



## White Paper

# Personalized Service World Demands Adoption of Actionable Customer Intelligence



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## Executive Summary

In order to deliver new, compelling, revenue generating, customer satisfying services, without overloading networks and without costs running out of control, network CSPs need to find new ways to manage their operations. They need to ensure fine-grained control of the services they provide, and they need to be able to make decisions and investments that are grounded in an in-depth understanding of all critical aspects of their businesses.

Harder still, CSPs increasingly need to be able to make decisions and react in real time. They face an environment in which customer satisfaction is ensured over periods of seconds, not days and weeks. They must be able to leverage the data that resides in a multitude of systems, make that immediately accessible, and use that data to generate insight and take actions that can help drive their business.

However, most CSPs across the globe suffer from real-time decision-making challenges. Most operational decisions are either made manually – which tends to be subjective, sub-optimal and not necessarily compliant with corporate policies – or they're hardcoded inside the BSS/OSS application, which means they are not dynamic and cannot keep up with changing business environment.

To solve this problem, CSPs need real-time actionable insight and decision-making capability that can improve and streamline their business processes to help them achieve not only their holistic end goal of profitable growth, but also secondary goals around customer experience and network efficiency, thereby reducing customer churn.

It is paramount for CSPs today to go beyond building a consolidated view of subscribers from different data sources, and to have the ability to convert those decisions and real-time insight into pre-defined measurable actions. This will drive profitability by helping CSPs to launch more personalized services and targeted promotions, dramatically increasing the success rate of these campaigns.

What CSPs need today are nimble back-office systems that can react in real time and help them to perform fundamental tasks such as:

- Creating innovative new business models
- Maximizing the value of network resources
- Acting on deeper subscriber and network insights in real time
- Simplifying and personalizing the subscriber experience

This paper explores in depth the problems that CSPs face in the absence of real-time insight, and how a new approach called **Actionable Customer Intelligence (ACI)** can help CSPs transform their business. The paper will also discuss potential applications and practical use cases of ACI and discuss HP's ACI solution.

## CSPs Lack Real-Time Actionable Insight

For CSPs to succeed in this hyper-competitive communications marketplace they need to first know their subscribers, understand how they use their services, be able to deploy innovative business models that maximize revenue with the ability to control allocation of their network resources. None of the established software solutions in BSS/OSS truly capture these requirements in their entirety, but only address some pieces of it.

Typically what we see today is CSPs and vendors trying to fit their customer experience and subscriber intimacy messages by stretching their existing solution's boundaries. Disparate BSS categories create integration bottlenecks. Fractured applications, minimal documentation and spaghetti code make it nearly impossible to re-engineer these systems to be completely integrated. The day-to-day operations also totally depend on these legacy architectures. However, these challenges become a bottleneck to the rapid rollout of new products and services to the market.

What is needed today is to tear down excessive layers within BSS modules by creating integration of key functional elements that can provide insight and subscriber visibility to CSPs and support end-to-end business processes. We believe it is time for a few traditional solutions – such as charging, policy management and subscriber data management (SDM) – to merge and be closely aligned with predictive analytics to capture the needs of the market more effectively.

Telecom CSPs have traditionally operated with complex, disparate silos of data, with useful information residing in customer relationship management, billing, inventory, provisioning and fulfillment, service management systems; network elements, element and network management systems, probes, deep packet inspection devices, application-specific databases and elsewhere. They also have different systems in different generations of network architecture, each holding different types of data, in different formats.

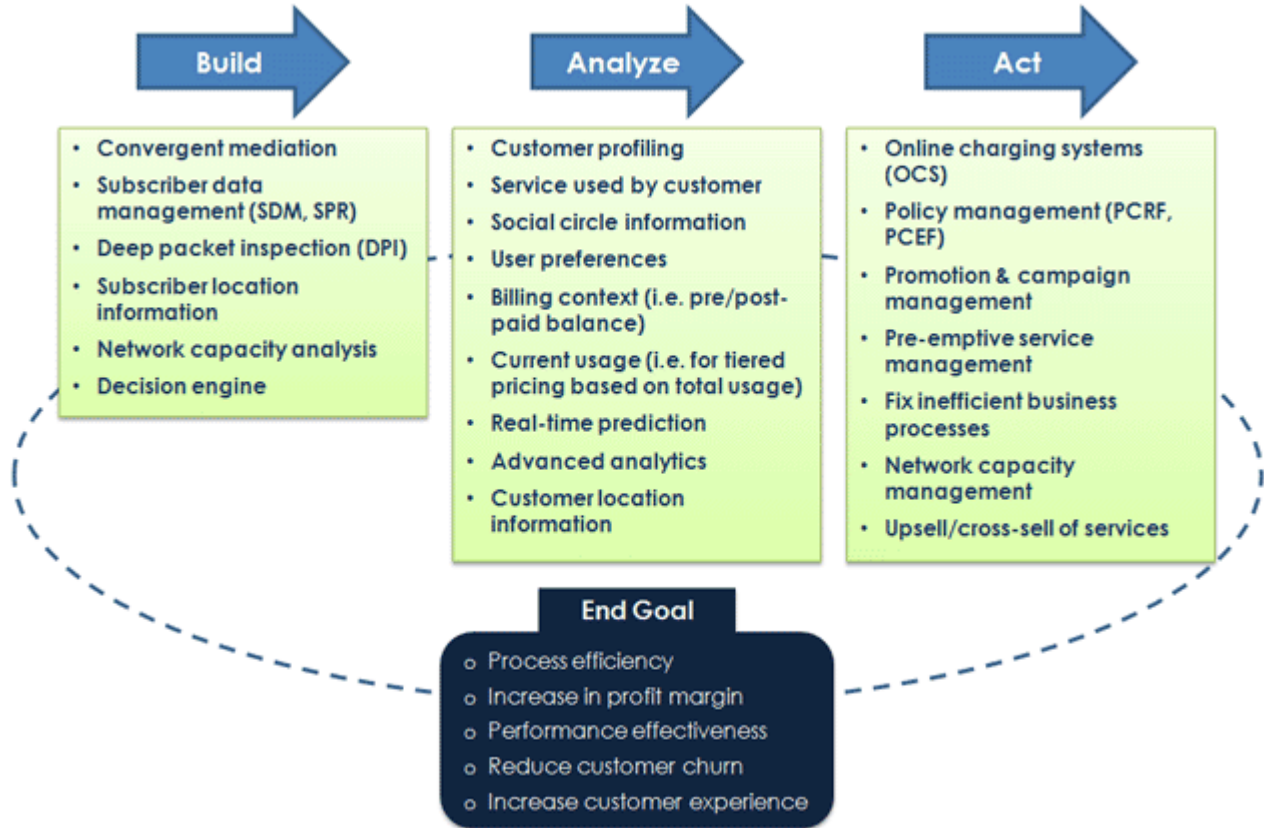
Most of these systems lack their own analytics application and do not have an end-to-end view of subscribers. Unifying subscriber information from different sources is critical for CSPs to achieve their goal of customer centricity, and for that they need a solution based on close alignment between SDM and advanced analytics. Typical integration efforts and a piecemeal approach to analytics have only allowed analysis of data from multiple systems to be done in offline mode in order to identify trends, patterns and behaviors.

However, this approach has severely lacked real-time analysis triggering actions and operations across business processes. We believe that customer centricity and profitability hinges on three pillars: efficiency, insight and performance. Profitability, customer churn reduction and increase in wallet share hinges on obtaining a coherent, current and actionable view of a CSP's entire business. As illustrated in **Figure 1**, the correct technology combination surrounding build, analyze and act has the potential to create profit for service providers.

In a world where more and more customers interact and talk about their experiences and issues online, online brand management has become big business. CSPs that ignore what customers say about them in unstructured environments risk swift and widespread brand damage. Making sense of structured and unstructured data to understand the mood and transaction pattern of customers in real

time is therefore critical, as is social network and sentiment analysis. This will help CSPs to take preventive actions so that they can avoid churn or customer dissatisfaction by providing targeted promotions or pre-emptive service assurance.

Figure 1: Build, Analyze & Act to Create Profitability



There is a need for solutions that can combine customer usage and subscription data with insight into the network, cost, revenue, supply chain, stock control, customer mood and customer preference data to trigger specific actions that help enhance the customer experience.

## Fluid Data Integration for Actionable Intelligence

Fluid integration of data sources can help service providers to take a pre-emptive, result-oriented approach to overall experience management for their high-value, demanding customers. Personalized offers can also be tailored according to location, with location-specific offers (and even time-sensitive, short-term services) made available to encourage migration to new packages, new networks, etc., and to reduce pressure on networks in those locations.

The need for real-time insight also applies in a customer call center setting. Existing call centers need real-time insight, which becomes all the more critical in the context of HSPA+, LTE and WiMax, because of the influx of more devices and the complexity and volume of transactions. In fact, just extracting the data from individual point solutions – e.g., to support decisions about how to respond to a customer enquiry, or how to manage different customers' traffic in an overloaded cell – has historically been challenging to do in real time, let alone taking action and enforcing business policy – automatically, intelligently and in real time.

Given the challenges CSPs face, the ability to draw on that data and to gain the required insight in real time is increasingly important but very difficult to achieve. CSPs' ability to leverage all the information at their disposal will be limited without an overarching system that can provide access to relevant data, enable analysis of that data, take actionable decisions or tell end users what they need to do.

Traditional business intelligence and data warehouse solutions have tried to bridge the data integration gap by trying to consolidate different data sources in a centralized warehouse. They have used extraction, transform and load (ETL) tools to load the data from different data sources into a warehouse, normalized the data and used business intelligence tools to analyze the data.

This offline data analysis has been typically used for reporting, planning, etc. purposes. However, the major gap that always prevailed is translating those analyses into real-time actions and operations, which impacts operator's business processes. CSPs today are looking for solutions that can integrate and analyze operational data in real time, and based on that be able to optimize and trigger actions that influence their business processes.

What is needed by CSPs today is to be able to build a single, easily-viewed and secure customer profile by analyzing all the collected subscriber related information using trend and predictive analytics. To achieve this, it is critical to transform the single, smart customer profiles into better policy management decisions and targeted promotions to lower churn. Harvesting customer data provides CSPs the opportunity to strengthen customer relationships and gain competitive advantage. It helps CSPs to effectively monetize enriched services, conduct targeted promotions and campaigns, control congestion and offer virtual profile exchange with third-parties to enhance their position in the value chain.

This type of solution needs to be a closed-loop, self-learning system that observes and absorbs what is happening in the service provider's environment, understands what it means for service provider's business and is able to take actions and enforce business rules automatically in real time. We call this **Actionable Customer Intelligence (ACI)**. In the next section, we explore how ACI can help CSPs transform their business, and how it differs from traditional business intelligence solutions.

## Introducing Actionable Customer Intelligence

For service providers to be successful and profitable, it is important that they build a single, trusted customer profile, analyze for insights and act for better business outcomes. Operator's business decisions need to be automated and intelligently optimized for streamlined operational decision making. It is also extremely critical that for achieving superior customer experience via continuous improvement of business processes the underlying solution fabric should be dynamic in nature and be able to absorb and contextualize data from the environment constantly.

We believe it is time for a new breed of solution to emerge that can underpin an actionable approach and bring together network and IT data to deliver meaningful, integrated insight when and how users need it most. The solution's sole focus should be to drive business forward, enable intelligent decision-making, integrated responsiveness and timely action.

Through intelligent data collection, discovery, predictive analytics and action delivered in real time, CSPs will be able to: improve customer intimacy and loyalty; increase average revenue per user through new services and applications and higher usage; reduce opex through improved network management and churn prevention; achieve superior retail and wholesale business results; and engage in a compelling way with OTT providers in the spirit of cooptation.

We define ACI as an intelligent, self-learning solution that can build a single, trusted customer profile, analyze it for insights and take actions based on the analysis of that data in real time. As a service provider's environment is not only restricted to their own internal systems, ACI needs to consider external factors such as social media, blogs, competitor's activity, etc., while making operational decisions. Some key areas where use of ACI can be critical include:

**Enhance offer effectiveness:** ACI can suggest offers by matching customers with offers that have been successful with similar customers, or based on an analysis of the customer's context (device, usage, rate plan, etc.). Strategically tying policy, charging and SDM with predictive analytics, ACI can bring unprecedented benefits to service providers. By correlating transaction data with subscriber policies and an end-to-end view of their profiles and social relationships, ACI can generate different pricing schemes and targeted promotions for each customer, which will help optimize pricing by time, geography and customer profile.

**Real-time capacity management:** As services are introduced, and as self-optimizing wireless networks readjust themselves constantly, CSPs will be forced to undertake proactive real time analysis of their capacity and have the right tools and insight to mitigate RAN, access and core network congestion. ACI can play pivotal role in this context by being able to receive real-time feeds from network and back-office systems and adjust customer's services, rate plans, tiers, etc., so as to help CSPs maximize revenue from network assets.

**End-to-end visibility for new product roll-outs:** New services place unexpected demands on networks. ACI can undertake proactive fault finding, rectification, planning, optimization and customer management to ensure the success of new product or service launch. When a product or service has already been launched by an operator in one geographical region, CSPs can apply the experience of that deployment to contextualize in real time the management of the new service deployment elsewhere.

## Competitive Market Dynamics Force Change

Flat-rate pricing models relegate operator's to bit pipe providers and also misrepresent how consumers construe the value of their service provider relationship. For example, a typical broadband subscriber does not equate the amount of bandwidth delivered with the degree of value. Rather, the subscriber thinks in terms of the services enabled, applications delivered and content made accessible on his or her particular broadband device. And given that CSPs generally are not the direct providers of the points of value to which consumers pay the most attention (that role is occupied by players such as Google, eBay, Apple, Amazon, Netflix, RIM, etc.), service providers must reposition themselves. Their value is not solely in being a provider of bandwidth; it is in being an enabler of services.

To maximize the revenue opportunity, CSPs need to personalize their service plans around specific consumer activities and behaviors such as video sharing, online gaming or live content streaming, and promote them accordingly. To avoid being marginalized as bit-pipe carriers, service providers need to be able to create customer loyalty, provide optimum customer experience, implement innovative, tiered business models and monetize them.

In a recent survey conducted by *Heavy Reading*, we asked 100 global service providers to rate their key business priorities in year 2010 and 2014. **Figure 2** illustrates key highlights from that survey, showing the trajectory of CSPs' evolving business priorities.

**Figure 2: CSPs' Evolving Business Priorities From 2010 to 2014**

	2010	2014
Churn reduction	Very high	High
Time to market	High	High
Business flexibility	High	High
Personalized service creation & delivery	High	Very high
Simplify business operations	High	Medium
Customer experience	High	High
Customer loyalty creation	High	Very high
Opex reduction	High	High

Source: *Heavy Reading*

The survey highlights some critical facts. Rather than the defensive mechanisms of trying to reduce customer churn, opex reduction, etc., in 2014 CSPs are planning to focus more on offensive mechanisms such as providing personalized services and creating customer loyalty. Simplifying business operations is a key endeavor for CSPs currently, and the assumption today is that by 2014 those processes will already be streamlined, so there will not be a big need to focus on that.

The key underlying theme that gets highlighted is the transition in focus from operational efficiency in 2010 to the theme of providing superior customer experience and personalized service offerings in 2014. It is obvious that for service

providers to meet their business objectives and achieve the goals of customer centricity, they need to adopt software systems and hardware implementation that promote control, monetization and visibility.

With the inherent value of reusing a common approach and software architecture base for new services across mediation, real-time charging, policy and business intelligence, an end-to-end view of subscribers will provide service providers with a future-proof solution stack, common semantics and data models that can help them significantly reduce integration and maintenance costs.

ACI encompasses critical software components such as mediation, SDM, policy management, promotions, analytics and real-time charging. ACI injects intelligence into the service provider's infrastructure and provides them with real-time actionable insight and visibility into their subscriber behavior. The goal is to provide CSPs with unified solution suites that address multiple areas across previously siloed product solutions.

A popular service does not always mean a profitable service. As one example, a certain European CSP launched the iPhone with a family plan that allowed minute sharing, among other features, as part of a Christmas promotion. The campaign was a tremendous success, but it had a negative side effect: On Christmas morning, the CSP's network crashed as all the people who got the iPhone as a gift opened it up and started making voice and video calls, downloading apps, etc.

This CSP obviously did not predict how such a successful promotion can negatively affect their network and overall profitability. CSPs need to have flexible, integrated underlying systems that not only help them launch innovative services, but based on visibility and insight help convert that popular service into a profitable service.

In *Heavy Reading's* view of ACI has the potential to bring major advantages to service providers. CSPs have spent billions of dollars in upgrading their systems and are not looking to rip and replace their existing BSS systems, but want to layer real-time control, billing and insight into subscriber behavior on top of what they have. Service providers are increasingly looking for mechanisms such as real-time mediation, policy management, SDM and online charging to handle the need for visibility and real-time transactions.

Policy control, mediation, SDM, analytics and online charging need to work closely together to support a variety of functions, including restricting access to services, QoS, network security and insuring that subscriber privacy preferences are respected especially where traditional telecom CSPs are allowing third-party access to subscriber data. The types of data usage today on smartphones means records have to be gathered in real time, and rating and analytics also must be real-time enough to identify trends for providing personalized offers and launch-focused marketing campaigns.



## Key Ingredients of an ACI Solution

The pieces that are necessary by service providers to enable new charging models might vary depending on the service provider's particular vision, but there are a few elements that generally must be in place. These are:

**Real-time data collection & processing:** Service providers must have intelligence gathering mechanisms at both the network and software layers in the form of data and voice mediation platforms, deep packet inspection devices that inspect, extract and enrich subscriber and application data.

**Policy enforcement & control:** Service providers must have a policy management element in place that serves as a rules repository for subscriber- and application-specific policies, as well as provide controls for bandwidth management and congestion control. For providing tiered charging models, the policy management element must be able to query and interface with real-time online charging and rating systems.

**End-to-end view of subscriber, profile, usage and their services:** A unified view of subscribers, their services, their profile, entitlements and historical interactions for use in real-time decisions and analytics.

**Subscriber authorization and monetization:** Online charging systems should be able to process transactions in real time and help service providers capitalize on real-time intelligence and customer insight. Service providers need to be able to tap into and make informed decisions based on their subscribers' context and usage information.

**Personalized promotion and effective campaign management:** Dynamic real-time or near-real-time offer management capability based on subscriber network usage and traffic-based promotion, loyalty points, event-based promotion and rules-based promotion will be critical for an operator's revenue-optimization strategy. Real-time analytics solutions offer key benefits in business areas of concern, such as marketing campaigns, contract negotiations, churn management, customer loyalty and operational processes.

## Vendor Analysis: HP's ACI Solution

HP's ACI solution brings together some of the fundamental technology components that help CSPs to build, analyze and act on real-time customer profiles to help them grow revenues through personalized services, optimized networks, targeted promotions and partnership with OTT players. HP's ACI closes the gap between subscriber, usage and network data through the combination of unified subscriber profile, mediation analytics, promotions and policy management.

HP ACI's solution is based on concept of **Build**, **Analyze** and **Act**. Let us briefly take a look at the technical building blocks of HP's ACI solution.

### Build

The customer experience is evolving in response to subscribers' expectations for anytime, anywhere access to content, communities and personal connections – regardless of the network or device they are using at the time. This includes:

**HP Subscriber Data Management (HP SDM)** solutions help correlate and manage subscriber data – including identity, status, preferences, behavior and social profiles – through the use of sophisticated, network-ready enablers, products and complete solutions. HP SDM simplifies network management and improves the customer experience by building a single view of the subscriber across domains, devices, applications, systems and environments. This single view enables CSPs to better know their subscribers and apply policy decisions that lead to higher levels of service, in order to help reduce churn and generate new revenue streams.

- **HP Mobility Management (HP MM)** puts personalized communication at the center of the service delivery environment, by consolidating the dispersed real-time profiles of mobile subscribers into a single, scalable database with high data integrity and a small footprint, addressing both Home Location Register (HLR) and Home Subscriber Server (HSS) needs.
- **HP Smart Unified User Profile (HP S-UUP)** enhances the overall subscriber experience with up-to-date, coherent views of individual user profiles, using data from core network elements, IT systems, application silos and even external environments.
- **HP Location Management Access & Positioning (HP LMAP)** provides a personalized experience based on subscriber location. HP LMAP solutions provide accurate positioning information in conjunction with location management. This allows service providers to deploy commercial and emergency location-based services.

**HP Internet Usage Manager (HP IUM)** offers convergent mediation for complex, real-time, multi-technology event collection and processing for offline charging. The solution serves converging markets such as voice, data, broadband, ADSL, cable, VoIP and IPTV.

### Analyze

**HP ACI's RealTime Profiling and Analytics (HP RTPA)** vision is to provide the real time insights to the consumer's behavior, interests and services consumption allowing both the consumer and CSP to strengthen their relationship through joint, timely interaction. HP RTPA portfolio offers the leading edge capabilities of tools, services

and end-to-end solutions to service providers by leveraging industry leading expertise in the areas of real-time analytics, massive processing analytics databases, business intelligence, network management and delivery of real-time actionable solutions.

## **Act**

**HP Policy and Charging** provides a holistic approach that extends across the subscriber, network and policy domains, bridging network and IT for making effective policy and charging decisions. HP's Policy and Charging solution components include policy definition and control, promotions management and real-time charging collaborating with policy enforcement functions to ensure flexible control of valuable network resources.

**HP Subscriber, Network and Application Policy (HP SNAP)** solutions provide a unique approach to making policy decisions based on network and IT resources, using subscriber and application information in real time to flexibly addressing key issues including control of bandwidth consumption and congestion, control of network access, subscriber spending control, operator and subscriber optimized service pricing and direct marketing of promotions to targeted subscribers. HP SNAP consists of a policy manager, promotion/campaign management and real-time charging.

**HP RealTime Charging** delivers charging control and session management to instantly authorize and charge for services in existing and next-gen networks. HP RealTime Charging handles various charging scenarios and service growth with benchmarked high performance and scalability on cost-effective HP platforms.

## Conclusions

In order to remain relevant as a value-added service provider in today's digital world, service providers need to capitalize on real-time intelligence and customer insight. They need to be able to make better informed decisions by tapping into subscribers' context and usage information, and their underlying software infrastructure needs to be able to support initiatives to deliver and monetize new, personalized service offerings.

In the last few years, the communications marketplace has witnessed sweeping changes and has become extremely competitive. A new breed of competitors in the form of over-the-top content and application providers have shaken the dominance of network CSPs that have rapidly threatened to disintermediate CSPs and their value in the ecosystem.

What network CSPs need today is to have an end-to-end view of their subscribers and their usage patterns, to quickly deploy innovative business models that help them to maximize their revenue, and to control the allocation of their network resources intelligently and efficiently.

In this context, HP's concept of ACI makes practical sense, because this solution succinctly captures immediate needs of network operator's requirements enabling them to balance bandwidth and network resources with the need to execute on their personalization and customer experience strategies. Software components in this category can provide CSPs with a solid foundation that will help them to create new pricing models, launch aggressive promotions and loyalty points, deploy new services, optimally utilize network resources, and streamline user experience for ordering, provisioning and interacting with existing services.