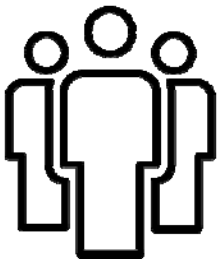


A Business Optimization Methodology Component

Guide Book: Developing *State Reference Models*

Author: D.F. Popowich, Dipl. Arch, GDM, MBA
Date Prepared: September, 2009
Version: 7.2

Legal Disclaimer

The contents of this document are the sole property of Dwayne F. Popowich, an Enterprise Architect residing in Calgary, Alberta Canada and are components of a proprietary methodology designed to support consulting efforts associated with achieving business optimization, business transformation and business process improvement.

All Items are deemed Proprietary and Confidential Information. All Independent Delivery Organizations, Individual Consultants or Employees hired, trained or contracted by end user organizations that license the use of the Proprietary and Confidential Information are contractually authorized to use the Proprietary and Confidential Information solely for the purposes of performing contracted responsibilities, to the extent the Proprietary and Confidential Information are incorporated into a deliverable that is part of a professional consulting service and used by a client's internal business only. All Proprietary and Confidential Information are made available on an "As Is" condition and without express or implied warranties of any kind.

If an end user organization or any of its successors cease operations the Proprietary and Confidential Information, including their ownerships and rights of use will revert to Dwayne F. Popowich, an Enterprise Architect residing in Calgary, Alberta Canada.

Contents

1 Business Optimization

The following guide book is a component of a business optimization methodology designed to support the completion of a *State Reference Models.*

The completion of a *State Reference Models* is a professional service that is part of a larger set of *business optimization services*, as depicted below:

Service Category	Phase	Service
Enterprise Analysis	Phase 0 – Establishing Context	**State Reference Modeling**
		Organizational Analysis
Enterprise Strategy	Phase 1 – Strategy Development	Competitive Analysis
		Strategy Mapping
		Strategy Value Modeling
Enterprise Design	Phase 2 - Design	Organizational Structures Design
		Informational Structures Design
		Technology Structures Design
		Physical Structures Design
Enterprise Solutioning	Phase 3 - Solutioning	Future State Reference Modeling
		Solution Concept Development
Enterprise Governance	Phase 4 - Governance	Corporate Controls
		IT Controls

2 Introduction

The *Guide Book for Developing State Reference Models* is focused on the creation of a current and future state representation of an organization's context. The modeling effort outlined herein is specifically focused on the inter-relationships between the people, business processes, associated workflows and computer-based systems that are present within an organizational setting.

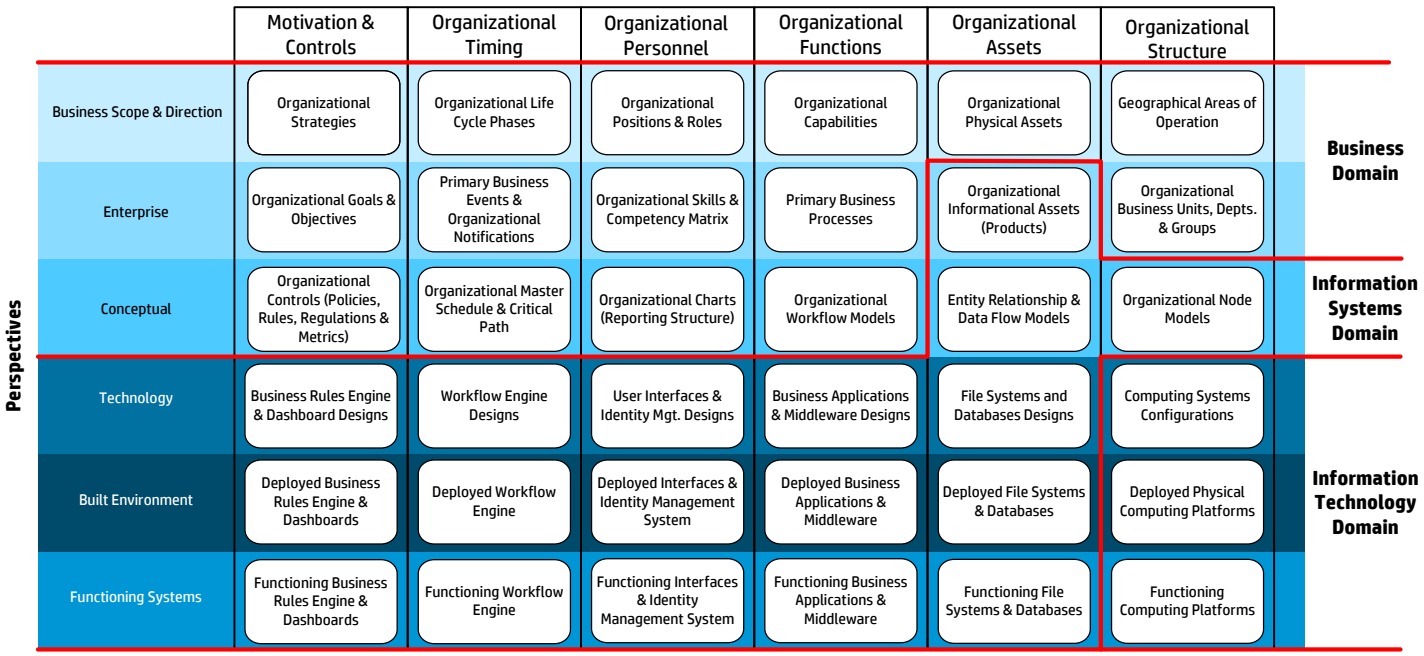
Central to the development of a *State Reference Models* is the need to develop graphically-based primary business process maps and associated workflow models.

The creation of the required maps and models is described in complementary documents titled *Integrated Workflow Modeling Notation™ (I-WFMN) For Developing Workflow Models Associated With Architecting Optimal Business Environments.*

3 Knowledge Base – An Inter-Relationship Model of the Enterprise

The diagram below is based on an inter-relationship framework (ontology) devised by John Zachman.

The *Zachman Framework* ™ was designed as a means for classifying and categorizing organizational artifacts in a manner that expresses the inter-relationship and inter-dependency of the many common elements within a modern organization.



Organizational Inter-relationship Framework (Architectural Ontology)

This inter-relationship framework is the foundation for the topical areas described in the following guidebook.

4 State Reference Modeling

State Reference Models express the state of an organization's business, information systems and computer-based system domains and takes into consideration:

- *Motivation & Controls* – expressed in its vision statement, strategies, business goals and objectives, business policies, business rules, industry regulations and performance metrics
- *Organizational Timing* – expressed as a set of business phases, business events, organizational notifications and a master schedule
- *Organizational Personnel* – expressed as a set of organizational positions, associated roles, organizational competency matrices and organizational charts
- *Organizational Functions* – expressed as a set of primary business services, business processes, business activities within workflows and associated software toolsets
- *Organizational Assets* – expressed as a list of business assets, and organization's lexicon, semantics and ontologies, entity relationship models and data flow models
- *Organizational Infrastructure* – expressed as a list of organizational geographical locations, computer-based assets and organizational computer-based node/role models

5 Required Artifacts

The development and delivery of a *State Reference Model* is the first step towards the design and deployment of successful business solutions that induce optimization within an organizational environment by achieving a deep insight into the strategic intent of the business and how work is accomplish in pursuit of established strategic goals and objectives.

State Reference Models purpose is to establish an understanding of an organization's business environment through the capture, creation and storing of varying artifacts.

The following sections, within this guide book, provide a description of each of the required artifact groups.

It should be noted that not all corporations will have the information that is being sought. If the information is unavailable, the lack of any sought artifacts should be appropriately noted in the *State Reference Models*.

6 Completing a Business Domain Review

The development of a *State Reference Models*™ begins with the review of the business domain and is focused on developing an understanding of:

- An **organization's motivation and controls** in the form of strategic themes, business goals and objectives, business policies, business rules, industry regulations and performance metrics that guide an organization's action in the marketplace and within the business itself
- An organization's **timing** established by its business events and master schedule
- An organization's **personnel** expressed as positions, roles and reporting structures
- An organization's **functions** as articulated in its business services, business processes and workflows
- An organization's **assets** described in the organization's lexicon, semantics and ontologies (foundational components for assembling data into information)
- An organization's **infrastructure** articulated as a list of organizational geographical locations, computer-based assets and organizational computer-based node/role models

6.1 Organizational Motivation & Controls

An organization's business environment generally contains two (2) competing aspects – motivation and control.

Generally, motivation represents the primary drivers that initiate specific business activities and organizational behaviour. Motivation is induced into an organization through:

- Organizational strategies (strategic themes)
- Business goals and objectives

6.1.1 Corporate & Business Unit Strategic Themes

While modern organizations often have vision statements, mission statements and formally expressed goals and objectives, few have a set of explicit statements that articulate the strategies it utilizes to guide its actions in the marketplace or in its internal work efforts.

Therefore, it is necessary to develop proxies (i.e. themes) that are reflective of an organization's "primary strategic intent".

These proxies are referred to as *strategic themes* and are high-level statements that are indicative of a specific set of "organizational patterns" that reflect an organization's "culture" – motivational factors that underpin both decision making and internal work efforts.

In general, three (3) types of *strategic themes* exist in an organization – at the corporate level, business unit level and department level.

The following table is an example of common *strategic themes* that exist at the corporate and business unit levels of an organization:

Corporate Strategic Themes	Business Unit Strategic Themes
Apply a high level commitment to workplace safety and environmental stewardship in all operational activities	Maintain a high level of commitment to health, safety and environmental areas associated with operational activities
	Ensure regulatory compliance with all regulatory agencies having jurisdictional authority over operational activities
Fund capital programs through operational cash flows	Reduce asset life cycle time and accelerate cash flow

6.1.2 Functional Themes

In addition to the broad-based *corporate and business unit strategic themes, functional themes* can exist within specific functional business units. For example, the following table articulates four (4) functional themes that expand the business unit strategic theme – "reduce asset life cycle time and accelerate cash flow".

Functional themes are generally responses to potential (or previously discovered) impediments to achieving the business unit strategy or are directives that establish the need for supporting activities that align with the functional actions of the organization.

Functional themes generally represent the "functional and non-functional requirements" that business analysts will often focus on when considering the design, development, purchase and/or deploying a computer-based automation tools into an organization.

BU Strategic Theme: Reduce asset life cycle time and accelerate cash flow	
Functional Themes	General Meaning
Ensure accurate geographical information	That the resulting geological information (compiled data) products can be cross-referenced to other information sources and be found equal to a level of acceptable tolerance.
Ensure that all information is exchangeable	That geological data and information (compiled data) is captured and stored in a digital format that allows the exchange of this data with other business areas and industry organizations.
All information must remain accessible to the entire enterprise	That data and information (compiled data) is a corporate asset that must be accessible to all business areas.
All group efforts must be efficient	That the actions of the department are completed through the most optimized utilization of the organization's resources (i.e. time, money, and people).

The relationship between *corporate strategic themes, business unit strategic themes and functional themes* is as follows:

Corporate Strategic Themes	Business Unit Strategic Themes	Functional Themes
Fund capital programs through operational cash flows	Reduce asset life cycle time and accelerate cash flow	Ensure accurate geographical information
		Ensure that all information is exchangeable
		All information must remain accessible by the entire enterprise

Capturing *strategic and functional themes* assists in establishing an organization's "tolerance for structural change and the possible introduction of formal controls".

More specifically, organizations that have clarity around their "strategic intent" and the relationship between *corporate strategic themes, business unit strategic themes and functional themes* tend to be more receptive to change and the introduction of controls.

6.1.3 Organizational Goals & Objectives

Organizations often express their "strategic intent" in the form of *business goals and objectives*.

However, there is often a misalignment between these formally established organizational components and the work effort it applies to achieve the identified business goals and objectives.

It is these misalignments that are important to understand.

More specifically, significant levels of misalignment generally suggest that an organization's "means for accomplishing work" (as established by its business processes, sub-processes and workflows) will also be misdirected giving rise to significant levels of expended resources (i.e. time, money, people) on business activities that add little value to the internal and industrial value chains.

Business goals and associated business objectives are formal "proxies" for senior executive decisions that are induced into an organization to ensure that the organizational work effort is focused on "doing *business activities* that add value and are measureable".

A *business goal* is a general statement about a desired position that an organization wishes to sustain over an extended period. Goals are generally qualitative, rather than quantitative and are often expressed as follows:

Business Unit Strategic Theme	Business Unit Functional Theme	Business Goals
Reduce asset life cycle time and accelerate cash flow	Develop accurate capital expenditure programs	Improved capital project scheduling and management
	Ensure accurate geographical information	Improve asset data management
		Achieve data integrity

A *business objective,* on the other hand, is measurable and generally attainable in a specific timeframe. The following are examples of business objectives associated with a recent business optimization project within a petroleum-based organization:

Business Unit Strategic Theme	Business Unit Functional Theme	Business Goals	Business Objectives
Reduce asset life cycle time and accelerate cash flow	Develop accurate capital expenditure programs	Improve capital project scheduling and management	• Increase inventory to six (6) months of drillable locations within each fiscal period • Achieve more efficient rig scheduling by making rigs available within thirty (30) days of on-site requirement during any fiscal period • Reduce project management process by ten percent (10%) in both time and resources during any fiscal period

6.1.4 Organizational Controls

Organizational controls represent offsetting constraints that "counter-balance" the motivational drivers within the organizational environment and are the primary mechanisms utilized in formal governance.

Organizational controls can be internal and external and are induced into an organization through:

- Business policies
- Business rules
- Industry regulations
- Performance metrics
- Civil and common Law
- Culturally-based customs
- Social responsibility
- Public opinion and perception

More specifically, *organizational controls* are designed to ensure that an organization meets or exceeds compliance levels in the areas of financial reporting, industry regulations and the over-arching laws of the countries in which it operates and, in doing so, provide constraints to the drivers of organizational behaviour.

6.1.4.1 Business Policies

Business policies can be developed for all functional areas within an organization. However, policies are most often developed for the following functional areas:

- Financial accounting
- Production accounting
- Administration
- Human Resources
- Corporate Facilities
- Field Facilities
- Company Vehicles
- Information Systems
- Health, Safety and the Environment
- Purchasing

Business policies can be explicit (preferred) or implied. In general, business policies take the following form:

- **Purpose**

  Example: The purpose of this policy is to set forth acceptable administrative and financial operating practices for the upstream operational groups within ABC Energy.

- **Responsibility**

  Example: It is the responsibility of all ABC Energy employees to insure compliance with these policies. The Office of the Vice President for Finance and Administration is responsible for ongoing revision and maintenance of these policies. This office will annually identify those policies which should be reviewed and notify appropriate department managers.

  All new or revised policies will be distributed by the Office of the Vice President for Finance and Administration.

- **General**

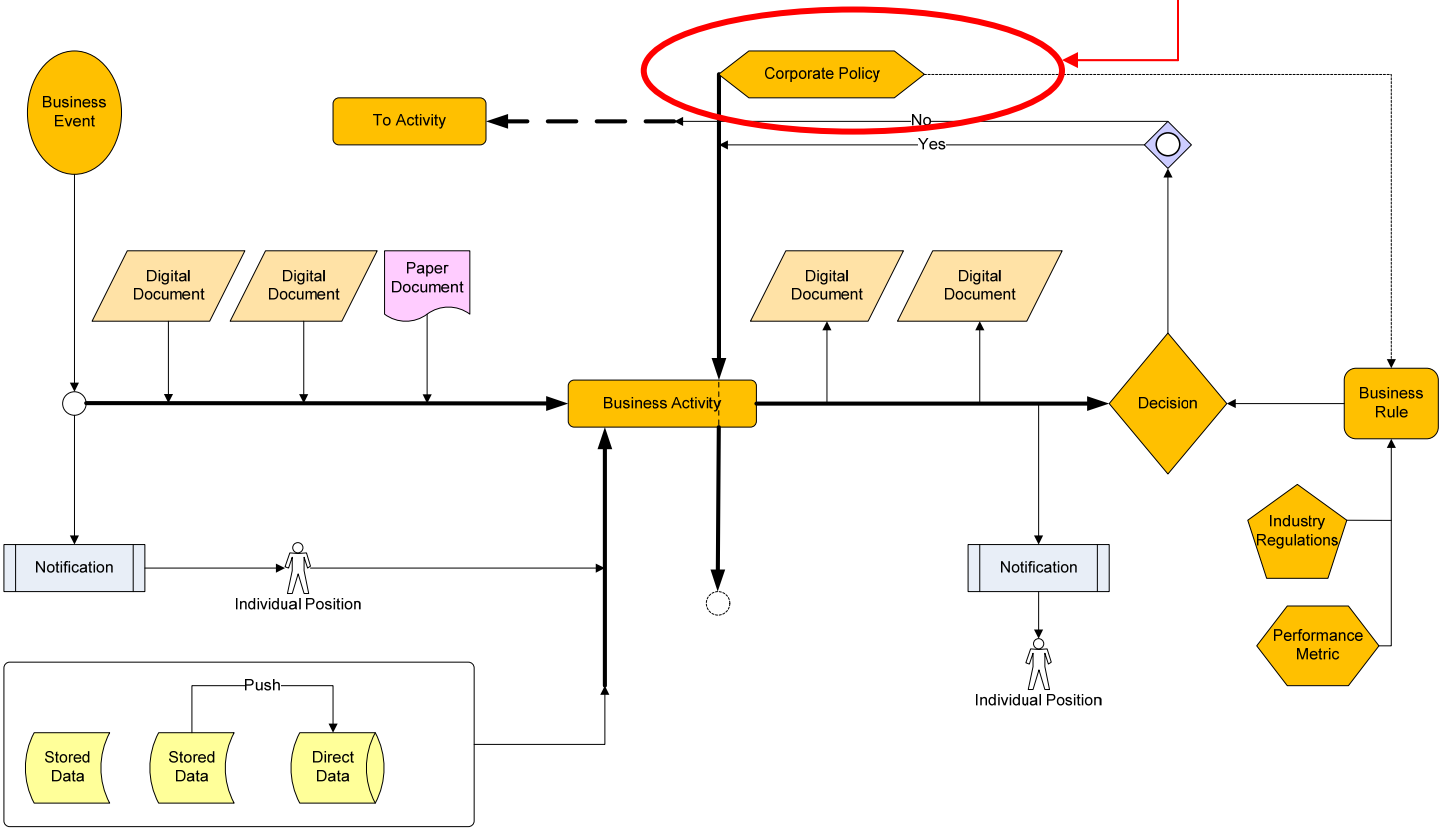
  Example: Exceptions to these policies, where appropriate, may be made by the President and/or appropriate Vice President.

- **Policy Statement**

  Example: All collected and retained data, including documents and reports that are compiled from the data, is the sole property of the corporation and, therefore, must be made available to all corporation personnel who have formal authorization to access and use the data.

For purposes of creating a *State Reference Models* a list of references to these *business policies* should be developed and linked with the appropriate workflow models (see diagram below).

Business Unit Strategic Theme	Business Unit Support Theme	Business Goals	Business Policies
Reduce asset life cycle time and accelerate cash flow	Develop accurate capital expenditure programs	Improved capital project scheduling and management	**Capital Expenditure Policy** **Purpose:** To guide capital expenditures during the asset life cycle. **Responsibility:** Asset Managers **Statement:** All capital expenditure programs must strive to ensure that actual costs shall not exceed capital estimates by more than 10%



I-WFMN™ Workflow Model

6.1.4.2 Business Rules

Business rules are part of the control mechanisms all organizations utilize to induce specific behavior within a work unit and have a direct relationship with business policies.

Business rules also have a close relationship with organizational workflow, insomuch as workflow is impacted by the various decisions incorporated within its structure – decisions are guided by business rules.

Business rules can be expressed as:

- Terms and conditions within contractual established interactions
- Organizational facts
- Mathematical derivations
- Inferences
- Mandatory organizational or business-specific constraints
- Organizational guidelines
- Industry regulations
- Action enablers that test conditions and initiate other actions

The following table highlights the alignment between *strategic themes, functional themes, business goals, business policies and business rules.*

Business Unit Strategic Theme	Business Unit Functional Theme	Business Goals	Business Policies	Business Rules
Reduce asset life cycle time and accelerate cash flow	Develop accurate capital expenditure programs	Improved capital project scheduling and management	**Capital Expenditure Policy** **Purpose:** To guide capital expenditures during the asset life cycle. **Responsibility:** Asset Managers **Statement:** All capital expenditure programs must strive to ensure that actual costs shall not exceed capital estimates by more than 10%	**Business Rule – Capital Expenditures:** Capital work shall cease if incurred costs exceed estimates by 10%

6.1.4.3 Industry Regulations

Industry regulations are specific *business rules* and are generally created and distributed by government agencies responsible for specific industry sectors.

Their purpose, for the most part, is to induce a "level of social responsibility" within the organization, through governmental agencies that represent a wide array of constituents.

Organizations generally adhere to the issued regulations. However, there are significant differences between the levels of effort organizations apply in maintaining regulatory compliance. Some will make no more effort than what is required to achieve compliance. Others will build large organizational structures and introduce highly visible programs aimed at creating a "culture of social responsibility".

For purposes of creating a *State Reference Models* a list of references specific to industry regulations their locations (i.e. web sites, networked file systems, etc.) should be developed and linked with the appropriate workflow models.

Once a general "sense" of how committed the organization is to adhering to established regulations a formal statement on the organization's level of "social responsibility and regulatory compliance" should be developed and placed within the *State Reference Models*™.

6.1.4.4 Performance Metrics

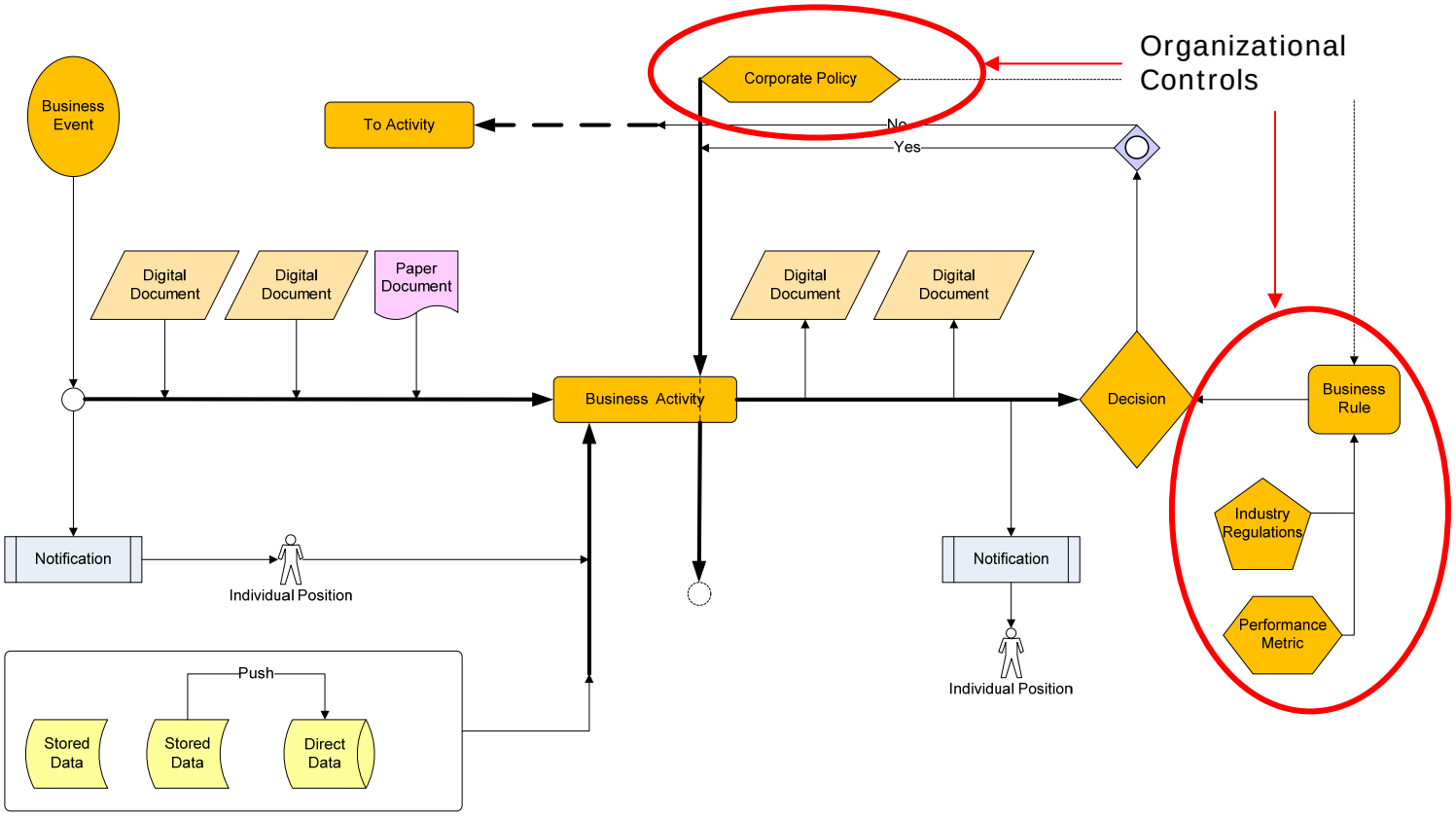
Organizations generally utilize some form of performance monitoring to induce controls around work efforts.

What is critical is to determine the "links" between established performance metrics, the work effort and the "strategic intent of the organization".

The "links" will assist in determining if the work effort (described as a set of *business activities)* is aligned with the "strategic intent of the organization" and is responsible for creating business value.

It is not uncommon to find performance metrics driving work efforts that are misaligned with the "strategic intent of the organization", thus having little business value.

For purposes of creating a *State Reference Models* references to all *performance metrics* should be linked with the appropriate workflow models.



I-WFMN™ Workflow Model

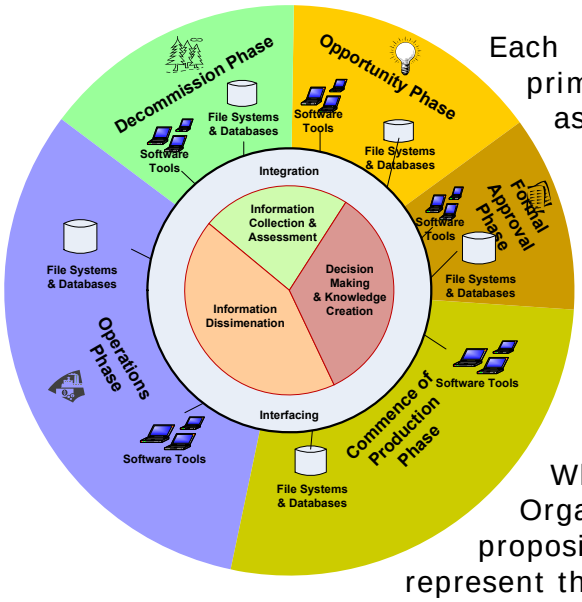
6.2 Organizational Timing

The next step within the State Reference Modeling effort is to focus on an organization's timing as expressed within the following organizational components:

- Business phases
- Primary business events associated with the each business phase
- Master schedule that expresses milestones and the effort (in time) between business events and business activities. There are five prominent time elements within each workflow – notification time, pre-condition time, activity time, post-condition time and decision time.

6.2.1 Business Phases

An organization's *business phases* reflect its link to a specific industrial sector (e.g. all hydrocarbon-based organizations have the same fundamental set of phases – as depicted in the diagram) in which it participates.



Each *business phase* provides for the establishment of the primary category in which a specific set of *business events* and associated *business activities* take place.

More specifically, each *business phase* has an identifiable pattern. For example, within a petroleum-based organization the *opportunity business phase and its opportunity core business process* will contain the *business event* "initial drilling prognosis is complete". This specific *business event* is not found anywhere else within the organization's efforts.

While organizational motivation and control gives the Organizational Consultant a "sense" of an organization's value proposition and capacity for change, the *business phases* represent the relative position an organization's work effort is within its own internal business cycle.

More specifically, each *business phase* is active at any given time. However a specific *business phase* will become more prominent at certain points in time during an organization's internal business cycle.

For example, the "opportunity phase" is most prominent when a hydrocarbon-based organization is moving through its planning and budgeting efforts, while a "human resourcing phase" can become prominent when an organization enters a growth stage.

Insomuch as each *business phase* has a *primary business process* (business processes are discussed in greater detail in Section 5.3.4 of this document) the prominence of one *business phase* over another often represents a precursor to where the largest positive impact in business optimization can be gained.

In addition, organizations (for the most part) have small "windows of tolerance" when it comes to accomplishing organizational change – a key aspect of business optimization and transformation work.

Therefore, it is prudent and wise to focus the consulting effort on the area that is "top of mind" within the organization.

The following table depicts the relationship between the *business phases* and *business processes* within a petroleum-based organization.

Hydrocarbon-based Organization Business Phases	
Management Business Phases	Core **Management** Business Processes
Ideas Phase	Ideas Business Process
Planning Phase	Planning Business Process
Budgeting Phase	Budgeting Business Process
Forecasting Phase	Forecasting Business Process
Operational Business Phases	Core **Operational** Business Processes
Opportunity Phase	Opportunity Business Process
Formal Approval Phase	Formal Approval Business Process
Commencement of Production Phase	Commencement of Production Business Process
Operations Phase	Operations Process
Decommission Phase	Decommission Process
Support Business Phases	Core **Support** Business Processes
Financial Phase	Financial Business Process
Human Resourcing Phases	Human Resourcing Business Process
Information Systems Phases	Information Systems Business Process

From this point forward, the capture of organizational information should include the creation of the required workflow models.

6.2.2 Primary Business Events

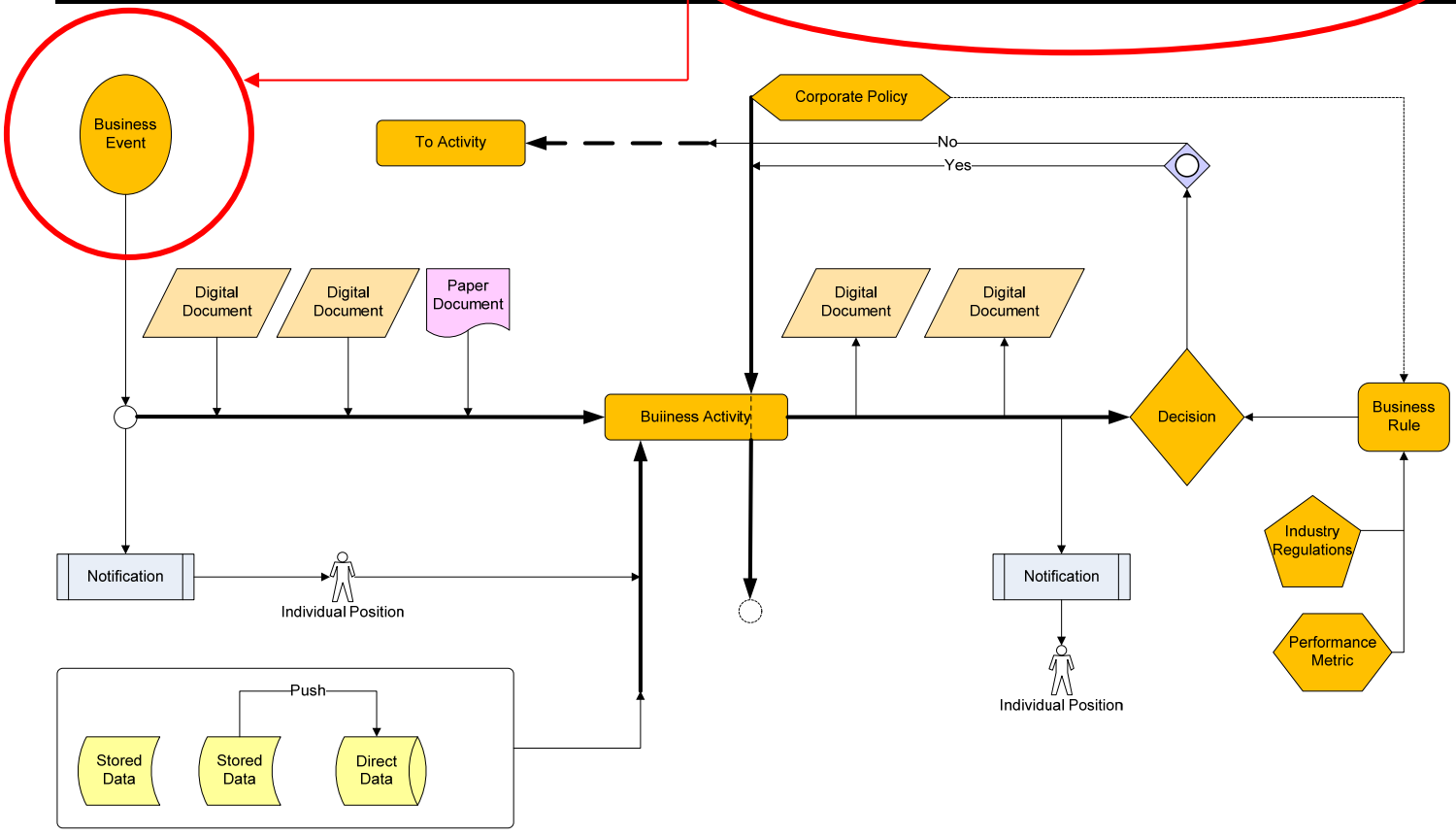
Primary business events represent "triggers" that initiate the execution of an organization's business sub-processes and workflows.

A *primary business event*:

- Represents a completed action that triggers at least one business activity that impacts more than one functional business area
- Has a minimum of one (1) business activity directly associated with it
- Can have many business activities associated with it

For example the petroleum-based *Opportunity Business Process* has the following *primary business events:*

Operational Business Phase	Core **Operational** Business Process	**Primary Business Events**
Opportunity	Opportunity Business Process	Corporate Budget Approved
		Drilling Location Defined and Approved
		Initial Drilling Prognosis is Complete



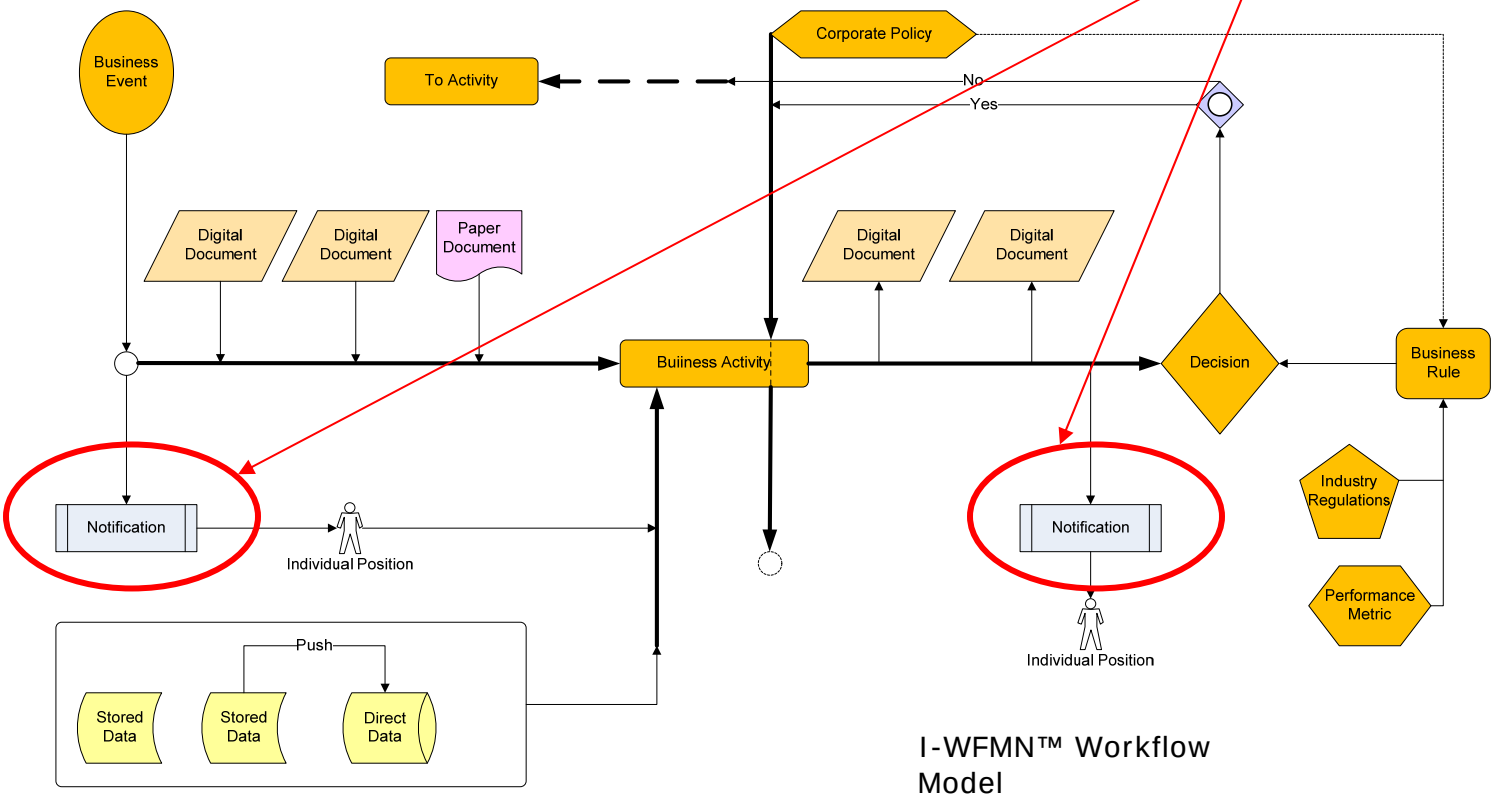
I-WFMN™ Workflow Model

6.2.3 Organizational Notifications

Organizational notifications are the interfacing points at which *business events* and functional personnel and groups associated with a defined work effort (expressed as a *business activity*) become connected. Generally organizational notifications manifest as, but are not limited to:

- Fax-based communiqués
- Telephone calls or messages
- In-person conversations or directives
- External communiqués via surface mail
- Internal communiqués via electronic mail

Operational Business Phase	Core **Operational** Business Process	Primary Business Events	**Organizational Notifications**
Opportunity	Opportunity Business Process	Corporate Budget Approved	Email to BU General Managers
		Drilling Location Defined and Approved	Email to BU General Managers & Drilling Supervisors
		Initial Drilling Prognosis is Complete	Email to Drilling Supervisors

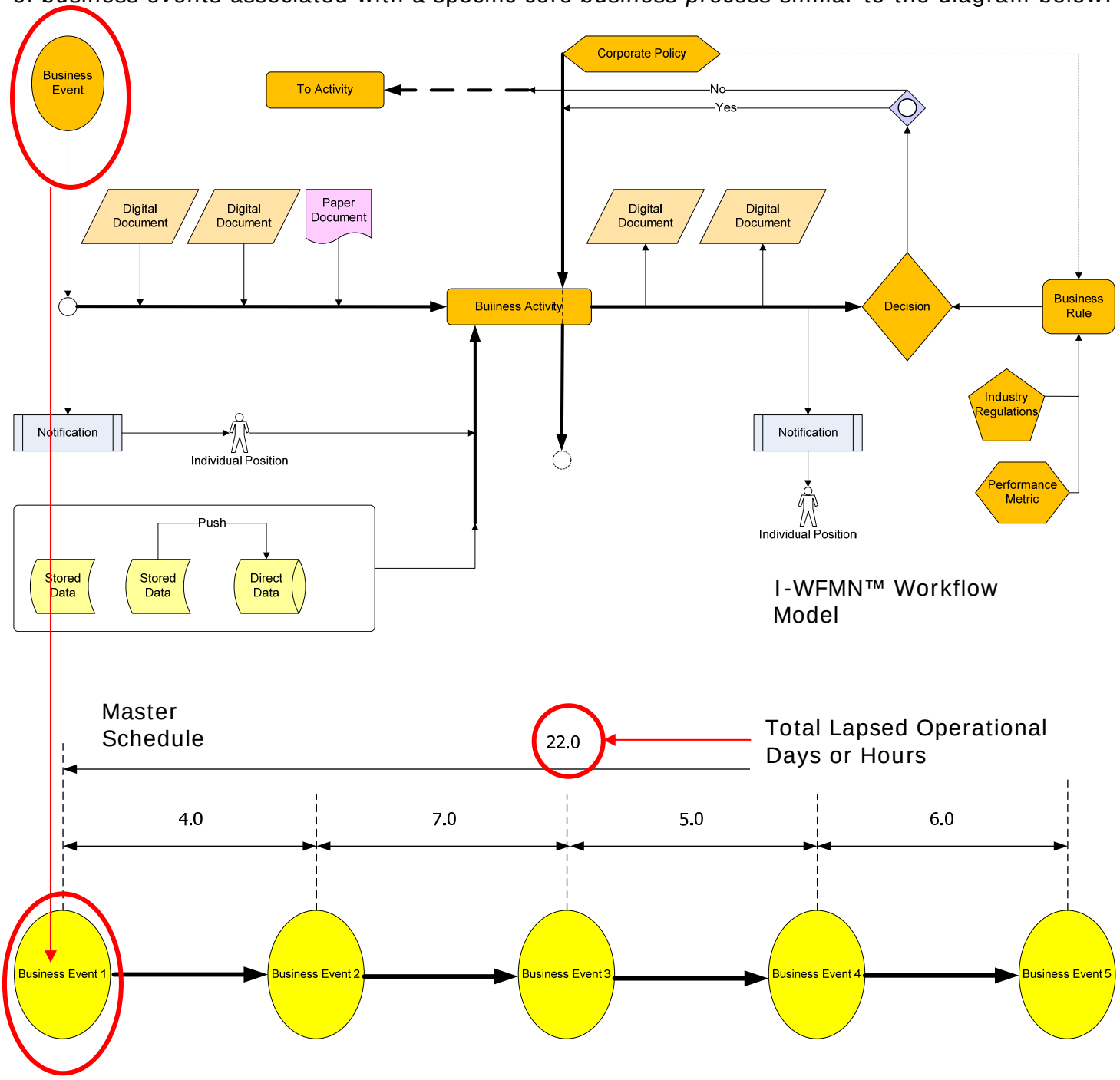


I-WFMN™ Workflow Model

6.2.4 Master Schedule & Critical Path

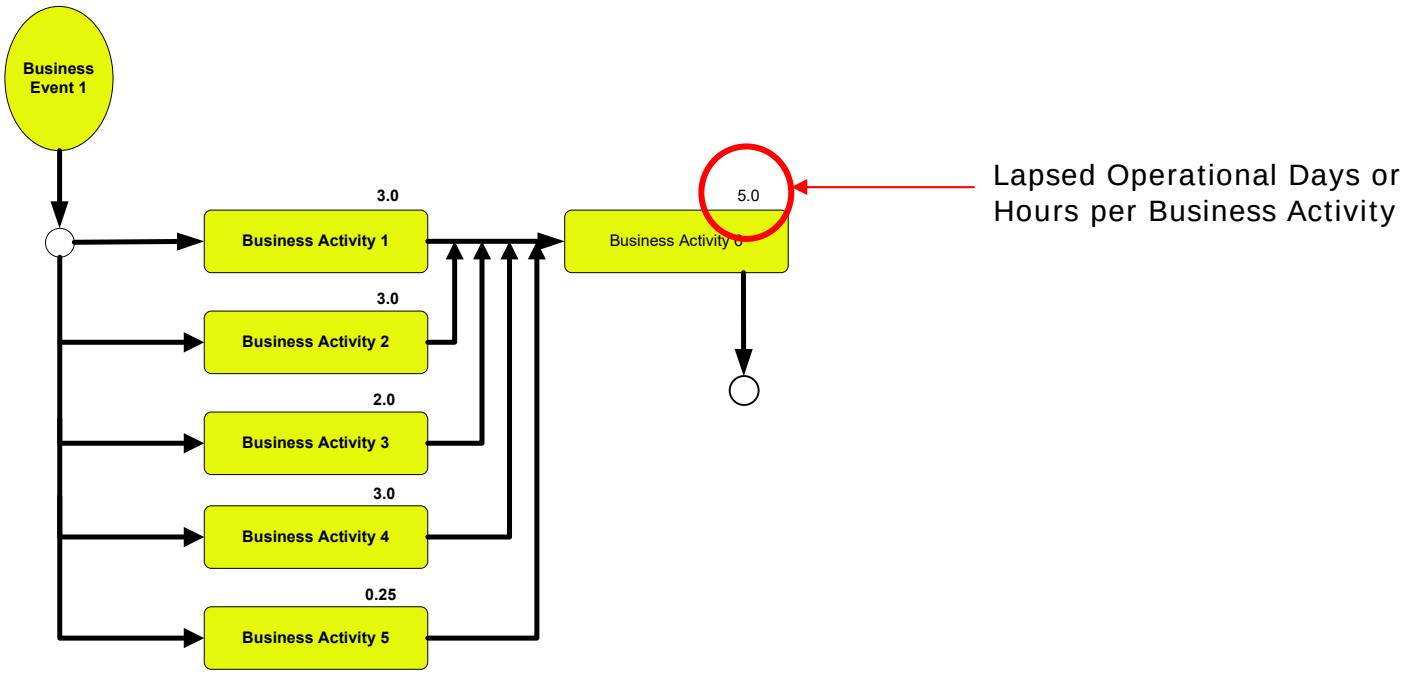
Every organization has a specific "time clock" to which its internal *business events* and associated *business activities* adhere to.

The *master schedule* is an overview of an organization's "time clock" and is depicted as a series of *business events* associated with a specific core *business process* similar to the diagram below.



A *master schedule* is a "roll up" of:

- *Sub-process maps* that depicts total lapsed time for each identified business activity and
- *Workflow models* that depict five (5) time components:
  - Initial Notification time
  - Pre-condition time
  - Business Activity time
  - Post condition time
  - Decision time



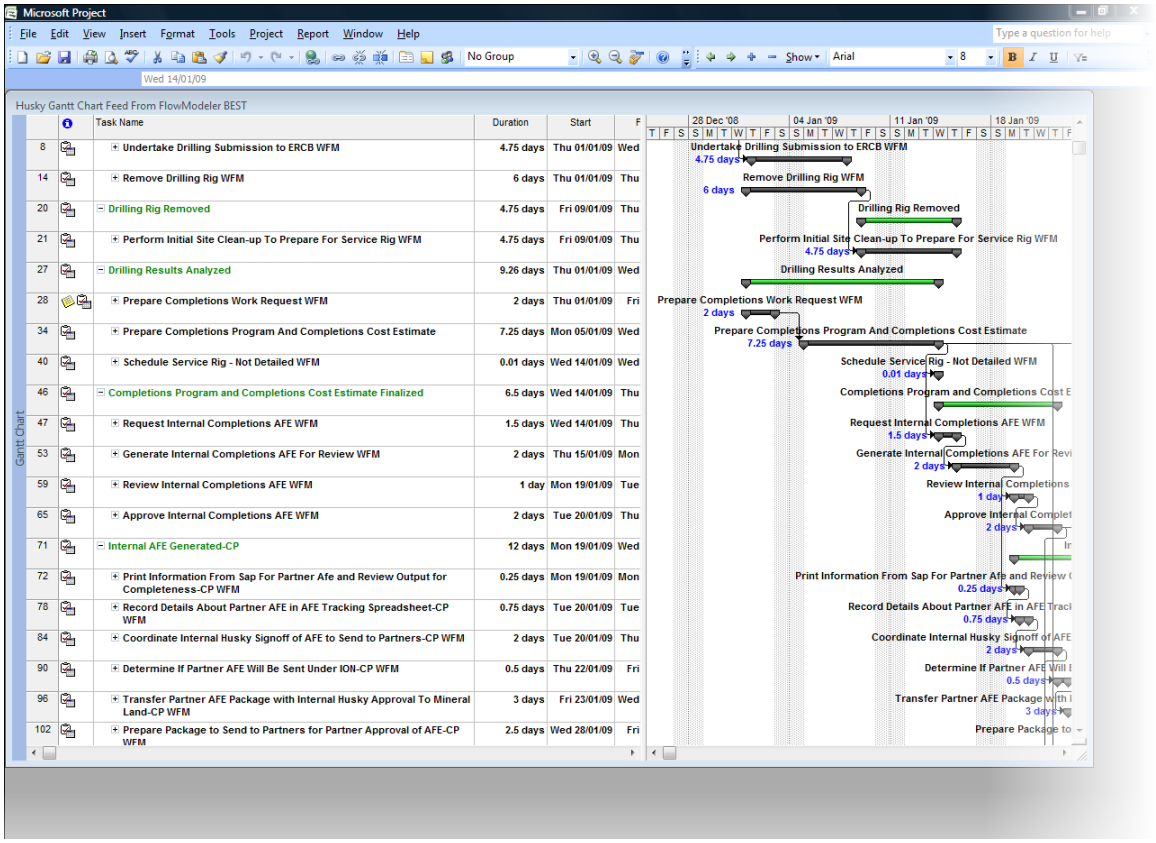
The following table depicts the relationship between *sub-processes, business events, workflows, business activities and the five prominent time components within a workflow.*

Sub-process #	Business Event	Work flow #	Business Activity	Notifi. Time (t_{not})	Pre-condition Time (t_{prec})	Activity Time (t_{act})	Post Condition Time (t_{post})	Decision Time (tdec)	Total Current Lapsed Time (Hrs.)
SP 5	Internal AFE Generated (Note: This applies to all AFE types)	SP5-WFC1	Print Information from SAP for Partner AFE	8.00	8.00	2.00	2.00	4.00	24.0
		SP5-WFC2	Record Details about Partner AFE in AFE Tracking Spreadsheet	2.00	0.00	2.00	2.00	0.00	6.0

An in-depth understanding of the timeframes for each workflow coupled with an understanding of the sequential or concurrent relationship between the various *business activities* within a sub-process and the total time duration of each sub-process provides the opportunity to develop a formal Gantt chart, similar to the diagram depicted.

A Gantt chart assists an organization in identifying the *critical path* associated with the flow of work within a specific core *business process*.

The development of a *critical path* assists the Organizational Consultant in determining were significant "bottlenecks" appears to be occurring within the flow of work.



Gantt chart

6.3 Organizational Personnel

To achieve and understanding of an organization's skills and capacity the *Organizational Consultant* should strive to secure the following artifacts:

- A formal list of *organizational positions* that represent the types of functional work that is to be accomplished within the business (e.g. Economic Analyst, Exploitation Engineer, Regulatory Technician)
- A formal list of *organizational roles* that are utilized within the organization (e.g. Leader, Mentor, Subject Matter Expert, Administrator)
- A *skills and competency matrix* for each *organizational role*
- A formal *organizational chart* that depicts functional groups and lines of authority and reporting

6.3.1 Organizational Positions & Roles

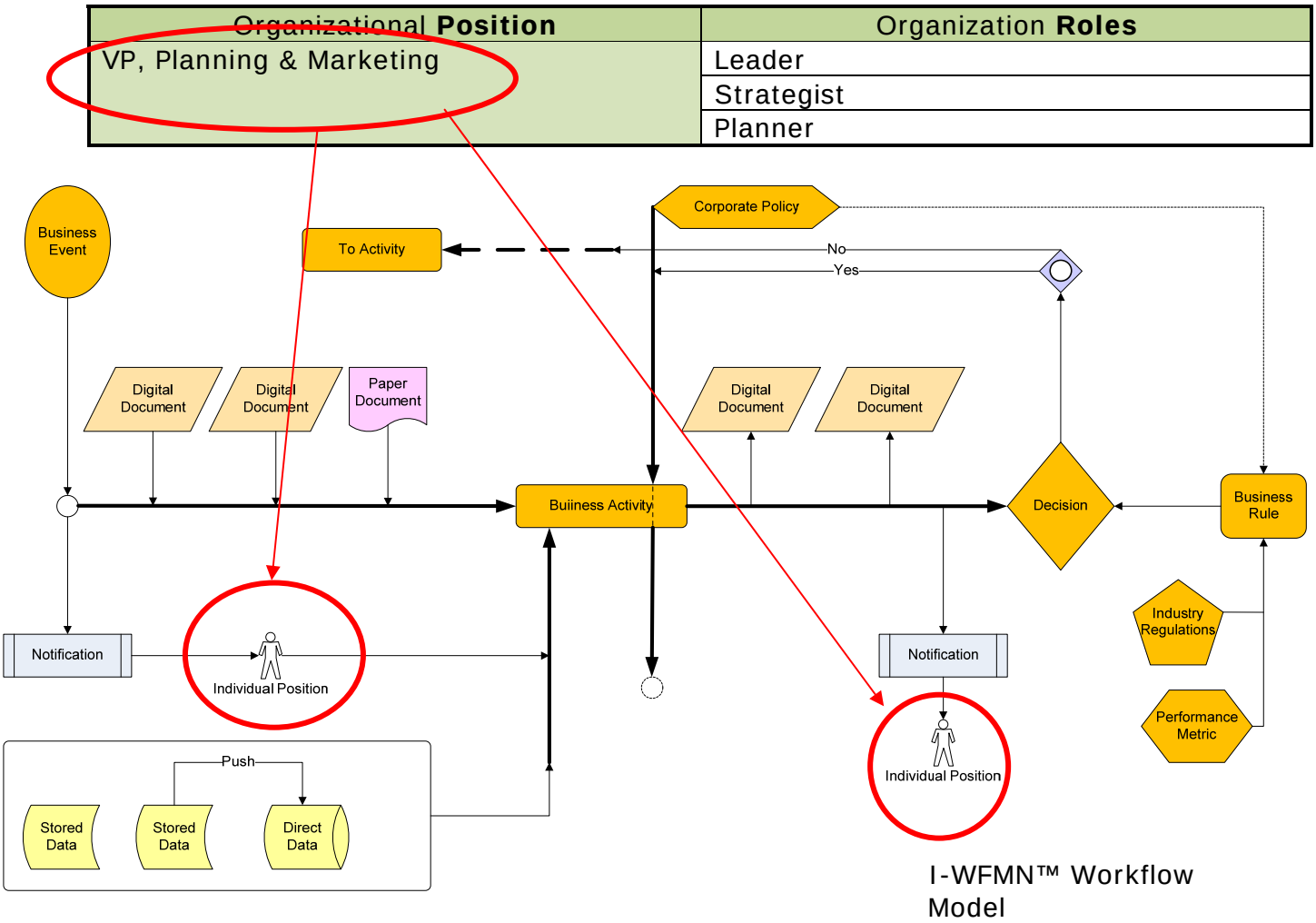
An *organizational position* is an important "mechanism" for completing the defined *business activity*. More specifically, the *organizational position* is a "proxy" for a group of required skills, competency and experience required to complete a defined *business activity.*

The *Organizational Consultant* must be cognizant of the fact that an *organizational position*, often described or articulated as a "job title" can vary dramatically from organization to organization and even within an organization itself.

This "organizational anomaly" is due to the fact that each *organizational position* can have numerous *organizational roles* assigned to it. For example the position of Exploitation Engineer can have the following roles assigned to it – budgeting, mentoring, leadership, project management and engineering.

The "role assignment" can vary significantly between *organizational positions* that carry the same "job title" and thus "suggesting" a similarity amongst personnel.

Most importantly, the *Organizational Consultant* must remain aware that "organizational capacity" to accomplish the work tasks associated with a *business activity* exists within the *organizational roles – not the organizational position.* More specifically, the "capacity" is a product of the skills, competency and experience levels associated with the *organizational roles* assigned to each *organizational position*.



I-WFMN™ Workflow Model

6.3.2 Organizational Competency & Skills

Competencies are often "less tangible" and represent the "social aspects of the modern work environment". Competencies tend to align with the hierarchical level of an *organizational position*.

More specifically, workers in lower *organizational positions* in which strategic decision making or leadership are not prevalent will have need for the following competencies:

- **Information -** one's ability to acquire, organize, interpret, and evaluate information
- **Interpersonal –** one's ability in working with others and involves participation as a team member, shares know-how, and negotiates by working toward agreements and resolution of divergent interests
- **Systems -** one's ability to understand how social, organizational, and technological systems work. A worker with this competency grasps the inter-relatedness of various structures within an organization and works toward maximizing the potentials of different departmental resources

- **Technology** - one's ability to select technology, apply it, and maintain its usability through a basic understanding of knowing how to prevent problems or identify them
- **Resources** – one's ability to identify, plan, organize, and allocate resources effectively. These resources include time, money, materials and facilities, and human assets.

As an individual "moves up the corporate ladder" competencies take on a global and holistic significance since the scope of responsibility at these levels is broader than at the worker level. The four distinct competencies required at these organizational levels are:

- **Decisional** – one's ability in output-oriented efforts that display a predisposition to action, results, and decisive calls
- **Conceptual** – one's ability to be visionary, thinks strategically, and is analytical. This competency gives one the ability to see the big picture, draw conclusions from information available and to analyze the results to show good judgment and decision-making
- **Relational** – one's ability to build team spirit, motivate a workforce toward a mutually desired cause, and purposefully create an atmosphere where individuals from diverse interests are encouraged to work together in pursuit of a common mission
- **Ethical** – one's ability to model and reinforce the organization's belief systems and strategic values

Skills are a worker's ability to produce an outcome that meets or exceeds accepted standards and are generally technically-based.

The following table depicts the relationship between *organizational position, organizational role, role skills and role competencies:*

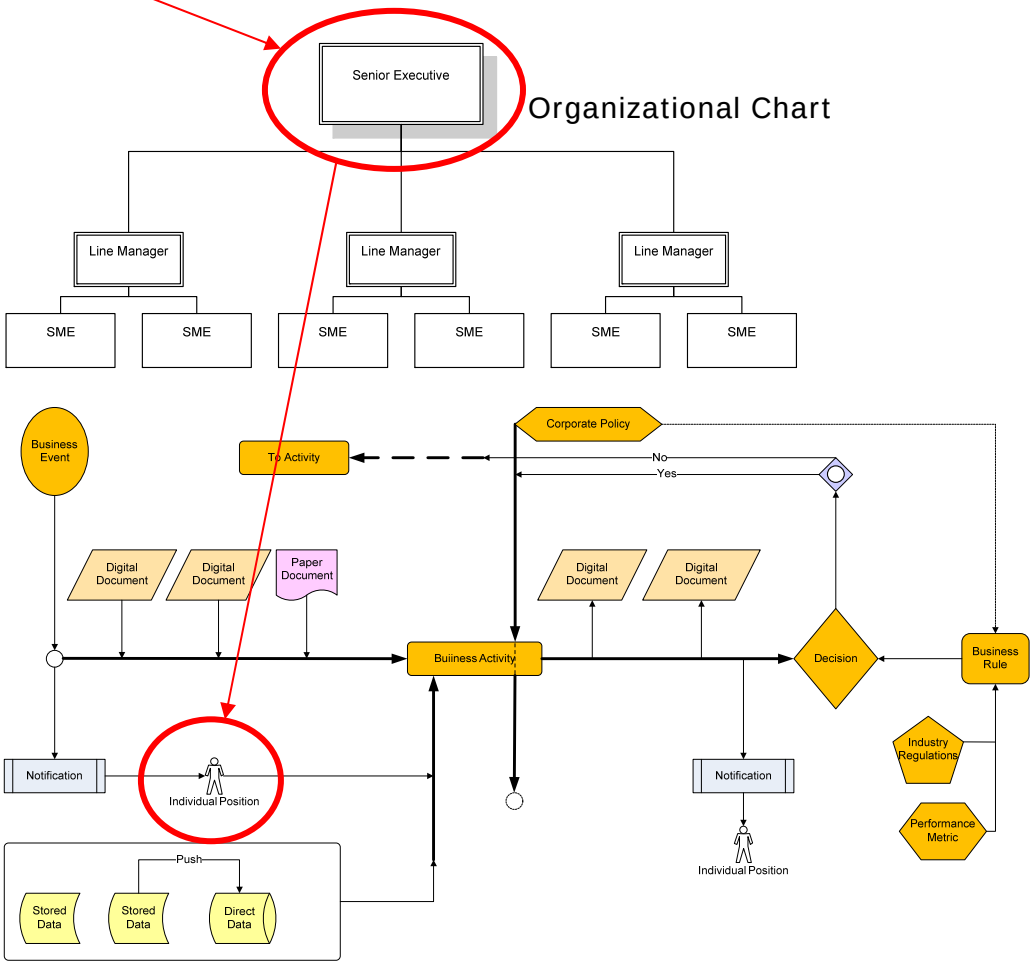
Organizational Position	Organization Roles	Role Competencies	Role Skills
VP, Planning & Marketing	Leader	Decisional	Communications
	Strategist	Conceptual	Market analysis
			Strategy development
	Planner	Relational	Resourcing

6.3.3 Organizational Charts

The most common artifact that depicts organizational personnel is an *organizational chart* in which primary positions and formal reporting structures are generally depicted. While common, the *Organizational Consultant* needs to be aware that most are outdated. The degree to which these types of organizational artifacts are accurate is proportionate to the amount of structural change taking place within the organization. Simply put, stable organizations tend to have more accurate *organizational charts.*

For purposes of creating a *State Reference Models* the *Organizational Consultant* needs to develop a relationship between *organizational position, organizational role, role skills and role competencies, a* high-level *organizational chart* and *workflows.*

Organizational Position	Organization Roles	Role Skills	Role Competencies
VP, Planning & Marketing	Leader	Communications	Decisional



6.4 Organizational Functions

Organizational functions and associated interactions that take place during the execution of work represent the "contextual setting" in which people and process co-exist and inter-relate.

Organizational functions, within the modern-day organization, the point at which human-based efforts associated with a functional responsibility is supported or replaced by a computer-based technology.

It is these *organizational functions* expressed as "functional requirements" that business analysts and software developers strive to uncover and understand as part of their efforts to design and deploy a computer-based application.

What is problematic with the "gathering of functional requirements" is that *organizational functions* are organizational components that have four (4) sub-components:

- *Primary business services*
- *Organizational models*
- *Business processes*
- *Organizational workflows*

While the four (4) sub-components expressed above are reasonably understood individually, there is a significant level of incongruence in how organizations "mix these sub-components" to derive an appropriate functional capability that addresses the needs of the business.

The problems in achieving an appropriate functional capability is further exacerbated by the fact that much of a modern-day organization's work effort has been codified and encapsulated in a plethora of computer-based applications.

As such organizations often find themselves modifying their internal business processes and work efforts to meet the functional capacity delivered by a computer-based application.

It is for these reasons why the *Organizational Consultant* should expend the greatest effort in this area.

6.4.1 Primary Business Services

Business services are intangible products that are not goods. During the execution (delivery) of a *business service* no transfer of possession or ownership takes place. Examples of *business services* are accounting, banking, cleaning, consultancy, education, insurance, medical treatment, or transportation.

Business services:

- Cannot be stored
- Are instantly perishable upon completion of service delivery
- Come into existence at the time they are bought and consumed

Business services utilize the underlying organizational structures, business processes, sub-processes and associated workflows as the mechanisms to engage and deliver its byproducts to clients/consumers.

6.4.2 Organizational Model

Organizational models represent the "foundation and structural framework" that support all work efforts.

However, *organizational models* can vary widely, even in businesses within the same industrial sector. Therefore, the *Organizational Consultant* needs to be diligent in producing a reasonable model that accurately reflects the structure of the enterprise under review.

Utilizing a generic industrial based business model is not appropriate.

Organizational models have a direct and dramatic impact on the flow of work, information creation and sharing and decision making. As such can be the primary basis for impediments to organizational optimization.

Therefore it is important that the *organizational model* types be identified. Generally, a modern-day organization will exhibit some aspect of the following *organizational models*:

- Bureaucratic Model
- Functional Model
- Divisional Model
- Matrix Model

6.4.2.1 Bureaucratic Model

Bureaucratic models have a certain degree of standardization, are often "tall" structures (i.e. there are several levels of authority extending from the senior executive down to individual contributors) with a distinct characteristic of *rule-following*.

As opposed to adhocracy, *bureaucratic models* have standardized procedures that guide the execution of most or all internal processes, have formal divisions of power and have a hierarchy of authority.

For the most part, organizations tend to introduce *bureaucratic models* as a "response" for achieving efficiency. In reality *bureaucratic models* do not delivery organizational efficiency, rather these structures form "communication channels" that support the flow of from leadership down into the organization.

As organizations become larger, *bureaucratic models* become enacted as formal governance mechanisms.

All publically traded organizations and government agencies use some form of a *bureaucratic model*. However, not all of these *bureaucratic models* are clearly understood or known.

A bureaucracy, created by the introduction of a *bureaucratic model*, is directly responsible to the leadership that creates it and generally takes the structural form as a government agency, board of directors, steering committee, internal audit groups or board of a professional association.

Bureaucratic models are not designed to create policy but, rather, enact it. More specifically, the laws, corporate policies, and industry-specific regulations utilized by a bureaucracy generally originates from the leadership of the organization, which, in turn, creates a bureaucracy to put them into practice.

As a matter of practicality, *bureaucratic models* are the mechanisms that an individual or group utilizes to interface with an organization, rather than directly with its leadership.

The drive towards better corporate governance through the enactment of the Sarbanes Oxley Act in the United States and Bill 198 in Canada are both catalysts in the creation of *bureaucratic models*.

Organizational Consultants must remain aware that corporate and operational policies and business rules are the primary internal organizational artifacts associated with *bureaucratic models*. Generally these artifacts do not "acknowledge functional and/or divisional boundaries" – they are enterprise-wide.

As important, elements of bureaucracy in the form of corporate and operational policies and business rules are part of all *business processes* (see Section 5.4.4.4).

Therefore the *Organizational Consultant* must be cognizant that these policies and rules can exist but may not be associated with specific business processes and associated workflows, thus leaving the organization without appropriate organizational mechanisms that ensure that internal work efforts meets the expectation of the executive and the marketplace.

For example and organization may have formal steering committees and/or internal audit groups but lack formal corporate policies and business rules within managerial business processes that support the planning and budgeting work effort - a "signal" that an organization is transforming into a more complex entity that requires modifications to their business processes.

6.4.2.2 Functional Models

Functional models reflect the division of labor within an organization.

As such, *functional models* generally manifest as "departments" in which work activities are grouped by the main activities or functions that need to be performed within the organization—sales, marketing, human resources, and so on.

Generally each functional group is vertically integrated from top to bottom leading to "organizational silos" that, at times, work as separate business units. Therefore, *operational business processes* tend to be designed and deployed vertically within *functional models.*

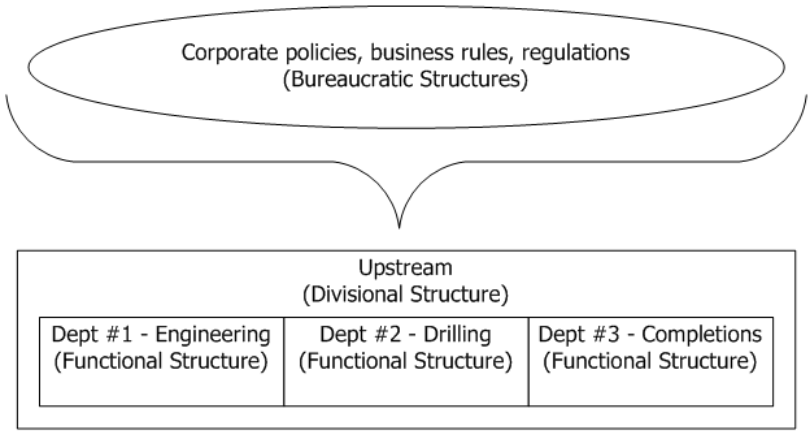
As organizations evolve towards a more integrated model, as most modern organizations tend to do, "organizational silos" (*functional structures*) become problematic – particularly at organizational boundaries.

Organizational Consultants need to be diligent in discovering and documenting "boundary impediments" that can impact an organization's ability to achieve an optimal state.

"Boundary impediments" can be further exacerbated by *organizational positions* within these functional divisions that tend to be designed to perform a specialized set of tasks, for instance the engineering department would be staffed only with engineers whose primary *organizational role* is engineering.

While functional specialization is designed to achieve operational efficiencies within a group, communication between groups or other functional areas within the enterprise can become difficult.

As a whole, *functional models* are best suited to producing standardized goods and services at large volume and low cost. Within these types of organizational structures, efficiencies are realized through the vertical integration of activities so that products are produced and distributed quickly and at a low cost.



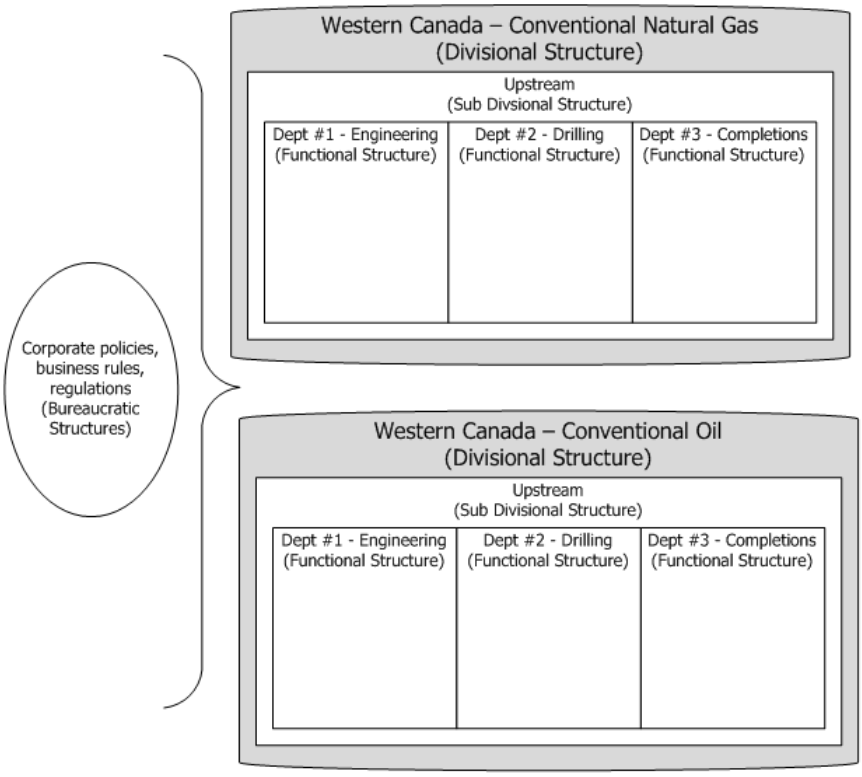
It is within the *functional model* that the primary operational business processes exist (see Section 5.4.4.4) and where the "value of the business" is created.

As such the *Organizational Consultant* should look towards the "revenue side" of the organization to get a "sense" of how well *functional model* is actually performing.

More specifically, declining or flat revenues may be signaling that either the work being accomplished in the *functional model* is not aligned with creating products that the market finds valuable (and want to purchase) or "boundary impediments" are creating problems in the production of valuable products which are manifesting as low volume levels that do not allow the organization to gain market share and increase revenue.

6.4.2.3 Divisional Models

Also called a "product models", *divisional models* divide each functional area along specific product lines (i.e. conventional gas, conventional oil, coal bed methane, heavy oil, etc). Generally, each division contains all the necessary resources and functions within it.



As depicted, a petroleum-based organization that is predominately an "exploration and exploitation" business might create *divisional models* along conventional natural gas and conventional oil delimitation lines and divide these *divisional models* into *sub divisional models* that reflect its primary focus on upstream operations (i.e. exploration and exploitation efforts such as opportunity selection, drilling, completions, facilities construction and tie-in).

Divisional models tend to manifest in organizations that have large operations in many geographical areas, thus requiring a level of decentralization to address and/or adhere to geographically-based laws, issues or conditions.

In these types of organizational settings the *Organizational Consultant* should be diligent in extracting an understanding of the "interfaces" between the core business processes that are executed within *divisional, sub-divisional* and *functional models*.

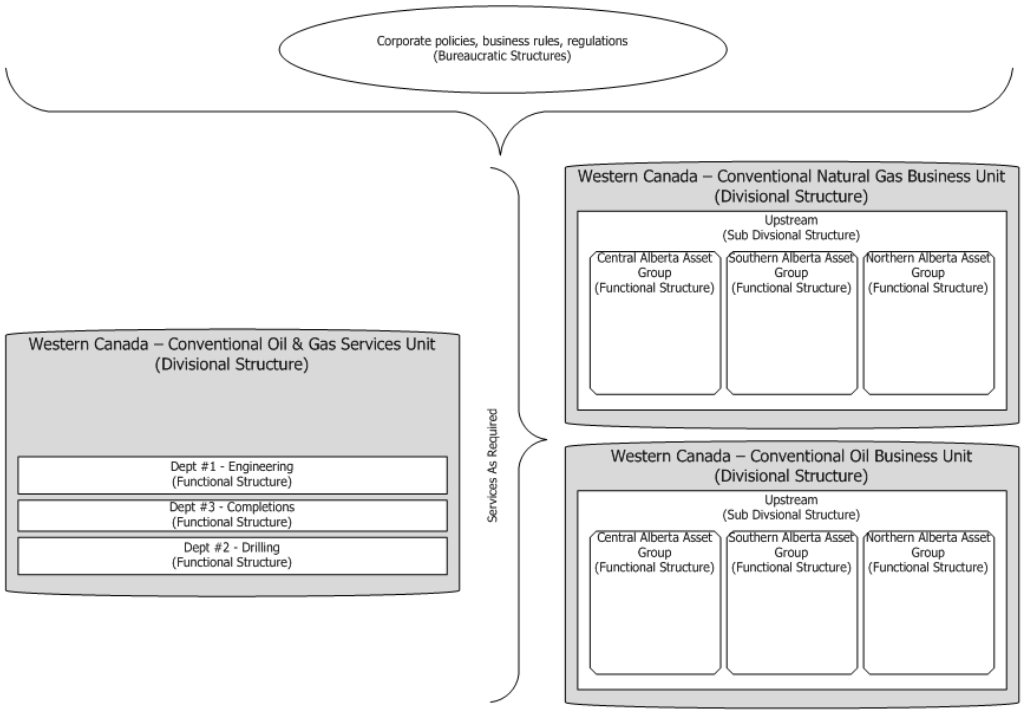
6.4.2.4 Matrix Models

Matrix models are designed along both function and divisional lines. This type of organizational model is utilized when a business wants the best of both models. Specifically a *matrix model* frequently uses "functional teams of subject matter experts" that provide identifiable strengths

to the work effort while eliminating (at least reducing) "boundary impediments" associated with *functional* and *divisional models*.

Matrix models are the most complex of the different organizational types.

The two (2) most common *matrix models* found in modern organizations is the "project team" and the "services team".



"Project teams" lean heavily on *bureaucratic models* to ensure that the work effort can exist within *divisional* and *functional* area. Further, the underlying business processes associated with project management are categorized as "support processes" that exist within temporary *matrix models*.

Therefore, it is of limited value to capture the current state of project-based processes and functions.

"Services teams", on the other hand, are *divisional* and *functional* models that utilize operational business processes that need to interface and align with other operational business processes. These "operational business processes" exist in permanent *matrix models.*

The *Organizational Consultant* needs to pay particular attention to the interface and alignment elements of the "operational business processes" within a *matrix model.* These business processes are generally complex and are prone to duplicate business activities, often have a significant amount of sequential activities and a high level of time-related delays in the underlying workflows.

With respect to the four (4) primary *organizational models* described above, the *Organizational Consultant* need not spend a significant amount of time in developing a detailed synopsis of the model types that might exist in an organization.

What is important is to gain a generally understanding of which organizational models are prominent within the organizational environment.

This knowledge will guide the *Organizational Consultant* in determining the level of complexity that may exist within the organizational environment and which core business processes and

associated workflows should be focused on in order to develop a meaningful *State Reference Models™.*

6.4.3 Primary Business Process Maps

The creation of the required business process and workflow models is described in a complementary document titled *IDEF0-based Workflow Modeling Notation™ (I-WFMN) for Developing Workflow Models Associated with Architecting Management Solutions.*

Primary business processes are a collection of interrelated business events and associated business activities which are directly related to the *business services* an organization provides to internal and external personnel.

Primary *business processes*:

- Span the enterprise to the extent in which all functional areas responsible for input and/or output within the defined process are included
- Is responsible for the delivery of an organization's primary product(s) or service(s)
- Are aligned with an organization's primary strategic intent
- Defines the direction of organizational workflow

Primary *business processes* can generally be categorized as:

- Short-lived processes such as Straight Through Processing (STP) that enables the entire process to be conducted electronically without the need for re-keying or manual intervention, subject to legal and regulatory restrictions. The concept is prominent in the financial businesses but has been transferred into other asset classes including energy (oil, gas) trading
- Long-lived processes that are based on human-oriented activities (i.e. workflow) that have significant levels of human intervention and potential "think time or decision making"

There are three types of primary *business processes*:

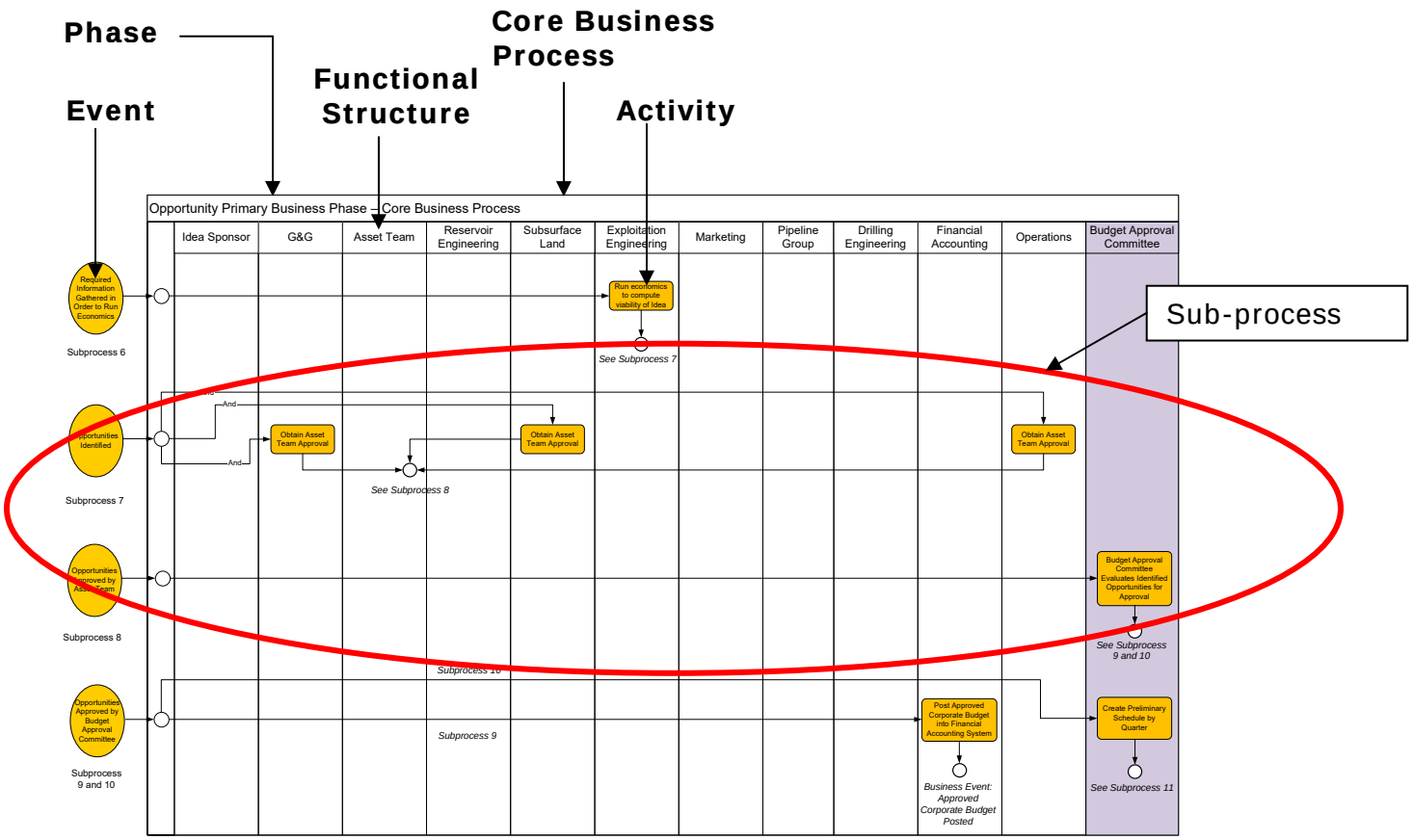
- *Governance (Management) processes* - the processes that govern the behavior of the organization and includes corporate governance and strategic planning and management
- *Core (Operational) processes* - the processes that create the primary value streams and constitute the primary (i.e. core) business processes that are industry-specific
- *Enabling (Supporting) processes* - the support processes associated with the primary business processes

6.4.4 Sub-processes

Generally an organization's primary *business processes* consist of a number of *sub-processes* that:

- Are a sub-set of the enterprise wide primary business process and are associated with a specific functional area of responsibility
- Start and end within functional areas and do not traverse the complete enterprise

The following diagram depicts the relationship between core business process and sub-processes.



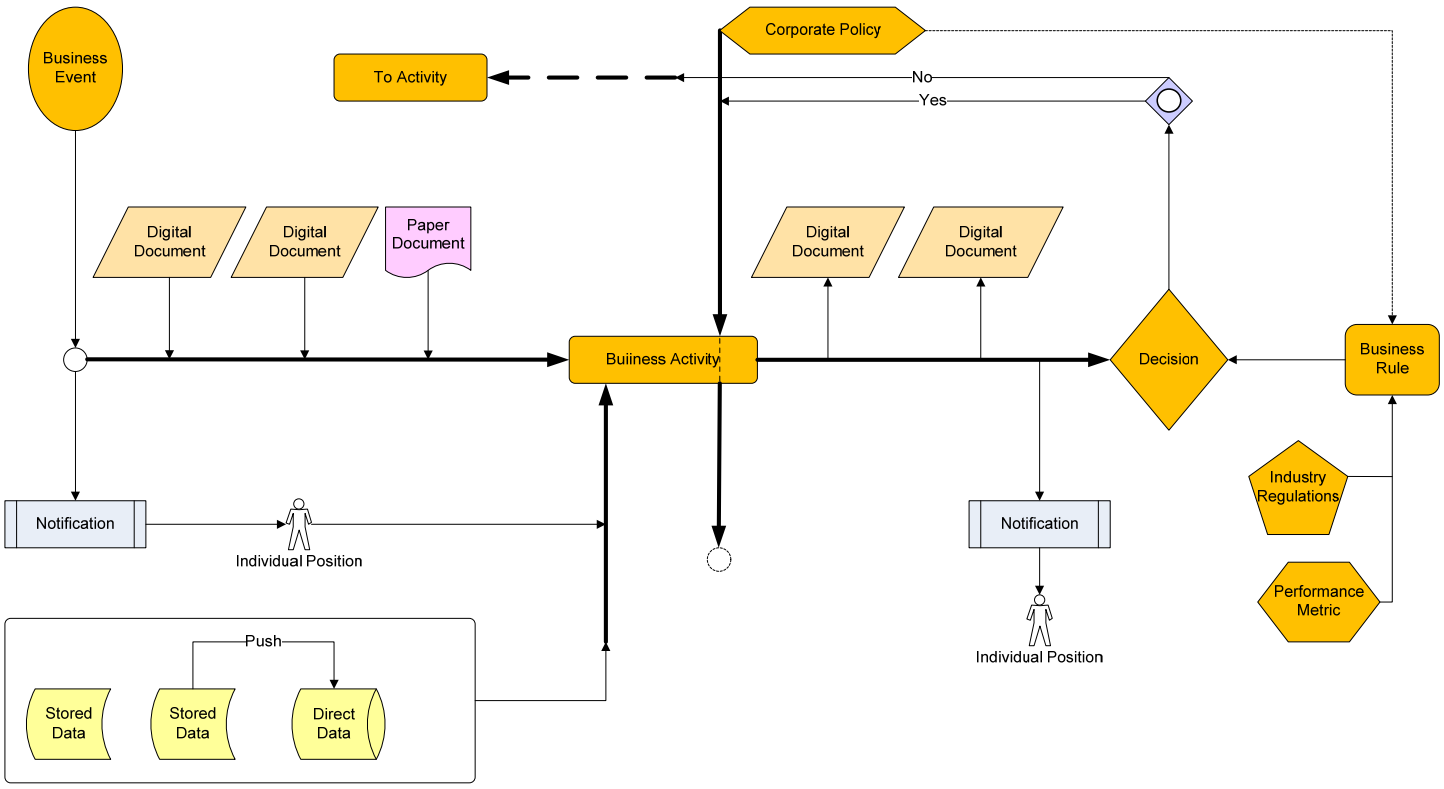
6.4.5 Workflow Models

All workflow models generally have a set of common components that identify the following:

- Business events
- Business notifications
- Business roles
- Business policies
- Business activities

- Business decisions
- Business rules
- Business inputs
- Business outputs
- Computer-based Systems:
    - Applications
    - Data Stores
    - Computing Platforms

The following diagram is an example of an *I-WFMN*™ based workflow model that depicts the relationship between the common components outlined above.



The following table contains the associated "textual narrative" commonly developed with each *I-WFMN*™ based workflow model.

EVENT:	**Drilling Finished**
ACTIVITY (DESCRIBED BELOW):	Enter Drilling Rig Release Date into Daily Drilling Report
WORKFLOW #:	**SP1-WFC1**
The Field Drilling Supervisor is notified informally that drilling has finished by being present on site. This is their trigger to enter the Rig Release Date into the Daily Drilling Report in WellView. At this time, the Field Drilling Supervisor also informs the Office Drilling Supervisor, E&PS Construction Superintendent or E&PS Field Construction Supervisor that drilling has finished. As a practice, the two Drilling Supervisors communicate daily on the status of the project by phone, and the Office Drilling Supervisor would also be pulling a copy of the Daily Drilling Report out of WellView each day. The phone call to the Construction Team is a notice that they will be required to clean the site shortly. The Daily Drilling Report in WellView is also accessed through OpWorks. OpWorks is a web-based reporting dashboard (created internally to be part of an Asset Life Cycle Management process) that pulls data from other Asset Life Cycle Management tools such as MaxWell or the Peloton suite of products (WellView/SiteView/RigView).	
Positions	**People / Groups Involved**
	• Office Drilling Supervisor • Field Drilling Supervisor • E&PS Construction Superintendent or E&PS Field Construction Supervisor
Pre-conditions	**Inputs**
	• Daily Drilling Report (WellView)
Pre-condition Notification(s)	**Take action, Verification / Validation, Approvals, Confirmations, Files, FYI**
	• The Field Drilling Supervisor is informally notified that drilling has finished by being present on site. This is the cue to enter the Drilling Rig Release Date into WellView
Post-conditions	**Outputs**
	• Daily Drilling Report containing Drilling Rig Release Date (WellView/OpWorks)
Post-condition Notification(s)	**Take action, Verification / Validation, Approvals, Confirmations, Files, FYI**
	• The Drilling & Completions Technician checks the Daily Drilling Report regularly through OpWorks to check for new Drilling Rig Release Dates. • The Regulatory Technician checks the Daily Drilling Report daily through OpWorks to check for new Drilling Rig Release Dates. • The Construction Superintendent or Field Construction Supervisor is notified by the Field Drilling Supervisor that drilling has finished (by phone).
Information Systems	**Computer-based Systems Utilized**
	• WellView • OpWorks
Decision Point	**Primary Decision**
	Has the Drilling Rig Release Date been entered into WellView?
If "No"	Enter Drilling Rig Release date into WellView. (may be done by Drilling Field Supervisor or Drilling & Completions Tech)
If "Yes"	Continue to: "Undertake Drilling Rig Release Submission to ERCB"
Corporate Policy(ies)	**Include either explicit or implied corporate policy(ies)**
	No Corporate Policy was identified.
Business Rule(s)	**Include either explicit or implied business rule(s)**
	• Actual Date of completion of Drilling operations must be entered • Rig Release Date must be entered in WellView

EVENT:	Drilling Finished
ACTIVITY (DESCRIBED BELOW):	Enter Drilling Rig Release Date into Daily Drilling Report
WORKFLOW #:	SP1-WFC1
Performance Metric(s)	Include either explicit or implied performance metric(s)
	• No Performance Metric was identified.
Industry Regulation(s) or Norm(s)	Include either explicit or implied industry regulations or norm(s)
	• No Industry Regulation was identified. • No Industry Norm was identified.
Time	Identify the approximate amount of time for each component
Notification Time	0.00 days
Pre-condition Time	0.00 days
Activity Time	0.00 days
Post-condition Time	0.00 days
Decision Time	0.25 days
Total Time	0.25 days

The *primary business process maps and associated sub-process diagrams and workflows* are key artifacts that the Organizational Consultant must develop.

These artifacts are the primary "communication devices" that create a common lexicon between senior decision makers, individual contributors and information technology specialists.

6.5 Organizational Assets

The importance in determining the types, quality and quantity of *organizational assets* reflects the modernization of the business environment in which the majority of the business assets are "abstracted constructs" that often exist in the form of digital documents and data.

As such, today *organizational assets* exists within the modern organization in both the business domain and information technology domains.

Within the business domain *organizational assets* takes on the form of "completed documents" (e.g. reports, financial statements, inventory lists, etc.).

However these "completed documents" are increasingly being constructed from digital data sets that exist in numerous locations throughout the organization, giving rise to concerns about accuracy and timeliness.

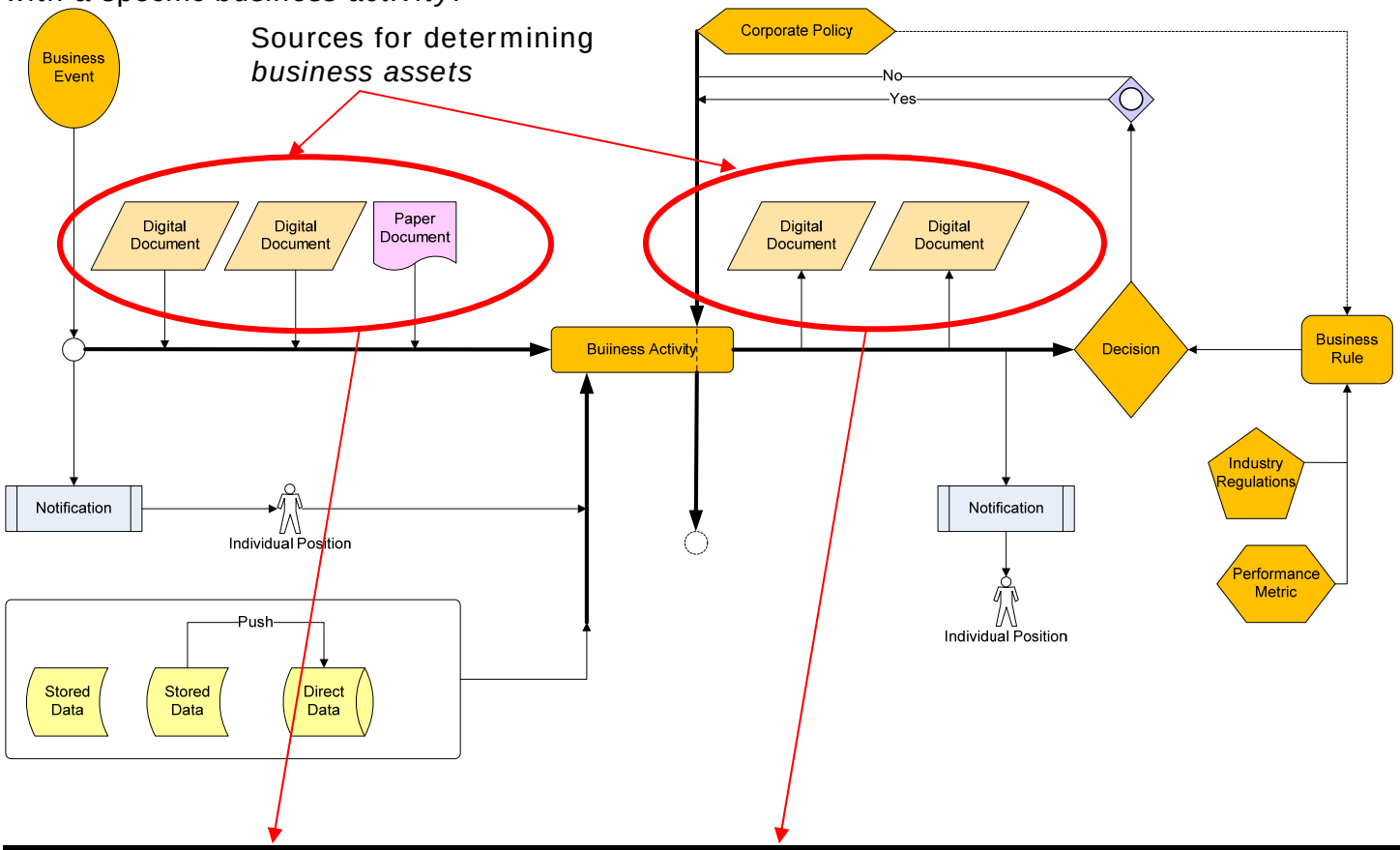
For purposes of creating a *State Reference Models* the *Organizational Consultant* needs to:

- Develop a list of *business assets* created by or utilized within the organization as the initial step in understanding the varying "abstracted constructs"
- Develop a *semantics model* that contains common organizational words and phrases and their associated meaning

6.5.1 List of Business Assets

The creation of a list of primary *business assets* (e.g., well, pipeline, lease, land location, etc.) should be guided by the *business processes* and associated *workflows* that the organization performs to achieve its "strategic intent".

Generally, the *business assets* are identified in the informational inputs and outputs associated with a specific *business activity*.



Organizational Component	Assets Category	Asset Quantity	Asset Location	Asset Description
ABC Energy Upstream Operations	• Conventional shallow oil wells	• 17 Operated • 3 Non-operated (15% working interest)	• NE Alberta – Athabasca Field	• Conventional oil wells to a depth of no more than 300M

6.5.2 Semantics Model

Common to all modern organizations is an industry-specific lexicon that is founded on specialized terms and their associated meaning. It is often the "unknown lexicon and misinterpretation of organizational terms" that leads to misinformation, poor decision making and ineffective work efforts.

Therefore, it is important that the *Organizational Consultant* develop a reasonably sized up-to-date and accurate *semantics model* that articulates the standard terms used to describe the primary data items used within an organization's core business processes.

A *semantics model* can be of significant size and contain hundreds of terms and definitions. Therefore it is important that the *Organizational Consultant*, within the context of developing a formal *State Reference Models*™ boundary the *semantics model* by the focus and scope of the current state review.

The following table is an example of a partially developed *semantics model.*

Organizational Term or Phrase	General Meaning
API	American Petroleum Institute
A&R	Abandon and reclaim
Abandonment	The permanent dismantlement of the licensed facility so that it's permanently incapable of its licensed use. Includes leaving downhole or subsurface structures in a permanently safe and stable condition in accordance with regulatory authority requirements; the removal of associated equipment and structures; the removal of all produced liquids; and the removal and appropriate disposal of structural concrete.
AFE	Authorization for Expenditure The estimated costs for drilling and completing a proposed well. It is prepared by a lease operator and sent to each non-operator with a working interest for approval before work is undertaken. Normally used in connection with well-drilling operations.
Appraisal Well	A well drilled to determine the physical extent, reserves and likely production rate of a field.
Battery	Equipment used to process or store crude oil from one or more wells.
Bitumen	Hydrocarbon material of natural or pyrogenous origin, which may be gaseous, liquid, semi-solid or solid and is completely soluble in carbon disulfide. Bitumens are found in asphalt and mineral waxes. Generally used in industry to mean heavy oil. The term is also used to refer to the components of coal that are soluble in organic solvents.
Blowdown	The production of gas, either from the gas cap of an oil reservoir (normally after depletion of the oil), or from a cycled gas pool upon cessation of the cycling operation.
Blow-Out	Uncontrolled flow of gas, oil or other well fluids from a well during drilling due to formation pressure exceeding the pressure exerted by the column of drilling mud.
Blow-Out Preventers	High pressure wellhead valves, designed to shut off the uncontrolled flow of hydrocarbons.
BPM	Business Process Model

6.6 Organizational Infrastructure

The underlying physical *organizational infrastructure* will have an impact on the computer-based information systems that support the work effort.

In addition, understanding the physical locations of an organization will assist in developing a "sense" of the diversity of the organization. Often organization's with broad international "footprints" strive for inter-cultural contact, allowing their internal personnel to become more "cultural diverse" and "transferrable" between business units.

Therefore it is important that the *Organizational Consultant* develop a reasonable understanding of the "physical operational scope" of the organization under review.

6.6.1 Geographical Areas of Operation

The *Organizational Consultant* should develop a list of business units and their geographical location similar to the table below:

Primary Corporate Name	Business Unit Name	Geographical Location (Country)
ABC Energy Inc.	ABC Refining Ltd.	Brazil

6.6.2 Business Locations

The *Organizational Consultant* should develop a complimentary list of business unit addresses similar to the table below:

Business Unit Name	Geographical Location (Country)	Business Unit Address
ABC Refining Ltd.	Brazil	SBN - Quadra 13 - Bloca B - 8º andar BRASILIA - DF BRAZIL 70002-900 BRAZIL

7 Completing an Information Systems and Technology Domain Review

The review of the information systems and technology domains is focused on developing an understanding of:

- An organization's functional components in the form of *computer-based applications* and *middleware*
- An organization's computer-based infrastructure in the form of lists of computer-based assets, network maps, node/role models
- An organization's data components in the form of *data flow models* and *database models*

7.1 Computer-based Functions

As previously stated within this guide book the problems in achieving an appropriate functional capability can be exacerbated by the fact that much of a modern-day organization's work effort has been codified and encapsulated in a plethora of computer-based applications.

Therefore the *Organizational Consultant* must strive to gather a reasonable understanding of the *computer-based application portfolio* and the general functional capacity the computer-based systems are designed to deliver into the organization.

The *Organizational Consultant* may find significant misalignment between the "work of the business" (as defined in its business processes and workflows) and the *computer-based application portfolio* deployed as an "enablement layer" within the organizational structure.

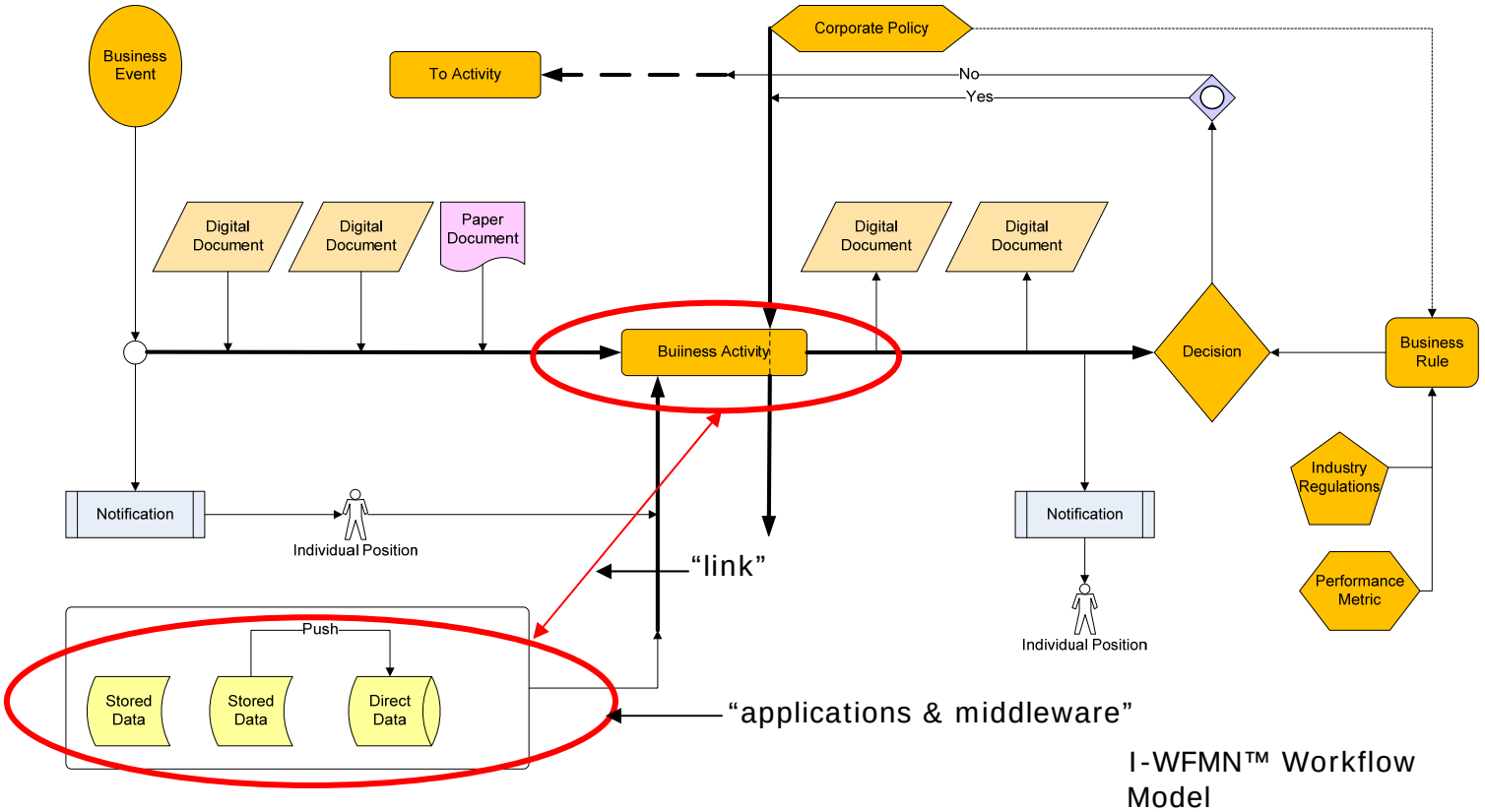
7.1.1 Computer-based Application Portfolio

The *computer-based application portfolio* consists of two (2) distinct component areas within an organization's physical infrastructure – specific functional applications and enterprise-wide middleware.

It is essential that an understanding of which software components are "shared" throughout the organization and which functional applications reside within defined departmental areas. More specifically, the deployment of functional applications within defined departmental areas has become increasingly more problematic within more organizations insomuch as these types of applications create a "siloed" approach to data sharing – i.e. sharing data outside the functional department can be limited or non-existent.

The *Organizational Consultant* must strive to capture a reasonable list of *computer-based applications* and *middleware*, together with an understanding of the how many of these *computer-based applications* and *middleware* components are "siloed" or "enterprise-wide".

Given the extensive number of components within an organization's *computer-based application portfolio* (it is not uncommon to find portfolio's containing 400+ components)the *Organizational Consultant* needs to use the link between *computer-based applications* and the *business activities* associated with each workflow as a guide and focus on only the *computer-based applications* and *middleware* associated with the business processes and workflows that are part of the developing *State Reference Models*™ .



I-WFMN™ Workflow Model

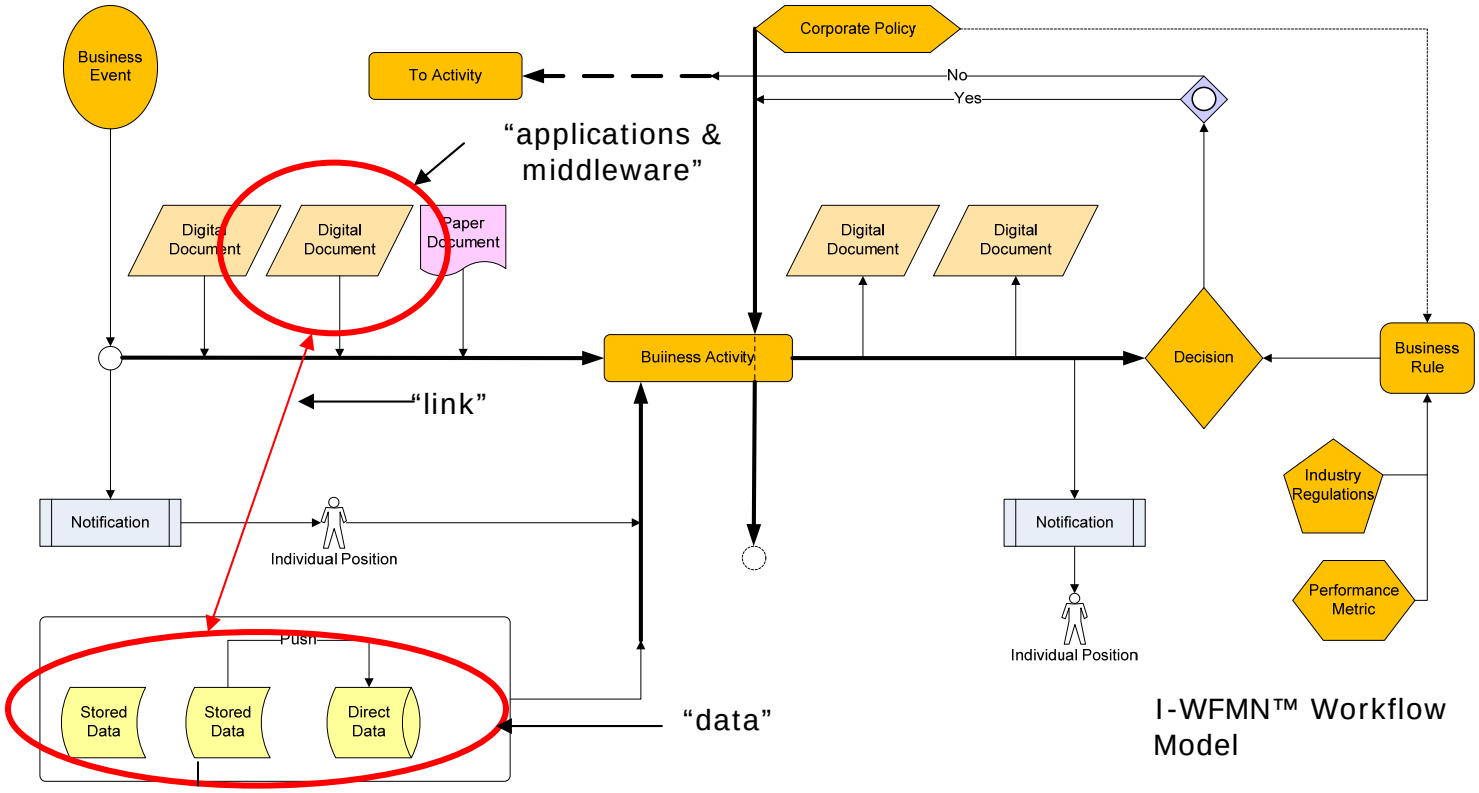
7.2 Computer-based Data Sets

In the modern organization, *computer-based data* has become an important "asset". However, most organization's often collect too much data and have been inconsistent in ensuring accuracy within the data set.

Computer-based data represents "an abstracted view" of an organization's information. The *Organizational Consultant* must remain cognizant of the fact that information and *computer-based data* are separate components. While intrinsically linked, *computer-based data* by itself contains very limited meaning to an organization. The value of *computer-based data* comes from the information its ultimately helps create – e.g. operational reports, financial records, etc.

Generally, *computer-based data* is directly linked to the *computer-based application portfolio* described above and takes on the "form" that is reflective of the industry-specific lexicon that is founded on specialized terms and their associated meaning.

Therefore the *Organizational Consultant* should utilize both the link between *computer-based applications* and the *business activities* associated with each workflow and a *semantics model* to guide the selection of which *computer-based datasets* that may be appropriate for the developing of State Reference Models™.



The *Organizational Analyst* should develop a table similar to the following as a means for depicting the relationship between *organizational semantics, business activity, computer-based applications* and *associated dataset.*

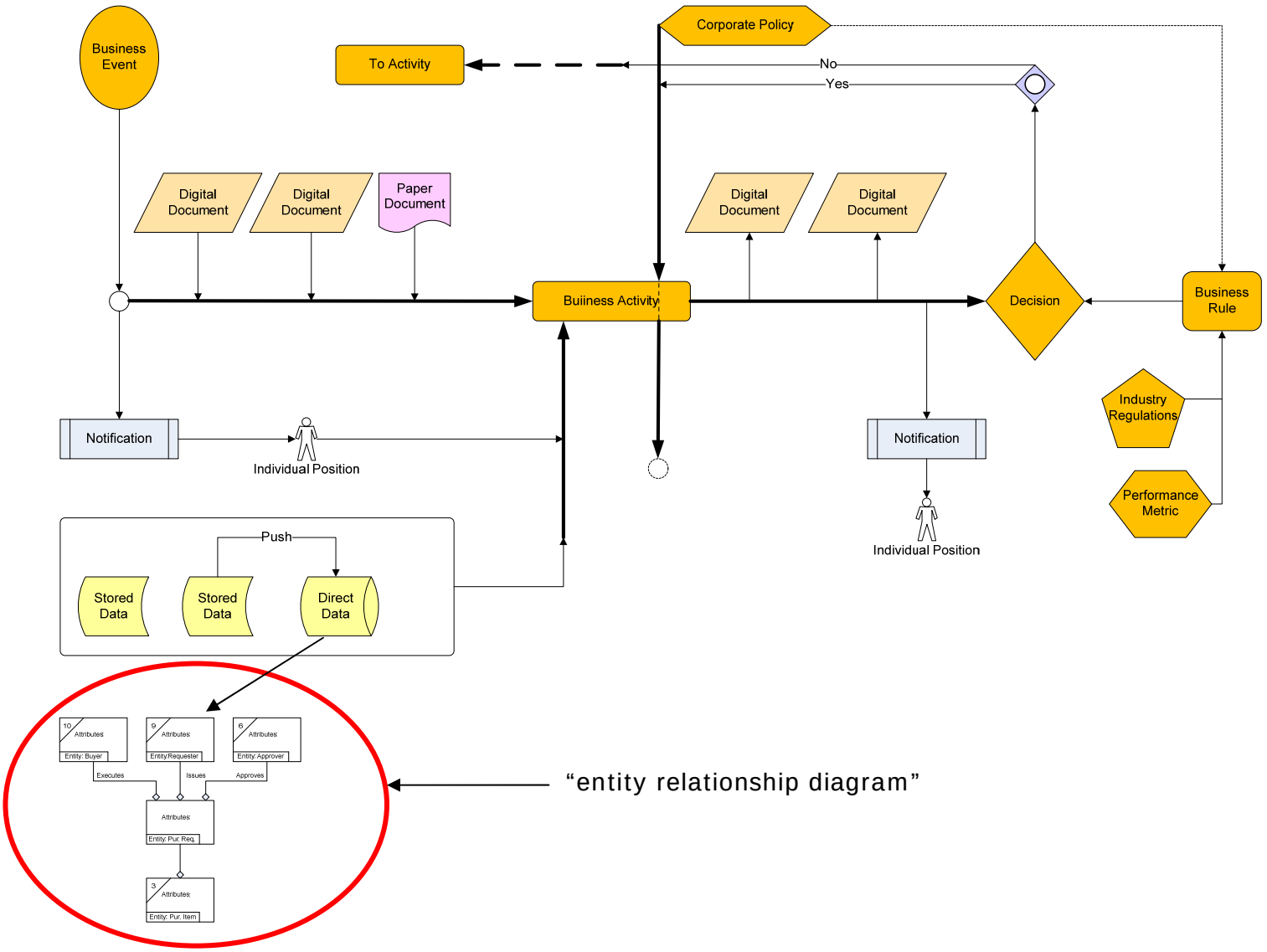
Organizational Term or Phrase	Business Activity	Application Name	Dataset
AFE	Submit AFE Request	AFE Navigator	AFE Navigator Database
Appraisal Well			
BPM			
Capital Assets			
Capped Well			
Capping			

7.2.1 Entity Relationships & Data Flow Models

Generally the *Organizational Analyst* would not develop formal "data models" as part of the *State Reference Models* - this is the world of the Data Architect and Data Modeler.

However, it is prudent that the *Organizational Analyst* understand what entity relationship and data flow models are and the relationship they have to the *I-WFMN*™ based workflow models within State Reference Models™. Specifically, these data modeling techniques are used to describe the ontology (i.e. an overview and classifications of used terms and their relationships) of the specific data and the relationship to developed information.

These models are often referred to as "conceptual data models", which at a later stage (usually called logical design) are mapped to a logical data model before a physical data set is constructed.



7.3 Computer-based Infrastructure

In conjunction with *computer-based applications and data sets* the modern organization contains a plethora of physical computing devices within its *computer-based infrastructure.*

The type and location of these varying physical computing devices is driven by an organization's *organizational infrastructure* and its *computer-based application portfolio* and *computer-based data sets.*

Generally the *Organizational Analyst* would not develop formal *computer-based infrastructure* models as part of the *State Reference Models* - this is the world of the Technical Architect and Systems Analyst.

However, it is prudent that the *Organizational Analyst* understand what *computer-based infrastructure* models are and the relationship they have to the *I-WFMN*™ based workflow models within State Reference Models™.

Generally, *computer-based infrastructure models* are expressed as a series of *computer-based nodes and roles.*

7.3.1 Computer Based Nodes & Roles

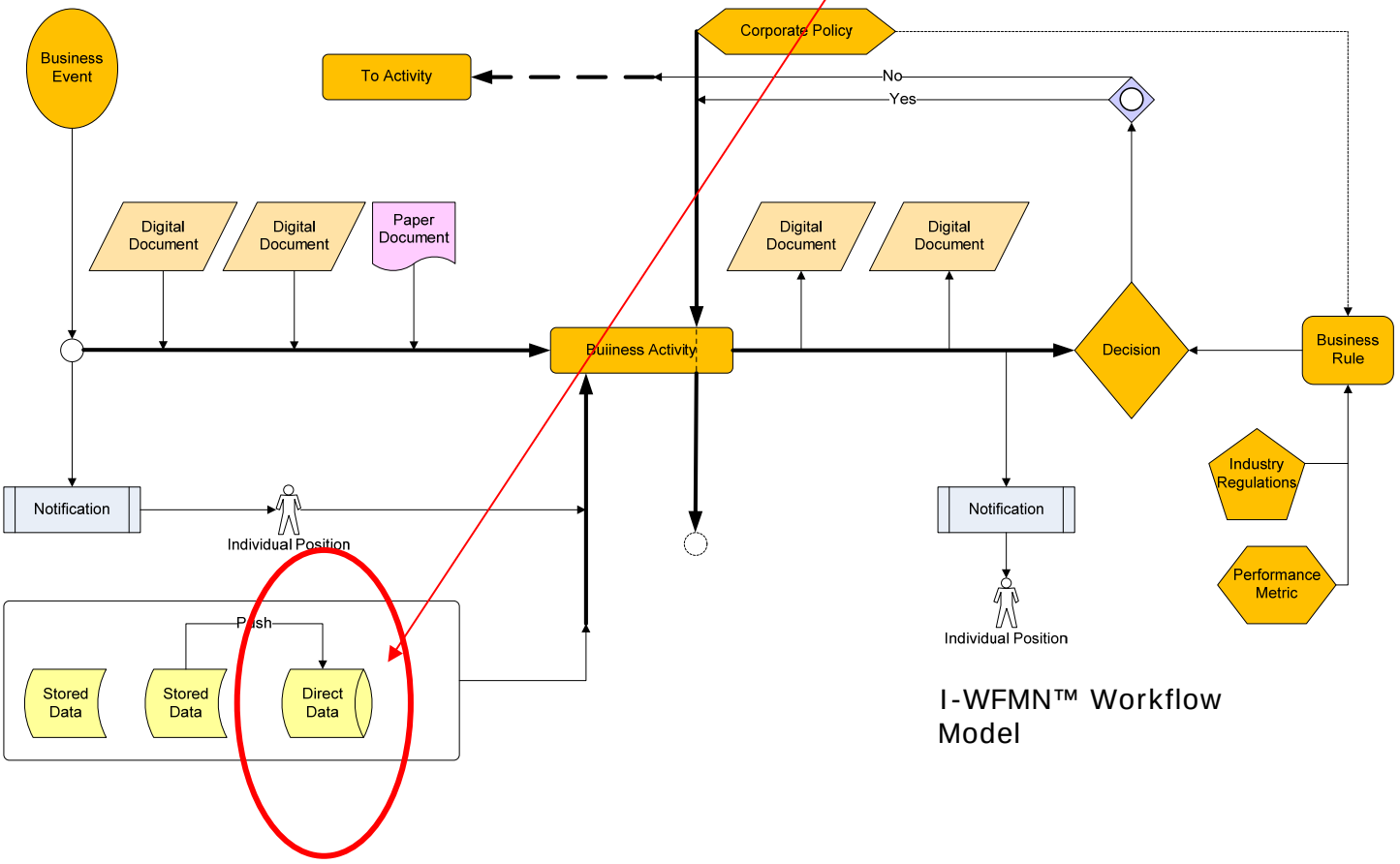
Generally the modern organization's *computer-based organization* contains a small number of "computing type devices" to facilitate the automation of underlying business processes and the creation, retention and distribution of digital-based data.

Unfortunately, the "role" each device plays is often used to describe (and establish within the organization's semantic model) the device. The result is a seemingly un-ending array of computer-based devices that appear to make the overall business environment complex and difficult to manage.

The *Organizational Analyst* should utilize the following guide to produce, if required, a simpler view of the *computer-based nodes* and *roles* utilized within an organization:

- Application Node – any computing device required to execute functional applications and middle ware
- Web Node – any computing device required to execute functional applications that is connected to or accessed through an HTML-based interface
- Security Node – any computing device required to execute security based software that is responsible for controlling internal and external access to computer-based applications and data
- Database Node – any computing device required to execute the capture, store and distribute digital-based data
- Information Node – any computing device required to capture, store and distribute compiled digital-based information (e.g. operational reports, financial reports, etc.)
- Data Networking Node – any computing device required to transmit digital data

Business Unit Name	Geographical Location (Country)	Business Unit Address	Node Name	Node Role	Node Description
ABC Refining Ltd.	Brazil	SBN - Quadra 13 - Bloca B - 8º andar BRASILIA - DF BRAZIL 70002-900 BRAZIL	DEF Database	Database Node supporting DEF Application	HP Proliant



I-WFMN™ Workflow Model