# Business Flexibility

### Removing dependencies between business process

### and technical infrastructure with SOA

**Contacts:**

Clive Longbottom
Quocirca Ltd
Tel +44 1189 483 360
clive.longbottom@quocirca.com

Elaine Axby
Quocirca Ltd
Tel +44  20 8874 7442
elaine.axby@quocirca.com

*Many of today's businesses have already moved from rigid siloed application approaches to more flexible business process focused solutions.  This is driving the need for transparency in the underlying technologies, and for better levels of standardisation and virtualisation of the infrastructure, along with consideration of the value chain that includes a company's suppliers and customers.*

## MAIN POINTS

- **The business is increasingly in charge – the technology must be more supportive**
  Windows of opportunity in the business world have shrunk alarmingly (for example, the lifecycle for many consumer packaged goods is now measured in weeks, rather than months), and large projects lasting many months are increasingly perceived as incapable of supporting the business.  Flexibility is required, at a far more granular level than has been required in the past.

- **Service Oriented Architectures (SOAs) are becoming the norm**
  Organisations are looking to the utilisation of SOA as a means of matching business tasks with technical functionality.  However, an SOA has to be built on a flexible foundation that creates a platform independent of hardware and operating systems.

- **Heterogeneity is here to stay – removing dependencies is key**
  Organisations have invested heavily in existing hardware and software solutions, and it is unlikely that wholesale change in the short term will occur.  Virtualisation of the underlying technologies and integration of existing application services points the way towards meeting the needs of tomorrow's organisations.

- **Now is the time for change**
  A Service-Oriented Architecture, based upon an open and flexible underlying architecture, utilising an enterprise bus providing solid data transaction, transposition and transport will provide enhanced flexibility for the future.  Standards are now in place with broad industry acceptance – SOA is being accepted by companies as the way forwards.

- **There are issues with application centric approaches**
  An application-centric approach to creating a suitable application platform/middleware solution may not provide the end-to-end flexibility required by the business, and may make a company more dependent on the ongoing capabilities of the application vendor in tracking and managing the changes in standards and process flows in the market.

- **The "Glass Walls" between an organisation and its partners are disappearing**
  Business processes go beyond the control of the organisation's control – technology solutions must be capable of supporting and reporting on processes that move along supplier and customer lines.

- **Tooling, maturity and independent software vendor support are key for a platform choice**
  A suitable platform must be capable of utilising common tooling so that skilled resources are easily available.  It is also key that the platform has adequate support within the independent software vendor (ISV) sector.

## CONCLUSION

Organisations wanting to create a more flexible, responsive environment to support their business processes must look towards the evolution of an environment that removes the process dependencies from the underlying hardware and software infrastructure.  This can only be done through the provision of suitable intermediary technologies such as a Service Oriented Architecture utilising application servers with integrated middleware providing solid support for existing application integration and future business process requirements.  A solution capable of supporting complete business processes end to end will define winners more completely than solutions based around specific applications.

quocirca

# Contents

# 1 Introduction

- **Process is King**

- **IT departments must provide on-demand solutions maximising use of existing investments and utilising open standards to help enable working across the value chain**

- **Service Oriented Architecture is the key way forward – but must be positioned around an open and flexible framework**

In today's business environment, success is driven by the need to support the transactional and knowledge processes[1] used within and across the organisation in the quickest and most effective way possible. A recent International Conference of Chief Information Officers and IT Directors in food retailing positioned "Improving Business Processes" at the top of their current agenda, ahead of gaining competitive advantage, cost control and innovation.[2] One has only to compare the performance of organisations that use IT effectively with those who do not to see how important IT is to the business: take the contrasting fortunes of UK supermarkets Tesco, which has made widespread use of IT to improve business performance, and the merged Morrison/Safeway chains, where significant IT issues, particularly around the accounting solution, have thrown doubt on the potential success of the merged organisations[3].

The role of partners – suppliers and customers - in the business is increasing, and these members of the value chain (see Figure 1) are being heavily incorporated into the business' core processes. Each company generally has a number of suppliers and customers with whom it has direct contact.  However, each of these customers and suppliers has their own supplier/customer ecosystem as well.  The need for information to flow easily and securely up and down these value chains is increasingly important – and many members of these chains may be several steps removed from the business itself.

**Figure 1**
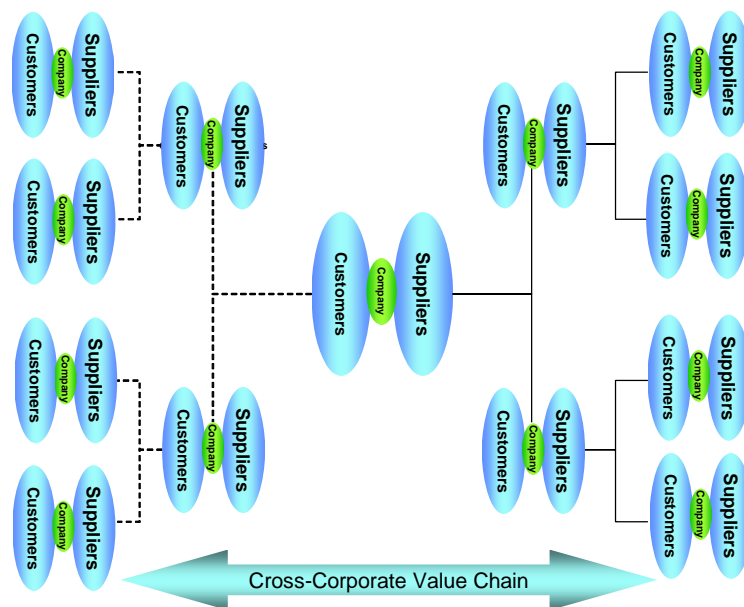
**The New Information Supply Chain**



*Figure 1: "Butterfly" Value Chains*

---

[1] In business terms, the usage of the term 'process' here describes end-to-end activities which create distinct value for the company, and generally for the customer.

[2] See: Information Technologies Management Programme from CIES, the Food Business Forum   May 2005

[3] See Morrison's statement, May 2005

As well as dealing with more complex value chains, businesses need to move increasingly quickly to take advantage of shrinking windows of opportunity: from finance to heavy industry, product lifecycles are shrinking fast and competitive responses often need to be measured in hours or days, not weeks or months.

IT departments find themselves faced with an increasing demand for on-demand solutions – supporting variability of process and variability in process load, whilst at the same time financial pressures mean that legacy IT investment cannot be thrown out and a complete replacement solution sought.

All this leads to a requirement for evolutionary architectures which will help maximise existing investments in hardware and software as well as enable new applications to be added as the business changes. The IT industry's most recent solution to this problem is SOA. Quocirca research shows many organisations are considering a more open approach based on SOA going forward. However, it is easy to get SOA wrong, and to hurt the business further.  The business must be the priority – and the technologies must support the business processes as they evolve.  This paper aims to give senior IT and business managers a strategic view of the technology and business issues to consider when purchasing new technology solutions in an increasingly open environment.

# 2 IT challenges – managing heterogeneity and delivering flexibility

- **Heterogeneity is a given – existing investments must be maintained**
- **Businesses are paying too much on IT maintenance – rather than on IT investments**
- **Standardisation is the way to future flexibility**

Virtually no-one can start from scratch with their infrastructure.  The vast majority of companies have different existing hardware platforms, operating systems, applications, development tools, reporting systems and systems management solutions, either developed within the business over the years, or gained through merger and acquisition activity. The silo mentality of past years, with many applications and hardware environments being managed in isolation to each other, has led not only to the need for multiple human resources replicating jobs being carried out by others, but also to a lack of capability in being able to identify where real root cause problems lie. Indeed, today's businesses are spending between 70-85% of their IT budgets[4] just in maintaining the existing systems – if this can be lowered through better centralised management, greater re-use of services and better root cause analysis, then more money can be allocated to investment in new functionality, rather than in running existing non-optimised systems.

Further heterogeneity is introduced through the increasing automated interactions between organisations and their partners within the value chains – customers and suppliers.  An organisation cannot be prescriptive in the systems these partners utilise, and so any standardisation within its own environment will have only a certain degree of effect over the whole value chain.  However, the organisation needs to manage the process as far as it possibly can – and this means being able to manage the interactions between its systems and the partner's systems as far as it can.

The fast pace of organisation activity however requires a fast and cost-effective response from the IT department, and may influence its choice of technology going forward. Technologies need to enable existing investments to continue to be used - they need to be forwards and backwards compatible - not to have to upgrade to the latest software version when new hardware is purchased, for example, or for a complete "fork-lift" upgrade to be carried out when a new standard appears in the market.

Technologies also need the support of accepted industry standards. The support for specific standards may constrain the capabilities for the organisation to be flexile in its dealings in the value chain.

Greater flexibility is also needed within the development environment – as new IT solutions are developed to support new processes, there will be a need to change parts of the solution, without impacting the rest. It will need to be possible to implement new solutions without the need for wholesale regression testing of the overall solution. The IT architecture should allow more "what ifs?" and greater flexibility in building and managing solutions and exceptions.

---

[4] Quocirca Report, Grid Index Cycle III, November 2005

# 3  The development of Service Oriented Architectures

- **High-level standards are driving SOA adoption**
- **Existing applications can be enabled as services**
- **Existing hardware assets can continue to be utilized within an SOA**

The latest IT industry solution to this problem is SOA (see Figure 2). Here, business applications are broken down into individual components, called services, which are generally loosely coupled through standard interfaces rather than being hardwired together as they would be in the traditional world of single applications integrated through fixed proprietary interfaces. A "calling service" (the user interface) makes calls to other services (which may then call other services themselves, or return data to the interface). A service might be common across a number of different business processes – checking customer credit for example – and in an SOA environment, it would be defined as such and integrated across the process, independent of the applications on which it runs. Therefore, services are based on repeatable business tasks that remove the constraints of a hard coded application. This enables optimisation of services, lessens process redundancy and increases consistency.  Service orientation is then the means that these services are interlinked to to provide support for the business processes, and these linkages produce a composite application – an aggregation of individual, independent services that provide the desired solution. Composite applications are therefore far more flexible than hard-coded applications, and new services may replace old services as required with minimum impact on the overall process itself.

**Figure 2**

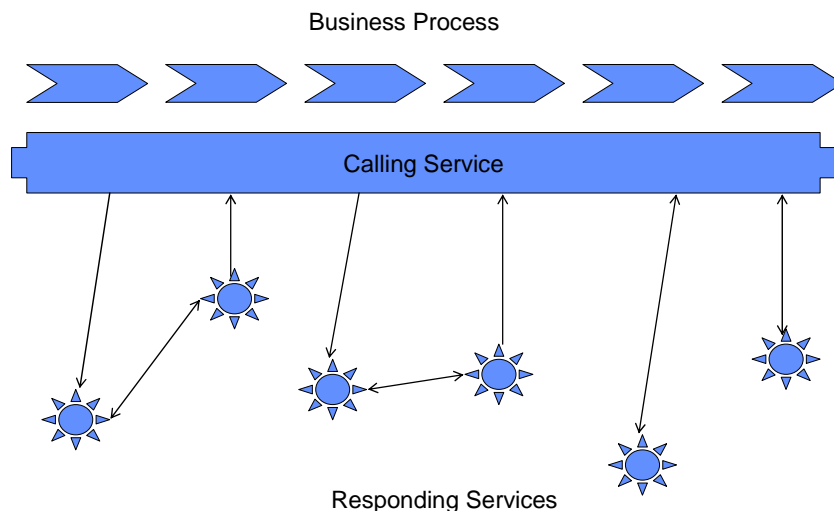**Service Oriented Architecture**



*Figure 2:  Basic SOA Architecture*

SOA has extremely broad vendor support – from the hardware manufacturers, through the platform providers to the application vendors.  It has IT buy-in – SOA provides a means of providing a more manageable and optimised environment.  It has business appeal – SOAs are designed to provide better responsiveness to market forces and better utilisation of existing assets.  SOA should not just be seen as a technical issue – demonstrable value add may be provided directly to the organisation through increased flexibility, information availability and capacity to enable corporate growth.

SOA is happening now – Quocirca's research shows that a large percentage of companies have basic levels of hardware standardisation in place, and have begun to adopt software standards mature enough for SOA to be considered.  Independent Software Vendors (ISVs) are moving towards Web Service based solutions,

providing the building blocks required for an enterprise SOA. The main software vendors such as Oracle and SAP have stated SOA directions, with smaller software vendors racing to provide associated services that will work alongside these enterprise solutions.

SOA "bus" architectures (see Figure 3) also help enable existing applications, new services and new service-capable applications to be easily brought together. Existing applications can be "wrapped" to create either a single callable application service, or can be deconstructed into sets of individual services. Here, the "bus" is a managed environment for controlling the flow of information between services, while logging all transactions and managing any problems where the transmitting or receiving service is not available for any reason.
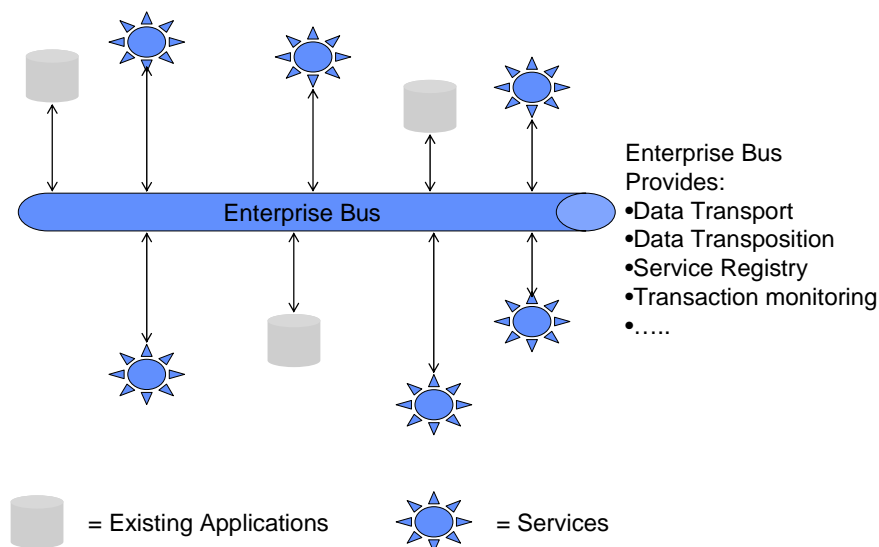
**Figure 3**

**The Enterprise Bus**



*Figure 3: Enterprise Bus Architecture*

SOA and bus concepts are not new concepts in IT. In the early 1990s, object-oriented coding and reusable code were put forward as possible solutions, but suffered from a lack of available standards and interfaces to create a functional enterprise environment. There have also been a number of 'middleware' solutions developed to meet this need for flexibility. During the mid- to late-1990s, EAI (Enterprise Application Integration) was developed as a means of creating a bus across which information could flow from one application to another. Although this approach was more successful than the previous re-usable code, the solutions tended to incur high up-front costs, and some vendors struggled, with many of them being acquired by the companies that have now evolved to offer advanced SOA and application platform solutions.

What is new is the introduction of industry standards for Web Services. As already mentioned, these have broad support from both vendors and standards communities, and enable services to be connected without the need for expensive and time-consuming custom development. Packaged application vendors in areas such as ERP (Enterprise Resource Planning) and CRM (Customer Relationship Management) have begun to implement standard interfaces so that their applications can be more easily integrated with others. Vendors such as IBM, Microsoft, Oracle, SAP and others have common frameworks which offer software platforms to integrate existing components as services and to rapidly build and implement new ones.

Within the Web Services world, a "service" can be defined and utilised like any other piece of reusable code. However, through the use of a central repository, known as the Universal Description, Discovery and Integration (UDDI) repository, services can be logged and then called by any request – without the need for hard-coding the linkages – in a form known as "loose coupling". The Web Services standards, utilising eXtensible Markup Language (XML) metadata, can call for either specific services via the UDDI, or can make a call for any service that will meet its requirements, via a "contract" request. In this manner, an existing service can be easily upgraded without requiring extensive regression testing of dependent

services, or can even be swapped out completely for a new service with better performance or greater functionality.

A prime means of providing this base infrastructure is through the provision of an "application server" platform. An application or service which has been written for a specific application server platform will run on that platform irrespective of the underlying operating system and hardware – without the need for re-coding or re-compiling. This enables companies to grow rapidly as required, with the hardware scaling to meet the application or service needs, or to meet changes in workloads through changing the physical box itself. For example, a company may find that there is a need to move from an initial low-end server system to a system more capable of dealing with high numbers of on-line transactions. Previously, this would have meant not only moving from, say, an Intel-based server to a mainframe, but would have required a complete re-coding of the application serving the need. Now, by utilising a common application server platform, the application itself can be more easily moved from one platform to another.

# 4 Application Centricity versus Services Centricity

- **Application-centricity may lead to constraints on flexibility**
- **Services-centricity provides an enterprise platform – and provides value-chain automation capabilities**

There are two main approaches to creating a suitable enterprise infrastructure based upon middleware and application server platforms. One is to look at a starting point of the organisation's main enterprise applications and work out from the vendor's platform (i.e. "application centricity"), while the other is to start from a base infrastructure focus and look at implementing a "standard" platform for all applications and services within the organisation (i.e. "services centricity").

**Figure 4**

**Application Centricity**
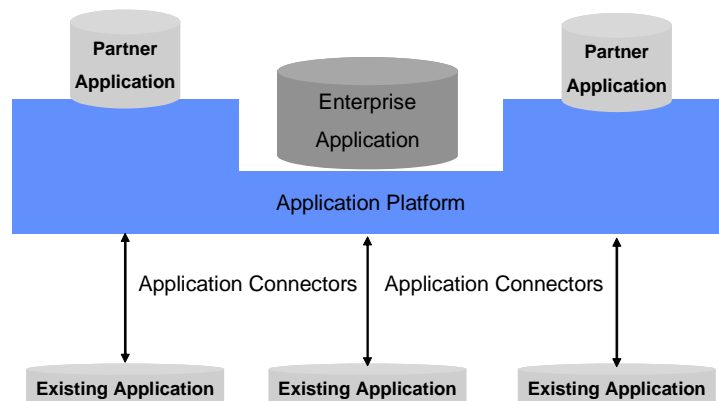


*Figure 4: Application Centric App Server approach*

Both approaches have their benefits and their challenges. By taking an application-centric approach (see Figure 4), organisations can have a high degree of trust in the integration of the basic platform into the application itself, and also that the vendor concerned should have a measure of long term buy-in to the strategy. It would also be normal for the vendor's dedicated ISV community to build external solutions that adhere to the platform's standards. However, for parts of the process solution that are more peripheral to the application itself (e.g. common reporting tools across a range of applications, or an information look up service that aggregates information across multiple applications), it is less likely that there will be ISVs that

will have ported and optimised their solutions for an application-centric platform, and the availability of off-the-shelf adaptors and connectors may be low.

A services-centric approach tends to provide a broader scope, building from the existing infrastructure upwards to create an open and flexible structure on which applications and services can be run. If one looks at the retail application described in Appendix A, there is not likely to be a single application available to service the entire requirement. Indeed, several of the applications may not even be hosted by the retailer itself – the repair and installation services may not be sourced internally, but may be hosted by the sub-contracted company that provides the service. Therefore, an application-centric approach to creating the required solution along with ongoing flexibility would be impossible. Through the use of a services-centric approach, an open and inclusive environment can be created that helps enable the process flows to move seamlessly between the applications and services required to reach the desired outcome.

Similarly in finance, the issues revolve around the number of different applications and services which are involved. Taking an application-centric route drives further dependency on a specific vendor's capabilities in areas that are probably not their core competency. For example, taking the front-office view, the centre of the application world will be the CRM system. If an organisation makes its solution dependent on the CRM vendor's application server and middleware stack, how will this support the back-office functionality that is required, or the remote working needs of the intermediaries? If taking the back-office view of making transactional systems the central point, how well will the application vendor's platform support customer-facing systems? The need is for flexibility – and a services-centric view independent of the applications, server hardware and operating systems is designed to create greater flexibility for the future

To achieve the desired level of information analysis and provision described in the third scenario, an organisation must have an environment that is independent of the underlying applications and the databases they are built upon. Application-centric approaches may have more of a dependence on the databases supported by the application vendor. A services-centric approach should provide a more open framework for accessing and manipulating data sources, feeding the information back via a suitable business intelligence (BI) service or tool to the client.

Within this environment, an organisation also has to look at how new applications and services are developed. Here, it is necessary to start from a process focus – the new solution may span several traditional applications and may well break out of the confines of the traditional organisational walls, either to partners or to utilise external services hosted by a third party. Development, testing, implementation, monitoring and management tooling must be capable of working in a dynamic environment. Through this means, the flexibility of the platform is kept at an optimum level, and re-use and industry best practices may be fully utilised.

For many organisations, it may be a hybrid solution that wins through. For an organisation that is highly dependent on a specific enterprise application, it makes sense to utilise the vendor's specific platform for the core application. However, as soon as the process moves away from the application, it makes far more sense to utilise a services-centric approach, helping to enable greater flexibility across the entire IT infrastructure.

# 5 Purchasing technology solutions

- **The business must drive technology decisions – not the other way round**
- **Stability and maturity of platform are key**
- **Security both inside the organisation and across the value chain must be supported**
- **Industry support for the solution must be broad**

What then should an organisation look at when purchasing a service-oriented solution going forward?

Business Issues.

The key business issues that need to be taken into account are:

- **The business must retain the business strategy, not be led by the technology strategy:** the technology must enable the ongoing changes in the processes that are required to enact the strategy –

so high levels of flexibility will be required.  The key to flexibility lies in the adoption of standards across the whole platform stack

- **The technology must be built on a suitably mature foundation:**  the use of middleware and application platform technologies is so strategic that the use of unproven solutions should not be countenanced.  Key areas to look at here are the messaging and workflow capabilities of the chosen solution – both must be open enough to interoperate with other systems embedded within applications, yet must have the capability to retain the state of the work packet – that is, be able to "hold" information in place - should an application or service not be available for any reason, being able to then re-start the flow from a known position automatically once the application is back on line.

- **The platform itself must be stable:** with today's business processes being so complex and spanning multiple applications, multiple sites and multiple companies, it is an imperative that the system not be the weak link in the chain.  Here, it is important to look at how resilience can be built into the solution: failover, load-balancing and n+1 redundancy are all areas that should be investigated to make sure that you are not dependent on any weak link for the capabilities of your solution.

- **The solution must support existing investments:** irrespective of the hardware and operating systems already in place, whether looking at mainframe systems, high-end, mid-range or low-end systems, or indeed blade farms and virtualised environments.

- **Connectivity to existing applications must be allowed:** the key here is that connectivity has to be across the whole of the business process – not just being able to integrate one enterprise application into other applications that it touches.  The latter approach constrains the capability of the organisation internally as well as externally.  As the world moves towards more of a service-based view, the need to see existing applications as sets of functions supporting the organisation is expected to become more pervasive, and the need for these services to be able to interoperate through loose bindings, across application and physical boundaries, will drive the need for systems that are completely free of specific applications, and that can reach and manage processes beyond the constraints of the organisation.

- **The solution must ensure information fidelity:** if the information cannot be trusted, then the process itself is suspect, and the organisation may suffer accordingly.  Therefore, any chosen solution must ensure information integrity through its support for standards such as the eXtensible Markup Language (XML) and other metadata capabilities, as well as having the capacity to raise exceptions where the fidelity of received information may be suspect.

- **The solution must be able to present information usefully**: as business processes within an organisation go across multiple applications, they go across multiple data stores, some of which may be formalised data (such as held within a standards database), while others may be more ad hoc (such as documents or e-mails).  The chosen solution should be able to aggregate the information required across all of these possible solutions and present this back to the reader according to their needs - a sales director will require the information to be presented differently to a sales executive, for example. This can best be done through the utilisation of a full-function, integrated portal solution making the most of the underlying openness and capabilities of the middleware and application server platform.

- **The solution should enable communication and collaboration:** a greater part of the decision making function within an organisation is now based around the capabilities of the people involved to be able to communicate and collaborate around the information feeds involved.  The chosen solution should enable this communication and collaboration, through standardised connections to existing tools such as e-mail, instant messaging, white boarding and web conferencing.

- **The solution must be able to support business continuity requirements:** should an unforeseeable event occur that does bring down a major part of a system, it will be necessary for the chosen solution to help you through the crisis.  For this, it will be necessary for the solution to be able to failover into a known state – it should be capable of logging the status of any ongoing processes and transactions, and rolling back unrecoverable transactions to a last known good position, so that once the problem has been resolved, it can resume where it left off with the minimum loss of transactions.

- **The solution must be able to support regulatory requirements:** in today's increasingly regulated world, the capability to monitor a process' progress along the value chain is needed, both for internal governance and external audit.  The capabilities of the chosen solution to facilitate this must be taken into account – it must be able to track the process end-to-end, with firm integration into an organisation's

policies and roles and responsibilities for its own employees and the individuals and services that are included within the value chain.

- **The solution must be secure:** as part of the creation of a supportive business infrastructure organisations need to ensure that there is a fully secure environment in place, supported through a framework driven by corporate policies and procedures. This again drives the need for a fully open environment with centralised tools for modelling, creating and managing the requisite policies.

## Technology Issues.

When looking at the main technology issues, standards are as much of an issue as they are from the business angle.

- **The solution must support a base level of standards:** the problem is in choosing which standards to back now – while ensuring that the door is not closed on any emerging future standards. Here, the main direction that Quocirca has identified is towards the utilisation of SOAs. SOAs are based upon the use of Web Services, which are defined through the various Web Services (WS-*) standards. Quocirca believes that any chosen solution must have a base level of Web Service support built around either J2EE and/or Microsoft's .NET frameworks.

- **A UDDI or other service registry capability must be in place:** although the true adoption of SOA-based infrastructures is still some way off, it is important to ensure that there is a UDDI or other service registry capability in place. This is necessary to manage the growth and usage of services as time goes on – hard linkages between services may lead to under-performing solutions, and lack of the capability to easily re-use services across multiple processes.

- **The solution must have a public roadmap for the future:** the slow emergence of grid computing is dependent on a suitable SOA being in place – and organisations looking towards the use of grid to help optimise technology asset usage and gain commercial advantage must ensure that the solution chosen will enable the creation of the required SOA, the capability to virtualise the environment and the flexibility to move to a gridded environment in the future. In a heterogeneous hardware environment, the solution must be capable of supporting all those platforms that will be involved with the corporate processes. Although some solutions are capable of being run against multiple hardware types, some do not have such capability. Therefore, it is necessary to ensure that the chosen solution has a public road-map for the future showing how the various implementations will be kept in step, and how they will interoperate with each other at the highest levels of functional and informational fidelity.

- **The solution must be in the leading group of standards adopters:** being a constant leader in the standards field can have disadvantages (instability, incomplete standard support and the need to continually patch solutions, for example). However, being a standards follower, forever one or more iterations behind the mainstream, often does not create an environment capable of supporting the organisation. What an organisation needs is to be one of those who are towards the leading group – the organisation may be able to be more responsive to the market, more flexible in its approach and more capable of changing its business processes to gain any advantage in the value chain.

- **The solution must enable easy performance management and optimisation:** when modelling a process, it is often the case that the new process instance in its un-optimised state suffers from various performance bottlenecks. It is imperative that the solution chosen enables these bottlenecks to be identified rapidly and easily, and that these can then be dealt with through the use of suitable tooling and management systems. Avoiding performance bottlenecks requires technical capabilities not currently present in all solutions on the market. Here, Quocirca recommends that buyers look for solutions that support dynamic workload management (the capability to maximise utilisation of available resources through the sharing of these resources across various processes through the use of dynamic provisioning of the resources to support the different needs of different processes), information caching (the capability to localise static information availability and to minimise the need to pull dynamic information over lower-speed wide area linkages) and process reporting tools (enabling issues to be identified before they become problems, thus allowing decisions to be made as to actions which may help prevent the problem from occurring).

- **The chosen solution should be componentised within itself:** it is increasingly difficult within today's organisations to shut down any part of a system for it to be replaced or upgraded. Should an upgrade of the very underpinnings of the infrastructure be required, a non-componentised system may require that

the whole environment be shut down during the upgrade – which may compromise the capability of the company to carry on business. However, a componentised solution is designed to enable parts of the environment to be upgraded rapidly – and often in parallel with the existing system, helping to ensure that any downtime is minimised. Componentisation also enables companies to decide where a "best of breed' approach makes sense – should a function be better provided through a different component, then the existing component may be replaced with minimal impact.

- **The solution must be supported by skilled ISVs:** the technology and business worlds will never stand still, and new technologies will continue to be required to help facilitate new business functions and respond to market forces. It is therefore key that the chosen solution has the on-going support of a high number of ISVs – the channel from which it is likely the new technologies will appear. In this, Quocirca does not just mean having ISVs that can state that as their solution has been written in J2EE/.NET, it is therefore capable of running on any solution that is compatible, but that the ISV can demonstrate an understanding of the chosen solution, that they can work with it in depth, providing hooks from their solution through into the value-added functionality of the chosen infrastructure where necessary. Broad-scale support through systems integrators and the availability of skills in the implementation and management of the environment must also be considered.

- **The solution must be able to be modified with ease:** Although the move towards packaged solutions is still strong, the majority of implemented solutions still require a level of modification. Therefore, the ease in which these modifications can be carried out is another key concern. An application-centric solution may provide the capability for your existing application developers to increase the reach of their skills beyond the application itself to directly connected third-party areas, but is unlikely to enable full value-chain capabilities, where a completely open approach is required. Quocirca recommends that the chosen solution have development tools that are well proven, are as open as possible and have a broad level of adoption within the development community at large. Wherever possible, the solution should be capable of being used with your organisation's existing development tools.

- **Quocirca recommends that a bus-based solution be utilised as a solution** – this helps enable high process throughput, as the bus can be highly optimised for the transactions it is dealing with. It also helps enable existing applications and services to be easily plugged into the bus, and for the connectors and adaptors utilised to be tuned for best performance against the bus.

- **The solution must be capable of reporting along the full value chain:** the capability to report at both a technical and business level against the process must also be considered. Again, this is predicated on the openness of the environment and the reach of the chosen solution.

# 6 Total Value Proposition

---

- **Technology purchases need to be made for solid business reasons**

- **The impact of not carrying out an action must be considered**

- **Qualitative, not quantitative, approaches to RoI and TCO are often required**

---

When making decisions on any change within an organisation, the majority of focus is often placed on measurements such as Return on Investment (RoI) and Total Cost of Ownership (TCO) discussions. For Quocirca, a more rounded view is required, where the overall *value* that a solution offers to a company is paramount. Within this "Total Value Proposition" (TVP) approach, simple set of criteria is utilised to ascertain what the probable value of a solution will be to a company.

Quocirca recommends that organisations utilise this approach when looking at the case for moving to an application server/middleware platform. The following sections identify the areas that should form the main business considerations to help ensure that the solution chosen will provide the greatest overall value to the organisation.

## Value, Risk and Cost

The first stage of a TVP evaluation is to look at the direct impact of the proposed solution on the three main variables within a company. These three areas are:

**Value:**

Does the proposed solution add incremental value to the organisation?

- Does it enable an organisation to offer more of the same goods or services more efficiently?

- Can an organisation offer different services/products to the customer?

- Can an organisation react quickly to its competitors' actions?

**Risk:**

The question here is whether the proposed solution help lower risks for the organisation: does the fact that there is a new infrastructure mean that developing new services involves less change across the whole of the IT infrastructure? How easy or difficult will it be to integrate your IT system with different systems if new organisations are acquired or take on new suppliers or sales channels? Will it help reduce the number of IT errors and downtime? If there are problems, can they be isolated and resolved quickly and efficiently?

**Cost:**

Finally, the question of whether the new system lowers costs for the organisation is vital: can it be changed or update the products and services with less development and testing costs? Will an organisation be able to help lower costs by reducing the number of staff involved in system maintenance? Will costs to the organisation be reduced by better availability of systems, less downtime for non-IT staff? How long will existing applications last with this new architecture?

## Game Theory

The second stage of a TVP is to ascertain what the cost may be of not implementing a specific solution. Quocirca utilises a simple form of game theory to ascertain an appreciation of the cost of not carrying out a proposed change. This is a process, where an organisation looks at the following four scenarios:

**Neither a business nor its competition have the proposed capability:** neither gets the benefits of the proposed change, and market position stays the same (all other factors being equal) – but customers and shareholders do not benefit from any changes the proposed solution brings, and overall economic benefits to ourselves and the wider environment are not realised.

**An organisation has the proposed capability, its competition does not:** a business gains the benefits of the proposed solution, and it helps enable it to move more quickly and efficiently to meet the business objectives, be they improved market share or better profitability. Even assuming its competitor gains the proposed capability, first mover advantage may enable the business to significantly improve its business position.

**An organisation does not have the proposed capability, its competition does:** an organisation is in a weak position and potentially have to incur costs in other areas in order to compete with its competition. An organisation will either lose market share, or become less profitable, or both.

**Both the organisation and its competition have the proposed capability:** both benefit from the benefits that the solution brings. At the worst case, the business growth continues, as does that of its competition. At best case, both pick up business from other competitors, and so customers may benefit and returns to shareholders may improve; overall economic welfare may be maximised.

## Simple cost of ownership and return on investment

For many organisations, the lack of full knowledge of how much an existing process really costs makes RoI and TCO calculations difficult. Indeed, for many companies, baselining costs will require the company to keep utilising the existing solution for a period of up to 3 months while the costs are calculated – thus eating into the windows of opportunity available through the implementation of the proposed new solution. Even for those who do have an idea of existing costs, there may be problems when it comes to comparing like with like: after a change is implemented, the process that is being compared may not be the same as the one

that has been already measured. Also, the availability of hard costs (such as the fully-loaded cost for specific resources) may not be readily available – and it can end up with wildly different findings depending on who has carried out the calculations.

Quocirca's approach is more qualitative than quantitative. It is recommend that companies take the five to ten highest priority processes that are going to be impacted through the proposed implementation. These processes should be at a high level, covering as broad a spectrum of usage as possible. Through this manner, we should still be able to compare like with like on a before and after basis.

Once the organisation has the process list, it can then make an educated estimate of whether the proposed solution will make each process more or less expensive to carry out. Scoring can be based on a level of 1 meaning that the process will be considerably less expensive, through 3 denoting that the process is likely to carry the same cost, through to 5 denoting that the process will be considerably more expensive.

Once this has been done, it is then simple to add up the scores, and divide by the number of processes involved. A low number will generally denote a rapid RoI/TCO; while a high number will show a low (or possibly no) direct RoI and a possible high TCO. However, this information should be utilised in conjunction with the previous two steps – if the Value, Risk and Cost components show high reasons for change, these may outweigh the risks of having a low RoI/high TCO. If the Game Theory exercise shows that not implementing the proposed change will result in market loss to the competition then the change may be the only way for the company to survive – even if the TCO is high.

# 7 Conclusions and recommendations

- **Standards and interoperability make SOAs a true option now**
- **A move to SOA is not a "rip and replace" action – it can be done gradually, and can include existing investments**
- **An SOA must be inclusive – it must cover the needs of the business, and give capabilities to automate interactions along the value chain**

The increased dependency of organisations on the underlying IT and the need to be able to respond more rapidly to changes in the market mean that changes in the way that they implement and manage the underlying IT infrastructure may be needed. No longer can "solutions" be put in place to specific issues – at all times, interoperability and technical flexibility must be borne in mind, so that business issues, predicated on business processes, can be dealt with in the round.

However, the existing investments in technology cannot be written off, and an organisation must look to how these can be included in the new environment.

To this end, companies must prepare for SOAs, putting in place an environment that has the inherent flexibility and standards support to include existing investments, and to embrace emerging solutions.

It is Quocirca's view that this platform must address the needs of not only the main users within the organisation, but also the needs of the company looking up and down the value chain, thus supporting the business' processes from end to end.

Quocirca's view is that attempting to do this through an application-centric approach may lead to an over-dependence on the application vendor, and that the lack of ISV in areas two or more steps removed from the ISV's core competencies can create the need for hard-coded connectors that may further compromise the flexibility of the company.

Therefore, Quocirca's main recommendations when looking for a suitable solution are that the following capabilities be demanded from the vendor:

- Solid ISV and system integrator support
- Full Web Services (WS-*) standards support
- A fully SOA, based on integrated yet independent service components
- Capability to support loose coupling of services
- The provision of a bus architecture including data transposition, translation and transport capabilities

- Full tooling, measurement and reporting capabilities

- Supported flexible connectors for existing enterprise applications

- Broad support for multiple hardware and operating system platforms

- High levels of internal and cross-organisation security

- Built-in workflows with "stateful" support (the capability to fully understand and track the state of a service and its associated data)

- Full support for existing communication and collaboration systems

- Support for business continuity through full workload management and virtualisation

The aim is to create a platform that removes the business processes from any dependencies on the technology – and so free up the organisation to concentrate on reacting to changes in the market. There is a need to minimise the amount of maintenance required – and so the number of supported platforms should be minimised as well. Although it may be felt necessary to underpin a core enterprise application with its own application server and middleware platform, Quocirca advises that organisations choose a main infrastructural backbone application server/middleware platform to support the end to end business processes.

## Appendix A – Use Case Scenarios – Facing up to Business challenges

In many ways, the challenges facing most organisations are similar – such as the shrinking of windows of opportunity, financial pressures, the need for inclusion of partners in the value chain.  However, specific verticals have their own challenges – and a few are addressed here.

## Channel Optimisation in Retail

- **Consumers are demanding new ways of shopping and are eagerly shopping across multiple channels**

- **A seamless cross-channel customer experience is an imperative not a luxury**

- **Success in the multi-channel world requires retailers to break down organizational silos**

- **New challenges require a flexible, multi-channel platform not standalone e-commerce applications and point solutions**

Many organisations want to put their customers at the heart of what they do. But as organisations expand, develop their product portfolios and enter new markets, then the relationship with their customers becomes more diverse.  Many of the most complex customer and channel relationships are to be found in the retail sector. Some of the issues facing typical large retail organisations will include:

- **multiple means of customer interaction**: in-store, online, from catalogues, by phone - with a mix of these methods potentially in a single transaction - phoning a call centre to add items to an online delivery, for example

- **retailers are looking to new goods and services to grow revenue:** white goods retailers are selling a range of services and products like repair contracts and installation services, while CPG/FMCG retailers are increasingly moving into such areas as cellular phone contracts, and even financial services.

- **specialist sales and support processes**: selling services rather than products means more and different processes and people, and some services – finance and utilities in particular – have very specific regulatory requirements.

- **specialist channels:** many of the services sold by food or other retailers will be operated by specialists in a particular area on behalf of the organisation which owns the brand, and the brand owner will need to be able to track what is being sold and to whom, and to be sure that the service is being sold and supported in such as way that is consistent with the overall brand message and commercial agreements reached.

- **single view of the customer**: with customers shopping across channels, and cross channel shoppers spending more than single channel shoppers, retailers need a consolidated view of their customers to help identify their most valuable ones

- **customers have single view of the retailer:** consistent delivery of service and information across channels is expected and that requires a continuous state of interaction with each customer

- **internal alignment:** retailers must harmonize assets and processes across the value chain to meet customer demands and help optimize their channels

In a multi-product, multi-channel environment, it is important that communications between the customer and the retailer are as easy as possible. From the retailer's perspective, having a holistic view of the customer across the different channels offers a number of benefits:

- **customer value may be increased:** information on customers' purchasing patterns can be accumulated, customised offers can be developed and opportunities for cross-selling identified, targeted promotions and point of sale cross sells can be deployed across channels

- **customer centricity may be improved:** the entire organization can make decisions based on accurate and consistent customer information, from merchandising through to the associates in the store, the call centre representatives and the web shopping experience. Channels may be optimized to suit the customer's needs and the retail assortment, helping to lower costs and increase customer satisfaction

If customer satisfaction is improved, loyalty may be built and repeat purchases may become more assured. This may lead to increased sales and decreased costs as organisations learn more about what their customers want and do buy.

The need here is for a platform that can seamlessly pull together the multi-channel aspects of customer interactions in a flexible, responsive and end to end manner.

## Pulling together the customer and vendor chains in Finance

- **The speed with which a transaction can be carried out is paramount**
- **Governance is key – all transactions must be monitored**
- **Risk management is vital**

Increasing complexity of channel relationships in the retail sector continues. In finance, complex vendor chains are common, and there has been pressure for many years to speed up transactions, most notably in equities. The growth of online trading has also given a stimulus for faster, automated, transactions. The application of straight-through processing (STP) has developed throughout the sector, seeking to automate the processes between the different entities involved in the sales and settlement chains.  Each part of the value chain presents different challenges:

- **external vendors:** these will include organisations completely outside of the financial sector as well as the traditional independent advisors (individuals or firms). They will need to be kept up to date with the organisation's products and services, sell in a manner which aligns with the internal processes and regulatory requirements, including risk assessment, and be paid in the appropriate way.

- **the organisation's own sales force:** again, making sure they align with internal risk processes, are compliant with regulatory requirements and paid appropriately is important. They may also be increasingly mobile and need business and technology support out of the office, at home or at a customer's premises.

- **the organisation's trading desk:** here, presentation of reliable, up-to-date data from a range of sources, accurate risk assessment and speed of transactions are key.

- **compliance management:** the need to be able to monitor processes across the value chain, to receive accurate and timely data and produce reports to show compliance are key

- **back office:** automating previously manual processes, such as traders filling out paper tickets which are then passed over to others for processing, may help reduce potentially costly errors and lead to greater efficiency and customer satisfaction.

A typical sale involved in the financial sector will encompass a range of processes which go across the various departments in the organisation. For example, in an insurance sale, lead generation might come from an external sales partner,  the lead might be qualified according to internal system of ranking (does this person live in a high crime area?), the lead would then be passed back to the external partner to identify and recommend a solution, then back to us to process the application, to another partner to underwrite the solution, back to the original sales partner to complete the order with the customer, back to us to complete with the underwriter,  then into the internal system and the sales partner's to manage the account.

Automating such processes brings significant benefits: operational efficiencies are increased, costs are reduced, error rates are reduced and customer service is improved.

The need here is for a platform that helps enable secure interactions across the value chain, enabling intermediaries to interact with centralised live data while dealing directly with their customers.

## Building dynamic business reports from multiple data sources in the telecoms sector

- **Organic and acquisitive growth has led to a high degree of heterogeneity**

- **The proliferation of services and channels requires multiple data sources to be aggregated**

- **Better information is key to helping improve marketing and sales**

Modern organisations sell an increasing range of products and services to more people and need to manage multiple channels involved in selling to, and supporting, customers. They need close relationships with all their partners in the value chain. However, the large-scale merger and acquisition activity in the market has led to highly heterogeneous environments, with multiple billing engines, multiple different base technologies at both the network and computer level, and multiple CRM systems aimed at providing support to the customer base.

Data from these customers and partners is vital in order to help maximise business effectiveness. More than this, data from many sources needs to be able to be consolidated, validated and used to produce actionable reports which may help improve effectiveness. These sources are both internal and external: a typical mobile operator, for example, will have a range of systems (network, messaging, customer care and billing), different sales channels (direct sales, own or third party retail outlets, internet) and a range of services (plain voice telephony, text or picture messaging, international roaming, data services). All of the data from such sources needs to be gathered together to build up a picture of both customers and performance of different parts of the organisation. Areas where dynamic business reports help add value to the organisation include:

- **Market segmentation**: which are the most valuable customers? What are their purchase patterns? Are there any segments which should be buying a particular product, but do not?

- **Usage patterns:** these can be tracked to help with new product development, special offers and churn management: how are customers using services? What can an organisation do to encourage their customers to make more use of its services?

- **Personalised offers:** mobile customers who travel frequently to France can be given a specific discount on roaming calls there, for example.

- **Sales channel effectiveness:** which channels bring us the most valuable customers? How much does it cost to gain customers from each of the identified channels? Where are the most effective channels?

- **Churn analysis:** which customers are most likely to stop using the service offered? Are there any usage patterns which lead to more churn than others? Are there any sales channels who supply customers who churn more frequently?

The need here is for a platform that helps enable multiple data sources to be virtualised, helping to enable data to be searched and reported rapidly.

# About Quocirca

Quocirca is a perceptional research and analysis company with a focus on the European market for information technology and communications (ITC). Its analyst team is made up of real-world practitioners with first hand experience of ITC delivery who continuously research and track the industry in the following key areas:

- Business Process Evolution and Enablement
- Enterprise Applications and Integration
- Communications, Collaboration and Mobility
- Infrastructure and IT Systems Management
- Utility Computing and Delivery of IT as a Service
- IT Delivery Channels and Practices
- IT Investment Activity, Behaviour and Planning

Quocirca research is always pragmatic, business orientated and conducted in the context of the bigger picture. ITC has the ability to transform businesses and the processes that drive them, but often fails to do so. Quocirca's mission is to help organisations improve their success rate.

Quocirca has a pro-active primary research programme, regularly polling users, purchasers and resellers of ITC products and services on the issues of the day. Over time, Quocirca has built a picture of long term investment trends, providing invaluable information for the whole of the ITC community.

Quocirca works with global and local providers of ITC products and services to help them deliver on the promise that ITC holds for business. Quocirca's clients include Oracle, Microsoft, IBM, Dell and Cisco, along with other large vendors, service providers and more specialist firms. Sponsorship of specific studies by such organisations allows much of Quocirca's research to be placed into the public domain. Quocirca's independent culture and the real-world experience of Quocirca's analysts, however, ensure that the research and analysis is always objective, accurate, actionable and challenging.

Quocirca reports are freely available to everyone and may be requested via www.quocirca.com.

**Contact:**
Quocirca Ltd
Mountbatten House
Fairacres
Windsor
Berkshire
SL4 4LE
United Kingdom
Tel +44 1753 754 838

quocirca