TITLE: "USING LOGICAL MODELS AS TEMPLATES"

by Tim Bryce
Managing Director
M. Bryce & Associates (MBA)
P.O. Box 1637
Palm Harbor, FL 34682-1637
United States
Tel: 727/786-4567
E-Mail: timb001@attglobal.net
WWW: http://www.phmainstreet.com/mba/
Since 1971: *"Software for the finest computer - the Mind"*

"Whereas logical IRM resources will remain relatively static, the physical resources will change dynamically."
- Bryce's Law

INTRODUCTION

The cover story of the April 18th issue of "*Business Week*" magazine, "*Beyond Blue*," describes IBM's latest strategy that goes beyond hardware, way beyond. According to the article, CEO Sam Palmisano is trying to position IBM to migrate from just a vendor of computer products to a service organization whereby IBM not only supplies the equipment, but implements and manages whole systems for companies, such as finance, accounting, human resources, etc. To pull this off, it will be necessary to look beyond hardware and consider the fundamental nature of the business. In other words, they have to think beyond the physical world and look at the logical business world.

It is a fundamental principle in "PRIDE" that there are both logical and physical dimensions to a company's information resources. Whereas the logical model of the business represents Who/What/When/Where/Why (the "5W's"), the physical model expresses "How" the work is performed using people and technology. Whereas the logical model is rather static, the physical model is dynamic and changes rapidly.

In "PRIDE" Special Subject Bulletin Number 12 ("Understanding the IRM/MRP Analogy," Feb 21, 2005) we described the various types of information resources which can be categorized into three types of information resources:

BUSINESS RESOURCES - representing both the consumer of the information as well as the human and machine resources participating in the production of information.

SYSTEM RESOURCES - representing how data is to be processed.

DATA RESOURCES - representing the facts and events of the business, along with how they are stored.

All three have logical and physical dimensions to them.

BUSINESS MODEL

The physical model of business resources can best be described using a simple organization chart showing superior/subordinate staff/line relationships in a company. In such a model, there are no practical limitations in terms of horizontal or vertical levels in a hierarchy and essentially represents the whims of management. Such a chart represents administrative relationships in a company and, as such, changes dynamically. To better understand the fundamental nature of the business, it is necessary to define its functions (the fundamental duties and responsibilities of the enterprise) which can be expressed in a simple hierarchy (or indented list) with certain restrictions in its representation. In the "PRIDE"-Enterprise Engineering Methodology (EEM), we have the concept of a *"Universal Enterprise Model"* to arrange the business functions. Under this approach, an enterprise has three basic functions:

* One area of the enterprise is concerned with **PRODUCING INCOME**, which is typically the goal of a marketing function. Without financial income, all other work will quickly cease.

* Another area of an enterprise **ADMINISTERS RESOURCES**, including human, financial, material, equipment and information resources. This includes the areas of accounting, finance, personnel, materials, and information resource management.

* The last area of the company is concerned with producing a product and/or service. This represents the "**OUTCOME**" of the enterprise and includes such things as manufacturing, consulting, training, or some other form of service, such as legal advice and accounting.

"PRIDE's" UNIVERSAL ENTERPRISE MODEL

(continued on page 2)

(continued from page 1)

These three areas can then be decomposed into three levels of functions denoting the types of actions and/or decisions involved.

* **POLICY** functions refer to executive decisions where policy is made and objectives are formulated.

* **CONTROL** functions relate to middle management actions and decisions to monitor day-to-day affairs and assure executive decisions are met.

* **OPERATIONAL** functions involve the routine activities or work of the enterprise.

These three levels can be charted as a hierarchy showing superior/subordinate/lateral functional relationships. (See Figure 1 below)

Information corresponds to the three levels. Policy information is used to establish the direction or policy for the enterprise. It includes such things as competitive analysis, trend analysis, forecasts, profit and loss, etc. Control information is used to control operational activities and assure policy decisions are implemented. Typical applications include production control, inventory control, accounts receivables, accounts payable, customer complaint analysis, error notification, progress/status reporting, etc. Operational information is used to perform the normal day-to-day operations of the enterprise, such as shipping, manufacturing, receiving, billing, payroll, processing customer orders/requests, etc.

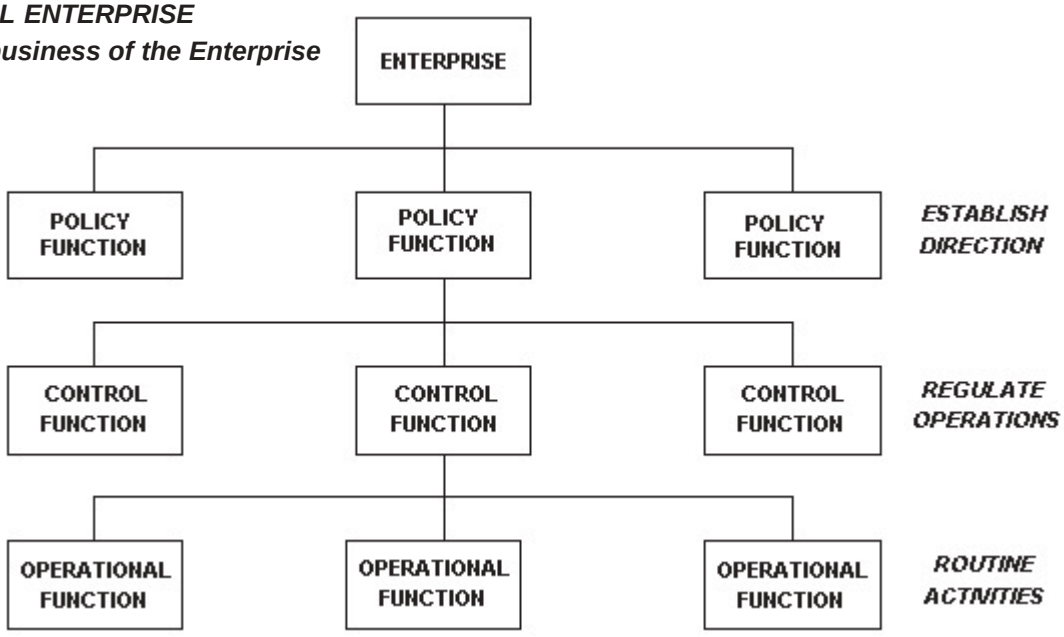
Each function has at least one "object" it must deal with or manage. Objects represent facts and events required to operate and manage in an enterprise. They may be as tangible as a product, employee or capital, or as intangible as a transaction, such as an order, debit or credit. In order to effectively manage these objects, functions require specific information about these objects in order to fulfill their mission. No single function has a monopoly on an object; they may be shared by many functions. (See "Data Base Model" below for more information).

Information flows between functions and is the cement holding the enterprise together. Systems, with their inputs, outputs, files and processes represent the means by which functions interact with each other. They represent the vehicle by which duties and responsibilities are discharged.

When the business functions have been established, they represent a stable model of the enterprise. It will only change if the fundamental mission of the business changes (e.g., new types of products and/or services to

(continued on page 3)

FIGURE 1
THE LOGICAL ENTERPRISE
Defines the business of the Enterprise



THE LOGICAL STRUCTURE REPRESENTS A STATIC VIEW OF THE ENTERPRISE;
IT WILL ONLY CHANGE IF THE BUSINESS MISSION CHANGES

(continued from page 2)

be produced). Further, enterprises with common business missions will have similar logical structures. For example, life insurance companies share similar logical structures, as do banks, automobile manufacturers, etc. What distinguishes one company from the next is its physical model representing how the company elects to implement its logical business functions.

SYSTEMS MODEL

In the "PRIDE"-Information Systems Engineering Methodology (ISEM) we have the concept of the "Standard System Structure" which is based on a product structure (hierarchy) consisting of assemblies, sub-assemblies, and parts. (See Figure 2 below).

The Standard System Structure consists of:

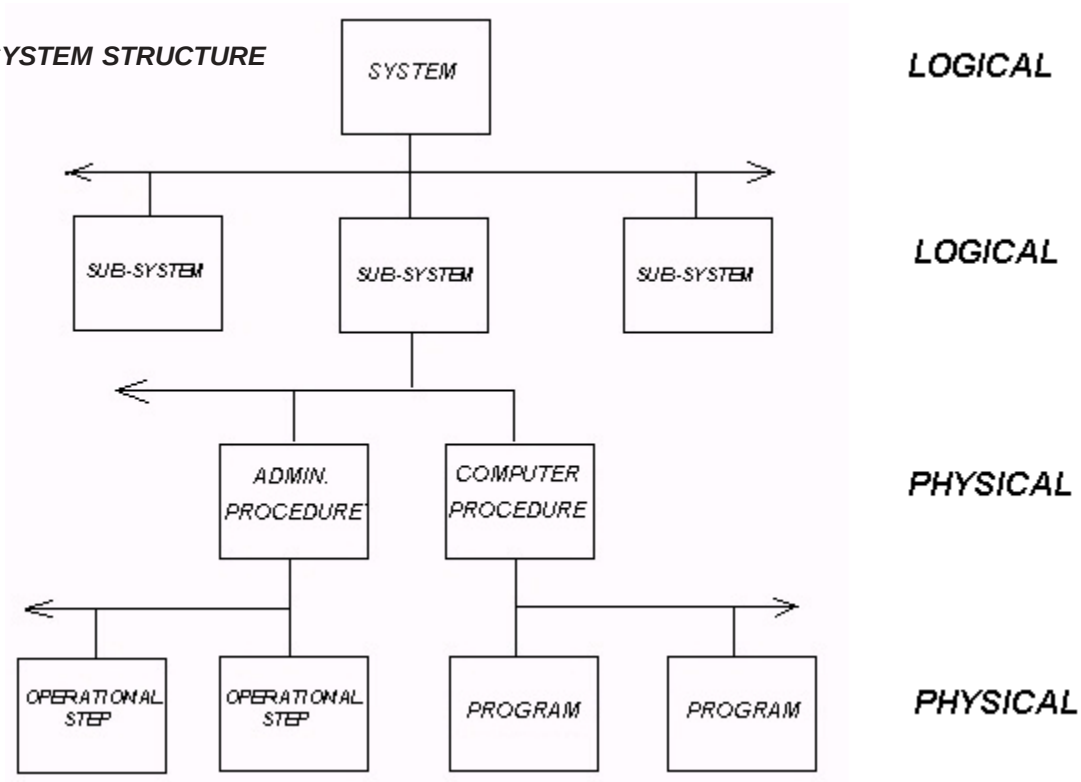
Information System - Represents the highest level of the product and the scope of the system. An information system is arbitrarily defined by an organization; it is based on the total number of sub-systems an organization desires to satisfy business needs. It is possible for a company to operate with a single system consisting of hundreds of sub-systems. In this situation, the system represents the enterprise overall. It is also conceivable to have several systems (a convenient way to partition subsystems). It ultimately depends on how the organization perceives the system. In any case, an information system is defined as one or more sub-systems that satisfy information requirements.

Sub-Systems - Represents a business process existing within a unique time frame. It is a logical process that dictates "what" data is to be processed and "when." Each sub-system consists of one or more administrative procedures and one or no computer procedures. As an example, a payroll application may have the following subsystems:

* Daily time posting by non-exempt employees.
* Weekly time posting by exempt employees.
* Payroll/Employee adjustments.
* Query employee time history.
* Weekly payroll for non-exempt employees.
* Monthly payroll for exempt employees.
* Monthly government reporting.
* Quarterly government reporting.
* Year end government reporting.

(continued on page 4)

Figure 2
STANDARD SYSTEM STRUCTURE



A SYSTEM IS A PRODUCT

(continued from page 3)

Administrative Procedures - Physically defines "who" is to perform "what" operations from an administrative perspective, e.g., manual processing, office automation processing, data entry, etc. The administrative procedure consists of one or more operational steps.

Operational Steps - Represent specific actions to be performed or decisions made.

Computer Procedure - Like the administrative procedure, this procedure defines "what" operations the computer will perform. The computer procedure consists of one or more programs.

Programs - These are comparable to the operational steps of the Administrative Procedure. Programs represent executable tasks to be performed by the computer.

There is little difference between an administrative procedure and a computer procedure; the only difference is the "actor" who has to perform the work. Whereas administrative procedures will deal with manual and non-computer processing, the computer procedure deals with computer processing. Of the two types of procedures, administrative procedures are the most commonly overlooked and omitted. Systems fail more for the lack of administrative procedures than they will for well written computer procedures. If people do not know how to use the systems, the systems will not be used.

This product structure provides the architectural framework required to engineer an information system. As we have proven time after time in different businesses around the world, all information systems, that work, have this structure. In manufacturing terms, it can be described as a "four-level bill of materials" which shows the product from the general to the specific. Any information system can be modeled using this standard system structure. Omission of any of these resources will highlight problem areas in a system.

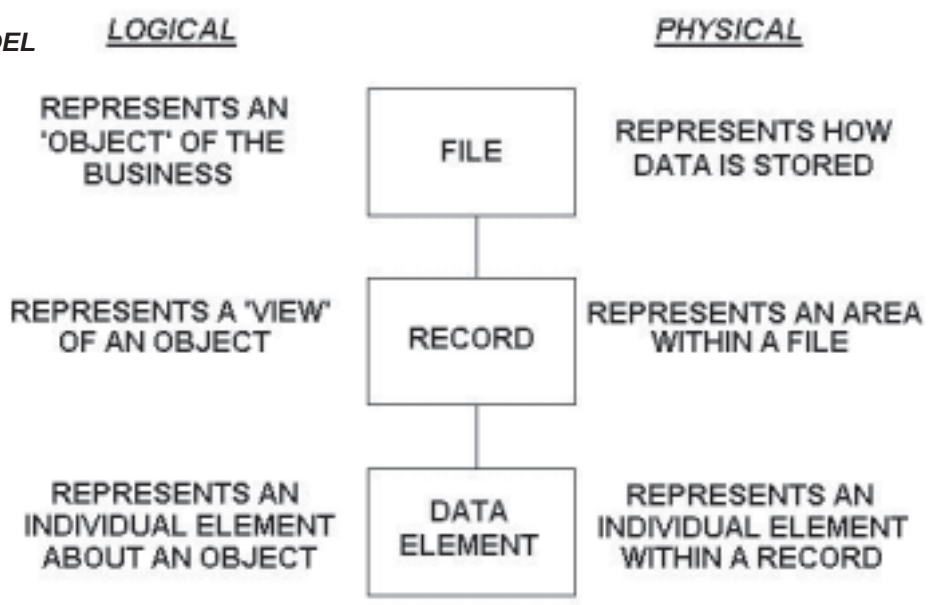
In the Standard System Structure, the System and Sub-System components represent logical constructs and the Procedures and Programs/Operational Steps represent physical constructs. As mentioned in "PRIDE" Special Subject Bulletin No. 8 (*"Is Software Hard?"*, Jan 24, 2005) it is possible to logically design a system and then provide multiple physical implementations. In the bulletin, we described how one corporate conglomerate designed a single logical system (a Payroll System) which was implemented in many different physical environments, including: IBM MVS, VM, Honeywell GCOS, UNIVAC Exec, HP MPE, DEC VAX/VMS, and Prime; all working harmoniously together. Despite the different programming languages and operating systems used, the system behaved identically in all environments.

DATA BASE MODEL

The organization of data serves two purposes: one is to logically describe the "objects" used to manage and operate the business, and; to express how data will be physically stored. The differences between logical and physical are substantial; there will not necessarily be a direct relationship between the two. (See Figure 3 below).

(continued on page 5)

FIGURE 3
DATA BASE MODEL



(continued from page 4)

Logical files represent the "facts" (customers, products, parts, etc.) and "events" (billings, orders, payments, etc.) needed to run the business. Although physical files must ultimately implement the logical files, they differ considerably in that they represent a particular way to physically store data. Data may be physically stored in a variety of file formats, such as an indexed file, a "flat" file, a DBMS file, etc. Regardless of the technology of the day, all DBMS' can implement logical files, be it the hierarchical model (anyone remember IMS?), CODASYL standard network, relational, or object-oriented DBMS.

THE NEED FOR STANDARD TEMPLATES

What have we learned? All three models (Business, Systems, and Data) have logical and physical dimensions to them. Again, whereas the logical is a rather stable model, the physical is dynamic and can be implemented many different ways. The logical models also deal with a finite number of resources, not infinite. For example, in the Business Model mentioned above, there are probably no more than 50 business functions in any given enterprise. Some might argue over the exact number, but the point is, there is not a inordinate number of resources in the logical models. Imagine if these models were all properly documented; it could then be re-used over and over again.

Assuming my argument is correct, it would be in IBM's best interest to develop standard logical models of businesses (templates) in order to implement their new business strategy. For example, let's assume they had a standard logical model for a bank. They could re-use the template in many different banks and offer different physical implementations based on the latest technology of the day. Such templates would add to their credibility by demonstrating to the customer they understand their business. It would also give them a roadmap of what they need to implement.

Now let's imagine IBM developing a library of such templates for different businesses. Wow! Talk about leverage. Wait. This could be scary in the hands of someone like IBM who now wants to take over the systems of the world.

END

"PRIDE" Special Subject Bulletins can be found at the "PRIDE Methodologies for IRM Discussion Group" at:

http://groups.yahoo.com/group/mbapride/

You are welcome to join this group if you are so inclined.

"PRIDE" is the registered trademark of M. Bryce & Associates (MBA) and can be found on the Internet at:

http://www.phmainstreet.com/mba/pride/pride.htm