point of view, it was conceived a facility, through Netscape Navigator, by which a simple clicking could ask access to database or generate complex financial reports without having to know any SQL syntax.

6.6 - Final results

Among the main results obtained, people were satisfied to enhance internal communication and collaboration, get access to information, use a consistent platform to access all corporate applications (finance, human resources, etc). It seems that the response of personnel was enthusiastic: the Intranet. The Intranet Web site itself is an "internal" achievement entirely designed by own staff.

Further, the annual expenses for publishing annual report and scientific publications were significantly reduced when all publications were transferred on-line on Intranet and Extranet. As an example, while the publication of Annual Report involved an expense of 10 $ per copy, once PDF format was available over the Internet the cost could be brought down to 25 cents. Even preparation of important meeting was taking some days to be arranged, the introduction of Netscape products was making it possible within hours.

7. **Telecom Italia Domestic Wireline**

Domestic Wireline is the business unit of Telecom Italia and supplies to market clients a set of services implemented on fixed network. The commercial offer ranges from traditional voice/data service to the wholesale national and international, from Web innovative services to complex solutions for great Firm/Organisation. Web services, in particular, have great part in the market strategy as they can drive the demand towards connectivity services either traditional and wide band. Further they can increase fidelity of clients who actually need solutions that can satisfy his specific need of communicating. Such services are more and more requested by a market of small and medium Firms, that can in this way use applications avoiding to purchase and maintain their own system. The implementation of services requested is fast: it keeps great reliability and integrates with existing support systems.

7.1 - Profile

The services of Web hosting let Companies/Organisations, even under lack of dedicated resources, have sites at the wanted level of complex features (from guided building of static pages to publishing dynamic sites in technology Active Server Page). Services of Storage Area Network, that is a kind of virtual remote disk, accessible by employees, even under mobility, to exchange documents and back up of data. All these facilities relate to two Internet Data Centres (Roma and Milano) which, as with of band (>7.5 Gbit/s), performances, reliability, security and volume of operations managed (22000 clients, 130000 mailbox, 500000 mail/day, 4.4 millions pages of Web, 410 applications and 197 databases) are at the top of Italian infrastructures.

The business Unit of Telecom Italia has as objective to quickly match the market needs. Either in terms of different Clients served – big corporations to small/medium Firms and residential – and in terms of services offered (from telephone to advanced data transmission). Particularly important, within this strategy, is the spreading of wide band services which became a priority. Because of that Domestic Wireline is implementing the technologies ADSL and xDSL, covering an increasing number of cities and with the offer of services added value.

7.2 - Situation

Within the initiatives which have the objective of developing the offer based on its own Data Centres, Telecom Italia created, in co-operation with Microsoft and Hewlett Packard a project of provisioning centralised to supply to Companies/Organisation applications and services without costs of purchasing and maintenance of system. On commercial level the work Microsoft appears to clients as a guarantee. Microsoft is able to provide specific solution non standard. Even n technological level Microsoft.NET is becoming a platform of reference for Web services. Eventually Microsoft is a partner whose organisation and experience helps very much to prevent or solve anomalies.

7.3 - Solution

The platform consists, on one side, in a system of provisioning centralised and general based on Microsoft BizTalk Server 2000, with an application Web of immissione, activate and monitoring of avanzamento, on the other side in a front end with hosting services supplied to clients and a set of interfaces of "self-provisioning" Web, used by client to manage the functionality acquired.

7.4 - Advantages

Immediate implementation with high reliability and full integration with existing support system. Low cost of maintenance, that reduces the expenses relevant to infrastructures; reliability, possibility of providing features adequate to changing demand; all this thanks to interoperability among systems. These are the basis upon which Domestic Wireless got success. At the end 0f 2002, the working mailboxes were 65000, sites in hosting wrere 10.700 and the storage solutions were 2500.

7.5 - The future

Whether, in any business activity, the capacity of following, if not of foreseeing market evolution is the key to compete successfully, in the field of Web services it is the condition to survive. It appears then normal if Telecom implemented already many projects to enrich the offer like private portal that gives to Firms all the functions of an Intranet) and update the platform of messaging and hosting.