



W H I T E P A P E R

Incremental Integration In Action

PolarLake Use Cases From Around The World

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Introduction

The desire to integrate IT systems is nothing new. And although various technologies designed to resolve the issues associated with integration have come and gone over the past few years, what has not changed is the central understanding that the integration of IT infrastructure can deliver key benefits in terms of improved efficiency and consequent competitive advantage.

It is not necessary to rehearse all these arguments here, but it may be worth reminding ourselves of some of the key drivers that ensure that integration remains an issue of pressing importance for IT managers.

Specifically, a number of modern business requirements are, on closer examination, integration challenges. In other words, their resolution depends on previously isolated systems or information communicating in some manner. Challenges that are ultimately solved by the application of integration technology might include:

- Delivery of services online via eBusiness and web solutions
- 'Straight-through processing' in financial services
- Compliance with emerging standards, such as Basel II and Sarbannes/Oxley
- Outsourcing of business functions to third party organizations
- Efficient supply chain and customer relationship management
- Improved operational efficiency and the automation of manual business processes.

At the same time as addressing these challenges, organizations are faced with a rapidly changing business and technology environment. The ever-growing frequency of mergers and acquisitions, and the constantly shifting regulatory environment ensures that any integration effort must be flexible, expandable and ready to evolve with these changing requirements.

The Enterprise Application Integration Landscape

Over the years the software industry has developed a number of methods for dealing with the issues detailed above. But to a large extent, they have all shared common characteristics – large budgets, lengthy development timescales, and a desire to solve the problem by 're-engineering' the entire enterprise and delivering integration in a single 'big bang'. However, for many organizations this approach has significant limitations:

- Large budgets must be committed before any return on investment is demonstrated.
- Such projects tend to be 'fixed in time' and unable to meet changing needs and standards without further costly development.
- Failure rates are high (up to 70%) – due to the complexity of the challenge when attempting comprehensive re-engineering.
- Reliance on proprietary technology, which in turn may lead to higher consultancy costs due to the rarity of skills required.

Given these considerations, it is unsurprising that many organizations are no longer willing to support this approach to enterprise integration.

Incremental Integration

The alternative to the 'big bang' is the *incremental* approach to integration. In this model, the organization is free to focus on the specific **business problems** that must be solved. By focusing on "point-to-point" integration challenges, organizations can maximise the use of existing assets without affecting the pre-existing IT infrastructure, deliver targeted projects on-time and under budget, and experience genuine ROI in the short term.

The traditional objection to such an approach was the resultant "spaghetti" effect and the inability to expand on these point solutions and so develop a cohesive integration vision for the enterprise as a whole. Now, with the advent of XML and the service-oriented architecture, the IT industry is finally agreeing on the standards that can help overcome these objections and make incremental integration a viable proposition.

Of course XML in itself does not meet all of the sometimes complex challenges associated with integration in 'real world' environments, but it does provide the basis for integration. On top of this must be delivered additional technologies to orchestrate business processes, manage transformations within XML and validate and route XML-based content.

XML defines the way in which data is structured, and as a consequence can be used as a common means of exchanging that data between applications and databases. The service-oriented architecture enables chunks of enterprise functionality to be presented as 'services' to a central bus which routes, transforms and validates the XML inputs and outputs from these services. By developing in this way, once the "Service Bus" is in place following an initial point-to-point integration project, further projects merely involve 'socketing' new services onto this backbone or the re-use of existing services.

The result is the ability to undertake integration projects that can:

- Focus specifically on high-value business issues and deliver rapid ROI
- Offer a low-cost alternative to traditional EAI models
- Extend across the enterprise as more business operations are offered as services
- Re-use these assets by using a 'building block' approach to application development
- Integrate with third parties
- Help avoid reliance on high-cost skills associated with proprietary or custom-built solutions

After making a *strategic* decision to move to such a standards-based, incremental integration approach, organizations are then free to make *tactical* decisions concerning suitable candidates for initial projects.

The rest of this whitepaper looks at some of the common integration problems that may be solved using this approach. All the examples used are selected from live deployments within the PolarLake customer base. For more information on our customers, please contact us and we can provide further information or even arrange a reference call.

Types Of Integration Project

What are the typical business issues that may require some form of integration solution? Typically they all involve the requirement to connect previously isolated data and or functionality in order to deliver new applications based on these existing assets. It is here that XML, Web Services and the technologies that build on these standards can add real value to the business – and here that we are seeing implementation of these technologies.

Furthermore, we can broadly break these challenges down into three categories:

- 1) Integration within a single organization
- 2) Integration across separate organizations
- 3) Integration across the web to end-users (usually via a portal solution)

Integration within a single organization

Although “Web Services” was initially proposed as a B2B technology, it has become apparent that it is within the organization that benefits can be most rapidly realised. In any large organization or department, there are likely to be a number of heterogeneous systems. Where heterogeneous systems exist, integration can deliver new efficiencies and support new business processes.

Case 1: Flexible, Evolutionary Architectures

As an example, consider the situation in which a large Government function, such as the management of local or magistrate courts, has traditionally been de-centralised. In this instance, the IT systems used by local court authorities may vary across the country, making the sharing of information and direct linking with other agencies almost impossible. This makes the use of shared databases difficult, and as a consequence leads to complications when assessing performance and interacting with agencies outside of the magistrate courts.

In order to create a single unified system, it is necessary to build a central “case management” system that in turn can interface with local courts and third party agencies. In order to do this as effectively as possible, a standards-based XML solution can be implemented that uses PolarLake to receive, validate and transform all messages between these parties.

Due to the complex nature of such an integration challenge, flexibility is a key requirement. The specific requirements are likely to change during development, and after deployment further evolution is inevitable, particularly

as the solution integrates multiple agencies and must support workers in courts around the country. For this reason a solution such as PolarLake that supports incremental integration is preferred, given that this meets unknown future requirements in the most cost-effective and efficient manner. The alternative, a rigid 'hard-coded' integration solution, is likely to be costly to re-model and re-engineer.

Case 2: Straight Through Processing

Straight Through Processing, or STP, is widely regarded as a key instrument in improving accuracy and reducing operational costs within the financial services industry. In an STP environment, the business processes surrounding transactions are entirely automated from initiation to resolution, and as a consequence huge amounts of manual and redundant processes may be eliminated from the business.

Consider a financial services organization providing trading solutions to its clients – solutions that must handle the execution and clearing of trades conducted by the end user. Using PolarLake, this process can be entirely automated through the integration of the multiple systems within the business. Furthermore, PolarLake can assist in reducing the duplication of technologies in the organization, thus driving down operational costs.

In this specific case (seen below in figure 1) when settlement information from CREST (The Central Securities Depository for the UK Market) enters the system, PolarLake is able to transform this data into XML format, and subsequently validate and route this information, based on structure and content, to the full range of systems (including four different flavours of relational database) handling auditing, settlement and the maintenance of reference data. As a consequence, settlement is faster and more accurate, and operational costs are dramatically reduced within the organization.

By adopting a standards-based approach, the organization is less reliant on specialist skill-sets and can thus reduce the costs associated with development and deployment of multiple proprietary applications. In addition, the choice of PolarLake and XML will provide a platform for future integration with other settlement systems within this standards-based environment, building on and leveraging the existing skills in the organization.

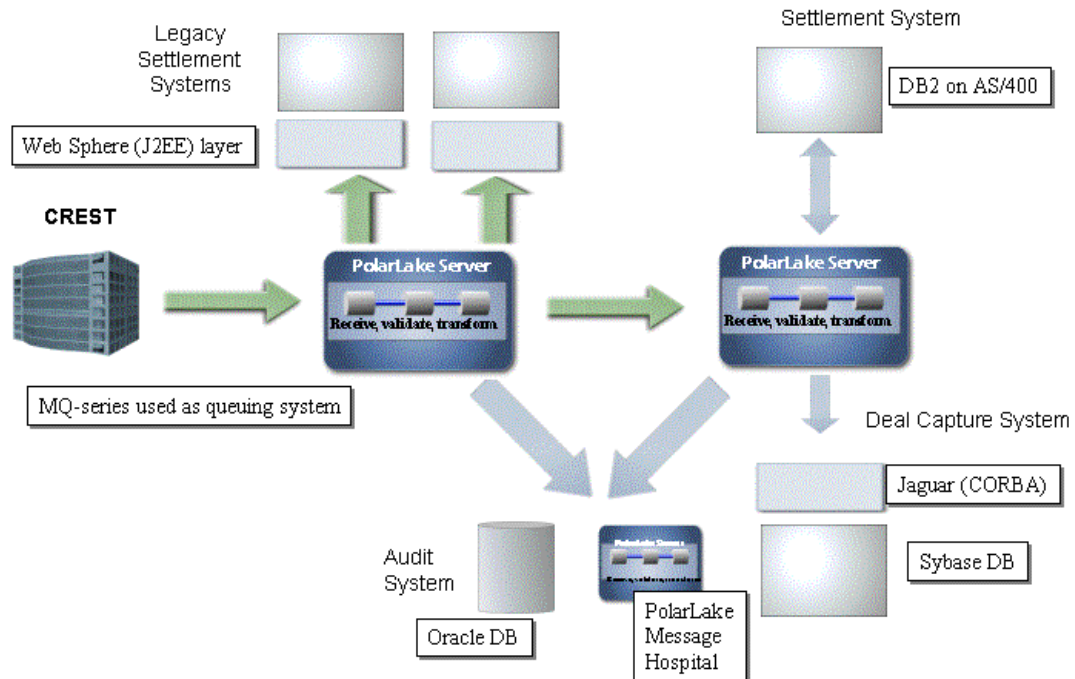


Figure 1 Straight Through Processing with PolarLake

Integration Between Organizations

As the business world becomes more complex, integration across organizations is becoming an everyday challenge. The trend towards outsourcing and the increasing prevalence of partnerships demand some form of integration, and the drive for competitive advantage results in a requirement for real-time, or near real-time, availability of information rather than a reliance on batch processing. This is particularly noticeable in the increased availability of real-time client or citizen access to services or information.

Previously, B2B integration has unsurprisingly proved more challenging than integration within a single organization. But with the advent of XML-based information exchange this is changing. Industry endorsed standards mean new possibilities are emerging that will deliver significant benefits to those organizations that act upon them.

Case 3: Integrating Multiple Organizations

Many large organizations may consist of multiple departments, each of which has implemented its own technology solutions over the course of time. As demands increase for automated business processes that cut across these departments, integration technologies are required in order to connect these departments, share information and provide de-coupled integration of the services provided within these departments. These requirements are becoming particularly common in Government, as the drive towards e-enablement of Government services demands the breaking down of information silos.

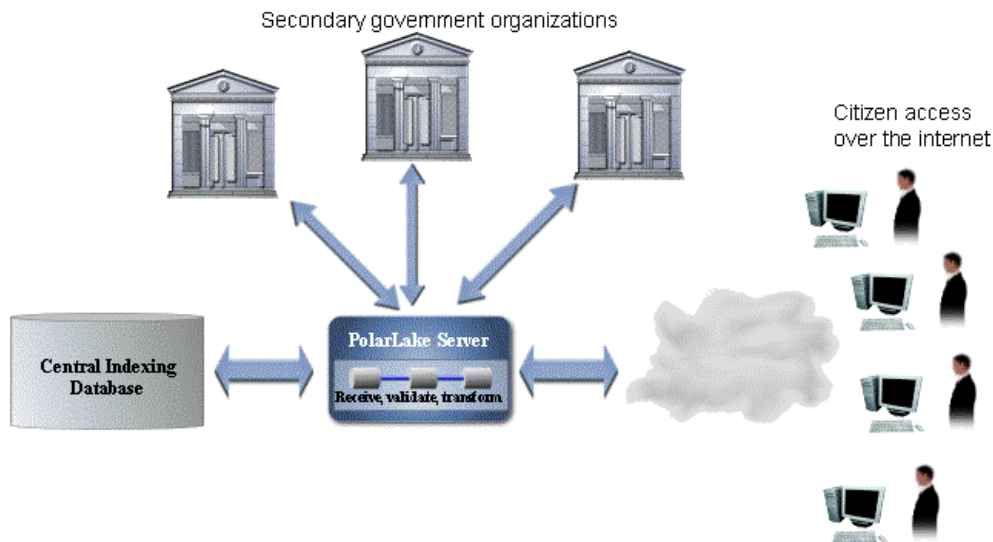


Figure 2 Integrating Multiple Government Organizations

As an example, consider the operations of a criminal justice department. As a whole, this function incorporates information and business logic from a variety of different departments – police forces, courts, the prison service, probation service and so on. For reasons relating to data protection, each department must retain control of its own data, whilst making it available for the community at large to support the improvement of business processes.

Unfortunately, when each department develops its own island of technology it can be hard to create systems that provide information across departments and to the general public. Among others, these may include:

- Timely information delivered to police departments and victims concerning the current status of suspects and convicted criminals.
- Management of court proceedings, and notification to all parties involved of forthcoming trial dates.

- Management of the transfer of offenders from the prison to probation service (for example), and notification of victims, local police forces of such events.

In order to create such solutions, a central hub is required that will manage the routing and transformation of information in XML form between the existing systems in operation within each department (see figure 2 above). This is the PolarLake solution, which

- Integrates with the full range of third party products in use across departments (application servers, web servers, relational databases, security and encryption software etc)
- Acts as a “message exchange”, handling XML-based information flows between these technologies and departments in order to support new solutions and efficiencies.
- Provides a portal solution supporting web-based solutions for members of the public (witnesses, victims etc)
- Supports changing business requirements by providing a flexible architecture that can be easily adapted and extended to evolve with the business

Of key importance is the flexible, light footprint nature of the solution. This enables rapid deployment and provides the ability to ‘plug-in’ further departments to the central exchange on an incremental basis. Furthermore, the light footprint nature of the product enables multiple deployments, both in the central exchange and within departments, which in turn enables information to be processed as efficiently as possible.

Once the messaging exchange is in place, any proposed integration solution simply involves the presentation of the relevant services as XML (a task supported by a number of PolarLake adaptors and integrators) and the creation of business logic / processes within the central ESB – for which no coding is required.

Case 4: Outsourcing

Consider the common situation in which a fund manager outsources its fund administration to a global custodian. Although outsourcing can offer significant benefits for an organization, care must be taken that it does not result in a loss of the accuracy or timeliness of information relating to the outsourced function. Standards-based integration solutions can ensure this does not happen.

In this case some form of integration is required to enable the third party to report back fund administration information such as fund values, transaction

histories and so on. For reasons related to the effective management of these funds, this information is desired in as near to real-time a manner as possible.

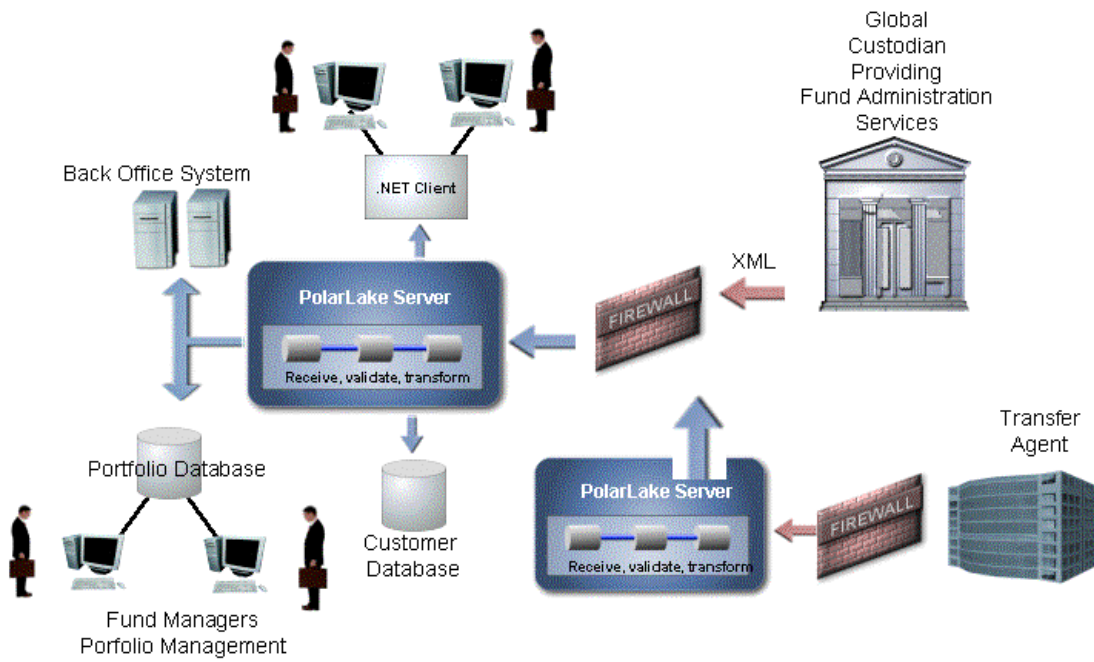


Figure 3 Outsourcing with PolarLake

The two organizations were able to agree to integrate based on PolarLake and WebSphereMQ, largely due to the standards-based nature of these products. In doing so they were able to leverage existing investment in a proven messaging system, on top of which PolarLake managed the validation, transformation and routing of the messages themselves (containing business critical data such as net asset values) based on structure and content. PolarLake integrates with a variety of transport protocols, and in addition does not require the installation of any additional transport layers. In doing so it leverages existing investment and ensures that application complexity is kept to a minimum, reducing support, maintenance and development costs.

The finished solution, illustrated in figure 3, delivers XML-structured data between the two organizations, via PolarLake and MQSeries, in near real-time. The result is greater visibility of key financial data, which in turn enables superior fund management and consequently improved client services. In addition, the creation of an infrastructure for further B2B integration projects on standards-based lines.

Case 5: Managing Data Feeds

As another example of PolarLake in action in the B2B integration space, consider the feed management challenge faced by a wireless services provider wishing to consolidate competitive advantage by upgrading text services to customers to include information on news, sport, severe weather warnings, financial information, entertainment services and other topics via their wireless phone.

An organization in this situation can leverage the huge variety of information available from third parties, supplied in a range of formats from binary data to XML and Web Services – as long as they are able to tackle the associated integration issues in a cost-effective manner. Managing these integration issues whilst reducing time-to-market is a key challenge for wireless service providers.

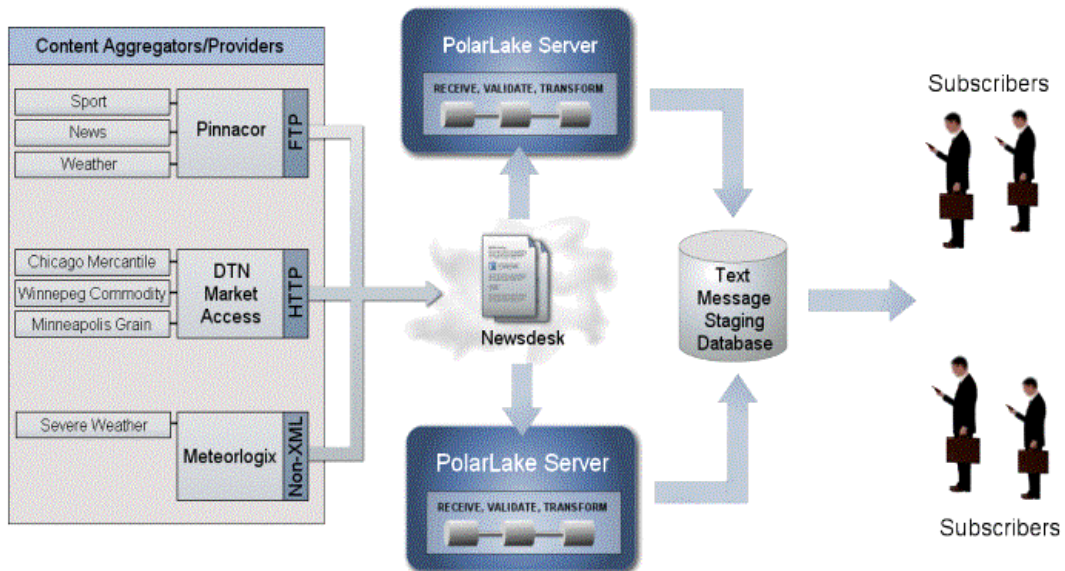


Figure 4 Feed Management with PolarLake

The format and delivery mechanisms for this information vary and can change over time and currently include XML (as specified by SPORTML, WEATHERML standards) and non-XML formats. The non-XML formatted data can be converted by PolarLake and thus be utilised within a standards-based XML solution. This ability is essential, given that many projects of this type will require the integration of legacy, non-XML data.

Once converted, XML-based information can be processed by a set of simple Java-based components that filter the incoming information based on data service definitions and subscriber requests, and then create the appropriate messages to be sent to subscribers. The components are then assembled into PolarLake *XML Circuits*[™], which take the XML information and route it to the processing components.

Such a system can also handle multiple payload and content types, as well as peaks and troughs of demand. PolarLake allows the application to be tuned to match this performance. It also allows performance to be tuned to meet new profiles, without code changes and without disrupting the running service.

Web-Based Integration

The improvement of customer service is a common goal for those organizations seeking competitive advantage. The web is a key technology in this area, enabling an ever-increasing range of services to be offered to customers online. Through the creation of portal sites, both business and government can provide customers with more accurate and timely information concerning a limitless range of services.

The development of these portal sites is, of course, an integration challenge, as data from across the organization must be available to the portal in order to be delivered across the web in the appropriate manner.

Case 6: Powering Portal Solutions

Consider a major insurance company that serves the consumer market – providing insurance products covering life assurance, personal accident cover, motor insurance etc. With a broad customer base, there are clear cost savings to be realised in moving common customer queries regarding policy changes and claims away from the phone and towards an online self-service model.

In order to achieve this in a cost effective manner, the integration project involved in providing flexible web-based access to pre-existing back-office systems must be as streamlined and flexible as possible. In addition, it must be built in a way that enables the gradual expansion of the online solution to include additional services over time, without requiring extensive re-development.

In this instance (see figure 5), PolarLake controls and manages the business process flows triggered by customer requests for data that are relayed by the portal server, and returns the relevant information from policy databases already in place in the organization.

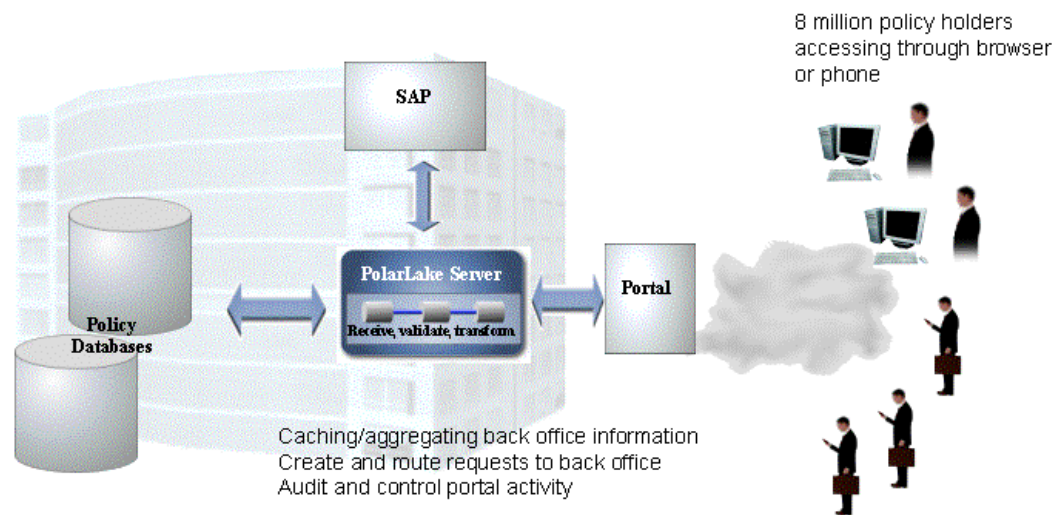


Figure 5 PolarLake Portal Solution

PolarLake uses XML-based messaging to create and route requests to the back office, and information is returned in XML format. As PolarLake is able to integrate these XML messages with any relational database, this solution can be easily extended across the enterprise in order to add new services to the customer portal. Furthermore, the use of standards-based technologies means the environment can be easily extended to include other third party technologies.

Case 7: Managing Web Services

As a further example, consider a major telecommunications organization wishing to provide new customer services to their customers, such as hotel booking and foreign exchange ordering. A similar service had initially been delivered using iMode (the Japanese equivalent of WAP), but this proved inefficient, due to the large amounts of data that had to be stored on the iMode servers. In addition such a solution lacked flexibility, due to the need to amend this data each time a service was altered or removed.

The alternative was an implementation based on a web services model, in which each service provider defines the services available, which in turn are stored in a UDDI registry which is accessed by a central PolarLake server (see figure 6).

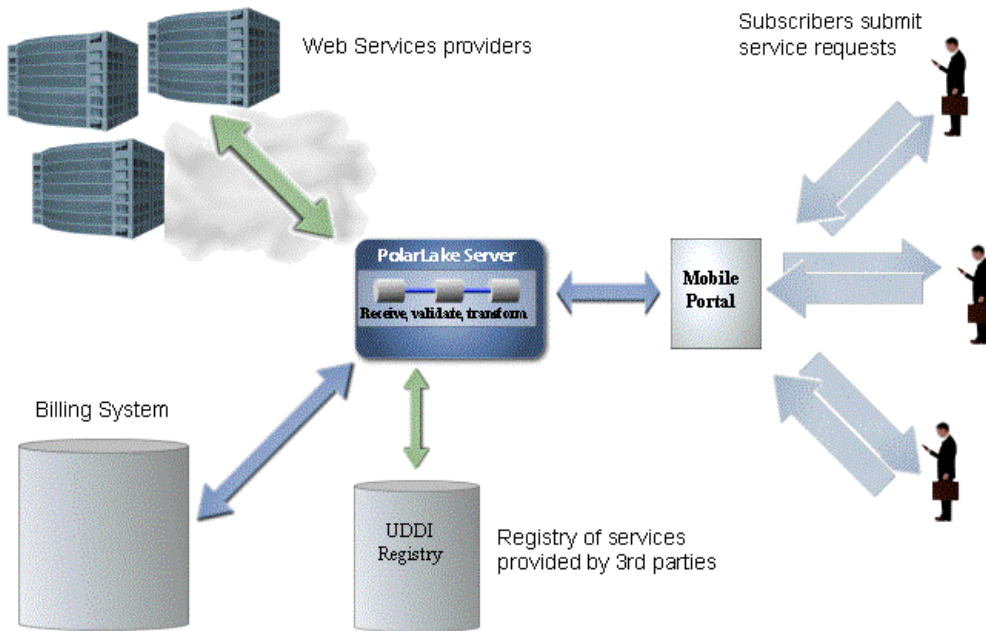


Figure 6 Web Services Management with PolarLake

Messages from consumers, either voice or data, are decoded and converted into XML, and are subsequently routed according to business rules defined in PolarLake. The PolarLake server in turn calls relevant third party web services and relays relevant information to the user.

This architecture allows the organization to 'plug in' new or alternative services with minimal effort or disruption to the infrastructure, which in turn leads to higher levels of flexibility and prevents the company being 'tied' to any particular service provider. In addition, such a dynamic model can improve customer service by ensuring best prices are offered, for example. Furthermore, as the data relating to the services themselves is hosted by the service providers, this reduces operational IT costs for the telecommunications provider.



PolarLake provides a complete suite of products for implementing integration solutions based on the Enterprise Service Bus. Our full-strength, productive solutions deliver code-free orchestration and mediation of software services, enabling integration solutions to be extended and re-used without extensive re-engineering. The result: real return on investment.

PolarLake has a proven track record in delivering the benefits of incremental integration with a technology that leverages existing IT investments in standards, skills and systems to reduce both initial investment and total cost of ownership. Deployed customers include leading corporations in financial services such as JP Morgan Chase, Pioneer Investments* (Ireland), Man Financial Ltd (UK), and Nissay Dowa (Japan), in Government, such as CJIT (Criminal Justice IT, UK), and in telecommunications such as Midwest Wireless (USA) and KDDI (Japan).

PolarLake's solutions are provided by partners such as Hitachi Systems and Services and Sun Microsystems. PolarLake is a private company, headquartered in Dublin, Ireland, with offices in London, New York and Tokyo.

Leveraging its unique Dynamic XML Runtime™ technology and XML Circuits™ application assembly framework, PolarLake's products allow customers to deliver integration solutions at a fraction of the normal time and cost.

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