INFORMATION MANAGEMENT: STRATEGY, SYSTEMS, AND TECHNOLOGIES

THE INFORMATION ENVIRONMENT: A BUSINESS WITHIN A BUSINESS

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INSIDE
The Company Information Products and Services, Information Resources, Information Processes and Functions, Information Projects

INTRODUCTION
This is the first of a series of articles that depict the company information environment as an integral part of the company business environment. The foundation is laid for future articles by creating an information model that mirrors the company. It is necessary to do this for company information and business personnel to communicate effectively. It is also necessary that the Information Services organization operate as a business rather than as the reactive, chaotic environment found in many organizations.

THE COMPANY
The company business environment can be viewed from five different facets:

1. Products and services
2. Resources
3. Business processes
4. Business functions
5. Projects

The company information environment that is serviced by its information services organizations can and should be viewed in the same manner, as shown in Exhibit 1.

PAYOFF IDEA
Although many companies consider their information services department to be a staff function, separate from the core business, this article presents the thesis that IS should be viewed as a business and that its organization and mission should mirror that of the overall company.
The following section examines how an information environment can be described using this business-oriented approach to organization and structure of its information services organization.

INFORMATION PRODUCTS AND SERVICES
Just as the company business environment receives customer requirements and delivers products and services, the company information environment also delivers products and services based on company information requirements. The areas represented in products and services are shown in Exhibit 2.

These are the fundamental information-related needs within a company that must be addressed.

While these needs appear to be clear and straightforward, proper emphasis must be placed on the primary ones. The key to identifying the primary information-oriented products and services is to understand the fundamental purpose of the information environment within a company. While some information requirements might change or might not be required in every company, there is one that is fundamental and crucial to the success of every company.

The primary need relating to information services is information. While this might seem obvious, most companies expend the largest portion of their information services budget on acquisition and support
of technologies rather than directly on the acquisition and support of information.

However, there is no greater business need than information. All else are minor comparison. This is the reason that an information environment was created. This is the reason that it exists. And, if it does not fulfill this need, this will be the reason that it fails. All of the personal computers, all of the spreadsheets, all of the big mainframes, and all the intranets in the company are empty shells if the need for information has not been satisfied.

If the required information is not available for that particular cross-section of the business, or for the most recent business day, or for the historical perspective desired, it does not matter whether or not the response time to a business query is less than a second.

But what is information? The answer is deceptively straightforward. Information is data in context. In a company's business environment, that context is primarily the business processes and business functions of the company. Sales amount, date, and customer identifier are data. By placing this data in the context of the appropriate business processes, such as sales, production planning, production, and customer satisfaction, it is appropriately structured for operational and informational use. Therefore, in order to satisfy the primary information need of the company —
data in context — the first and primary product of the information environment must be data access.

The primary objective of data access is to make data easy to find and use by as many of the company personnel as possible, after it has been appropriately structured to reflect the context of the company business environment as was previously described. Only then, will this, the most important product of the information environment, be considered a success within the company business environment.

The reason that data access is so important lies in the high value placed on data. And it really is valuable. The reason for its value lies in its longevity. Data objects usually live forever. More current data might become available but the old data still retains value. Sometimes old data is even more valuable than the new data because it provides an historical perspective that can be analyzed in order to make better decisions that affect the future of the company. When a customer calls to place a large order, it would be foolish to accept it if you can see that the customer has a history of late and sometimes non-payments for past transactions.

But how does a company acquire data for the information environment? It does not just appear by magic.

The internal company data is acquired and used by groups of computer programs called information systems, written with those objectives in mind. And what is a computer program? It is a representation of the business activities of the company; not so much the physical activities as the mental activities. This is an unusual way of defining a program, but it is necessary to better understand what business programming is really trying to accomplish. When the actual lines of source code are examined, it becomes obvious that they are a depiction of the mental steps taken by company personnel. In fact, when a computer program is developed through a technique such as Computer Aided Systems Engineering (CASE), much emphasis is placed in capturing the business rules, another name given to the business activities.

Business activities usually either create data or use data. Business functional activities such as order entry and payroll create data, and business process-oriented activities such as marketing and human resources use data.

Since information systems are computerized versions of the company business activities, they also have a very high value. Not just because they enable those activities to be accomplished faster, and hopefully more accurately, but primarily because they facilitate the acquisition and use of data. Also, if they are written properly, they accurately capture the business rules of how to conduct the company business activities. Therefore, the next product of the information environment that is required to satisfy the need for information is information systems.
The primary information-oriented products and services that are crucial to a company’s business environment are data access and information systems.

**Data Access.** This provides access to all forms of electronically stored data to authorized personnel. Data forms include numeric, text, and image. Data access is the most important product and service offering.

**Information Systems.** These support the company business environment through computerized versions of the company business functions that acquire data for current and future use.

Data access and information systems are the memory and intellect of the company information environment. There are, however, several other products and services that can be provided. Just as the company has primary products and services that it offers to its main customers, it also has secondary products and services that it must provide.

So it is with the information environment and the information services organization. There are several other products and services usually required to provide a full range of support to satisfy all of the information environment needs of a company’s business personnel.

**Computing.** It provides support for a company’s direct computing needs by supplying computer capacity, connectivity, job scheduling, report distribution, and an array of software for direct use by all company personnel as a tool to improve their functional productivity.

**Voice and Video.** These provide telephone facilities, operator services, installations, video conferencing facilities, and coordination for users of the internal and external communications networks of the company.

**Desktop.** It provides complete hardware/software acquisition, installation, service, upgrades, replacement, and network connectivity coordination services at the desktop. Installation of personal computers and associated software such as operating systems, office products, and specialized software for personal productivity are also provided.

**Information Technology Consulting.** It provides information technology consulting, research, and development services. This service is used extensively by the information environment itself and is also provided to other company business areas that have information technology needs. By providing this as a product, the information services organization helps to ensure that compatible information technologies are used throughout the company.
Customer Support. The term user has been replaced with customer when referring to internal company personnel that rely on the company information environment to provide their information-oriented products and services. Company personnel want to identify their new, changing, and on-going information requirements to a responsive, customer-oriented person. Most company business environments offer a customer support service. The information environment should be no exception.

As these information products and services indicate, some, such as computing services, are fundamental to the information environment and have been in existence since the advent of computers. Some are relatively new, like desktop services. And others, such as data access services, have been created as a result of a need generated by the development of the information environment itself. And still others, like customer support, have already been in existence for many years in the company business environment.

As with any new business, the fundamental approach to an effective information environment is to identify the customer’s needs, determine the products and services that will satisfy those needs, acquire the necessary resources, and develop a production environment to build and deliver the products and services to the customers.

The time has now come to examine the resources of the information environment that will be used to build and provide the information products and services.

INFORMATION RESOURCES
Exploring these information resources on a high level will show how they support the overall information environment. Each resource will be discussed in detail in future articles and effective resource management perspectives will be presented. The different resources in an information environment are represented in Exhibit 3.

The Personnel Resource. The personnel resource is the most important of the three resources. Its effective structuring and organization is crucial to the success of the overall information environment. Too often, personnel are taken for granted as an information resource with information technology receiving most of the attention. In reality, the opposite is true. If personnel were to be viewed as a critical resource, the frequent reorganizations that plague many information services organizations would cease and retraining would be provided as readily as upgrades to hardware and software.

The Raw Material Resources. There are only two raw material resource types in an information environment: business data and business activities. This article stated earlier that the primary need of the company information environment is information. The two products and services
that are designed to service that business need are data access and information systems.

The primary raw material of the data access product is business data. Without business data, one cannot build the data access product.

The primary raw material of the information systems product is the business activities; business functions and business processes. Information systems are built from computer programs that represent those business activities. Without the business activities of the company there would be nothing to program.

Business data, the data that is generated and used by the business environment, is one of the most valuable assets of any modern company. Many times, however, data slips through the cracks. Companies have become better at capturing their numeric data. Also retained are textural descriptive data relating to products, customers, and employees. Very few companies save intellectual data such as business decisions and their results. So, when a company needs to decide on a new business acquisition and the personnel involved in past acquisition decisions have left the company, it would be nice to be able to do a little data mining, apply appropriate software technologies, and develop a decision supported by actual historical data, actions and results.
Business activities are the fundamental business activities of a company. They consist of business functions and business processes. When these activities are transformed into computerized terms they are called computer programs. Since the business activities of a company’s business environment naturally exist, they can be justifiably viewed as raw materials. Capturing these activities through computer programming makes them available for use in the information environment.

Therefore business data and business activities are true raw material resources in every sense of the term. The business data resource is generated and used by the day-to-day operationally oriented business functions and supports the strategically oriented business processes of the company. The business activities are the company business functions and processes themselves.

The Technology Facilities Resources. The information technology facilities used in the construction and delivery of the information products and services are also a resource category. Determination of the technologies used in these facilities is usually the responsibility of the functional organizations responsible for this facet of the information environment in support of the information technology consulting products and services.

The information technology facilities, in the broadest sense, can be classified into two major types: computing and communications facilities.

Computing facilities are the hardware and support software that execute the programs and store the data of the company. The computing facilities are analogous to a manufacturing plant that produces a product. Examples of computing facilities are programming languages, database management systems, operating systems and, of course, large and small computers.

Communications facilities are the hardware and support software that move the programs and data from one physical location to another. The communications facilities are analogous to a truck fleet of a company that is used to deliver its products to its customers. Communications facilities include voice and data communications lines, network operating systems, modems, and switching facilities.

THE INFORMATION PROCESSES AND FUNCTIONS
The major business processes of the information environment should be the same as the business process groupings of the company business environment. When that happens, the information environment can relate to the other business processes of a company in a manner that facilitates dialog and understanding. Too often, information professionals do not relate
a customer satisfaction business process model. Also, business professionals fail to understand that information systems and data need to be created using a manufacturing process having the same structure and rigor that is used for the company’s customer oriented products and services.

**The Information Services Business Processes.** The business processes of the information environment are the same as the four major business processes of the company itself. See Exhibit 4.

*Customer satisfaction* supports the customers of the information environment, the other personnel of the company, through marketing, sales and customer support activities. These are the same activities as the business environment, and they should be. Too often information services organizations forget to treat the other personnel of the company as customers. A business uses personnel skilled in human relations to interface with customers. Too often a computer specialist, skilled in keeping a cantankerous piece of hardware operating, is also asked to soothe irate users who cannot access their critical data. And the results are disastrous.

*Manufacturing* develops, tests, and maintains information systems. It creates and maintains data warehouses, and installs and maintains direct-
use computing and communications facilities. In other words, the manufacturing process of an information environment produces the information-oriented products and services for its customers: the other personnel of the company.

Development is charged with the responsibility of research and development of new, emerging technologies, tools and techniques. It is also here that scaling of a new concept or technology to a production environment is conducted.

The business support process contains processes such as strategic planning, budgeting and control, asset acquisition of computers and software and comparisons of plans to achievement of objectives.

As can be seen from these examples the business processes performed within an information environment are very similar to any business.

The Information Functions. Within each Information Services business process are the functions that perform the tasks required to produce the information environment products and services of the company.

The following are the primary functions of an Information Services business process (see Exhibit 5).

EXHIBIT 5 — Information Services: Functions
• Systems development writes programs, develops, and maintains systems.
• Data management designs data from a logical and physical viewpoint.
• Hardware/software support maintains support software and hardware.
• Operations operates computing and communications equipment.
• Project leadership ensures that customer expectations are met.
• Management facilitates rather than manages.

All of these functions will be described in more detail in the next article along with an organization structure that maximizes productivity and effectiveness.

INFORMATION PROJECTS

A project is an activity that is required within every company to ensure the orderly creation, maintenance, or enhancement of a product or service, the implementation of a new resource, or the development of a new concept within a company. The information environment requires the same discipline. The different areas pertinent to information projects are represented in Exhibit 6.
Development projects are concerned with the creation of a new capability or the addition of a major new capability to one that exists. This type of project is especially important to a growing organization and often the bulk of the resources is devoted to development projects until a level of maturity is reached.

Maintenance projects are concerned with the activity of keeping things operational. These types of projects include both preventative and ongoing maintenance activities. Once an organization has completed a development effort, it must create maintenance projects to effectively manage the result. Too often, the results of a great development effort are ignored and taken for granted. Then slow deterioration and decay set in.

Enhancement projects are concerned with extending existing functionality. No matter how well a new development effort was conceived and created, times change. And those changes should be reflected as enhancements to the original effort. In fact, the better the job that was done originally, the longer the life of the result, and consequently, the more times change. By periodically enhancing a development result, the need for a drastic total replacement is postponed and many times actually eliminated.

Production projects are concerned with tracking and monitoring ongoing activities to ensure their effectiveness. If there are no established methods to find out how much production is costing and how well it is operating, the organization is running blind. It will eventually will run into a dead end, a brick wall, or just drop off the deep end.

In the information environment, the most common use of formal projects is usually associated with information systems development. However, it is just as important to create formal projects for implementation of any new hardware or software or a new concept such as data warehousing.

CONCLUSION
A company information environment should be created in the same manner as the company business environment itself. This results in a common vocabulary and parallel organization structures that facilitate communication between these two facets of the company. In turn, improved communication results in fewer misunderstandings and information products and services that successfully meet the information needs of the company.

Only when those needs are determined and can the products and services of the information environment required to satisfy those needs be identified. This ensures that the information services organization does
not create a solution in search of a problem. Data access services and information systems are usually the primary products and services of a company's information environment.

Other parallels within the company business environment are identification of the information raw material resources of business data and business activities. Also, the two primary groups of information technology facilities resources are computing and communications facilities. By keeping these facets separate in their appropriate categories of raw materials and facilities, it becomes apparent that the information environment is truly a business within a business and appropriate management practices can be put in place.

The information business processes are usually identical to the business environment. The functions, however, are unique to the information environment as is usually the case with any business process and its associated functions. By taking the time to identify information business processes and then assigning appropriate functions to each, much organization flexibility will be achieved.

Finally, while information systems development has usually been project oriented, all facets of the information environment can also benefit from this discipline.

NEXT ARTICLE
The next article describes the primary information environment resource: personnel. It will reveal how, by applying the principles of this chapter to an organization structure, to minimize the need for major reorganizations and disruptive changes to an information environment while facilitating the ability to react to a dynamic changing business environment. If the fundamental structure of a company follows this multifaceted model, then change and regeneration will be an orderly, on-going activity.

Robert E. Typanski is currently an independent writer and consultant with over 35 years of experience in the information environment. He has managed all facets and has performed strategic and organization planning initiatives. Bob is a regular presenter at information environment conferences regarding data warehousing and data mining and has been published in industry periodicals and magazines. He has also lectured and presented at universities on intelligent information systems and database technology. He can be reached at snapyt@worldnet.att.net.