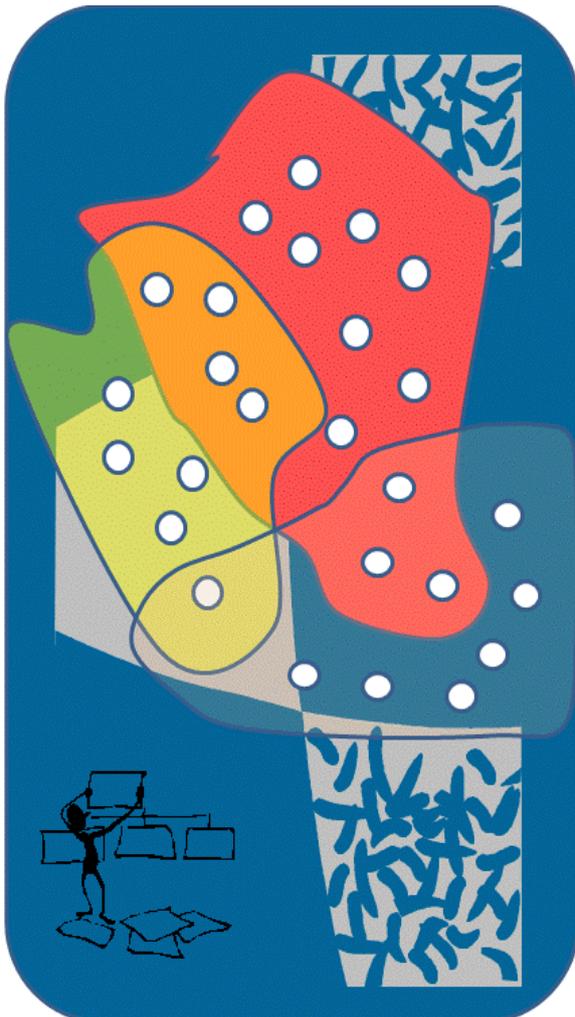


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Research Report

Business Design for the Service Oriented Enterprise

Business design is set to undergo a dramatic transformation. The convergence of ecosystem automation and autonomies, architecture for continuously evolving business, together with the merger of consumer and business IT will have a profound impact on conventional business models.
By David Sprott

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Independent Guidance *for* Service
Architecture and Engineering



Business Design for the Service Oriented Enterprise

Design patterns for the smart, continuously evolving, virtual enterprise.

Business design is set to undergo a dramatic transformation. The convergence of ecosystem automation and autonomies, architecture for continuously evolving business, together with the merger of consumer and business IT will have a profound impact on conventional business models, which will in turn affect business modeling techniques and enterprise architecture. In this article we provide an outline of what we believe will become de facto best practice using some new and not so new patterns to guide the design process.

By David Sprott

The original SOA vision of the enterprise as a network of services is now attainable by many enterprises. But the route to the Service Oriented Enterprise is not so direct; it must evolve and integrate with an ecosystem of services that reflects business reality.

Introduction

The way we design business is undergoing profound transformation. For the past 100 years business design has been directly influenced by Frederick Taylor¹, focused on how we do work and how we can make it more efficient. The LEAN and Six Sigma movements are the visible manifestation of that thinking. Together with BPM they have focused on incremental improvements of primarily internal processes and tasks encoded in process orchestration and workflows that control how the enterprise works.

But this is equivalent to looking in the rear view mirror to design tomorrow's business. In this article we will look at three major trends that are going to break this conventional model.

- Smart behaviors enabling cross ecosystem processes
- Capability services (independent business components) enabling continuously evolving business models
- The convergence of consumer and business IT enabling the real "end user"

Along the way we identify and list a number of primary patterns that describe this new world. Most of which by the way, are not new.

Smart Behavior in the Ecosystem

Just over ten years ago when you walked into an airport you would stand in line for an agent and collect your boarding pass. When you wanted to purchase a book you visited a bookshop. In each of these use cases we transacted with human beings.

Today, in each of these use cases, we interact instead with an automated interface that actually does more than the human interface. In the case of Amazon of course they have moved far beyond the scope of a book shop, the interface is considerably



improved because Amazon provides extensive customer reviews and a virtual market in which we can interact with vast numbers of specialist providers to acquire niche or second hand products. In the case of the boarding pass collection, not only has the airport check-in process been replaced with self-service, the physical pass itself is eliminated and we can have an image of the boarding pass sent to our smart phone which is scanned at the security checkpoint. At the same time the boarding pass frequently contains personalized advertising and vouchers for airport shops and behind the scenes the airline system may be checking with security agencies as well as perhaps establishing lounge access and in some territories checking with immigration and passport control as well.

What's happening in these examples is that we have moved beyond automation of the basic process and integrated services from an ecosystem of providers that span numerous enterprises, to deliver an enhanced and more efficient service to the consumer, and in the process, eliminated unnecessary human intervention.

These examples have some very important lessons for us all. First, enterprise architecture must increasingly be scoped around an ecosystem that encompasses traditional and new participants in the process. Second intervention in the business process should be eliminated except where it is an intrinsic step in the process for a human or some form of node or agent to play a part. The real end user places an order. A toll barrier detects and reports a vehicle. A scanner detects and reports a piece of luggage has been received at an airport terminal. But be careful, because apart from customers and physical actions, most "human" interventions can and should be substituted by rules, and alerts used to bring humans into play only on an exceptional basis.

In recent years there has been a focus on autonomic or smart systems and there has been much attention on fully automating certain processes in verticals such as energy, climate change, transportation and healthcare. These processes are rather obvious candidates for rules based mediation and intervention, often using sensors to drive rules based processes, but we should look beyond this relatively narrow definition of smart systems and apply the same thinking across the entire enterprise architecture and business process design.

Readers that wish to explore this topic in greater detail should refer to the CDBI Journal Report Information Services Architecture for Responsive Process Management².

Continuously Evolving Business

As the enterprise becomes increasingly part of one or more ecosystems, (yes each enterprise will almost certainly be involved in more than one) there are further predictable changes to the business design. First, the enterprise inevitably becomes more focused on its core business because participation of partners naturally creates networks of specialists. Consider what is Amazon's core business? They may have started out as a book seller in 1994, but today the core business today is clearly the platform, including all layers of the stack spanning Cloud technology to commercial storefront and business intelligence.

Second, the enterprise must become much more adaptive. Because the ecosystem is comprised of numerous specialist partners, each participant will be driving an independent business strategy that naturally serves their own objectives and goals. So



each participant will need to be prepared to both lead and respond in equal measure, and this applies equally to a platform provider as an ecosystem participant.

In consequence each enterprise needs to manage its business as a set of highly independent capability services that can be upgraded, switched on and off with minimal impact on the rest of the ecosystem with upgrade lead times measured in weeks, not months and years.

Third, successful specialized capabilities may well exhibit exponential growth as the enterprise is so much more tightly focused.

Over the past decade the idea of business change has become almost a cliché. The business services and software marketing industries have pulled the change rabbit out of the proverbial hat so many times that we are all quite inured to the message. However the above discourse is quite serious, insofar as the supply and demand signals for change are clearly set to become even more acute. And the required response time will be similarly challenging.

The way to respond to this challenge is to reduce dependencies, to forge independent units of capability that offer software services that automate the interfaces with capability consumers and that are designed to be rapidly evolved without major impact on the consumers.

In the early stages of SOA, we and many other analysts articulated a clear vision for SOA – a network of standardized services that provided a stable and enduring set of interfaces for consumers to easily integrate core capability services into customized solutions, supported by highly independent implementation components with no implementation level dependencies. In other words architecture designed to support continuous evolution.

Since then a few organizations have achieved that vision, but it must be said, it is a minority of enterprises. We anticipate that given the radical transformation in prospect, most enterprises will redouble their efforts to reboot their SOA, to achieve the service architecture vision which is going to be a critical success factor for most enterprises.

Convergence of Consumer and Business IT

People are demanding to use their own gadgets and devices for business use. Attempting to prevent this is very short sighted.

WILLEM EELMAN, the chief information officer (CIO) of Unilever, an Anglo-Dutch consumer-goods giant, recounts the reaction of young employees when they first come across the complicated and often confusing ways in which many big corporate IT systems still present information to staff. "They take a look at a business-application screen and they scream in horror," he says. The youngsters are even more horrified when presented with tomes of instructions through which they must plough before getting down to work. Economist October 8th 2011

Since its inception in the 80s the PC has dominated business computing. Over the past decade the rise of consumer technology has been spectacular but largely separate from enterprise computing. IT departments have frequently laid down rules for use of consumer technologies, in many cases using security as a primary reason why personal devices of all types should not be used in the business network. Of course



Web services protocols have shown that message based security is perfectly adequate, and in many situations provides stronger risk prevention than transport based security.

CIOs that try to limit consumer technology run the risk of creating a grey zone, where employees bring their own technology to work in defiance of IT policy. This is not a new problem as it happened in the 80s when computer enthusiasts brought their PCs into the office to use VisiCalc, Excel and Word. But this time around it's not only enthusiasts, it's pretty much everyone!

Whilst PCs are not going to disappear any time soon, it's clear that there is a huge groundswell of demand for people to use their own devices in business, or at least to be provided with consumer grade technology. And this demand isn't restricted to college graduates - the use of smartphones and tablets is now ubiquitous across society. So the challenge for IT departments is for consumer technologies to be integrated into the business process both internal to the enterprise and with external end users.

Consequently we are already seeing the reversal of the normal pattern where business leads technology adoption; today consumer technology, smart phones and tablets, are being brought into the enterprise computing network. At this juncture therefore, the term "consumer" technology is becoming redundant and might be superseded by "personal". And it really is personal - the reason people want to use their own device is because of the amazingly high ease of use in a single, integrated device that spans all requirements.

Yesterday's IT business was also all about the User Interface (UI). The UI was the way the business visualized and articulated its requirements, and was the foundation stone of countless methodologies and the basis for Agile methods and prototyping. For the past few years the emphasis has been on multi-channel UI, supporting conventional client/server, browsers, kiosks and devices. But this is all going to change.

As discussed above, in tomorrow's business our objective is to eliminate all unnecessary user interfaces in a business process. The UIs that remain should be genuine user interfaces that are connected to the genuine end user – not an internal proxy. This is illustrated by the Horse's Mouth pattern. And the use of personal technology allows us to communicate effectively with the actual end user in real or near real time, with a user interface that is appropriate for the relationship between provider and consumer.

One of the most interesting developments in the consumer technology space has been the emergence of the "App" and App Store. This allows a customized interface with an appropriate amount of local processing, and customization. Enterprises are clearly using Apps today for consumer purposes and we should expect that enterprises will extend this model for business process integration both with consumers and other parties to the process to enable improved behaviors (quality, ease of use) as well as alternative communication mechanisms to respond to personal profiles. The airline boarding pass App has been a pathfinder, and many business processes will follow the example.

Beyond the “horses mouth” we expect most interfaces in a business process will be service interfaces with ecosystem partners. Most end user interfaces will be mobile – using heterogeneous, consumer devices. Regardless of whether the user is an employee, partner employee, agent or end consumer, there will be a multiplicity of devices that will be in the overwhelming majority of situations, the end users’ personal property, and not under the control of any enterprise.

Finally we note the recent acquisition by Apple of Siri, a small start-up that created a voice activated personal assistant application. A Siri user can simply say, “Tell my wife I’ll be 20 minutes late,” and Siri scours the user’s social networks, address books and other programs, finds the person tagged “wife,” converts the message to text, and sends it directly to her phone. We expect voice recognition combined with smart Apps to considerably strengthen the convergence of consumer and business technologies and stimulate a whole raft of innovative UI patterns.

Patterns

The core pattern underlying the Service Oriented Enterprise (SOE) is illustrated in Figure 1: the Differentiated Response. An SOE is part of an ecosystem in which capabilities (potentially from many collaborating businesses) subscribe to events which are of common interest.

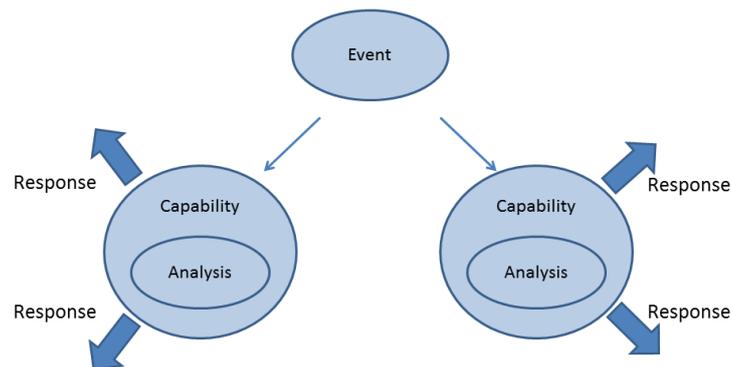


Figure 1: Differentiated Response Pattern

However in the SOE subscribing capabilities may have very different perspectives on the common event. For example:

- A sensor at a toll barrier records a car license plate passing the barrier. The toll operator capability will typically make the immediate response of posting a charge to an account. But in parallel the police may also subscribe to the service and track movements of license plates of interest. Also in parallel a market research company may subscribe to the data for market analysis.

The differentiated response pattern encourages us to look for collaborations across unconventional partners that would not typically be part of a unified business process.

A further key question for the SOE is “what capabilities should form part of the core business and which should be classified as context³”. And in the SOE the core capabilities are those that have clear strategic dependency; they are highly likely to adapt, evolve and change together, although hopefully, if they are well designed capabilities, with the minimum of message dependencies.

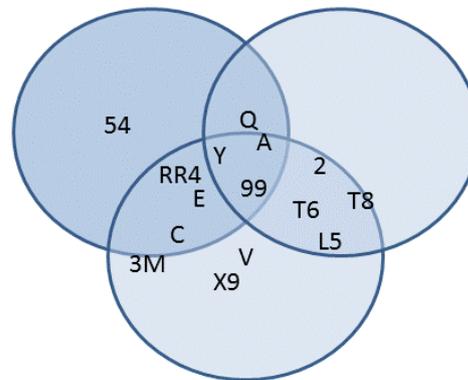


Figure 2: Capability Intersection Pattern

Figure 2 uses a Venn diagram to illustrate a technique for analysing dependencies between capabilities. In the example each reference denotes a capability dependency. As detailed in the attached patterns table, there are numerous dimensions to capability dependency, and the objective is to identify those dependencies in the intersection that are strategic, for example share a common change cycle, or are mutually supportive in strengthening customer relationships, and therefore indicate a capability should be part of the core business.

Conclusions and Remarks

In the CBDI SOA Maturity Model first published in 2004 we identified the Ecosystem maturity stage as “following” the Enterprise stage. For many years few were interested in what lay beyond the enterprise, for most organizations it was out of sight. However we always predicted that last stage implied big changes and today we see the SOE will have profound impacts on organizations. For example:

- A reduction in enterprise scope to focus on core capabilities
- Capability ownership drives organizational structure
- Autonomics and direct connection with leaf nodes in the business process will lead to reduction in workforce.
- Empowerment of the customer as the real “end user”.
- The demise of intermediaries
- The demise of the call center as routine transactions and queries handled by smart autonomic systems; the rise of advisors – specialists who have skills and authority to sort out real exceptions

There are examples of the SOE in some successful corporations today. But you have to assess that they arrived at the strategy by a combination of lucky accident and individual genius. So what do architects and business managers do to make sure they



have a strategy and are moving down the right path? Here are some recommended actions:

1. Understand your capabilities, classify them as core and context and act accordingly
2. Figure out your place in one or more ecosystems? Look at it from your customers', partners and suppliers perspective. Analyze the capability intersection
3. Organize around core capabilities, encapsulate business processes, MI and BI inside the capabilities.
4. Partner for context capabilities

Finally there is a table of relevant patterns appended to this article. Some of these are new and we will document these further.

References

The Support Economy, Why Corporations are Failing Individuals and the Next Episode of Capitalism, by Zuboff and Maxim, Penguin Books 2002

Dealing With Darwin, Geoffrey A Moore, Portfolio 2005

¹ Frederick Winslow Taylor, 1856 – 1915 an American mechanical engineer who sought to improve industrial efficiency. “. . . the first man in recorded history who deemed work deserving of systematic observation and study” Peter Drucker.

² Information Services Architecture for Responsive Process Management, CBI Journal January 2011. The report describes how business process management is evolving to incorporate dynamic response to events.

³ The concepts of Core and Context as described by Geoffrey Moore (Dealing with Darwin) are recommended by CBI as an excellent classification mechanism



Pattern	Short Description	Examples	Business Value
Autonomic Trading	Buy/sell trades triggered by preset rules	Commodity or stock exchange	Real time response to trading events.
Avatar	In computing, a pattern that uses a software representation for something else, typically of a real or virtual human being.	Automated trade consumer	Reduced headcount costs Reliable, rules based response to events
Capability Intersection	The space between capabilities. May include many forms of relationship or dependencies including temporal, process, scope, events, messages, semantics . . .	The generic capabilities Transaction and Analytics are quite independent, but have relationships for: <ul style="list-style-type: none"> - Shared semantics - Updates of Transaction rules by Analytics - Common interest in specific events 	Independence of each capability allows freedom to evolve both independently
Capability Service	A service defined as a part of a business model that has the power or ability to perform something of value to your business.	Google: Search; Analytics; Browser Amazon: Cloud Service; Storefront DHL: Shipment Processing; Tracking; Collection Booking Government (DHS): Risk Management, Laboratory Testing; Environmental Health	Stable, shareable, measurable, independent service.



Closed Loop Business Response	Business process response implemented as a control loop. The response to analysis of events and performance may be automated or semi-automated in an appropriate combination of rules and alerts. Managers use tools to process and interpret information; they then act upon this information by setting rules and alerts to monitor and respond. If management intervention doesn't work in the expected way, then this should trigger further analysis and adjustment.	Financial Services – high volume trading Risk surveillance Regulatory compliance Fraud prevention Price variation on volume (telecoms)	Tailored process response to events (physical and data analysis)
Customer Kiosk	Special purpose UI	Ticket collection, ATM	Customer self service
Differentiated Response	Single event, multiple and diverse capabilities responding	Toll barrier recording and response	Coordinated ecosystem response
Double Boundary	A pattern wherein the enterprise has a small management core, surrounded by a community of contractors, associates, affiliates, franchisees, partners and other allies.	Ariba Exchange	Tight focus on core business by all participants Encourages specialization Encourages start-ups
Federated Transaction	Components provided by multiple participants –	Orchestrated Airline Booking, Hotel and Car Hire	Process organized to achieve efficiency for end user (Customer)



Horse's Mouth	<p>Going to the source of the truth, as opposed to dealing with an intermediary.</p> <p>In horse racing circles tips on which horse is a likely winner circulate amongst punters. The most trusted authorities are considered to be those in closest touch with the recent form of the horse, i.e. stable lads, trainers etc. The notional 'from the horse's mouth' is supposed to indicate one step better than even that inner circle, i.e. the horse itself.</p>	<p>Customer takes responsibility for maintaining their own data quality</p> <p>RFID tracking of physical assets</p>	<p>Data quality</p> <p>Customer satisfaction</p> <p>Reduced costs of intermediaries, headcount</p>
Multi-Channel Service	Single service supporting multiple processes or channels.	Mortgage sales service supporting Web browser, branch kiosk and iPhone application.	<p>Single service</p> <p>Cross channel behaviors deliver customer satisfaction</p>
Responsive Process Management	Process rules varied depending on context	Sales price varied on demand	<p>Real time response to events</p> <p>Predictive business</p>



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