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CSP Revenue Management: Enabling the Digital Service Provider Evolution

A Heavy Reading white paper produced for

HUAWEI

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EXECUTIVE SUMMARY

In the last decade, the telecom market has changed dramatically, with the rise of a new generation of cloud-native businesses that interact with their customers exclusively via the Internet. The rapid migration of content (OTT video), applications (enterprise SaaS) and services (storage) to the cloud has driven widespread network transformation.

Communications service providers (CSPs) have spent billions upgrading their networks to deliver the bandwidth that consumers and enterprises demand. However, many CSPs continue to operate with the same business support systems (BSS) they employed in the era of telephony and Web browsing.

Without modern revenue management capabilities, CSPs cannot properly monetize their assets. This applies to their established communications services, such as voice, as well as emerging digital ones, such as e-health and the connected home.

Those limitations make CSPs unattractive to potential partners such as content providers. Digital service providers are looking for CSPs that can provide a reliable platform through which they can offer multiple services and, more importantly, collect revenue.

The ability to rate service, charge precisely and bill accurately are table stakes for revenue management. To truly add value, revenue management systems must enable the rapid launch of innovative new services, monetize them simply, and support an engaging user experience for consumers and enterprises.

CSPs need to evolve their revenue management systems to become monetization platforms that provide agile service innovation and superior customer experience with greater cost-efficiency. By doing so, CSPs can position themselves as enablers of digital commerce, providing a platform play for the digital revolution for which they have laid the groundwork.

In October 2017, Heavy Reading conducted an online survey of 100 CSP representatives working for around 75 different organizations across the globe. The questionnaire assessed the current state of CSP revenue management systems and explored their priorities for modernization.

The body of this report contains the responses to the 25 multi-part questions related to revenue management. The survey highlights where CSPs are focusing their efforts, what capabilities they believe are important and where the greatest benefits can be achieved from revenue management modernization.

ONLINE SURVEY ANALYSIS

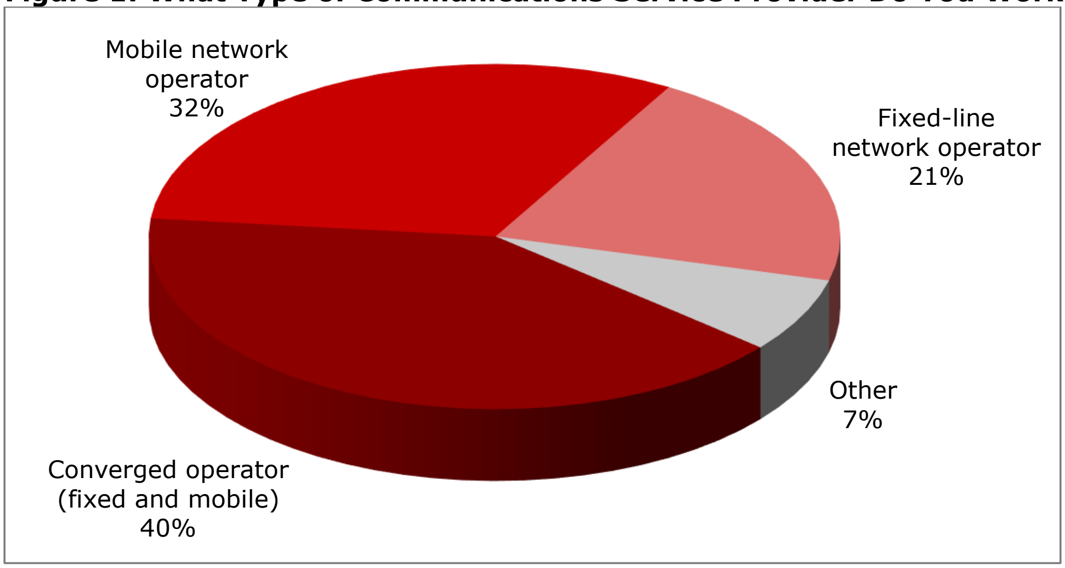
Research Methodology

The research for this report was carried out in October 2017 and consisted of a Web questionnaire composed in conjunction with the sponsor. Email invitations were sent to contacts in the Heavy Reading database. After culling disqualified and incomplete entries, we were left with 100 valid service provider responses from 76 discrete companies worldwide. This section provides detailed analysis of the data from this survey.

Online Survey Demographics

The largest constituent group of respondents worked for converged operators with both fixed and mobile infrastructure. The next largest group were mobile network operators, followed by fixed-line operators. Others include MVNOs and enterprise-only service providers. Example companies participating in this survey include AT&T, Bell Canada, CenturyLink, Comcast, Cox, Orange, Telefónica and Verizon.

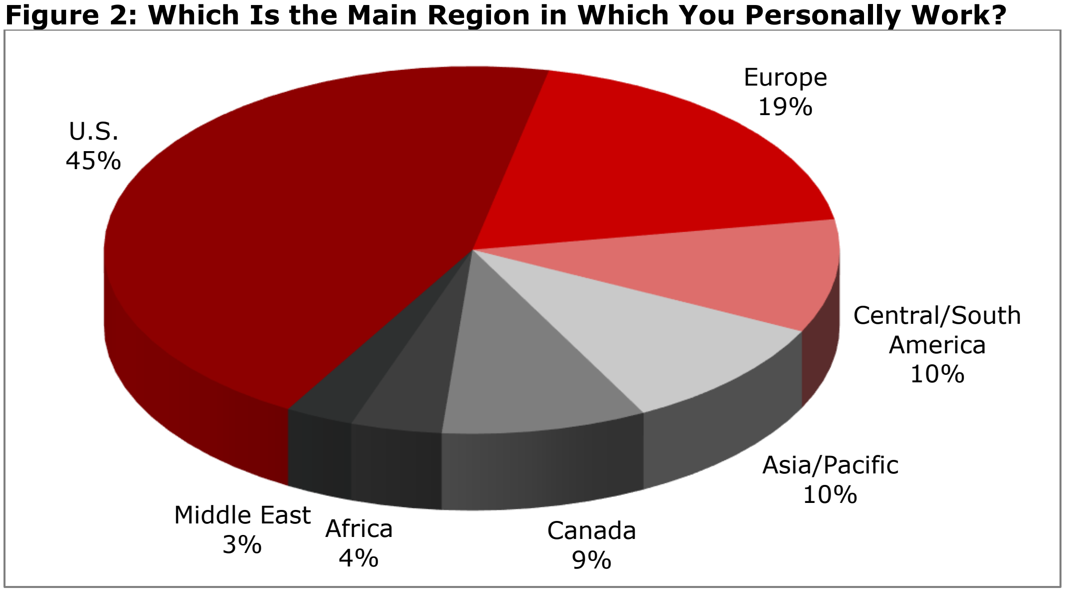
Figure 1: What Type of Communications Service Provider Do You Work For?



Source: Heavy Reading survey, October 2017, n=100

Slightly more than half of respondents work in the North America region, and nearly a fifth work in Europe. The next largest regions were Latin America and Asia/Pacific, followed by Africa and Middle East.

Figure 2: Which Is the Main Region in Which You Personally Work?

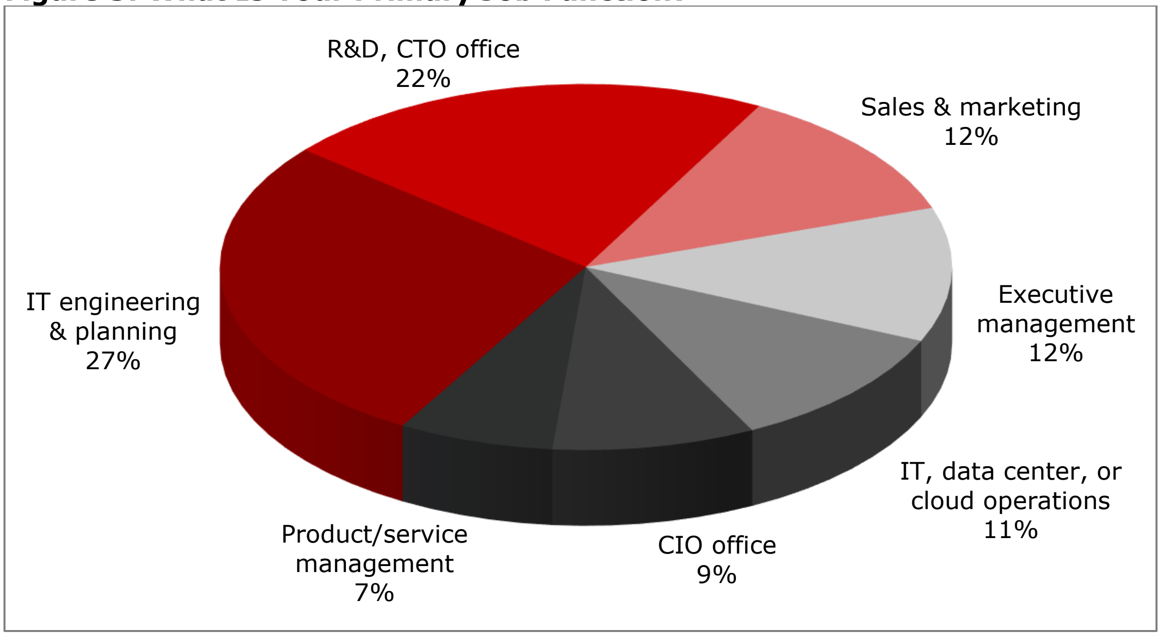


Source: Heavy Reading survey, October 2017, n=100

A Blend of Perspectives Across IT & Business

The largest group of respondents work in IT engineering and planning, closely followed by those working for the CTO office, including R&D. There were similar sized groups from sales and marketing, executive management and IT operations. CIO office workers and those in product/service management constituted the remainder.

Figure 3: What Is Your Primary Job Function?



Source: Heavy Reading survey, October 2017, n=100

Main Survey

A Mishmash of Aging Systems

We asked the survey participants whether their organization used 1, 2 to 4, 5 to 10 or more than 10 different systems for each of 6 system categories (Billing, Invoicing, Rating, Mediation, Charging, Analytics). We also asked about the average age of these systems for each category: less than 2 years, 2-5 years, or more than 5 years. For presentation below we estimated, based on the survey responses, the average number of systems for each category and their average age.

We found that the average number of revenue management systems for each category was around 5, with slightly more billing and charging systems than average and slightly fewer rating and mediation systems. The average age of revenue management systems overall was around 4 years, with billing systems being significantly (25%) older than average and analytics systems being significantly (24%) younger.

Figure 4: Average Number & Age of Revenue Management Systems

System	Average # of Systems	Average Age
Billing	5.2	5.2
Invoicing	4.7	4.7

System	Average # of Systems	Average Age
Rating	4.4	3.7
Mediation	4.2	3.9
Charging	5.1	4.4
Analytics	4.9	3.2
Average	**4.8**	**4.2**

Source: Heavy Reading survey, October 2017, n=100

Budgets Are Increasing, Led by Analytics

For each of the 6 system categories, we asked survey participants whether their budget was likely to increase, stay the same or decrease over the next 1 to 2 years. The category where investment appears most likely to increase is analytics; the least likely, with broadly similar results, are mediation, rating and invoicing. Similarly, mediation and rating were most likely to see a reduction in budget, while analytics was the least likely.

The average response across the 6 categories was an expected increase in budget across 44% of respondents and a decrease in budget across 19%, which suggests a net increase in budget overall – though to what extent is unknown.

Figure 5: How Do You See Your Revenue Management Budget Changing in the Next 1 to 2 Years for the Following Tools & Systems?

	Likely to Increase Spending	Likely to Decrease Spending	No Change
Billing	50%	16%	34%
Invoicing	36%	16%	48%
Rating	34%	25%	41%
Mediation	33%	26%	41%
Charging	40%	18%	42%
Analytics	68%	12%	20%

Source: Heavy Reading survey, October 2017, n=100

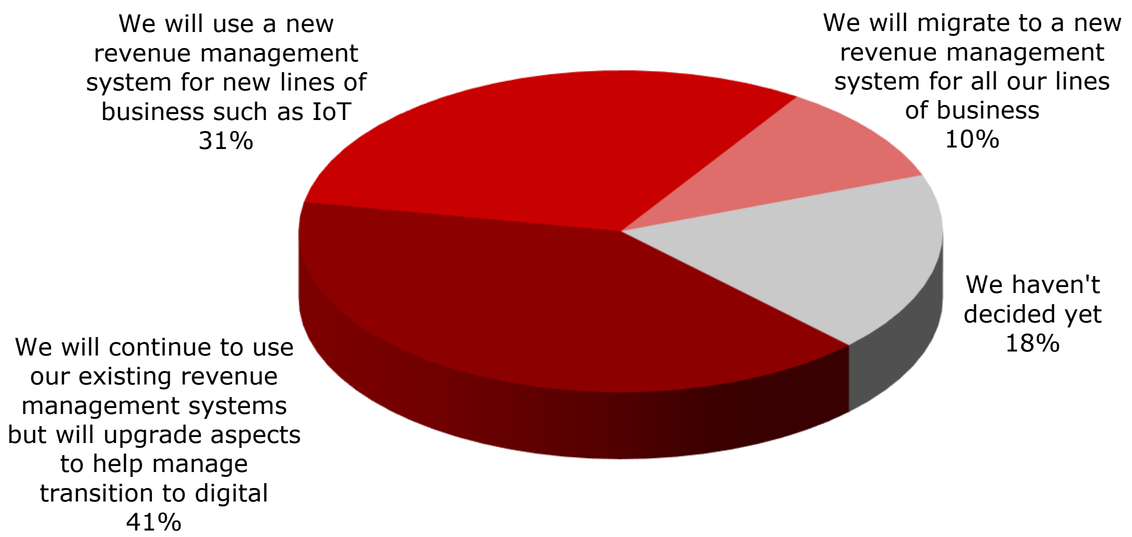
Tactical Upgrades With Some New Deployments for New Lines of Business

The greatest number of respondents indicated that their organizations would continue to use existing revenue management systems but upgrade certain aspects to help manage the transition to digital.

The next most popular response was that they would use a new revenue management system for new lines of business, such as IoT, but implicitly leave existing lines of business to operate with legacy systems.

A significant percentage (18%) indicated that their organization had not yet decided. A minority (10%) thought their organization would migrate to a new revenue management system for all lines of business.

Figure 6: How Do You Plan to Upgrade Your Revenue Management Systems to Support Business Transformation?



Source: Heavy Reading survey, October 2017, n=99

Shortcomings of Existing BSS

Respondents were asked to assign an importance score to 5 shortcomings. We weighted these responses as follows: 100% for a 5, 63% for a 4, 38% for a 3, 13% for a 2 and 0% for a 1. **Figure 7** is sorted by this score, showing that configurability is the most important shortcoming, while integration between policy management and billing is the least.

Figure 7: Shortcomings of Your Current BSS

Shortcoming	2017 Importance	2017 Ranking	2013 Ranking
Very difficult to configure & launch new offers	54%	1	5
Post-paid systems are not real-time	52%	2	4
Difficulty enforcing network policies associated with data packages	50%	3	3
Siloed BSS systems resulting in redundancy & complexity	49%	4	2
Lack of integration & synchronization between policy management & billing systems	47%	5	1

Source: Heavy Reading survey, October 2017, n=98. 2013 data is from the Heavy Reading report "Monetizing Data: The Role of BSS in the Digital Revolution," November 2013

The right-hand column gives the rankings of these shortcomings according to a survey Heavy Reading conducted in 2013 with the same question. Surprisingly, the rankings are completely inverted: The shortcomings that were highest priority in 2013 are now the least important, and vice versa. This may reflect the fact that operators have solved a lot of the technical challenges that they faced 4 years ago, such as system integration, but they still haven't solved the challenge of making the business more agile to improve customer experience and reduce cost.

Lack of Real-Time Capabilities Still Restricts BSS

Respondents were asked to assign an importance score to 8 limitations. We weighted these responses as follows: 100% for a 5, 63% for a 4, 38% for a 3, 13% for a 2 and 0% for a 1. **Figure 8** is sorted by this score, showing that slow time to market is the most important limitation, while inability to provide loyalty programs is the least.

Figure 8: Limitations That Result From a Lack of "Real-Time" Capability in Your BSS

Limitation	2017 Importance	2017 Ranking	2013 Ranking
Slow time to market with product launches & changes to plans	59.6%	1	1
Inability to convert huge amounts of data into real-time actionable insights	51.1%	2	5
Inability to provide customers with self-controlled spending limits	50.8%	3	4
Inability to allow customers to change their service plans themselves	50.7%	4	8
Inability to provide creative charging packaging for advanced data services	50.5%	5	3
Inability to provide creative package bundles	48.7%	6	6
Inability to provide real-time upsell of services	48.6%	7	2
Inability to provide effective loyalty programs	41.3%	8	7

Source: Heavy Reading survey, October 2017, n=98. 2013 data is from the Heavy Reading report "Monetizing Data: The Role of BSS in the Digital Revolution," November 2013

The right-hand column gives the rankings of these shortcomings according to a survey Heavy Reading conducted in 2013 with the same question. Time to market was also the key limitation in the 2013 survey, and loyalty programs were considered less important. However, the rankings of many of the other factors have changed noticeably: For example, customer empowerment features jumped from last to fourth. This may reflect users' increased expectations about self-service from their experience using digital services such as Uber and Netflix.

Importance of a Unified Approach to Converged Billing

Respondents were asked to assign an importance score to nine benefits. We weighted these as follows: 100% for a 5, 63% for a 4, 38% for a 3, 13% for a 2 and 0% for a 1. **Figure 9** is sorted by this score, showing that operational efficiency and time to market are the most important benefits, while marketing flexibility and prepaid customer care are the least.

Figure 9: Potential Benefits of Unified Approach to Converged Billing for BSS

Benefit	2017 Importance	2017 Ranking	2013 Ranking
Operational efficiency resulting from fewer systems	61.8%	1	1
Centralized product & offer definition in one place for fast time to market	61.1%	2	3
Ability to deliver relevant, usage-driven offers to increase spend	58.5%	3	6

Benefit	2017 Importance	2017 Ranking	2013 Ranking
Consistent & complete customer information available through any touchpoint for consistent customer experience	57.4%	4	9
Real-time rating for postpaid subscribers for credit control & "bill shock" prevention	56.5%	5	2
Ability to support family plans that mix prepaid & postpaid models for customer satisfaction & marketing flexibility	55.2%	6	7
Tight linkage with policy to support differentiated charging schemes (e.g., by service, website, etc.) & capture revenue	54.0%	7	5
Rich customer care options & loyalty plans to prepaid subscribers for customer satisfaction	52.7%	8	4
No limits or restrictions on what can be sold (any combination of service & payment type), increasing marketing flexibility	51.7%	9	8

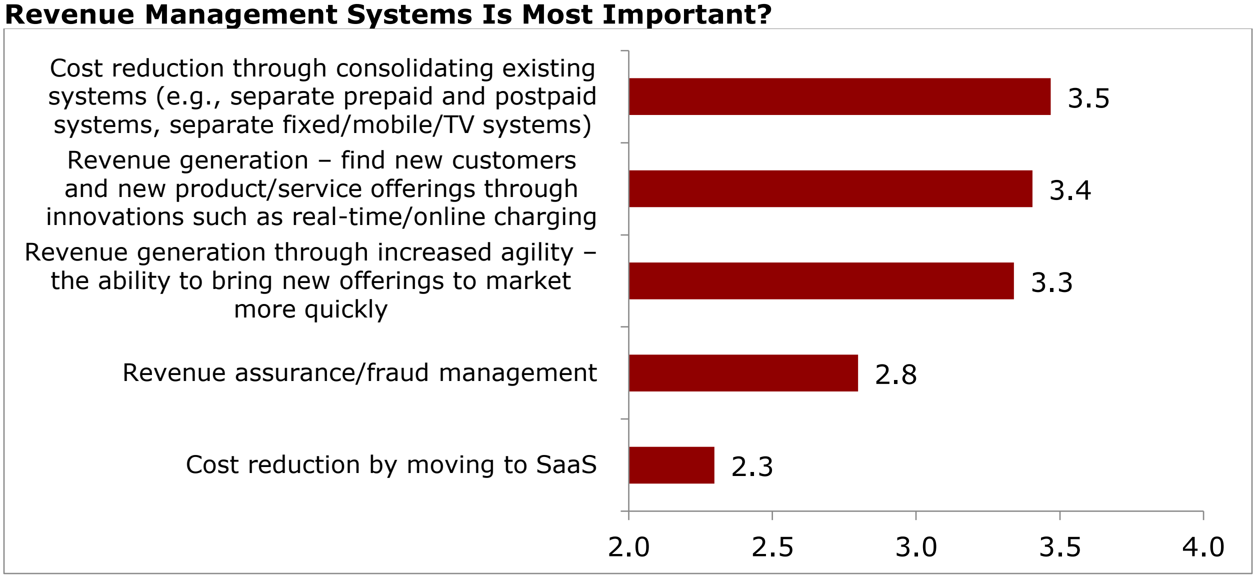
Source: Heavy Reading survey, October 2017, n=98. 2013 data is from the Heavy Reading report "Monetizing Data: The Role of BSS in the Digital Revolution," November 2013

The right-hand column gives the rankings of these shortcomings according to a survey Heavy Reading conducted in 2013 with the same question. Operational efficiency and time to market were also considered important back then.

Cost Reduction & Revenue Generation: The Key Drivers for Modernization

Respondents were asked to rank 5 reasons from 5 (most important) to 1 (least). **Figure 10** shows the average ranking for each reason. The most popular reason was cost reduction, closely followed by revenue generation. Revenue assurance was deemed less important, and cost reduction by moving to software-as-a-service (SaaS) was considered the least important reason.

Figure 10: Which of the Following Reasons to Modernize Your Organizations' Revenue Management Systems Is Most Important?

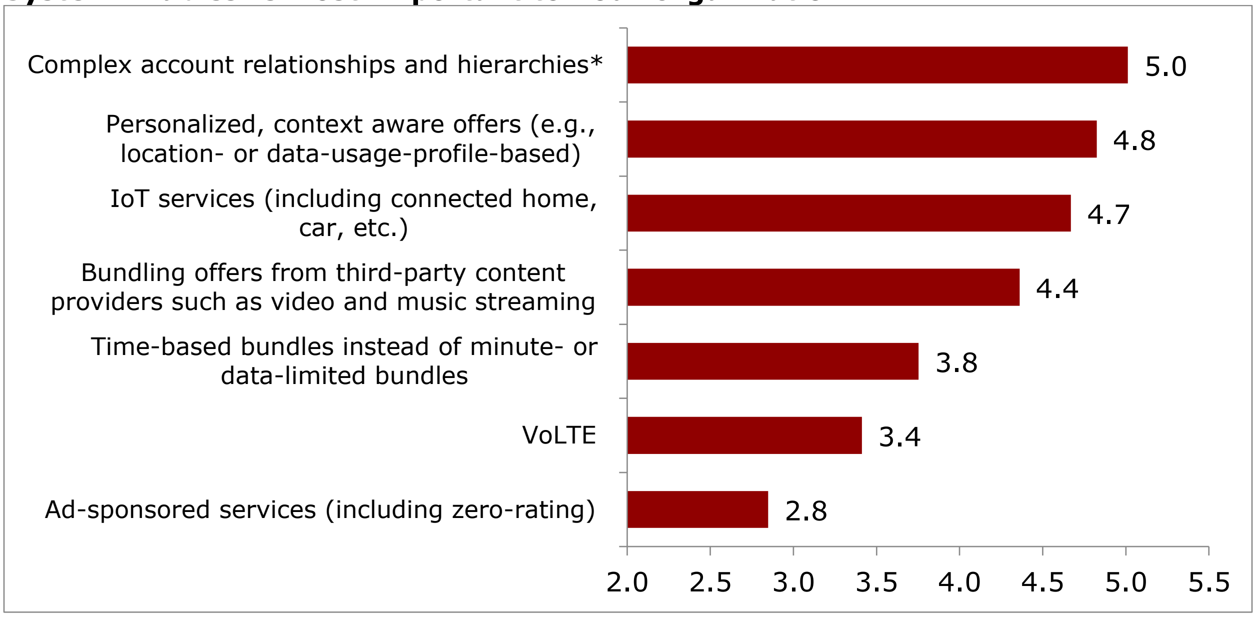


Source: Heavy Reading survey, October 2017, n=94

Key System Capabilities: Complex Accounts & Personalized Offers

Respondents were asked to rank 7 services from 7 (most important) to 1 (least). **Figure 11** shows the average ranking for each service. The most popular response was "Complex account relationships and hierarchies." This was closely followed by personalized, context-aware offers and IoT services. Ad-sponsored services (including zero-rating) were the least popular response, followed by VoLTE.

Figure 11: Which of the Following Services That a Modernized Revenue Management System Enables Is Most Important to Your Organization?



Source: Heavy Reading survey, October 2017, n=91
** enabling direct sales (digital and physical goods), sales through resellers, billing on behalf of third parties and other B2B2X permutations*

Key Revenue Management Features

Respondents were asked whether they deemed 13 different aspects to be high, medium or low priority, and whether they already had this capability. **Figure 12** shows the percentage of "high priority" *minus* "low priority" responses in the middle column. The right-hand column shows how many indicated that they already have this capability. We have sorted the table by the middle column to highlight those aspects that are considered the most important.

Figure 12: Which of These Aspects of a Revenue Management Solution Are Important to Your Organization & Which Do You Currently Have?

Aspects	High Minus Low Priority	Have?
Real-time policy enforcement	46%	46%
Single charging engine for prepaid and postpaid	44%	57%
Real-time balance management and notifications	39%	45%
Flexible pricing, bundling, and discounting	39%	43%
Integrated charging and policy management	38%	51%

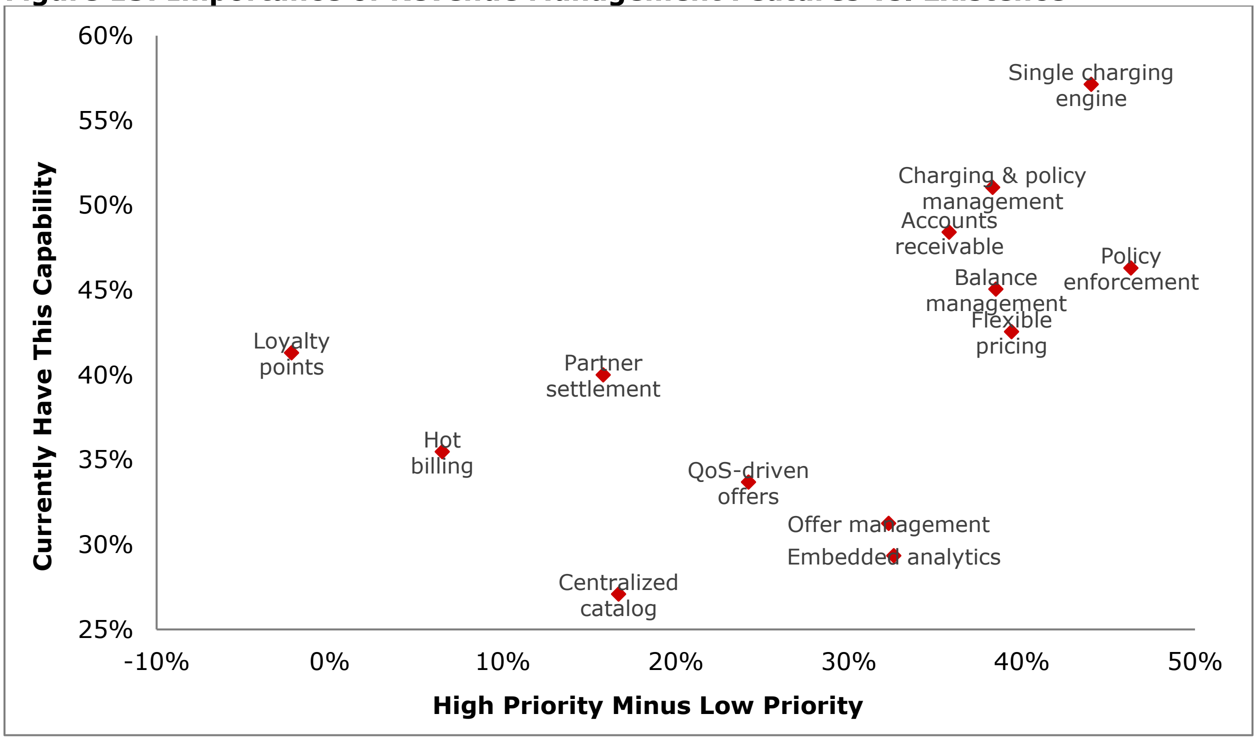
Aspects	High Minus Low Priority	Have?
Accounts receivable, payments processing, and taxation	36%	48%
Embedded analytics for customer insight	33%	29%
Integrated real-time offer management capability	32%	31%
Support QoS-driven offers	24%	34%
Integrated, centralized catalog	17%	27%
Support partner settlement and contract management	16%	40%
Hot billing	7%	35%
Support loyalty points	-2%	41%

Source: Heavy Reading survey, October 2017, n=96

Real-time policy enforcement and a single charging engine for pre- and post-paid are considered the most important aspects, closely followed by real-time balance management, flexible pricing and integrated charging and policy management. Loyalty points and "hot billing" were not considered to be a high priority by most respondents.

We have plotted the two columns above on an X-Y axis in **Figure 13**. There is a general correlation between aspects being considered high priority and operators already having these capabilities. Loyalty points is an outlier, in that it is of low importance relative to its actual deployment. Conversely, analytics for customer insight, real-time offers, flexible pricing and real-time policy are slightly less prevalent relative to their importance.

Figure 13: Importance of Revenue Management Features vs. Existence

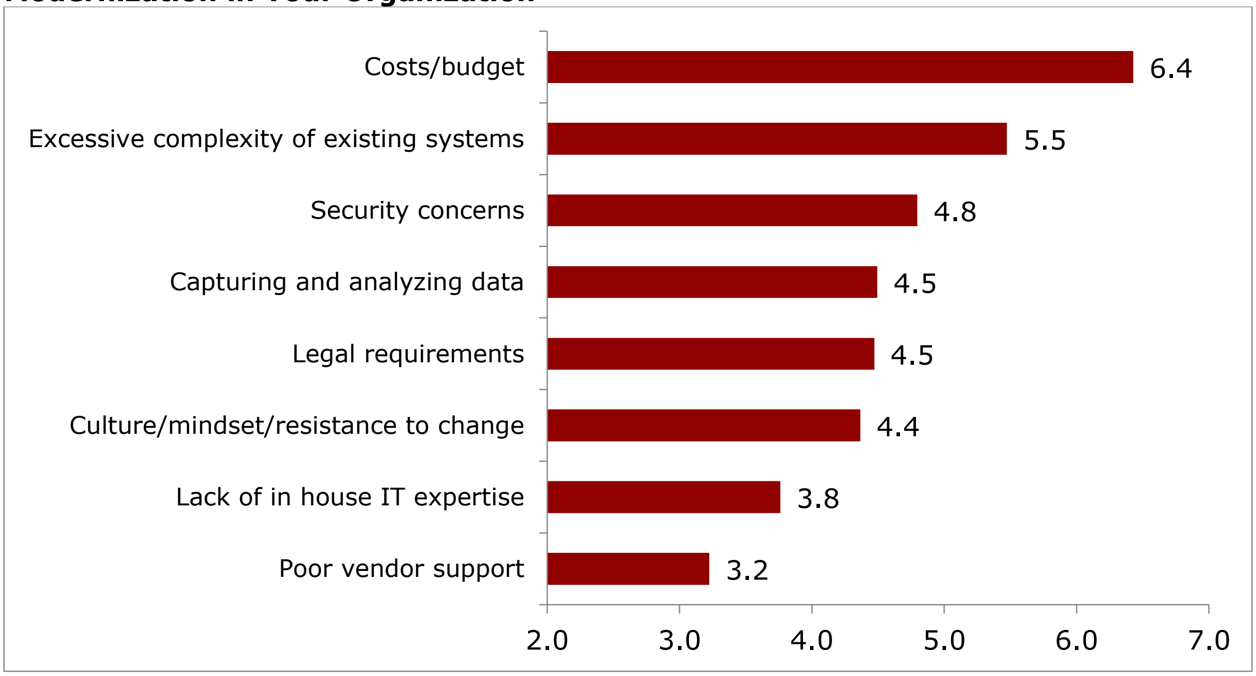


Source: Heavy Reading survey, October 2017

Key Barriers to Modernization: Cost & Complexity

Respondents were asked to rank 8 barriers from 8 (most important) to 1 (least). Below we show the average ranking for each barrier. The most important barrier was cost, followed by complexity of existing systems. A lack of vendor support and in-house IT expertise were not considered to be significant barriers by respondents on average.

Figure 14: Rank in Importance the Following Barriers to Revenue Management Modernization in Your Organization



Source: Heavy Reading survey, October 2017, n=86

Key Rating & Charging Features

Respondents were asked whether they deemed 11 different aspects to be high, medium or low priority, and whether they already had this capability. **Figure 15** shows the percentage of "high priority" *minus* "low priority" responses in the middle column. The right-hand column shows how many indicated that they already have this capability. We have sorted the table by the middle column to highlight those aspects that are considered the most important.

Security and scalability was considered the most important aspect, closely followed by reporting/analytics and real-time rating and credit control. Day passes and SaaS deployment were not considered to be a high priority by most respondents.

Figure 15: Which Aspects of a Rating & Charging System Are Important & Which Do You Currently Have?

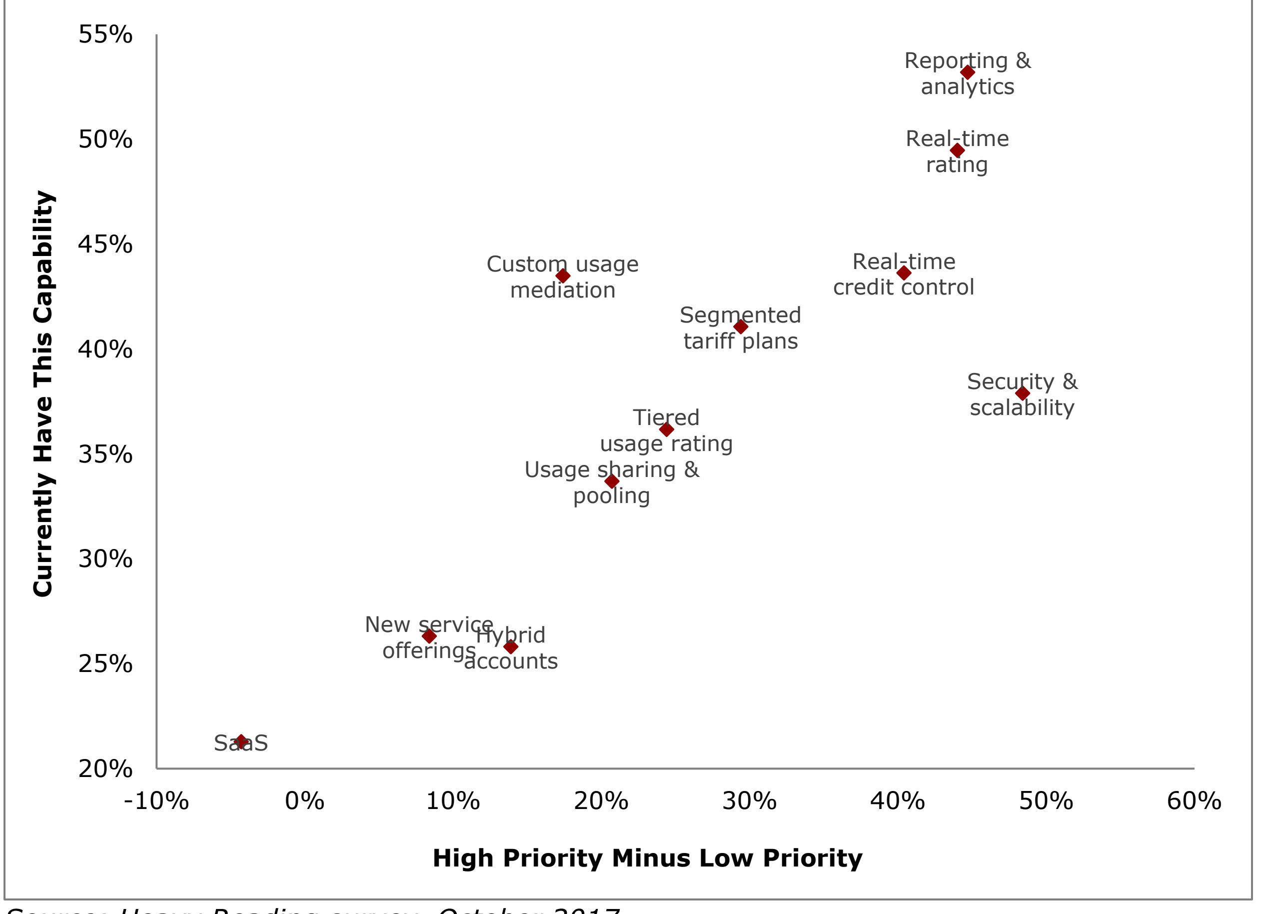
Aspects	High Minus Low Priority	Have?
Security and scalability	48%	38%
Reporting and analytics	45%	53%
Real-time rating	44%	49%

Aspects	High Minus Low Priority	Have?
Real-time credit control for postpaid customers	40%	44%
Segmented tariff plans	29%	41%
Tiered usage rating and notifications	24%	36%
Usage sharing and pooling options	21%	34%
Custom usage mediation	17%	43%
Hybrid accounts that combine pre- & post-paid elements	14%	26%
New service offerings such as day passes	8%	26%
SaaS deployment	-4%	21%

Source: Heavy Reading survey, October 2017, n=94

We have plotted the two columns above on an X-Y axis in **Figure 16**. There is a general correlation between aspects being considered high priority and operators already having these capabilities. Custom usage mediation is an outlier, in that it is of low importance relative to its actual deployment. Conversely, security and scalability are less prevalent relative to their importance.

Figure 16: Importance of Rating & Charging Features vs. Existence



Source: Heavy Reading survey, October 2017

Key Billing Features

Respondents were asked whether they deemed 17 different billing aspects to be high, medium or low priority, and whether they already had this capability. **Figure 17** shows the percentage of "high priority" *minus* "low priority" responses in the middle column. The right-hand column shows how many indicated that they already have this capability. We have sorted the table by the middle column to highlight those aspects that are considered the most important.

Electronic bill presentment was considered the most important aspect by a significant margin. Roaming self-administration and SaaS deployment were not considered to be a high priority by most respondents.

Figure 17: Which Aspects of a Billing System Are Important & Which Do You Currently Have?

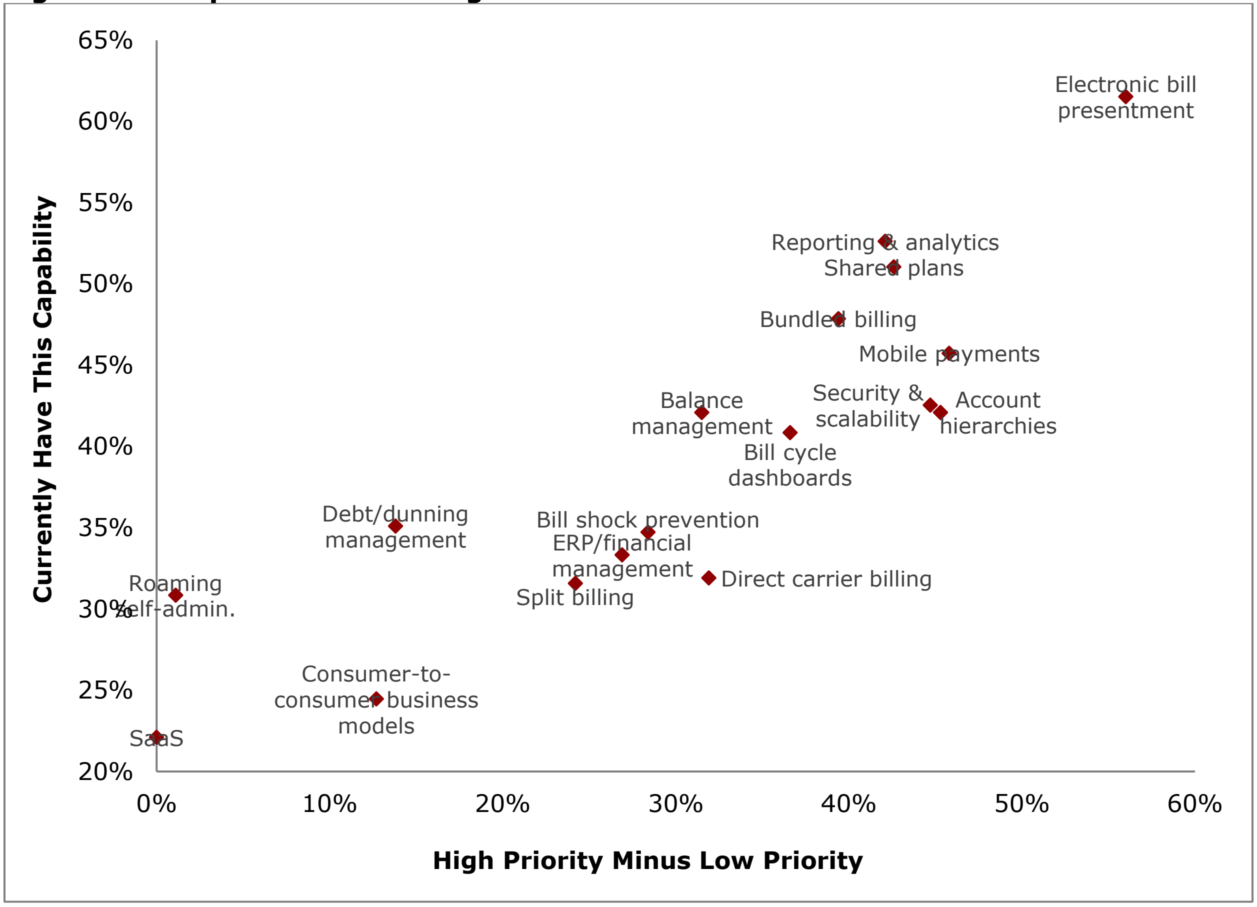
Aspects	High Minus Low Priority	Have?
Electronic bill presentment	56%	62%
Mobile payments	46%	46%
Ability to manage complex account hierarchies	45%	42%
Security and scalability	45%	43%
Shared plans (e.g., family)	43%	51%
Reporting and analytics	42%	53%
Bundled (rolled-up) billing	39%	48%
Bill cycle dashboards and configurable bill frequencies	37%	41%
Balance management (including transfers)	32%	42%
Direct carrier billing enablement	32%	32%
Bill shock prevention	28%	35%
ERP/financial management integration	27%	33%
Split billing e.g. wholesale services with multiple parties	24%	32%
Debt/dunning management	14%	35%
Ability to support consumer-to-consumer business models	13%	24%
Roaming self-administration	1%	31%
SaaS deployment	0%	22%

Source: Heavy Reading survey, October 2017, n=96

We have plotted the two columns above on an X-Y axis in **Figure 18**. There is a general correlation between aspects being considered high priority and operators already having these capabilities.

Roaming self-administration is an outlier, in that it is of low importance relative to its actual deployment. Conversely, the ability to manage complex account hierarchies and security/scalability are less prevalent relative to their importance.

Figure 18: Importance of Billing Features vs. Existence



Source: Heavy Reading survey, October 2017

Key Product Catalog & Price Plan Features

Respondents were asked whether they deemed 10 different product catalog and price plan features to be high, medium or low priority and whether they already had this capability. **Figure 19** shows the percentage of "high priority" *minus* "low priority" responses in the middle column. The right-hand column shows how many indicated that they already have this capability. We have sorted the table by the middle column to highlight those aspects that are considered the most important. Security and scalability was considered the most important aspect. SaaS deployment was not considered to be a high priority by most respondents.

Figure 19: Which Aspects of a Product Catalog & Price Plan System Are Important & Which Do You Currently Have?

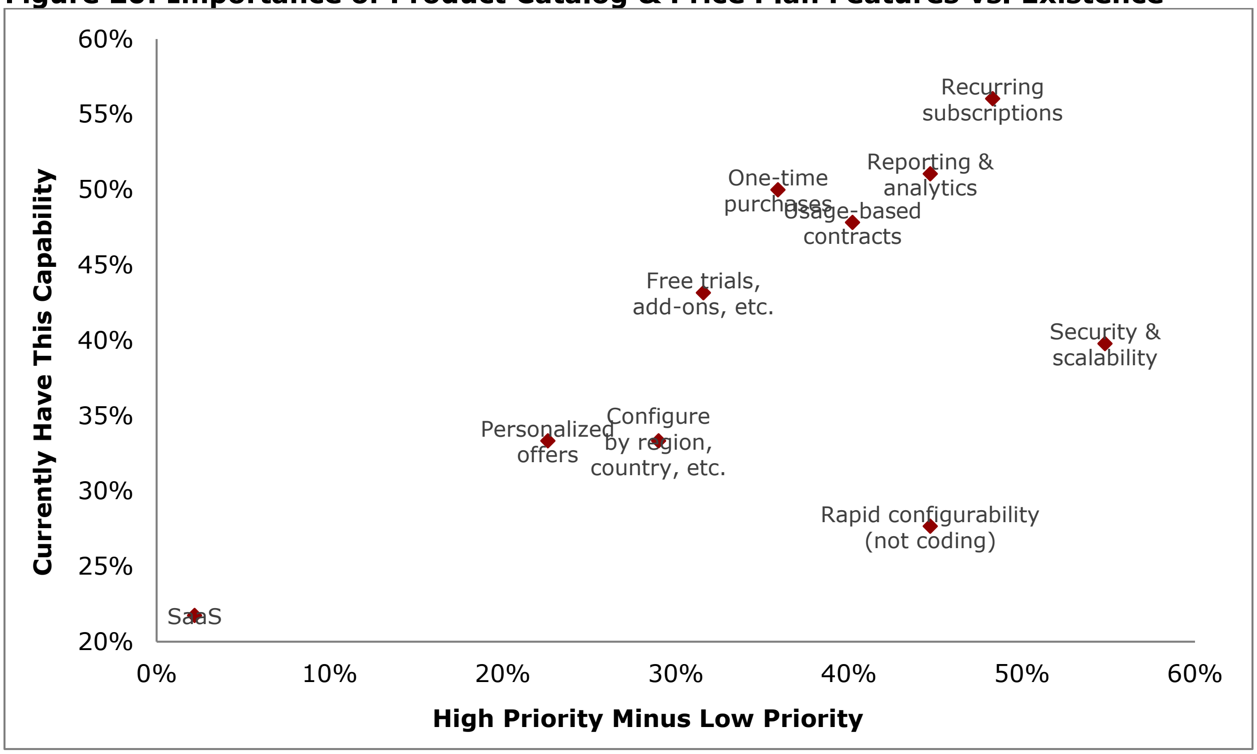
Aspects	High Minus Low Priority	Have?
Security and scalability	55%	40%
Recurring subscriptions can be monthly, quarterly, or annual	48%	56%
Can configure, test, and implement new service offerings quickly through configurability (not coding)	45%	28%
Reporting and analytics	45%	51%

Aspects	High Minus Low Priority	Have?
Usage-based contracts	40%	48%
Enables one-time purchases	36%	50%
Ability to offer free trials, add-ons, discounts/promotions, and tiered pricing	32%	43%
Can be configured by customer tier, region, country, etc., with support for multiple languages, currencies and taxation rules	29%	33%
Enables account representatives to create personalized offers	23%	33%
SaaS deployment	2%	22%

Source: Heavy Reading survey, October 2017, n=92

We have plotted the two columns above on an X-Y axis in **Figure 20**. There is a general correlation between aspects being considered high priority and operators already having these capabilities. The ability to implement new service offerings quickly through configurability (as opposed to coding) is an outlier, in that its availability is low relative to its importance.

Figure 20: Importance of Product Catalog & Price Plan Features vs. Existence



Source: Heavy Reading survey, October 2017

Post/Pre-Paid Billing Is Converged, but Subscriber Management Not Yet Centralized

Respondents were presented with the seven statements below and asked whether they totally agreed, partly agreed, partly disagreed, totally disagreed or didn't know/weren't sure. For ease of presentation, **Figure 21** shows the percentage of respondents agreeing (either totally or partly) *minus* those disagreeing with the statements.

Respondents were most emphatic about the convergence of post- and prepaid billing (65% agreed with this statement), closely followed by rate plan flexibility (64% agreed that they were taking full advantage of this to launch new offers). There was the least conviction about centralization of subscriber management information (36% disagreed with the statement) and unified product and service catalogs (32% disagreed).

Figure 21: To What Degree Would You Agree With the Following Statements?

	Agree-Disagree
We have fully converged our post-paid batch billing and real-time prepaid billing systems	45%
We are taking full advantage of the rate plan flexibility that rule-based rating enables to launch innovative new tariffs	43%
We have completely unified Account Balance management for prepaid and postpaid	30%
We have significantly reduced the time it takes to launch new products and services	26%
Our revenue management system is seamlessly integrated with CRM and ERP	19%
We have completely unified our product and service catalogs	18%
Our subscriber management is fully centralized (info is no longer held in separate silos)	12%

Source: Heavy Reading survey, October 2017, n=99

On-Premises Remains the Default Deployment Option for Revenue Management

On-premises appears to be the most popular choice for revenue management system deployment, with an average of 82% seeing this as likely, versus 76% for private cloud and just 25% for public cloud. Public cloud was relatively more popular for analytics than other applications. Billing was the least likely option for public cloud, with 80% seeing this as unlikely.

Figure 22: Is It Likely That Your Organization Uses the Following Deployment Options for These Revenue Management Systems in the Next 1 to 2 Years?

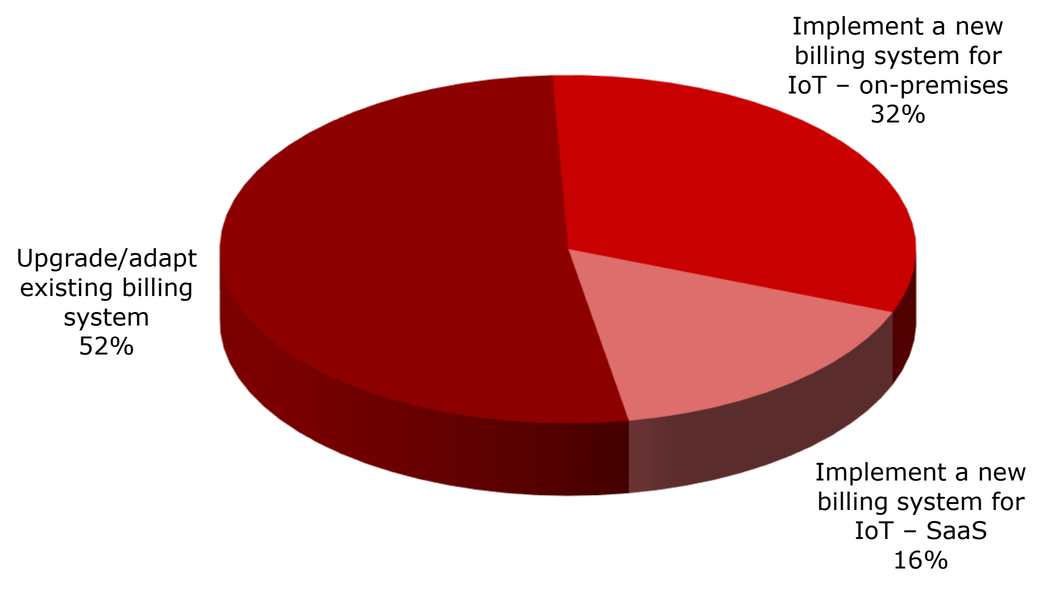
% Answering "Likely"	On-Premises	Private Cloud	Public Cloud
Billing	83%	81%	20%
Invoicing	81%	77%	23%
Rating	83%	70%	28%
Mediation	75%	68%	22%
Charging	84%	77%	25%
Analytics	84%	83%	32%
Average	**82%**	**76%**	**25%**

Source: Heavy Reading survey, October 2017, n=69

Operators Mostly Supporting IoT With Existing Billing Systems

Around half of respondents expect to upgrade or adapt their existing billing systems to support new IoT services. Of the remainder, around two thirds expect to implement a new billing system for IoT on-premises, and the remainder expect a new system delivered via SaaS.

Figure 23: How Will You Support Billing for New IoT Services?



Source: Heavy Reading survey, October 2017, n=98

Time to Market Has Reduced

We asked participants how long it generally takes to introduce a new offer, such as a data plan. Below we compare the results with those of the survey we conducted in 2013. Note in 2013 we had three options: 1 to 3 months, 3 to 6 months, and 6 to 9 months. The survey in 2013 did not even contemplate time scales of less than 1 month.

Although the 2017 survey had different response options, making it difficult to compare directly with the 2013 study, it is clear that a significantly higher percentage of respondents consider their systems capable of introducing new offers in less than 3 months, with nearly a quarter indicating a lead time of under a week and around half under a month.

The percentage of respondents indicating lead times of 3 to 6 months has dropped from 54% to 12%, and those waiting more than 6 months has dropped from 26% to 16%.

Figure 24: How Long Does It Take to Introduce a New Offer (e.g., Data Plan) Today?

2017 Study	2017 Responses	2013 Study	2013 Responses
1 to 2 days	14%		
3 to 6 days	9%		
1 to 4 weeks	25%		
1 to 2 months	23%		
Subtotal	**72%**	1 to 3 months	20%
3 to 6 months	12%	3 to 6 months	54%
> 6 months	16%	6 to 9 months	26%

Source: Heavy Reading

Bottlenecks to New Plan Introduction: Bureaucracy, Complexity & Cost

We asked respondents to identify the biggest bottlenecks in the introduction of new plans. Of the 89 free-text responses, 60 of them are categorized in **Figure 25**.

Management bureaucracy was the top complaint, including comments such as "red tape," "conservatism of leadership," and "inability for management to see how time to market and flexibility are crucial to winning."

The complexity and age of billing systems was the next most popular category, with comments such as "system very complicated, a lot of dependencies," "right product configuration may require vendor intervention for code change," and "configurations on multiple interconnected systems."

Costs and justifying the business case was also popular, with comments such as "determining margin impact and revenue per user of potential plans under consideration" and "creating the business case and adapting the billing system for it."

Figure 25: What Is the Biggest Bottleneck in the Process of Introducing New Plans?

Bottleneck	# of Respondents
Management/bureaucracy	14
Complexity/age of billing systems	11
Costs/business case	11
Integration	7
Processes	7
Employee skills	6
Competition	2
Regulation, legal, security	2
Other	29
Total	**89**

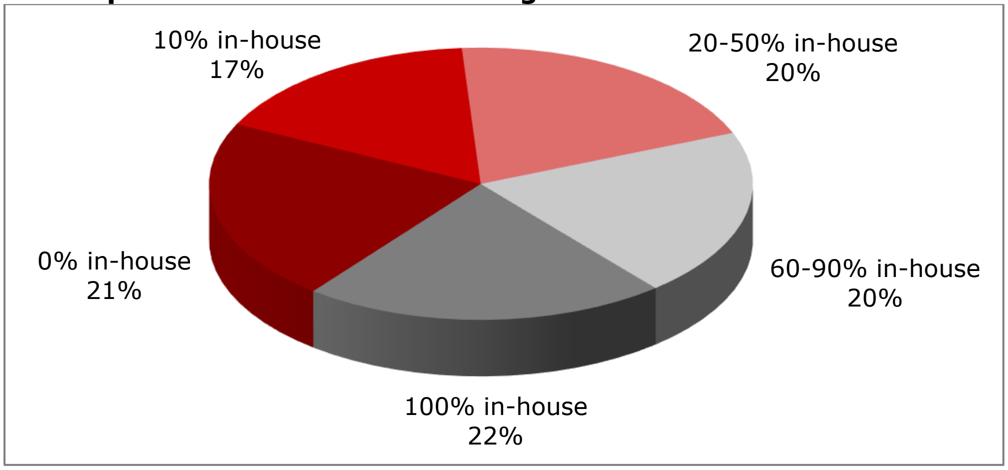
Source: Heavy Reading or Company

A Mixture of In-House Development & Commercial Solutions

We asked participants: "To what degree have your existing revenue management systems been developed in-house and to what degree have you used commercial solutions?." Of the 84 free-text responses to this question, we have categorized 60 of them into broadly equal cohorts, as shown in **Figure 26**. The remaining responses were either ambiguous or "don't knows." Around a fifth of responses indicated their solutions were entirely commercial, and a similar percentage claimed they were entirely developed in-house.

Many responses indicated a mixture of in-house and off-the-shelf solutions, with comments such as "base software from commercial solutions and extensive add-ons and customizations developed in-house." Some comments indicated a trend toward adoption of more commercial solutions in future such as "legacy are a mix of in-house and COTS, strategic is to use COTS."

Figure 26: To What Degree Have Your Existing Revenue Management Systems Been Developed In-House & to What Degree Have You Used Commercial Solutions?

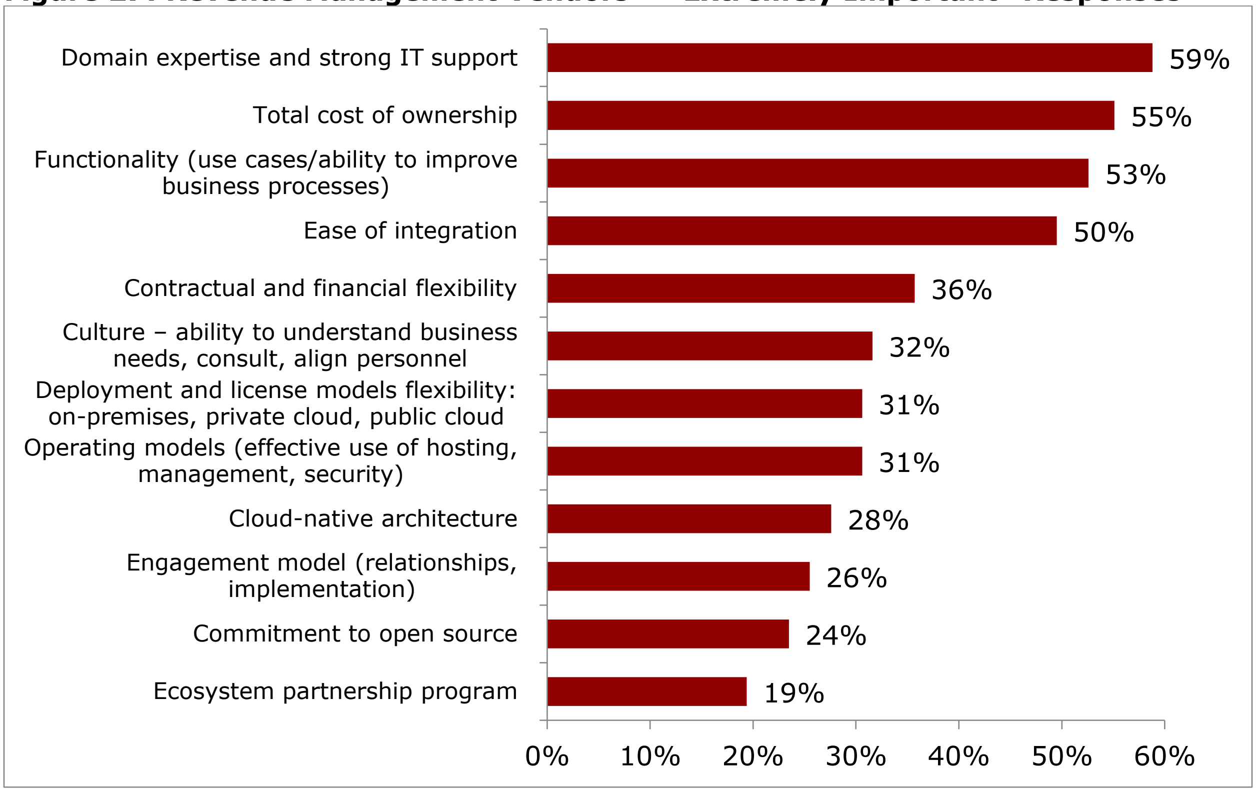


Source: Heavy Reading survey, October 2017, n=66

Key Factors When Selecting Revenue Management Vendors

Participants were asked about the importance of 12 different attributes. **Figure 27** shows the percentage that cited these attributes as "extremely important." Domain expertise and strong IT support is the most important attribute, closely followed by cost, functionality and ease of integration. Ecosystem partnerships and open source commitment were the least important.

Figure 27: Revenue Management Vendors – "Extremely Important" Responses



Source: Heavy Reading survey, October 2017, n=98

CONCLUSIONS

CSPs Are Stuck in a Vicious Cycle of Patching Instead of Transforming

When we asked survey participants, "How do you plan to upgrade your revenue management systems to support business transformation?" around 40% indicated they would continue to use existing revenue management systems but upgrade certain aspects to help manage the transition to digital. Around 30% said they would use a new revenue management system for new lines of business such as IoT, but leave existing lines of business to operate with legacy systems. Just 10% thought their organization would migrate to a new revenue management system for all lines of business, and the remaining 20% were undecided.

The overall trend is that operators continue to make tactical upgrades to existing systems, with some new system deployments for new lines of business.

Number & Age of Systems Leads to Inefficient Operations

This trend has resulted in a plethora of systems that operators must maintain and integrate. Our survey found that operators had around 5 different systems for each of 6 separate revenue management categories (Billing, Invoicing, Rating, Mediation, Charging and Analytics), giving a total of 30 systems on average.

These are a mixture of in-house and commercial solutions accumulated over the years through M&A and as operators have added services such as Internet connectivity, IPTV and mobile to their legacy fixed-line telephony offering. In-house systems carry the risk that, as key individuals retire, the knowledge of how to maintain and update these systems disappears. Operators can face a similar risk with commercial systems if these have been purchased from smaller vendors that subsequently run into financial difficulties.

The complexity and age of systems was identified as a key bottleneck to the introduction of new tariffs and plans, with comments such as "system very complicated, a lot of dependencies," "right product configuration may require vendor intervention for code change," and "configurations on multiple interconnected systems." Siloed systems result in complexity and integration challenges, which in turn lead to inflexibility and a bloated cost base. Incremental upgrades on top of legacy systems exacerbate this problem.

Time to Market Has Been Reduced, but Not Enough

However, there are signs that progress has been made. Given the statement, "We have significantly reduced the time it takes to launch new products and services," 56% of respondents agreed, while just 30% disagreed and the remainder were unsure. When asked about time to market, more than 70% of respondents think their revenue management systems can deliver a new offer in less than 3 months, compared to just 20% in 2013.

Even those respondents who have reduced their time to market probably still have significant room for improvement. A comparison of survey results about BSS shortcomings between 2013 and 2017 suggests that CSPs may have solved a lot of the technical challenges that they faced 4 years ago, such as system integration, but that they still haven't solved the challenge of making the business more agile to improve the customer experience and reduce cost.

The Case for More Radical Modernization

BSS modernization can lower costs and boost revenue potential for CSPs by making them better able to exploit new business opportunities, such as IoT. But the complexity of existing systems is trapping CSPs in a vicious cycle of making *ad hoc* patches without solving the real business issues.

Justifying the investment case for more radical revenue management modernization is often the main roadblock. Respondents commented that "determining margin impact and revenue per user of potential plans under consideration" was a challenge, as was "creating the business case and adapting the billing system for it."

To break the cycle, CSPs must take a more radical approach to revenue management modernization that can:

- Deliver the agility required to capture new market opportunities, such as IoT
- Enable a more personalized and engaging customer experience
- Simultaneously reduce the cost of operations

Self-Care Drives Need for Real-Time Capability

Another key finding from the survey is the increasing importance of real-time capabilities in BSS. A lack of real-time capability for postpaid systems ranked second out of five BSS shortcomings in the survey, while it ranked just fourth in 2013.

Real-time policy enforcement was identified as the most important feature in a list of 13 revenue management features, and real-time balance management was ranked third. Similarly, from a list of 11 features of rating and charging systems, real-time rating was the third most important feature, and real-time credit control was the fourth most important.

One of the survey questions asked about the key limitations from the lack of real-time capability. Two of the responses mapped to the ability to offer self-serve capabilities to customers. As **Figure 28** shows, one of the responses was about self-controlled spending limits. The other was about allowing customers to change their own service plans via an app or online, rather than having to go through a call center. Both of these options have increased in importance from the 2013 to the 2017 survey.

Figure 28: Limitations That Result From a Lack of "Real-Time" Capability in BSS

Ranking (out of 8)	2013	2017
Inability to provide customers with self-controlled spending limits	4th	3rd
Inability to allow customers to change their service plans themselves	8th	4th

Source: Heavy Reading survey, October 2017

Consumers are used to self-serve with providers such as Google, Netflix or Uber. No one expects to have to call a contact center to change their Spotify service. Telecom operators must be as easy to transact with as the OTT players if they are to successfully transform themselves from communication service providers to digital service providers.

SaaS Is Just a Delivery Option, Not a Panacea

Another observation that stood out from the survey was a relatively low interest in SaaS deployment for revenue management. As **Figure 29** shows, SaaS deployment was the least important out of 17 billing features, 11 rating and charging features, and 10 product catalog features that respondents were asked to rank. Interestingly, around 20% of respondents indicated that their revenue management systems already had a SaaS delivery option.

Figure 29: Little Interest in SaaS Deployment

SaaS Deployment	High Minus Low Priority	Ranking	Have?
Billing	0%	Lowest of 17 features	22%
Rating & charging	-4%	Lowest of 11 features	21%
Product catalog	2%	Lowest of 10 features	22%

Source: Heavy Reading survey, October 2017

There was a similar skepticism toward public cloud deployment. On average, 82% of respondents thought it likely that they would deploy revenue management systems on-premises, and 76% thought it likely that they would deploy on private cloud, but just 25% thought public cloud was a likely option.

Operators are generally keen to move to a subscription model for commercial software, as opposed to paying steep up-front licenses. However, delivering the software as a service running in the public cloud seems less popular than on-premises or private cloud deployment. This may be due to perceptions about data governance risks with public cloud. Billing data is highly sensitive, which may explain the reluctance to manage this on public cloud (only 20% thought this likely). Analytics can also be sensitive, but the variability in workloads makes it a more likely candidate for public cloud deployment (32% thought it likely).

Arguably the distinction between on-premises and private cloud is moot. By employing techniques such as virtualization and automated management, IT staff can evolve the internal data center into a private cloud that offers many of the performance, scalability and cost-saving benefits associated with public cloud, but without the data security and sovereignty concerns.

FOR FURTHER INFORMATION

To see a Light Reading webinar presentation of this survey, recorded on November 8, 2017, please visit: http://www.lightreading.com/webinar.asp?webinar_id=1045

For other Huawei webinars on the topic of digital revenue management, please visit: http://carrier.huawei.com/minisite/huawei-revenue-management/index.html

To contact a Huawei representative directly, please email: huaweisoftware@huawei.com