

REVENUE MANAGEMENT:

Essential for monetizing
current and future services



In association with:



Author

Mark Newman
Chief Analyst, Research & Media
mnewman@tmforum.org

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thePAGEDESIGN

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4 Century Drive,
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NJ 07054
USA

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Introduction

Communications service providers' (CSPs) bottom lines are under increasing pressure as margins on core services like voice, messaging and data access get squeezed. They need new ways to grow profitability. In particular, they must better monetize exponential growth in the usage of data transport and associated services, and to do so, they must completely transform their businesses.

CSPs are undertaking huge technical, operational, business and cultural changes that are all competing for resources and priority. Despite a common goal, many of these transformation projects occur in silos. However, only when these changes are holistic will they deliver the benefits CSPs want. A significant cog in that integration is ensuring that service and performance developments are matched by the ability to charge correctly for them, and that the money flows effectively through the entire value chain. In short, monetizing traffic growth requires effective end-to-end revenue management.

Drivers for change

The entire CSP business is under pressure, and this is manifesting inside organizations as demands for change that can be categorized under three major themes:

1. The need for a step-change in efficiency – this means driving costs out of the business through automation and software-driven platforms that can support changes quickly and cheaply. The marginal cost of services must be reduced across all network, operational and support functions.

For example, creating and changing settings in charging and policy functions to support new tariffs or services cannot bring with them additional costs, nor cause significant delay in rollout. Working in internet-time is essential.

2. The adoption of a new customer experience paradigm – the direction of service flow has always been from the CSP to the customer, but increasingly control needs to be put in the hands of customers through self-service provisioning, activation, and tariff flexibility. This meets with the expectations of millennials and provides a

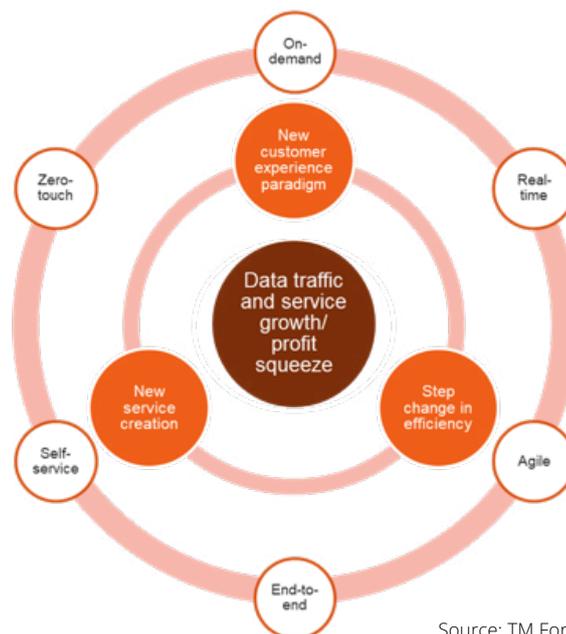
valuable tool for CSPs to differentiate beyond price, reduce churn and even gain market share from competitors.

3. The creation of new services – point-to-point voice, messaging and internet access will remain the core CSP services, but new services are essential for their future growth. However, many new services will not be delivered solely by the CSP, will operate on different business and pricing models, and will have definitive lifespans. This means CSPs need to create ecosystems and build new value chains.

In turn, these create requirements for new and advanced capabilities in CSP operations as illustrated below.

This context is important as it demonstrates that the way in which demands for growth in profit create very specific requirements of operational IT systems. However, to truly understand what this means, it is important to follow the money through the changes CSPs are making.

FIGURE 1: CSPS ARE REACTING TO STALLING REVENUE GROWTH IN THREE WAYS



Source: TM Forum

Transforming core services

Core services are impacted by all three of the transformational drivers identified above. CSPs want to increase the perceived value of their services to customers and their profitability. Millennials and their expectations of low-cost access are impacting heavily on the ability of CSPs to link volume growth to increases in revenue.

Unlimited data plans have become an increasingly common solution to millennial demands. Fifteen European and four US operators have launched unlimited data bundles. This has increased data usage. For example, when Three launched its unlimited data plan in the UK, usage doubled over 12 months, while on the fixed side of the business data usage is increasing at around 40 percent. However, this increase doesn't provide the necessary long-term boost to revenues. There is often a short-term one-off increase in average revenue per subscriber (ARPU), but this doesn't last as competition pushes bundle prices down.

The value of high-speed data access is being undermined, and there is a genuine concern among mobile CTOs that their upgraded network will be filled by low-value data. The negative impact of unlimited data plans is a concern shared by investors as illustrated by the belief of a major European investment bank that unlimited data plans would mean networks hit capacity within three to five years.

CSPs need to attack this issue from two sides. Firstly, improve customer experience and secondly add content to increase the perception of value. In turn, these steps impact the efficiency of service delivery both positively and negatively.

Efficiency: a KPI for success

CSPs are investing heavily in the transformation of their transmission networks. Next-generation access, the evolution and upgrading of core and backhaul networks, the virtualization of network functions,

and the introduction of software-defined networking (SDN) are all important steps in the transformation of network capabilities that positively impact transmission efficiency.

The cost per bit is falling and this will affect the economics of future services, particularly around the internet of things (IoT) as it opens the door to different business models, such as monthly subscription irrespective of usage as a replacement for volume-based models. Transmission transformation resets the cost base, but these benefits can quickly be undermined if the cost of changing a charging model or enforcing a policy for a specific group of things incurs disproportionate costs. Even though the cost per bit is falling, it is the cost associated with the end-to-end transaction that is the more important key performance indicator (KPI). This requires calculation not just across previously discreet functions but also across different CSP divisions: network and IT.

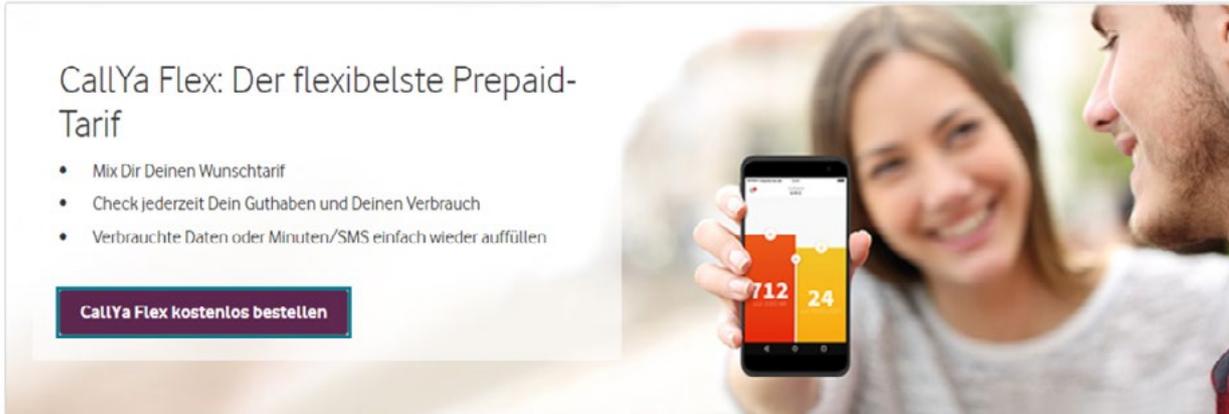
Similarly, when you follow the transaction back from the customer into the organization, end-to-end management and the ability to measure the impact of improvements is key.

Redefining the customer experience

The new customer experience paradigm centers around putting more control in the hands of customers. However, it needs to be more than simply a self-service portal to the same rigid tariff plans; customers need to be able to develop their own bundles.

An example of progress in this direction is Vodafone Germany introducing a new capability for its prepaid customers. This allows customers, via an app or online, to:

- Create their own prepaid bundle
- Change the mixture of services/prices that they have subscribed to
- Check their balance and consumption at any time



The app (illustrated above) and portal provide a view of consumption over the previous three months, and the customer can adjust how their credits are allocated across voice, SMS, and data on a monthly basis, as well as all the usual pre-paid functions such as checking and adding credit.

This is only the beginning. Other examples of functionality that could increase customer loyalty and reduce churn include the exchange of unused units of one service for units of another that is approaching its usage threshold – for example, unused minutes could be used to add more data to a package.

Bills must change

Furthermore, the bill, the primary interface between the customer and the CSP needs to change. The phone bill has changed little in recent years despite the changes in tariffs that now mean calls are often bundled into a single package and the consumer attaches greater value to data than to calls. As such, the bill is not an accurate reflection of consumers' relationship with their CSP or the value that the CSP is attempting to demonstrate.

Operators need to shift away from presenting the 'price' of what they provide to presenting the 'value' of what they offer. This would look more like a statement than a bill and should include:

- All the services and benefits (digital and physical) that the operator has provided
- All customer interactions and the resolutions provided or awaited
- Advice on how to lower monthly costs
- New offers from partners, loyalty schemes, etc

Such statements of value should also shift from a set periodic interaction to become dynamic with CSPs able to change the view based on where the customer is in the billing cycle. By doing this, CSPs can use the statement as a proactive way of interacting with their customers.

However, improving the customer experience is just part of the solution. CSPs must also look at ways of increasing revenue from data transport and its associated services.

New service creation and innovation

At Mobile World Congress 2017 Shanghai, Telstra CEO Andrew Penn said he believed that, "eventually the price for the provision of data would fall towards nothing, and operators must focus on providing other services on top of connectivity."

This is both a stark statement and a commonly held view. However, new revenue-generating services have consistently failed to materialize. The separation of

"Eventually the price for the provision of data would fall towards nothing, and operators must focus on providing other services on top of connectivity."

transport from service that is inherent with IP and the webscale businesses that have resulted from IP-based data mean that CSPs have no protected path to new service revenue; there is no next voice or messaging service, or 'killer app'.

Instead CSPs must find ways to build numerous value propositions they can combine to grow revenue. This has been a very painful lesson for CSPs, but they are learning. Part of this education is understanding when infrastructure dedicated to a single service no longer make sense.

Creating platforms for new services

New services require a more inclusive approach that links demands from many customers with products from many suppliers. The goal is to move closer to the platform business models that have made webscale companies, such as Amazon and Google so successful.

By becoming some form of middleman – an introducer, a matching service, a distributor, a marketplace – CSPs open the doors to revenue that is well beyond their direct reach. However, creating a platform business is a major departure from all that CSPs know. It requires the ability to analyze and manipulate huge amounts of data, and will take time.

Indeed, as one European solutions architect explains, "In general, legacy BSS [business support systems] lack the flexibility and capabilities required to integrate third-party digital providers in a CSP's business easily and with a valid time to market."

Therefore, small steps that try out concepts are a valuable method in developing new service revenues. For example, as a precursor to the platform business model, many CSPs are selling consumer IoT devices and charging for them through the customers' existing payment methods. Operators need the option of bundling such services with their core telecoms propositions. Moving on from these, building a platform requires the CSP to:

- Support multiple charging models – pay-per-view, pay-per day, pay-per genre, pay-per device, etc.
- Improve knowledge about the customer so the CSP and its partners can target services more effectively
- Provide third parties with the ability to charge customers through the traditional CSP payment methods – the monthly bill and pre-pay account
- Create the ability to distribute the revenues gathered through the CSP bill and pre-pay account to all players in the value chain

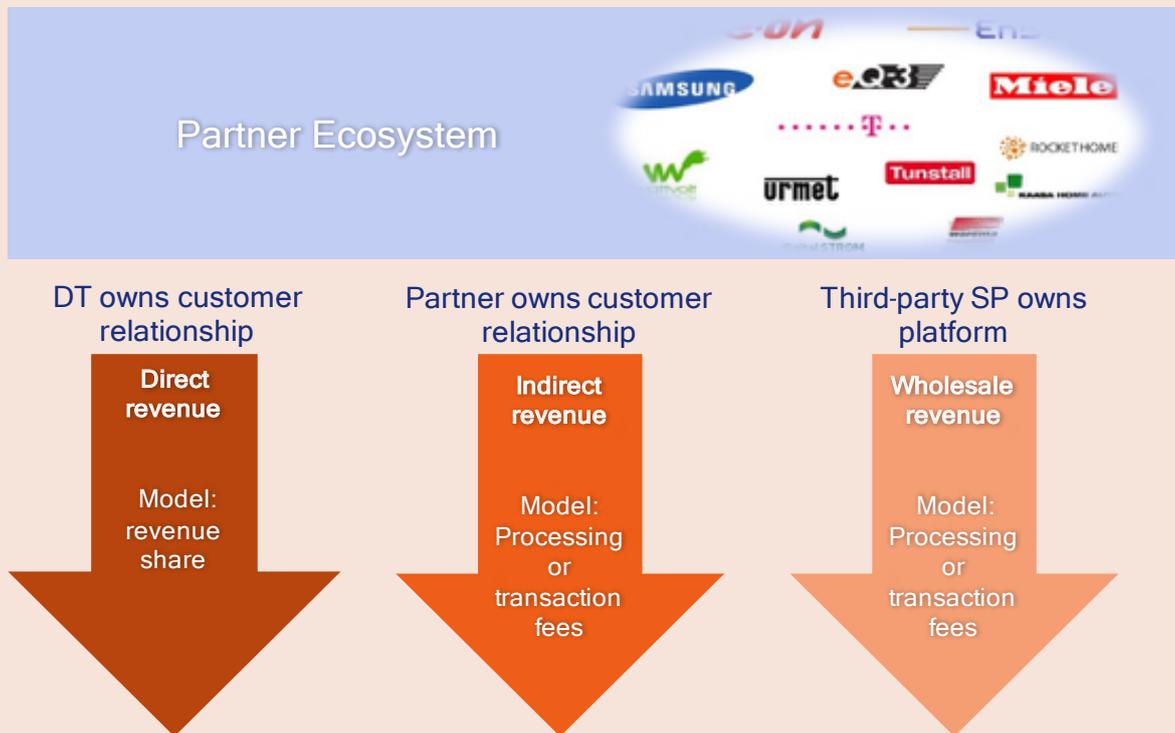
"In general, legacy BSS [business support systems] lack the flexibility and capabilities required to integrate third-party digital providers in a CSP's business easily and with a valid time to market."

DEUTSCHE TELEKOM QIVICOM – A CASE STUDY IN PLATFORM BUSINESS DEVELOPMENT

Deutsche Telekom has made substantial headway towards a true platform structure for the smart home market with its Qivicom smart home platform. Qivicom is based on an open principle that means third-party app developers can add their applications to the platform and leverage as much or as little of the platform functionality as they choose. They can charge the consumer directly if, for example, they are a utility with that capability. Or they can charge through the Deutsche Telekom bill should they not have such capabilities – if they are an equipment vendor, for example.

Deutsche Telekom can also partner more closely with app developers if it wants to sell the service to its customers directly. Interestingly, the company is now white-labeling the platform to other CSPs and other service providers in the smart home sector, creating a third possible revenue stream from the same partnerships. Creating more than one revenue stream from the same partnerships is important if CSPs are to grow revenue.

FIGURE 2: DEUTSCHE TELEKOM'S APPROACH TO PLATFORMS



Source: Deutsche Telekom and TM Forum

More revenue streams = more complexity

Supporting multiple revenue streams isn't without challenges. Most importantly, revenue needs to be distributed through the value chain according to the commercial agreements between partners, and these very well could and should be different from partner to partner. While settlement is not a new concept to CSPs, it is generally the carrier and roaming divisions that hold the expertise. Even more than their technical experience, they also understand how to work with partners that can also be competitors, customers and suppliers. It's a cultural maturity that is essential to make new business partnerships work.

However, CSPs and their partners must recognize that interconnection and roaming agreements and other wholesale contracts often take months to finalize and then stay in place for years. Revenue is then distributed or settled between the partners periodically, usually monthly. This process has been extended to digital content partnerships but it couldn't be further from the real-time requirements of an online content owner.

As a result, the time between batch processing is decreasing but, as Sabitha Vikram, T-Mobile Principal Architect says, moving away from batch processing and toward event processing is the aim. "We feel that by moving toward that we can have a kind of on-demand ability: We collect information as an event is generated and then it gets completed right away," she explains.

In the carrier or wholesale environment the ability to buy services on demand is something TM Forum and MEF are working together to address. A TM Forum Catalyst project called *Partnering platform for MEF services*, has defined a set of standards for specific wholesale use cases. This represents an important

step towards on-demand operations, but it is very much about CSP-to-CSP partnering where the language, business practices and architectures are relatively similar. With non-CSP partners this tends not to be the case.

Therefore, another important source of experience and best practice is machine-to-machine (M2M) and IoT divisions. They have expertise in capabilities such as split billing and multiple charging capabilities, and it is no surprise that partner innovation is being driven from M2M, IoT and other newer divisions that aren't burdened with legacy BSS. However, even in these divisions, while real-time billing may be supported, real-time ordering and provisioning may not be.

Revenue assurance fears

Platform businesses need to support new functionality and real-time operations at all points, and this is a new requirement. It is also one that causes concern amongst revenue assurance professionals. Whether its distributing revenue to third parties or integration with third-party systems, the revenue risks are greater than from a CSP's own services.

As Christian Lagresle, Group Revenue Assurance Director, Orange says, "It is not always simple to check and reconcile revenue flows and shared service streams. This scheme is risky from a fraud and revenue assurance perspective, and it requires robust controls along the revenue chain."

These concerns cannot be ignored. They reinforce the fact that developing a platform business is complicated and that creating the right infrastructure requires integration across all BSS and operational support system (OSS) processes. That it will take

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time and some trial and error to develop the correct systems and partnerships only reinforces the fact that new services can only be part of the CSP growth story. Core data access, which represents over 50 percent of revenue in many markets, also needs to be monetized more effectively now and for the foreseeable future.

Data monetization – great hope or white elephant?

Data monetization is a much-used phrase but one that lacks clear understanding. It helps to assess the alternative business models for data consumption that aim to counter price erosion or have potential to increase CSP revenue from charging for data in a way other than by the megabyte.

The expectation is that exponential growth in traffic will lead to increased revenue. Analysts’ forecasts suggest this assumption is true. Ovum predicts that CSPs’ revenue will grow, albeit slowly as Figure 3 illustrates.

Add into these calculations inflation and currency variations and the picture will look even closer to flat. Indeed, according to TM Forum’s *Digital Transformation Tracker*, fewer than 50 percent of CSPs expect revenue growth in the next two to three years (see figure 4 opposite).

A primary reason for this conservative outlook is that customers’ expectations and CSPs’ strategies designed to associate value with the service not the transport are working together to break the connection between volume and revenue.

Consumers have little concept of the value of data access. Instead the value perception comes with the applications, services and information that they access. However, consumers often don’t pay for these services. Social media applications, online video, voice, and messaging are usually free to use. Web searching and browsing are always free. The only cost to the consumer comes with the content – digital or physical – that they purchase. Therefore, to create value CSPs have either to demonstrate it by reducing the cost of access or tie themselves to the content that holds value in the eyes of consumers.

FIGURE 3: CSPS’ REVENUE WILL GROW, BUT SLOWLY

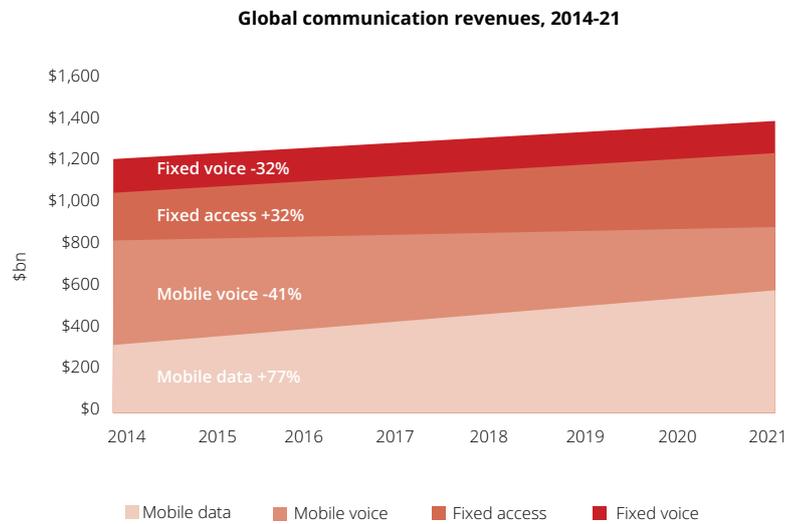


FIGURE 4: CSPS ARE UNSURE ABOUT REVENUE GROWTH

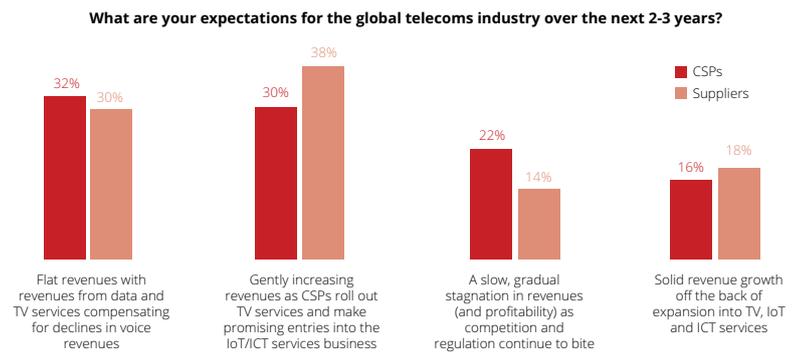


TABLE 1: FOUR MODELS OF DATA MONETIZATION

Model	CSP business model	Status	Example	Analysis
Inclusive/discounted premium content - Premium content such as TV, video, music is included or discounted in the customer package	<ul style="list-style-type: none"> CSP subsidizes the cost of content to increase CSP data ARPU through increased data usage Reduce churn and attract new customers 	<ul style="list-style-type: none"> The most commonly used model and is deployed by many CSPs; generally successful in driving upsell to higher value tariffs and increasing data usage Is being deployed across pre-pay and post-pay 	<ul style="list-style-type: none"> Bharti Airtel 	<ul style="list-style-type: none"> ARPU uplift often a one-time and short-lived effect; CSPs are having to add more and more subsidized content to stand still True success not measured as cost of content often not offset against revenue uplift Churn and customer acquisition not measured specifically against the model Growth of the model requires a greater variety of content beyond media and requires better partnership and support for different pricing models
Zero-rated content - Popular applications are zero-rated (e.g. Twitter usage does not count against a user's data allocation)	<ul style="list-style-type: none"> Reduce churn, increase market share Increase ARPU by encouraging users to stay on the network and not use Wi-Fi. 	<ul style="list-style-type: none"> Widely deployed as it doesn't require support from the app provider Is being deployed across pre-pay and post-pay 	<ul style="list-style-type: none"> Virgin UK and Twitter on 4G 	<ul style="list-style-type: none"> Churn and customer acquisition not measured specifically against the model Merging with sponsored data model as creates the market – e.g. number of eyeballs to advertise to
Sponsored data – third parties, such as content owners, advertisers pay for the user's data	<ul style="list-style-type: none"> Third parties are charged by the CSP Consumers are not charged for access or traffic either for specific content or for all access 	<ul style="list-style-type: none"> Sporadic deployment with some high profile failures e.g. Blyk MVNO Evolving to combine with and build on the zero-rated proposition and gaining traction in this form 	<ul style="list-style-type: none"> AT&T 	<ul style="list-style-type: none"> Merger with zero-rated content model leverages the take-up of zero-rating and provides a credible revenue stream; a real example of a web/OTT model working for CSPs Issues around net neutrality impact are being ironed out Partner examples include sponsors that ask for surveys to be completed; this provides digital economy value to the sponsor without advanced analytics from the CSP These services are still in their infancy and have a long way to go to compete with the proposition of other online businesses; much greater investment in and development of data analytics are required to offer potential sponsors the targeting they are looking for
Charging for quality differentiation	<ul style="list-style-type: none"> Charing model can go either way, charging content owners for guaranteed higher quality delivery of their content to consumers or charging consumers for a better quality service 	<ul style="list-style-type: none"> Consumer-orientated not supported technically as cannot guarantee end-to-end performance Issues with net neutrality Only real consumer service quality differentiation example are negative i.e based around throttling CSP to webco interconnection can include quality SLAs but these are often not monetized directly e.g. through peering; attempts are being made to improve value of these interconnects 	<ul style="list-style-type: none"> Level 3 and Google bit mile model to improve quality and ensure a fairer exchange of traffic by adding a distance metrics to capacity to define cost 	<ul style="list-style-type: none"> CSPs cannot yet guarantee the quality differentiation necessary to sell it to consumers and there is no evidence of a demand for a paid for product; this may change with loE, network slicing etc. Negative differentiation is unsustainable Content owner/webco differentiation doesn't necessarily include additional revenue for CSPs

Source: TM Forum

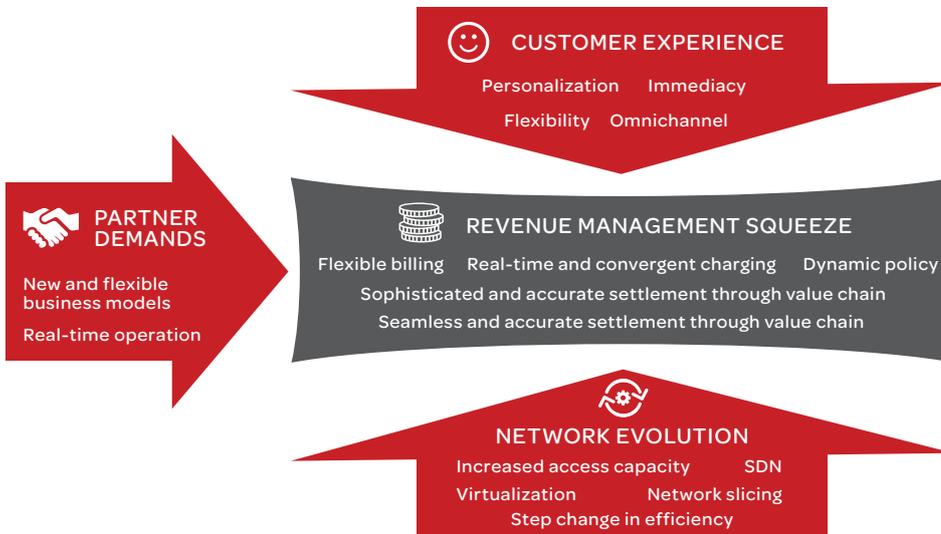
Four models of data monetization

Over the past decade, CSPs have attempted to monetize data with varying levels of success. These can be summarized under four distinct models as illustrated in the table above.

None of the models is perfect or even predominantly successful. Each has shortfalls and requires greater development and refining. The missing elements for effective data monetization include:

- Greater personalization – putting control in the hands of the customer
- Measurement of total cost and revenue; success cannot be judged simply by a one-off ARPU increase
- Greater choice of pricing
- Effective revenue settlement to partners
- Greater information about network status and customers
- Future growth plan – data monetization cannot be a one-time play

FIGURE 5: WHAT DO REVENUE MANAGEMENT SYSTEMS NEED TO MONETIZE DATA?



Source: TM Forum

These factors combined with the evolution of core services and the creation of new ones are putting pressure on revenue management. Releasing this pressure and developing a more effective revenue management strategy is critical. The capabilities required are illustrated in Figure 5 above.

The role of revenue management

The components of end-to-end revenue management are not new to CSPs. They all have product catalogs, billing systems, charging mechanisms, policy control functions, rating engines, mediation applications, etc. However, these can be limited, rigid and unintegrated.

This is especially true in the post-paid environment which doesn't use intelligent network (IN) and online charging systems the way pre-pay systems do. Programmability, flexibility and real-time operation are essential characteristics for these functions if CSPs are to transform for the digital age. Finally, revenue management functions must be integrated to ensure an end-to-end view and eliminate dead ends or function silos.

Product flexibility

Flexible product catalogs are central to the long-term growth and management of revenue. Products need to be added, edited and removed more easily, but this means the catalog could easily become overloaded and unmanageable.

According to T-Mobile's Vikram it makes more sense to separate the catalog out and ensure that it remains a sales tool, with the other elements, such as provisioning attributes removed.

"We want to have a seamless flow, which means if a customer chooses a plan, that seamlessly transfers into all of our BSS modules to say that's what they get – that's exactly what would be provisioned, that's exactly what they would be rated on and that's exactly what would be on their bill," she explains.

Real-time convergent charging

Core services have a relatively limited number of charging requirements. The metrics are time for voice and volume for data and messaging. The associated tariffs are equally simple with discounts and bonuses again based on volume. This limits the number of levers that BSS needs to support but doesn't mean that the system itself is simple. The data underlying these systems is from call detail records (CDRs).

"There are millions and millions of usage records," Vikram explains. "Is that really useful as I move to a subscription model? So, move away from event-based charging and toward subscription model for billing, charging and mediation."

Vikram cited an example cited of a phone connecting to a car, home or other IoT system. Combined they

will produce lots more data than the phone alone, and the BSS needs to evolve to deal efficiently with that amount of data and flexibly support different charging models. It needs the ability to charge based on the type and number of events, and not be limited by metrics for minutes, messages and megabytes.

While transformation will never come quickly enough for those driving it, there are signs of positive change. According to TM Forum's research, CSPs are rapidly implementing real-time convergent charging (RTCC) and policy control.

RTCC implementation had increased rapidly in the preceding 12 months and TM Forum's expectation is that the trend is continuing. CSPs expect RTCC and policy control to help them meet some of the business demands we've outlined. Survey respondents highlighted threshold management; data packs and roaming tariff management; promotion and offer management; and dynamic pricing and sponsored data as the capabilities that the implementation would create (see Figure 6 opposite).

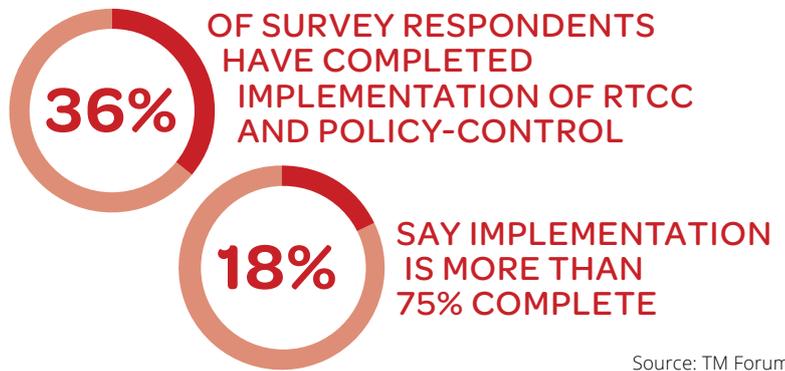
Cross-function integration

The deployment of RTCC and integration with policy control is a start but integration needs to spread beyond elements that have always been expected to work together. As Gina Pesheva, Senior Expert, Revenue Assurance at Deutsche Telekom explains: "A significant part of the digital transformation is related to transformation of the BSS and OSS environment. Basically, the borders between the OSS and BSS are disappearing...The major trends of online charging, pay as you go, simply do not give the 'comfort zone' between the service activation and charging to exist anymore."

Downstream-focused mediation capabilities need to be developed in line with the network functions below and the charging and rating capabilities above. In turn the billing system upstream must be as functional as the rating systems and deliver bills for post-paid and statements for pre-pay that are flexible and available in real time.

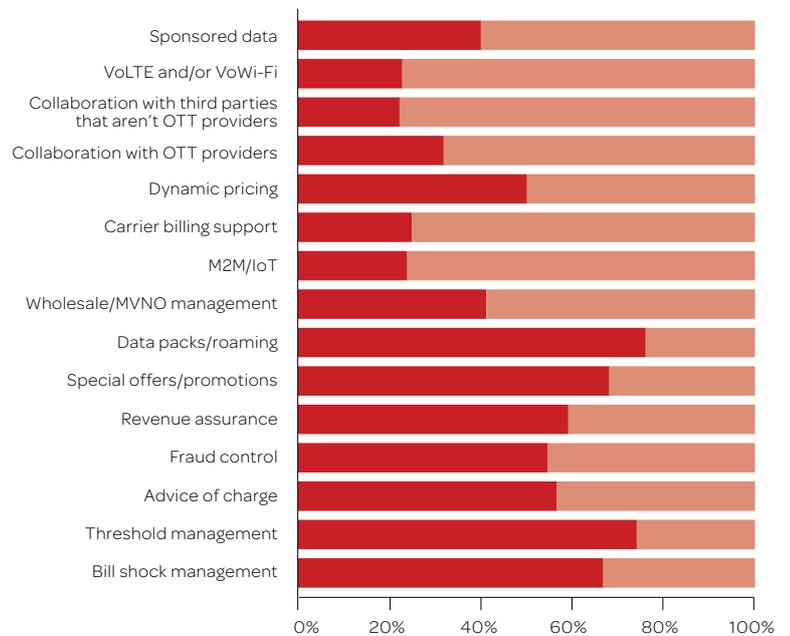
Creating a real-time flow of information up and downstream is the goal, but CSPs can easily get caught in a chicken-and-egg cycle, where each

RTCC & POLICY CONTROL TAKE OFF



Source: TM Forum

FIGURE 6: HOW ARE CSPS USING RTCC AND POLICY CONTROL?



Source: TM Forum

"A significant part of the digital transformation is related to transformation of the BSS and OSS environment. Basically, the borders between the OSS and BSS are disappearing."

process element is waiting for another to start the transformation or integration. Or they develop independently meaning that integration is more difficult and time consuming.

BSS integration is time-consuming and expensive but sometimes it is unavoidable. The realities are that legacy systems exist and operations need to continue. No CSP can close down its BSS for a few weeks while it implements a new end-to-end revenue management system. Therefore cross-function transformation planning is vital. This will minimize the need to run parallel functions and ensure the impact of one transformation does not hit a brick wall when it reaches the traditional boundaries of another function.

The architect for one multinational CSP states, “New services need to be developed and doing this through a middleware layer is possibly the easiest way, albeit not easy. It also requires a lot of collaboration across the IT teams from both the vendor and the CSP to ensure that the systems communicate and billing is done correctly.”

He adds: “A part that is often neglected is the reconciliation process; the focus is usually on activating and deactivating the service, however reporting and reconciliation between the service provider and the CSP is often an afterthought that can lead to a frustrating customer experience.”

A TM Forum Catalyst project called [*Joint Agility Delivery \(JAD\)*](#) has been looking at how to create this value fabric. It has previously demonstrated that it's possible to use a collaboration platform to develop, validate

and deploy assured services in a virtualized hybrid environment. Now in its third phase, the project is contributing its findings back to the TM Forum in the form of standardized processes, a standardized test language and [*Open APIs*](#).

Measuring success

A final element of successful revenue management is the ability to measure the impact of transformation on revenues and costs. One of the major difficulties for transformation projects is building a business case, and without solid data that only becomes more difficult.

For example, when a new partnership is formed to deliver inclusive premium content, it is not uncommon that no one is reconciling between the costs paid to the partners and the revenues generated by the retail invoicing. It may make sense for such services to be loss-leading but it also may not. Those responsible for the product need to know what the real results are.

This becomes even more important as customers take control of their own tariff-building and as CSPs implement multiple data monetization models that require partner onboarding. This will create a huge amount of data that CSPs must collect, analyze and feed back into business development, product management and financial functions.

Not all changes will work, and CSPs need to have the information to retire as well as introduce new services and capabilities. It may also make sense to ensure that the billing system supports services that are free. This will help CSPs demonstrate their value to the customer, even when they're not charged.

“New services need to be developed and doing this through a middleware layer is possibly the easiest way, albeit not easy. It also requires a lot of collaboration across the IT teams from both the vendor and the CSP to ensure that the systems communicate and billing is done correctly.”

Make it happen – revenue management requirements for profit growth

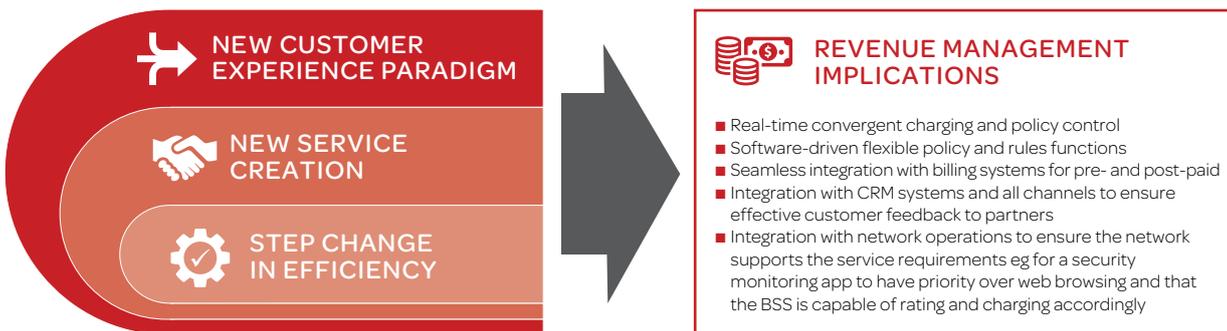
Organic revenue growth is no longer something CSPs can rely on, and fewer than 50 percent of CSPs are expecting revenue growth in the next two to three years. This is a new challenge for many operators and a huge one. Data traffic on the other hand is continuing to grow at a rapid pace, illustrating that demand is strong and customers do desire and value the information, content and services they use. CSPs are attempting to better monetize that data growth and

build new value propositions following three strategies:

- Creating a new customer experience paradigm
- New service creation
- Generating a step-change in efficiency

There is, however, a dependency between profit-growing strategies and developments in revenue management capabilities, as illustrated below.

FIGURE 7: HOW DO STRATEGIES FOR PROFIT GROWTH AFFECT REVENUE MANAGEMENT?



Source: TM Forum

Only when the correct revenue management elements are in place, will CSPs be able to benefit fully from many of the higher profile elements of their growth strategy, such as network virtualization, 5G and the IoT. The key steps to make this happen are:

 Create new levels of business process automation, real-time charging across pre- and post-pay systems, flexible policy management, and seamless integration with CRM systems to support the change in the customer experience paradigm. Only then can CSPs give customers what they want, when they want it and to demonstrate value. By doing this, CSPs can maintain a link between the increase in data traffic and revenue growth, albeit at a lower level.

 Develop effective systems to support new the new partnership models that underpin the creation of new services with new revenue streams. New services are not likely to be solely provided by CSPs; they will come from partnerships with other companies that have assets CSPs don't. Creating effective partnerships that benefit all parties is essential. However, such partnerships require new settlement structures, real-time operation, and greater integration between previously separate BSS and OSS functions.

 Create a step-change in efficiency that makes the above possible at the speed and cost required through virtualization and automation. This is a business wide development and one which must include IT systems if investments in other areas of virtualization, such as Network Function Virtualization, are to deliver the expected return on investment.



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