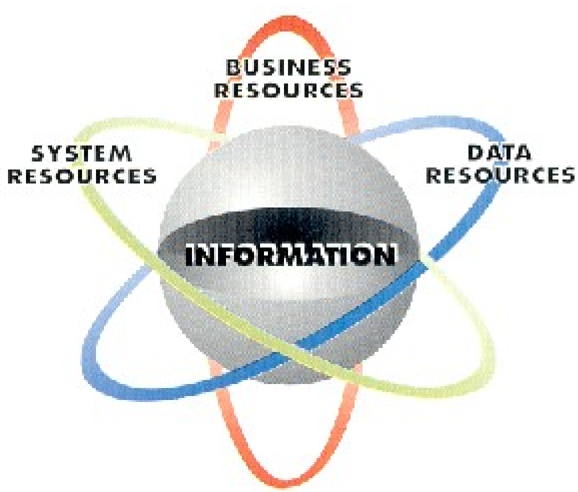
PRIDE® METHODOLOGIES FOR IRM

(PRofitable Information by DEsign - through phased planning and control)



The science of Information Resource Management (IRM)

TRIAL VERSION (EXCERPTS ONLY)

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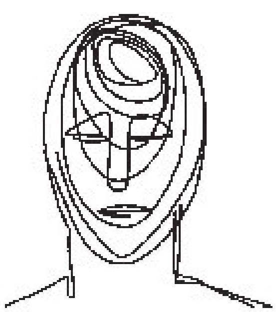

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Software for the finest computer - the Mind

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ABOUT THE AUTHOR

TIM BRYCE

Tim is the Managing Director of M. Bryce & Associates (MBA), an international management consulting firm located in the Tampa Bay area of Florida.

Mr. Bryce graduated from Ohio University in 1976 with a Bachelor of Science degree in Communications (BSC) from OU's College of Communications, School of Communication Studies (formerly School of Interpersonal Communications). Upon graduation, he joined MBA full time and served in a variety of capacities, including both sales and consulting. As Director, his responsibilities include product development, implementation, training and on-going support of all MBA customers on a worldwide basis. Because of this, he has traveled extensively providing training and consulting services at various levels of computer proficiency (novice to expert) on a variety of management and computer related subjects.

Tim is the principal author of MBA's "PRIDE"-Enterprise Engineering Methodology (EEM) and the designer of the Computer Aided Planning (CAP) tool (a tool for calculating corporate priorities and performing an organization analysis) and Automated Systems Engineering (ASE), a tool used to generate system designs. He is also responsible for the development of MBA’s Automated Instructional Materials which includes instructions and documentation for all of the “PRIDE” methodologies for IRM,

A prolific writer, Tim has considerable experience in writing technical documentation (paper and on-line), help text, and web design. He has authored several papers on a variety of management and computer related subjects and was the co-author of the book, *The IRM Revolution: Blueprint for the 21st Century* (ISBN 0-9621189-0-7). He regularly maintains a blog which is read by thousands of I.T. professionals worldwide. His *“Management Visions”* commentaries are regularly broadcasted over the Internet.

Mr. Bryce has also made several presentations at computer trade related meetings and has given lectures at various universities. Tim also actively participates in various trade related associations and user groups, as well as community organizations. He is available to give presentations on subjects related to Information Resource Management (IRM).

Tim has also served on numerous Board of Directors of industry, non-profit, and fraternal organizations, as founder, President, and a variety of other capacities.

END SECTION

PREFACE

WHY THIS BOOK?

The intent of this book is to provide a uniform and consistent approach for the development of information resources. Over the last 50 years there has been a noticeable void in terms of standards for design and development. This has resulted in inconsistencies that have complicated the maintenance and upgrading of systems, software, and data bases. To overcome this problem, the "PRIDE" Methodologies for IRM are herein published as an attempt to bring standardization to the development process.

"PRIDE" represents a substantial body of work that has been field-tested by customers all over the world. The concepts and philosophies embedded in "PRIDE" have stood the test of time. We have also put considerable effort in articulating our concepts and terminology, thereby moving IRM from an art to a teachable science.

Over the last thirty years companies have taken a tool-oriented approach to solving their development problems. Not surprisingly, the tools and techniques have changed over the years, but the problems haven't: user information requirements are not satisfied, systems lack integration and adequate documentation, data redundancies plague companies, projects are delivered late and over budget, etc. Despite the fine tools and techniques available, the problems are essentially no different than they were 35 years ago. What is needed is not more tools, but rather how to orchestrate them and make our people more productive. In other words, a management-oriented approach; hence the publication of this book.

HOW TO USE THIS BOOK

The book is divided into six major parts:

An Introduction to IRM

Describing the concepts and philosophies of Information Resource Management. Included in a description of the concept of an "Information Factory." The section should be considered a prerequisite for the remainder of the book.

"PRIDE"-EEM

Describes the concepts and philosophies of the Enterprise Engineering Methodology, along with a description of the Phases and Activities.

"PRIDE"-ISEM

Describes the concepts and philosophies of the Information Systems Engineering Methodology, along with a description of the Phases and Activities.

"PRIDE"-DBEM

Describes the concepts and philosophies of the Data Base Engineering Methodology,
along with a description of the Phases and Activities.

"PRIDE"-PM

Describes the concepts and philosophies of Project Management, along with a description of PM activities, including: Planning, Estimating, Scheduling, Reporting, and Control.

Supplemental Narratives

Provides supportive tutorials on subjects such as Establishing a Technical Library, Quality Assurance, Establishing an IRM Repository, Forms, and a Glossary of Terms.

WHO SHOULD READ THIS BOOK?

This book will be of interest to a variety of people, including:

Chief Information Officers (CIO)
Development Management
Enterprise Engineers/Architects
Systems Analysts/Engineers
Software Engineers
Data Engineers
Data Base Administrators
End Users

It also complements a college curriculum for Information Resource Management, making it well suited for students.

EXAMPLES USED IN THIS BOOK

Pertinent examples are included throughout the book, primarily at the end of each section. Space prohibits the inclusion of full examples. As such, key deliverables are included herein. For more complete examples, see the Internet version as maintained at MBA's web site.

Throughout the methodologies, you will read about the preparation of estimates and schedules. Such samples can be found in the Project Management section and not the phase deliverables sections.

The examples contained herein include the names of fictional companies and people. Any relation to any organization or any person living or dead is strictly coincidental.

THE INTERNET VERSION

MBA maintains a separate Internet version of the methodologies. This includes additional materials not included herein, such as:

- Functional Matrices - quick summaries of the activities within each phase.
- Functional Descriptions - describing the duties and responsibilities of IRM specific functions; useful for developing job descriptions.
- Phase Review Checklists - defining the acceptance criteria when reviewing a phase deliverable.
- Supplemental Narratives - a variety of tutorials in support of the methodologies.
- More detail instructions of the various Activities, complete with advice on applying tools and techniques.
- More examples.

Adding all of the material as mentioned above would have easily doubled or tripled the size of this book. As such, this book complements the Internet version. Again, the Internet version as maintained at MBA's web site (see cover for address).

THE AUDIO BOOK VERSION

An abridged audio version of this book is also available from MBA and is suitable for the mobile manager of developer. It is also useful for the visually impaired.

CORPORATE PROFILE

M. Bryce & Associates (MBA) is the developer of the "PRIDE" Methodologies for IRM. MBA is an international management consulting firm that was founded in 1971 in Cincinnati, Ohio. In 1985, the company relocated its offices to Palm Harbor, Florida (Tampa Bay area).

MBA is a division of M&JB Investment Company, also of Palm Harbor, Florida.

ABOUT OUR SLOGAN

"Software for the finest computer - the Mind."

Years ago when MBA was first starting to market "PRIDE," people would ask us what language the product was written in; was it COBOL? Fortran? It would surprise them when we told them it was written in "English." After all, "PRIDE" is not software for computers. It is a philosophy that transcends technical implementation. It is a way of thinking and managing, and affects our perspectives on development, which is why we coined the slogan, *"Software for the finest computer - the Mind."*

Since the inception of our company in 1971, the underlying theme in our methodologies and writings is the recognition of the vital role the human being plays in business. In the end, it is the human-being that matters most, not our technology.

- Tim Bryce
May 2006

END PREFACE

Section 1

AN INTRODUCTION TO IRM

Productivity = Effectiveness X Efficiency
- Bryce's Law

Welcome to the "PRIDE" methodologies for Information Resource Management (IRM). This product includes three methodologies:

“PRIDE”-EEM (Enterprise Engineering Methodology) - used by business analysts to model the business, determine information requirements, and calculate an Enterprise Information Strategy.

“PRIDE”-ISEM (Information Systems Engineering Methodology) - used by Systems and Software Engineers to design enterprise-wide information systems.

“PRIDE”-DBEM (Data Base Engineering Methodology) - used by Data Base Engineers and DBA's to design an integrated corporate data base.

"PRIDE" also includes a Project Management (PM) system and an Information Resource Manager (IRM) to catalog and cross-reference information resources.

WHY WAS "PRIDE" CREATED?

"PRIDE" was created based on MBA's experiences in managing large IS/IT departments where it was necessary to bring uniformity and consistency to development efforts in order to improve productivity. The problems experienced by IT organizations today are essentially no different than they were in the early 1970's when "PRIDE" was first introduced:

• User information requirements are not satisfied. The development staff and end-users do not work together harmoniously; e.g., users lack confidence in the development staff, and the development staff is frustrated with the users.

• Little or no planning is performed; IT management can best be described as "reactive" as opposed to "active."

• Systems are poorly documented causing headaches in terms of maintenance and implementing changes.

• Systems lack integration thereby creating work redundancies.

• Data redundancy plaques corporate data bases. Consequently, inconsistent information is produced.

• Projects are rarely delivered on time and within budget.

• Development personnel are not working in a concerted manner (no standards). As a result, quality is lacking causing users to lose confidence in the IT staff and redundant development effort.

• Little time is spent in systems analysis with programming representing 85% of the development effort, thus causing programmers to re-write applications until they "get it right."

• Development personnel are constantly in a "firefighting mode" (maintenance) and not developing new systems.

• There is no effort to share and re-use information resources, causing developers to constantly re-write applications.

Understanding the enormity of the situation, MBA studied various disciplines to develop other types of products that are much more tangible than information resources. As such, MBA considered the **Five Basic Elements of Mass Production:**

1. **Division of Labor -** to break the production process into separate tasks performed by specialists or craftsmen.

2. **Assembly Line -** defining the progression and synchronization of work.

3. **Precision Tooling** - for mechanical leverage in the assembly line.

4. **Standardization of Parts -** for interchangeability and assembly by unskilled and semi-skilled workers.

5. **Mass Demand -** the impetus for mass production (as represented by a company's information requirements).

In studying production processes, MBA came to the conclusion that:

Productivity = Effectiveness X Efficiency

Most people fallaciously equate productivity with efficiency, which simply gauges how fast we can perform a given task. Effectiveness, on the other hand, validates the necessity of the task itself. There is nothing more unproductive than to do something efficiently that should not have been done at all. An industrial robot, for example, can efficiently perform tasks such as welding. However, if it welds the wrong thing or at the wrong time, then it is counterproductive. It therefore becomes important in the production of any product to define Who is to perform What work, When, Where, Why, and How (we refer to this as "5W+H").

From this, MBA devised a set of integrated engineering/manufacturing concepts for the development and control of information resources. These concepts became the foundation of the "PRIDE" methodologies. MBA then played the role of "Industrial Engineer" and detailed the production process (methodologies) in terms of the steps and sequencing of work, defined deliverables, and review points. By doing so, MBA defined the expert craftsman's rules for developing information resources. In other words, "PRIDE" does not do anything more than what a good IRM craftsman does already.

WHAT MAKES "PRIDE" UNIQUE?

The strength of "PRIDE" rests in its integration of concepts and philosophies, all of which are based on common-sense engineering and manufacturing concepts that have stood the test of time and have been applied to just about every field of endeavor imaginable around the world. This engineering/manufacturing approach is what distinguishes "PRIDE" from other CPA-based or programming related methodologies. The concepts embedded in "PRIDE" and its approach to development were also proven unique in a court of law (Trade Secret litigation: M. Bryce & Associates vs. Gladstone, et al). Because of its integration, a company can either use "PRIDE" in its entirety or in selective pieces and evolve into other parts of the product over time.

The emphasis in "PRIDE" is on design correctness and the production of a quality product. Each methodology consists of a work breakdown structure consisting of phases, activities, and operational steps (tasks), each specifying Who is to perform What work, When, Where, Why, and How (5W+H). The work breakdown structure is based on producing specific deliverables that can be reviewed and inspected to verify completeness, thereby assuring a quality product is produced. The deliverables can take many forms, be it a report, source code, data base structures, etc.

The structure and sequencing of the methodologies were not randomly devised such as the classic linear "water-fall" approach to programming. Instead, the "PRIDE" methodologies are based in the information resources affected; for example:

EEM - Phases map the logical and physical organizational structures.

ISEM - Phases map the system structure being developed.

DBEM - Phases map the logical/physical data base models.

Although "PRIDE" includes forms to document information resources, flowcharts, and to estimate time and costs, it is most definitely not a "forms driven" system. Instead, "PRIDE" is a way of thinking and looking at information resources. This is why we refer to it as "Software for the finest computer - the Mind." A "forms driven" methodology implies that if you fill out forms in a specific sequence, the desired work product, such as a system, will be automatically produced. We consider this a fallacious concept. "PRIDE" views documentation as a working tool and a by-product of the development process, just as blueprinting is to an architect. The processing of forms will not make a person a better Systems Engineer; the person must understand the process and the rationale by which it is based. Only then will they be able to channel their energies effectively and produce superior results.

"PRIDE" is intellectually honest. We have gone to great extremes to define our terms and concepts. We believe Information Resource Management (IRM) to be a science, one that can be taught. To do so, one must define their terminology and explain their concepts, which is why we have done so. One by-product from defining our terms is that companies can standardize and communicate with a common language, thereby avoiding the "Tower of Babel" effect that commonly plaques most application development organizations.

"PRIDE" recognizes development tools and techniques will change over time as technology changes. As such, it provides for a myriad of outside tools and techniques to be used throughout the methodologies, just as an assembly line allows such devices. Regardless of the marketing hyperbole of the computer industry, there is no single product on the marketplace that can do everything for everyone, in all situations. An overriding theme in "PRIDE" is that "if there is anything in life that it constant, it is change." Techniques and tools will come and go, but the assembly line process will remain constant.

"PRIDE" requires a change of focus and orientation. Instead of concentrating on programming, "PRIDE" is concerned with the overall architecture of a system. Due to its orientation towards up-front work, programmers become the beneficiaries of better specifications and, as such, improves their productivity. Due to the organization and discipline of "PRIDE", it can even make semi-skilled workers produce superior results. In the hands of a competent manager, we have never seen "PRIDE" fail.

CORPORATE PROFILE

M. Bryce & Associates (MBA) is an international management consulting firm specializing in Information Resource Management (IRM). The "PRIDE" methodologies have been used worldwide in every field of endeavor imaginable:

Countries Served:
Australia, Belgium, Brazil, Canada, Denmark, Japan, Korea, Mexico, New Zealand, Norway, Saudi Arabia, South Africa, Spain, United Kingdom, United States, Venezuela

Industries Served:
Aerospace, Automotive, Banking, Brewing, Chemical, Communications, Construction, Electronics, Energy, Engineering, Government (Federal/State/Local), Insurance, Manufacturing, Paper/Wood, Printing/Publishing, Public Utilities, Retail/Wholesale, Shipbuilding, Steel, Transportation

In particular, "PRIDE" products have been used extensively by firms throughout Japan, including several companies who have received the prestigious Deming Prize for quality.

"PRIDE" is a universally applicable approach that can be used in any company, on any information system, in any cultural environment, and is not restricted to any particular computer platform, data base, language, or programming tool/technique.

Since 1971, MBA has never failed to meet a customer implementation commitment, regardless of the customer's geographical location or training requirements.

Through the "PRIDE" product line, MBA has established several precedents and introduced many new concepts to the industry:

1. First to offer commercial methodologies for system design, data base design, and enterprise engineering.

2. First commercial repository for capturing, controlling, and re-using information resources.

3. First on-line methodology for accessing automated

instructional materials.

4. First methodology enacted into law (State of Minnesota, 1978).

5. Concepts and Techniques introduced: Information Driven Design, Structured Systems, Chronological Decomposition, Layered Documentation, Data Resource Management, 4 Data Base Models, Enterprise Decomposition, Priority Modeling, Bill of Material Processing for managing information resources, Mini-Project Manager, Estimate-to-do (versus percent complete), estimating by bill-of-materials.

While many of MBA's competitors have come and gone, the "PRIDE" product line enters its fourth decade of use. This is a testament to the integrity and durability of the product and the company who produced it.

"With almost 1,500 installations worldwide and the fact MBA has existed in the methodology world for almost 20 years, it is fair to say that the company is well capable of managing its revenues and balancing them off with consistent research and development by investing about 80 percent of those revenues into R&D."

- DATAPRO

IRM: THE CONCEPT

"PRIDE" is an important part of an overall corporate program for Information Resource Management (IRM). The underlying philosophy behind IRM is to design, inventory and control all of the resources required to produce information. When standardized and controlled, these resources can be shared and re-used throughout the corporation, not just by a single user or application.

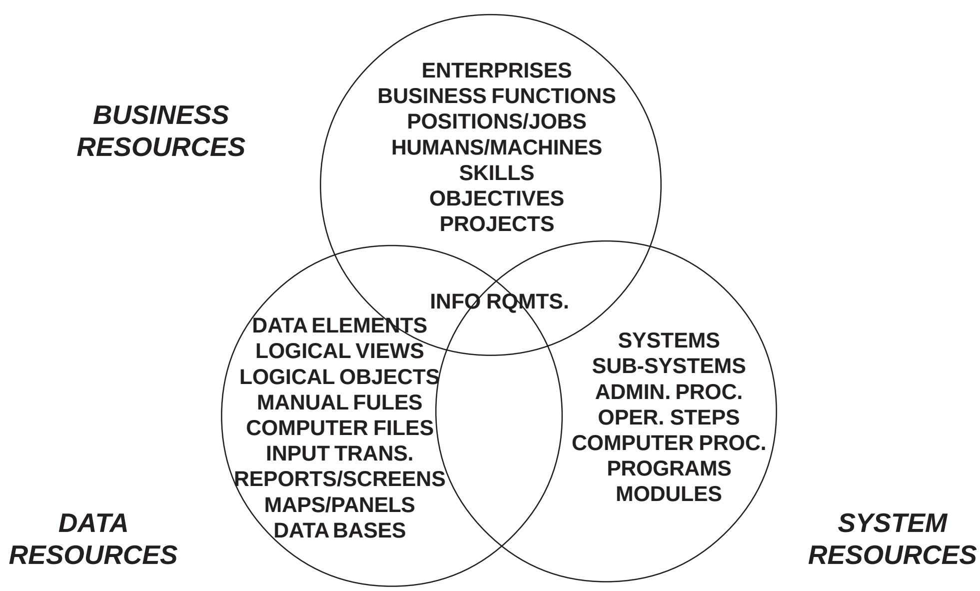
There are three classes of information resources:

- **BUSINESS RESOURCES** - Enterprises, Business Functions, Positions (Jobs), Human/Machine Resources, Skills, Business Objectives, Projects, and Information Requirements.

- **SYSTEM RESOURCES** - Systems, Sub-Systems (business processes), Administrative Procedures (manual procedures and office automation related), Computer Procedures, Programs, Operational Steps, Modules, and Subroutines.

- **DATA RESOURCES** - Data Elements, Storage Records, Files (computer and manual), Views, Objects, Inputs, Outputs, Panels, Maps, Call Parameters, and Data Bases.

INFORMATION RESOURCES



Integration is made possible through a Bill Of Materials Processor (BOMP)

These three classes of information resources provides the rationale as to why there are three complementary methodologies within "PRIDE".

- **ENTERPRISE ENGINEERING METHODOLOGY (EEM)** - for defining the mission and goals of the business and the development of an Enterprise Information Strategy synchronized with the business.

- **INFORMATION SYSTEMS ENGINEERING METHODOLOGY (ISEM)** - for designing and building enterprise-wide information systems (business processes crossing organizational boundaries). Software Engineering is considered a subset of ISEM.

- **DATA BASE ENGINEERING METHODOLOGY (DBEM)** - to design and develop the corporate data base, both logically and physically.

Each methodology consists of a series of defined phases, activities and operations. Laced throughout the methodologies are defined deliverables and review points to substantiate completeness and to provide an effective dialog between management and developers. The methodologies promote design correctness and the production of a quality product.

IRM/MRP ANALOGY

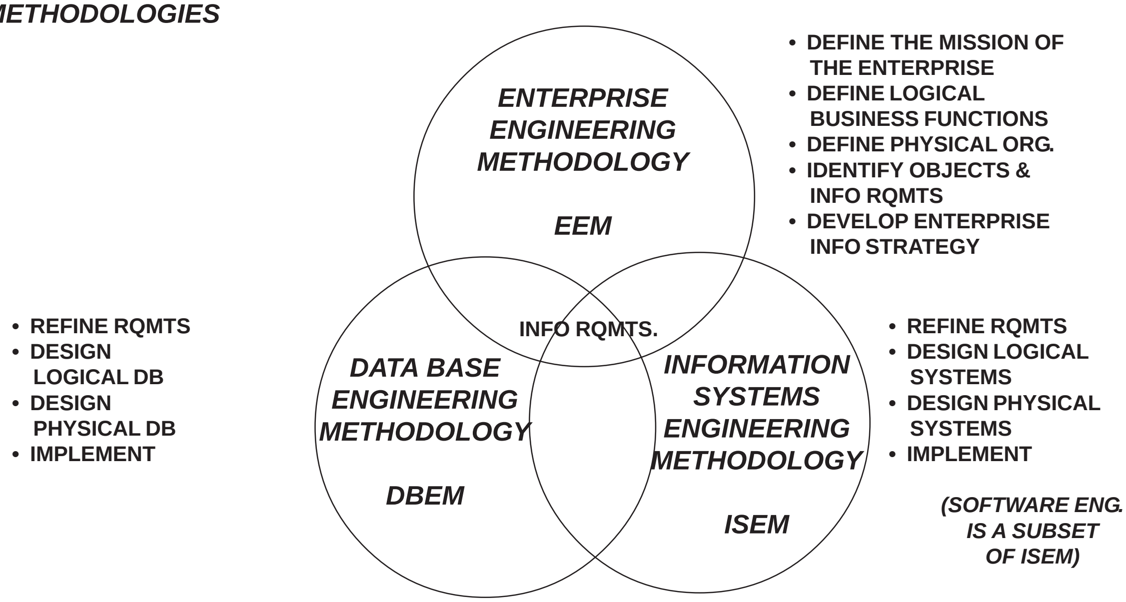
The concept of IRM is actually no different in intent than "Materials Resource Planning" (MRP) as used in manufacturing. Both are concerned with the efficient and cost effective use of resources. The classification and control of resources are the main objectives. Resources are classified to prove their uniqueness so that redundancy is not introduced and to promote sharing. Control is required to collect, inventory and retrieve resources as required by the business.

Whereas MRP is concerned with managing products and the parts required to produce them, IRM is concerned with managing information and the resources required to produce it.

One of the important by-products of cataloging and cross-referencing information resources is a model of the enterprise, including how it is organized and how it operates. Other benefits include:

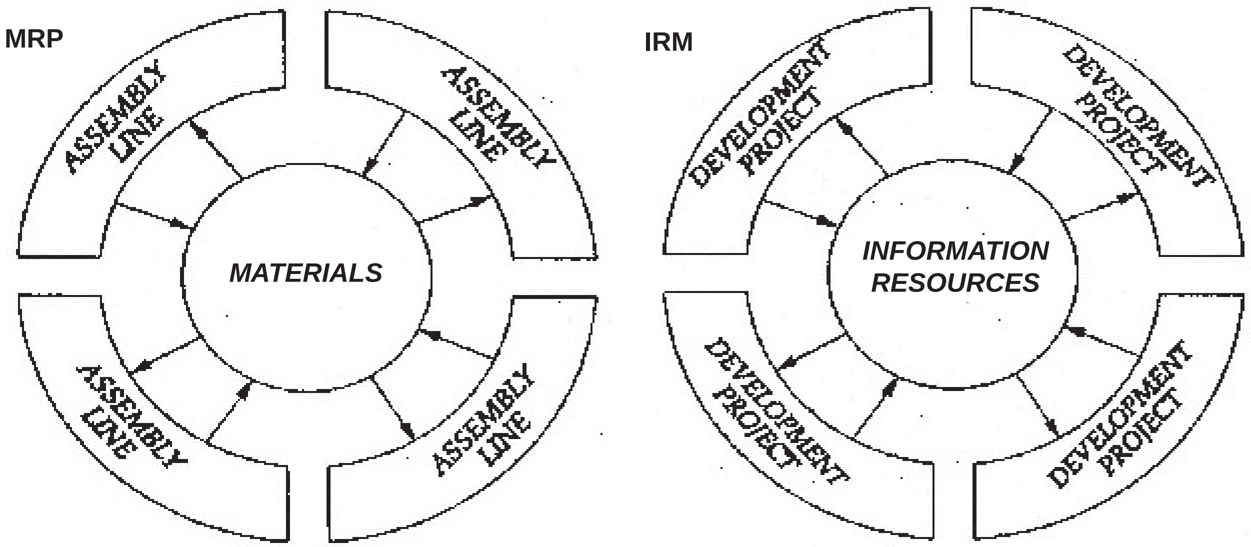
- All information resources are controllable, permitting the ability to design integrated systems and perform an "impact analysis" of a proposed resource change.

3 METHODOLOGIES



Each Methodology Consists of Phases, Activities, and Deliverables

IRM/MRP ANALOGY



MISSION:
Standardize, Control, Share & Re-use

• Simplified search of information resources for re-use. Redundancy of resource definition is eliminated.

• Complete and current documentation of all information resources, in an organized and meaningful way.

• Communications within the organization is improved since developers and users would use standard and common definitions for information resources, all of which would be in standard business terminology.

INFORMATION FACTORY CONCEPT

There are several other engineering/manufacturing related practices that can be applied to the development of information resources. Just as it is possible to engineer a manufacturing environment to build products, it is entirely possible to engineer a manufacturing environment to build information resources.

There are three basic components within any manufacturing facility:

1. **ASSEMBLY LINES -** stages of work sequenced in such a way to develop products. Along the assembly line, a series of tools and techniques will be deployed, some implemented by the human being, others through automated assistance, such as robots.

2. **MATERIALS MANAGEMENT -** the business function concerned with standardizing parts so they may be re-used in various product assemblies. Further, it is concerned with collecting, storing and retrieving parts in the most efficient means possible (e.g., JIT - "Just In Time").

3. **PRODUCTION CONTROL -** oversees the assembly lines, looking for unanticipated delays or accelerations of production schedules. Consequently, corrective action can be taken as required to resolve problems.

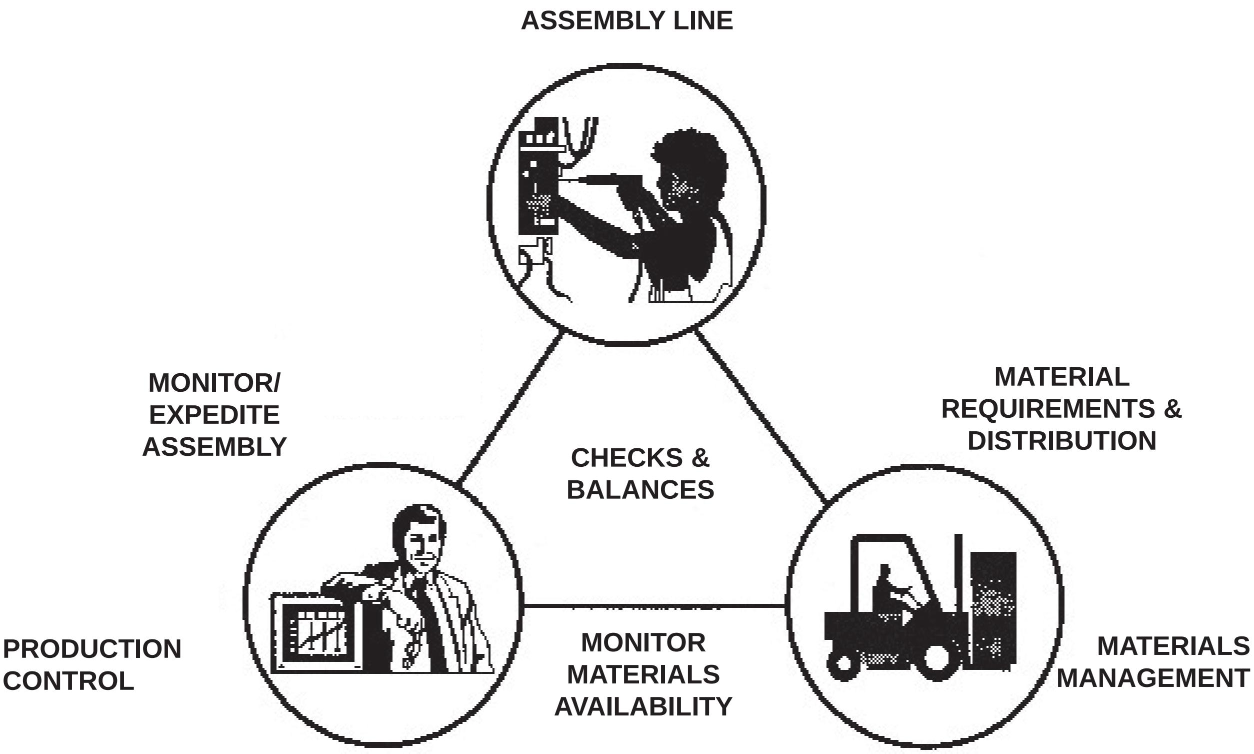
These same disciplines can be utilized to develop and manage information resources:

1. **METHODOLOGIES** (Assembly Lines) - defines the work environment by establishing WHO is to perform WHAT, WHEN, WHERE, and WHY, thereby synchronizing the flow of work. Within the phases of the methodology, a variety of tools and techniques may be deployed which defines HOW the work is to be performed.

2. **RESOURCE MANAGEMENT** (Materials Management) - identifies and classifies information resources, thereby sharing and re-using resources. Also, ensuring they are collected, stored and retrieved in a timely manner.

3. **PROJECT MANAGEMENT** (Production Control) - is used to plan, estimate, schedule, report, and control project work.

FACTORY CONCEPT



It is possible to apply the same discipline, organization and automation as used in an engineering/manufacturing facility.

Some people might argue that an "Information Factory" represents a much too rigorous environment that would stifle creativity. Far from it. An "Information Factory" is simply a recognition that the development of information resources can move from an art to a science. Ultimately, it represents organization, communications, and discipline. It also promotes teamwork and cooperation by sharing and re-using information resources.

With its emphasis on defined deliverables, validation/acceptance criteria, and review points, "PRIDE" is compatible with a total quality assurance program, e.g., ISO-9000.

THE VOCABULARY OF "PRIDE"

The vendor has taken great care to keep the language of the methodologies clear, consistent and easy to understand. In fact, a comprehensive "Glossary of Terms" is included. Despite this, there are some common expressions used in "PRIDE" which the user will need to become familiar with. To illustrate:

RESOURCE refers to one of the many elements used to produce information. As developers proceed through the "PRIDE" methodologies, they will document (either manually or mechanically) each resource and link it to other resources, thereby creating a chain of relationships. Under "PRIDE," each resource is identified by number and name (consult the "Establishing a Repository" narrative under the "Supporting Narratives" section). Most resources, follow a "Part Number" numbering convention consisting of a two digit prefix denoting the type of resource, followed by an alphanumeric control number to identify the individual description. For example:

NUMBER	**RESOURCE TYPE**	**USED TO DEFINE..**
FE-XXXXX	Functional Entity	Enterprises, Business Functions
OE-XXXXX	Organizational Entity	Jobs/Positions
RE-XXXXX	Resource Entity	Employees, Consultants, Machines
SD-XXXXX	Skill Description	Knowledge, Experience, Talent, Feature (for equipment)
MI-XXXXX	Modification/Improve.	Business Objectives, Problems, Work Requests
PD-XXXXX	Project Description	Projects (any size or type)
IR-XXXXX	Information Rqmt.	Information related or non- info related (e.g., equipment specs)
MD-XXXXX	Module Description	Reusable program code (including subroutines)
DD-XXXXX	Data Description	Data Elements and Field Entries
FD-XXXXX	File Description	Physical Files (manual & computer), and Objects (Logical Files)
ID-XXXXX	Input Description	Screens, Documents, Verbal
OD-XXXXX	Output Description	Screens, Reports, Audio
RD-XXXXX	Record Description	Records, Views (Logical Records), Transactions, Maps, Panels, Messages, and Call Parameters.

These resource prefixes (DD, PD, RD, etc.) will become a natural part of the vernacular of the development organization.

Unlike the other resources, System resources follow a product structure numbering convention reflecting the four levels in a system/product hierarchy (a basic "PRIDE" concept):

XX	System number	LEVEL 1
XXXX	Sub-System number	LEVEL 2
XXXXXX	Procedure number (Administrative or Computer)	LEVEL 3
XXXXXXXX	Program or Operational Step number	LEVEL 4

NOTE: The XX-XX-XX-XX convention can be modified as required for installation standards; for example: XXX-X-XX-XX, XX-X-XXX-XX, etc.

The term **"IRM"** refers to the overall concept of Information Resource Management, but it is also used throughout "PRIDE" in reference to a **"repository"** where information resources are documented and inventoried (either manually or mechanically). Each resource is cataloged in the IRM by number and name in the manner mentioned above. For a more complete description of the organization of the IRM as a tool, consult the following section: Establishing a Repository.

METHODOLOGY:

Other commonly used expressions associated with the "PRIDE" methodologies include:

PHASE - consisting of a set of one or more activities of work. Phases represent significant milestones in the life of a project.

ACTIVITY - a unit of work consisting of one of more operations.

DELIVERABLE - a report, file, or some other object produced from a specific phase, activity or operation. Deliverables are sometimes referred to as "work products".

MOD/IMP - short for "Modification/Improvement"; refers to a business objective of any kind (small, medium, large; new development, maintenance activity, modification/improvements). The expression "Mod/Imp" is a recognition that most development activity is devoted to changing and enhancing existing information resources.

The layout and structure of the methodologies contained herein are uniform making it easy to learn and navigate. Once a person understands the structure of one "PRIDE" methodology, he/she will be able to easily navigate another.

END SECTION

Section 3

“PRIDE”-EEM
PHASE 1
EEM PROJECT PLANNING

Organizations progress when the impact of good actions and decisions outweighs the impact of poor actions and decisions.
- Bryce's Law

The purpose of this phase is to initiate an EEM project. An Enterprise Engineering project may be used to study the entire enterprise or a portion of it (e.g., Manufacturing, Marketing, Administration); this is specified in the scope of the project. Several events occur during this phase:

- The scope of the EEM project is defined.

- A profile of the enterprise is defined.

- The current operating environment is defined.

- The enterprise's business plan is defined.

- A project plan is developed for the remainder of the project, including an Order-of-Magnitude Estimate and Schedule.

- A formal review with management is conducted to verify the phase findings.

Phase 1 requires considerable participation by Executive and User Management. Several interviews are required in order to properly define the mission of the enterprise, the current operating environment, and the business plan.

METHODOLOGY NAVIGATION

EEM projects are initiated based on a directive from Information Resource Management. At this time, Enterprise Resource Management assigns project personnel, including a Project Manager, and the project progresses according to the phases and activities of the methodology.

An EEM project may also begin as a result of a previous EEM project. Phase 5 of the methodology is used to initiate the Enterprise Information Strategy which includes a set of prioritized objectives and projects. At this time, Information Resource Management will initiate pertinent ISEM, DBEM and additional EEM projects. In this way, EEM is a "closed loop" methodology. It recognizes that the enterprise and its information requirements are constantly evolving. Change is constant.

Phase 1 will be used to evaluate the magnitude of the project, determine how much work is involved,

Section 4

“PRIDE”-EEM PHASE 2 LOGICAL ENTERPRISE ANALYSIS

Enterprises with identical missions will also be identical in terms of their logical structure.
- Bryce's Law

The purpose of this phase is to develop the logical model of the enterprise, which is represented using functions. Several events occur during this phase:

• Business functions are defined and organized into a hierarchy.

• Information requirements and "objects" needed to perform the business functions are defined and related to the logical model.

• The set of skills required to perform the business functions are defined.

• The project's Order-of-Magnitude estimate and schedule is updated.

• A formal review with management is conducted to verify the phase findings.

Phase 2 requires considerable participation by User Management. Interviews are required to properly define business functions and to specify "objects" and information requirements.

METHODOLOGY NAVIGATION

Depending on the magnitude of the enterprise, this phase can either be executed for the entire enterprise or, as is more common, for a specific area (e.g., Marketing, Administration, Manufacturing, etc.). This breaks the project work into smaller, more manageable pieces. In other words, it is not unusual for an EEM project to branch from Phase 1 to parallel Phase 2's. This decision is left to the discretion of the Project Manager who must judge the project's complexity.

Phase 2 will be used to define the enterprise logically and to specify the "objects" and information requirements needed to perform the business. Based on a formal review as conducted in Activity H, management may elect to:

1. Approve the project for proceeding to the next phase, "Physical Enterprise Analysis."

2. Request revisions to the findings produced in the Phase.

Section 5

"PRIDE"-EEM PHASE 3 PHYSICAL ENTERPRISE ANALYSIS

All companies have a culture. In order for employees to function and succeed, it is essential they understand and believe in the culture.
- Bryce's Law

The purpose of this phase is to develop the physical model of the enterprise, which is primarily represented using positions (jobs). Several events occur during this phase:

- The administrative reporting structure of the enterprise is organized into a hierarchy.
- Information requirements and "objects" needed to perform the business functions are defined and related to the physical model.
- An organization analysis is performed which compares the logical business functions against the physical organization structure. Also, the corporate culture is analyzed.
- The project's Order-of-Magnitude estimate and schedule is updated.
- A formal review with management is conducted to verify the phase findings.

Phase 3 requires considerable participation by User Management. Interviews are required to properly define positions and relationships, and to specify the use of information resources.

METHODOLOGY NAVIGATION

Depending on the magnitude of the enterprise or project, this phase can either be executed for the entire enterprise or, as is more common, for a specific area (e.g., Marketing, Administration, Manufacturing, etc.). This breaks the project work into smaller, more manageable pieces. In other words, it is not unusual for an EEM project to have multiple Phase 3's, particularly if the project had already branched into multiple Phase 2's earlier. In this situation, a Phase 3 follows each Phase 2. This decision is left to the discretion of the Project Manager who must judge the project's complexity.

Phase 3 will be used to define the enterprise physically and to specify the "objects" and information re

Section 6

"PRIDE"-EEM
PHASE 4
ENTERPRISE INFORMATION STRATEGY (EIS)

There is nothing more unproductive than to build something efficiently that should not have been built at all.
- Bryce's Law

The purpose of this phase is to develop an information strategy that is synchronized with the mission and goals of the enterprise. Several events occur during this phase:

• The current Enterprise Information Strategy (EIS) is evaluated for accuracy and currency.

• Information Requirements (IR) are grouped into objectives (MI) based on commonality.

• Objectives (MI) are grouped into projects (PD) based on commonality.

• A proposed new Enterprise Information Strategy is calculated. This includes a priority ranking of all objectives (MI) and projects (PD).

• A formal review with executive management is conducted to confirm/revise the EIS.

METHODOLOGY NAVIGATION

This phase cannot be started until the last Phase 3 of the project has been completed. Normally, there is only one Phase 4 per EEM project.

Phase 4 will be used to define the Enterprise Information Strategy. This will be a high-level policy decision for the business. Based on a formal review as conducted in Activity F, management may elect to:

1. Approve the project for proceeding to the next phase, "EEM Evaluation."

2. Request revisions to the findings produced in the Phase.

3. Reject the proposed EIS (existing priorities remain in effect).

Following Phase 4, the EEM project will proceed to Phase 5.

Section 7

"PRIDE"-EEM
PHASE 5
EEM EVALUATION

A project will only be accomplished if the individuals performing the work want to do it.
- Bryce's Law

The purpose of this phase is to evaluate project results and initiate pertinent ISEM/DBEM/EEM projects. Two events occur during this phase:

- ISEM, DBEM and EEM projects are started in accordance with the Enterprise Information Strategy.

- An evaluation of the EEM project is performed included an analysis of proposed versus actual estimated time, costs and schedules.

METHODOLOGY NAVIGATION

This represents the concluding phase of the EEM project. It is performed either immediately after Phase 4, or if a project has been discontinued earlier on (such as after Phase 1, 2 or 3).

GENERAL DISCUSSION

With the Enterprise Information Strategy in place, Information Resource Management begins to implement project plans. Systems Resource Management, Data Resource Management, Enterprise Resource Management and Data Processing Operations are briefed on the strategy and their role in its implementation. Objectives and Project Scopes are reviewed and tactics discussed. Following this meeting, Information Systems Engineering projects, Data Base Engineering projects and additional Enterprise Engineering projects are initiated.

Project Management performs an evaluation of the EEM project. Order-of-Magnitude estimates and schedules as prepared in Phases 1, 2 and 3 are compared to actual figures. An OOM Estimate/Actual report is used to show actual time, costs and schedules. Actual figures are compared and analyzed to the original estimates. This proposed versus actual comparison is then reviewed with project personnel, Enterprise Resource Management and Information Resource Management. Based on the findings of this analysis, it may be desirable to update estimating guidelines. Project Management then prepares concluding comments about the project which is included in the formal phase deliverable.

Section 8

"PRIDE"-ISEM INFORMATION SYSTEMS ENGINEERING METHODOLOGY

An information system is a product that can be engineered and manufactured like any other product.
- Bryce's Law

The "PRIDE"-Information Systems Engineering Methodology (ISEM) is an important part of an overall philosophy of Information Resource Management (IRM) as defined by "PRIDE". This involves the development and control over all of the resources required to produce information. Whereas the "PRIDE"-Enterprise Engineering Methodology (EEM) is principally concerned with developing an Enterprise Information Strategy, methodologies such as ISEM and the "PRIDE"-Data Base Engineering Methodology (DBEM) are concerned with actually building the system and data resources needed to produce information.

The intent of any of the "PRIDE" methodologies, including ISEM, is to define the business environment as to "Who" is to perform "What," "When," "Where" and "Why" (the "5W's"). As a result, it is used to convert a heterogeneous operating environment into a homogeneous environment. This improves communications and promotes cooperation and teamwork throughout an enterprise. Better organization and discipline also enhances the ability to build quality products and make effective use of resources. In addition, to the 5W's, the methodology provides "How" to perform the work by providing a variety of techniques and tools that are deployed throughout the methodology. A methodology, therefore, resembles an assembly line where work is performed in manageable stages.

ISEM is a generic and universally applicable approach for building any type of information system, regardless of industry, type of application, or software language/technique. It is based on tried and proven approaches that are so fundamental to sound system design that tailoring to individual development requirements is not only unnecessary but highly undesirable. It has been used around the world to develop applications in every field of endeavor imaginable, including banking, communications, education, government, insurance, manufacturing, retail, transportation, utilities, etc.

ISEM is concerned with building major systems in their entirety; this includes integrated business processes, complete with administrative and computer processing. As such, ISEM provides the high-level systems architecture required by software engineering to develop computer programs. Because of this, software engineering is considered a subset of ISEM. Although ISEM provides the ability to design any type of system, it does not mandate the use of any particular programming language or design technique. Consequently, the programming phases of ISEM (4-II, 5 and 6) allow for the use of any pertinent software engineering tool or technique.

CONCEPTS & PHILOSOPHIES

"It must be remembered that there is nothing more difficult to plan, more doubtful of success, nor more dangerous to manage than the creation of a new system. For the initiator has the enmity of all who would profit by the preservation of the old institution and merely lukewarm defenders in those who would gain by the new ones."

- Machiavelli, "The Prince" (1513)

INFORMATION = DATA + PROCESSING

The processing of data is surely as important as the data to be processed. Whereas the data represents "what" is to be processed, processing (or systems) represents "how" it is to be processed, using formulas, algorithms or calculations. An invalid calculation is just as misleading as invalid data; both will produce erroneous information. From this perspective, both data and processing must be carefully designed and controlled as resources for producing information. Whereas Data Base Engineering is concerned with the integrity of the data, Information Systems Engineering is concerned with the integrity of systems.

An information system is not an amorphous mass. It has specific characteristics that can be precisely defined. For example:

• It has a purpose; to produce information to serve business needs.

• It operates routinely in a predictable manner. In fact, it runs in time frames required to make specific decisions and take actions.

• It is a grouping of one or more elements which form a whole; this defines the scope of the system.

These three characteristics represent the basic elements of any system, information or otherwise.

With the advent of the computer many in the field have come to regard an information system as nothing more than a collection of programs or "jobs." From this perspective, there is little consideration for processing through non-computer means. As a result, non-computer processing and data are treated as irrelevant, and users are left with the awkward task of synchronizing administrative processing with computer processing.

Those biased with programming suffer from a narrow perspective of the system. Anything outside of computer software and hardware is considered meaningless. This is one of the primary reasons why information systems lack integration; some developers tend to ignore the overall picture and concentrate only on the computer. Many developers are more concerned with programming than they are with engineering the overall system. The analogy here is that there are many carpenters on the job, but very few architects. This is why systems development is usually regarded as an art rather than a science.

A SYSTEM IS A PRODUCT

The fact of the matter is, an information system is a product that can be engineered and manufactured like any other product. With a product orientation, a system consists of several levels of abstraction, from general to specific, that define the processing.

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 that 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. It is also conceivable to have several systems. 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 in particular time frames.

Sub-Systems - Represents a business process that exists 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 sub-systems:

• Daily time posting by non-exempt employees.
• Weekly time posting by exempt employees.
• Payroll/Employee adjustments.
• Query employee time history.

Section 9

"PRIDE"-ISEM PHASE 1 SYSTEM STUDY & EVALUATION

If an information requirement is stated incorrectly at the beginning, then everything that follows will be incorrect.
- Bryce's Law

The purpose of this phase is to specify and analyze an information systems related problem and/or opportunity, and to propose to management a viable solution. It is the most critical phase of the ISEM methodology. Several events occur during this phase:

- The scope of the ISEM project is defined.

- An "impact analysis" is performed to determine the phases and activities required to implement the project.

- An analysis of the current system is performed.

- User information requirements are defined and reviewed.

- A system approach is defined for satisfying the requirements. The approach may include new development, modifications/improvements to existing systems, a packaged solution, or combinations of all three.

- An evaluation of alternatives is prepared, including estimates, costs, and schedules.

- A formal review with management is conducted to verify the phase findings.

METHODOLOGY NAVIGATION

An ISEM Phase 1 is normally initiated by a Work Request/Objective as defined by the Enterprise Information Strategy (EIS). This strategy was developed during Phase 4 of the Enterprise Engineering Methodology (EEM) and is issued to Systems Resource Management during EEM's Phase 5.

The Work Request/Objective defines the business problem/opportunity to be addressed by the project, which typically relates to new development, modification/improvements, or maintenance. During Phase 1, Activity A, the project scope is analyzed and a determination is made as to the phases and activities needed to satisfy the Work Request/Objective. For new development, the project proceeds normally through the activities of Phase 1. However, for mod/imps or maintenance an "impact analysis" is performed to study the information resources affected by the request. From this analysis, a determination is made as to the phases and activities required to

Section 10

"PRIDE"-ISEM PHASE 2 SYSTEM DESIGN

Only when the Systems Engineer can walk in the moccasins of the user does the engineer have a right to design a system for the user.
- Bryce's Law

The purpose of this phase is to design sub-systems to implement information requirements. This is the logical system design phase of ISEM. Several events occur during this phase:

- Sub-Systems are designed with their appointed inputs, outputs and files.

- Actual examples of outputs (reports, screens, etc.) and pertinent inputs are prepared.

- The project plan and associated project estimates/ schedules are updated.

- A formal review with user management is conducted to verify the phase findings.

METHODOLOGY NAVIGATION

A Phase 2 may be initiated either by following a normal Phase 1 or, if a modification/improvement, following Phase 1, Activity A. There is a one-to-one relationship between Phase 2 and an information system. In other words, a Phase 2 will be executed for each system identified in Phase 1 (normally there is just one).

The formal deliverable resulting from Phase 2 is a "System Design Manual" consisting of a description of the sub-systems, samples of outputs, along with an updated project plan. This is reviewed with management who must decide whether to:

- Approve the project for continuation.

- Request revisions to the phase findings.

- Discontinue the projects.

Following Phase 2, the ISEM project will branch to multiple Phase 3's "Sub-System Design." Because of the one-to-one relationship between sub-systems and Phase 3, the number of Phase 3's to be performed is based on the number of sub-systems identified in Phase 2.

Phase 2 may also trigger a supporting DBEM project. As part of the system design, Systems Engineering will have defined all of its major data requirements. Because of this, a Data Base Engineering project can then be initiated to begin the process of incorporating the system's data into the corporate data base.

Section 11

"PRIDE"-ISEM PHASE 3 SUB-SYSTEM DESIGN

Forgetting the human-being during design will cause the human-being to forget the system at time of startup; it will be DOA, Dead On Arrival.
- Bryce's Law

The purpose of this phase is to design procedures to implement the sub-systems in a cost effective manner. Several events occur during this phase:

• Procedures are designed with their appointed inputs, outputs and files.

• Inputs and outputs are finalized, complete with input transactions, messages, maps, and panels.

• Narrative is written to describe the processing logic and test criteria.

• The project estimates/schedules associated with the sub-system are reappraised.

• A formal review with user management is conducted to verify the phase findings.

METHODOLOGY NAVIGATION

A Phase 3 may be initiated either by following a normal Phase 2 or, if a modification/improvement, following Phase 1, Activity A. There is a one-to-one relationship between Phase 3 and a sub-system. In other words, a Phase 3 will be executed for each sub-system identified in Phase 2.

There can be several Phase 3's executing in parallel or, depending on resource allocations and/or project priorities, some Phase 3's may be postponed or delayed.

The formal deliverable resulting from Phase 3 is a "Sub-System Design Manual" consisting of a description of the procedures, input/output definitions, along with an updated project estimate/schedule for the sub-system. This is reviewed with management who must decide whether to:

• Approve the sub-system for continuation.

• Request revisions to the phase findings.

• Discontinue the sub-system.

Section 12

“PRIDE”-ISEM PHASE 4-I ADMINISTRATIVE PROCEDURE DESIGN

Information is for people, not for the computer.
- Bryce's Law

The purpose of Phase 4-I is to prepare clearly written Administrative Procedures for the User in accordance with the specifications contained in the Phase 3, "Sub-System Design Manual." Several events occur during this phase:

- The operational steps of each Administrative Procedure are defined.
- If applicable, on-line "help" text is written.
- A formal user manual is prepared, including procedures, and descriptions about inputs and outputs.
- The documentation and procedures are reviewed with users.

METHODOLOGY NAVIGATION

A Phase 4-I may be initiated either by following a normal Phase 3 or, if a modification/improvement, following Phase 1, Activity A. There is not necessarily a one-to-one relationship between Phase 4-I and an administrative procedure. In most instances, all administrative procedures within a sub-system are written during a single Phase 4-I. In other words, a Phase 4-I will normally be executed for each sub-system, not for each procedure.

If a large and complex procedure has been identified, then the Project Manager may elect to manage it separately in a different Phase 4-I. In this situation, the Procedure number can be put into the project/phase key instead of the sub-system identifier.

The formal deliverable resulting from Phase 4-I is an "Administrative Procedure Manual" consisting of the procedures, along with input/output explanations. This is reviewed with User Management for clarity.

Following Phase 4-I, this branch of the ISEM project will proceed to Phase 7 where it may rejoin the Computer Procedure in a parallel test. If there is no Computer Procedure in the sub-system, then Phase 7 is still performed in order to walk through and test all of the Administrative Procedures.

Section 13

“PRIDE”-ISEM PHASE 4-II SOFTWARE ENGINEERING

Good Systems Design + Good Programming = Great Systems
Good Systems Design + Bad Programming = Good Systems
Bad Systems Design + Good Programming = Bad Systems
Bad Systems Design + Bad Programming = Chaos

- Bryce's Law

The purpose of this phase is to design software to satisfy the computer procedure as specified in the Phase 3, "Sub-System Design." Several events occur during this phase:

- Processing and data requirements are evaluated.
- A software strategy is defined to satisfy the requirements.
- Software is designed, complete with specifications to represent processing logic.
- The computer operating environment is defined and evaluated.
- A Computer Run Book is assembled containing the design specifications suitable for review.

Phase 4-II marks the beginning of the software development phases of ISEM. Phase 4-II is used to design the software; Phase 5 is used to produce and test individual programs, and Phase 6 is used to test the software ("string test"). These phases represent where supplemental application development tools can be used in the methodology. For example, CASE tools (Computer Aided Software Engineering), program generators, report writers, fourth generation languages, test data generators, etc.

METHODOLOGY NAVIGATION

A Phase 4-II may be initiated either by following a normal Phase 3 or, if a modification/improvement, following Phase 1, Activity A. Normally, there is a one-to-one relationship between Phase 4-II and a computer procedure.

Section 14

"PRIDE"-ISEM PHASE 5 SOFTWARE MANUFACTURING

Programming is a translation function, going from human understandable specifications to machine processable instructions.
- Bryce's Law

The purpose of Phase 5 is to translate the specifications prepared during Phase 4-II, "Software Engineering," into efficient computer processable instructions. Several events occur during this phase:

• The program is produced according to specifications.

• Test data is developed and a unit test is performed.

• The test results are reviewed and retained for future reference.

METHODOLOGY NAVIGATION

A Phase 5 may be initiated either by following a normal Phase 4-II or, if a modification/improvement, following Phase 1, Activity A. There is a one-to-one relationship between Phase 5 and a program.

Multiple Phase 5's within a computer procedure can be performed in parallel. Each will be used to write a program and perform a unit test. They will then be assembled as a string in Phase 6 and tested accordingly.

There may be unusual circumstances where it may be more practical to create sub-Phase 5's. This usually occurs when a single program is too large and complex to be administered by a single phase. In this situation, it may be necessary to subdivide Phase 5 into its subordinate modules.

Phase 5 represents the bottom of the Standard System Structure hierarchy. The intent is to produce the necessary software and to perform a unit test of the program. Following this phase, testing and implementation begins to revert back up the system hierarchy. In Phase 6, all of the programs in the computer procedure are assembled and tested as a string.

GENERAL DISCUSSION

SPECIFICATIONS

Prior to Phase 5, Software Engineering defined the logic for each program in the computer procedure. The level of definition was based on the method of implementation. If a program generator is to be used, then the specifications were developed to the level where the generator can produce source code in

Section 15

"PRIDE"-ISEM
PHASE 6
SOFTWARE TESTING

Systems are designed by 'explosion' and implemented by 'implosion'.
- Bryce's Law

The purpose of Phase 6 is to perform a test of all of the programs within the computer procedure. Several events occur during this phase:

• Test data from the various phase 5's are assembled.

• The programs are linked together and a test is performed to assure that the software performs according to the specifications as contained in the Phase 4-II "Computer Run Book."

• Test results are produced and reviewed with the sub-system designer and Quality Assurance. The results are then filed in the master copy of the Computer Run Book in the Technical Library.

METHODOLOGY NAVIGATION

A Phase 6 may be performed only after all of the Phase 5's in the computer procedure have been completed. There is normally a one-to-one relationship between Phase 6 and a computer procedure.

The formal deliverables resulting from Phase 6 will be the test data and test results, which is reviewed by the sub-system designer and Quality Assurance.

Phase 6 will then proceed to Phase 7 where it will rejoin the administrative procedures in a test of the entire sub-system.

GENERAL DISCUSSION

During the preceding phases of ISEM, primary emphasis was placed on the design or "explosion" of the system into its detail components. This phase and the succeeding phases are concerned with the "implosion" of the detail components into operating units for implementation, e.g., programs into procedures, and procedures into sub-systems.

The purpose of this phase is to test and correct errors in the computer procedure. This is sometimes called a "string test," "job stream test," or "stress test." Whereas the "unit test" performed in Phase 5 was concerned with data format, the emphasis in Phase 6 is on volume testing.

Testing within ISEM is performed in three parts: Unit testing of individual programs is conducted in Phase 5 by the programmer; the computer procedure test is conducted in Phase 6, normally by the computer procedure designer; and the sub-system test, of both administrative and computer procedures, is conducted in Phase 7 by the sub-system designer. Testing performed in this manner assures a continuity of

Section 16

"PRIDE"-ISEM
PHASE 7
SUB-SYSTEM TEST

How a system is implemented is of little importance if it solves the problem effectively.
- Bryce's Law

Sub-System testing represents a test of both the administrative and computer procedures in a sub-system. Several events occur during this phase:

- Test data from the previous phases are assembled.

- The procedures are tested in accordance with the Test Criteria of the Phase 3 "Sub-System Design Manual."

- Test results are produced and reviewed with Quality Assurance. They are then filed with the master copy of the Sub-System Design Manual in the Technical Library.

METHODOLOGY NAVIGATION

A Phase 7 may be performed only after Phase 4-I and Phase 6 have been completed. There is a one-to-one relationship between Phase 7 and a sub-system.

The formal deliverables resulting from Phase 7 will be the test data and test results, which are reviewed by Quality Assurance.

Phase 7 will then proceed to Phase 8 where it will rejoin other sub-systems and put into production.

GENERAL DISCUSSION

Testing in Phase 7 is performed in a similar manner as in Phase 6, except at a higher level. Whereas Phase 6 "Software Testing," is performed by Software Engineering for all of the programs within the computer procedure, Phase 7 is performed by Systems Engineering for all of the procedures in the sub-system, both administrative and computer.

During Computer Procedure Design, Software Engineering prepared the computer procedure that will be used by Operations. In order to test this procedure, it is recommended that DP Operations actually perform the tests under Software Engineering's direction. In this way, the operating procedures are tested along with the programs used to implement the procedure. Often the operating people will point out areas for procedure improvement.

During Phase 3, Systems Engineering specified a testing criteria for the overall sub-system. This in

Section 17

“PRIDE”-ISEM
PHASE 8
SYSTEM OPERATION

Systems are built by evolution, not by revolution.
The day a system is installed is the day it begins to undergo change.
- Bryce's Law

Phase 8 "System Operation" represents the point in the methodology where a system or groups of sub-systems are put into production. Several events occur during this phase:

• The system and data base are installed and a final test of the sub-systems is performed.

• Users are trained in the effective use of the system. This includes Data Processing Operations.

• The system is put into production.

METHODOLOGY NAVIGATION

A Phase 8 may be performed for either an entire system or for a group of sub-systems. It ultimately is based on the magnitude and complexity of the system, along with the delivery schedule of the project. Normally, one Phase 8 is performed for a single project. However, it is not unusual to have multiple Phase 8's; one for each grouping of sub-systems.

There is a one-to-one relationship between Phase 8 and a system.

The formal deliverables resulting from Phase 8 will be training aids which are reviewed by Quality Assurance.

From Phase 8 the project will proceed to Phase 9 where the system/project audit will be performed.

GENERAL DISCUSSION

The installation of a new information system can either be a frustrating, time consuming, traumatic endeavor, or it can be an orderly, well planned, rewarding experience.

NOW IS NOT THE TIME TO GRASP DEFEAT FROM THE JAWS OF VICTORY!

The more preparation and organization, the greater the chances are for a smooth installation and success.

INSTALLATION

A system can be installed either in its entirety or in groups of sub-systems. This permits the sub-systems

Section 18

“PRIDE”-ISEM PHASE 9 ISEM EVALUATION

Systems do not have a 'life cycle.' They may go on forever if kept viable with change. The only thing that has a 'life cycle' is a project which has a beginning for planning, a middle for execution, and an end for review.

- Bryce's Law

The purpose of this phase is to evaluate the system and project in terms of how well they were delivered as compared to what was proposed in the early phases of the methodology. Several events occur during this phase:

• The implemented system is analyzed in terms of how well it satisfies its requirements. Also, performance issues are evaluated. From this, strengths and weaknesses are evaluated.

• Project performance is evaluated in terms of how well the project met estimates, schedules and proposed costs. Further, an analysis of the project is prepared.

• A system evaluation report is prepared summarizing the phase findings and reviewed by management.

METHODOLOGY NAVIGATION

This represents the concluding phase of the ISEM project. It is performed either after Phase 8, or if a project has been discontinued earlier on (such as after Phase 1, 2 or 3).

The formal deliverables resulting from Phase 9 will be the "System Evaluation Report" which is reviewed by Quality Assurance prior to being issued to management.

GENERAL DISCUSSION

During Phases 1, 2 and 3, Systems Engineering prepared the "System Study and Evaluation Report," "System Design Manual" and "Sub-System Design Manuals." On the basis of these reports, management either approved or disapproved the project for design and implementation of the system.

If the project was disapproved, the reasons are outlined during this phase and placed with the original documentation for future reference. If the project was approved, this approval was given as a result of certain expectations outlined within the reports. The purpose of this evaluation is to determine if these expectations were realized.

Section 19

"PRIDE"-DBEM DATA BASE ENGINEERING METHODOLOGY

A Data Base is all of the data needed to support the information requirements of an enterprise, regardless of where used or how stored. By this definition, all companies have a data base; some are managed, most are not.
- Bryce's Law

The "PRIDE"-Data Base Engineering Methodology (DBEM) is an important part of an overall philosophy of Information Resource Management (IRM) as defined by "PRIDE". This involves the development and control over all of the resources required to produce information. Whereas the "PRIDE"-Enterprise Engineering Methodology (EEM) is principally concerned with developing an Enterprise Information Strategy, methodologies such as DBEM and the "PRIDE"-Information Systems Engineering Methodology (ISEM) are concerned with actually creating the data and system resources needed to produce information.

The intent of any of the "PRIDE" methodologies, including DBEM, is to define the business environment as to "Who" is to perform "What," "When," "Where" and "Why" (the "5-W's"). As a result, it is used to convert a heterogeneous operating environment into a homogeneous environment. This improves communications and promotes cooperation and teamwork throughout an enterprise. Better organization and discipline also enhances the ability to build quality products and make effective use of resources. In addition, to the 5-W's, the methodology provides "How" to perform the work by providing a variety of techniques and tools deployed throughout the methodology. A methodology, therefore, resembles an assembly line where work is performed in manageable stages.

DBEM is a generic and universally applicable approach for building any type of data base, regardless of industry, type of application, software language/ technique, or data base tool. A Data Base Management Systems (DBMS) is not a prerequisite for DBEM. The methodology is based on tried and proven approaches that are so fundamental to sound data base design that tailoring to individual development requirements is not only unnecessary but highly undesirable.

CONCEPTS & PHILOSOPHIES

INTRODUCTION

Data is one of the resources needed to produce information. This implies that Data exhibits distinctively different characteristics than Information. Information represents the intelligence or insight needed to support business actions and/or decisions. A data element by itself is meaningless. It is used to define the facts and events about a business. Data identifies and describes the objects of importance to the enterprise, such as products, orders, customers, vendors, parts, billings, payments, shipments, etc. It is also used for quantitative purposes in measurements and calculations. A single information requirement, thereby, represents an assemblage of these business facts presented in a specific context and time frame. In this respect, data represents the raw material needed to produce information. Obviously, one data element can support many information requirements. Because of this, it is necessary to manage data like any other resource.

Data is the binding force behind information systems. The only way systems communicate, either internally or externally to other systems, is through data. For this reason alone, data must be controlled to promote sharing between information systems.

The management of data as a resource begins with a corporate attitude and disposition, not with an elaborate set of tools. Data Resource Management requires the same perspective as managing the parts department of a manufacturing company. The objective is twofold: to classify and standardize resources so they may be shared by multiple applications, and; to control the collection, storage and distribution of resources to minimize overhead. Both are concerned with the efficient and cost effective use of resources.

Under DBEM, a data base is defined as all the data required to produce information, regardless of where the data is used or how it is stored. From this perspective, all companies have a data base. In fact, the day a company begins to conduct business is the day its systems and data base are born. Both evolve with the business over time as the company's information needs change.

Data Resource Management is another area where corporate management has abdicated its responsibilities to technicians who have turned a simple concept into an esoteric technical practice. As computer technology evolved, several physical file management techniques were introduced to manage data on the computer, most notably the Data Base Management System (DBMS). The intent of the DBMS is to physically store and retrieve data for use in computer programs. In fact the term "DBMS" is a misnomer since it only deals with data on a direct access device (disk). It does not deal with data on other devices, such as tape files, card files, manual files, etc. Therefore, it does not manage the entire data base, only a portion of it. Nor does it do any logical file management which is more important than the physical file management.

Although the DBMS was originally designed to permit the sharing of data among applications, this has seldom been implemented. Due to a lack of management discipline, the DBMS is one of the most abused and misapplied products in the industry. It is typically used as nothing more than an elegant file access method, not as a tool for integrating systems.

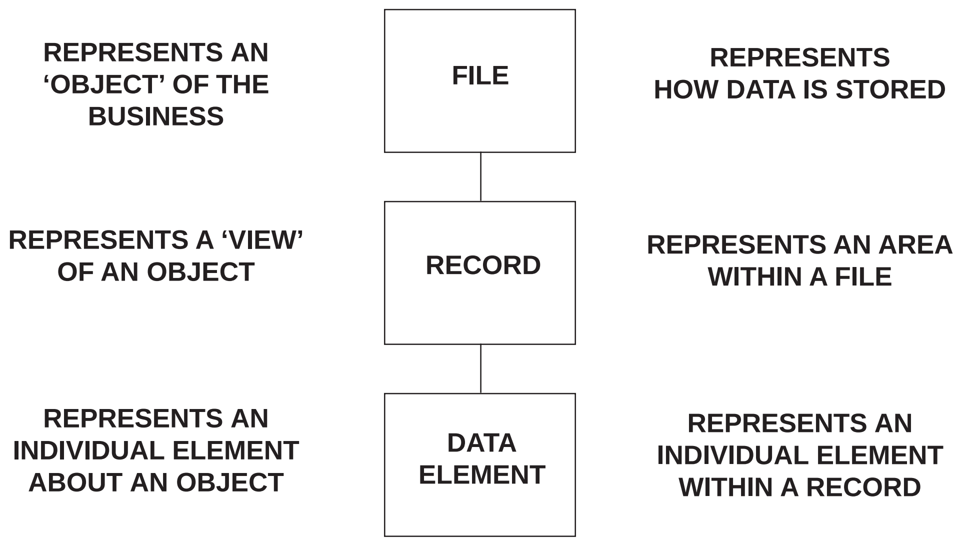
What this points out is that companies have been taking a tool oriented or physical approach to managing data. Despite the considerable investment in DBMS technology over the last 25 years, very few companies have realized a managed data base environment. Why? Primarily due to management's failure to recognize and treat data as a reusable resource. Data Resource Management is a "materials management" issue, nothing more, nothing less.

Imagine a manufacturing company without a materials management function. Under this scenario, engineers would design products without consideration for the other products marketed by the company. Each product would be designed with a unique set of parts. Inevitably, many duplicate parts would be designed. Without some form of coordination, there would be significant overhead and waste from collecting and storing redundant parts. Also, because no formal control mechanism existed to track parts, implementing changes to parts consistently throughout a product line would be a haphazard endeavor.

This is exactly the situation that occurs during traditional systems development. Each analyst and programmer is permitted to design data bases unique to their application. The result: rampant data redundancy throughout the organization. There is a natural tendency for an analyst to do only what is best for

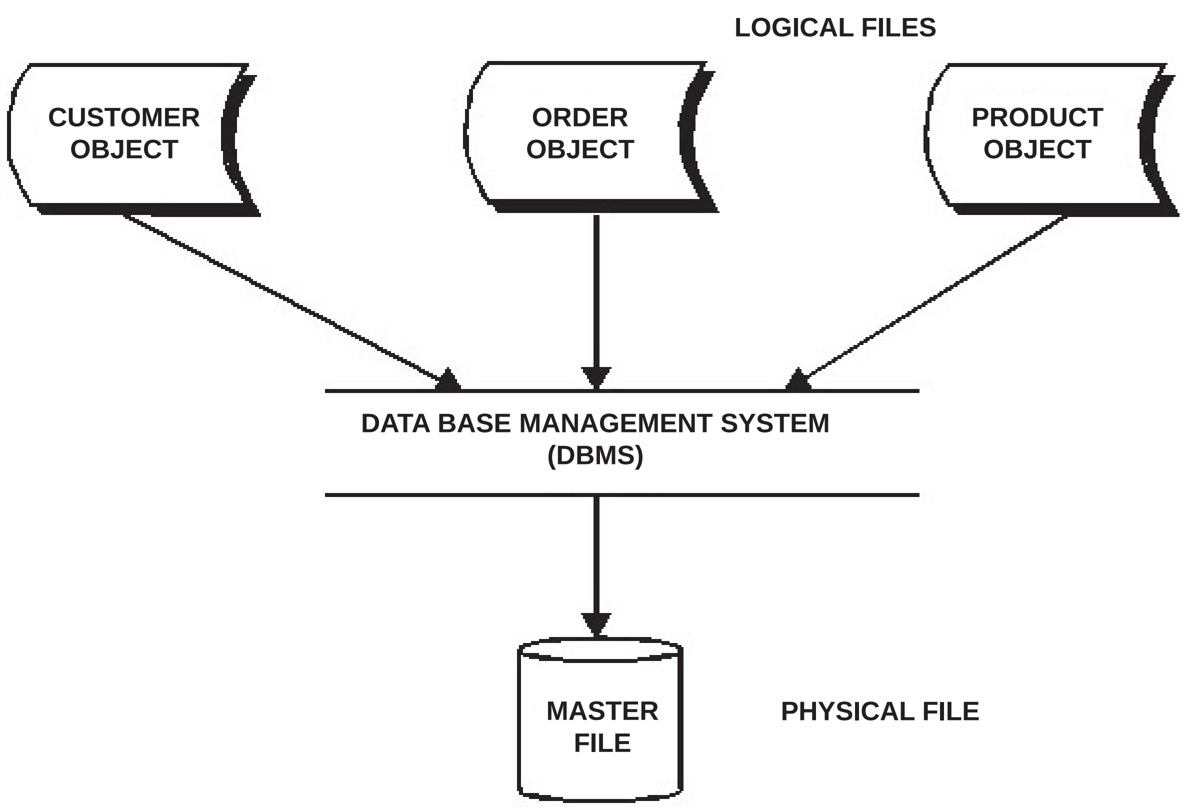
LOGICAL/PHYSICAL CHARACTERISTICS

LOGICAL ***PHYSICAL***



There is not necessarily a one-to-one relationship between logical and physical

LOGICAL TO PHYSICAL RELATIONSHIPS



can be deviated from in an application record. In other words, the primary physical representation of "Unit Cost" is expressed as an eight character numeric to conform to the "currency" domain. However, in one application, a user desires the data element be expressed as a ten character numeric. It is the same logical data element with just another form of physical expression.

With a classification system in place, data elements can then be uniquely and consistently defined. When this is done, we then have a basis for checking data redundancy. Also, when a data element has been properly specified in this manner, it becomes rather simple to locate it again for use in other applications.

Classifying data helps to fulfill one of the the major objectives of Data Resource Management: to eliminate redundancy and promote the re-use of resources in applications.

SUMMARY OF MAJOR DBEM CONCEPTS

• DATA IS A RESOURCE THAT MUST BE MANAGED AND CONTROLLED LIKE ANY OTHER RESOURCE. SYSTEMS COMMUNICATE THROUGH DATA.

• THE MISSION OF DATA RESOURCE MANAGEMENT IS TO STANDARDIZE AND CONTROL DATA RESOURCES IN THE MOST COST-EFFECTIVE MEANS POSSIBLE.

• BASIC CONSTRUCTS - Data Base, Files, Records, Data Elements

	LOGICAL	PHYSICAL
FILE	Represents an "object" of the business.	Represents how data is stored.
RECORD	Represents views of the "object."	Represents an area within the File.
DATA ELEMENT	Represents an individual element about an object.	Represents an individual element within a record.

There is not necessarily a one-to-one relationship between logical files and physical files. However, the logical is used to design the physical.

• THERE ARE TWO TYPES OF "OBJECTS": Facts and Events.

-FACTS are Name/Location oriented (tangible things).

- EVENTS are Date/Time oriented (intangible actions) and represent some form of interaction between two or more factual objects.

• AN OBJECT HAS ONE DATA ELEMENT USED TO UNIQUELY IDENTIFY THE OVERALL OBJECT, THIS IS REFERRED TO AS THE "Primary Basic Grouping."

• A FACTUAL OBJECT TYPICALLY RELATES TO ANOTHER FACTUAL OBJECT THROUGH AN EVENT:

```
CUSTOMER ------- ORDER ------- PRODUCT
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• THREE TYPES OF VIEWS WITHIN AN OBJECT:

- IDENTIFICATION VIEW - all objects will have one.

- CHARACTERISTIC VIEW - describes an object and is typically associated with a factual object.

- RELATIONSHIP VIEW - establishes a relationship between two or more objects. Will typically apply to event related objects.

ONLY PRIMARY DATA IS STORED IN A LOGICAL RECORD; GENERATED DATA CAN BE DERIVED FROM PRIMARY DATA.

• BASIC GROUPING: The key to a logical record. It is used...

- As the principal criteria for combining logical records into logical files (based on the primary basic grouping data element).

- As the principal criteria for establishing relationships between logical records (based on secondary keys).

- To give meaning to descriptive and quantitative data.

• THE ASSIGNMENT OF THE BASIC GROUPING INCLUDES:

- The Primary Basic Grouping; a primary/indicative data element used to identify an object in its entirety.

- Secondary Key, to either:

1. Establish a relationship to other objects (a Foreign Key); object-oriented data elements are thereby used.

2. To identify a specific view within an object (a qualifying key to note a single occurrence of data). A view-identifier data element is used.

• THERE ARE FOUR DATA BASE MODELS;

1. ALDBM - Application Logical Data Base Model - all of the primary data needed to satisfy the information requirements of a system.

2. ELDBM - Enterprise Logical Data Base Model - all of the primary data needed to satisfy all of the applications (the global view).

3. EPDBM - Enterprise Physical Data Base Model - represents how all corporate data is physically stored.

4. APDBM - Application Physical Data Base Model - represents how data for a single system is physically stored. It also represents a subset of the EPDBM.

• DATA HAS ONE LOGICAL DEFINITION, BUT CAN HAVE MORE THAN ONE PHYSICAL REPRESENTATION.

• TYPES OF DATA:

- INDICATIVE - to uniquely identify and control objects, in part or in full. This will include data elements to either identify a whole object or a single view.

- DESCRIPTIVE - to describe objects.

- QUANTITATIVE - numeric values used in calculations.

• FORMS OF DATA:

- PRIMARY - data assigned from a user area; outside a system.

- GENERATED - data derived from other data values; either from calculations or group (concatenated data).

• ONLY PRIMARY/INDICATIVE DATA CAN BE USED IN THE BASIC GROUPING OF A LOGICAL RECORD. Group data elements cannot.

• DATA TAXONOMY - a hierarchical structure used to classify data elements. The intent is to eliminate redundancy.

• DOMAIN - the lowest level in the Data Taxonomy. A collection of data elements exhibiting common characteristics.

Section 20

"PRIDE"-DBEM PHASE 1 DATA BASE STUDY & EVALUATION

Data is stored; Information is produced.
- Bryce's Law

The purpose of this phase is to specify and analyze a data base related problem and/or opportunity, and to propose to management a viable solution. It is the most critical phase of the DBEM methodology. Several events occur during this phase:

- The scope of the DBEM project is defined.
- An analysis of the current data base is performed.
- Information requirements are reviewed and updated as required.
- A data base approach is defined for satisfying the requirements. The approach may include new development, modifications/improvements to existing data base, a packaged solution, or combinations of all three.
- An evaluation of alternatives is prepared, including estimates, costs, and schedules.
- A formal review with management is conducted to verify the phase findings.

METHODOLOGY NAVIGATION

A DBEM Phase 1 is normally initiated by an Objective as defined by the Enterprise Information Strategy (EIS). This strategy was developed during Phase 4 of the Enterprise Engineering Methodology (EEM) and is issued to Data Resource Management during EEM's Phase 5. The Objective defines the business problem/opportunity to be addressed by the project, which typically relates to new development, modification/improvements, or maintenance.

DBEM related projects are initiated primarily in support of ISEM related projects. However, special projects can be initiated to prepare tentative descriptions of Objects and Views in support of the Information Requirements and Functional Entities identified under EEM.

As an adjunct to an ISEM project, there are two ways of treating a DBEM project: either establish a separate DBEM specific project, or; include DBEM phases within an ISEM project. In most situations, the Data Resource Management organization tends to man

Section 21

“PRIDE”-DBEM PHASE 2 APPLICATION LOGICAL DATA BASE DESIGN

A data element has only one logical definition, but may be represented physically in many different ways.
- Bryce's Law

The purpose of this phase is to design or modify an Application Logical Data Base Model (ALDBM) for an information system. Several events occur during this phase:

- Application Logical objects are defined, complete with views, and data elements.

- Relationships between objects are established via the views.

- A schematic of the Application Logical Data Base Model is prepared and reviewed for accuracy.

- A technical review of the Application Logical Data Base Model is performed to validate its integrity.

METHODOLOGY NAVIGATION

A Phase 2 is initiated following a Phase 1. There is a one-to-one relationship between Phase 2 and an information system. In other words, a Phase 2 will be executed for each system identified in Phase 1 (normally there is just one).

The formal deliverable resulting from Phase 2 is an "ALDBM Design Manual" consisting of a description of the Application Logical Data Base Model. This is reviewed with Data Resource Management who must decide whether to:

- Approve the project for continuation.

- Request revisions to the phase findings.

- Discontinue the project.

Following Phase 2, the DBEM project will proceed to Phase 3, "Enterprise Logical Data Base Design," where the Application Logical Data Base Models will be merged into the Enterprise model.

Section 22

"PRIDE"-DBEM PHASE 3 ENTERPRISE LOGICAL DATA BASE DESIGN

Data Resource Management is a neutral third party who represents the enterprise's overall interests, not just a single application.
- Bryce's Law

The purpose of this phase is to design or modify the Enterprise Logical Data Base Model (ELDBM). Several events occur during this phase:

• Enterprise Logical objects are defined, complete with views, and data elements.

• Relationships between objects are established via the views.

• Relationships between the ELDBM and pertinent ALDB Models are established.

• A schematic of the Enterprise Logical Data Base Model is prepared and reviewed for accuracy.

• A technical review of the Enterprise Logical Data Base Model is performed to validate its integrity.

METHODOLOGY NAVIGATION

For normal application development projects, a Phase 3 is performed following Phase 2. The one exception to this is when a special project is subsequently performed from an EEM related project. The phase 3, therefore, is used to define a preliminary set of enterprise level objects.

There is a one-to-one relationship between Phase 3 and the Enterprise Logical Data Base Model as represented by an FD resource in the IRM Repository.

The formal deliverable resulting from Phase 3 is an "ELDBM Design Manual" consisting of a description of the Enterprise Logical Data Base Model. This is reviewed with Data Resource Management who must decide whether to:

Section 23

“PRIDE”-DBEM PHASE 4 ENTERPRISE PHYSICAL DATA BASE DESIGN

Whereas the logical Data Base will remain relatively static, the physical data base changes dynamically.
- Bryce's Law

The purpose of this phase is to design or modify the Enterprise Physical Data Base Model (EPDBM). Several events occur during this phase:

• A method of implementation is selected to physically store data to satisfy the logical data base models.

• Enterprise Physical files are defined, complete with records and data elements.

• Relationships between physical files and records are established.

• Relationships between the EPDBM and ELDBM are established.

• A schematic of the Enterprise Physical Data Base Model is prepared and reviewed for accuracy.

METHODOLOGY NAVIGATION

A Phase 4 is initiated following completion of a normal Phase 3 (ISEM related). There is a one-to-one relationship between Phase 4 and the Enterprise Physical Data Base Model as represented by an FD resource in the IRM Repository.

The formal deliverable resulting from Phase 4 is an "EPDBM Design Manual" consisting of a description of the Enterprise Physical Data Base Model. This is reviewed with Data Resource Management who must decide whether to:

• Approve the project for continuation.

• Request revisions to the phase findings.

• Discontinue the project.

Although the intent of the three DBMS' is to promote the sharing of data and simplify data access, their implementations are significantly different. To illustrate:

DBMS PROS AND CONS

Feature	HIERARCHICAL	NETWORK	RELATIONAL
ACCESS PATH	Tree Processing.	User defined chains; can be extensive.	Based on selected keys.
REFERENTIAL INTEGRITY	Excellent.	Good if chains are well maintained.	Good; shows promise.
DATA SHARING	Hindered due to complicated global DB. Multi data bases normally occur.	Good. Maintaining global DB	Excellent. Encourages sharing.
PROCESSING CONSIDERATIONS	Excellent for heavy transaction volume.	Excellent for heavy transaction volume.	Slower for heavy transaction volume. Consumes resources.
DEVELOPMENT CONSIDERATIONS	Harder to develop. Mostly supports procedural languages.	Harder to develop. Mostly supports procedural languages.	Easier to develop. Supports both procedural & non-proc lang.
MISCELLANEOUS	No standard. Predominantly IBM's IMS.	CODASYL standard. Many packages.	SQL Standard-ANSI. Trend is to relational.

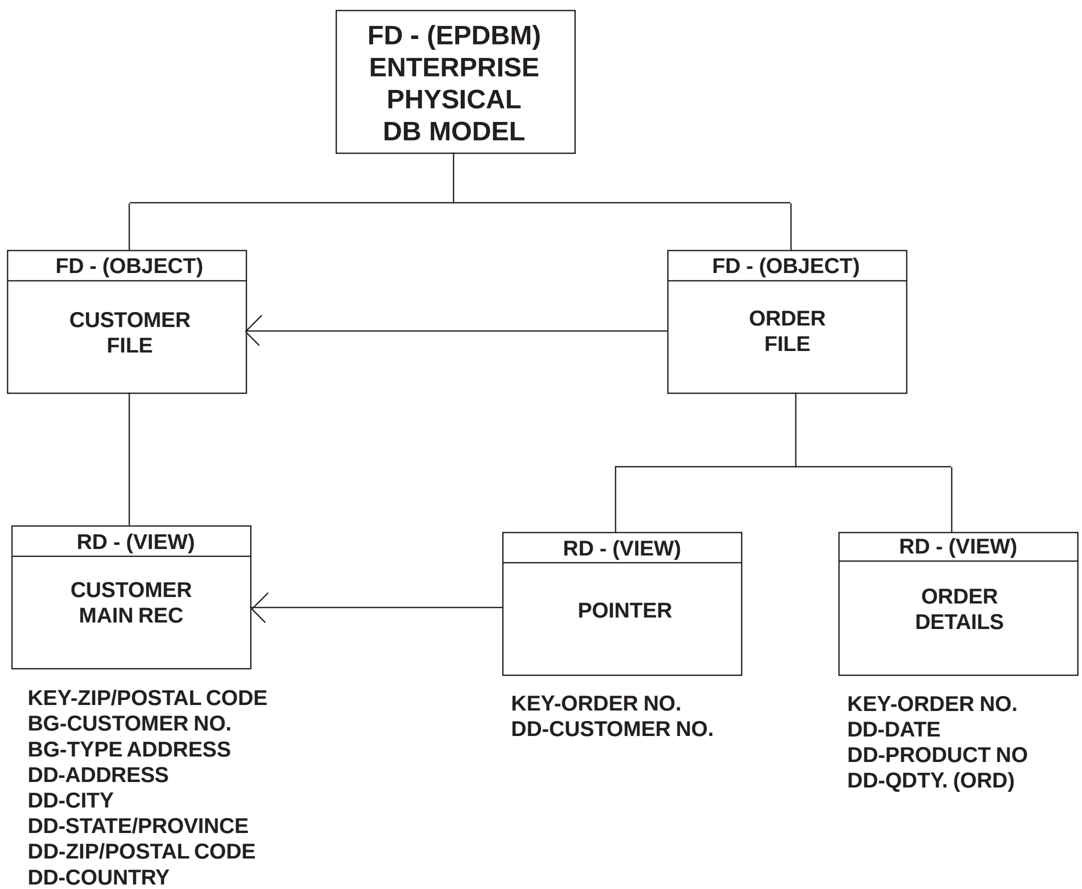
Obviously there are trade-offs between the various approaches. One is not necessarily better than the other. Bottom-line: Data Base Administration must resolve how well the DBMS fulfills the data and processing requirements of the various applications.

In order to represent the different structures found in the major DBMS products within a standard framework, it is necessary to draw a correspondence among the various levels of aggregation they support. The table below shows such a correspondence and the IRM resources used to represent them:

IRM Resources	**Flat File**	**Hierarchical (IMS)**	**Network (CODASYL)**	**Relational (DB2)**
DD	Field	Field	Field	Attribute
RD	Record	Segment	Record	Table
FD	File	Physical DB	Area	Tablespace
FD		Logical DB	Schema	Database

While the first two levels (field and record) are quite similar for most DBMS packages, the clustering provided by an IMS Physical Data Base, a CODASYL Area or a DB2 Tablespace are quite different. However, these and higher level aggregations are still represented as FD resources.

ENTERPRISE PHYSICAL DATA BASE MODEL (EPDBM)
BASIC CONSTRUCTS



NOTES: The pointers represent relationships between the various resources as physically recorded in the IRM. RD-to-RD and FD-to-FD relationships depend on the selected file management technique.

- FD represents File Description
- RD represents Record Description
- KEY represents the "Sort/Access Key" data elements.
- DD represents Data Definitions

Section 24

“PRIDE”-DBEM PHASE 5 APPLICATION PHYSICAL DATA BASE DESIGN

A Data Base should naturally evolve over time and synchronize with all Information Systems.
- Bryce's Law

The purpose of this phase is to design or modify an Application Physical Data Base Model (APDBM) for an information system. Several events occur during this phase:

- Application Physical files are defined, complete with records, and data elements.

- Relationships between physical files and records are established.

- Data Resource Layouts, and program file structures are provided to Software Engineering for inclusion in programs.

- Data structures in the APDBM are related to those in the EPDBM and ALDBM.

- A technical review meeting is performed to validate the integrity of the APDBM and to issue file layouts to Software Engineering.

METHODOLOGY NAVIGATION

A Phase 5 is initiated following Phase 4. There is a one-to-one relationship between Phase 5 and an information system. In other words, a Phase 5 will be executed for each system in the project (normally there is just one).

Even if the scope of the project is to only modify a small portion of a system (such as a single sub-system, procedure, program or module), the whole system identifier should be used.

The formal deliverable resulting from Phase 5 is an "APDBM Design Manual" consisting of a description of the Application Physical Data Base Model. This is reviewed with Data Resource Management, Project Management, Data Communications Administration and Software Engineering.

Following Phase 5, the DBEM project will proceed to

Section 25

"PRIDE"-DBEM
PHASE 6
DBEM EVALUATION

Most organizations use a DBMS as nothing more than an elegant file access method. Consequently, the opportunity to share data and integrate systems is lost.
- Bryce's Law

The purpose of this phase is to evaluate the data base and project in terms of how well they were delivered as compared to what was proposed in the early phases of the methodology. It is similar in intent to Phase 5 of EEM "EEM Evaluation" and Phase 9 of ISEM "ISEM Evaluation." Several events occur during this phase:

• The data base is analyzed in terms of how well it satisfies its requirements. Also, performance issues are evaluated. From this, strengths and weaknesses are evaluated.

• Project performance is evaluated in terms of how well the project met estimates, schedules and proposed costs. Further, an analysis of the project is prepared.

• A data base evaluation report is prepared summarizing the phase findings and reviewed by management.

METHODOLOGY NAVIGATION

This represents the concluding phase of the DBEM project. It is performed either after Phase 5, or if a project has been discontinued earlier on (such as after Phase 1, 2 or 3).

The formal deliverables resulting from Phase 6 will be the "DBEM Project Evaluation Report" which is reviewed by Quality Assurance prior to being issued to management.

GENERAL DISCUSSION

During Phase 1 Data Engineering and Project Management prepared the "Data Base Study and Evaluation Report." On the basis of these reports, management either approved or disapproved the project for design and implementation of the data base.

If the project was disapproved, the reasons are out

Section 26

"PRIDE" PROJECT MANAGEMENT

Manage from the bottom-up, not just from the top-down; this creates personal commitment and accountability.
- Bryce's Law

CONCEPTS & PHILOSOPHIES

If we lived in a perfect world, there would not be a need for managers. Everyone would know precisely what their assignments were and would successfully accomplish them on time and within budget. However, the reality is we live in an imperfect world. We as human beings make mistakes; we work on multiple assignments concurrently, and require guidance. It must be recognized from the outset that project management does not come free. Nor does it come naturally to people.

Traditionally, the typical approach to project management has most often been to find a project manager, provide resources, and then give them an assignment with no direction as to how the project will be conducted or controlled. With this approach, the success or failure of the project is dependent on the abilities and experience of the project manager and how well the manager can organize and train the project team, plan the project, estimate, etc. Consequently, there is significant trial and error in the process. This approach usually results in a unique method for the particular project because it reflects the thinking of the project manager. Different managers use different techniques and ideas.

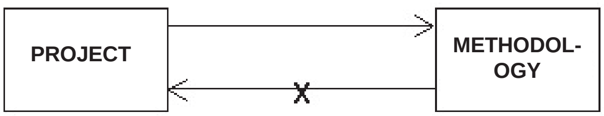
Another common approach used was the "brute-force approach." Simply stated, *"I don't care how you get the job done; just have it completed by (date)."* This approach shows a lack of sensitivity to the complexity of project management.

There is more to project management than maintaining costs and time schedules. It is the process of applying resources to a defined goal and attaining this goal within time and cost objectives. Fundamentally, it is a people oriented function as opposed to an administrative or clerical function. Project management, therefore, is not a tool or technique, but rather a philosophy of management.

To put it into proper perspective, project management is analogous to the production control function in manufacturing, which is concerned with controlling the orderly assembly of products. This involves monitoring the assembly lines and assuring that materials management delivers the necessary parts to the assembly lines on time and within reasonable cost. Project management is to a methodology, what production control is to an assembly line. Without the assembly line, production control is a useless exercise. Conversely, without a methodology, project management is useless.

The ultimate test of a methodology is if it can operate independent of project management. The two are not synonymous. Although they work in concert, there are distinct differences. Whereas a methodology dictates what work is required, project management controls the application of work. Just as an assembly line can produce a product without production control, a methodology can produce a product without project management. Therefore, a methodology is independent of project management, but project management is totally dependent upon a methodology.

A PROJECT REQUIRES A METHODOLOGY



BUT A METHODOLOGY DOES NOT REQUIRE A PROJECT

A project is an application of effort towards prescribed objectives through the execution of a defined sequence of events. All projects have a life cycle; a beginning for planning, a middle for execution, and an end for review. Each project has a unique scope, set of objectives and defined sequence of events. These events are defined by a methodology, whether it is to develop enterprise resources (as in EEM), system resources (as in ISEM), or data resources (DBEM). The methodology thereby is the "roadmap" for a project. It provides organization and direction for the project.

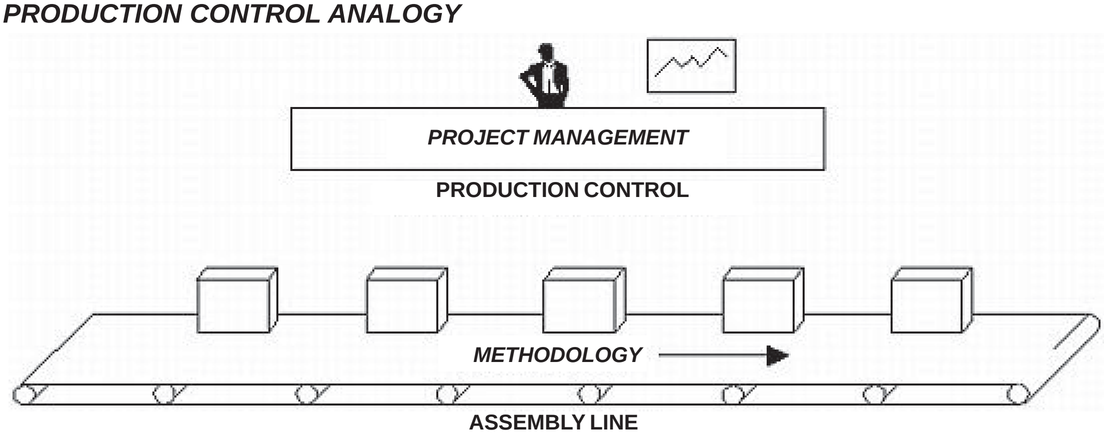
Project managers must recognize that they are in the business of solving problems, not creating problems. They do not wait for things to happen, they make things happen. This "active" versus "reactive" management philosophy distinguishes management from supervision. Whereas management assigns and reviews work to assure that goals are met, supervision is responsible for implementing the assigned work and directing the daily activities of others. Problems arise when there is more time spent on supervision than on managing and actually performing the work. This phenomenon occurs when people are improperly trained and/or when they are not held accountable for their actions.

MINI-PROJECT MANAGER CONCEPT

At the root of the problem is the issue of accountability and commitment. Historically, companies have taken a unidirectional approach to management. Assignments, estimates and schedules are dictated by management with little concern for the opinion of the people who have to perform the work. This typically results in unrealistic estimates and schedules that are seldom achieved. Why? Because the individual human resources were not consulted and made accountable for achieving the goals. Workers may even go so far as to undermine project plans simply because they were not consulted.

Instead, companies must learn to manage from the bottom-up, not just top-down. We refer to this approach as the "Mini-Project Manager" concept. Under this approach, people are treated like professionals and are expected to act as such in return. It emphasizes less supervision and more personal management by the individual worker. Employees must

PRODUCTION CONTROL ANALOGY



Section 27

“PRIDE”
PROJECT PLANNING

You cannot put two quarts of liquid into a one quart bottle. If you try, you will lose a quart.
- Bryce's Law

INTRODUCTION

We as human beings have a natural aversion to planning of any kind. Some of us cannot plan a day of activities, let alone a week, month, year, etc. This is primarily due to an inherent resistance to organizing and structuring our activities. Planning requires discipline, something that is sorely lacking in most information systems organizations. To obtain the results of planning requires an expenditure of time and some serious thinking. There is no "free lunch."

Projects are often preordained to failure before they even start, simply due to the lack of effective planning. This may be caused by our temptation to *"leap before we look."* Emotional desire must be overcome by logical fact in order for planning to succeed.

In order to perform project planning, we must resolve the following questions:

• What is the scope of the project? - The scope must state the project's objectives and the parts of the organization involved, both directly and indirectly.

• What are the steps required to meet the project's objectives? The old adage is true, *"If you don't know where you are going, any road will take you there."* Performing work in a logical sequence gives direction to the project. The inability to do so results in lost time and effort. Therefore, not only do the required steps in a project need to be defined, but the precedent relationships within a project must also be defined. The methodology thereby becomes the "roadmap" for the execution of the project.

• What are the deliverables and benchmarks of the project? In order to verify that a particular project task has been completed, it is necessary to substantiate that all aspects of the task have successfully been executed. An impartial and objective mechanism that checks the completeness of tasks is necessary. It is important to demonstrate tangible results from our project efforts in the form of accomplishments and deliverables. A**ny task that does not result in a reviewable or tangible result is an unnecessary step that should be eliminated.**

• What resources are required to perform the work? Assigning the correct resources to the appropriate work steps is a critical factor in every project. By properly defining the work steps and the benchmarks, it is possible to clearly identify the skills required to execute the steps. Resources with the appropriate skills and availability can then be assigned to the project tasks.

GENERAL DISCUSSION

WORK BREAKDOWN STRUCTURE (WBS)

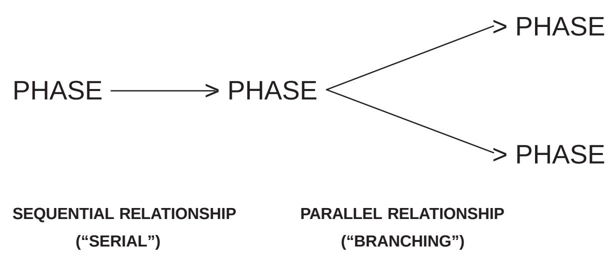
All projects have a structure depending on the methodology used. The methodology defines what is going to be produced. It can be as simple as one step or as extensive as several phases involving multiple activities and tasks. The methodology represents the selected approach for implementing a project. It is structured into a hierarchy consisting of one or more phases of work. A phase represents a major "key event" or milestone in the project. Each phase consists of one or more activities representing "sub-events" required to meet the milestone. Each activity consists of one or more operational steps or tasks representing the individual actions to be taken in the project.

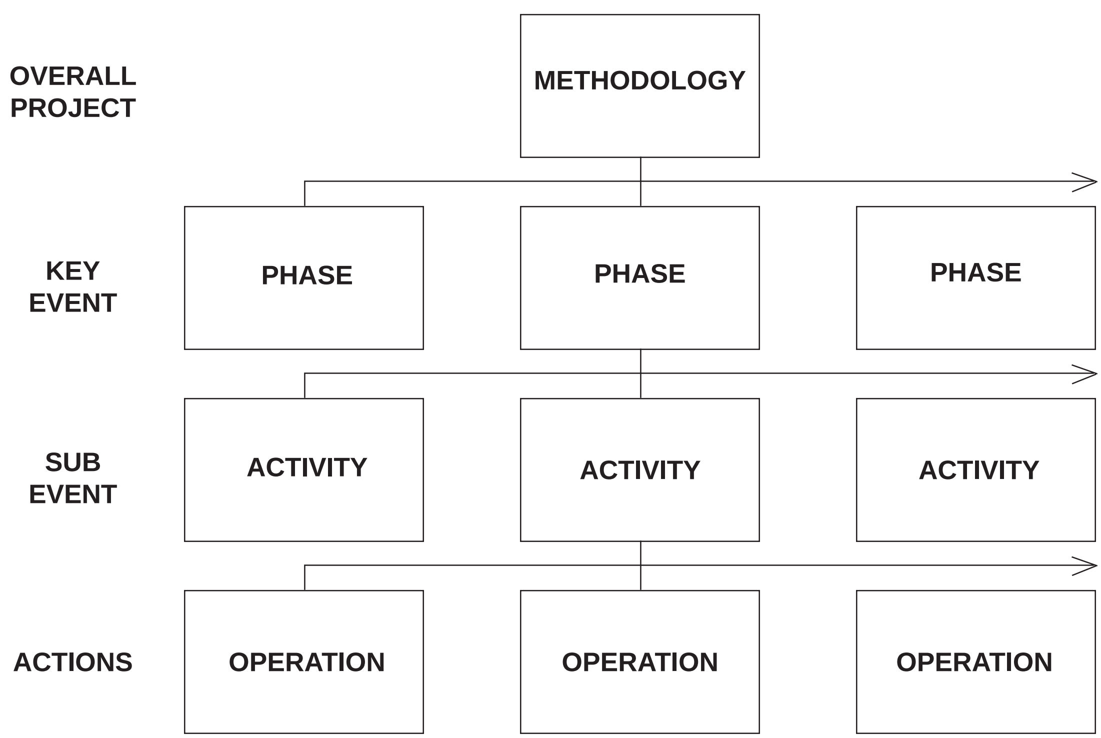
The level of detail required to perform a project is ultimately left to the discretion of the Project Manager. If a simple project, perhaps the manager will only define a phase with a few activities. However, if a project is large and complex, the manager may wish to define and manage at the operation level.

PRECEDENT RELATIONSHIPS (DEPENDENCIES)

Up to this point we have only defined WHAT work is involved, not its sequencing. A methodology defines not only the various units of work, but also dependencies between the worksteps. Such dependencies are referred to as "precedent relationships."

Project worksteps may be conducted either sequentially, in parallel, or combinations of the two. Precedent relationships define what worksteps precede and succeed a single workstep.





Each phase, activity and operation of a methodology should produce a reviewable result (work product) to substantiate completion of assignments. Otherwise, a methodology becomes a meaningless series of tasks.

Section 28

“PRIDE” PROJECT ESTIMATING

Most estimating errors are errors of omission, not commission. It's what we forget to estimate that gets us in trouble.
- Bryce's Law

INTRODUCTION

Estimating is one of the most controversial subjects in project management. There are some people who have turned the subject into a cryptic science involving esoteric techniques bearing a close resemblance to "voodoo."

Estimating is simply the process used to determine the amount of effort and cost required to implement a project, in part or in full. It is important to acknowledge that estimating is fundamentally an effort at projecting the future. Like all projections, the more facts and information available, the better the estimate. There is a natural human tendency to avoid making estimates because estimates are commitments, and people tend to shy away from commitments, particularly when they are not sure of the facts. Nevertheless, little progress would be made if we never attempted to plan for the future.

Most estimating errors are errors of omission, not commission. It is what we forget to estimate that often leads to problems. Methodologies, with their defined structure, materially assists with eliminating some of the unknowns when estimating. They provide frameworks and structures that act as checklists for estimating. Methodologies isolate the activities that have to be performed into small enough increments, thereby minimizing the margin of error.

An estimate improves in accuracy in direct relation to the level of detail considered. A methodology defines the sequence by which parts are assembled. For example, a construction methodology identifies all of the resources of a product, such as lumber, steel, glass, etc. and how they are assembled. An IRM related methodology specifies the sequence by which data elements, records, files, inputs, outputs, processes, etc. are assembled. This provides the ability to use a "bill of materials" technique to count all of the resources in the product and develop an estimate for the project, in part or in full, based on the standards developed for completing and/or installing a resource. This is why the "PRIDE" methodologies put in emphasis on "rough designs" in the early phases of work. At this time, the Project Manager is asked to consider:

• The number and types of NEW resources to be created.

• The number and type of existing resources requiring MODIFICATION.

• The number and type of existing resources that can be RE-USED as is (no modification required).

To illustrate, in a "PRIDE"-ISEM Project (Phase 1), a complete "rough design" of the envisioned system is

Section 29

"PRIDE" PROJECT SCHEDULING

Time lost is time lost forever; You cannot buy it back.
- Bryce's Law

INTRODUCTION

Scheduling is a distinctly separate activity from estimating even though it depends upon accurate estimates. It is the process of converting direct hour estimates into date schedules. Scheduling includes the assignment of resources to tasks in the correct sequence to meet the objectives of the project. This is a complex process and one that is almost impossible without automation. In most organizations, there are many projects, resources and environmental conditions that can influence projects and cause the need for changes in schedules.

Scheduling is an iterative process of balancing the resources available against the time requirements established for the project. There are several variables involved:

- The direct hour estimate, either O-O-M or detail.

- The methodology for the project, as defined by the key events of the project.

- The human resources to be used on the project, with their effectiveness rate, current schedule, and skills and proficiencies.

- Project priorities as established by executive management.

- A corporate calendar which notes weekends, holidays, shutdowns, etc.

As an example of how a schedule is calculated, assume that there is a professional working on an assignment with an estimate of 100 direct hours. If the individual's planned effectiveness rate is 70%, then the 100 hour estimate converts to a projected 142.85 elapsed hours required to complete the assignment. The elapsed hours in the normal business day is divided into the 142.85 and (using 8 hour work days) results in 17.85 business days required to complete the assignment. These 17.85 business days are applied to the corporate calendar which expresses weekends and holidays, also other commitments for the professional, such as vacations and other work assignments. Taking these into account, start and end dates are then determined.

If the end date is unsatisfactory to the manager, there are several possible alternatives which can be used to improve the schedule:

- Reduce the employee's indirect activities and increase their effectiveness rate.

- Schedule work on weekends and/or holidays.

- Add additional personnel or use alternative personnel.

- Increase the number of available hours in the business day (within reason of course).

- Or combinations of the above.

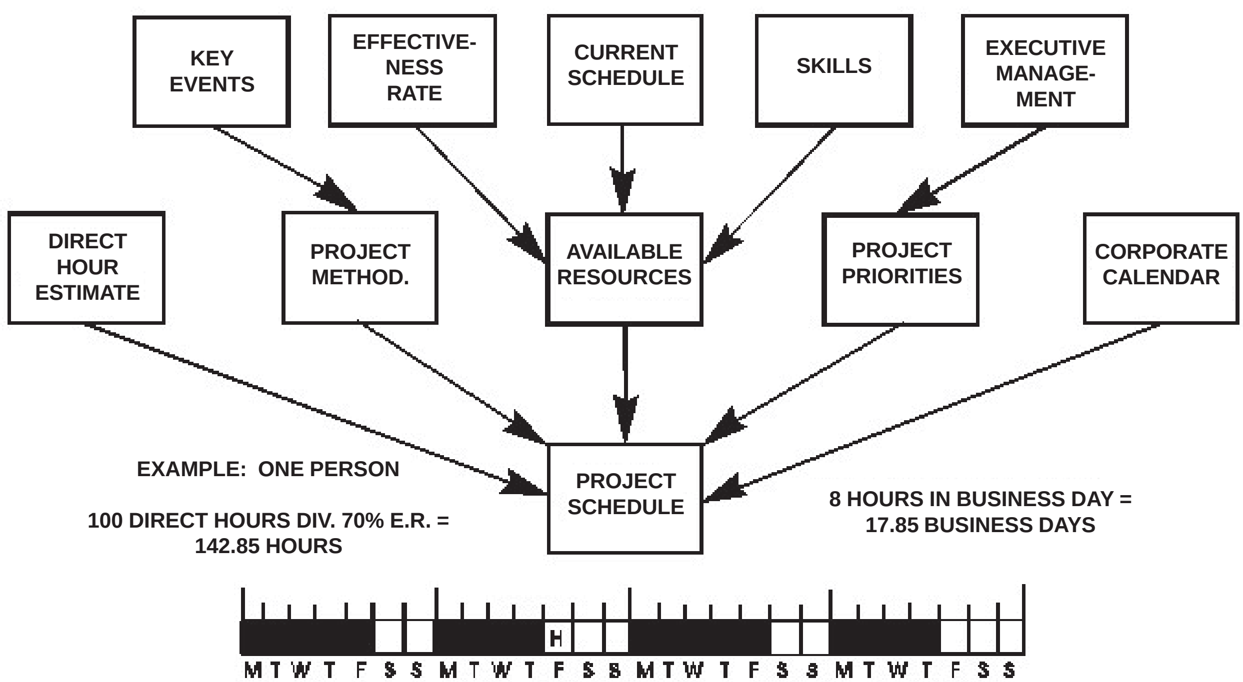
By understanding and adjusting the variables associated with a project, a project manager has the ability to play "what if" with a high degree of certainty.

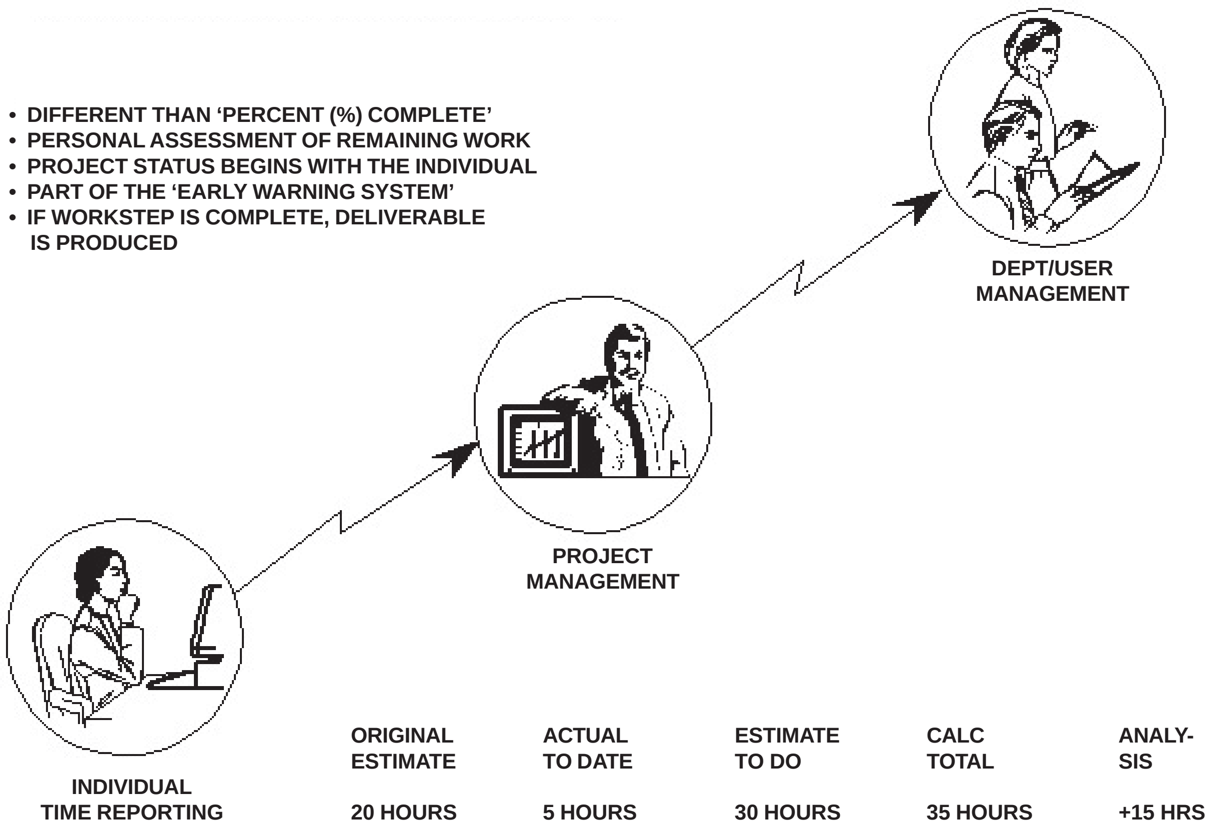
Scheduling is an activity that is greatly influenced by the concept of effectiveness rate. By examining the use of time, both direct and indirect, realistic schedules can be prepared. The "man hour" approach mentioned earlier does not take the environmental influences into consideration and assumes an effectiveness rate of 100%. Under this approach, the sample schedule would be completed in 12.5 business days as opposed to the 17.85 days mentioned. The difference is that effectiveness rate builds reality into the schedule. It does not make use of some esoteric "fudge factor" as typically used in relation to "man hours."

Time lost, is time lost forever. You cannot buy it back. Because of this, we must carefully manage the use of resources throughout the methodology of the project. The methodology defines the project network which may involve parallel and sequential work. The longest path in the methodology which is critical to the timely completion of a project is referred to as the "critical path." A project will always have a critical path until it is completed or closed. The path will not always be constant; it may vary depending on accomplishments. As one part of a project is concluded, the critical path may change to another branch of the project. Defining and monitoring the critical path is an essential part of project management, not only in scheduling, but in planning and control also.

PROJECT SCHEDULING

DEFINITION: The process of converting direct time estimates into date schedules.





viewed. If it has not been produced, the work is not completed.

This "estimated to do" approach overcomes the "99% complete syndrome," which is an estimate of the percent of work completed. The problem with this approach is that it is less than scientific. For example, the project may be 99% complete, yet it may take another year to complete the critical 1% remaining to work on the project. Under the "estimated to do" approach, with emphasis on deliverables, there is much greater accuracy in project reporting and control.

Requiring employees to prepare estimates, report time and personally assess remaining work creates accountability and commitment. It provides for the ability to manage from the bottom-up, not just from the top-down. The data prepared by the individual employee is "rolled up" through various levels of management reports; for example:

A blank copy of the "Time Distribution Worksheet" is included in the “Forms” section.

Section 31

“PRIDE”
PROJECT CONTROL

Projects will only be completed if people want to complete them,
- Bryce's Law

NTRODUCTION

"You only get out of project management what you put into it." Without follow-up, there is little point to managing a project. Although project management is an on-going process, it is important that project status reports be prepared and reviewed on a routine basis for consistency. A weekly time frame is perhaps the best cycle to routinely evaluate project progress. A monthly reporting cycle may not detect project errors in time for correction.

Each resource must review their work for the past period and the next succeeding period. The project manager, in turn, prepares a comparable report for the overall project. A careful review will reveal problems and suggest areas for improvement. Communication problems requiring correction will be uncovered. This review provides the opportunity to examine each individual's performance and to give recognition to accomplishments and progress. By careful attention on the part of management to these reviews, problem areas will not occur as surprises. Management will be able to take corrective action on a timely basis.

To assist in the detection of problem areas, project tolerances should be established to note when time estimates, costs and schedules will be overrun or underrun. Tolerances represent the percent allowable deviation on a project, e.g., 10%, 15%, etc. It is the relationship between "estimated to do" and project tolerances that provides for an early warning system in project management. If an employee expresses a slipped assignment and it surpasses project tolerances, then an estimate or schedule deviation is brought to the attention of the project manager. An estimate and/or schedule revision should then be prepared.

Revisions are a natural part of all projects. Any revision in estimate and schedule should be accompanied with an explanation for the change. These explanations can be used later for project auditing purposes and to provide insight for adjusting estimating guidelines.

Any time a project becomes inordinately large, it will be difficult to control. This problem usually occurs due to poor planning where the work effort is ill-defined and bottlenecks created. The temptation to try

Section 32

"PRIDE" SUPPLEMENTAL NARRATIVE - ESTABLISHING A TECHNICAL LIBRARY

Every step in a methodology should produce a reviewable result in order to substantiate completion and assure a quality product.
- Bryce's Law

The purpose of this narrative is to provide guidelines for the establishment of a Technical Library.

INTRODUCTION

The concept of a Technical Library is an important part of Information Resource Management (IRM) and "PRIDE." As projects progress, documentation is produced, both formal and informal deliverables, representing project decisions and descriptions of the various information resources. This intelligence represents a considerable investment for the enterprise. Documentation must be maintained and controlled to protect this investment. It will be referenced frequently for a variety of research purposes.

The library is typically managed by a Technical Librarian who works closely with Project Administration and other "PRIDE" support functions. In many cases, both the Technical Librarian and Project Administrator are implemented by a single person.

OVERVIEW

The Technical Library is the organization's repository for all project records and approved copies of phase documentation. It may also contain other materials including computer hardware and software manuals, trade publications, text books, source program listings, standards manuals, supplies of forms, etc.

The Technical Library should be organized and patterned after a normal library, complete with procedures for cataloging documentation, check-in/check-out of documentation, etc. Any items which cannot be replaced should remain in the library and copies should be issued instead. If access to the library will be required during off hours, special provisions for controlling this access will need to be established.

The content and use of the Technical Library should not be confused with the content and use of the IRM

Section 33

"PRIDE"
SUPPLEMENTAL NARRATIVE - QUALITY ASSURANCE

Quality must be built into the product DURING design, not inspected in afterwards.
- Bryce's Law

The purpose of this section is to provide a framework for Quality Assurance during the execution of the "PRIDE" methodologies (EEM, ISEM, DBEM).

INTRODUCTION

It is generally agreed that the quality of a product is judged by how well it conforms to specifications. It is not a matter of how well it compares to another product of the same kind, but how well it fulfills the requirements for which it was designed. What this means is that quality is concerned with fulfilling the expectations of the customer. In this regard, quality can be described as providing a product the customer wants, when the customer wants it, and at the price the customer agreed to purchase it.

Quality Products Come From Quality Workmanship

Historically, quality was checked simply by how well the finished product conformed to specifications. This is the "black hole" approach for developing a quality product. Here, requirements are loosely formulated before they are turned over to the development staff for design. A quality inspection is performed only after the product has been installed and made operational. The process looks something like this:

Section 34

"PRIDE" SUPPLEMENTAL NARRATIVE - ESTABLISHING AN IRM REPOSITORY

IRM is the view of the enterprise from 50,000 feet.
- Bryce's Law

The purpose of this section is to describe the role of a "Repository" in a development organization and how to implement a repository, using either a manual or automated approach.

WHAT IS A REPOSITORY?

As should be obvious from studying the "PRIDE" methodologies, the cohesive bond behind all development efforts is the "IRM Repository" (aka, "IRM" or "Repository"), a system to inventory and control all of the resources in an enterprise needed to produce information. As developers progress through the "PRIDE" methodologies, information resources are defined and cross-referenced to other resources in the repository. In this way, the repository becomes a manifest of all information resources, thereby providing the means to share and re-use resources. The IRM is also a useful documentation tool; the various resource definitions should contain sufficient intelligence to generate reports, draw graphics (e.g., flowcharts), and interface with third-party development aids (e.g., DBMS, application generators, etc.).

The repository concept has been a part of "PRIDE" since its inception in 1971. Unlike classic data dictionary/directories that support CASE tools and DBMS packages, the "PRIDE" approach views a repository as a "bill-of-material processor" (BOMP) to catalog and cross-reference ALL information resources, not just those associated with the computer; a much more global perspective of an enterprise's information resources.

RESOURCE DEFINITION

To implement a repository, it will be necessary to create the means to uniquely define each resource and link it to other resources. This can be implemented two ways:

1. Manually - using the resource worksheets accompanying "PRIDE".

2. Computer assisted - using commercial packages or to develop such software in-house. Today's Data Base Management Systems (DBMS) provide the

Section 35

"PRIDE" SUPPLEMENTAL NARRATIVE - "PRIDE" IMPLEMENTATION

It is one thing to enact legislation, quite another to enforce it.
- Bryce's Law

The purpose of this section is to provide guidance in the implementation of "PRIDE" in a company.

INTRODUCTION

Never underestimate the implementation of "PRIDE" since it represents a change of attitude and perspective that is uncommon in the typical programming shop. This is why we refer to it as *"Software for the finest computer - the Mind."* Because "PRIDE" is first and foremost a unique management philosophy, it is not installed in the same manner as hardware or computer software. We have seen many approaches to the implementation of "PRIDE" over the years; some successful, some disastrous. The disastrous implementations are those where a "Dictator" approach is taken and "PRIDE" is jammed down everyone's throat. This will only work as long as the dictator remains in power. It is typically abandoned shortly thereafter. The more successful implementations have been those where the responsibility for "PRIDE" is placed on several key people in the organization, thereby giving the appearance that "PRIDE" is the will of the company and not just one individual.

STEP 1 - ESTABLISH A PROJECT

The first step in installing "PRIDE" is to first establish a project for this purpose. This can either be done using an automated Project Management system or using the manual forms as included in "PRIDE"-PM. Use of a Project Management system is extremely useful for keeping the project on schedule and within costs.

Key to the startup of the project is the appointment of a "PRIDE" Coordinator who will act as the Project Manager for the implementation of "PRIDE". Considerable thought should go into the selection of this person. The "PRIDE" Coordinator should be respected by the development staff as well as management; should work well with people, but more importantly; must be results oriented.

STEP 2 - ESTABLISH SUPPORT TEAM

A Support Team is assembled who will be assigned tasks in this project. One of the principal reasons for forming a Support Team is to share the responsibility

Section 36

“PRIDE” FORMS

Just because it is on a PRIDE form,
doesn't mean it was prepared using PRIDE.
- Bryce's Law

This section includes the forms used throughout the "PRIDE" methodologies (EEM, ISEM, DBEM) and Project Management system. "PRIDE" forms consist of worksheets to document information resources, and forms for Project Management purposes. The worksheets are used to interview users, organize notes, and act as a data entry vehicle for an IRM Repository. The Project Management forms are used to plan, estimate, schedule, and report on project activities. They are also used as a means to collect data for a Project Management system.

These forms are also available from the web version of the product at MBA’s corporate web site.

If you are going to use the "PRIDE" forms in-house, you may add your own corporate logo to the form but you must maintain the "PRIDE" logo and trademark, along with the copyright notation at the bottom of the form.

RESOURCE WORKSHEETS

- Functional Entity (FE) Worksheet
- Organizational Entity (OE) Worksheet
- Human/Machine Resource (RE) Worksheet
- Skill Description (SD) Worksheet
- Objective/Modification-Improvement (MI) Worksheet
- Project Description (PD) Worksheet
- Information Requirement (IR) Worksheet
- System Worksheet
- Sub-System Worksheet
- Computer Procedure Worksheet
- Program Worksheet
- Module Description (MD) Worksheet
- Playscript Worksheet
- Input/Output Description (ID/OD) Worksheet
- File Description (FD) Worksheet
- Record Description (RD) Worksheet
- Data Description (DD) Worksheet
- Matrix Worksheet
- Control Log

PROJECT MANAGEMENT FORMS

- General "PRIDE" Documentation Form
- (Project Description (PD) Worksheet)
- Methodology Definition Worksheet
- Project Control Sheet
  - Project Control Sheet - alternate form to also post "Actual" time.
- Project Estimate/Schedule Recap Worksheet
- Planning Chart (Gantt)
- Time Distribution Worksheet
- Cost/Benefit Analysis Worksheet

PRIDE® MATRIX WORKSHEET

CONTROL NUMBER

TITLE:

PAGE OF

PREPARED BY	DATE	APPROVED BY	DATE

Section 37

"PRIDE" CHRONOLOGY

The first on-line, real-time, interactive, data base system was double-entry bookkeeping which was developed by the merchants of Venice in 1200 A.D.
- Bryce's Law

The "PRIDE" Methodologies for IRM have evolved into a substantial body of work. This did not happen over night. Considerable thought and work went into the product. The real-world input from our customers were invaluable for important modification/improvements to it. For this we give our thanks. "PRIDE" set many precedents over the years, and as such, the company wants to set the record straight.

FOR THE RECORD

1971

MBA is founded and introduces "PRIDE" (PRofitable Information by DEsign - through phased planning and control) for designing and building Information Systems. "PRIDE" sets the following precedents:

- The world's first commercially available methodology for developing systems (the term "Methodology" was coined in the industry by "PRIDE").
- First to apply engineering/manufacturing concepts to the development of Information Systems, e.g., Standard System Structure, Layered Documentation (Blueprinting), standard and reusable parts (data resources).
- First Structured Systems Design Technique (Chronological Decomposition).
- First Data Dictionary/Directory.

"PRIDE" also includes Documentation and a Project Management System, all integrated into a single product.

The first "PRIDE" customer was the Marion Power Shovel Company of Marion, Ohio (08/18/1971).

1974

MBA introduces "PRIDE"-LOGIK (Logical Organizing and Gathering of Information Knowledge) an automated Data Dictionary/Directory system. It is designed to complement the Data Management and Documentation techniques of "PRIDE." The product is the first of its kind in the world. It is originally developed to run under IBM MVS & VM, Honeywell GCOS, and Burroughs MPE computers. Over time it is migrated to many other configurations including: CDC Cyber Series, UNIVAC 100 Exec, Hewlett Packard 3000 MPE, ICL George III, Hewlett Packard 3000 MPE, Data General Eclipse AOS, DEC VAX/VMS, and IBM AS/400 and OS/2.

1976

MBA establishes representation in Japan, the start of a long relationship in the land of the rising sun.

1977

"PRIDE" becomes the first commercial methodology enacted into law (State of Minnesota).

1979

The Automated Design Facility (ADF) is developed by MBA as a productivity tool which is used to automatically design Information Systems and logical Data Bases. It is the world's first "Systems Generator" (not to be confused as a "Program Generator"). Based on Information Requirements, ADF automatically designs a system into its sub-systems, procedures, and programs, as well as design the logical data base and suggests physical files. By accessing "PRIDE"-LOGIK, ADF promotes the sharing and re-use of data resources.

Also in December, MBA wins a highly contested trade secret lawsuit with AMF-Harley Davidson Division and Arthur Young & Company in Milwaukee, Wisconsin. A jury determines that "PRIDE" is a unique product and that MBA took all of the necessary steps to protect it, thus making it a trade secret. They also determine that Arthur Young was guilty of trying to misappropriate the product.

1981

MBA enhances "PRIDE"-LOGIK and renames the product, the Information Resource Manager (IRM) and the name "PRIDE"-LOGIK is dropped. Among the enhancements are new components (resources) to represent business models and information requirements. As such, it is no longer referred to as a Data Dictionary/Directory but rather a Repository.

MBA demonstrates program generation by developing an interface from the IRM to the System-80 COBOL program generator. Between ADF and the IRM's interface to program generators, MBA successfully demonstrated 100% systems generation.

Several other interfaces are developed by MBA and its customers for program generation and DBMS support.

1982

MBA announces "PRIDE"-ASDM, Automated Systems Design Methodology. "PRIDE"-ASDM is a major development effort by MBA and includes Automated Instructional Materials (AIM). AIM represents all of the "PRIDE" documentation available on-line, the first such product to do so.

MBA is recognized by its customers for improving the productivity of systems development in Japan.

1984

"PMC2" (Project Management - Command & Control) is introduced by MBA. It represents the automation of the Project Management activities in "PRIDE."

1985

MBA relocates its offices to Palm Harbor, Florida.

1986

MBA renames "PRIDE" as the "PRIDE"-Information Systems Engineering Methodology (ISEM). The company also unbundles and restructures its product line consisting of manual and automated combinations of ISEM, IRM, and PMS (formerly "PMC2").

1987

MBA introduces "PRIDE"-Data Base Engineering Methodology (DBEM). DBEM introduces the concepts of "objects", 4 data base models, and "Data Taxonomy."

Also, ADF is enhanced and renamed ASE (Automated Systems Engineering). The facility now includes standard templates for engineering business processes (sub-systems and procedures).

1988

MBA introduces "PRIDE"-Enterprise Engineering Methodology (EEM). EEM introduces the techniques of "Enterprise Decomposition" and "Enterprise Information Strategy" (EIS)

MBA develops automated support for "PRIDE"-EEM in the form of "PRIDE"-CAP (Computer Aided Planning) to model and communicate priorities, group information requirements and objectives, and to perform an Organization Analysis (the first such product to do so).

MBA publishes its book, *"THE IRM REVOLUTION: BLUEPRINT FOR THE 21ST CENTURY"* (ISBN: 0962118907), which quickly makes the top ten list in Japan.

1990

MBA unveils the "PRIDE"-Information Factory, an OS/2 based implementation of the "PRIDE" product line.

1993

MBA enters into agreement with the American Management Association (AMA) to conduct a series of IRM Executive Seminars

1994

MBA announces "PRIDE"-PC, a PC implementation of its Automated Instructional Materials (AIM).

1996

MBA and "PRIDE" celebrates its 25th birthday.

2004

MBA puts the "PRIDE" Methodologies for IRM in the public domain via the Internet.

2006

MBA and "PRIDE" celebrates its 35th anniversary and publishes this book.

END SECTION

Section 38

BRYCE'S LAWS

A compilation of our axioms on IRM and management.

Productivity = Effectiveness X Efficiency

Information = Data + Processing

There is nothing more unproductive than to build something efficiently that should not have been built at all.

Organizations progress when the impact of good actions and decisions outweighs the impact of poor actions and decisions.

The solution to improved productivity is not better software but rather a better understanding of business and its objectives.

IRM is the view of the enterprise from 50,000 feet.

We must apply the same discipline, organization and automation that we recommend for other parts of the company.

Technology alone will not solve our problems, only effective management will.

No amount of elegant programming or technology will solve a problem if it is improperly specified or understood to begin with.

If anything in life is constant, it is change. The only constant involved with information is that it is seldom static.

If an information requirement is stated improperly to begin with, then everything else that follows will be incorrect.

The only way that information systems communicate, both internally and externally to other systems, is through shared data.

The more we understand about the external entities affecting our business, as well as our own internal operating limitations, the better we can compete.

Data is the glue that holds systems together.

Data is stored, Information is produced.

A data element has only one logical definition, but may be represented physically in many different ways.

Group Data tells us a lot about what objects are important to an enterprise.

Data Resource Management is a neutral third party who represents the enterprise's overall interests, not just a single application.

Quality must be built into the product during design, not inspected in afterwards.

Enterprises with identical missions will also be identical in terms of logical structure.

Never embark on a journey without knowing your destination.

Whereas logical information resources will remain relatively static, the physical resources will change dynamically.

100% of your design documentation is contained in the specifications of your information resources.

Information is a perishable commodity; it only has value at a particular point in time.

Information is highly volatile in that it is greatly influenced by external factors, such as government, economics, competition, customers, etc.

An elegant solution to the wrong problem solves nothing.

The day a company goes into business is the day when its information systems are born.

Only when the systems engineer can walk in the moccasins of the user does the engineer have a right to design a system for the user.

Information is for people, not for the computer.

An information system is a product that can be engineered and manufactured like any other product.

Systems =/= Computers
Systems =/= Software
Systems =/= Projects

Q: How many interpretations of systems development are there?
A: How many analysts and programmers have you got?

All information systems have the same structure. In manufacturing terms, it is known as a "four-level bill of material."

Systems are designed by 'explosion' and implemented by 'implosion.'

Documentation is a working tool and a byproduct of design.

The word 're-engineering' implies something was 'engineered' in the first place, which is rarely the case.

No one has ever built a perfect system the first time, and no one ever will.

Systems are built by evolution; not by revolution. The day when a system is installed, is the day it begins to undergo change.

85% of all systems development work is modifications/improvements.

Good Systems Design + Good Programming = Great Systems
Good Systems Design + Bad Programming = Good Systems
Bad Systems Design + Good Programming = Bad Systems
Bad Systems Design + Bad Programming = Chaos

How a system is implemented is of little importance if it solves the problem effectively.

Forgetting the human-being during design will cause the human-being to forget the system at time of startup; it will be DOA, Dead On Arrival.

Systems are logical, programming is physical.

Programming is a translation function, going from human understandable specifications to machine readable instructions.

Good specifications will always improve programmer productivity far better than any programming tool or technique.

Whenever you see a ratio of 1:4 analysts:programmers you will find systems analysis being performed at the wrong time and by the wrong person.

Beware of your "firefighters," they are probably your chief arsonists.

If we built bridges the same way we build systems in this country, this would be a nation run by ferryboats.

There are very few true artists in computer programming, most are just house painters.

Systems will fail more for the lack of administrative procedures than well written computer procedures.

A program without any form of transaction serves no useful business purpose.

The first on-line, real-time, interactive, data base system was double-entry bookkeeping which was developed by the merchants of Venice in 1200 A.D.

Successful screen design is based on how well the developer knows both the user and the data.

All organizations have a data base; some are managed, most are not.

A Data Base should naturally evolve over time and synchronize with all Information Systems.

Most organizations use a DBMS as nothing more than an elegant file access method. Consequently, the opportunity to share data and integrate systems is lost.

You must first plant the seeds in order to harvest the crop. Unfortunately, most companies tend to eat the seed and then there is no crop to harvest.

There is only one problem with common sense; it's not very common.

A methodology is nothing more than an assembly line that produces a finished product.

Every step in a methodology should produce a reviewable result in order to substantiate completion and assure a quality product.

Project management is only possible with an effective methodology.

Having a Project Management system without a methodology is like attaching a speedometer to an orange crate; it measures nothing.

The number of lines of communications grow exponentially based on the number of people involved in a project.

Systems do not have a "life cycle." They may go on forever if kept viable with change. The only thing that has a "life cycle" is a project which has a beginning for planning, a middle for execution, and an end for review.

It is one thing to enact legislation, quite another to enforce it.

Project management is a philosophy of management, not a tool or technique.

Most estimating errors are errors of omission, not commission. It is what we forget to estimate that gets us into trouble.

An estimate improves in accuracy in relation to the level of detail considered.

A project always has a critical path until it is completed or closed. The path can vary depending on accomplishments.

A project requires a methodology, but a methodology does not require a project.

It is just as bad to underrun a project as it is to overrun a project.

If we lived in a perfect world, there would not be a need for managers; projects would be executed on time and within cost. However, the reality is, we live in an imperfect world.

Managers do not create problems, they solve problems.

Manage from the bottom up; not just from the top down; this creates personal commitment and accountability.

A project will only be accomplished if the individuals performing the work want to do it.

We accomplish projects through people.

Manage more, supervise less.

The only good business relationship is where both parties benefit.

Employees should be treated as professionals and held accountable for their actions.

All companies have a culture. In order for employees to function and succeed, it is essential they understand and believe in the culture.

Culture is learned. It can be taught and enforced.

The ethics of a business are whatever the top-dog says they are.

Time lost, is time lost forever. You cannot buy it back.

You cannot capitalize on your workers' talents if you do not know their skills and proficiencies.

You cannot put two quarts of liquid into a one quart bottle. If you try, you will lose a quart.

An expert is someone who lives more than 50 miles out of town and wears a tie to work.

"We never have enough time to do things right."
Translation: *"We have plenty of time to do things wrong."*

Just because it is on a "PRIDE" form, doesn't mean it was prepared using "PRIDE."

The "man" in the word "management" refers to "mankind."
Don't forget it.

Do not try to apply a band-aid when a tourniquet is required to stop the bleeding.

All of your hard work, regardless of how well it is intended, is for naught if it results in a pile of rubbage.

If there is no governing science supporting it, use of the term 'engineering' is fraudulent and misleading.

You cannot treat a patient if he doesn't know he is sick.

A man's trustworthiness is measured by the number of keys he holds.

Most children are raised by amateurs, not professionals.

Never trust a person who doesn't have at least one known vice (e.g., drinking, smoking, swearing).

Business is about people, not just numbers.

Management is more of a benevolent dictatorship as opposed to a democracy.

Unless someone is looking for an excuse to duck a work assignment, nobody wants to attend an inconsequential meeting.

I have never encountered a technical problem that couldn't be conquered with a little imagination, some concentrated effort, and a lot of good old-fashioned management.

Lawsuits primarily benefit the attorneys and nobody else.

A policy is written to protect a company from those who break the rules, not from those who follow them.

Technology without Management is Madness.

You eat elephants one spoonful at a time.

You simply can't build anything of substance without a good set of blueprints.

If you are not pissing someone off, you are probably not doing your job.

If the mind really is the finest computer, then there are a lot of people out there who need to be rebooted.

If they do not have an appreciation of whence we came, I doubt they will have an appreciation of where we should be going.

In this industry, we tend to worry about the wrong things. This is like rearranging the deck chairs on the Titanic.

Its never lonely at the top of an IT organization, primarily because the IT Director is never there.

Forget about today, build for tomorrow.

Social intercourse is a two way street. Make sure you are driving on the right side.

Do not criticize unless you can offer an alternative. Turn something negative into something positive.

"Bullshit" is the most versatile word in the English language. It can be applied in just about any business situation. Frankly, we do not use it enough.

Youth is our only true vacation in life, and our most unappreciated.

In every person's life, you must eat at least one spoonful of dirt.

END SECTION

Section 39

GLOSSARY OF TERMS

4GL - initials for "Fourth Generation Language" (See listing).

Access Key - the data element(s) which are used to identify and search through a physical file.

Access Method - the technique used to access data on a physical file device. Types of access methods include sequential, index sequential, hierarchical structure, network structure, relational structure, etc.

Accessibility - a timing consideration used in "Information Driven Design" for specifying when and where data is to be retrieved to produce information for delivery to end user destinations. Accessibility answers the question, "Can I get to the data when I need to?" How data is accessed is a function of output. (See Availability, and Output).

Administrative Procedure - a detailed set of human processable operating instructions required to accomplish a specific process within a sub-system. Administrative procedures detail manual steps along with explanations and examples. They are procedures to be used for such things as performing routine or clerical assignments, making decisions, report distribution, input preparation, or for using "office automation" related equipment. (See Sub-System and Operational Step).

ANSI - initials for American National Standard Institute; standards institution.

ASCII - American National Standard Code for Information Interchange - standard control characters and graphic characters (as used in a simple text file).

Availability - a timing consideration used in "Information Driven Design" for specifying how and when data is collected from various sources within an enterprise. Availability answers the question, "Is the data there when I need it?" How data is made available is a function of input. (See Accessibility, and Input).

Available Time - time when an employee is available for work. Available time is divided into two categories: Direct and Indirect Time (see listings).

Basic Grouping - refers to the indicative data elements used to uniquely identify a view (logical record). It also represents a dependency between data elements in a particular context (it is how they are "grouped" into separate views). For example, in a Customer Object, it is used to segregate address data, from credit data, from customer contact data, etc. Perhaps it is easier to think of the "basic grouping" as the key to a logical record (not a physical record). Because the intent is to uniquely identify data, the "basic grouping" consists only of "Indicative" data (not "Descriptive" or "Quantitative"). There may be up to two parts in a single basic grouping:

PRIMARY BASIC GROUPING - Since views are used to describe objects, they must all be defined with the one data element used to uniquely identify the overall object; this will be a primary/indicative/object-oriented data element. The Primary Basic Grouping will be the basis to sort views into objects (e.g., all Product related Records will be put in the Product File, all Customer related Records in the Customer File, etc.).

SECONDARY KEYS are used to either distinguish Characteristic Views or Relationship Views.

Batch - a method of processing that involves the processing of several transactions and does not necessarily require instantaneous response. Batch processing is especially suited to entering or retrieving large volumes of data from the enterprise data base. (See Interactive, Processing Method, and Transaction).

Benefit - something that contributes to an improvement in condition or promotes profitability for a given enterprise, either tangibly or intangibly. When writing benefits, begin with a transitive verb, such as: Improve, Maximize, Minimize, etc. Be sure to substantiate your claim; do not simply say "Improved cash flow." Instead, say, "Improved cash flow by reducing inventory overhead."

Bill of Materials - an itemized account of all of the parts of a product and their relationships in order to assemble a complete product. In IRM terms, the bill of materials for information includes systems, data and business resources.

Bill of Materials Processing (BOMP) - a mechanized way of tracking all of the resources in a product.

BLOG - slang expression referring to a web page devoted to topics relating to a specific subject (e.g., News, Essays, etc.).

BOMP - initials for "Bill Of Materials Processing" (see listing)

Break Even Point - a point in time where cost savings match accumulated development expenses. Typically calculated as:

BEP = Investment divided by Average Annual Savings.

Business Process - (see Sub-System).

Byte - a group of eight adjacent binary digits treated as a unit and often represent a single character.

C - a procedural programming language. (See Procedural Languages).

C++ - variation of the C programming language oriented to Object Oriented Programming (see listing).

CAD - initials for "Computer Aided Design" (see listing).

CAM - initials for "Computer Aided Manufacturing" (see listing).

CASE - initials for "Computer Aided Software Engineering." Computer tools that provide support for software engineering and manufacturing activities. Their perspective is on software only.

Chief Information Officer (CIO) - an executive level officer who represents the chief information broker/architect/strategist of a company. Ideally, the CIO reports to the Chief Executive Officer (CEO) and maintains a lateral working relationship with the Chief Operating Officer (COO) and Chief Financial Officer (CFO).

Client/Server Computing - computing technique for processing data between a "client" computer and a file "server."

COBOL - acronym for COmmon Business Oriented Language; a procedural programming language (see listing).

Command File - a PC file (BAT or CMD) containing basic computer operating commands.

Command Line or Prompt (aka DOS prompt) **-** the ability to type a command directly to the computer (as opposed to through a GUI interface).

Compiler - a program translator that converts source code into executable programs. (See Source Code).

Computer Aided Design (CAD) - computer software/hardware used to assist in the design of a product.

Computer Aided Manufacturing (CAM) - computer software/hardware used to assist in the manufacturing of a product, such as industrial robots.

Section 40

INDEX

Please note this index does not include any reference to the *"Glossary of Terms"* (Section 39). Also, please observe the convention used for pagination: SECTION-PAGE

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