

BUSINESS EVOLUTION AND INTEGRATION MODERNISATION

INTEGRATION MODERNISATION: DON'T LET THE PAST HOLD BACK YOUR FUTURE

The integration industry is very mature having seen relatively little technological change in the last 20 years. Cloud has brought change in terms of where data is located, how we connect to it and how vendors offer up technology. However, if you compare the integration technology domain with that of business intelligence, there's a marked difference in how far technology has moved in business intelligence.

Innovation is long overdue in integration, which makes the next few years interesting for anyone in the integration domain. It has also created a position where organisations are left using yesterday's technology choices to solve today's business problems. Anyone who is reviewing their legacy technology assumptions have probably already noticed that technology that enabled business several years ago is not as enabling in a connected world any more.

This paper looks at many of the recurring themes and challenges that organisations encounter in the modernisation of their integration environment and why a change agenda is important.



THE PREVIOUS GENERATIONS OF INTEGRATION

Enterprise Application Integration & Extract-Transform-Load (ETL)

The integration industry really reached maturity with the advent of the broad paradigm of Enterprise Application Integration (EAI). By the early 2000s there were a number of technology suppliers extolling the virtues of taking a strategic approach to integration. The key aspect to this style of integration was a centrally managed integration capability allowing consistent tooling for integration. This was solidified by a seminal book by Gregor Hohpe and Bobby Woolf called Enterprise Integration Patterns. Within this book were lots of low level patterns that are repeatable in nature. Another common term banded at the time for a similar paradigm was Message Oriented Middleware (MOM), which was also a way of distinguishing the use of messaging to Data Integration.

In the Data Integration world the ETL (Extract-Transform-Load) pattern also became de-facto as a style of integration and also equally provided a single toolset to allow centrally managed integration.

There are many organisations whose integration estate still follows these approaches. They can be characterised as much as anything by the tools utilised and the integration styles deployed.

Service Oriented Architecture (SOA)

Service Oriented Architecture (SOA) has been around in conceptual form since the late 1990s and although it existed during the 'golden era' of Enterprise Application Integration there were very few genuine early adopters of this paradigm. The key difference in respect to integration was that the exposure for integration was performed via a service rather than simply dealing with whatever interface was exposed by a specific system. In reality from the outset the concept of the paradigm was muddled by integration because the concept itself is around an architectural paradigm as a whole, not just an integration paradigm. That's why some people refer to this as Service Oriented Integration (SOI).

The realisation of Service Oriented Architectures is rarely in keeping with the concept, the common problem being what granularity to expose for services. In general most organisations utilised coarse grained services which are services that are orthogonal to Business Services that should have some meaning to a business, rather than interfaces that rarely do.

During the advent of SOA there was a strong market-driven push around the integration technologies changing as a result of this. The concept of an Enterprise Service Bus, i.e. the bus that can be used to connect these SOA services together. This introduced some new entrants into the integration market targeting this paradigm in particular, but equally many EAI vendors re-badged their tools as ESBs whether or not they met the concept or not. During this era of integration the vast majority of medium and large organisations acquired an ESB.

One other key difference between SOA to EAI was that due to the service exposure, there were many other potential benefits to be realised, such as reusability, modularisation, and repeatability at a more granular level than was possible with low level Enterprise Application Integration Patterns.

The fundamental problem though was the lack of recognition that the needs of information consumers is not always the same and by taking an inflexible coarse-grained approach arbitrarily that it would actually have major side effects, such as compromises to performance and perceived complexity for consumers to deal with. Many organisations' SOA implementations were (and still are) characterised by a slow development and execution process partly down



to granularity and partly down to tool productivity.

To some extent the realisation of SOA was also compromised by ESBs themselves, for those who were heavily involved in the inception of the paradigm will point to the fact that it is not the only way that Service Oriented Integration can be realised, and possibly some other integration models are better suited to SOA as a whole and to some specific use-cases.

Another common problem with SOA implementations is the bias towards web services as though the paradigm was called Web Service Oriented Architecture.

In terms of technologies, as well as the same tools being used as were used for EAI the tools became weightier over time.

KEY CHANGES

The advent of Cloud spawned specific integration technology we know as Integration Platform as a Service (iPaaS). Analysts have very much endorsed the use of iPaaS in the enterprise as the on/off ramp to the cloud and hybrid cloud/on-premise in a bi-modal IT operation. Recognition that the ESB and EAI tools enterprises bought are not able to effectively handle cloud business use cases. iPaaS products typically address Integration with a low-code connectors approach to building solutions. They also expose varying API platform capabilities. Typically the ability to expose and manage APIs.

APIs represent one of two major topics that come up again and again in the world of integration. The other is Microservices. They are also intersected with other major changes in the IT industry such as Cloud and Big Data as well as the overarching banners of Digital and customer-centricity. APIs and Microservices together have spawned a new kind of integration expert – the Digital Integrator.

APIs

APIs are the response to the problems caused by not being consumer-centric enough and utilising arbitrary granularity for services. They are also a vendor response the integration problem by divesting responsibility for it to the user. Hence the alternate API acronym of 'Another Person's Issue'. Buyers have somewhat perpetuated this as well by asking for the API for their shiny new or not so shiny old integration technologies to connect to. Much of the problem some APIs present is borne out of them being written by application developers instead of integration developers or more technically savvy business analysts. Many vendors still present APIs lacking a contract through which the customer can reliably consume the API.

There are technology suppliers who offer pure-play API capabilities now, and the proposition is significantly different to that which was described around an ESB or EAI for that matter. However, the value of pure-play API products diminishes in the absence of integration technology or a developer to make the API relevant to a system, process, database or other data store.

Microservices

The microservices market is less mature than the API market because the paradigm is more complex as a whole, but it is reaching sufficient maturity for many medium and large organisations to be acting on it. Organisations like Amazon have made their microservices architecture a differentiator of their business. Increasingly some businesses



are realising that it forms the basis of a transition they need to make in their market to be competitive. Rather than using technology to support business functions they are becoming technology businesses. Why? They recognise that technology is likely to be a key driver in the transformation of their industry and there is mileage for many industries to be transformed in the equivalent way as *AirBnB* and *Uber* have transformed their respective industries.

The need to integrate with Cloud and increasingly with services like PaaS and SaaS is a major shift because the core integration needs are different, including a much higher prominence around dealing with multiple security contexts. At the same time the Data Integration space is moving radically with the maturing of Big Data technologies realising altogether new integration capabilities.

One other changing key aspect is tooling around the periphery of an integration technology. Continuous Integration and Continuous Deployment are not particularly new concepts, but those who have implemented them with ESBs have had to work hard at it to make it work. Aligned with this there are also the common modern ways of working such as DevOps, CloudOps and agile methodologies which classic integration approaches can introduce some impedance to.

One considerable change in scope of integration is the increasing closeness of identity integration to general integration. The two are ever more intrinsically linked by the common need towards adjoining consumers to that which they are consuming

Mobile Development techniques are changing, leading to an hand-in-glove approach between mobile application development and the mobile application's integration.

Aligned with the some of the above changes, it is interesting to note that many would cite that productivity has also seen a major change: some of the modern integration technologies offer the potential for a significant uplift in productivity. Interestingly this can be realised through almost diametrically opposed approaches.

Citizen Integration and Digital Integrators

Citizen Integration is not a new concept, the idea that non-developers can define simple to medium integration scenarios has been around in tooling for a long time. The area has though come to prominence because it is becoming an increasingly adopted practice, and within the next few years it is likely to increase significantly further in adoption.

Digital Integrators are people focused on supporting the realisation of Digital transformation, where their primary integration approaches are user-centric utilising APIs and Microservices.

THE 'LEGACY' TRAP

The Technology Trap

The fundamentals of Integration have changed so drastically particularly in the last 5 years, and modern approaches are being adopted by many organisations who do not have the baggage of older integration approaches.

There are a significant number of organisations who are still pursuing an approach that was similar to an integration approach taken some 10 years or more ago. There are also a large number of organisations trapped in a half-way



house where they have a mix of new and old technologies and struggle with the right approach to take.

One particular problem is the 'legacy' trap where organisations broadly understand the problem they face, yet are trapped in an old style of integration. This is because it is firstly a major sunk investment that has become intrinsic in the fabric of the IT organisation. Sometimes it is also because they did such a good job of promoting their previous approach that it is hard to challenge it.

To the contrary, some organisations have had an opportunity to address their legacy brought on by the vendor themselves, for instance there are many integration technologies that are now end-of-life.

The People Trap

One major problem in delivering modern integration is *legacy thinking*. People brought into SOA and often the technology supplier spin on the paradigm sometimes have this way of working ingrained in their thinking. It can be hard to challenge this because the API world in particular is often over-marketed by technology suppliers.

Another people-oriented aspect is the change in skillsets. If anything the integration market is now more divided than it ever was in the past over the skillset needs and many technologies favour different background skillsets over previous integration technology skillsets. This means that introducing new technologies has to be supported by introducing new competencies which presents its own challenges.

Add to the people trap the new skills required – such as for a Digital Integrator – one who can work effectively with APIs and microservices, and is much more user-centric in posture and supporting transformation enablement. Equally, the ability of iPaaS to support less technology-centric integration development, potentially by Business Analysts, Technical Analysts and for simple tasks Business Users forms a new challenge. The paradigm is moving to less but more specialised integration experts allied with increasingly business-centric integration activities.

The Organisation Trap

Many organisations especially large enterprises have a one size fits all approach to technology implementation. If one size fits all isn't the intent then security, architecture or the nature of the systems they are engaging in system terms force the one size fits all methodology. To the man holding a hammer, all problems look like a nail. Gartner's pace layering a bi-modal and multi-modal IT inform us that we need to have an ability to adapt our rigour and approach to the needs of the business and the market it is operating in.

Sometimes it is perfectly acceptable to pay the piper later down the track for compromises we accept in the name of getting the job done. The important thing is for the business to be able to make those risk decisions in a balanced way without getting hung up on edge case outcomes. Knowing where you are at in terms of integration capability can be a good first step in understanding which rules you can bend in the name of time-to-market or other business pressure and for how long.



CHANGING THE STATUS QUO

It is absolutely true that in most (but not all) cases the way an organisation performed integration before is not the best way to perform integration now. The market has moved on because integration itself as a discipline has moved on. In fact for most organisations the problem-space has moved on more than the technologies themselves, and now integration is being asked to solve completely different things. The prominence of integration has also increased from hidden plumbing to a key component of reducing time to market and delivering improved IT agility.

For organisations who have not adopted new integration practices the primary challenge is around how to change the status quo with all the challenges that presents. Many organisations faithfully 'did the right thing' architecturally and at considerable expense. The problems most of those organisations face is an inability to move and react fast enough to the changing business climate and Digital imperative. Those that have adopted new technologies like iPaaS are trying to find a sensible balance between where that technology starts and stops architecturally in their existing integration landscape. iPaaS vendors have generally been fairly sensible in terms of selling co-existence with existing enterprise integration investments.

So how do organisations choose the right path and the right balance? Organisations generally choose to revisit integration capability in the same way dental patients want to revisit a root canal. However, like revisiting a root canal where the nerve is gone and the procedure no longer painful, revisiting your integration investment needn't be painful. Most of the pain we remember centred on how the solution should work. Second time around, you already have that information.

There are two frequently used techniques that can be utilised either together or individually that can help challenge and change the status quo, these are –

- **Review/Health-check.** Take an objective and impartial look at all aspects of integration and determine if it is still the right way to perform integration. If it is not, then define a set of changes to make it meet both the prevailing needs of the organisation and enable the most appropriate and applicable modern integration practices
- **Strategy.** Look at the problem from the perspective of a forward-facing statement first. Determine the most appropriate ways of performing integration to meet the business imperative that best supports the future direction of the business. Then reflect (review!) this against the current integration capability in terms of all dimensions of the current capability and how this must change.

Sometimes a review is a path of lower resistance for organisations because it intrinsically feels more incremental in nature as an approach. A Strategy, however, can be more effective at galvanising the need to change.

In considering these, there are some common macro considerations, such as –

- **Definition of the Problem Statement.** What business imperatives are there and which requirements derive from them for the domain of integration?
- **Styles of Integration to solve the problem.** What are the most appropriate ways in which integration problems need to be solved?
- **Ways of working.** How might the ways of working need to change to support the problem statement? There is also the interesting dichotomy over the fact that in the industry there are diverging ways of working around



integration and the tools are increasingly supporting business engagement.

- **Ways of organising.** How should integration disciplines be organised?
- **Controls and Governance.** How should integration be managed and governed?
- **Benefits.** What are the key benefits being targeted and how will they be achieved?
- **Transition.** How to move from the current approach to the target approach?

LIKELY OUTCOMES

If an organisation has not significantly changed their approach to integration during the last 5 years it is highly likely that - by evaluating the current approach or looking at the most appropriate future approach - there are many changes to be made. It is important to frame changes required in the context of a changing market and changing integration needs, rather than necessarily implying there is anything intrinsically failing.

Understanding how to build the business case and execute change in integration to modernise the capability are the next stages in the journey.

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