



*Stringing
The
Quartet*

"Cloud, SOA, BPM & BI"

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Introduction

The Cloud, SOA, BPM and BI - While there is much written about these four hot topics of the day, there is perhaps less published as to the roles each play with respect to the other. While each of the four can play a significant role in improving the service capability and reach of a business with possible reduction in costs and time to market, working together the impact is compounded and within a short time can change the profile of small and large organizations in the eyes of the customer.

The Cloud provides assets. It impacts business two ways, it offers more to all and thereby reduces the value of proprietary assets. It is perhaps the second aspect that is understated but has had a greater impact on systematically eroding the bottom lines of organizations which have come to rely on their leading edge products or services around these products. Long term assets and market share resulting from decades of huge investments to facilitate development, implementation, innovation are now being challenged because never before has so much been spent by many towards making so much available for consumption in small parts at will. The term barrier of entry may well become passé. What started as simply providing excess hardware to others on demand, either by renting out tin or idle processors, has now extended to a pay as you consume model that now spans virtually every component of the value stream. Platforms, software, people are available on demand and increasingly, worryingly native.

Service Oriented Architecture, SOA, is a means of invoking assets. Parts of the enterprise are increasingly constructed to model a plug and play environment. While the assets themselves can be found inside or outside the enterprise, all that happens in a SOA centric organization is that these assets can be discovered and put together at will to render a business process that can be quickly changed. The principal benefit of SOA is perhaps just this, the ability to change the offering fairly quickly. In terms of cost savings, depending on reuse of certain components there may well be some gains but by itself this may not make the transition to SOA worthwhile. However SOA working with the Cloud enhances geometrically what can be offered in terms of technology and delivery of that technology that is abstracted from the user in a way that was hitherto not practical.

Business Intelligence, BI, is made more powerful by the use of the Cloud and SOA. While the others can be considered as the means, BI, or Improved business intelligence that acts in real time may be seen as one of the desirable outcomes of deploying the Cloud and SOA. More accurate and timely business intelligence has led to the automation in the use of assets that are invoked once pre determined criteria are satisfied, leading to what is termed as Event Driven Architecture. (EDA).



End-User Experience

With SOA, BPM, BI and Cloud, Enterprises can offer their customers...

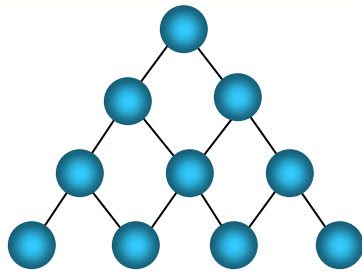
- Innovative product offerings that are ahead of the competition
- Customized offers created by analyzing user patterns in real time
- Seamless user experience across different mediums – PC & Mobile devices

The Cloud

Cross-cutting aspect across the enterprise – On-demand, elastic infrastructure for SOA & BI

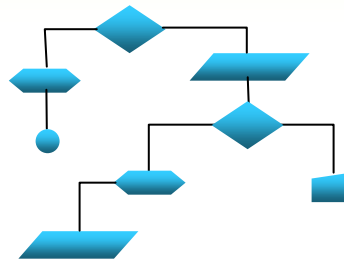
SOA

- Loosely coupled logic as services
- Change-friendly processes
- Re-exposes existing assets



BI and BPM

- BAM enables Real-time BI
- Business Insight as it happens
- Rapid decision making capability



BAM

Existing IT Assets and Apps



Cloud Computing – A Primer

This section aims to provide a quick primer to Cloud computing in terms of the technical assets provided. Forrester's defines cloud computing as *"A pool of abstracted, highly scalable, and managed compute infrastructure capable of hosting end-customer applications and billed by consumption."*

In simple terms, Cloud offers:

- Pay per use for computation power (CPU, Storage, Network)
- Virtually infinite computation resources
- Automatic scalability on spikes

A Cloud typically offers three models – IaaS, PaaS and SaaS.

- IaaS – Infrastructure as a Service
- PaaS – Platform as a Service
- SaaS – Software as a Service

The fourth model has been around longer, People as a Service. What is commonly called outsourcing, of which Offshoring has now become a billion dollar industry. While this started with technical services to design, develop and run company owned technology stacks, today SLA based models offer managed services which can literally do away with all most all requirements which can fall within the scope of documentation and definition. The undefined of course cannot be found in the Cloud. More on this later.

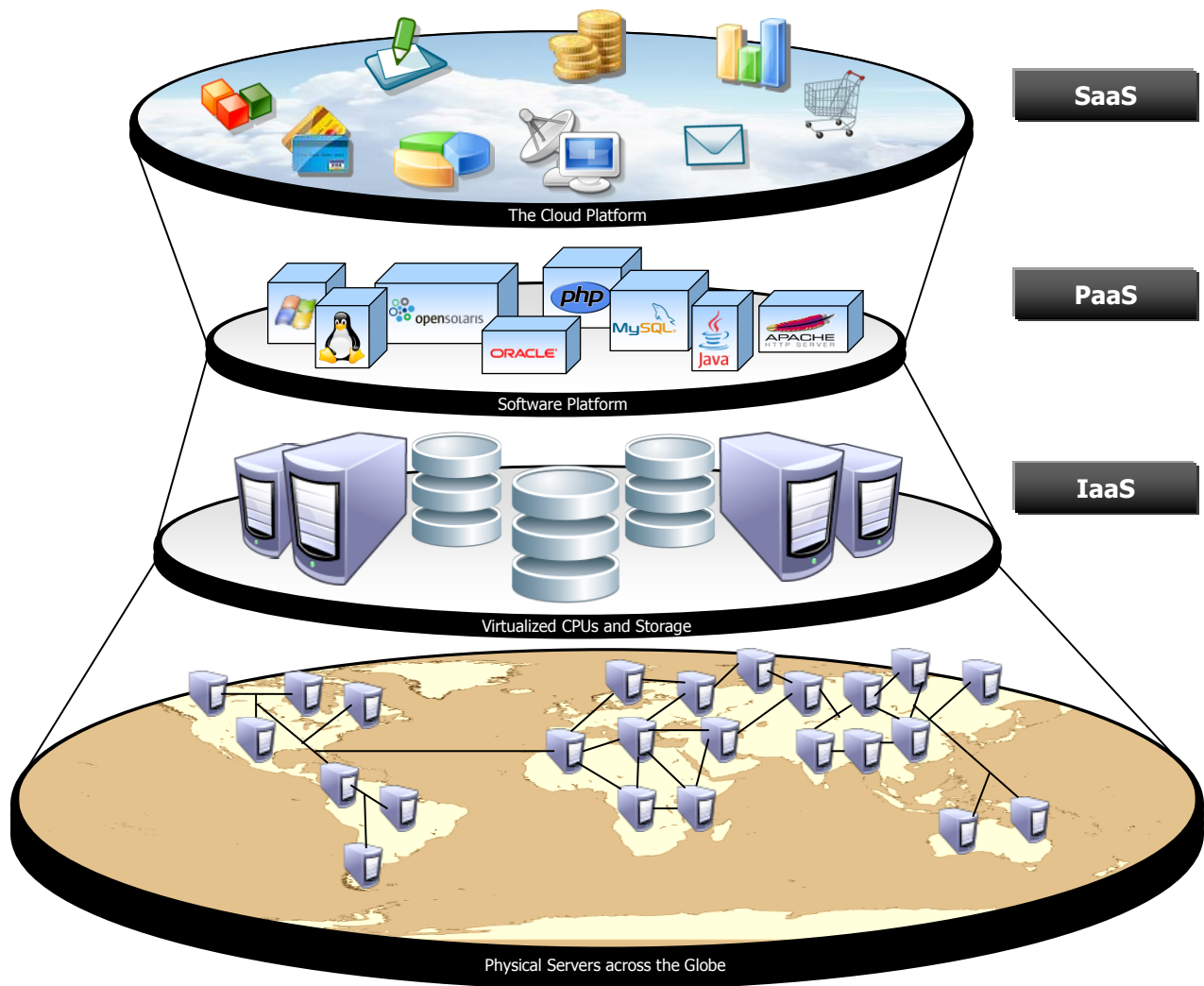


Figure 1 – Cloud Business Models

IaaS – Infrastructure as a Service is a business model where-in the Cloud provider offers online purchasing of raw computation power in terms of CPU, Storage and Network. Customers are given access to a pre-installed base virtual server with a selection of common Operating Systems (Linux, Windows, Solaris). This model is ideal for customers to deploy existing applications on the Cloud. Popular vendors who offer IaaS are Amazon Web Services and GoGrid.

PaaS – Platform as a Service is a business model that builds on top of IaaS. A pre-configured application runtime environment is provided off-the-web. Customers need to worry only about the business logic and data model of the application while the underlying

infrastructure (CPU, databases, etc) and common architectural elements of clustering, load balancing, deployment, etc is fully abstracted (hidden) from the user. This model is ideal for customers to deploy new applications on the Cloud. Popular PaaS vendors are Google App Engine, Microsoft Azure, Force.com and RackSpace Cloud.

SaaS – Software as a Service is a business model that is based on the concept of hosted online applications. Naturally, they are hosted on the Cloud to leverage the benefits offered by the Cloud platform. This is the ultimate way of optimizing time to market as software is almost ready to use as it requires only minor customizations. Popular SaaS vendors are Salesforce.com, Google Apps, Microsoft Live, etc

People as a service – Traditionally doers have been available on a pay as you consume model. Consultants were rarely doers and their influence did not extend from the board room to the factory floor. Foremen were foremen and strategists were strategists. Today innovation must happen at the level closest to the consumer, and the backbone simply an extended means to transmit information and process across the organization so nothing has to be rediscovered, at least more than twice. As opposed to the straight rigid notion of a backbone we are seeing an octopus like structure, armed with highly sensitive tentacles that reach into all domains, sensing and reaching into small and large opportunities across the oceans.

The Cloud really consists of a judicious mix of all of the above.

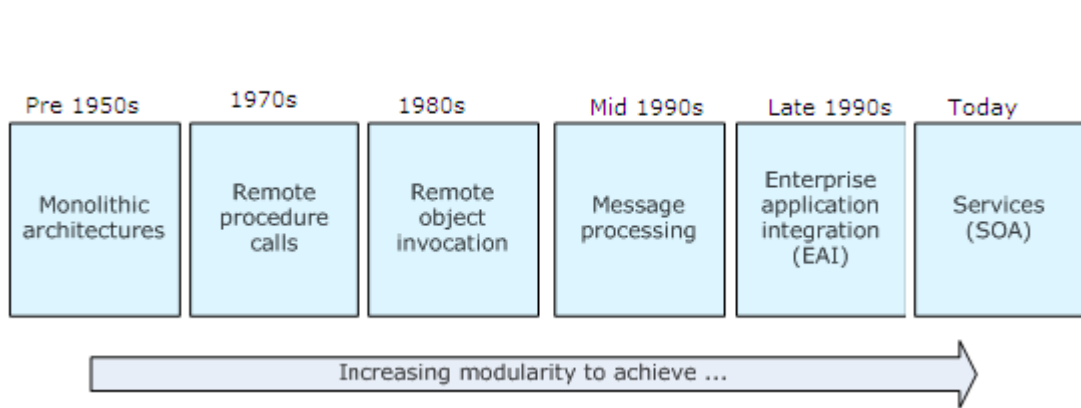
Service Oriented Architecture – A Primer

The key goal of Service Oriented Architecture is to offer 'Business Agility' – The ability for business to respond to change quickly in an agile manner. SOA is a methodology of grouping resources, where each resource/entity performs a well defined functionality. The entities interact with each other in order to reuse functionality. In order to facilitate this interaction, a resource should be made available to others in the network as an independent service, accessible in a standardized way. The services, hence forms the fundamental backbone of SOA. The services need to have a well defined governance strategy in order for them to be useful.

SOA has many predecessors and all of those architectural predecessors were stepping stones towards the goal of achieving flexibility and loose coupling amongst components. One evolutionary step enhanced the previous step and helped to get closer to the SOA

objectives. Hence the concept of SOA is based on a positive evolution from component based distributed architecture and integration paradigms.

The following timeline graph of technologies denotes the evolutionary process culminating into a Service Oriented Architecture.



To SOA or Not to SOA

It is important to understand that not all applications are suitable for SOA. The following sections outline when and when NOT to consider SOA

For SOA

The benefits of SOA are realized through a combination of Business centric and IT centric values. By re-looking into the current architecture and applying these values, a clear picture will emerge as how the current architecture would look when adapted based on SOA principles.

Business Values

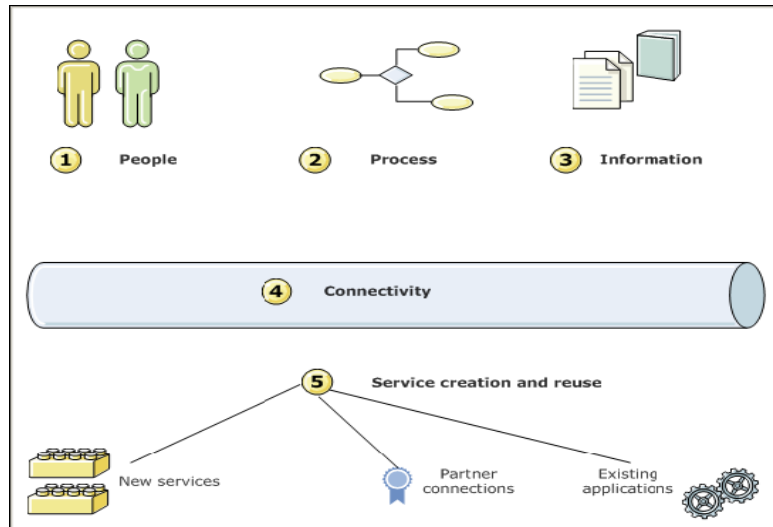
- People
 - Integration of the business and IT teams through a common language – services
 - Provide the business community the ability to compose new business processes or make changes to existing processes through a set of business services
 - Provide the UI layer with reusable UI services that are agnostic to the backend technologies

- Process
 - Mandates the documentation of business processes thereby reducing personnel dependency, a quicker ramp up time when on-boarding new resources and help in identifying common set of services when these processes are further broken down
 - Ability to view the SLAs and system performance in correlation to the Business Processes instead of mere technical data which might not be useful to the Business team
- Information
 - Data can be aggregated from multiple sources with ease and presented to the end users through different channels – desktop applications, web clients or handheld devices
- Time to Market
 - The ability to react rapidly to changing business requirements or implementations that warrant adherence to strict deadlines as imposed by statutory requirements
 - With the service reuse and the loosely coupled independent services, the delivery lifecycle can be reduced to accommodate multiple change requests
- Cost Optimization
 - With the reuse of the IT investment, the cost to deliver new services which can reuse existing services will reduce significantly.
- Agility - Built for change
 - Helps applications evolve over time and last through time
 - Abstract the backend and replace over time
 - Access to the business value, no matter what technology delivers it
 - Incremental implementation approach is supported

IT Values

- Connectivity
 - Seamless integration among components and services owing to the standardization of the interfaces and the protocols
- Reuse
 - Reuse the available components, be it the IT infrastructure or the IT services
- Ease of development and maintenance
 - The main aspect of IT development would be to enable easier development and more importantly, easier maintenance. There should be an effective mixture of the perfect blend of tools and technologies in order to achieve this perspective

The end architecture for SOA combines the two perspectives and gets it into an efficient and effective business centric IT methodology.



Against SOA

As seen in the 'For SOA' section, SOA defines an architecture paradigm that requires loose coupling between systems so that composite applications can be built by re-arranging services accordingly. A large SOA implementation would typically involve multiple integration points to other systems. These integration points introduce a small element of latency depending on the quality of network. Such latency issues do not cause a major issue for most of the business use cases, however exceptions exist. For such exceptions, it is not recommended to go for SOA. Examples of such exceptions are:

- Systems involving extreme real-time response times, such as 10 to 20 milliseconds
- In telecom industry, systems that interface directly with Network Elements that operate in call control
- Applications and Systems that typically do not have access to network during its operation (Thick-client mobile-phone applications). Mobile devices having network access do not fall in this category
- Applications that require very low memory footprint

Business Process Management – A Primer

Business Process Management is a wider discipline that deals with designing, modeling, executing, monitoring and optimizing business processes. A business process is a set of actions that helps any enterprise achieve its stated goal towards running its business or serving its customers. Business Process Management System (BPMS) represents the technology element to automate and increase the efficiency of Business Process Management. BPM and SOA work very well together because SOA abstracts individual tasks and activities as services. BPM execution needs technologies to string the services together to execute the business process. This approach of managing business processes is highly flexible and change-friendly because any change in business would typically involve re-arranging the service invocation steps, or stringing new set of services.

A SOA approach is generally considered and looked upon from a technology / IT perspective, whereas a BPM is treated as the domain of the business users and processes and generally disowned by IT. They are fairly distinct but complementary to each other. BPM addresses the processes to get work done more efficiently and SOA provides a more flexible IT architecture & increased re-use of assets. BPM's top-down approach can actually accelerate a SOA rollout by fostering better business-IT alignment. BPM also encourages an iterative approach to development & production implementation. SOA helps IT define and construct software assets which can be reused by business; and BPM defines their effective consumption.

Business Intelligence - A primer

Business Intelligence is an umbrella of technologies and processes for gathering, storing and analyzing data to help organizations make better business decisions. Hence, they are also referred to as 'Decision Support Systems'. Common functions of Business Intelligence are:

- Data mining
- Online analytical processing
- Predictive analytics
- Reporting

A BI solution typically helps enterprises in the following ways and much more:

- Identify market share and opportunities
- Understand their profitability drivers
- Determine business areas of high performance
- Get insight into profits

BI Yesterday, Today and Tomorrow

The first generation of BI was characterized by basic querying and reporting. The level of intelligence offered by first generation BI was greatly limited. Collecting and analyzing data from different disparate sources was tedious, expensive and time consuming. The reports generated by first generation BI were not reflective of the “as-is” state of the data.

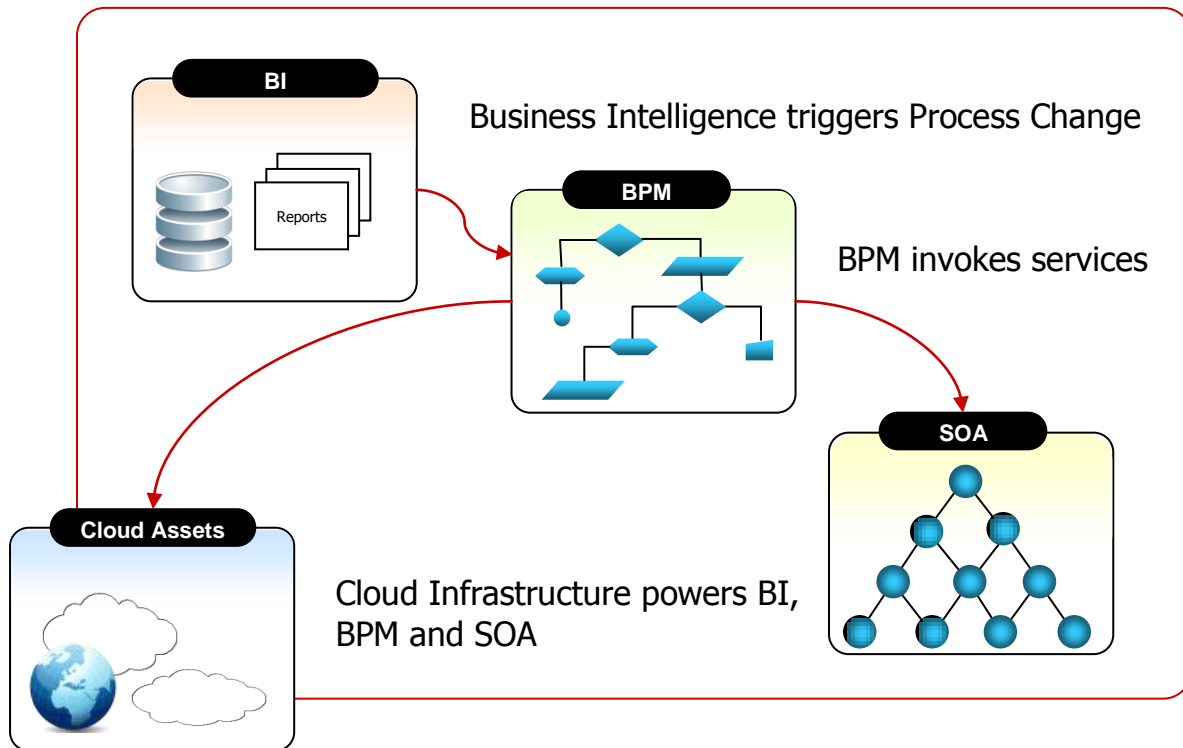
The current BI solution uses a data warehouse as a centralized, combined storage by combining data from multiple and varied sources. Before loading data into the data warehouse, inconsistencies are addressed using ETL – Extract, Transform and Load, which introduces an element of latency.

The BI solution of tomorrow, powered by SOA and Cloud is designed to react and respond instantly to high-volume, high-speed data for competitive advantage, to minimize risks, and avert disasters. This is combined with Complex Event Processing, which makes it possible to identify complex patterns out of business events.

Example of the Cloud, SOA, BPM and BI working together

So far, we have seen Cloud, SOA, BPM and BI in isolation. The four technologies can be combined in many interesting ways. To name a few:

- Cost-efficient real time decision making capabilities
- Ability to create Composite business applications by leveraging the power of mix and match
- Possibility of Business Process Orchestration to combine in-house assets and assets on the Cloud
- Address un-predictable spikes in load with the power of “elastic” computing resources offered by Cloud
- Service enabling Business Intelligence increases the value of BI investment and greatly increases the possibility of automated intelligent applications
- Proactive business performance management (Business KPIs, etc) and correct problems as they occur



The diagram shown above outlines how SOA, BPM, BI and Cloud work together. From a business point of view, Business Intelligence triggers change in business process. Business Processes involve stringing together service assets and Cloud assets (services and applications). Cloud is the common fabric that ties all the three together by providing a scalable, dynamic infrastructure.

While BPM and BI have existed for more than a decade, SOA has been around for years and Cloud is gaining rapid momentum. The combined use of Cloud, SOA, BPM and BI can make a huge difference to enterprises by offering exponential increase in benefits.

About Torry Harris Business Solutions

Torry Harris Business Solutions (THBS) was founded in 1998 in New Jersey, USA. The company focuses on high-end, niche technical skills, predominantly in the middleware, integration and Service-oriented Architecture areas. It provides software services to enterprise clients across different industry verticals through a combination of offshore and onsite services. The company has offshore development centers in Bangalore (India) and Shenzhen (China) and Sales & Operations offices in Bristol (UK), Ireland, Munich, Madrid, Singapore, Dubai and Shenzhen.

The company has been CMMi Level 3 certified; for quality and maturity of processes. It has also been certified to comply with British Security Standards 7799 (now termed as IS 27001).