

Improve your odds with Infosys Predictability



Right Questions



Business Insights



Integrated Solutions



Value Multipliers

EAI for CIOs: A Pragmatic approach

– Sunil Senan

Reusability and decoupling enterprise architecture is the key

Leveraging the promised benefits of Enterprise Application Integration (EAI) technology has emerged as one of the key CIO concerns today.

The challenges are manifold—they range from the fundamental attributes of the technology (the age old debate of the “value proposition”) to management issues such as vendor/technology lock-in and realizing the TCO promise. CIOs have, over the years, sought to balance optimism and innovation around emerging technologies. However, in the case of EAI probably because of the unconventional nature of the technology, this hasn't been the case.



Why is EAI Challenging?

The fundamental question, which CIOs seek to address, is “Does my enterprise need EAI?” If one were to go with the value based need identification (What can EAI potentially do?), every company would have required an EAI solution. However, that is not how enterprises evaluate technologies. Their decisions are mostly made based on enterprise specific value based need identification (What can EAI do for me?).

EAI, somewhat ironically, is a technology phenomenon that has more to do with business transformation than mere technology implementation. Technically speaking, one could use EAI technology to enable integrations between applications/technologies. However, doing that without any further considerations would result in existing integrations on another technology called EAI. That’s not what EAI promised to bring as a value to IT. Truly, EAI is a bridge between business and IT to enable business integrations cutting across many applications and making it applications/technology agnostic. In an ideal world, we are talking about supporting business while moving IT from technology to technology and from evolution to revolution. The challenges of EAI implementation are essentially two fold:

- A. Re-aligning the enterprise architecture, which supports this objective. Generally, the cost of re-alignment and implementation of such architectures are nowhere close to what CIOs had in mind for implementation of EAI. Is it achievable at all?
- B. As EAI deals with the issue of synergy between business and IT implementation, the question of its sustainability in a changing business and technology environment?

It is clear that EAI is ideally positioned as a technology that can enable business transformation through IT, however, it is not a direct technology implementation. It takes a detailed and meticulous planning and a well thought out architecture; usually beyond the typical “integration” thought process. The action standards for EAI implementation ultimately narrows down to the probability of achieving the objectives it set out to achieve and its sustainability.

Delineating an Architecture Roadmap – reusability and decoupling is the key

Architecturally speaking, there are a few challenges that aren’t easy to deal with. Re-usability tops the list with the complications arising from the way applications portfolio has been built in the past and have grown over the years. There has been a minimal focus on creating the application functions in such a way that rest of the enterprise can use it. Traditionally, the functions in each application area have grown independent of the rest of the enterprise.

In order to implement EAI with re-usability, there are some pre-requisites to it. Mainly, the architectural strategy needs to be formalized. The most relevant one to the re-usable EAI could be “service oriented architecture” which, fundamentally, moves the entire integration workspace to the reusable paradigm. Depending on the kind of business processes an enterprise has, other architecture strategies may also be found relevant e.g. component based architecture, etc. Service oriented architecture, fundamentally, requires the enterprise functions to be identified (e.g. billing function, order entry function etc.) and create a list with mappings to the existing application where the function is implemented. On browsing through the list, one would come across a number of redundant functions, which exist in numerous applications across the enterprise. In order to create unique functions that have more relevance to the business than to an application, a process of rationalization has to be followed. The rationalization process delivers a function list marked as “required”(which means that it has to be kept as-is or with modification), “transit” (to be kept until alternates are identified) or “retire” (which can be taken off). Each unique function is a foundation to a service in SOA. Such uniqueness makes that service identifiable and distinguishable to make it an unambiguous service.

The second most challenging issue in front of the IT managers is the question of “de-coupling”. Why do companies go for EAI solution rather than Point-to-point solution? Most likely, one would find that many leaders and managers’ reasoning for opting for EAI solution is that such solution makes it more manageable. The unmanageability element assumes significance in point-to-point interfaces from the fact that it is usually very tightly coupled with applications, systems and environment that it is integrating with. As technology environment moves, such integrations act as an “inertia” resisting that move; making it highly unmanageable.

EAI, on the other hand, works with the fundamentals of decoupling many applications, systems and environment so that they can grow/change without a major impact on the existing connections. The architectural challenge lies in the objective. At most times, when CIOs decide on EAI as an initiative and select EAI technology, there is very little focus on discussions around on which elements of the architecture needs decoupling – platform, application technology, application functions, data, or processes etc.. There are some elements which are easy to de-couple between two systems e.g. platform and application technology. However, the benefits of EAI are limited in these areas. In other words, whenever there is a change in technology landscape of a company, the elements, which are still tightly coupled, will ask for an investment in change in order to adapt to the new environment. Does this negate to some extent the perceived benefits of implementing an EAI?

The answer is a qualified “Yes”. In order to de-couple every element of the architecture e.g. data, it might take a huge effort and the reality may seem distant. So the challenge is to figure out is the point where to draw the line. The answer clearly is, “somewhere between the two extremes—completely decoupled versus no decoupling at all”. Enterprises that have focused on data architectures and have been able to establish a solid architecture may be good candidates for venturing into data de-coupling and achieve benefits from EAI.

In essence, there are architectural strategy related pre-requisites to EAI before a meaningful EAI can be conceptualized and implemented in a reasonable cost with favorable time to market dynamics.

Is EAI the best-fit, “future proof” architecture paradigm?

For any enterprise to venture into a high cost solution, which requires a large number of other architectural elements to be put in place, the key question is – should the CIO go in for such substantial investments? Will the enterprise be able to sustain the architecture in a dynamic business and technology environment? What will happen to the enterprise architecture if there are business mergers & acquisitions and the whole idea of service-oriented architecture comes under scrutiny (because of inorganically added duplicity in functions)? . Does the enterprise need to rework on the services landscape or should the IT department continue maintaining it? Is this a sustainable model? This is an architectural challenge since it depends on what business events could occur in the next few years. One way of looking at this is – EAI is the best choice among technologies available e.g. point-to-point with improved reusability and data decoupling, implementation of custom built service oriented architectures etc., which makes it easy for moving from one technology landscape to another. These alternate technologies do not measure up to the critical factors like TCO, Manage ability and time-to-market. But the point here is, how much of service orientation should the enterprise build in while the business environment continues to be dynamic?

The EAI challenge, therefore, continues beyond strategizing EAI as the enterprise IT initiative to solve numerous business and technology problems & making EAI product/technology selection decisions. While the initial decisions are tough to make, the challenges that lie ahead in organizing & adopting the technology to realize the promised benefits requires balancing the costs vis a vis promised benefits which is not easy considering the fact that the investment has already been made prior to the balancing act. This brings up a very relevant and intriguing

question that lingers on, “by the time, the technology decision is made, is it already too late in understanding the realizable benefits” or “if the technology decision has already been made, what is the pragmatic strategy for the enterprise to organize and adopt the EAI technology.

Does it have to be right the first time? Or is it too late?

In the event of the enterprise being under prepared to successfully implement EAI (successful implies delivering the benefits and not mere successful technical implementation) it is difficult for the enterprise to continue with the current momentum of EAI implementation and still bridge the gaps. The key issue is to find ways and means to make it progressive. These questions become very relevant to figure out the optimal strategy which balances the pre-requisites while working on EAI implementation. Suspending the EAI implementation completely or slowing it down considerably for the required due diligence does not come across as a practical option since this may get some projects/initiative to proceed without EAI. The most pragmatic approach is to figure out the “must” objectives that the enterprise cannot afford to let go. . Any pragmatic strategy that is derived must meet these essential objectives for the enterprise (either in short term or in long term). The enterprise needs to realize that in the given state of business and technology environment (w.r.t. the EAI initiative), it may not be possible to take an ideal approach to meet its objectives. The balancing act may result in meeting some of them in one of the following ways:

- A. Strategic alternative – There may exist an alternative that delivers the same value even in the current state of EAI initiatives and surrounding environment.
- B. Tactical alternative – There may exist an alternative that delivers the same value for the objective in a short term.
- C. Scalable alternative (skeleton decisions)–There may exist an alternative that does not meet the objectives either in the near or long term. However, it enables the enterprise to scale up in the future when the required pre-requisites/related initiatives mature. This alternative becomes relevant when there is no strategic/tactical alternative existing which meets the objective directly.

By performing such thorough and comprehensive analysis, the enterprise will be able to create a time-based EAI strategy, which keeps the enterprises’ needs continuously in perspective and derives the best possible approach for meeting its long term and short term objectives. The utmost important aspect that such a strategy must cater to is the current projects. The enterprise could have some strategic initiatives on the ground, which may well create further imbalance if the EAI challenges directly impacting those initiatives are not addressed –creating a vicious circle (of higher non-preparedness and finding out a pragmatic strategy to move forward). Taking a progressive approach with enterprise wide considerations ensures that the bad decisions are not made which would either impact the long-term goal or impact the progress of current projects. For example, if the re-usability is an objective, creating a framework which allows the identification & creation of the re-usable elements should not be de-prioritized. Also, the creation of monitoring and operations framework may be very critical to the rollout of the current EAI projects and hence should be kept on the top of the priority list.

Is EAI a success story so far?

The industry may not have heard of many successful EAI implementations. This, in turn, makes it very difficult for enterprises to believe in the theoretical assessment of its’ strategy creating a whole set of pessimism in the initiative. The issue probably does not lie in the core content of the strategy and the technology; but in most cases, it is related to the enterprises’ strategy to own and adopt the technology within the enterprise.

The perception, that EAI is too idealistic a solution, makes senior management look outside for the success rate of this technology. While it is important to look for the success/failure trend, it is also important to know and understand the causes behind this trend and relate it to the specific patterns in one's own enterprise before making any decisive conclusions. By careful planning and creating pragmatic & relevant strategies, it is possible to take on the challenges associated with the implementation of EAI solutions. The enterprises that have succeeded in getting EAI to deliver the business & technology benefits have made enterprise level decisions and some tough decisions at the project level in favor of the "value towards objectives" against the tactical goal of a project/initiative.

How? – A big question but the answer lies somewhere in the Enterprise itself

There are many methodologies in practice in the industry related to EAI implementation. While some of these methodologies are very specific to some technologies, it is important that the methodology supports and complements the existing methodologies prevalent in the enterprises' IT. The best practice here is to study and analyze the existing processes and methodologies and make necessary modifications to accommodate the specific needs for an EAI development. However, since the EAI development has many dependencies on other groups and the ownership management of these may require modifications to the way existing developments are managed.

Another key aspect that EAI methodology must address is – Governance. How does the enterprise ensure that every project level decision made during the solution architecture and design process "makes" the integration architecture and does not "break" it? A well thought out governance model must ensure that appropriate review checkpoints are identified which allows the earliest detection of an architectural non-compliance. The earlier is the checkpoint, the lower is the amount of rework. This is key to the adoption and acceptance of the governance model. Few other parameters that affect the success of governance model are –

- A. Publishing and building awareness in the IT development and operations community about the best practices and key architectural standards. This balances the investment the enterprise would have to make in building and running the governance model over a period of time.
- B. Creating a organization wide Roles and responsibility chart – delineating the work responsibility in terms of the enterprise wide EAI versus Project level EAI.
- C. Creating a change management framework – to delimit the impact of new paradigm to the IT development and operations community and effectively channelize the new ideas for implement by creating positive ambience for the acceptance of the change.

Manageability – the Biggest Benefit Basin

Management, monitoring and tracking

EAI is not only a different animal to handle in the IT development organization, but it also impacts the way IT infrastructure and applications are managed. The key question that bothers today's enterprises is that – does the EAI technology provide a good management, monitoring and tracking functionality to allow in-time detection of the potential problem followed by a good assessment of where the problem occurred and the source of the problem. With the current trend moving towards real-time seamless business integrations, the problem of in-time tracking became obviously important. While EAI related management solutions are quite different in nature from the conventional operations management solutions – it demands a careful assessment of the current IT management structures, processes and tools. EAI related management solutions

should fit in logically with the current processes and tools so that the current IT management team can be logically extended to meet the EAI management needs.

Contingency Planning

Most of the successful senior IT managers always think of contingency plans – in case everything does not go according to plan. Specially, it is very important with high investment technology implementations that a contingency plan is laid out so that in case of non-realized results, a well thought-out alternate plan is executed to avoid damaging consequences of the tactical decisions that are made & which deviates from the main goals and objectives. For example, a tactical decision to allow point-to-point interface development in case when a particular project evaluated EAI not meeting its timelines or budget defeats the whole purpose of not just the EAI decision but also the need for the objectives laid out in the first place. The contingency plan should analyze the failed process and try to come out with plans to fix the problem area rather than encouraging the project communities to jump to alternatives, which are not very well thought out. Enterprises should endeavor to implement EAI through the use of some pilots so that the learnings can be built into the process and technology architecture. Pilots would also help the IT function in the enterprise to make their assessments of potential risks and potential mitigation plans. Such data would allow a meticulously structured way of approaching a solution in case of a contingency.

Productivity gains

For today's enterprises, an important factor of IT success is to be able to increase the productivity of its IT staff. The continuous improvements in the pain-point areas in the current integration work results in increased productivity. For example, repeating business logic in many interfaces may result in the increased effort spend in order to build the business logic or implement a change in business logic. Re-usability is another key factor affecting the productivity of the IT dept. With effective re-usability strategies, the enterprise can realize improved productivity of its IT staff. However, the benefit due to re-usability is preceded by the extra investment in giving a component an enterprise view & in creating re-usability frameworks.

Enterprises also have to look at other strategies that can directly enhance the productivity e.g. Knowledge management, competency center for building common components & re-usable frameworks to name a few. By putting a central infrastructure (of competency center), the enterprise can afford large initiatives involving EAI where project resources focus on building functional capabilities on EAI layer while the technical implementation of EAI layer is deployed and managed by the competency center. There are quite a few models for implementing competency centers varying in the responsibilities in the area of development and support. The competency center can also be responsible for the knowledge management across the enterprise enabling every developer access to the EAI artifacts that can enhance the productivity to build any component.

Such strategies have dual advantage – one is improved productivity, and secondly, it improves compliance across enterprise wide projects since the re-use propagates the compliance and awareness.

Structural fit

One of the questions that is mostly ignored by various enterprises is “How will an enterprises' IT own this since it may not have direct relevance to any one particular group in IT?” This is a critical aspect since any architectural strategy has to be implemented in a seamless manner without any intra-organizational boundaries.

The dependencies that EAI carries on enterprise elements is a very critical one that impacts the EAI architecture to a great extent. Data, processes, networks etc. area case in point where without a proper synergy between these responsible groups, the success potential of EAI can get significantly reduced.

In other words, EAI not only impacts the technology stack of the enterprise but it may also impact the way the IT developments are owned and executed within the enterprise IT function. Due to the infrastructural nature of the technology, it needs to be centrally owned and managed.

However, such decisions need to be taken after the various assessments are done both structural and procedural. Typically, EAI would impact the governance and funding models as well as the integration organizational structure among others.

Conclusion

The final question is – Is EAI going to survive the battle of various integration strategies? The enterprises today are looking at EAI as a complete integration portfolio where business process integration is the key driving all application specific integrations.

With Web Services, the debates in the technology circles is heating up about its impact on the enterprise application integration. Web services offer tremendous values in the integration portfolio; among other benefits is the standardization right from the integration protocol to the business process management protocols. EAI technologies offered varied protocols with no standardization so far and Web Services has brought in the long awaited synergy between vendors. With Web Services still struggling to build a competing application stack for EAI, EAI vendors have realized the power the Web Services and the industry's need for standardization incorporating strengths from both the technologies. Current maturity of Web Services point towards EAI complementarity than competition. Enterprises will be able to realize the benefits of promised values from the blend of both the technologies; well, till the next technology wave hits us!

About the Authors:

Sunil Senan heads the Strategic Planning and Solutions Group for the Enterprise Solutions domain in Infosys. Sunil specializes in the Enterprise Application Integration space and has worked as principal consultant with Global 1000 corporations in their Integration initiatives.

About Infosys Technologies Ltd. (NASDAQ: INFY)

Infosys (NASDAQ:INFY) defines, designs and delivers IT enabled business solutions. These provide you with strategic differentiation and operational superiority, thereby increasing your competitiveness. Each solution is delivered with the industry-benchmark Infosys Predictability that gives you peace of mind. With Infosys, you are assured of a transparent business partner, business-IT alignment with flexibility, world-class processes, speed of execution and the power to stretch your IT budget by leveraging the Global Delivery Model that Infosys pioneered.

© 2004 Infosys Technologies Limited.

ALL RIGHTS RESERVED

Copyright in the whole and part of this **EAI for CIOs: A Pragmatic approach** belongs to Infosys Technologies Limited. This work may not be used, sold, transferred, adapted, abridged, copied or reproduced in whole or in part in any manner or form or in any media without the prior written consent of Infosys Technologies Limited.