Using Digital Identity to Drive Personalization, User Experience and Monetization

An Operational Practice Prepared for SCTE/ISBE by

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Introduction

Gartner stated: "By 2020, customers will manage 85% of their relationships with enterprises without interaction with a human." User identify will be key to such digital interactions and the Digital Service Provider (DSP) that manages this identity will also need to stitch together these different interactions to create the personalized user journey. This journey will bring together digital technologies, the digital customer and the digital economy. Figure 1 below depicts the different components and characteristics of the future DSP which will play a key role in realizing Gartner's prediction.

Digital technologies

- Cloud
- Network – 5G, NFV
- Open APIs
- Service creation
- AI
- Analytics, Big data

intelligent DSP

Digital customer

- In control
- Always connected
- Channel of choice
- Social
- Self-service
- Apps
- Consumer or enterprise

Digital economy

- OTT
- Content
- IoT
- Financial services
- Advertisement
- Healthcare

Figure 1 - Digital Service Provider

Today's digital providers like Google, Microsoft, Alibaba, and Amazon understand how to utilize user identity via a username and password that enables them to access a user's personal information. The user ID enables them to personalize services, create innovative monetization models, and deliver great user experiences where consumers can purchase and consume digital goods, wherever and whenever they want.

Communications Service Providers (CSPs), which for the purposes of this paper also includes Multi-System Operators (MSOs) and cable operators, typically manage their relationships and interactions through a physical street address without much understanding of individualized usage. As an example for cable operators, a single address would have all or some of the family members watching the same TV in the living room or sharing the same broadband connectivity, with the operator not knowing which family member actually interacted with the service. But with the evolution of digital TV and personalized connected devices, each member of the family can watch TV or connect to digital applications via the internet using their own personal or shared device, such as a set-top box, a game console, a streaming media stick, or a tablet.

Today's viewers expect a more personalized video viewing experience. MSOs and cable operators need to implement capabilities to better understand who the users are in order to provide smarter personalized experiences– for example, knowing the user's digital video recording (DVR) history, favorite channels, preferred genres, favorite actors and actresses, or the next episode they've queued up to watch. All of this contributes to a more satisfied audience.

The transformation from a CSP to a DSP providing personalized digital experiences will require a change in the way CSPs engage their customers as well as their business partners. Every video or broadband interaction, promotion, trailer, advertisement, landing page etc. should be captured and matched to an individual user. Personalization eliminates the guesswork. It "unbundles the bundle" and opens the door to a wide variety of futuristic service offerings and business models. But, it requires a thorough, accurate and integrated digital user identity mechanism. This paper discusses a new digital user-identity approach (both the challenges and monetization opportunities) that will enable CSPs to transform to DSPs by identifying and managing their users as active individuals versus passive members of a household address.

The new digital identity consists of:

- A secure authentication and authorization process enabling an excellent user experience

- An intelligence-powered, personalized customer journey using a single ID

- An integrated experience across owned and partner-enabled digital services

- A simple entitlement management capability

- Dynamic grouping, such as families and ad-hoc communities

Digital Identity

1. Challenges of the Digital Service Provider

1.1. Connecting to the Users

For mobile service providers, it's the SIM that identifies a user. The IMSI number that attaches to a SIM is used to identify the user and the user's entitlements, while billing is implemented based against the user's telephone number.

For cable operators, transactions are completed based on a home address, which was originally used as the basis for feasibility and serviceability. Address-based identification is not a sustainable identification approach for cable operators wanting to compete in a market where over-the-top (OTT) digital companies have redefined the user experience. DSPs of the future will need to center their business around user-specific digital IDs to improve the user experience while providing user-centric personalization, as well as giving users the ability to self-manage their entitlements.
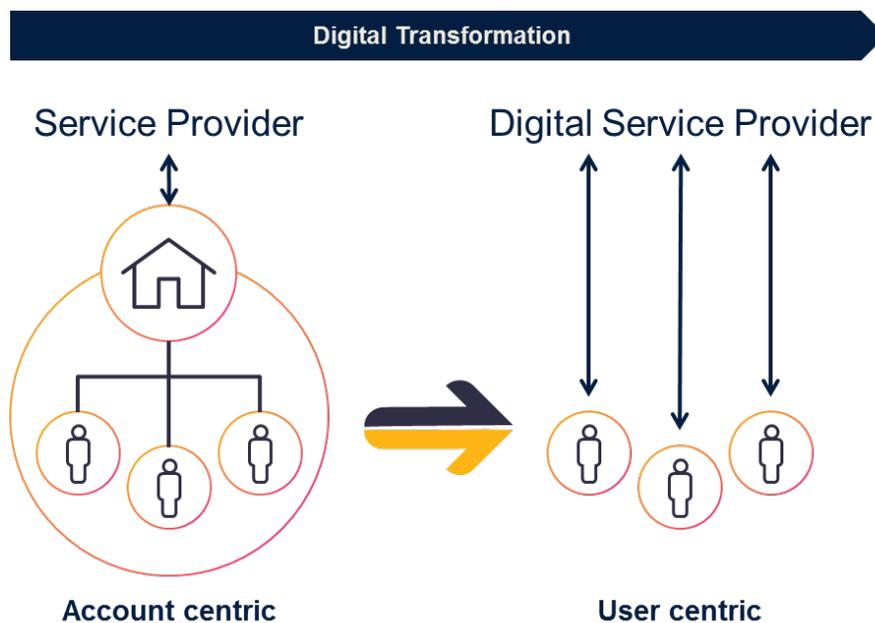
Figure 2 - Digital ID Transformation

1.2. Collecting the User's Journey

DSPs will need to provide services to a wider variety of users with different expectations and needs, including:

- An occasional user (not a subscription customer) who purchases a one-time event
- A wallet user (not a subscription customer) who wants to pay for digital services
- An user of OTT services who pays a subscription fee using a credit card
- A connectivity subscriber (recurring monthly subscription)

For the traditional SP, these different types of users are typically managed in different systems and the same customer may have different user names. If customers are required to self-onboard for multiple services, the SP may be unable to collect necessary information, personalize their experience and manage their journey.

The examples below (see Figure 3) depict a variety of personalized digital experiences. Each experience typically requires a unique registration and authentication. How will the DSP be able to capture the full user identity and manage the user's journey if they cannot associate the distinct interactions with a single user? How can a DSP deliver a true, holistic personalized experience with a disconnected user journey?
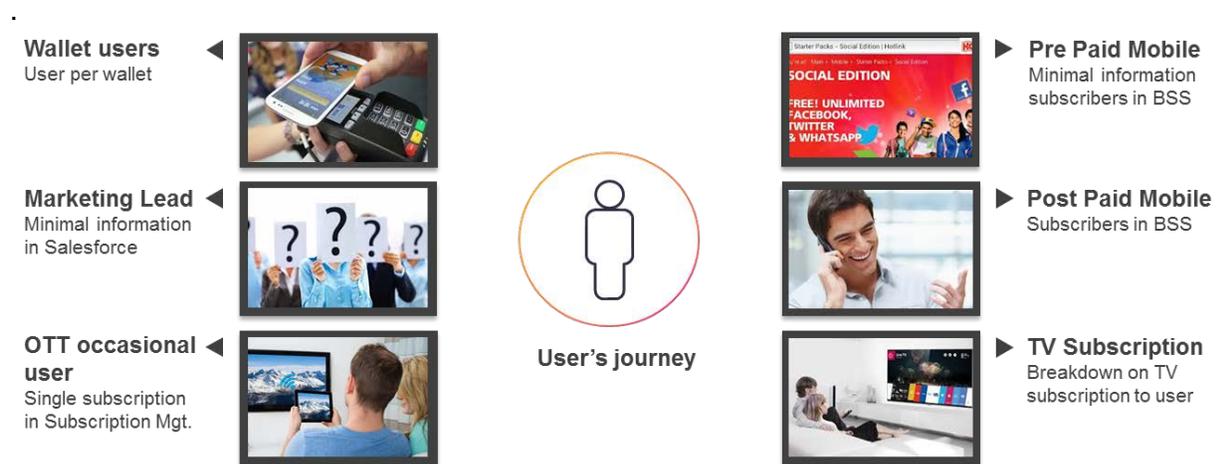

Figure 3 -The Disconnected User Journey

1.3. Creating a Trusted Enviroment

Once the DSP is able to fully capture the user journey, it needs to navigate the delicate association between trust and the likelihood of individuals to leverage and embrace personalization. How do you avoid making personalization intrusive and creepy? DSPs must find the right balance regarding the level

of personalization and privacy, meeting regulatory requirements, and the value and user experience the consumer receives in return.
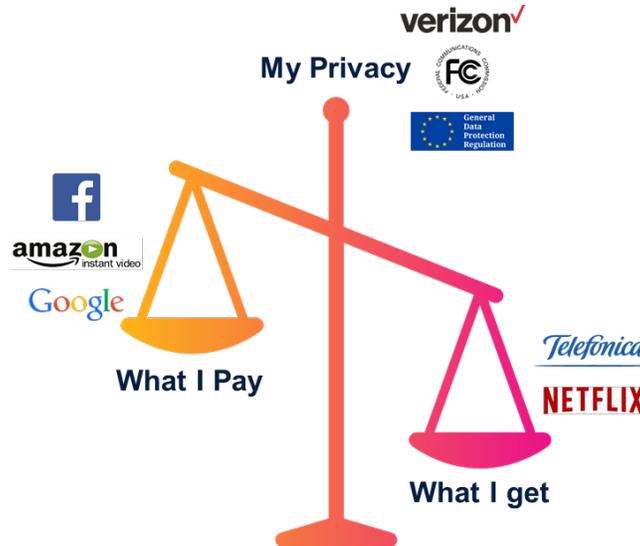
Figure 4 - User's Trust and Value Balance

On the one hand we have privacy regulations, set by the regulator. In the European Union (EU), General Data Protection Regulation (GDPR) defines the new data regulation while in the US, the FCC is in charge of privacy regulation. For example, Verizon was recently fined more than $1 million by the FCC for "supercookie" tracking which captured user activity without any notification or "opt out" option.

On the other hand, what the user pays varies by digital provider and the value to the consumer is in the "eye of the beholder." A variety of Google services are free, but in return for a free service, a consumer is willing to give up much more information and privacy (and perhaps a drained battery). Some people use and rely heavily on Google services while others hardly ever use Google. Consumers pay an annual fee for Amazon Prime, but in return Amazon provides free streaming and free delivery as part of this prime subscription. and a different value proposition for their user community.

Consumers are constantly checking and validating the value they are receiving in return for the data they share. If consumers acknowledge that they are getting benefits from sharing their data, they will be more likely to provide consent for collecting and using their data for personalized purposes. As an example, Telefonica's "Giving the Data Back" initiative provides an entirely new edge for Telefonica to differentiate themselves from their competitors by giving data back to their customers. One of the use cases is enabling consumers to manage some data functions on their own, and eventually generating royalties from partnerships or selling data to partners with customers' permission. So Telefonica collects and maintains consumer data but returns it to their customers for monetization purposes.

The amount consumers are willing to pay depends on the value they expect and experience in return. For example, consumes are willing to pay a monthly fee for Netflix for the value of the commercial-free content (on-demand and original) they can access on top of the standard cable and broadband monthly fee. Comcast recently announced the launch of a new service for $5.99 offering users the ability to

receive an ad-free, premium FX network experience. You can expect to see more SPs experimenting with the user's trust and value balance equation as part of their DSP transformation journey. Finding the correct balance is extremely important for user adoption of true 360 degree personalization.

2. The Opportunities with Digital Identity

Digital identity plays a critical role in creating a new personal TV user experience, building trust between the DSP and the consumer, creating a strong digital brand, and finding new ways to monetize the DSP's services.

2.1. Digital Identity for TV

For cable operators, the most important piece of information they currently have is the home address, and while we can all imagine the traditional picture of the family (or some of the family) watching TV in their living room, unfortunately, the cable operator doesn't know *which* person is actually consuming the service at any particular time.

"Watching TV" no longer means viewing content via a physical TV mounted on the wall. Each family member can now "watch TV" using personal devices like tablets, or shared devices such as a set-top box or a streaming media stick or within a digital application. Since viewing and internet habits differ from person to person, it's become critically important from a service standpoint for MSOs to understand exactly who the user is, as well as the groups they belong to, in order to personalize the services for that specific user and so deliver a user experience to rival or exceed those provided by OTT and other digital service providers.

Leveraging data at the user level will enable cable operators to:
- Provide recommendations about new series and episodes
- Give consumers the option to switch between favorite channels easily
- Give consumers a more personalized DVR experience
- Give consumers the option to consume on multiple devices switching mid-session
- Create a connected user journey providing a more holistic and intimate understanding of the individual

MSOs will also need to personalize at a group or family level in order to enable users to perform so tasks as:
- Managing parental controls, such as the type of content a child is allowed to watch, (and during which hours)
- Managing the amount users are allowed to spend (e.g. video on demand, gaming) from the family or group allowance
- Enabling the user to share specific events with their friends

2.2. Engage with Every User

A single digital identity enables collecting the information on the user through the user lifecycle in the correct sequence and context. Starting with a common sign-up and easy onboarding for new customers, to managing user journeys with different services consumed, there are many opportunities to provide a compelling customer experience while increasing the revenue per user via a single digital identity.
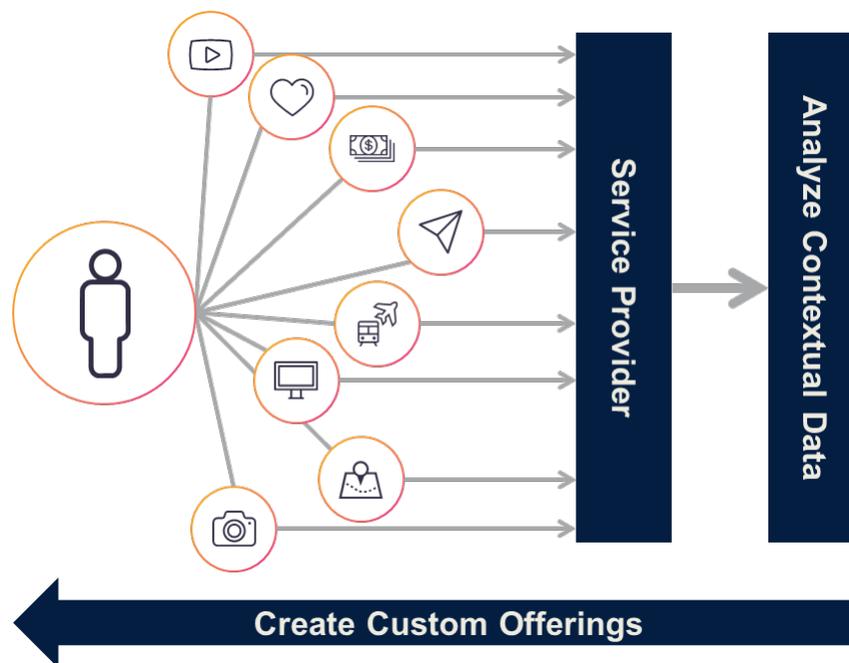
Figure 4 - Manage User Journey; Increase Revenue Per User

Big data and advanced, contextualized analytics are game changers and are absolutely required for extracting the value out of the digital identity and user journey. However, CSPs and DSPs continue to struggle with solving the challenge of managing massive amounts of data collected from all contributors to the user journey in a highly structured way. DSPs will need to leverage big data in order to make consumers feel individually valued at precisely the right moment and the right location.

2.3. Digital Identity – Asset to Generate New Revenue

Digital identity is a key enabler for DSPs to create additional revenue in the following areas:
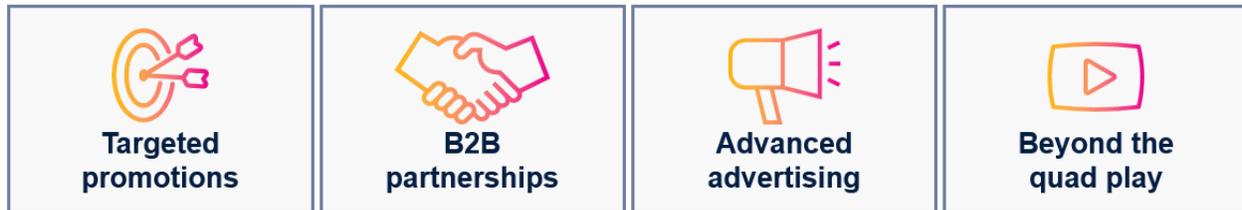
Figure 5 - Monetization oportunities

2.3.1. Targeted Promotions

With the transition from an address-centric paradigm to a user-centric paradigm, cable operators will be able to engage with users in the household, personalizing their experience and recommending new services – for example offering a parent in the household a gift card for their son's birthday which could be used for online games, pay-per view movie, etc. Perhaps the cable operator partners with an on-line retailer (another digital service provider) to offer a gift card for the toy that their son has been searching and researching on his tablet over the past couple of weeks using the family's broadband service. This type of robust targeted promotion offering is only made possible with Business to Business (B2B) partnerships, but most importantly, digital identification and user journey capabilities enabled!
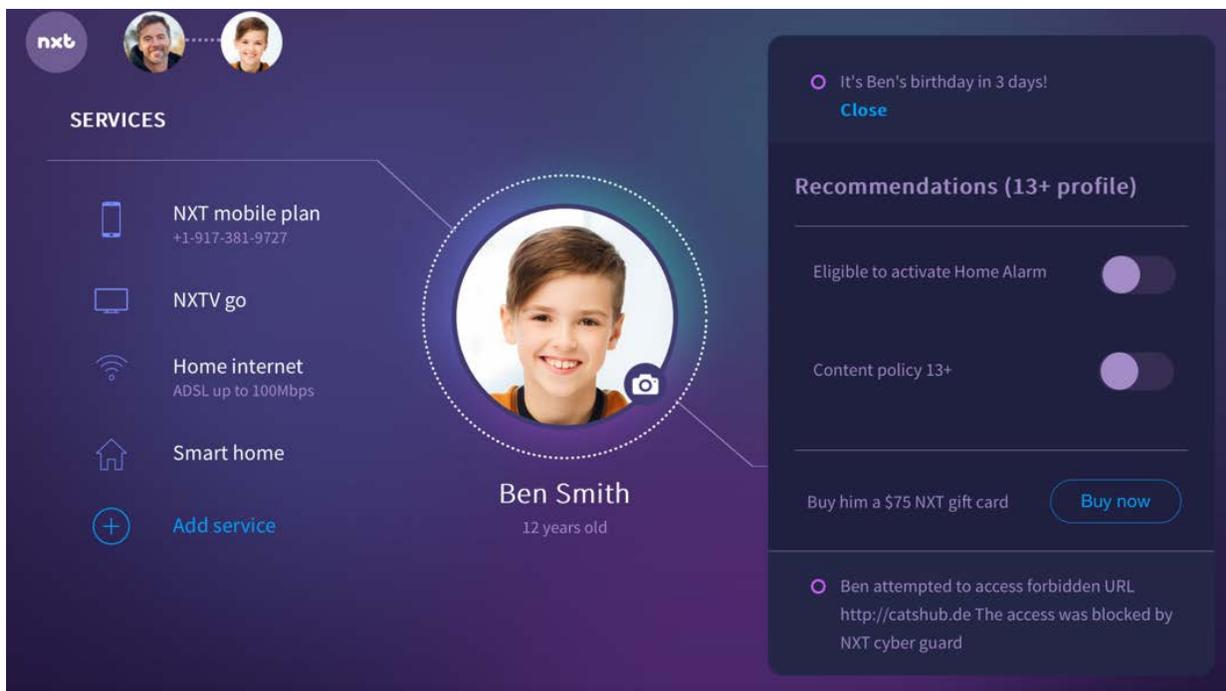
Figure 6 - Example of Targeted Promotion

2.3.2. B2B Partnerships

Becoming a DSP, or digital aggregator, requires working with partners from different industry sectors such as entertainment, retail, hospitality, travel and leisure, smart home, connected cars, connected health, IOT device providers, and many more in order to offer consumers a range of timely and contextually relevant digital services. There are several challenges to creating a meaningful and seamless consumer experience when working with digital partners – these include:

- How will the user purchase the partner's service? Will they need to register on the partner's portal?
- How will the user consume the service? Do they need to login to the partner's portal?
- How will the DSP differentiate between the users?
- How will partners capture user information in order to deliver a personalized experience?
- Will the user be able to manage family/group entitlements?

Russian service provider VimpelCom recently rebranded itself Veon as part of their DSP transformation. "We are doing two things", explained CEO Jean Yves Charlier. "We think we have to be a great telecoms business providing connectivity, but we also think we have got to do much more than that, and that's what we are focused on. We want to bring a new digital model to the industry, not just a bricks-and-mortar model."

The potential acquisition of Time Warner Inc., by AT&T, who once referred to themselves as "The World's Networking Company," is yet another step in AT&T's plan to become a DSP providing premium content, advanced advertising and a variety of OTT capabilities.

Fifty percent of CSPs' new digital services originate from partnerships and investment. The diagram below shows possible partnerships to fulfil the needs of the digital savvy consumer.
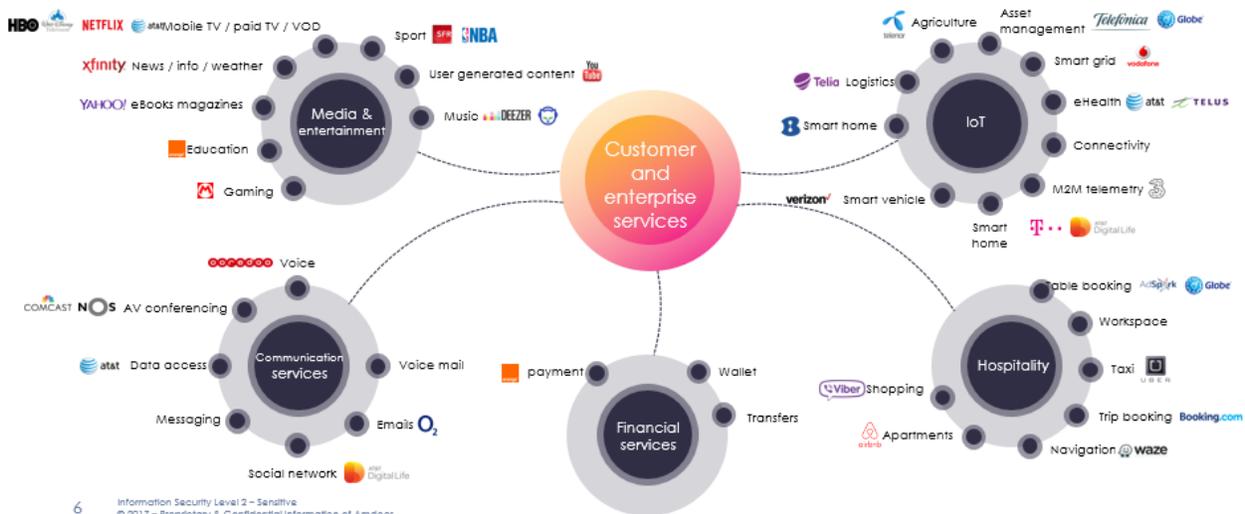
Figure 7 - The Digital B2B Economy

2.3.3. Advanced Advertising

Targeted advertising enables DSPs to reduce advertising 'clutter' and improve the overall customer experience. But targeted advertising is challenging and less effective when customer information is scattered. An orchestration function or layer to correlate information from multiple systems is required to get a more comprehensive user profile for effective targeted advertising.

Personal profile data is today's advertising currency reaching across channels like mobile, web and TV as it increases the targeting capabilities and correspondingly the advertising yields. Digital advertising is at a point where advertisers are willing to pay a premium to service providers for subscribers' first-party data. Generally defined, first-party data is specific data collected by you about your audience (i.e., the first party is "you") as compared to third-party data which is acquired from outside resources (i.e., a third party) and provides generic, segmented information This creates an immediate opportunity for service providers to monetize new channels by using an enriched customer profile that combines relevant first and third-party data for use with interactive targeted ads, which increase subscribers' engagement and affinity with the advertised product.

First-party data or customer profile data available to SPs is unique. It combines a variety of location, usage and spending behavior that provides good indications about the customer's interests and needs. Data can be gathered ongoing from multiple platforms and interactions, and then packaged in a data model that enables service providers to create audiences. These audiences, based on rich customer insights, are highly sought after by brands and advertisers in the advertising ecosystem.

DSPs with properly implemented digital identity and B2B relationships will be able to go beyond regular behavioral targeting. They will be able to access enhanced customer profiles, consisting of content, service and user data updated in real time by multiple subsystems in a flexible, efficient, and cost-effective way. By leveraging this information, service providers can create a high-value advertisement inventory for themselves as well as for advertisers.

Targeted advertising is not just about offering the right product to the right person at the right time. It is about "closing the loop" and encouraging the consumer to take action. For example – a car advertisement which also includes directions to the nearest car dealer to the customer's location, and which can be accessed by the customer across multiple channels, touch points and devices.

By leveraging the digital identity of their customers, and the data collected from their activities, DSPs can:
- Improve user experience by providing relevant ads to their customers
- Increase the value of multi-screen advertising
- Deploy a targeted ad platform with innovative third parties – the operator can license, partner, or sell ads to the content owners and television networks
- Maximize revenues from digital advertising

2.3.4. Beyond the Quad-play

Some OTT providers are already monetizing their service with different paradigms – examples include:

- *Family Sharing with Apple* – family sharing makes it easy for up to six people to share apps, iBooks, iCloud, music and more
- *Netflix's screens pricing model* – pricing determines how many users can access a Netflix account at the same time

The new bundle will definitely embrace personalized and targeted content, and for these new innovative monetization models, the service provider needs to have information about individual users and devices.

2.4. The Trust Factor

It is not surprising that in today's digital world and the rise of hacking, consumers are paying more and more attention to their personalized digital data and how it is used. In a recent global consumer survey almost half the respondents emphasized how critical it is for them to know that their provider keeps consumer personal data in a place that is extremely private and secure. CSPs and pay TV providers are relatively well trusted. They can leverage this trust as they transition to become DSPs, or digital aggregators, where they offer a more personalized experience and sell more services. In order to meet privacy requirements, DSPs will need to identify who the user is and make sure they have appropriate consent for any action that has to do with use of personal data.

People's trust in companies with their personal data

	Somewhat to very Uncomfortable	Rather to very Comfortable
CSPs	-30%	40%
Financial organisations	-31%	45%
Device manufacturers	-33%	30%
Pay TV providers	-33%	32%
Video streaming players	-34%	30%
Physical retail stores	-34%	32%
Search engine companies	-34%	34%
Online retail stores	-36%	33%
App developers	-39%	24%
Digital unicorns	-41%	21%
Social Media companies	-41%	30%

Figure 8 - Level of Trust Cross-Industries

2.5. Contact Center of the Future

Customer support is changing and DSPs will have to engage with their customers across a range of channels – traditional channels such as call centers and interactive voice response (IVR), and increasingly online (online chat, email, etc.) and social channels (e.g. Facebook, Twitter). Service providers need to keep track of their customers digital journey across all channels for all services. By having a complete

view of their customers, and by analyzing the interactions with these customers, service providers are able to move from reactive to proactive in their support and sales efforts.

3. The Digital Identity Solution

3.1. Digital Identity Ecosystem

DSPs need to create a digital identity ecosystem that maintains trust with their customers regarding use of personal information and fosters collaboration with their digital partners. The primary component of such an ecosystem is a digital identify solution that eventually empowers a digital locker while enabling new, flexible monetization models.
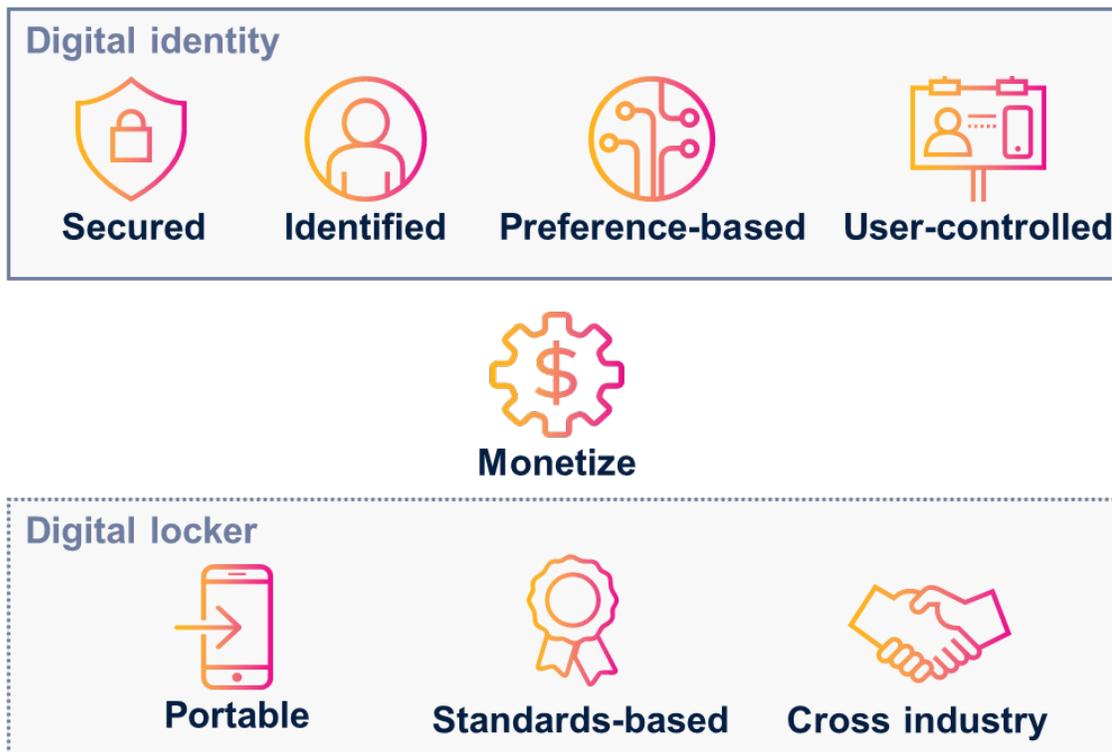
Figure 9 - Digital Identity Ecosystem

The digital identity component of this ecosystem consists of the following attributes:

- Highly secured user identity information
- Individual user identification for all services on any device
- A collection of user preferences based on user consent
- User control determining who can see and access their data

In order to facilitate usage, sharing and, eventually, advanced monetization models, the user's digital identify should be stored in a digital locker consisting of the following attributes:

- Users should be able to port their identity using it wherever and with whoever they choose
- User preference and API standards need to be defined to support porting
- Adoption between many partners, across different industries

The digital identity component is the foundational enabler for expanding monetization opportunities. It needs to be fully integrated with partner contract management and billing systems and enhance the DSP household level billing to individual user billing.

3.2. Digital Identity Solution Functions

To implement this digital identity ecosystem, CSPs looking to transform to DSPs need to ensure they have the following areas addressed:

3.2.1. Identity Management

Identity management should maintain all of the consumer's identities and associated information. The DSP will need best practices defining how to manage the user lifecycle: onboarding users, converting anonymous users into subscribers, how to identify a suspended user, etc. Identity management also needs to enable a user to manage both their own and related identities. Some examples of required functionality include:

- Self-registering for services
- Granting permissions to other users within an account (e.g. parent enabling service for child)
- Registering a new device and associating it with a user on the account

3.2.2. Access Management

Access management to provide user authentication and authorization can be activated in various ways (e.g., username/email and password, biometric authentication, two-factor authentication, mobile authentication). For effective authentication, the DSP will need security policies such as strength of password or token expiration period.

Access management in many complex organizations is determined by a single sign-on (SSO) property.

3.2.3. Authorization

Once users have been authenticated by the access management system, they can use the services that are enabled by the provider based on their authorization level. The authorization can be based either on the role of the user or according to their individual entitlements. Roles can be provided to a group of people and dictate their permission to access specific activities, and/or, information.

3.2.4. Single Sign-on and Easy Integrations

While the DSP will rely on partners to provide different digital services, the desired user experience is that the entire registration process will be via the DSP's portal. The user should not be required to register on the partner's portal or obtain an additional username and password – a single name and password should enable the user to access both the digital service provider and their partners' services.

The DSP's access management should support single sign-on standards like SAML or OpenID Connect. If the partner does not support these standards, then integration is required and integration tools must be put in place.

3.2.5. User Entitlements

User entitlements cannot be based solely on the user's role. Entitlement models are complex and need to take into account such actions as:

- Did the user pay for a specific service?
- What is that user's position in the account hierarchy?
- How many users are already signed on to the service?
- Maintaining previous entitlements

Identity management should support the data model of the entitlements, and access management should check when a user is trying to access a resource whether that user is entitled to such an activity.

3.2.6. Device Registration, Entitlements, Consent Management

When it comes to the Internet of Things (IoT), it is very important to enable the user to register new devices – even if they haven't been purchased through the DSP's channels – and allow them to manage entitlements for specific users on these devices. For example, a person could configure the system so that only the household adults have access to adjust thermostats in the home.

As part of the new EU security regulations (i.e. GDPR in 2018) and in the USA, users own their personal data, and as such, the user must give their explicit consent for their data to be used for a specific service.

A consent management system is therefore required in order to:
- Enable a consent lifecycle (i.e. the ability to consent, revoke and freeze data consent)
- Enable parental consent management
- To link between consent management and the user's personal data
- Allow user consent to be distributed to partners.

The consent information is stored in the user identity as part of the user profile. Access management should restrict access to personal information according to the user's consent.

4. Integrating Digital Identity E2E Solution

Realization of the digital identity ecosystem requires integration into the existing business and operational environment. The comprehensive, trusted digital identity becomes the cornerstone of the end-to-end operational flow. Below is a sample solution of the digital identity ecosystem integrated into a complex end-to-end DSP environment.
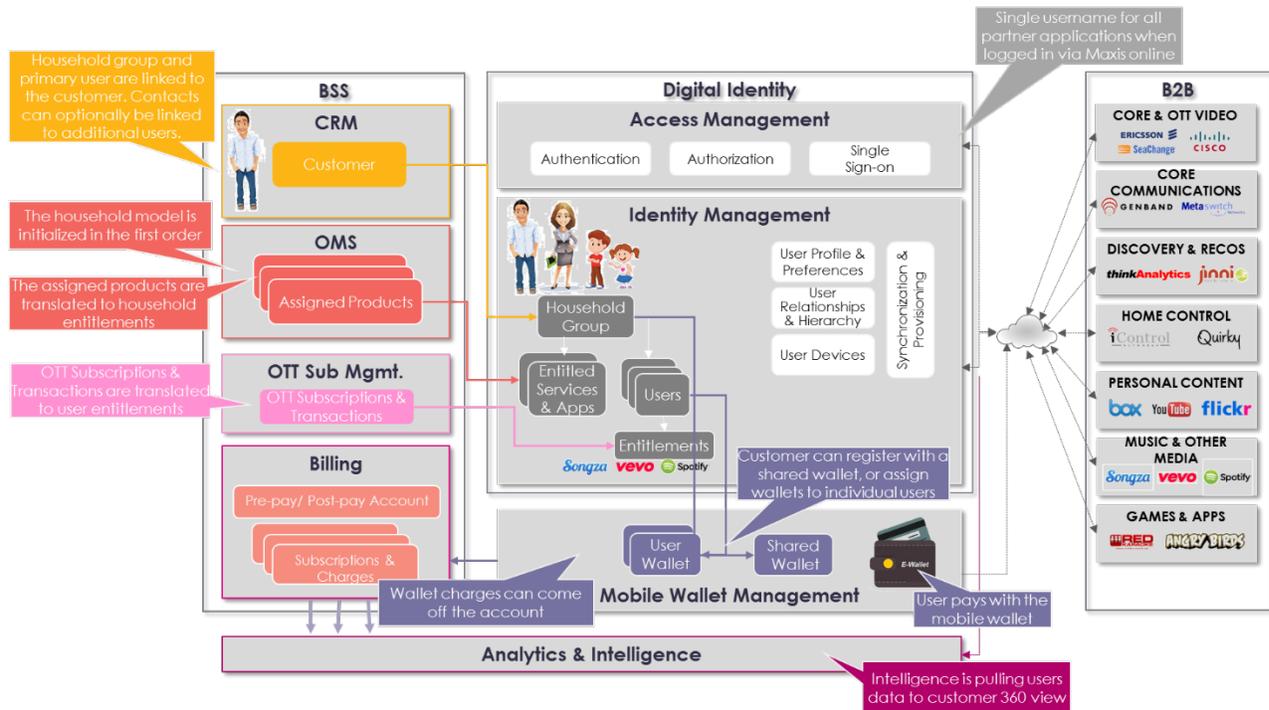
Figure 10 - Integrated Digital Identity Ecosystem

The user ID serves as an identifier to many of the surrounding systems and connects to the mobile wallet, BSS, partner B2B and data analytics systems.

User identity is foundational to any BSS environment including global billing and monetization engine(s). It enables the introduction of fast time to market digital content and services, including real-time personalized promotions and merchandising for both existing and anonymous customers. In the pre-paid system, the user ID identifies a specific balance. In the wallet system, the user and group's identification will authorize who within the family is permitted to pay using the wallet. In the video system, the user identity validates the customer's entitlement for a content.

The user identity stores previous customer actions and connects to the analytics engine. This enables the delivery of intelligent, contextual and personal interactions across the customer journeys with up-sell and cross-sell opportunities by collecting and analyzing the variety of customer data available through the provider's own platforms as well as partner-originated data, turning it into action by predicting and automating any customer engagement across the lifecycle. Digital identity drives higher revenues, service uptake, loyalty, satisfaction and engagement.

Digital identity powers efficient connection to partner B2B systems and manages all the digital services from one place.

The digital identity in the above solution is comprised of two main components: access management and identity management.

The user management system stores the users, groups, locations, devices, the customer entitlements and the user entitlements information. When a customer purchases a new service, that service is distributed to the user management system along with the customer entitlement, devices and location information specific to that user. The user can manage these entitlements for the family, along with the location and devices data, by using a graphical user interface (GUI).

When a user logs in to the system, the access management GUI will invoke a series of authentication steps which are processed according to its configuration. One of the authentication steps is to validate the user entitlements. Once the user is authenticated, the SSO component in the access management system uses an access token to login to any service that the user is registered, including operator services and partner services.

Conclusion

In today's all-encompassing digital world, where many of our day-to-day business and social interactions are anonymous, customers' are demanding a well-shaped, personalized experience. Spotify and other digital services, such as Netflix and YouTube have given birth to the personalized music and video DJ, supplying us with targeted content at the exact moment we want to consume it.

But today's TV viewers have an overabundance of content to choose from, and have come to expect a timely, purposeful, customized experience. It will not be long before traditional TV, and for that matter all connected digital services will be provided by our own personalized content DJ.

Transforming to a DSP requires adopting a more holistic approach to user identity, which takes into consideration the way today's viewers are consuming their entertainment: anytime, anywhere, on multiple devices. In order to put the end user in the personalized driver's seat, individual consumers will need to be able to create and manage their own profiles. But this movement from household to individual is not sufficient as it only addresses one of the many dimensions of a total personalized experience.

A true 360-degree personalized experience will require the DSP to deliver highly relevant experiences across every connected device and digital channel. There are large amounts of customer digital touch points and a wealth of data available, but it's scattered, often non-standard and disjointed. To really understand customers and deliver the most relevant experiences, a DSP needs to be able to stitch together all the digital interactions and associated data sources under one digital ID in order to track the user journey.

To enable a well-connected and contextualized user journey, DSPs must demonstrate they can be a trusted partner. Customers are only willing to share their information if they know (1) it is being using to help them get what they want, when they want it, (2) the information is securely maintained, and (3) consumers can control how their data is used.

Once the digital identity ecosystem is established and embedded within the end-to-end operational environment and the CSP has transformed to a trusted DSP, the monetization door will swing wide open, providing access to a variety of new, innovative B2B and B2C monetization possibilities. If executed properly with the right balance between trust and value, DSPs can enable and support blended, contextualized, and customized experiences bridging and integrating our different day-to-day digital interactions along with our entertainment and social experiences.

For the consumer, it will feel like they are carrying around their identity inside a digital locker which can be plugged into their daily activities and subsequently leveraged to drive an enjoyable, finely tuned experience. Customers will then become comfortable sharing the contents of their digital locker across different industries to support a contextually relevant experience that reaches from their living room, to their car, to the store while traveling with them to and while on vacation.

If you are a CSP today, are you ready to transform and become a DSP, assuming the responsibility of managing users' identities as a trusted partner, creating new B2B partnerships in order to enable great personalized experiences for your users with a rich portfolio of digital services?

We are all consumers of digital services and content. As a consumer of a variety of digital services, are you ready to move from account centricity to individual identities for your family? Are you willing to have your digital locker full of personalized information? Are you ready to trust your identity with your DSP? But most importantly, are you comfortable sharing your personalized journey in exchanged for unique, effortless, meaningful digital experiences?

Abbreviations

B2B	Business to Business
B2C	Business to Consumer
CSP	Communications Service Provider
DSP	Digital Service Provider
DVR	Digital Video Recorder
E2E	End to End
EU	European Union
FCC	US Federal Communications Commission
GDPR	General Data Protection Regulation
GUI	Graphical User Interface
IMSI	International Mobile Subscriber Identity
IoT	Internet of Things
IVR	Interactive Voice Response
MSO	Multi-System Operators
OTT	Over The Top content
SAML	Security Assertion Markup Language
SIM	Subscriber Identity Module
SP	Service provider
SSO	Single Sign On

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Telefónica to create personal data bank for customers, expose "unfair" apps

Telefonica Plans to Give Customers More Control Over Their Data

VimpelCom ditches bricks and mortar for digital model