



Whitemarsh
Information Systems Corporation

Information Systems Plan,
The Bet Your Business Project

Whitemarsh Information Systems Corporation
2008 Althea Lane
Bowie, Maryland 20716
Tele: 301-249-1142
Email: whitemarsh@wiscorp.com
Web: www.wiscorp.com

Foreword and Acknowledgments

This book would not have been possible without the hard work of Dagmar Bogan and Stan Hopkins. We all know how much *actual* work a project manager does versus the project staff; Stan and Dagmar were the project staff.

The Information Systems Plan project was started with the Systems Engineering Corporation¹ in 1993. The mission model and the high-level data model had already been completed. Both were stored in the Oracle CASE tool. The ISP project was to leverage on that effort to layout the sequence of information technology projects for the next five years.

Dagmar undertook detailed research of alternative methods of creating an ISP. None of the popular methods were even remotely possible because of cost and time. The work of Ron Ross, Resource Life Cycle Analysis, was uncovered. It was examined and a “strawman” process was created around RLC analysis. Metrics were employed to estimate the RLC analysis based ISP versus the other three most popular ISPs. When it was determined that the Ross approach would cut the effort by between 10 and 20 times, the technique was immediately accepted by SEC management as worthy of exploration.

The entire ISP effort took only about 5 months during the first part of 1993. The total staff time, counting the prior mission and data models were close to the original estimates for the effort. The actual ISP results were more than expected. Again, much thanks goes to Dagmar and Stan.

The material presented in this book is the combination of the two work plans that were employed to create the mission and high level data models, as well as the Information Systems Plans that were leveraged from this work. The work breakdown structure for the complete ISP methodology is provided in the Whitemarsh methodology book available from the Whitemarsh website.

¹ System Engineering Corporation was the name given the enterprise for whom the ISP was created. The actual “Systems Engineering Corporation” is a world wide organization that provides systems engineering services to the public sector. SEC has been in business since the middle 1950s. At the time the ISP effort was accomplished there were about 4,000 employees, offices throughout the United States, Europe, and Asia, and income of about \$500 million.



1

Rationale for an Information Systems Plan

Today, enterprise database is deployed on distributed, heterogeneous hardware and systems software environments.² The hardware platforms are both multiple-vendor and multi-tiered, with different architectures. In short, most businesses have embraced some form of downsizing, decentralization, and distributed processing.

Critical to the *enterprise database* environment is the capture of the business model and the implementation of the enterprise's memory: its data architectures. Once the data architectures are implemented in a sophisticated, generalized manner, software tools can be quickly and effectively deployed to create the necessary business systems to collect, update, and report critical business data.

The business systems can be implemented through a network of databases across different computing platforms. To make database a success, each must be carefully defined, deployed along with high-quality processing systems, and effectively utilized through high-level natural languages.

To have database success is to be organized. And with an organized enterprise, the past can be researched, the present can be mastered, and plans for the future can be set into place.

1.1 The Knowledge Worker Framework

The knowledge worker framework is the delineation of an environment within which persons who are primarily engaged in “white collar,” that is knowledge work operate. A knowledge worker primarily works with information and abstract concepts. Another type of worker is the real product worker. White collar workers such as clinicians and clinical support personnel are knowledge workers because they develop care plans, provide treatments, and record results. Administrative staff is also a class of knowledge workers that includes executives, administrators, data processing/information systems personnel, and most other office workers. Alternatively, workers on a manufacturing line and for example, food service personnel are not knowledge workers because they are primarily focused on the creation and/or assembly of real products.

Both knowledge workers and real product workers share common characteristics including plans, schedules, estimates and result assessments. Notwithstanding, the fundamental work methods and environment that underlies the knowledge worker and the real product worker are different at the core. Thus, trying to make one a clone of the other is both frustrating and invalid.

Due to the abstract nature of their work, information required by knowledge workers can best be stored, assimilated and used as objects, which are encapsulations of data, processes and

² Enterprise in this book means a business, company, establishment, or industry.



The Information Systems Plan

business rules. To most effectively support knowledge workers, the enterprise should strive to create object oriented environments.

These two concepts, knowledge worker and object oriented environments are brought together into technology architectures since both uniquely characterize the ideal working environment.

The knowledge worker's environment involves both automated and non-automated activities. Some non-automated activities involve the use of automation, for example, once a patient receives a treatment from a clinician (non-automated activity), the characteristics of the treatment, and the clinician's observations about the patient's reaction to the treatment are typically recorded in some automated system. A knowledge worker's framework must therefore address manual and automated activities.

Knowledge workers perform groups of functions to accomplish their designated job or to accomplish some aspect of the enterprise's mission. Knowledge workers may perform these function groups in different combinations depending on the enterprise's organization. For example, if an organization is highly distributed into multi-functional units, there may be staff that perform diverse groups of functions. Conversely, a highly centralized organization may have certain staff devoted to specific and highly specialized functions. The knowledge worker is therefore a complex multi-faceted person who performs diverse functions of different complexities for one or more organizations.

Enterprises commonly create computing supports for knowledge workers under the assumption that the functions they perform and the organizations through which they act are fixed and seldom change. Not only are these assumptions wrong, but when the functions and organizations do change, computing environment changes seldom keep pace because they are time consuming to specify, difficult to implement, and slow to accomplish. Slow-to-react computing environment changes, therefore, become the very reason why information technology support to business functions and organizations cannot keep pace with the demands of change. What is needed are computing environments that are object oriented, sensitive to knowledge worker functions and organizations, and that can react to the demands of change in a timely fashion.

The Whitemarsh Knowledge Worker Framework, depicted in Figure 1.1, was inductively built from the Whitemarsh methodology. Whitemarsh Information Systems Corporation, starting



Whitemarsh Knowledge Worker Framework						
Levels	Mission	Man-Machine Interface				
		Machine		Interface	Man	
		Database Object	Business Information System	Business Event	Business Function	Organization
Scope	List of business missions	List of major business resources	List of business information Systems	List of interface events	List of major business scenarios	List of organizations
Business	Mission hierarchies	Resource life cycles	Information sequencing and hierarchies	Event sequencing and hierarchies	Business scenario sequencing and hierarchies	Organization charts, jobs and descriptions
System	Policy hierarchies	Specified data models and Database object models	Information system designs	Invocation protocols, input and output data, and messages	Best practices, quality measures and accomplishment assessments	Job roles, responsibilities, and activity schedules
Technology	Policy execution enforcement	Implemented data models	Information systems application designs	Presentation layer information system instigators	Activity sequences to accomplish business scenarios	Procedure manuals, task lists, quality measures and assessments
Deployment	Installed business policy and procedures	Operational data models	Implemented information systems	Client & server windows and/or batch execution mechanisms	Office policies and procedures to accomplish activities	Daily schedules, shift and personnel assignments
Operations	Operating business	Application interface data models	Operating information systems	Start, stop, and messages	Detailed procedure based instructions	Daily activity executions, and assessments

Figure 1.1. Whitemarsh Knowledge Worker Framework



The Information Systems Plan

in 1981, has been employing the methodology for large scale database projects and installing repositories for both industry and government³. Databases, treaties that govern the behavior of its users, are broad in scope, inter-organizational and multi-functional in nature. Thus, database projects by their very nature deal with most aspects of the Knowledge Worker Framework. The Knowledge Worker Framework consists of six major rows and six major columns. The major columns are:

- ! Missions: Mission “drive” all other columns and their unfolding rows to achieve the purpose and intent of the enterprise;
- ! Database Objects: Database objects represent the collection of traditional (that is, formatted and structured data) and nontraditional (that is, video, sound, and unstructured text) data presented to requesters. Database objects proceed through precisely defined states and are squarely based on policy analysis for its data structure formulation, and on implemented processes that are embedded within the database object and that accomplish the database object’s proper valuation, modification, migration, and reporting.
- ! Business Information Systems: Business Information Systems accomplish the computerized transformations of database objects from within the context of business functions. Different business functions may cause the execution of the same business information system. If, in any of the business functions that employ a business information system, the database object value state transformation is not accomplished, the entire set of database object transformations are rolled back so that the database object returns to its prior state.
- ! Business Events: Business Events represent the interface between the two “machine” columns of the framework (database object and business information system) and the two “man” columns (business function and business organization). The business event column maintains the independence between these two sets of columns. Thus, the “machine” columns are able to serve the different sets of “man” columns which are in turn able to be crafted to fit different and individual functional styles within different and unique organizations.
- ! Business Functions: Business Functions represent procedures accomplished by someone within an organization to complete some aspect of a business’ mission. Business functions almost always exceed the bounds of business information

³ Repositories have been implemented at Hartford Insurance (1982), U.S. Army (1984), Hershey Chocolate(1985), Social Security Administration (1986), MITRE Corporation (State of Ohio, MITRE, State of Delaware, and State of California)(1991-1995), the Mars Corporation (1995 -1996).



systems. Business functions are commonly a matter of style. Different business organizations can have the same business function style, and the same business organization can have different business function styles.

- ! Business Organizations: Business Organizations represent formally constituted group of persons chartered to perform business functions to achieve some aspect of a business' mission, possibly through one or more business information systems.

Business organization change rates are different from business functions or business information systems. Business information systems change at a rate different from database objects or business missions. It is because of these different rates that each column is independent from each other. The goal is to encapsulates the internal designs of columns and to insulate them from the effects of design changes to other columns. Because of encapsulation, only when the business organizations change to the extent that they need additional or different business functions are business functions impacted. The most common changes are those that cause business functions to be either transferred from or into different business organizations. Those changes seldom ever impact business information systems. The only business organization changes that impact business information systems are those that typically occur after there has been a business mission change. Finally, database objects change only when missions change.

The Knowledge Worker Framework is important because it provides the opportunity to view knowledge work on a single continuum from mission through organization (the columns) and at multiple levels, that is, from scope through day to day operations (the rows). If all the analysis, specification, and implementation metadata resulting from this holistic approach is stored in a metadata repository database (hereinafter called the metabase), then complete job descriptions, job duties, procedures, guidelines, work effort measures can be stored, interrelated, examined for conflicts and, over time, evolved and maintained to remain current with the evolution of an enterprise's mission.

1.2 Metadata

A cursory review of all the cells in the framework quickly lead one to the conclusion that accomplishing the framework will cause a mountain of paper. The paper results from recording the results of the necessary analysis, design, and implementations. In addition to the original creation of the paper mountain, there is its reporting and maintenance. One could spend a whole lifetime caring for and feeding the mountain without ever getting anything "real" or "useful" done. That is both correct, and represents an outcome that is neither desired nor needed.

Rather than a mountain of paper, there is a need for a computer system to take-in, report, support, and reflect the inevitable evolution of the enterprise's information technology environment. This computing system has at its core, a metadata database, or metabase. This metabase system is also commonly referred to as a metadata repository. It is however more than a repository. It is a



The Information Systems Plan

fully functional computing system, controlled by a DBMS and fully supports the identification, analysis, specification, implementation, operation, and evolution of entire information technology environments.

A number of Whitemarsh books address metabase system. At the core of the information systems plan is all the metadata that actually represents the ISP. The ISP data is stored in a functional component or subsection of the metabase. Without the ISP database system, a useful, efficient, and effective ISP is not possible. Supporting the production of the ISP is the ISP life cycle, which is an integral part of the overall Whitemarsh methodology.

The main models of the Whitemarsh repository conform to the columns of the Knowledge Worker Framework. The key models are depicted in Figure 1.2.

The data model of the Whitemarsh ISP software system that supports the capture and reporting of critical data for the development of the information systems plan is contained in Figure 1.3.

1.3 The Information Systems Plan

Every year, \$300-700 million dollar corporations spend about 5% of their gross income on information systems and their supports. That's from about \$15,000,000 to \$35,000,000! A significant part of those funds support enterprise database, a philosophy of database system applications that enable corporations to research the past, control the present, and plan for the future.

Even though an information system costs from \$2,000,000 to \$10,000,000, and even through most chief information officers (CIOs) can specify exactly how much money is being spent for hardware, software, and staff, CIOs cannot however state with any degree of certainty why one system is being done this year versus next, why it is being done ahead of another, or finally, why it is being done at all.

Enterprises do not have models of information systems development that allow system designers to see the benefits of rearranging an information systems development schedule. Questions that cannot be answered include:

1. What effect will there be on the overall schedule if an information system is purchased versus developed?
2. At what point does it pay to hire an abnormal quantity of contract staff to advance a schedule?
3. What is the long term benefit from 4GL versus 3GL?



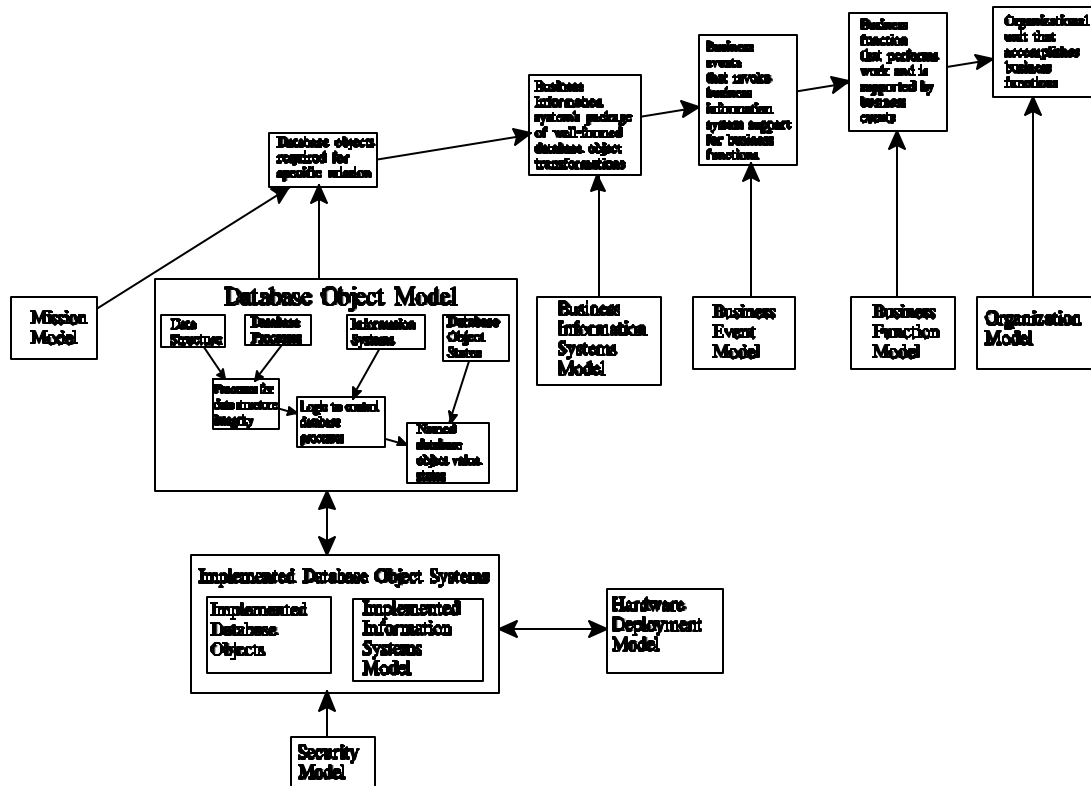


Figure 1.2 Meta Models Critical to Knowledge Worker Framework



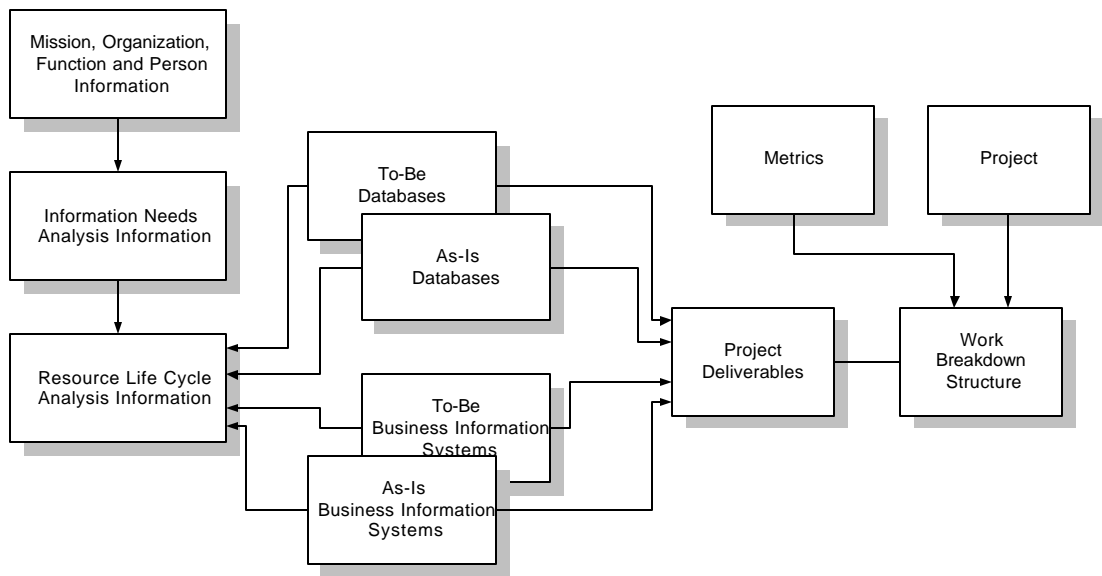


Figure 1.3. Metadata Environment for Information Systems Plan



4. Is it better to generate 3GL than to generate/use a 4GL?
5. What are the real costs of distributed software development over centralized development?

If these questions were transformed and applied to any other component of a business (e.g., accounting, manufacturing, distribution and marketing), and remained unanswered, that unit's manager would surely be fired!

We not only need answers to these questions NOW!, we also need them quickly, cost effectively, and in a form that they can be modelled and changed in response to unfolding realities. This books provides strategies for developing answers to these questions.

Too many half-billion dollar organizations have only a vague notion of the names and interactions of the existing and under development information systems. Whenever they need to know, a meeting is held among the critical *few*, an inventory is taken, interactions confirmed, and accomplishment schedules are updated.

This ad hoc information systems plan was possible only because all design and development was centralized, the only computer was a main-frame, and the past was acceptable prologue because budgets were ever increasing, schedules always slipping, and information was not yet part of the corporation's critical edge.

Well, today is different, really different! Budgets are decreasing, and slipped schedules are responsible for preventing business alternatives. Confounding the computing environment are different operating systems, DBMSs, development tools, networking, and distributed hard- and software.

Rather than having centralized, long-range planning and management address these problems, today's business units are using readily available tools to design and build ad hoc stop-gap solutions. These ad hoc systems not only do not interconnect, support common semantics, or provide synchronized views of critical corporate policy, they are soon to form the almost impossible to comprehend confusion of systems and data from which systems order and semantic harmony must spring.

Not only has the computing landscape become profoundly different and more difficult to comprehend, the need for just the right--and correct--information and just the right time is escalating. Late or wrong information is worse than no information.

Information systems managers need a model of their information systems environment. A model that is malleable. As new requirements are discovered, budgets modified, new hardware/software introduced, this model must be such that it can reconstitute the information systems plan in a timely and efficient manner.



1.4 The Information Systems Plan Project

The information systems plan project described in this book (Chapters 4 through 13) determines the sequence for implementing specific information systems. The goal of the strategy is to deliver the most valuable business information at the earliest time possible in the most cost-effective manner.

The end product of the information systems project is an information systems plan (ISP). Once deployed, the information systems department can implement the plan with confidence that they are doing the correct information systems project at the right time and in the right sequence. The focus of the ISP is not one information system but the entire suite of information systems for the enterprise. Once developed, each identified information system is seen in context with all other information systems within the enterprise.

The following steps are involved in the development of the Whitemarsh ISP:

1. Create the mission model
2. Develop a high-level data model
3. Create the resource life cycles (RLC) and their nodes
4. Allocate precedence vectors among RLC nodes
5. Allocate existing information systems and databases to the RLC nodes
6. Allocate standard work break down structures (WBS) to each RLC node
7. Load resources into each WBS node
8. Schedule the RLC nodes through a project management package.
9. Produce and review of the ISP
10. Execute and adjust the ISP through time.

Collectively, the first nine steps take about 2500 staff hours, or about \$250,000. Compared to the IS budget \$15-35 million, that's only about 1.5% to 0.75%.

If the pundits are to be believed, that is, that the right information at the right time is the competitive edge, then paying for an information systems plan that is accurate, repeatable, and reliable is a small price indeed! The price however, for traditionally accomplished ISPs is not small. A fair sized IBM's Business Business Systems Plan (BSP), or a James Martin's System's Data Planning (SDP), or Finkelstein's Strategic Management Planning (SMP) can take up to 40,000 staff hours (\$4,000,000). Traditional ISPs are also inaccurate, can't afford to be repeated, and are



out of date well before they are completed. Most ISPs, done the expensive and traditional way are never completed!

ISPs were "all the rage" five to ten years ago. Many died on the vine because the time to "grow" an ISP exceeded the "growing season" many times over! ISPs thus fell "out of favor," not because the need was invalid but because the approach/method for developing it was grossly unacceptable.

The need for ISPs has not diminished. It has in fact increased due to the decentralization and distribution of planning and control for data and processing. No longer are one or a few persons in control. Rather, many hundreds of groups have access to data and the means to create sophisticated information systems in cost effective manners. The result regrettably is that the cumulative cost of thousands of small systems with discordant semantics far exceeds the cost of their former centralized ones.

The avalanche of PCs and client/servers computing environments cannot be turned back to an environment of a few well placed and centralized mainframes. Nonetheless, it is imperative that there be centralized planning and control over the accomplishment of all these information systems so that resources can be conserved, and data and process semantics standardized. Once managed and optimized, the decentralization and individual empowerment efforts can have their benefits accumulate beneficially rather than be a source of endless conflicts and semantic clashes.

Not only does this book illustrate how to accomplish a very useful ISP in an extremely efficient manner, that is, at only 10% of the time and cost of an IBM, Martin, or Finkelstein ISP, the value from a Whitemarsh ISP effort can be realized almost immediately. The very products that are essential to the final ISP are, individually, very important. Because the ISP intermediate products have real value, the ISP project receives positive recognition along the way. Such recognitions almost always translate to continued management support and continued funding.

An ISP project of this type, that is, one that is open, empowering, and providing immediate use benefits, can only be derailed by those who want to keep power and total control "close to the vest." While such power trips are gratifying to "master-slave" corporate cultures, these power trips are--in the long run--fatal to enterprises trying to succeed in today's highly competitive environments.

1.5 The Rest of the Book

This chapter, Rationale provides the justification for organizations building an ISP. Chapter 2, ISP Alternatives identifies the three most popular approaches to building an ISP and shows why those very approaches provide almost fatal ISP roadblocks.

Chapter 3, The Whitemarsh ISP identifies and describes the steps of the Whitemarsh ISP and then compares these steps to those of the three alternative approaches.

Chapter 4, Creating the Mission Model, describes the steps required to develop the mission model.

Chapter 5, The High-level Data Model, describes the steps required to develop the high level data model that is appropriate for an ISP.



The Information Systems Plan

Chapter 6, Resource Life Cycles (RLC), describes this Ron Ross technique that forms the essential framework for the Whitemarsh ISP.

Chapter 7, Allocating Precedence Vectors Among RLC Nodes, describes the steps necessary to intersect the resource life cycles, one with another to then identify the critical information system operational dependencies.

Chapter 8, Allocating Standard WBSs to each RLC node, provides the steps necessary to understand the types of information systems projects necessary to accomplish the inferred information systems from the resource life cycle nodes.

Chapter 9, Allocating Existing Information Systems and Databases to the RLC Nodes, describes the steps required to identify and characterize an enterprise's existing information systems and databases and to allocate them appropriately to the resource life cycle nodes so that a true picture of database and information system coverage can be portrayed.

Chapter 10, Resource Loading of each WBS Node, identifies the critical step necessary for resource loading the projected information system projects that have been identified as required to accomplish the information systems plan.

Chapter 11, Project Management scheduling of RLC Matrix, describes the process that must be performed by an information systems organization to allocate its scarce resources to accomplish the most pressing information systems that are identified on the ISP.

Chapter 12, Publication and Review of the ISP, describes the steps necessary for the publication of the resulting information systems plan.

Chapter 13, Execution and Adjustment of the ISP, is the final chapter and it describes the process of amending the ISP to reflect the unfolding realities of enterprise.

1.4 Whitemarsh on Database WebSite

Whitemarsh publishes a series of books, courses, and software on database. Each item represents the *lessons learned* from almost thirty years of database projects. It's often said that wisdom is 99% scar tissue. Given that truth, using Whitemarsh *on* Database books is a wise move. Information for Whitemarsh *on* Database materials is available on the web site: www.wiscorp.com.



