SERVICE ORIENTED REAL-TIME ENTERPRISE CONTENT MANAGEMENT

In Association with Business Process Integration

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Abstract: Organization's distributed and evolving enterprises demands an integrated approach providing consolidated control and secure information sharing among users and applications in support of business processes. Businesses faced considerable challenges due to unawareness of setting an integration infrastructure with specific business context. Recent industry trend is inclined to investigate rapid and cost effective BPI platform with indisputable business benefits in terms of Real-Time Enterprise Content Management (RT-ECM). RT-ECM ensures consistency among users and infrastructure. The perception also provides secure access to necessary and valid content in real-time. Modern RT-ECM architectures are focused to assist content sharing across multiple resources as well as enterprise applications. SOA, a distributed computing environment, is poised at the intersection of business and technology. SOA enables enterprises to seamlessly and rapidly adapting altering environment. Service-Oriented RT-ECM approach offers integration specific, flexible, and featured BPI platform. The contribution of this paper is an RT-ECM architecture framework illustrating most prominent technical challenges during establishment of business process perceptive integration and time sensitive content flow management. Real-time content management engines, business process engines, and service provisioning are at the centre of presented framework. Initiative behind the research effort is to capture and estimate generic aspects of BPI such that organizations may exclusively focus on unique business characteristic. Eventually, the paper discusses advantages and consequences of service oriented RT-ECM besides outstanding issues for further research.

1 INTRODUCTION

Enterprises competitiveness is creating necessity to rapidly streamline business processes results in generating novel business values and increase operational efficiencies. Ever since organization's business requirements emerge, evolve, and mature, the former enterprise systems are becoming incapable of dealing with business transformations. Apparently, enterprises must have the control of business logic into the integration processes in order to deal with the pressure of today's dynamic business environment. Enterprises must respond with innovative ways to attract as well as retain customers (or partners) and achieve greater visibility into business processes.

BPI is the key ability of an enterprise to respond efficiently to leverage business changes offering competitive advantages. However, ability for businesses to incorporate and react to changes is hampered in many instances by ECM. ECM poses an agility barrier on BPI (Buco M J. et al., 2005) due to composition of enterprises with wide range of technologies implemented by means of disparate resources. Capability to assist organizations to narrow the scope of integration and focus on specific business objectives has become an increasingly motivating issue for BPI vendors in recent years (Deshpande, 2004).

BPI fosters an approach to serve most significant business requests through correlating enterprise contents with business processes. BPI platform articulates exactly the way each process must provision. It ensures execution of processes aligning to satisfy business objectives. The enterprise software development team can gradually drills down to the specific implementation detail such as connecting to the various subsystems that may execute the functionality in each step of the process.

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It requires identifying the specific content element that must be referred at runtime. Only relevant content pertaining to the processes is being automated. BPI promotes incremental Return-on-Investment (ROI) sanctioning enterprises to break up large problems into more manageable entities with right information at the right time.

Traditional approaches to build BPI and resolve the needs of distributed enterprise architecture incorporates relatively brittle coupling between various components (Leune, 2004). The infirmity of enterprises becomes a crisis as the scale, demand, volume, and rate of business change increases. Unavailability of relevant content, lack of time to market, inability to rapid transformation to business opportunities as well as competition (Sheth A. et al., 2002) are the characteristics of present enterprise architecture framework. Hence there is a growing realization to replace the present deficient ECM model with more flexible architecture approaches yielding enterprises for further amenable to business revolution.

The revolutionary approaches to develop RT-ECM platform archives the goal by providing diverse content management methodologies, process establishments, and system integration functions. We have presented enterprise architecture framework managing business process modelling and service oriented content flow aspects of RT-ECM. The target is to grip the generic aspects of process integration such that it may focus exclusive to the unique business needs. The major components of RT-ECM are real-time content management engine, business process engine, and service provisioning.

RT-ECM platform is generally implemented in the course of acquiring commercial software packages and customizing them to convene the organization's business requirements (Turner M. et al., 2004). SOA facilitates the subsequent phases of business process evolution from merely automated to manage flexibility. The service oriented real-time content flow management aspects of BPI lacks empirical research. This paper explores the concepts of SOA based RT-ECM. It also identifies issues when operating the proposed model in conjunction with actual industry based BPI platform. The benchmark criterion presented reflects characteristic of typical SOA based RT-ECM in relation to integration, usability, and functional adaptation.

The paper represents the relationship between SOA based RT-ECM and BPI. Section 2 provides an overview of mandatory requirements to introduce SOA within existing BPI. Section 3 addresses issues of building efficient RT-ECM architecture framework. Section 4 discusses implications of SOA to develop RT-ECM platform elaborating our approach. Section 5 brief the benchmark to evaluate effectiveness of proposed SOA based RT-ECM with set of business criteria to be measured. Section 6 presents our observation with industry specific case studies justifying the perception and advantages. Section 7 is dedicated to conclusion as well as further research.

2 STRATEGIC ALLIANCE OF SOA AND BPI – ESSENTIAL REQUIREMENTS

Combination of SOA and BPI is more powerful than either is in itself. Services are joined together to arrive at a composite business process. SOA minimizes the gap between business analysis and IT development work. Business processes and contents are considered and designed simultaneously due to access of applications and corresponding information. Figure 1 indicates that the services layer consists of line of services that are aligned to a particular business domain. Reusable nature of defined services can be shared across multiple business domains.

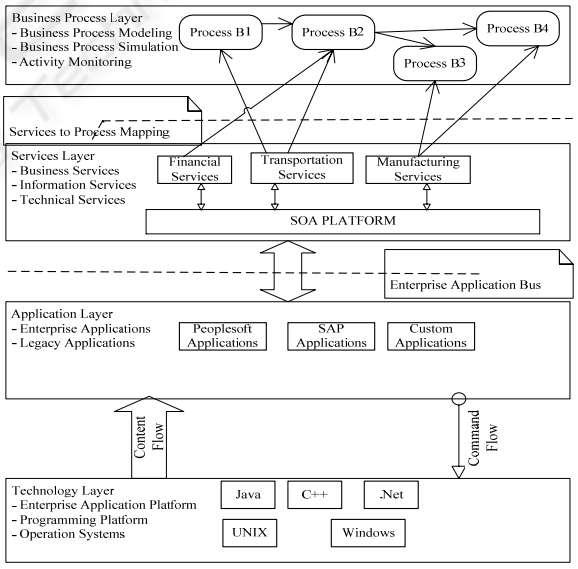

Figure 1: Relation between Business Processes and Service Layer.

Viewpoint is a well recognized architectural concept to describe the audience and concern of particular description (Caron, 2006). BPI might be called the 'Process Viewpoint' and SOA the 'Service Viewpoint'. The process viewpoint is concerned with the overall end-to-end lifetime of a

business process. The business process is concerned with combining individual activities. It is also responsible for executing, managing and monitoring the current state, progress and performance of the entire process. The service viewpoint is concerned with the collection of services that are available to the processes. It identifies the method in which process is being constructed, organized, provisioned, managed, and maintained irrespective to the specific utilization of the process.

The synergy of SOA must provide a solution to how services are designed, utilized, and combined to meet the requirements of BPI that facilitates traversing the organizational boundaries of consumers and providers. SOA presents a detailed definition of what a service is and how it uses the SOA infrastructure. It also ensures that independent services can be combined together in business processes through identifying interfaces a service is required to present, service contract semantics, service registration and discovery methodologies, service level agreements (SLAs), and all aspects of a service lifecycle. Following are the primary criteria for SOA to support BPI.

- Shared Information and Semantics - Information in the services needs to be conform to the enterprise information model and semantics. SOA must consider a transformation between the enterprise semantics and the internal information model ensuring seamless integration with existing ECM.
- Application Integration – The legacy system capabilities and content needs to be service enabled such that they can be included into new BPI platform. Services need to map from the enterprise model to the application model as part of the integration and not imposing the legacy model on the business processes. SOA exposes functions and associated contents as services exhibiting all important service characteristics (such as contract or discovery). SOA must treat integration services differently than business services.
- Service Reuse and Governance - The process designers requires identifying set of available services to ensure that they perform necessary functions before including services in the respective business processes. The producers of services need to determine that a similar service isn't already offered to understand the boundaries of the role and responsibility of new services avoiding creation of redundancy and overlap. The SOA platform must provide a design time service repository that supports the discovery and examination of services during the design of business processes distinguishing from the runtime registry.
- Versioning and Lifecycle – If a service is used by more than one business process then it lead to enhance and extend services in a way that manages the different requirements. Evolution of services ultimately leads to multiple versions of the same service. The ability to assign version numbers to service interfaces and bind a client to the appropriate service based on version compatibility are mandatory for SOA to provide BPI platform.
- Management – The SOA must define and measure the performance of services and manage services according to their agreements. SOA should offer the ability to notify service providers and define corrective action when performance is not being met or certain thresholds are reached.

SOA platform enables a new level of flexibility and agility to BPI (Baresi and Guinea, 2005). The services layer provides the ideal platform for the business process due to the business functionality that map to the services in a business process. The admission of implementing an SOA is to provide a loosely coupled integration platform that allows application instance to change and evolve without affecting the core integration technology. The process modifications that require different applications to communicate with each other should not alter the core integration technology as well as application instance. The process and service independence establishes the relationship between business process modelling and application implementation.

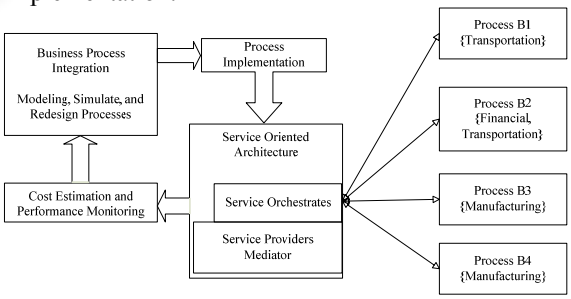

Figure 2: BPI in conjunction with SOA.

Figure 2 depicts the relationship between BPI and SOA. BPI accomplishes the modelling, simulation, and re-engineering of processes. SOA infrastructure orchestrates business processes and mediates service providers. SOA is tied to process services resulting composite business flows. A service-level content model is defined based on the business domain and it is independent of the ECM model. BPI includes additional run-time power for

service composition. It has ability to modify a flow in exchange for more run-time complexity necessary for compensating transactions in the case of failure.

3 CHARACTERISTICS OF REAL-TIME ENTERPRISE CONTENT MANAGEMENT (RT-ECM)

A common infrastructure is essential to manage unstructured information due to increasing number of enterprise applications with collaborative requirements. Most enterprises are not designed to cohesively manage unstructured information. Information is exchanged outside of a provided enterprise application such as a sales record in a Customer Relationship Management (CRM) system prohibiting collaboration among multiple users (Sreenan and Cranor et al., 2001).

One of the most critical phases of unified content strategy is building an appropriate ECM platform (Sheth A. et al., 2002). Determining the elements required for each information type and methodology to integrate with enterprise functionality for optimum usability is at the highest consideration when deciding upon the modelling technique. The ECM model becomes the summit for an enterprise architecture framework. Information is discerned at element level in unified content strategy. Elements are stored in a single source instead of distributed across platform. Elements are then compiled into content management and delivery artefacts. The power of content reuse lies in effectively reusing information elements. ECM platform must identify all the required elements and illustrate how to structure and reuse them.

The process of developing ECM platform involves identifying information requirements for a particular enterprise. The decisive factor is to identifying the exact location of information ownership. The subsequent phase is to build a model illustrating the compilation of information elements. ECM model ensures the consistency, scalability, and reliability of information across organization. Guaranteed content integrity property of ECM enables point-in-time recovery for all metadata stored to the information resources and for all element structures residing in external storage. Point-in-time recovery of the metadata is accomplished through standard content management utilities (Uniform Server, 2006) including regular backup schedule of the available as well as valid content. The three core business issues that ECM addresses are content development, application content management, and content delivery or acceleration. Content development is the process of obtaining content from a concept to an organized and enterprise-wide accepted state.

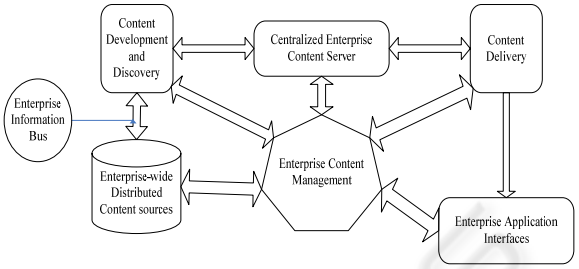

Figure 3: Enterprise Content Management (ECM) Platform Overview.

Application content management is viewed as process of carrying artefacts characterizing particular delivery context. It is also responsible for enhancing artefacts with value-added metadata and eventually deploying them to the appropriate delivery environments (or channels) in the predefined combination as well as format. Content delivery management is process of managing the controlled and optimized delivery of artefacts to the intended enterprise users. Figure 3 depicts the core functional blocks of a successful ECM.

Identifying behaviour of ECM platform in real-time is recent industry trend due to the unpredictable alteration of enterprise information during critical business decisions. The present offering of enterprise architecture is to organize and present right information at the right time throughout the product development (or service) life cycle. RT-ECM platform begins in response to a specific organizational objective and often with the goal of managing content to the intranet or portal to satisfy the requirements of real-time transactions considering temporal properties of enterprise content.

Specific and well-bounded enterprise architectures (Leune, 2004) lead organizations to select a tightly bounded RT-ECM solution. RT-ECM targeted at the identified pain point always appears an attractive alternative to accomplish current requirements. However, the solution presenting immediate clarification persuades additional and unforeseen challenges. It is utilized to build great point-to-point solutions connecting one group of content management platform to a constituency of content consumers. Although resolution frequently lacks to scale in broader requirements as well as efficiently deliver multiple instantiations of time sensitive content access (or update). Instead, content is locked to other information storage facility and can not seamlessly

be presented to newly introduced enterprise applications.

RT-ECM requires considering following artefacts when architecting a solution that can be highly integrated and scalable to BPI platform.

- Define and address short-term goals but also consider the broad ways content management could be applied within the organization.
- Assume successful initial ECM in concise form may lead to additional implications across other business units and constituencies.
- Ability to deliver multiple initiatives from the single infrastructure such that the cost-of-ownership (TCO) of additional integration units can be lowered.
- Ability to dynamically delivery content and reduced response time to the content change requests or upgrades.

4 OUR APPROACH – BPI ENABLED SOA BASED RT-ECM

Section 3 indicates that RT-ECM platform must have architecture compatible to the service contracts pertaining to SOA governance providing a single streamlined environment that can serve all enterprise users (Turner M. et al., 2004). In this section, we are presenting SOA based RT-ECM encouraging disparate enterprise applications to communicate in an environment that is scalable, process oriented, and robust to achieve business demands. A RT-ECM framework leverages all of the underlying components to deliver distinct services to a wide range of enterprise users in secure fashion. The approach inclined to provide the architecture framework ensuring each user's experience is personalized and that management of service delivery is standardized.

Each layer in the architecture presented is buffered from changes in the other layers (Leune, 2004). Moreover, the services are available for reuse improving productivity and accelerating content management ability responding to the specified business objective. BPI feature requirements available to the RT-ECM encapsulating business processes as services. The service developer publishes a description of services in a registry encoded in an XML dialect. If RT-ECM developer requires a service of specific type, it is searchable from registry. Similarly, enterprise application modules can browse the services interacting with real-time content from registry. The services model coordinates three roles and respective responsibilities. Service providers publish wares through brokers that maintain registries. Enterprise users find services in registries. Enterprise application binds specific real-time content with service at runtime.

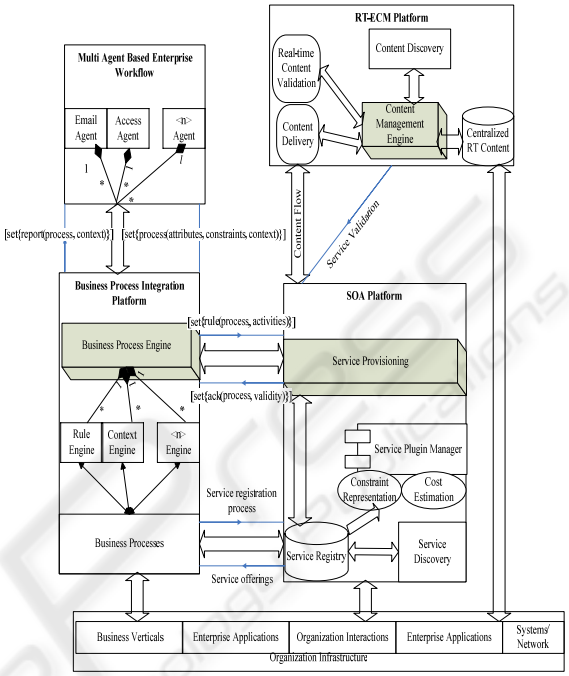

Figure 4: SOA based RT-ECM enabling BPI – Architecture Framework.

To define a terminology and derive consistent RT-ECM model, we adapted and integrated the basic notions from available business process (Schmelzer, 2004) and content management (Sheth A. et al., 2002) platform. It leads to a conceptual framework for integrated model-based approach presented in Figure 4. The content management engine is defined by information model. It defines the structure and composition of information elements with respective dependencies. The properties of an element denoted as the content element configuration attributes. The content management engine coordinates with content discovery as well as content delivery modules.

Content discovery component of RT-ECM platform receives type of service, SLAs with content provider's detail, enterprise capacity, and load caused by user access. Elements are tagged or untagged to map with the service defining how elements are discovered and managed for the service provisioning. Eventually content discovery is triggered by either user request to service or as a result of the actual discovery process occurs between RT-ECM entities. Content-aware redirection mechanisms embedded to content delivery

component forwards user requests to the service provisioning that may best satisfy them. The location of the requested content along with other relevant information is utilized to determine appropriate service from which content should be served to the enterprise user. The service oriented content management presented in Figure 4 consists of a core set of building-block services including the library service, workflow service, transformation service, import and export services, publishing service, and financial transaction service.

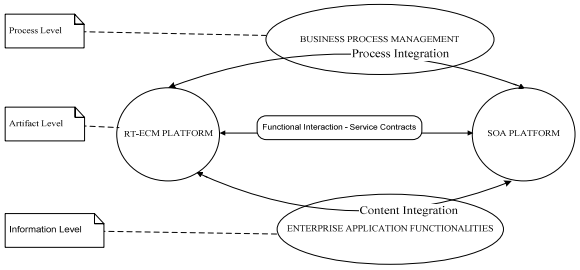

Figure 5: RT-ECM – Fundamental Integration Aspects.

Business process engine is to denote the active substances of a business process in consideration. Furthermore, the business process engine evaluates task, resources, and enterprise content for the process that requires to be served. The business rules are specified to the BPI enabled platform. The additional rules can be implied and supplemented to the BPI platform. The business rules are directly associated with the actors pertaining to service provisioning component. The service provisioning consists of set of services that the actor requests to accomplish business process including temporary results. The invocation of particular rule from BPI platform triggers specific actor of service provisioning.

Integration aspects within the business process engine support processes at a low level of abstraction for the technical lateral such as building of derived software objects whereas on a high level of abstraction for the management lateral such as planning and monitoring of tasks. Concurrent and correlated process instances have been independently initiated, combined, and synchronized during execution. A business process usually consists of activities with different execution behavior. The integration of ad-hoc workflow agents into prior defined process is of particular interest for business process engine. Processes are integrated into an overall process model that satisfies global constraints involving process chain. The integration aspects between the business process engine, content management engine, and service provisioning are denoted in Figure 5.

Integration aspects within the content management engine are of structural duality of processes and products. Most of the business processes are adapted to the product dimension. Distinguish between physical and logical data integration is a key challenge to the approach presented in Figure 5. The content discovery covers the aspect of integrating physically distributed information into a logically centralized content during the content development. The latter concerns the integration of heterogeneous information schemes and the transformation between different content types are being considered at lexical, syntactical, and semantic level. Integration aspects of business process and content management engine are controlled through service provisioning. The service provisioning modules are developed based on the following principles.

- The process and product (or service) structure indicating the decomposition of processes in terms of products (or services) and the corresponding dependencies.
- Reflexivity: The representation technique and formalism to provide reflective features from process specification.
- The formal relationship derived between abstract level of processes and product (or service) specifications to determine the types of input and output that a process may consume or produce. The static relationship evaluates properties of the actual content-flow.
- Content flow and information access: Different types of content transition and information access have been considered. In particular, the implicit coordination by access control mechanisms may affect the scheduling of activities under the control of a business process and content management engine.
- Behavioural interrelationships: The state of objects affects the operational behaviour of a process. A business process must not be started if content is not valid for the provided timeframe. Object's state transitions are associated with specific activities describing an object life-cycle within business process.

5 EVALUATION AND BENCHMARK CRITERIA

We have a three phase selection process to identify and evaluate optimal service set between the business processes and real-time content management. The first phase is service discovery

based on the criteria identified between content management and service provisioning. It is followed by constraint analysis and then optimization based on enterprise user specific constraints. The constraint analyzer module dynamically selects services from subset of services that are identified by the service discovery engine. Any set of services for the precise business process satisfying the constraints is a feasible set. The constraints analyzer has two sub-modules, the constraint representation module and the cost estimation module.

The constraint representation module allows representing the business constraints in ontology (Horrocks et al., 2004). A business constraint is defined as any constraint that affects the selection of a service for a process. The number of such business constraints is specified to business process in terms of business rules. Certain constraints may be more important than others depending on the particular instance of the process. A legitimate example of representing business constraints is networking product equipment ontology presenting relationships between items such as adapters, circuit boards, cables, power cords and batteries. The ontology is utilized to capture the suppliers for each part, the relationships with the manufacturer, and the technology constraints pertaining to equipments.

Table 1 presents a working example of an ontology that enables to identify required business and technological constraints that are critical in deciding the suppliers (or vendors).

Table 1: Rule specification in context of Business Processes.

Process Parameters and Context	**Rule Specification**
->Vendor-A is an instance of network cable supplier ->Vendor-A supplies #Type-COAXIAL ->Vendor-A is a preferred supplier.	<NetworkCableSupplier rdf:ID=" Vendor-A"> <supplies rdf:resource="#Type-COAXIAL"/> <supplierStatus>preferred</supplierStatus> </ NetworkCableSupplier>
->Type-COAXIAL is an instance of Network Cable ->Type-COAXIAL works with ->Type-DS3-Circuit-Board	< Network Cable rdf:ID="Type-COAXIAL"> <worksWith> < Circuit-Board rdf:ID="Type-DS3-Circuit-Board"> </worksWith> </ Network Cable>

The cost estimation module queries the content accumulated dedicated to estimating various factors that directly impact the selection of services for the process. The factors that we have considered when selecting service for example represented in Table 1 are the depth of service dependencies, service's capabilities, and intensity of service (Aggarwal at el., 2004). The depth of service dependencies are based on business and technological constraints of the items. One type of service captures the notion that the selection of one service affecting choices of other services. Cost for procurement, delivery time, compatibility with other suppliers, relationship with the supplier, reliability of the supplier's service, and response time of the supplier's service are the prominent examples of service's capabilities. In order to be able to set priorities between the factors, the cost estimation module provides a way to specify weights on each factor. Intensity of service is either actual or estimated values of service in units identified during the initial measurement criteria set for the deployment cost.

The process integration level complexity is calculated considering participant services in the specified business process (*n*).

$$PI_{Complexity\,(n)} = \alpha \sum_{i=1}^{S_n} [T_{(i)} \times C_{(i)} \times R_{(i)} \times A_{(i)} \times ECa_{(i)}] \quad (1)$$

- $T_{(i)}$ represents the execution time of present service.
- $C_{(i)}$ is cost (or time) of invoking service considering identification of dependencies and search effort involved within the business process context.
- $R_{(i)}$ is reliability of service with respective to validation of temporal content in utilization.
- $A_{(i)}$ is the factor deciding availability of service from service registry.
- $ECa_{(i)}$ cumulative scores for enterprise content access specific to business process parameters associated with the service.
- α is the impartial factor identified during the initial definition of business process (*n*) from constraint representation module depending on the type of request as well as technology involved.
- S_n is the number (or set) of services participated in business process (*n*).
- × represents predefined or custom defined aggregation operator.

For most metrics, the $PI_{Complexity}$ is calculated using the aggregation operators such as summation, multiplication, and maximum or minimum of services presented in the business process. However, in certain cases, the user defines a custom function

for aggregation. The enterprises also generates performance metrics utilizing pilot project through the SOA based models and create set of experiments. The experimental evaluation is typically conducted to identify the performance measures with explicit timing variations according to the types of target market as well as technology involved in the businesses. Several benchmarks are also generated by initiating the enterprise-wide questionnaires represented below as an example. The reliable and accurate method to measure the success of BPI during RT-ECM is to communicate and conduct the organizational survey identifying the benefits related to primary drivers behind the adapted service model.

- How much faster delivery of information and services at reduced operating cost?
- What leverage value of and investment made in existing enterprise?
- Whether it provides seamless integration of core services among internal and external partners, customers, and suppliers?
- What types of value-added decision making have been supported?
- How much reduction in manual content access, lookup, and upgrade resulting in higher quality and performance?
- What are the system integration cost and improvements in traditional delivery times?
- Whether it brings enhanced product (or service) offerings to market faster than before?
- What advantage it offers to resolve business problems that are considered costly, time prohibitive, unrealistic, or impossible to achieve?

6 CASE STUDY - OBSERVATIONS

During our evaluation of various available methodologies, we found different solutions to incorporate BPI platform. We have categorized available solutions and suite vendors in three different classifications depending on the architecture characteristics, industry utilization, and implications of business processes. Model, execute, and monitor developed business processes. The right approaches to model SOA yields to many practical applications for each category identified. Table 2 represents our evaluation of business processes in simulated environment (E107, 2006). It illustrates the measurement of $PI_{Complexity}$ attribute depicted in Equation 1.

Table 2: Industry Based Evaluation – Process Integration Complexity ($PI_{Complexity}$).

Process	Type	Industry	Refer time units/ process	#of invalid services/ process	#of param/ process	$PI_{Complexity}$ (%) Percentile
Delivery notification	Monitor	Transportation	40	1	4	18%
Transaction approval	Model	Financial	60	2	3	33%
Documentation	Monitor	Standardization	65	4	5	46%
Ecommerce connectivity	Model	Internet	50	2	5	55%
Assembly- line instructions	Execute	Manufacturing	95	0	7	72%

Advantages are identified through implying the concept to the reality in various industry segments as indicated in Table 2. The observations designates following features and characteristics of ensuing BPI platform.

- Secure IT investment: Customers do not have to switch platforms, re-implement software, and/or incur additional hardware for expanded capabilities. For example, abstraction in terms of services to manufacturing assembly-line instructions process remains unmodified upon technology change.
- Connectivity: It provides the flexibility to collaborate through sharing of content across supply-chain and enables ability to view enterprise application interfaces augmenting existing business processes. The most prominent scenario is the ecommerce activity in a secure environment.
- Enhanced product quality: It reduces the risk within the product development life cycle where code must be manipulated in order to deliver new functionalities. It offers reduction in maintenance cost as a result of reuse. The transaction approval process as set of services in financial industry remains unmodified even if the type of business alters.
- Accelerated development: It greatly reduces the time required to perform quality assurance (QA) due to automation made uncomplicated. With less time needed for QA, it is possible to accelerate development cycles expanding the functional depth and breadth of the product. The wide spread utilization of Tivoli and IBM WebSphere (Baresi and Guinea, 2005) in product development is an undoubting proof.
- Simplified upgrades: As recent versions of the enterprise software are released, customers do not have to deploy an entire executable. Instead, the

only receivable modules that have an impact should be available in latest release. The automated documentation revision process is an excellent pattern to represent in standardization industry.

- Remote access: Remote employees are able to easily access content without having to connect through VPN or use terminal server. The current advances in SOA based XML VPN controller indicates the seamless advantage of combining technology and business (Radding, 2006)
- Scalability: It provides the foundation for new business processes on the horizon. As customer relationship management (CRM) and supply-chain management processes evolve, SOA enabled business processes are equipped to integrate new practices.
- Flexibility: The framework facilitates grouping of information and display supporting unique business process. Advanced content management platform (E107, 2006) in combination with enterprise server (Uniform Server, 2006) is an excellent example of user configured real-time content presentation.

7 CONCLUSION

The automation, integration, and optimization of business processes across the enterprise have become essential to leverage competitive advantage for organizations today. BPI and SOA provides a perfect combination for real-time enterprises. BPI platform presents higher level abstraction for defining businesses processes as well as other important capabilities of monitoring and managing processes. Derived services present the functions that support business processes. SOA offers the capabilities to combine and construct an agile enterprise model. SOA based RT-ECM offers integrity that enterprises are require solving business process problems and improving operational efficiencies. RT-ECM enables enterprises to produce rationalized system infrastructure based on implied SOA models. It supports rapid assembly and orchestration of process services into larger end-to-end business processes.

In this paper, we discussed business process engine, real-time content management engine, and service provisioning aspects of SOA in detail. We have experience enhanced productivity as well as accuracy due to flawless access of most relevant and appropriate information in real-time. Since the developed version of architecture is generalized to certain extend, subsequent stage is to contrast and compare various industry specific business processes and associated services according to the identified decisive evaluation factors. Impact of developed SOA based RT-ECM in association with BPI architecture framework on various types of business models may prove challenging goal to achieve as the consequent research effort.

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