telesperience

A fresh look at telecoms business support systems

transverse

Sponsor's message

We've all heard about the need to "run leaner" in telecoms. At the same time there's lots of new business opportunities that communications service providers are interested in exploiting. And then there's the age-old challenge of keeping the customer happy.

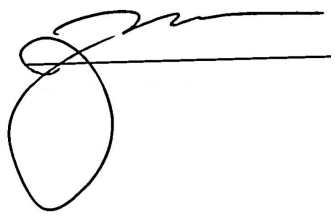
The problem is that all too often business support systems (BSS) are a hurdle to doing better business rather than an enabler. Telesperience caution that CSPs left stranded on older and high-cost legacy BSS platforms run the risk of being outcompeted by those with a more effective, lower cost and adaptive BSS. They say "even CSPs who renewed their BSS relatively recently are affected, because changes in technology, architectural approaches and sourcing options mean that optimal running costs of BSS have decreased. Such CSPs are therefore still paying more to run their BSS infrastructure than rivals implementing BSS solutions today."

At Transverse we see the need to run leaner, be more operationally efficient, deliver a great customer experience and open up new revenue streams as part of the same business challenge. We think it's perfectly possible to achieve all of these objectives if you take the right approach.

It's this belief that led Transverse to develop the business logic execution environment and platform, or blee(p), an integrated business support system that can bill for just about anything. But blee(p) isn't just a powerful and flexible billing solution – it provides a wide range of support for revenue management, service management and customer management.

Using the experience we've gained from years of working in telecoms software, we've built blee(p) using the very latest technologies and made it available as a Cloud-based service. By adopting blee(p) you can achieve that coveted win-win goal of lowering your total cost of ownership (TCO) while maximizing your return on investment (ROI).

As part of our commitment to helping you "run leaner" we asked UK-based analysts Telesperience to conduct some research into the current status of BSS, strategies being used to improve the performance of BSS, and to suggest some action points to help you reduce your costs. We hope you enjoy reading this paper as much as we did; we found it both insightful and enlightening.



Jim Messer

CEO, Transverse

transverse

1 Summary

"Restlessness is discontent and discontent is the first necessity of progress. Show me a thoroughly satisfied man and I will show you a failure." Thomas Edison

Legacy telecoms business support systems (BSS) infrastructures are far from optimal. In our recent research programme[1], not one single communications service provider (CSP) that we spoke to believed they had optimised their BSS. Yet this dissatisfaction with current BSS - both as businesses and as customers - should be seen as an opportunity.

Changes in the telecoms market are presenting enormous challenges to legacy BSS, and often it comes up short. But by being aware of the challenges we face, and the full gamut of options available to address these, we create opportunities for telecoms businesses to perform better and reap rewards in the form of higher profits, greater market share, happy customers and positive brand values.

CSPs recognise the shortfalls of their current BSS

Typically, ongoing maintenance and operation of legacy infrastructure consumes 70% or more of IT budgets – leaving relatively little money for innovation, investment and renewal. Lowering the cost of supporting legacy BSS is therefore vital to fund innovation in a market where it is unlikely that IT budgets will rise significantly overall. All the CSPs who took part in our recent research programme said that decreasing the cost of running their BSS was important; but 57% said that improving the performance of their BSS was more important than just slashing costs. CSPs cited numerous negative commercial, operational and customer outcomes resulting from sub-optimal BSS, including revenue leakage, slower service rollout and higher customer support costs (see *Figure 2*).

Modernising BSS delivers technical, operational and business benefits, as well as lower costs

The good news is that modern approaches to BSS design, new sourcing options, and new technology can deliver a wide range of technical, operational and business benefits to CSPs, while also lowering the cost of implementing and maintaining BSS. This report analyses popular strategies being used today and examines the benefits that can be delivered in two main areas:

- **sourcing strategy** – utilising strategies such as outsourcing & software-as-a-service, commercial open source software, and auditing current software licensing (see *Section 3.2*)
- **BSS performance** – through increased automation, utilising SOA & web services, consolidating software & hardware, and employing Cloud computing & virtualisation (see *Section 3.3*).

Combining these strategies and technical approaches delivers considerable business benefits to CSPs. Some of these benefits generate easy-to-understand ROI that can be quantified in the short term; others deliver tangible but harder to measure improvements in business performance over the long term. However, the benefits delivered by these strategies are essential for creating the commercially agile, customer-focused, operationally efficient and innovative telecoms businesses that will prosper in the new telecoms economy. To remain competitive and profitable, CSPs urgently need to address their current BSS weaknesses, and implement a modern BSS that is built for today's business environment not yesterday's.

[1] *Please see the accompanying data sheet for detailed analysis of the findings of the research programme*

2 Legacy BSS is struggling to adapt to new telecoms business paradigm

2.1 Three major change drivers are transforming the telecoms market

Historically, there was minimal competition in telecoms markets, and technical- and service-level change was slow. Today, however, the commercial environment is far more challenging, customer behaviour and expectations are continually changing, and CSPs are evolving to become retailers of telecoms products. These three high-level change drivers have profound and wide-reaching effects on the way CSPs do business, and therefore present new challenges for BSS (see *Figure 1*).

Figure 1 **Examples of change drivers and commercial imperatives facing CSPs**

Primary change drivers	Examples of secondary change drivers	Typical commercial imperatives
Increase commercial agility	Remain competitive	Differentiate offering, lower cost base, innovate faster, improve customer experience, make better (and rapid) business decisions, attract and retain customers, decrease time-to-market
	Comply with new regulation and legislation	Decrease cost of providing service, secure data, improve corporate governance
	Maximise profitability	Lower support costs, increase commercial agility and flexibility, support innovative billing models, support re-use
Maximise product opportunities	Launch and renew products rapidly	Create flow-through fully automated processes, lower BSS costs to make niche products profitable, support re-use
	Create complex and niche products	Implement effective support for partnerships, manage product complexity, promote re-use
	Target products more effectively	Mine customer data to understand customer need and design new products
Maintain excellent customer experience	Onboard customers efficiently and cost-effectively	Create effective, rapid and automated infrastructure to onboard new and returning customers, lower cost of acquiring and onboarding customers
	Maximise effectiveness of customer support	Offer multi-channel support, integrate data to ensure rapid resolution of customer issues, deliver fully convergent and accurate billing
	Personalise the experience	Use customer data to understand individual behaviour and personalise the customer experience

Source: Telesperience 2010

Over the last ten years, established CSPs have typically tried to "sweat" their existing BSS infrastructure, taking a siloed and product-based approach, and adding adjunct systems over time to provide supplementary capabilities. As a result, a large number of established CSPs now have a complex, siloed, inflexible and high-cost BSS infrastructure. At the same time, this infrastructure is often less effective than it could be – or needs to be - due to duplication, sub-optimal integration, lack of "flow-through" (that is, fully automated) processes, and fragmentation and misalignment of business processes and data. Older legacy systems and the overall infrastructure were not designed to support the new telecoms business paradigm, and although robust they are often inflexible, difficult to make changes to, and based on proprietary technology.

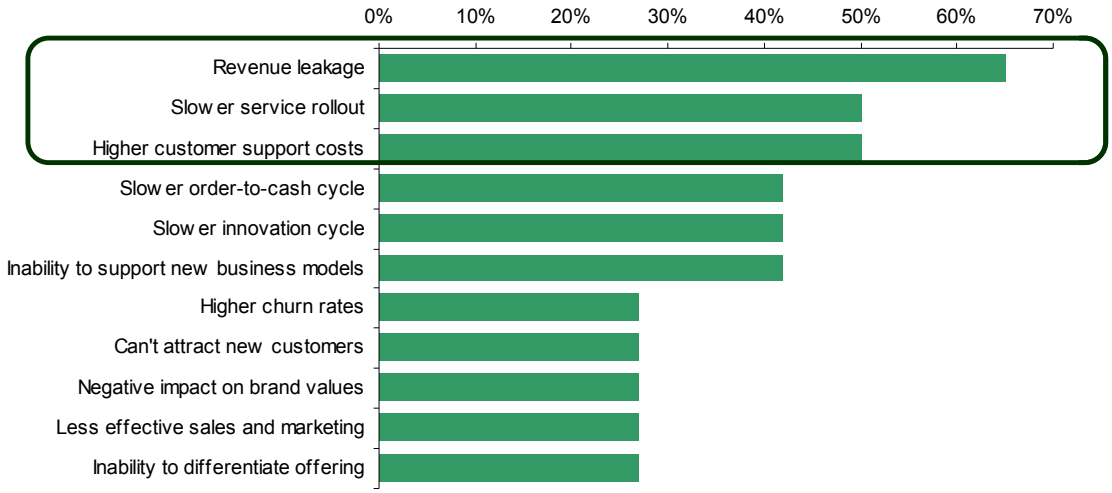
This situation has become increasingly unviable. Since the mid 2000s new entrant CSPs have been able to implement fully convergent, integrated, capable, low-cost, automated, standards-based and agile BSS from the outset, and some established CSPs have also consolidated, migrated and modernised their infrastructure. *Those CSPs left stranded on older and high-cost legacy BSS platforms therefore now have a high risk of being outcompeted by those with a more effective, lower cost and adaptive BSS.*

What's more, even CSPs who renewed their BSS relatively recently are affected, because changes in technology, architectural approaches and sourcing options mean that optimal running costs of BSS have decreased. They are therefore still paying more to run their BSS infrastructure than rivals implementing BSS solutions today.

2.2 Current BSS performance is sub-optimal

In our recent research programme on telecoms BSS no CSP we spoke to said they had fully optimised their BSS infrastructure. Instead, they told us that sub-optimal BSS was having a range of negative impacts on their business (see *Figure 2*), the most common of which were revenue leakage, slower service rollout and higher customer support costs. All three of the most common negative consequences affect CSP profitability, but those who suffer from all of them face the double whammy of having an elevated cost base while being unable to roll out new services (and thus benefit from new revenue streams) quickly. This makes it much harder for them to compete with rivals who have a better performing BSS.

Figure 2 **How are legacy BSS affecting CSPs' businesses?**



Source: Telesperience 2010

2.3 Impact of current BSS performance

The cost to the business of poorly performing or obsolete BSS is enormous, but is often not fully understood. This is because it comprises both direct and indirect costs, and there is often little enterprise-wide understanding of the true impact of underperformance. If all the costs of BSS underperformance were captured, it would be a "no-brainer" to prioritise action to address them. Instead, many CSPs continue to limp along, trying to run a modern business on an aging or sub-optimal software infrastructure that is costing too much to run. *Figure 3* captures some of the direct and indirect costs of the negative impacts resulting from the BSS failures cited by the respondents to our research programme.

Figure 3 **Direct and indirect costs of BSS underperformance**

Negative impact of BSS	Direct cost	Indirect cost
Revenue leakage	Loss of revenue through fraud, bad debt and poor billing practices	Lower profitability affects stock value, increases cost of borrowing; affects brand value; risks non-compliance with legislation on corporate governance (eg SOX)
Slower product rollout, order-to-cash cycle and product innovation cycle	Increased cost largely due to requirement for increased manual intervention	There is an opportunity cost associated with retarded service rollout (loss of potential revenue due to the delay). Slow innovation and product refresh will also affect competitiveness and brand values
Higher customer support costs	Inefficient BSS will mean that there are more complaints, queries and disputes and these will take longer to resolve, raising the cost of resolution. Legacy BSS may not support self-service and other low-cost channels driving customers to more expensive channels	Higher churn rates, unnecessary payments against breached SLAs and bill disputes, damage to brand image, lower profitability
Inability to support new business models	Loss of new revenue streams	Damage to brand values. Makes business less attractive to new customers and makes customer retention harder. Affects competitive positioning in market and makes it harder for CSP to differentiate their offering
Higher churn rates, inability to attract new customers	Loss of revenues, higher customer acquisition costs, higher customer retention costs	Loss of market share, damage to brand
Negative impact on brand values	Makes brand less attractive to investors and customers, affecting revenues and investment	Can make finance harder to raise. Can take significant sums of marketing spend to repair. Undermines trust which is essential for certain new services (eg mobile money)
Less effective sales and marketing, inability to differentiate offering	Lowers ROI on sales and marketing, raises cost of sale, retards revenues from new products	Loss of market share, damage to brand

Source: Telesperience 2010

3 Improving BSS performance to deliver lower costs and greater commercial agility

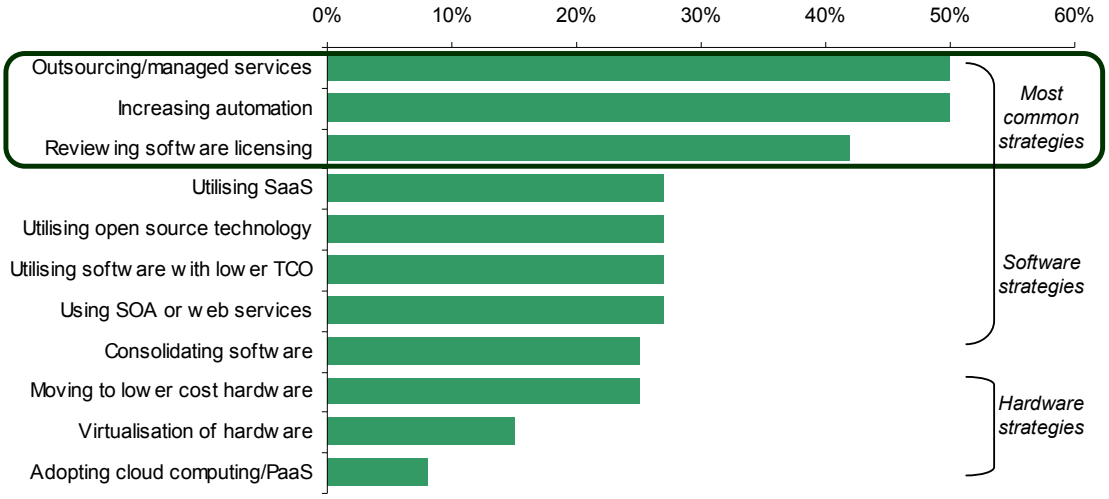
3.1 Common strategies being used to improve BSS performance

CSPs intend to use a range of strategies in the next 24 months to improve their BSS performance (see *Figure 4*); but three strategies were particularly popular. These were: outsourcing all or part of their BSS infrastructure, increasing automation and reviewing their software licensing.

CSPs are taking two main approaches to improving their BSS performance by focusing on their sourcing strategy and by directly addressing the performance of their software. In the following sections we will analyse:

- **alternative sourcing strategies** – such as outsourcing & software-as-a-service, commercial open source software, and auditing software licensing
- **strategies being employed to improve BSS performance** – such as increasing automation, utilising SOA and web services in the design of BSS, employing Cloud computing and virtualisation.

Figure 4 **Popular strategies being used by CSPs to modernise BSS**



Source: Telesperience 2010

3.2 Sourcing strategies: outsourcing, SaaS and open source technology

CSPs are now highly willing to question the traditional third-party licensed software model

Many CSPs are now looking at their sourcing strategies as a relatively easy way of lowering their BSS costs and improving their performance. During our recent research programmes it has become apparent that CSPs are highly willing to question the traditional third-party software licensing model and consider alternatives in order to lower costs and modernise their BSS. This takes several forms:

- **reviewing current software licensing** to consolidate licences or renegotiate terms – many CSPs have discovered they are paying too much and for too many licences. Thus quick savings can be gained by reviewing the licensing position and taking action (software asset management can help support such a move). Two-fifths of respondents to our research said they were currently undertaking such an exercise
- **outsourcing some or all of the BSS infrastructure** – this was the most popular choice to improve performance with regards to sourcing strategy. Half the CSPs in our study were outsourcing some or all of their BSS
- **moving to a software-as-a-service (SaaS) model** – this was also a popular option amongst the CSPs who took part in our study, with around one-third doing this. SaaS is a specialised form of outsourcing and should therefore be seen as part of the movement to outsource BSS
- **using open source technology** – this was a surprisingly popular option, with around one-third using some open source technology and one-fifth actively investigating using it. The vast majority of those who aren't using or actively investigating using open source technology told us they wouldn't rule out using it in future.

Reviewing software licensing

Established CSPs who have bought software on a departmental basis for many years often have a poor understanding of their software assets. This can be because of siloed buying and recording of software infrastructure, M&A activity, and loss of key IT staff who stored this information in spreadsheets, paper records or in their heads.

When CSPs undertake an audit – which can be supported by software asset management – they often discover that they are paying too much for software licences. This may be because:

- they are paying licences for "shelfware" – software that was never fully implemented or used
- they are paying for unnecessary duplicate licences due to non-centralised buying strategies, or because of software duplication (eg due to M&A activity)
- they are paying elevated fees due to IT buying extra licences or seats to gain volume discounts, or because they have downsized but are still paying for the original number of seats
- the BSS has been migrated to a new solution, but the legacy software hasn't been switched off
- they are paying penalties to the vendor unnecessarily
- they are paying for parts of a solution they're not using (that is, extra modules or functions)
- contracts were not efficiently negotiated, meaning costs could be reduced through renegotiation with the vendor (for example, because volume discounting has not been applied).

Depending on the IT budget, scale of operations, composition & history of the CSP, and how current software licensing is approached, considerable sums can be saved by performing software licensing audits. It is quite typical for 20-30% of IT spend to go on software licensing, and also for companies to find 20-30% savings on this spend. In theory this means that up to 10% of IT budget could be clawed back that is currently simply being wasted on unnecessary licensing spend.

Software licensing – like network equipment before it – has often been managed from a combination of spreadsheets, paper-based records and home-spun databases. Since software licensing optimisation has not traditionally been high on the list of priorities for CSPs, there is real potential to audit the entire IT stack and free up considerably sums for investment, innovation and BSS refreshes just by gaining greater visibility and understanding of the licensing position across the enterprise.

Figure 5 **Summary of business benefits obtained from reviewing software licensing**

Business benefits from reviewing licensing	ROI
Ensures you are minimising spend on licences	Can free up large sums relatively quickly to be redeployed on innovation and renewal
Supports compliance	Improves corporate governance and reduces risk – you are able to prove you are managing your software assets efficiently
Improves software investment decisions	Makes software assets more visible to finance, supports the business case for future investment
Reduces cost of managing licences	Centralised and automated software asset management reduces the cost to the business as well as improving efficiency

Source: Telesperience 2010

Outsourcing and SaaS can help lower costs and help CSPs budget for renewing BSS

CSPs are utilising outsourcing and SaaS strategies to deliver a number of benefits to their business. For example, it helps them lower their costs, because they benefit from economies of scale and can move to an OPEX (as opposed to CAPEX) model for BSS. CSPs pay monthly or quarterly for their

subscription, making it easier and more predictable to budget for. They avoid the need to purchase and house hardware upfront, while hardware costs (including upgrades) are factored into their monthly subscription. There is a major advantage here, because we know that implementation costs for BSS have traditionally often been double and may be up to five times the initial licence cost – making budgeting for software lifetime costs difficult.

A further cost advantage of SaaS can be that you may only pay for what you use (you need to check that the vendor is charging you on this basis though). When implementing third-party software it has traditionally been necessary for CSPs to estimate likely usage upfront and buy a system and hardware that can scale to their requirements. This is very costly for fast-growing and new CSPs, as they have to pay for more than they need when they begin operation. Outsourced and SaaS arrangements can fit IT supply more closely to business demand, because they use a tight fitting pay-as-you-go mechanisms, which mean you only pay for the software and hardware you actually use (also see *Section 3.3* about the advantages of the Cloud).

There are variations of this arrangement which mean it is vital to carefully investigate precisely what you will be charged for. Under some arrangements you will not be paying in stepped increments, but literally for just what's used at the time, which is particularly suitable for fast-growing CSPs, or to iron out peaks of usage, or to support trial or short-lived services.

Another advantage of outsourcing and SaaS models that is attractive to CSPs is that implementation times should be fast, giving access to modern technology rapidly and delivering immediate benefits. Outsourcing and Saas also enable CSPs to benefit from scarce expertise, so are particularly suitable for companies that have limited expertise in BSS or wish to free up their skilled staff from day-to-day operations in order to deploy them where they add more value. This is one of the hidden costs of maintaining complex BSS that is often overlooked: the necessity to tie up highly skilled staff in simply maintaining the current infrastructure.

Open source technology is an increasingly popular option for telecoms software

Based on the research we have conducted, it is clear that telecoms is one of the leading verticals in terms of adopting open source technology[2]. Firstly, it is important to be clear that commercial open source technology (COSS) describes a business model rather than a type of software. So it is possible for open source software to be offered on a SaaS model or as on-premises software. What's different is that with COSS you get access to the source code. It's also possible for you to avoid paying for the software, although in reality you are probably going to want to pay for services and premium functionality.

If you download and install COSS then you will still be responsible for hardware, maintenance, upgrades and all the other costs associated with on-premise third-party software (apart from the software licence). If you adopt COSS on a SaaS or Cloud model then you gain the advantages from these - just as you would if you adopted a traditional licensed solution on this basis.

So what are the advantages of taking a COSS approach? Firstly, it is usually very easy to customise or configure COSS software. You have access to the source code, so you will not be held hostage if the vendor is acquired, discontinues the software or goes bust. You also benefit from an active community, which means that innovation can be extremely rapid and security very high (since everyone in the community is looking for bugs and problems and then fixing them). A particular advantage of COSS is that you can download and 'play' with the application for free from day 1. Thus

[2] *In our recent research programme we discovered that 28% of CSPs have adopted COSS compared to 18% across enterprises of all types; 20% are actively investigating using it, compared to 9% across enterprises of all types. Mobile SPs are even more likely to be using and investigating than fixed, cable and satellite SPs. (see accompanying data sheet for more details)*

it can be particularly suitable for supporting service trials and it means you can accurately assess the solution before you progress your relationship with the COSS vendor (true "try-before-you-buy").

We have found that while CSPs are initially attracted to COSS because they believe it will lower their costs, the reason that most of them stay with it is because of the speed of innovation and the high levels of service. Particularly in the case of COSS deployed on an SaaS basis, CSPs are not "trapped". This means that if the vendor does not maintain a satisfactory service level then it is much easier for them to walk away, so successful open source vendors maintain a high level of customer service.

There has been some criticism that COSS requires a considerable amount of technical expertise. For early on-premise 1G and 2G open source technology this may have been true (thus the criticism may have been correct in the mid-2000s). However, 3G COSS are not technologies you utilise to build BSS; they are fully-formed solutions. The vendors behind them also have partnerships with other COSS vendors to ensure interworking of different types of software (eg BSS with OSS, BI and data integration). By taking the paid-for approach to COSS you can therefore benefit from all the expertise pouring into the solution, without having to have large amounts of expertise internally. How this works varies by COSS vendor, so it is something that needs to be scrutinised before you adopt, in order to understand exactly which services the COSS vendor will provide for you.

Figure 6 **Summary of business benefits obtained from SaaS, outsourcing and COSS**

Business benefits from using outsourcing, SaaS and COSS	ROI
SaaS and outsourcing: faster access to modern technology without the requirement for upfront capital costs	You can quickly gain the cost advantages of moving to modern technology, while also benefitting from improved functionality to help you compete, innovate and differentiate
Outsourcing, SaaS and COSS can give you access to expertise	If you lack expertise in BSS or are suffering from limited resources then outsourcing to a company that specialises in this area can give you access to the expertise you need. Likewise with COSS, you can either benefit from sharing expertise with other companies, or piggy-back off their innovation by using the paid-for option
Taking a COSS approach gives you access to source code	This means you can continue to use and develop the product in the event that the vendor gets bought, goes bust or stops supporting it
The COSS innovation cycle can be very rapid	COSS innovation cycles tend to be extremely rapid. Many CSPs tell us this is a key benefit for them. The software also tends to be highly secure as flaws are being scrutinised by large numbers of people

Source: Telesperience 2010

3.3 Improving BSS performance

Increasing automation levels

Legacy BSS infrastructures often only function because of continual manual intervention. Business managers may not be aware of how much manual effort is required simply to keep the BSS systems functioning. For example, there may be functional gaps or poor integration between multiple systems that necessitate manual effort. Or the process may not have been fully automated, or changes have to be made by hand across multiple systems at the cost of considerable effort.

Manual intervention is extremely costly for many service providers because it introduces the risk of human error, slows the process and makes it less efficient. In some countries there may be a scarcity of skilled resources and labour costs can be high. For customer-facing business processes the requirement for manual intervention impacts on both the business and the customer. For example,

the lack of a flow-through process from sales and order management through to provisioning and on to billing could mean a lengthy provisioning process, delays in the order-to-cash cycle and frustrated customers. When the bill is finally generated it may be incorrect, or failure to upload the necessary information to the billing system correctly may mean a bill is not generated at all.

Automation is increasingly essential to cope with the realities of the new telecoms economy. Today, customers churn more and refresh their products more often; CSPs refresh their offers more frequently. Delivering convergent billing, a 360 degree view of the customer, personalisation, realtime and contexualised offers, modern VAS and so on - as well as complying with new legislation such as EU laws to limit mobile bill shock and laws to improve corporate governance - all require the BSS infrastructure to be integrated and automated to reduce errors and speed business processes.

This tends to favour adoption of pre-integrated suites of applications, the use of technologies such as SOA to design BSS architectures, and implementation of a single data model. Some smaller CSPs in high-growth markets take the stance that it's cheaper to get people to perform some IT functions than to invest in their BSS infrastructure. However, Telesperience would argue that people should be placed where human judgement delivers added value, and not used to perform repetitive tasks which exposes CSPs to the risk of human error and lack of availability of skilled staff.

Utilising SOA and web services

One of the most popular technical approaches being implemented currently to improve BSS performance is service-oriented architectures (SOA). Simply put SOA is a way of building software by designing business-oriented "services" (such as "charging") compiled from basic level services (provided by billing systems). In a SOA-based architecture services can be used across multiple business domains and this can deliver significant business benefits to CSPs. Systems are loosely coupled and are commonly built using Web service standards to connect systems (such as SOAP). Taking a standards-based approach to integration lowers the cost.

BT's Matrix Project is delivering a range of business benefits

An early pioneer of using a SOA approach was the UK's BT. At the start of their "Matrix" project BT had over 4,000 BSSOSS systems (some of which were only re-discovered during the project), around 15,000 servers and 26 data centres. The project aimed to simplify BSS processes and reduce the number of systems by at least 80%. The Matrix project ties together 14 platforms with common capabilities that are reusable, and uses standards to streamline engineering and maintenance costs.

Business benefits have been on many levels. Over 10,000 redundant hardware devices were removed during the project along with their maintenance costs, and BT reported multi-million pound savings from electricity consumption alone. BT calculates that it will save recurring overheads of up to £60 million a year as a result of the Matrix project.

BT's George Glass has explained the main benefit, however, is increased agility: "The new architecture is enabling us to bring new products and services to market much faster and more cost effectively." BT says that a reduction in a BT Wholesale line rental charge, for example, used to require changes to 42 systems – followed by three months of testing. Now the change is made through a single interface that automates the change process. Average lead times have been slashed as a result.

SOA is a useful architectural approach in fast-changing business environments like telecoms, because it supports commercial flexibility, re-use of capabilities and reduces the cost of integration. Arguably the most significant business benefit of building a BSS infrastructure using a SOA approach is that it enables you to get products to market more rapidly by facilitating re-use. Increasingly, telecoms business users desire more immediate control and shorter change cycles in order to remain competitive. Gone are the days when telecoms businesses could afford to wait months or years for changes – and SOA can help significantly reduce the time taken to make changes in the BSS from years or months to weeks or days.

It is difficult to calculate the ROI on increased commercial agility, but the value delivered is often immediately obvious to business users. Other SOA benefits, however, are easier to calculate but reside squarely in IT. Re-use of capabilities, for example, means that CSPs are able to squeeze far more value out of their BSS investments. Standards-based[3] and loosely-coupled integration, significantly reduces the "integration tax" by replacing multiple function calls at a fine level of granularity with coarser, loosely coupled and more flexible services. This reduces the complexity of integration and hence the cost, while also reducing the pain of supporting ongoing and inevitable business-level change in the IT domain.

Using a SOA approach, new business processes and applications can be created by re-using existing services, which substantially reduces the work required. Now the business can focus on creating new services if needed and not on "reinventing the wheel" – shifting budget, skills and effort from maintenance to innovation. The gains from implementing SOA therefore tend to build over time, which although a great advantage also makes it harder to determine ROI and justify the investment at the outset. As stated, while some aspects of ROI are highly measurable (reduced staffing, lower hardware and energy costs and so on); others – often the most valuable benefits - are far harder to quantify in their entirety at the outset of the project. However, in retrospect it's possible to calculate the opportunity cost by quantifying the extra revenue gained from launching the product faster.

Figure 7 **Summary of business benefits obtained from using SOA and web services**

Business benefit from implementing SOA	ROI
Reduced cost of BSS	Reduction in direct costs can be easy to capture (eg reduced cost of maintaining simpler infrastructure, reduced cost of hardware and electricity, lower cost of integration) but other costs can be harder to capture (eg faster time to market and reuse of existing services). ROI tends to ramp over time but again this ongoing ROI can be hard to capture
Greater business agility	Re-use of services means that key IT staff can be freed up from day-to-day maintenance to deliver more innovation. Re-use also means time-to-market is reduced. It can be hard to quantify the value of greater business agility and how this contributes to measurable business improvement (such as lower churn, increased market share and greater profitability), but greater agility can be immediately obvious at a business level and is highly valued by business users
Lower risk; compliance with legislation/regulation	This can be hard to quantify other than to reduce risk to an arbitrarily acceptable level. However, this is often seen as a key benefit by the business. Fines for non-compliance and damage to the brand are also avoided
Increased flexibility	Since change is inevitable in the telecoms market, supporting business-level change easily and rapidly is a key determinant of success. At the technical level we can measure the reduction in lead time to make changes and the reduction in cost to the business of the changes. However, the most significant benefits to delivering flexibility will be closing the opportunity gap to deliver new revenues more quickly. Ultimately this can only be quantified as part of improved business performance
Delivering greater ROI from IT investment	IT budgets are unlikely to rise significantly in the near future, yet IT is being asked to do more with current budgets. Being able to deliver greater ROI from IT investment is a significant benefit. It means freed-up budget can be used to support innovation, or cashed in to increase profitability

Source: Telesperience 2010

[3] *For example, using Web services standards such as SOAP.*

The role of virtualisation and the Cloud

"Cloud computing" as a term has been stretched by marketers to fit many shapes. So what does it actually mean and how does a cloud approach differ from traditional outsourcing and SaaS?

To begin with it's important to understand that for CSPs there are two main Cloud opportunities. The first is the opportunity to develop a Cloud business themselves, supporting other enterprises. The second opportunity is to utilise a Cloud approach to drive efficiency through their own software infrastructure. It is this opportunity that we will analyse in this paper.

The difference between Cloud computing and SaaS can be hard to understand, because the term "Cloud computing" is often used inexactly. Cloud computing really describes the infrastructure layer providing the "Cloud platform" (which includes all the elements of a platform and underlying infrastructure), it does not strictly speaking describe the software that sits on it (the Cloud application, which can be SaaS or a product, and may be COSS or proprietary software)[4]. The two are connected in the sense that if we take "Cloud computing" to be analogous to the way "computing" is used generally, then SaaS is a subset of "Cloud computing" in the same way that IaaS and PaaS are.

When all of these strategies are used in combination, the benefits can be considerable. Therefore you can have BSS applications (which may be COSS) delivered on a SaaS basis and sitting on a Cloud-based infrastructure (PaaS and IaaS).

The advantages of using a Cloud approach at the platform and hardware layers is that you only pay for what you use. The cost flexes to fit your usage, shaping to the peaks and troughs of demand. It is therefore particularly suitable for peaky service demand, new or fast-growing CSPs.

A key concept here is virtualisation – which can be used for on-premises hardware to squeeze better utilisation and ROI out of it, but is also used in Cloud computing to multi-tenant and dynamically spread processing across servers as required. Virtualisation can massively reduce the cost of hardware, particularly in typical telecoms software environments where hardware has previously been deployed in a siloed fashion for each application, irrespective of utilisation.

Within a large enterprise it's now possible to use networked virtualisation – the "Private Cloud" – to make better use of computing resources across the enterprise. This is likely to be highly attractive to larger CSPs, particularly those with applications that have peaky demand or those that have a large geographical spread. This is an effective way of reducing the cost of on-premise applications and maximising ROI from computing resources.

[4] *There are actually three elements here. Infrastructure-as-a-service (IaaS) provides servers, firewalls, switches, routers, load balancers and even VPNs; platform-as-a-service (PaaS) provides the operating system, the application server stack, and the database software; software-as-a-service provides the application itself (in this case BSS).*

Figure 8 **Summary of business benefits obtained from virtualisation and the Cloud**

Business benefit from using virtualisation and Cloud technologies	ROI
Cloud: fast deployment	Infrastructure is available, so extra capacity is deployable as needed. This is highly applicable for peaky usage and for fast-growing CSPs or services
Cloud: lowers cost	Decreases upfront investment required and supports a pay-as-you-use model which matches supply to demand more precisely, reducing costs. Allows CSP to benefit from economies of scale, reduces hardware maintenance costs and makes cost more predictable
Virtualisation: lowers cost	Allows CSP to maximise usage of internal resources to lower costs and increase performance. IT analysts estimate that internal server utilisation is a mere 5-25% of potential capacity. So savings can be enormous. These derive from needing less servers, licences, space and electricity
Virtualisation: increases business agility	By moving away from a one-to-one paradigm for software and hardware, businesses that employ virtualisation techniques are able to flex IT resources to ongoing and changing business requirements. This greatly increases business agility and is particularly valuable in fast-changing business environments like telecoms

4 Action points

Review your current licensing position

Perform an audit of current software licensing – it's possible that you are paying far more than you should be. This will free up wasted IT budget for innovation and renewal.

Consider "fast tracks" to modernisation that don't require upfront investment

By using alternative sourcing models such as outsourcing and SaaS you can quickly gain access to modern technology without the need for upfront investment.

Don't be afraid of COSS

Commercial open source software (COSS) is just another business model. It does not tell you if the software is good, bad or indifferent. Using 3G COSS in the BSSOSS infrastructure is still relatively new, but there is a high level of interest in doing so. In certain software sectors (such as BI, CRM and data integration) COSS is a more established business model, and even where it isn't commonly used certain underlying open source technologies often are (eg open source databases). COSS should be evaluated in exactly the same manner as you would software offered on any other basis.

Understand the business impact of SOA not just the technical impact

Whatever ROI you think you might get from building your BSS using SOA is likely to be an underestimation. Many of the benefits delivered by SOA are hard to quantify; others keep paying back over a very long period. You have to view SOA as a long-term investment and understand that some of its most valuable benefits are in the business layer, not the technical layer.

That said, it's really important to implement SOA in an incremental fashion, but according to an overall plan – to be successful it requires not just technical renewal but also renewal of business goals and processes.

Reap the benefits of virtualisation and the Cloud today

In your rush to win a bit of the future Cloud business, don't be blinded to the benefits you can reap today from employing virtualisation and Cloud approaches inside your own business. Whether you choose to make better use of your internal resources, or to move away from owning your own servers, adopting Cloud and virtualisation strategies will have twin benefits. The first is operational and cost effectiveness; the second is the insight you will gain from doing so (which can be repackaged to other enterprises).

Read my lips: automation, automation, automation

The requirement for speed, volume and accuracy is going to increase. You cannot continue to stitch together your BSS with manual processes and remain competitive in the long term. Put you skilled staff where they deliver most value to your business and let software take the load.

5 Definitions and key concepts

5.1 Scope of this report

This report considers the impact of a number of modern technologies and technical strategies on the business support systems (BSS) of communications service providers. In this report we look at how legacy infrastructure is impeding CSPs' commercial agility and impacting their customer experience. We reveal the most popular strategies currently being employed to improve BSS performance, and we explain how these strategies can do so.

5.2 Defining business support systems

For the purposes of this report we define business support systems (BSS) as being:

"those software systems in a communications service provider's infrastructure that support interactions between the customer and the service provider, encompassing revenue management, service management and customer management, as well as marketing software".

BSS is a term that is used to differentiate between customer-facing systems and network-facing systems, which are generally known as 'operational support systems' (OSS). The OSS encompasses solutions that support, for example, network inventory, provisioning services, the configuration of network components and fault management. Sometimes the term 'OSS' is used to refer to both sets of systems; but in this report we use the term 'BSS' and concentrate on the customer-facing systems.

5.3 Defining the telesperience

Telesperience is a term that encompasses two enormously important and interconnected concepts that define the performance of modern CSPs – the customer experience that a CSP delivers and the way it conducts its business (its commercial agility).

"The telesperience describes and measures the commercial agility, operational efficiency and customer experience delivered by CSPs. CSPs that deliver a good telesperience are able to transform raw telecommunications capabilities into a successful telecommuncations business."

5.4 Acknowledgements

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5.5 About Telesperience

Telesperience is a UK-based telecoms analyst firm focused on how technology impacts both the commercial and customer experience. It is wholly-owned by Babworth Ltd, a provider of research, publications and writing services to the global Internet, Communications and IT markets.

The scope and focus of Telesperience is as follows:

- the commercial telesperience – to analyse how key IT technologies impact on telecoms service providers' businesses and commercial agility
- the customer telesperience - analysing how key IT technologies impact on the end customer experience.

Telesperience was founded in 2008 by an experienced team of telecoms IT analysts who wanted to provide a more convergent view of the telecoms market, focusing on business and customer issues. We consider where the problems lie with legacy technology, and how companies can transition to provide a more positive telesperience for their customers and a more profitable business for themselves.

Telesperience's open source research programme relies on the goodwill of companies who fund research in order to make it free at the point of delivery. We endeavour to ensure that our research remains objective and independent – the steps we take to do this are outlined on our website, but the most significant is using experienced and respected analysts who have a track record within our industry. Report sponsors are always acknowledged, so readers are aware who is funding the research programme. Find out more about Telesperience at www.telesperience.com and www.microsperience.com.

5.6 About Transverse

Transverse is an Austin Texas-based provider of business support systems. The company specializes in providing innovative solutions to complex business environments characterized by sophisticated ordering and fulfilment processes, subscription and usage based charging models, virtual/digital products, pre-paid billing authorization and micro-payments.

As a solutions company focused on tapping the value of SOA and web services architecture models, Transverse provides customers with greater business agility and business model innovation under a commercial open source model. The company's core offerings include strategic architecture, application portfolio selection and assembly, billing, order management and customer care applications. For more information visit: www.gotransverse.com.