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The Elastic Telco: How a Smart Catalog Drives a Smart Business

Multi-user Independence Sparks Innovation and Collaboration

Stratecast Analysis by

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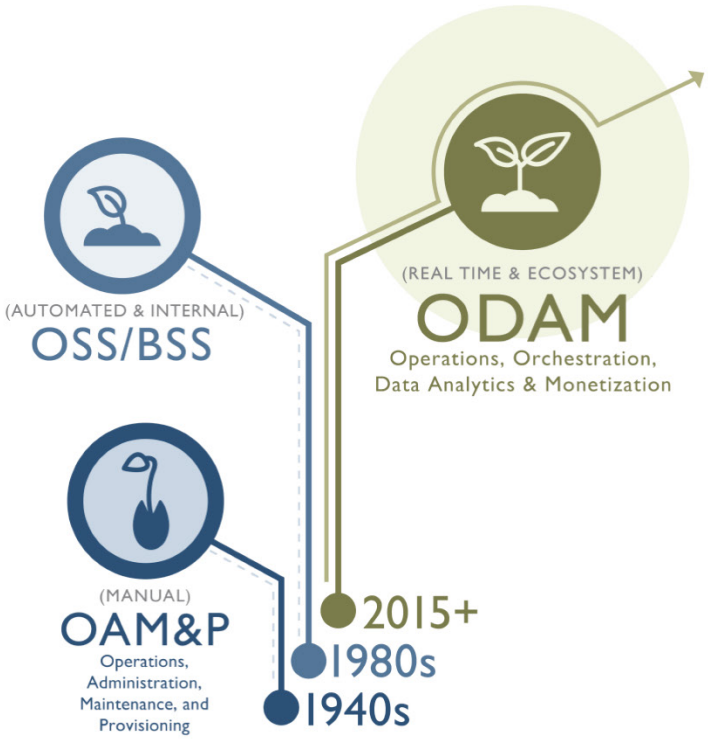

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The Elastic Telco: How a Smart Catalog Drives a Smart Business

Multi-user Independence Sparks Innovation and Collaboration

Introduction[1]

In their effort to become more competitive, and to control their own destiny, communications service providers (CSPs) are going to great lengths to transform their infrastructure and operations. Their collective vision for becoming agile, responsive, programmable and innovative companies is grand. Sometimes their vision is too grand for more immediate challenges. It can take effort and mindshare away from more practical and immediate ways to improve business and operational performance. One such opportunity resides in the more humble product and service catalog. By building in elasticity to make the catalog more useful to a broader set of users, and adding sophisticated analytics to make it operate from a seat of intelligence, the catalog can become an important business driver—not simply a repository of data.

Of course, managing product and service lifecycles is not a simple task, either. In fact, the activity is becoming, like so much else in the communications business, incredibly complex. **Stratecast has determined that the answer to such complexity is to embrace it, incorporate it into one's processes, build it into the matrix, and learn to control it. The time has come to accept that complex problems require complex solutions. However, the same innovative spirit applied to creating complex solutions should be applied to hiding complexity from the user.**

The best catalog-based solutions for CSPs will be those that perform incredibly complex acrobatics on the inside; yet, take usability to a new level of simplicity on the outside; and extend that usability to a broad set of traditional and non-traditional stakeholders. The acrobatics driving highly functional catalog systems cannot be based on clever programming tricks that automate a few processes. They must be based on intelligence derived from broad, deep and immediate data analysis about customers, networks and products. Leveraging analytics will be a big change to building and operating catalogs; but it will also drive big change for the CSP business.

This report will examine these challenges and the options for addressing them. This report will also evaluate the market's latest approach to catalog-based lifecycle management: the Amdocs Catalog. The Amdocs Catalog focuses on something called business elasticity, which allows many groups to work within the catalog environment, independently and in parallel, or to collaborate. This includes a broader set of business users within the CSP, as well as their ecosystem partners. The catalog

[1] In preparing this report, Stratecast conducted interviews with:

- Amdocs – Ronit Soen, B2B Marketing Executive
- Amdocs – Ron Surets, Director of Product Management
- Amdocs – Doron Youngerwood, Product Marketing Manager

Please note that the insights and opinions expressed in this assessment are those of Stratecast, and have been developed through the Stratecast research and analysis process. These expressed insights and opinions do not necessarily reflect the views of the company executives interviewed.

continues to be an underestimated, yet essential, component of the new communications marketplace.

The Catalog

Each category of operations support has its internal debates: focus on virtualizing the network or staying physical; centralize operations or decentralize; build monolithic architectures or embrace microservices. The catalog sparks similar debate: should there be a single master enterprise catalog or many diverse interconnected catalogs—or, as is most likely, a combination of both? Either way, CSPs need to think about transforming in ways that make them catalog-driven organizations, whichever configuration is applied.

To be catalog-driven is to recognize a couple of necessities. First, CSPs, departments within CSPs, and ecosystem partners need to drive their businesses from common principals for how products are defined, built, tested, launched, and later altered or optimized. In other words, work from a common information model. Second, remember that in a catalog-driven organization that is responsive and adaptive, the IT department cannot be the sole proprietor of service creation and deployment.

The catalog is essential for housing product definitions, and maintaining their consistency and integrity across user domains. It also controls not only what products can be sold, but the terms and conditions by which they can be sold; and how they can be bundled, priced and discounted. The catalog may also manage and drive the integration with other fulfillment processes and systems.

Some of the challenges for catalog-based operations are long-standing, particularly in the areas of service innovation, bundling, special offers, feature compatibility, and order fallout. Other challenges are new, with the evolution of next-generation network architectures and the changing competitive landscape. These challenges include conducting full lifecycle management, supporting multiple internal users, resolving the inconsistencies of product definitions across partner dimensions, and improving responsiveness to new business goals.

Only through an efficient and flexible service creation and delivery environment, backed by deep intelligence and real-time decision making, will CSPs be able to address their biggest challenge: adapting quickly to change.

The idea of working across partner dimensions is an important one, as the very business model for CSPs is changing to one that is ecosystem-based. CSPs will be bringing products and services to market with and through their ecosystem partners; so, those partnerships will require equal access to the catalog environment, and the ability to operate within it, sans the decades of familiarity with its complex rules. Only through an efficient and flexible service creation and delivery environment, backed by deep intelligence and real-time decision making, will CSPs be able to address their biggest challenge: adapting quickly to change.

The Persistence of Performance Issue for Catalogs

The industry has drifted over the last few years, driven somewhat by the development of centralized management and orchestration needs of a virtual architecture. It has moved toward using an enterprise-wide catalog that acts as the single repository for all product information; into which other catalogs—to the extent they exist—would send their information. While this approach has many benefits in terms of consistency and providing a single source of truth for product information, it leaves the long-standing problem of integration unresolved. Different catalogs, and the systems that touch the catalog (order management, other fulfillment solutions, and the monetization process), must be kept in sync—so, managing system upgrades remains an issue.

This trend toward centralization continues; however, the logic for communicating between catalogs has changed. As CSPs expanded the number of over-the-top (OTT) partners, multi-play providers, wholesalers and channel partners in their service delivery ecosystem, the integration issue grew more unwieldy. As a result, pre-integrating catalogs has waned in favor of using application programming interfaces (APIs); as APIs have become more open, thanks in large part to the efforts of the TM Forum and contributing members of its Open API Program.[2] APIs help reduce the integration and synchronization issues between catalogs. However, there is still work underway to solve the catalog-to-catalog integration issue, which will be addressed later in this report.

What has not changed in catalog management, at least not enough, is the persistence of the following barriers to high customer satisfaction:

- **Non-Standard Product Definitions** – Among the multiplicity of ecosystem partners now involved in the service delivery lifecycle for CSPs, many have never heard of essential tools such as the Shared Information & Data Model (SID)[3] or other standards involved in the process. Some partners use different product definitions and nomenclature altogether. This makes it difficult to collaborate on bundled services in a fluid and consistent way.
- **Order Fallout** – Fallout rates for CSPs, which generate millions of orders every month, are still unacceptable. However, CSPs have learned, by dearth of choice, to accept it. The fallout rate for service orders has hovered at 5% – 25% for several years; improving only incrementally along the way. The hybrid network configuration that CSPs will be operating from, for the next decade or more, could reverse any gains they have made over the years; because the addition of another silo of management and orchestration systems is emerging for virtual networks, adding again to the complexity of defining new services.
- **IT-Driven Creation Process** – IT departments should not be disparaged for the way services are launched; any more than operations departments deserve the blame for how network elements have not always ideally communicated. Both teams work with the systems and standards they have. However, when it comes to knowing what end users want, what services should be bundled and how, what offers are most enticing, and which channels are

[2] TM Forum's Open API program is a global initiative to enable end-to-end connectivity, interoperability and portability across complex ecosystem-based services. The program is creating an Open API suite of standard REST-based APIs for integration among operations and management systems. For more information on the API Program, click here.

[3] The Shared Information & Data Model, now known as Information Framework, was also developed by the TM Forum. SID provides standard definitions for all the information that flows through the enterprise and between service providers and their business partners. For more information on SID and the TM Forum Frameworx suite of best practices and standards, click here.

preferred, marketing teams know better than IT.[4] Armed with this knowledge, they should have much more open access to the service creation and service definition environment within the catalog.

- **Time-to-Market** – There has been no other area within operations that has achieved improvement to the degree seen in the reduction of time-to-market. The industry has taken what used to be an 18-month average for new service creation and launch down to a couple of weeks—and even days, in many cases. Unfortunately, the benchmark for success keeps moving, as the near real-time, on-demand nature of the communications market continues to shrink the time-to-market window. Every phase of the product lifecycle has been commendably shortened; and every phase needs to be shortened further.
- **Low Visibility into Business and Operational Metrics** – Order fallout has long been the primary metric by which the fulfillment process has been measured, and customer satisfaction affected. Time, as mentioned above, is very important; but it runs a close second to fallout because it is easier to smooth over a time delay with customers than it is an order that is incorrect, and that results in rework or an unfulfilled promise. However, it is often difficult to point to the true cause of either delay; and even more difficult to know or predict the impact without deep visibility into both operational metrics and business metrics. The catalog and its processes need to broaden the focus to include deeper business metrics.
- **Applied Intelligence** – Traditional metrics that measured operational performance for the catalog, fulfillment process, and overall lifecycle management have provided visibility into what happened across some process to negatively impact a service request. These metrics seldom answered the "why" question or included a customer or business impact analysis at a meaningful level. And they certainly did not provide evidence-based analysis resulting in recommendations for alternative offers or personalized approaches. Going forward, CSPs need to apply the latest technologies for developing and executing on intelligent, personalized alternatives to service customers.

A smooth fulfillment process and successful product life-cycle management effort begins and ends with the catalog. Not only do the definitions and processes within the catalog need to be consistent across internal departments and lines of business, but also in sync with surrounding OSS and BSS, including external partner catalogs and ordering systems. Only then can intelligence be applied to the degree that is a must.

Catalog-to-Catalog-to-ODAM Integration

Proceeding on the assumption that although there may be a central, primary, enterprise catalog that contains most relevant definitions, pricing schema, bundling options, etc., it is safe to say there will never be one uber catalog, like there are uber-inventory systems. Currently, many specialized catalogs exist in many parts of the network. **To address the important component of synchronization across catalogs and between catalogs and Operations, Orchestration, Data Analytics & Monetization (ODAM) solutions, the TM Forum has launched an initiative on catalog-to-catalog integration. However, improvements in catalog-to-catalog integration**

[4] It is expected that, one day, AI will know better and faster than the marketing team, causing CSPs to revisit the process once again.

may have the unintended consequence of increasing the number of catalogs in play across the ecosystem, rather than consolidating them.

For example, partner catalogs that are comprised of service components that work with many other industries besides telecom will be an important part of the emerging platform approach to service delivery. Partners trying to shoe-horn their catalog definitions into the CSP catalog platform, and then be forced to do likewise for the other industries they partner with does not make sense. Take, for example, a specialized GPS device that is sold as part of a mobile business application by CSPs, but also sold by another industry to, say, an environmental sciences organization. Integration, not customization, is the way to get such a product into multiple catalogs, so it can be offered in all applicable markets. The CSP and GPS provider should not have to re-create a new common information model with which to build their service. The two catalogs should simply share what data they need.

The catalog-to-catalog integration effort is part of the TM Forum's Catalog Management project. For now, the project disseminates business oriented use cases to test and refine Aggregate Business Entities (ABE) within the forum's Information Framework. Members of this group are creating new catalog APIs to help a broader set of catalogs share information in a common format.

Currently, the group is working on assessing business-oriented use cases that would drive demand for Entity Catalog APIs, which support dynamic API operations investigating the usage of JSON-LD.[5] The group is also working on Entity Catalog API specifications, incorporating entity catalog API modeling capabilities into the Information Framework, as well as product, service and resource catalog API specifications. TM Forum has ten lightweight REST-based APIs used for connecting complex management systems such as billing, catalog management, service level agreement (SLA) management and policy control. Participants in a recent Catalyst project at the forum used the APIs, including the Catalog Management API, to integrate a catalog with ordering, orchestration and monitoring systems in near real time.

Amdocs is working with the TM Forum and others on these specifications to improve catalog-to-catalog integration. The following information explores the company's new catalog.

Amdocs Leverages New AIA Platform to Bring Intelligence and Elasticity to the Catalog

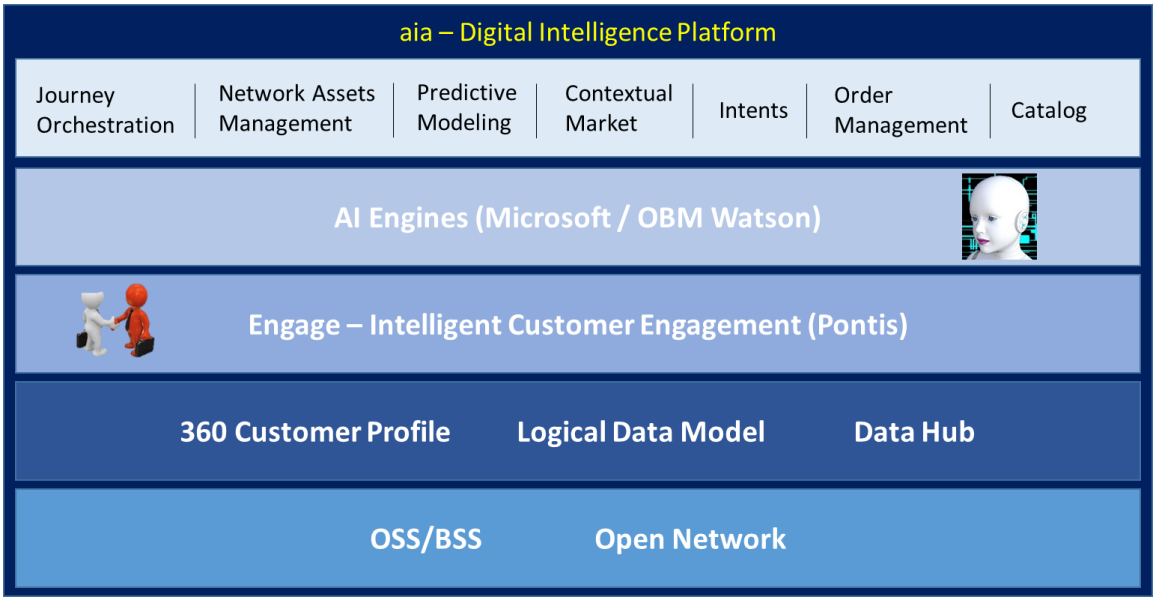
With the launch of the Amdocs Catalog, Amdocs addresses many of the concerns raised earlier in this report over integration, usability, visibility into both operational and business metrics, and most of all, intelligence. Preceding this launch, Amdocs introduced its AIA intelligence platform in February at Mobile World Congress. Amdocs created AIA to inject intelligence across the CSP business. The platform will incorporate machine learning, artificial intelligence, big data analytics, and purpose-built analytics to provide deeper insight into every part of the business that Amdocs touches. While some in the industry are skeptical of AI's applicability, and concerned over an implied loss of operational control, Amdocs embraces the technology as the work-in-progress it is. However, AI already has applicability to telecom operations today, particularly in voice recognition,

[5] JSON (JavaScript Object Notation) is a lightweight data-interchange format. It is easy for humans to read and write, and for machines to parse and generate. JSON-LD is a lightweight Linked Data format that helps JSON data interoperate at Web-scale. It is an ideal data format for programming environments, REST Web services, and unstructured databases such as CouchDB and MongoDB.

and will continue to expand that applicability across Customer Care, network and service management, marketing, and the business itself.

AIA is a cross-domain platform that leverages the company's Real Time Data Management platform. The data management platform consists of the Amdocs Data Hub and the Amdocs 360 Customer Profile. The Data Hub is a scalable, Hadoop-based data management platform that enables CSPs to extract, integrate and visualize diverse data sources, to enable data-driven decision making and analytics. Amdocs 360 takes a holistic approach to providing a view of the customer, based on all relevant and available data, as shown in Figure 1.

Figure 1: Amdocs AIA Serves Functions across the Business



Source: Amdocs/Stratecast

AIA also leverages partnerships with IBM and Microsoft (for now just tied to voice recognition); and the analytics capabilities of its September 2016 acquisition: Pontis. Pontis provides digital engagement solutions, real-time decision-making and machine-learning technologies that combine to offer personalized services based on the context of a customers' journey with the CSP. This is also known as "journey management." By context, Amdocs means that through Pontis, now known as Engage, CSPs can reach out to customers with personalized next-best-action and next-best-offer strategies based on intelligence-derived location, propensity, and relevance-in-time. Below is an example of how catalog and intelligence work together to meet an important challenge.

The Challenge: Data for Analyzing Customer Offerings is Scattered

Data on the performance of bringing new customer offers to market is scattered across distributed systems. There is no single view of customer data, making the task of comparing current data to historical data tedious and time-consuming. By the time information is compiled and understood, it may already be irrelevant. Marketers are too often acting in the dark when building a CSP's most important assets: customer offerings, bundles and promotions. Marketers are too overwhelmed by operational tasks to focus on their more important contributions in creativity and innovation.

The Solution: Catalog driven AI

Tracking and analyzing catalog data must be a continuous process, which loops lessons learned back to marketing teams for use when defining customer offerings, applying discounts, pricing, bundling, or terminating customer plans. AI should expand the view and sharpen the focus of these marketing teams by providing comparisons to past data, analysis of how offers have performed compared to targets, trend analysis, and better ways to monetize data from the CSP BSS systems. Catalog AI will highlight the right channels and segments, assist with pricing recommendations, and set expectations for meeting and exceeding business targets.

To get a sense of how this works within an intelligent catalog, consider the following scenario:[6]

> *Last night, a CSP's competitor launched a new triple-play bundle, special summer promotion. The CSP Marketing manager arrives at work in the morning and opens the catalog intelligence module to track how the company's offerings are doing. He sees that the number of new subscribers declined. Predictive analysis showed that if no action is taken, the decline would likely steepen.*
>
> *The marketing manager drills down and finds that social channels and online activity was hit hardest. The Intelligence Module recommends a discount be added to a similar bundle in order to match the competitor's newly discounted rate. With a single click, the manager applies the recommendation and ensures that the marketing team is able to compare performance before and after applying the promotion. The new offer is updated in the catalog, and the new price is visible to the agent in the call center and retail stores. The intelligence module also recommends increasing social-channel distribution to match the competitor's promotion visibility on social channels. The intelligence module then continues to track offers with real-time visibility, automatically triggering data analytics.*

Intelligence was applied at every step in the process, and initiated the ongoing data analytics process to measure the performance of the new offer.

This was an example of journey management orchestration during a single interaction. The same process will be played out across the customer lifecycle of Customer X. How successful scenarios like this are will tell the tale of the efficacy of AI in solving real-time operational problems. Theoretically, the more information an AIA-driven system develops over time, the more successful it can be. As long as the CSP does not employ these skills in a way that either is or appears to be manipulative, it will be viewed as a positive experience.

Sharing the Intelligence and the Creativity of the Catalog

If AIA were applied to discovering people's propensities around intelligence itself, the system would find that people have a propensity to horde intelligence. When embroiled in competition, hording is probably a good idea. However, internally, organizations should be more inclusive with regard to who can leverage the information. When it comes to launching new products, CSPs need to expand access to the product catalog, and equip marketing teams with the tools they need to focus on service creation.

The result of creating a catalog that is more open and easy for non-technical (other than IT and engineers) personnel to get involved in the service creation and definition process, is business elasticity and agility. This allows CSPs to better adapt to change in the market and

[6] This scenario was described by Amdocs, and edited by Stratecast for space.

trends in customer demand. Open, elastic catalogs are sure to become a trend. The bigger benefit comes from providing the independence within the catalog that all users need in order to experiment, get creative with bundling and offers, and test on their own.

To this end, Amdocs has created a role-based user interface called the Catalog Design & Management Portal, which allows users to adopt tailored personas and interact with the catalog in ways that best suit their needs and abilities, independent of what others are doing within the system. CSPs can build persona-based user interfaces for partners, resource managers, enterprise administrators, marketing managers, IT technicians, and others. These users do not have to go through the IT department to get services and offers created, or to make changes to existing offers.

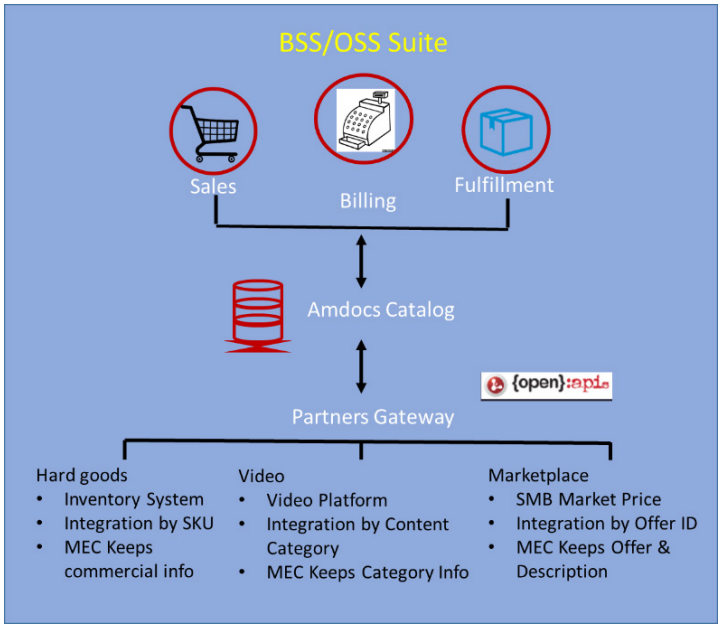
The concept of independence is important to these other stakeholders. Independence means more than having one's own interface. It also allows users:

- To leverage the automated testing and quality assurance features of the catalog
- Use guided flows that ensure a proper configuration, rather than relying on customization
- Collaborate when they need to with other personas
- Circumvent the waiting list created by too many other IT requests

Using the approved access and tools for their personas, users can create and test their offers without altering the product models or definitions—which protects the consistency and compatibility with existing services. No matter who is using the system, the complexity of BSS and OSS systems are abstracted, and service can be launched across all channels simultaneously.

Collaboration is as important as independence when building new services. To facilitate collaboration, Amdocs built a parallel model that allows multiple teams to create new services at the same time. Teams work and test in parallel, in a segregated mode, without impacting other teams. In the collaborative environment, teams can share results and feedback in real time, as seen in Figure 2.

Figure 2: Federated Design Allows Simple Partner Onboarding



Source: Amdocs

In addition to internal collaboration, the need to collaborate with partners will continue to grow. Making it easy to onboard partners will accelerate the process. Sharing resources in a federated manner with partners, allowing them access to OSS and BSS systems will both maintain consistency across the operation and make it easier for partners to engage.

Onboarding partners this way for collaboration turns the catalog into a marketplace for service creation, and supports bundling of service modules across CSP and partner domains, even if the partner works from a different business model. Also making the process faster is the reliance on APIs rather than catalog-to-catalog integration, or catalog-to-OSS/BSS integration. For deployments requiring integration, Amdocs is developing an Integration Gateway.

But How are We Doing?

A significant challenge to building different personas, and allowing partners to use them in order to access the magic within the catalog, is maintaining visibility into how services, plans, and other offers perform in the market. This comes back full circle to the intelligence-driven catalog. CSPs need auto-generated business analytics from continuously refreshed data, to understand how their processes are performing and what the effect is to their business. They need predictive capabilities and the ability to present and execute on actionable recommendations. The systems must know, and be able to relay in real time, knowledge about which channels are the most successful in reaching the customer, as well as the context in which customers take up or reject an offer. These lifecycle management capabilities for products, offers and customers, are built into AIA, which feeds directly into the Amdocs Catalog and other systems.

Stratecast believes that the attributes described here take the catalog to a new level of importance within telecom operations; and that, as machine learning, AI and other analytics tools evolve, the catalog will become increasingly important.

Stratecast
The Last Word

Open collaboration to drive innovation, without the need to rely on the open source community: what a concept. As demonstrated in the capabilities of the intelligence-based, open catalog, there is still plenty of room for innovation within the telecom environment—even the legacy environment. This becomes more apparent when CSPs are allowed to work closely with their partners to create new offers, and find new takes on existing services by bundling their distinct capabilities.

Products such as an open, intelligent catalog also demonstrate that CSPs do not have to wait for the next generation of networks (NFV, Cloud, IoT, 5G) to unleash their inner innovator. The application of intelligence, derived from different sources, also speaks volumes to the ability of analytics to make a difference to the business of telecom. Once users of machine learning, artificial intelligence, and other purpose-built analytics applications figure out what they need to know about their products and services, customers, and business trends, there is no limit to the ways CSPs can improve the way they deliver services, satisfy customers and operate a profitable business.

There is always the danger of growing dependent on intelligent tools. And there is special concern over the inability of AI tools to be interrogated in order to understand how they came to certain conclusions. However, the industry is not there yet. The industry would be foolish not to explore what it can learn at this stage of analytics. Besides, any tool that promotes cross-domain, cross-industry collaboration is a tool worth using.

There is a lot of talk from the TM Forum and, of course, from catalog providers, that the industry needs to be catalog driven. Stratecast agrees, especially as intelligence and elasticity are built into the catalog, bolstering CSPs' ability to react to change, and eventually to drive it.

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About ODAM

The processes and tools that communications service providers (CSPs) have utilized to run their businesses have changed over time. More than a half-century ago, CSP network and business management processes were manual (OAM&P). As CSPs evolved over the years, so did the operations support systems (OSS) and business support systems (BSS) that address CSP business and network management needs. In recent years, the lines between OSS and BSS have become less clear, with much overlap. In addition, the roles in which OSS and BSS operate have expanded beyond traditional boundaries. As such, Stratecast now uses the term Operations, Orchestration, Data Analytics & Monetization (ODAM) to encompass both the traditional OSS and BSS functions and the new areas in which business and operations management must now work together, including virtualized networks and telecom data analysis.

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