WHITE PAPER

Building the Dynamic Datacenter: FlexFrame for SAP

Sponsored by: Fujitsu Technology Solutions

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IDC OPINION

CIOs' top concerns center on reducing overall operational costs, making their infrastructure more flexible and scalable, and, increasingly, on issues such as reducing electricity consumption. Although CIOs are increasingly building IT infrastructure with standard building blocks of volume servers — including rack-optimized servers and blade servers — it is the way those building blocks are linked together that determines the ultimate system characteristics. Performance, reliability, availability, and manageability are all affected by the way in which the pieces are assembled.

Using a modular concept, FlexFrame for SAP replaces the traditional environment with a large number of dedicated servers. Both the SAP software and operating system (Linux or Solaris) are located on a central storage system and can be started from any server in the FlexFrame pool. Every SAP service can thus run on any server. Services can be moved from one system to another within minutes; peak loads can also be addressed quickly by the addition of extra systems. The whole server pool is monitored and managed by a central FlexFrame control center. Should a server fail, the respective SAP software is automatically restarted on another server.

The first FlexFrame systems, announced in 2003, delivered SAP solutions, in out-of-the-box deployments. Based on customer demand, Fujitsu developed the solution further. The pre-integrated FlexFrame for SAP solution now includes Fujitsu ' standard portfolio of x86-based PRIMERGY as well as SPARC64- based PRIMEPOWER systems, delivering SAP for 50 to 1,000s of users.

IDC's survey of FlexFrame customers' shows:

☒ Better availability, continuity, and flexibility were often the driver for change.

☒ Customers found increased ease of use and ease of operations associated with FlexFrame adoption.

☒ Customers benefited from reduced operational costs associated with deployments.

IN THIS WHITE PAPER

This IDC White Paper presents the results of a recent demand-side, customer-based study, in which customers were questioned with respect to their use of the Fujitsu Technology Solutions FlexFrame solutions for SAP.

IDC looks at how customers are using infrastructure to gain competitive advantage. The paper draws on the experiences of Fujitsu Technology Solutions' FlexFrame customers.

METHODOLOGY

IDC interviewed a sample of IT directors, datacenter managers, and CIOs who had deployed FlexFrame in their datacenters. Through extensive telephone interviews we aimed to understand their infrastructure needs, how they are using servers and storage to meet those needs, and the challenges and opportunities created by their technology choices.

The 25 companies surveyed in-depth came from a variety of backgrounds, covering finance, manufacturing, telecommunications, BPO, public sector, and non-governmental organizations. Showing the applicability of the FlexFrame solution, site sizes included 20 to 12,000 employees, with the total number of employees in one country ranging from 45 to 120,000. Most customers are based in EMEA, although some FlexFrame installations have occurred outside of EMEA. IDC analyzed the results of respondents' replies to the survey questionnaire, and, based on this, has developed recommendations for customers who are planning to deploy similar IT solutions.

MAKING INFRASTRUCTURE DYNAMIC — THE CIO'S CHALLENGE

A Dynamic IT infrastructure, as defined by IDC, is one that maps business processes to IT infrastructure, so that each can address changes in the other. The driver for this approach to IT is straightforward: business processes are continually changing in modern enterprises and the "inherited infrastructure" that has resulted in so many islands of information throughout the enterprise is a barrier to improved productivity for the enterprise and for its end users.

The aim, then, is to break down these barriers, and to link the islands of information together, wherever possible, to forge end-to-end solutions that combine Web serving, application serving, and database-serving tiers of computing so that applications can span the enterprise. This is easier said than done. Servers run different types of operating systems, applications may be incompatible with one another, networks may need to be updated — and management software needs to link all these elements.

Fujitsu has a Dynamic Data Center (DDC) program, one which aims to combine flexible IT infrastructure with the pooling of server and storage resources. To do this, virtualization software is leveraged, as are bladed and rack server systems, in order to ensure that server resources are efficiently used, and that workloads are shifted to available resources, as needed. This flexibility in IT operations is the quality that supports agility in business operations. Today's business shows peaks and valleys in demand — sometimes driven by special events (e.g., the World Cup, the Olympics), marketing promotions (e.g., store sales or limited-time discounts), or end-of-quarter/end-of-year accounting deadlines.

# THE ROLE OF FLEXFRAME IN A DYNAMIC INFRASTRUCTURE

Fujitsu Siemens' Approach to Dynamic IT: The Dynamic Datacenter

Within the DDC, Fujitsu already has a long history of developing a view of the components and best practices to establish a datacenter approach to Dynamic IT.

Below is a short synopsis of the major components as described by Fujitsu .

FIGURE 1

The Dynamic Datacenter
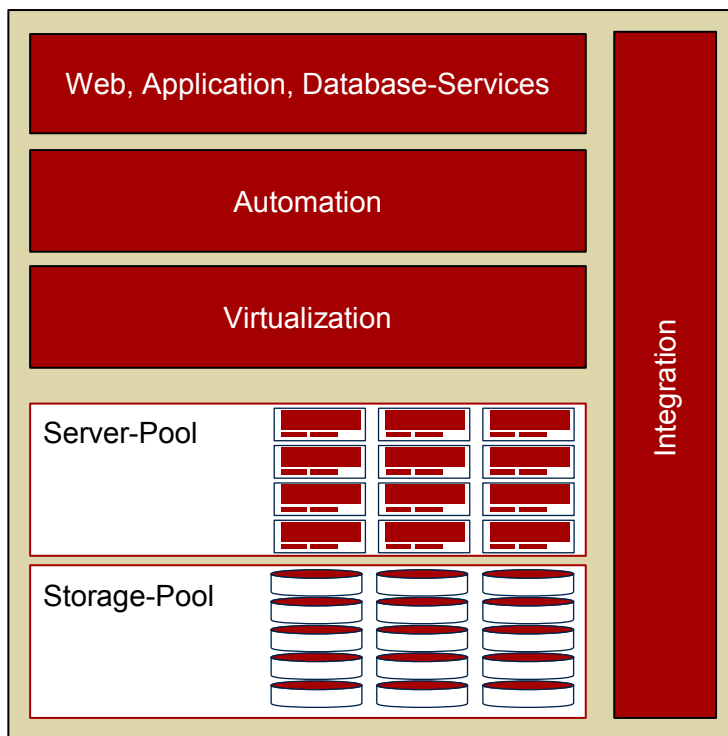
Source: Fujitsu Technology Solutions, 2006

Embedded within the DDC, the different areas listed above are also reflected in the FlexFrame approach, ensuring consistency of the main parameters that make the solution flexible. Additionally, it needs to be highlighted that FlexFrame takes the DDC approach one step further, providing a pretested and pre-integrated solution, hence decreasing deployment and implementation times and costs.

In more detail FlexFrame for SAP architecture consists of:

TABLE 1

FlexFrame Architecture

Control Node	2 PRIMERGY
Application server	PRIMERGY or PRIMEPOWER Server
Database server	PRIMERGY or PRIMEPOWER Server
Storage	Storage systems from EMC and Network Appliance
Operating systems	SLES, Solaris
Database	SAP MaxDB, Oracle Database
Application	All SAP solutions
High availability	FlexFrame Autonomous Agents
Scalability	From 50 to thousands of users

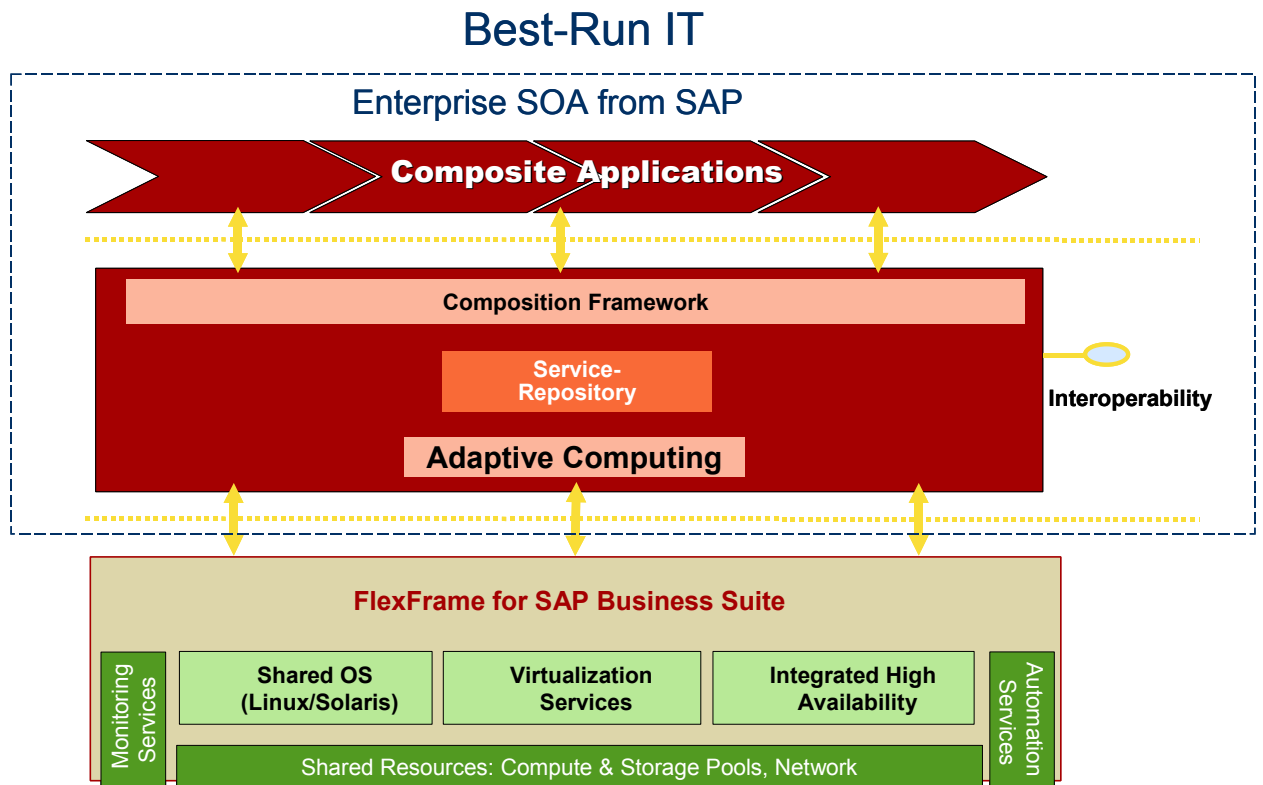Source: Fujitsu Technology Solutions, 2006

In order to be fully functional as a Dynamic IT solution, this architecture is further optimized by integrating:

☑ Virtualization for SAP applications through SAP's Adaptive Computing Controller (ACC)

☑ Automation with FlexFrame's Intelligent Management Software

☑ Integration of further components such as network attached storage and storage area network

☑ SAP Services on Demand

Together with these components, the FlexFrame architecture allows Fujitsu to deliver a pre-integrated Dynamic IT solution for SAP.

FIGURE 2

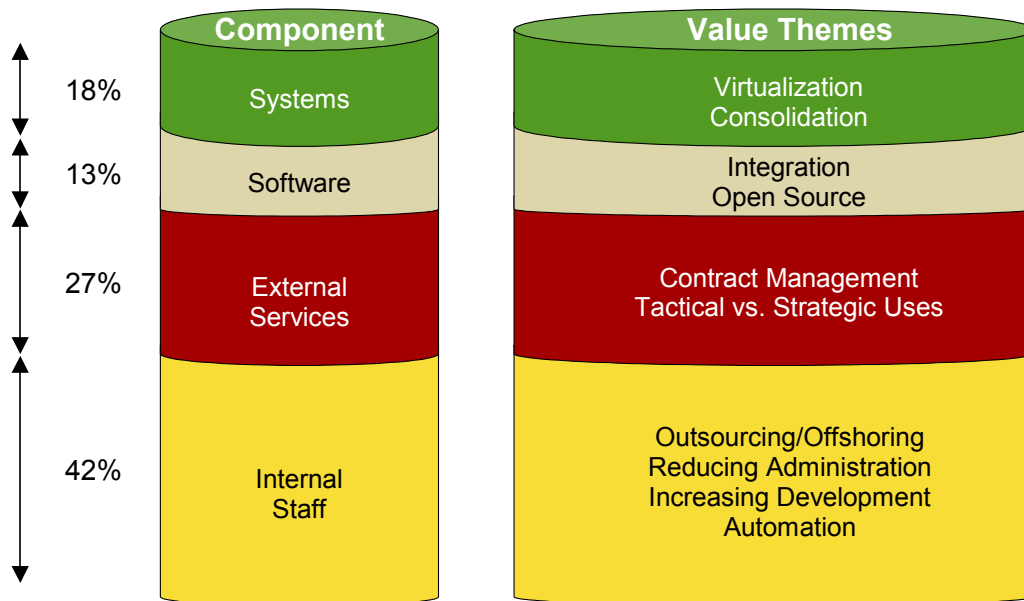Dynamic IT Solution for SAP

Best-Run IT

Source: Fujitsu Technology Solutions, 2006

Fujitsu ' FlexFrame systems deliver business solutions by supporting line-of-business applications, such as SAP applications, across multiple servers housed within a chassis. With this approach Fujitsu acts as the system integrator, and ensures that all of the building blocks are present in the system — and that all of them work well together.

Through this approach FSC aims to reduce IT personnel costs which, as Figure 3 shows, are usually the largest component of cost in the datacenter.

Components of Cost in the Datacenter and Points of Value

Component	Value Themes
18% Systems	Virtualization Consolidation
13% Software	Integration Open Source
27% External Services	Contract Management Tactical vs. Strategic Uses
42% Internal Staff	Outsourcing/Offshoring Reducing Administration Increasing Development Automation

Source: IDC, 2006

All of the system software, application software, and management software is already in place — and the system supports reallocation of compute resources, as needed, to support changes in workload requirements. It is this ability to dynamically change the IT infrastructure underlying the workloads that typifies the tenets of Dynamic IT. Fujitsu calls this type of computing the Dynamic Data Center.

Details About FlexFrame for SAP Solution

Fujitsu has taken a solutions approach to deployment of enterprise applications on server systems with FlexFrame for SAP, which was introduced in 2003.

The key to this approach is the reduction in operational expenses associated with configuring the servers within the chassis, capacity planning, and applying software upgrades to the application software. Fujitsu has worked with the enterprise software vendors to do this configuration — and has taken on the role of a single-point-of-contact for deployment and maintenance of the solution once it is installed at the customer site.

The business benefits of this approach are clear: The FlexFrame solutions support rapid deployment of new software in an organization, while minimizing operational costs and avoiding custom system-integration costs for the customer. They support customers' IT simplification projects, which aim to reduce complexity in IT infrastructure while improving manageability of infrastructure that has been deployed.

A significant element is the relationship and the interconnection between Fujitsu and SAP and their products. SAP has for some time focused on adaptive computing as a strategy to bring better control and more flexibility to customers. Within SAP NetWeaver, the company provides a management tool called SAP Adaptive Computing Controller (ACC). This is not only part of NetWeaver but also available free of charge to NetWeaver customers. Part of the ACC is a virtualization layer that acts as the interface to infrastructure solutions such as FlexFrame, delivering a fully integrated SAP NetWeaver applications architecture.

The SAP data services deployed on the FlexFrame solution can be restarted more quickly than if they had been deployed in a traditional fail-over clustered solution — the same approach to distributing software components that can be reprovisioned on the PRIMERGY x86 blades and racks or SPARC64-based PRIMEPOWER systems.

FlexFrame — Where is it Appropriate and What Should You Consider When Evaluating It?

This section provides more detailed information on the experiences of customers running FlexFrame. In particular we look at why customers consider FlexFrame, the main issues faced in installing and running FlexFrame, and the benefits and risks associated with FlexFrame.

Why Consider FlexFrame?

Our research with FlexFrame customers showed that they were largely positive about their experiences with FlexFrame. Particularly noteworthy is the fact that customers expressed a high level of satisfaction both with IT as well as business process improvements, as Figure 4 shows.

FIGURE 4

Customer Business Benefits of SAP

Q13. On a scale of 1 to 10 (where 10 is best), what was your overall satisfaction with the FlexFrame for SAP project?

Q14. On a scale of 1 to 10 (where 10 is best), what was your satisfaction with:
The IT benefits of FlexFrame for SAP project?
The business/process benefits of the FlexFrame for SAP project?
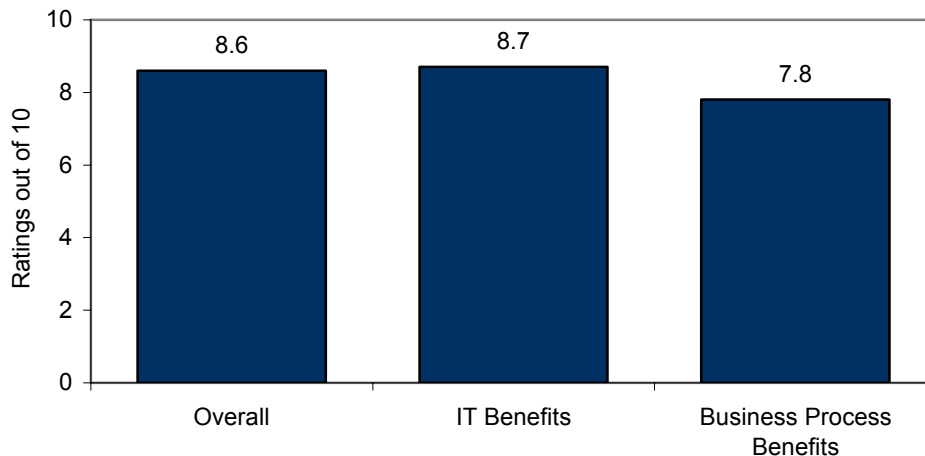
Source: IDC, 2006

As noted earlier customers are dealing with two central challenges in respect to their infrastructure. Firstly reducing operational cost and secondly providing a flexible, guaranteed level of service to their users. FlexFrame customers consider both these factors to be central to their evaluation of FlexFrame. As one IT services provider puts it:

> *"The main reason for adopting FlexFrame is to enable us to migrate systems at a much lower cost. We were looking for a system that was more ready to accommodate flexibility demands ... The underlying factor is cost of achieving scalability needed — FlexFrame addresses this well." (IT services provider)*

Although scalability and flexibility are important, cost was the main reason customers looked at FlexFrame. While this came out as being critical for almost all the customers we spoke to, it was particularly important for public sector customers, as one organization observed:

> *"[Why did we look at FlexFrame?] The reduced TCO that it promised — We have quite tight IT budgets here and we are keen to spend the money wisely and this seemed to be the best long-term option." (public sector services)*

FlexFrame Installation Benefits

Planning, skills, and the maturity of the technology were the three critical factors for customers in getting FlexFrame into their organization and getting the maximum benefit from it when it was installed.

If these factors can be controlled and dealt with successfully, FlexFrame customers emphasized a range of major benefits they had realized with their FlexFrame deployments. Below, IDC presents the major findings for benefits found both on the business and IT side. However, as these metrics are getting increasingly interrelated, and the FlexFrame solution best attests to this view by most companies, we have summarized the results in the "Delivering Benefits to the Company Across IT and Business Environments" section.
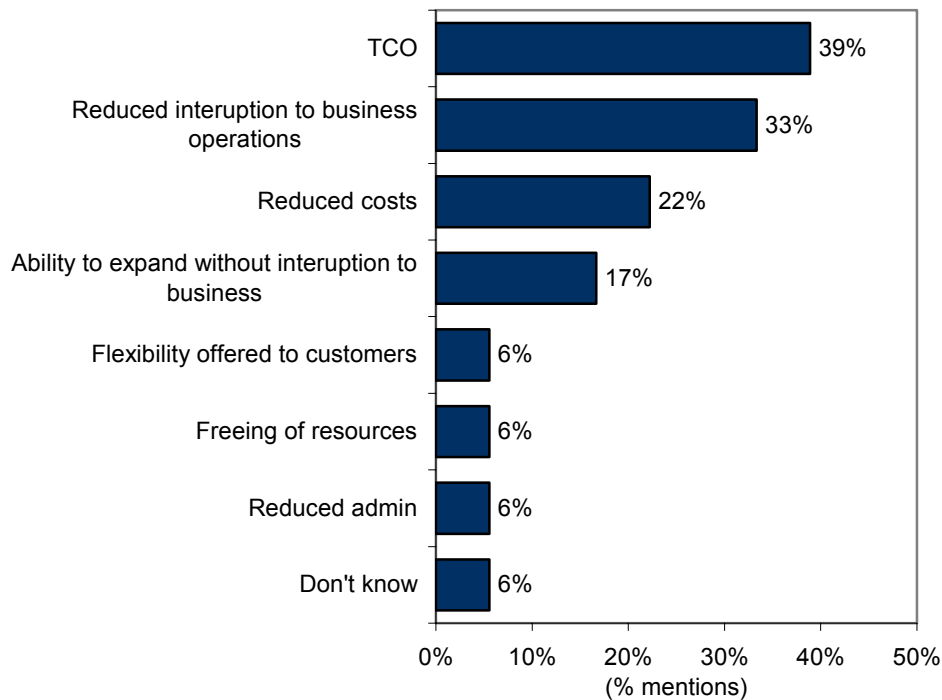
Customer Business Benefits

On the business side, a summary of the customer benefits evaluation is presented below. Though the majority of the benefits were clearly on the financial side, the risk of endangering continuity of the business ranked very highly. Interestingly, reduced interruption was mentioned both in the general context of the business but also in terms of extending the business operations both organically as well as through mergers and acquisitions.

FIGURE 5

Customer Business Benefits of SAP

Q8. What do you see as the business or process benefits of FlexFrame for SAP?

Source: IDC, 2006

Delivering Benefits to the Company Across IT and Business Environments

Firstly, reduced cost was a goal and it was realized in several ways. For most customers it was through reducing the time spent on systems administration. As noted earlier, people cost, external and internal, makes up the majority of enterprise IT cost. Customers found FlexFrame easier to manage with fewer administrators, who could then be deployed to other tasks:

> *"[What Benefit Did You See?] Reduced TCO — especially when considering the cost of maintenance. We need far fewer people to maintain its running, and as a result has reduced our costs substantially." (consumer goods manufacturer)*

Flexibility was the second most important benefit. Customers were able to use the virtualization and systems management technologies that are an inherent part of FlexFrame to provide a better service to their users. For one customer it was systems management that was especially important:

> *"The simplicity of migrating systems on to and off FlexFrame is one of the main benefits. It enables us to provide a more flexible service to the customer." "IT services provider)*

Linked to reduced cost and flexibility customers found the system easier to maintain and were able to provide a better service through reducing downtime. For customers whose users require high levels of availability, such as one telecommunications company, ease of maintenance, and improved service levels saved them a considerable amount of time and improved their service levels:

> *"The simplicity of routine system work is a real benefit — previously we would have needed to seek authorization to take systems down and carry out this work — now we can migrate the workload to redundant blades and continue with the work in the background." (telecommunications provider)*

The blade architecture was mentioned by a number of customers as being very important to how the benefits of flexibility, scalability, and reduced downtime could be realized. This applied both to customers that needed very high levels of availability, such as the telecoms provider quoted above, but also those that in the past might have wanted this level of service but did not have the resources to provide it; one public sector customer highlighted this improved service at lower cost as the main benefit:

> *"The ability to reduce the service and maintenance cost — both in terms of the hardware maintenance and the downtime to the business." (public sector services)*

Finally, some customers saw FlexFrame as being a way to consolidate systems and reduce not only administration cost but also save on floor space and electricity cost. A relatively new FlexFrame customer was in the middle of evaluating the financial benefits of its system but already saw savings from server consolidation:

"There was an almost instant realization of a number of business benefits (greater flexibility for customers, sharing resources), the financial benefits will take some time to materialize properly, but it is evident that it is lower cost than having a whole series of servers." (IT services provider)

What Should You Look for in Installing FlexFrame? Challenges and Considerations

Planning Considerations

Those with experience of FlexFrame suggest that three things are important:

☑ A thorough planning process, including financial and technical risk assessment.

☑ Having the skills or bringing them in to ensure that the project runs smoothly.

☑ Managing unfamiliarity with the technology.

Of these the first was of most importance. FlexFrame customers made the point in several ways. Firstly, that to be successful you need to develop a comprehensive risk and cost assessment. Customers recognized that the higher initial price tag for FlexFrame meant that risk and cost were interlinked in the success of their project. As one CIO put it:

"We consider the cost to be the most important in terms of risk — being unsure whether we would meet financial objectives … this is amplified given that the initial cost of implementing a FlexFrame solution is greater than a traditional architecture solution." (consumer goods manufacturer)

We consider the cost to be the most important in terms of risk.

The planning process, although similar to any other major enterprise computing deployment, needs to incorporate enough time for testing and ensuring that the solution meets requirements. Without providing enough time for testing it is difficult to adjust the architecture in light of any problems, however it should be noted that few customers found major problems at the test stage. Nevertheless the deployment plan needs to provide time to do this, as the CIO who was concerned about the link between cost and risk put it:

"Understanding the risks thoroughly is the most important thing. We were fortunate in that we could test before going live and we had a couple of days production time set aside for testing and everything went smoothly." (consumer goods manufacturer)

Understanding the risks thoroughly is the most important thing.

Another challenge exists in that this only makes sense financially if your application is being deployed for several years. As he puts it, the most important thing is:

"Size of workload and applications — to warrant paying the higher price these need to be significant and also the life cycle of an application needs to be suitably long enough to gain the ROI." (manufacturer)

Additionally, FlexFrame makes most sense for customers that need to scale their applications. For smaller SAP instances where scalability is not required FlexFrame might not be the optimal solution:

> *"The important thing is to look at how much the scalability benefits are going to apply — it can't be appropriate for every organization and the additional cost is considerable, especially if those benefits are never to be realized." (telecommunications provider)*

The Importance of Skills and Knowledge Transfer

After the planning stage having the right skills or bringing them in was the most critical factor in successfully deploying FlexFrame. This is of course closely linked to the fact that the technology is relatively new for many customers and hence they did not have skills immediately available in-house. Two FlexFrame users put this point in different ways. For the first it was the management system that they needed help in using:

> *"… FlexFrame was a new system that was operated and controlled in a completely new way … adopting new technology was the first consideration." (IT services provider)*

For the second, it was its unfamiliarity with the software architecture overall:

> *"The software being relatively new and unproven there was an added degree of risk. We wanted to know that it would work well and also offer some sort of reduced cost to us." (manufacturer)*

Additionally, many customers emphasized again that skills are critical and that you need to train staff to a high level if you are going to get benefit from FlexFrame. This dependency on particular skills and indeed on a particular infrastructure carries some risk, but this is a risk that can be overcome:

> *"We were quite dependent on the expertise of Fujitsu during the implementation of the systems. We have benefited from the knowledge transfer during this process and are now able to provide some support internally." (IT services provider)*

For these and other customers being able to see the system in action and speak to existing users was a crucial step in understanding if FlexFrame could be of use to them and in mitigating risk. If possible you should seek out FlexFrame customers and assess the similarity between your business and IT challenges and the benefits and risks experienced by other organizations.

> *"We went to see similar instances prior to this implementation to ensure that we had a good understanding of the system prior to taking on the technology ... It can be hard finding someone who is willing to do this but it is worth trying to find out as much as possible." (roofing product manufacturer)*

We went to see similar instances prior to this implementation to ensure that we had a good understanding of the system prior to taking on the technology.

Customers emphasized that to be successful you need to work closely with Fujitsu and ensure that a high level of technical knowledge is passed between FSC and your staff. You need to take advantage of the range of planning tools and workshops that are available; for one customer *"knowledge transition from Fujitsu to ourselves"* was the main risk mitigating factor in the deployment.

Finally it is important that there is a mix of in-house and third-party skills. As one customer described it, you can't rely on third parties because the demands of the business to fix problems quickly mean your own staff need to be able to do this work:

> *"Making sure that our own staff had the necessary skills to put right any problems after the implementation. Having a support agreement is all good but most of the time it is your own staff that have to put things right when they go wrong." (public sector services)*

Technology Development

We carried out this research with the first wave of FlexFrame users, those that had bought FlexFrame over the past two years. Because the technology was relatively unfamiliar to the CIO's IT staff it needed the longer planning cycle and the skills transfer and development that we have discussed above. As customers became more familiar with FlexFrame some of these concerns receded; for one organization evaluating its approach to FlexFrame it was still important to bring in skills to get the maximum benefit:

> *"I think that if we were to do this again I would make use of the greater number of experienced integrators; at the time we went ahead with this project we were not in a position to benefit from this [system] as it was still quite new technology." (manufacturer)*

Looking forward, like all systems vendors, Fujitsu faces the challenge of differentiating its server-based products in the marketplace. This is becoming even more important in a server world that builds its products on standard hardware components, standard I/O interconnects, and software standards and application programming interfaces (APIs). Fujitsu has tackled this challenge by focusing on the overall system solution, and its value to the customer. The value is seen in rapid time-to-deployment, ease of use in operations, and follow-on maintenance and upkeep of the system.

In the world of the Dynamic IT, the ability to rapidly adjust to changing business conditions, by reallocating appropriate computing resources, as needed, is key to successful business processes. The core value of the FlexFrame lies in its ability to effect that kind of rapid change within the IT infrastructure, while retaining high levels of availability for the applications and data it supports.

Moving forward, more vendors will undoubtedly come to market with other server solution sets. That is why Fujitsu will need to continually assess its position within the worldwide and EMEA marketplace, and stay on a path of continuing improvement and optimization of the original FlexFrame application-specific solutions.

CONCLUSION

FlexFrame customers have seen benefits in several areas; important among these are:

☑ Cost reduction — Customers were able to reduce their overall IT cost, particularly in people dedicated to systems administration. This enabled them to redeploy these administrators to more valuable tasks.

☑ Scalability and flexibility — The scalability of the system, compared with standard blades or rack servers, allowed customers to deal with rapidly growing demands on their infrastructure. This was achieved through the systems management and virtualization capability of FlexFrame.

☑ Reduced downtime and improved service levels — The architecture of the system and the ability to move workloads across blades reduced planned downtime and allowed improved service levels.

Customers emphasized two important considerations in getting value from it. Firstly, planning is critical. Effort put into both the financial plan for evaluating FlexFrame and in the deployment plan will repay itself many times over. Secondly, because the technology is relatively unfamiliar to many IT staff you need to work closely with FSC and bring in skills as required to make the project successful.

FlexFrame users suggested you need to ensure that your application requires the level of scalability and flexibility that FlexFrame delivers. While there is a wide range of customers running FlexFrame it is aimed at demanding SAP workloads.

The theme that emerged from all our discussions with customers is that gaining the benefit of FlexFrame and building a Dynamic IT infrastructure through using this architecture is a process that requires careful consideration of your current and future workload and requires you to work closely with Fujitsu and third parties. This is a long-term commitment and you need to ensure that it can bring you the benefits you need now and in the future. This is summed up by one company that has adopted FlexFrame to meet its future needs:

> *"… we believe that this (FlexFrame) has been a good investment to take us forward for the next five years or more. I would certainly recommend it to a growing business as it helps to take away some of the growing pains, like the premature ageing of IT investments due to rapid growth." (consumer goods manufacturer)*

Analyze the Future

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