

Which BSS capabilities are required to monetise the 5G opportunities



A whitepaper by

OpenCloudBSS

| | |
|---|-----------|
| The 5G opportunity | 2 |
| Service innovation | 3 |
| Organisational innovation | 4 |
| Use case innovation | 4 |
| Monetisation of the innovation | 5 |
| Capabilities required to support the Monetisation | 6 |
| Service activation | 7 |
| Creation of new offerings | 8 |
| Selling new services | 9 |
| Providing customer support | 9 |
| Invoicing of new services and usage types | 10 |
| Enabling resellers and B2B2X model | 11 |
| Run the platform in devops mode | 11 |
| Platform requirements to support business growth | 12 |
| Microservices based design to create agility and mass scalability | 13 |
| Decoupled front-end and back-end applications | 15 |
| Open API framework for easy integration | 17 |
| Converged platform, offering 2C and 2B over any type of service | 17 |
| Multi-tenant capabilities | 18 |
| Summary | 19 |
| About us | 20 |

The 5G opportunity

“There is a common understanding in the Telco industry that 5G is not just the next generation following on 4G.”

The 5G opportunity

Where 4G made our data connections a bit faster and allowed us to stream content wherever we are, 5G will enable true innovation and provide opportunities to launch new services and serve new verticals.



Innovation in different areas will come together, creating new value for customers, CSPs and innovative companies.

In this chapter we provide an overview of the different areas of innovation and what should be done to monetise this innovation.

Chapter 2 and 3 of this white paper provide insights in the platform capabilities and technologies required for CSPs to monetise the 5G opportunities.

Service innovation

As part of 5G not only new Radio Access Network equipment is rolled out to enable coverage but complete core networks, handling all traffic, are new. Not just an upgrade from the previous generation but new technology, using new integration protocols for service activation and charging compared to the current 2, 3 and 4th generation networks.

As a result of these new technologies and protocols used, new services can be created and made available to customers. Initial services include network slicing and dedicated SLAs like ultra-low latency and guaranteed bandwidth. It is expected that many more services, including what now would be considered as non-Telco services, will be created.

These new services will get their own REST APIs for activation and maintenance that will have to be integrated into the business support systems and product catalogues.

¹ Source: Huawei Marketing Insight

The 5G opportunity

Organisational innovation

Next to innovation in technology to provide new services, CSPs (Communication Service Providers) will have to innovate themselves and their own organisation.

New services will lead to new business models, new partnerships / eco-systems and new responsibilities for the CSPs. Their organisations will have to be ready to cope with this to prevent new OTT players taking the benefits away from the CSPs.

The time to act is now!

Use case innovation

As part of 5G existing 4G IoT uses cases will be extended and accelerated and on top of that many new use cases for both the B2C as the B2B will be developed.

Initial value will most likely come from the B2B market but different use cases around the world are showing that value within B2C can also already be created.

Interesting use cases² for B2C are:

- LG U+ in South Korea offering 360 VR content to their customers, achieving a 75% increase in ARPU for customers moving from 4G to 5G
- Video Ring back solution generating \$ 10 Million new revenue per month for China Mobile
- Gaming offerings launched by different Operators in Europe bringing in new customers and additional partner revenue

Main departments impacted:

- ✓ Strategy
- ✓ Business development
- ✓ Partner management
- ✓ Marketing
- ✓ Product Management



² Source: Huawei Marketing insight

³ Source: <https://medium.com/@miccowang/5g>

The 5G opportunity

In order to become successful within a use case a CSP needs to ensure all aspects of the service are in place. Our strong recommendation is therefore to align use cases with technical development and capabilities inside the organisation

But also, to build an eco-system of partners that can deliver parts of the use case.

In the sample of gaming a CSP could work together with a provider of gaming content like Vodafone does with Hatch.

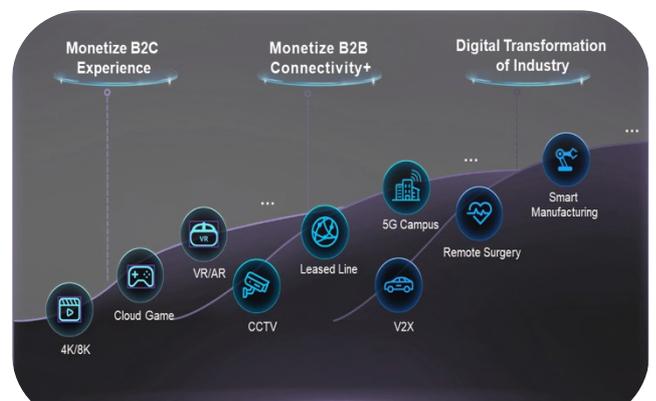
“As example, to deliver a great gaming experience the CSP needs to bring content, guaranteed bandwidth and low latency together to ensure the end user has a great overall experience. If one of the elements is missing the proposition will fail.”

“They should create a roadmap of different use cases to be launched per vertical they are active in. This business roadmap helps to ensure alignment between business value and technology roadmap plus investment.”

Monetisation of the innovation

To be able to monetise on all investments required to deliver 5G it is important that CSPs take the use case approach and not just start selling additional data speed for a small premium. If we can learn one thing from the change from 3G to 4G that should be that only selling higher bandwidth does not work. There is very little perceived value by consumers there and competition will reduce the additional price premium.

Once the desired roadmap is created and aligned between business and technology **plus** the organisation to deliver the end to end value is in place CSPs are ready to make money from 5G



Sample use case roadmap

Capabilities required to support the Monetisation

Time to Market will not only be measured in the ability to launch new offers but will include the launch of new services.

CSPs will require the ability to launch new services in days rather than the months that are used today.

Capabilities required to support the Monetisation

CSPs are currently spending a lot of money, time and effort in deploying 5G RAN and core network capabilities. This is of course the basis of being able to enable 5G services but what about the Business Support System (BSS) that is required to support all these new services, business models and use cases.

How will CSPs

- ✓ Activate the new services, monitor them, orchestrate the activation and deactivation of different services required to deliver a single use case
- ✓ Create new offering containing these services and include partner products
- ✓ Sell these services into existing and new customer types
- ✓ Manage the services of their customers now they also become responsible for the SLAs and agents will get questions that need to be answered
- ✓ Invoice new services including providing kick back if service SLAs are not met
- ✓ Enable new partners and settle commission or share revenue
- ✓ Run their platform in agile & devops mode

In the next few chapters we will go into more detail around what is required in the different areas.

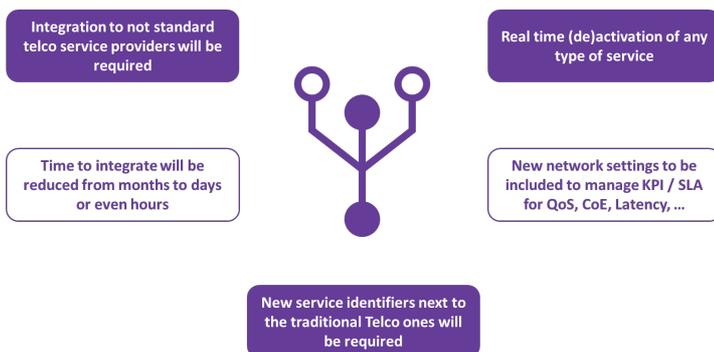
CSPs can use this as a checklist to see if their current IT systems are ready to support the 5G opportunities that will arise shortly and identify the areas that require further actions.

Service activation

Currently CSPs activate services on network level using dedicated provisioning gateways to handle the complex activation processes.

With 5G a new explosion of services will hit operators.

Next to activating new 5G stand-alone core networks and related new services as network KPIs, network slices, edge computing and many more, CSPs now also will have to provision many new services activated on top of their core network.



Samples of these are VR/AR services, access to live content, cloud services, gaming subscriptions, IoT applications, etcetera

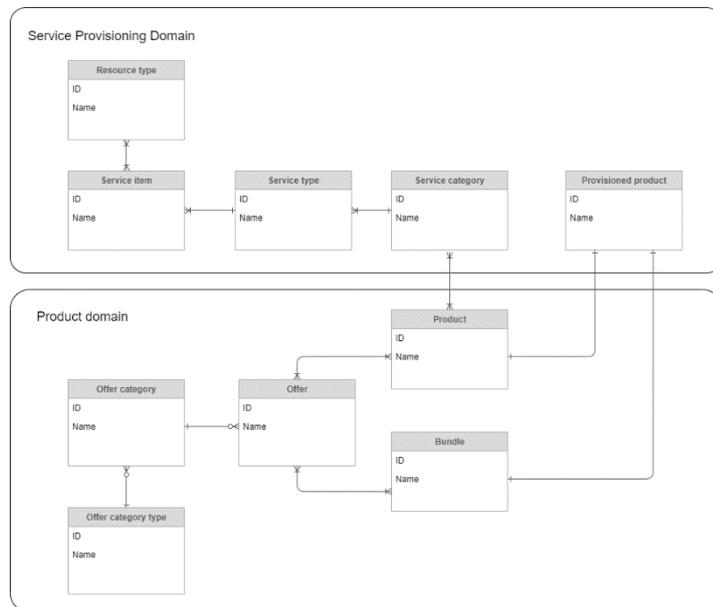
Capabilities required to support the Monetisation

The existing Provisioning platforms are typically not ready to cope with this.

Currently operators use their order management systems to activate services as Netflix and Spotify, which most resemble some of the new services of the future from an integration perspective.

With the limited number of use cases currently available that is manageable, but once 5G takes off and CSPs have not covered this aspect properly an unmanageable situation will be created quickly

Flexibility in the data model will be required to be able to handle the different combinations of services and dependencies between services. The model will also have to cater for different service identifiers and resources than the ones used today.



Mapping of service and product domain

Creation of new offerings



New type of offers supporting the new services

Try & Buy as standard option for new services

More combinations of products & services to be supported

The new services provided by 5G will lead to new offerings and new offering structures to be provided by CSPs.

Time to market will become even more crucial than it already is today. Launching new services and products will no longer be a once or twice a year activity but part of daily work. The pressure from marketing teams on IT to be able to launch and adapt these new services quickly will also grow.

The product catalogue will require new dimensions to cope with the increase of new services, dependencies between services and to easily upsell services to existing subscribers generating new revenue and creating customer lock in.

Capabilities required to support the Monetisation

Selling new services

Next to the new services that will be sold, new partners and types of partnerships will also be introduced.

Leading to new channels and new ways of selling services. The point of sales solution and APIs exposed to the channel and sales partners are an important element of future business support systems.

Supporting new customer types, e.g. B2B2C, Business 2 Home

New Sales processes to support new products & services

Utilising new sales channels



Many new parameters will have to be captured within the sales channels and sales rules plus availability checks common for sales of fixed line will also be introduced for Mobile.

“To be able to guarantee latency and bandwidth checks on network inventory and capacity will have to be performed as part of the sales journey.”

Parameters as username and email address will become more common service identifiers where for mobile the mobile number (MSISDN) is currently used.

Instead of using a resource from an existing pool in inventory management a validation on availability of a username will have to be done based on already created users and names reserved for inflight orders.

Providing customer support

The movement of digitalisation of customer services will continue with an increased speed.

The introduction of new services will lead to an increased demand of customer services. For CSPs to be able to cope with this increased demand and to lower their overall cost it is important that customers can serve their own needs using online and mobile application channels.

For customers who do want to interact with the CSP, easy access to agents is required. Next to existing solutions as chat and robots behind chat a new channel will emerge, being 5G messaging.

5G messaging has the potential for operators to gain back market share from companies as Whatsapp and Wechat and provide an easy to use, secure and interactive experience between a customer and any company.

(more info on 5G messaging: <https://kr-asia.com/china-mobile-rich-communication-services-first-5g-messaging-app>)

Capabilities required to support the Monetisation

New processes & activities supporting new products

Partners managing their customers on your platform

New ways to interact, e.g. 5G messaging



Next to the new activities and processes required to support the new services, Partners of CSPs will also want to be able to better manage their own customers in the B2B2C model. The business support systems will have to be able to separate customers and ensure partners can only manage their own customers and do not have access to the CSPs customers. This not only from a commercial perspective but more importantly from a privacy (GDPR) perspective.

Invoicing of new services and usage types

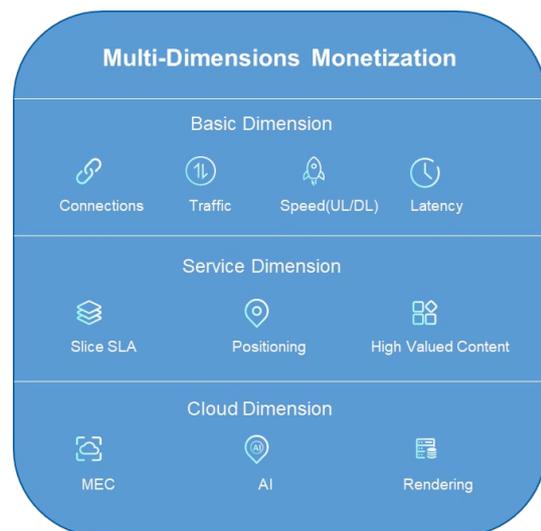
The new 5G core network will come with a new set of charging interfaces (Service Based Interface – SBI), replacing the existing Diameter interfaces used for real time rating.

Charging and billing solutions will have to support the new SBI standard to be able to real time rate traffic once 5G stand-alone is being launched.

Within these interfaces a new set of charging dimensions can be considered, enriching the offer sold to customers

Next to the new network events, new services with their own consumption models and out of allowance usage will be introduced, increasing the complexity and required flexibility of the rating & charging solution.

The new network KPIs will have to be considered as input for the monthly bill run. If KPIs are not met this might lead to discounts / penalties that will have to be applied to some of the elements on the invoice.



New event types to be rated not only voice, text and data

New interfaces into 5G core stand alone (SBI)

New type of billing discounts to be considered, e.g. SLA performance



As part of a wider product portfolio different billing discounts related to the number or combination of products a customer has will also be introduced. Currently CSPs often run offline processes to provide additional discounts for customers subscribed to Fixed Mobile Convergence offers. These types of discounts will become the new norm and will have to be automated to make it a sustainable business model.

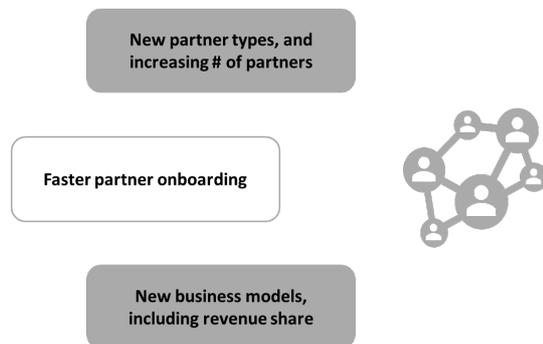
Capabilities required to support the Monetisation

Enabling resellers and B2B2X model

The number of partners and type of partners will increase. Partners selling their own services with connectivity as add on are a sample of this.

This could be a gaming company selling dedicated network KPIs like low latency and guaranteed speed to their customers as part of a subscription to their gaming content.

Instead of traditional sales commission or MVNO agreements these types of partnerships will lead to more white labelled resellers of services where the agreements will contain a percentage of revenue share. Automated solutions will be required for operators to be able to cope with complexity and different variations of these models.



“With a multi-tenant solution, it is easy to integrate a service once and make this integration available to one, multiple or all tenants based on configuration.”

Multi-tenant solution will be required where new tenants can be setup quickly to support the launch of new partners. This setup ensures a clear divide between CSPs customers and partner customers and prevents access of partners to the CSPs customers.

Next to sales partners the number of solution partners, companies offering services that are being sold by the CSP, will rapidly increase. Integration and setup of commission / revenue share models will become a day to day task where the IT solutions used by the CSP will have to be able to support this.

Run the platform in devops mode

All new capabilities required to monetise the 5G opportunity require a quick time to market. It is therefore critical that CSPs work with suppliers that can help them to run the platform in devops mode. A close link between the development and operations team allows for continues development of the platform while ensuring the high operational standards required.

“The key words every platform needs to be built around are cloud native, micro services, open APIs and a decoupled front and back-end.”

In the next chapter of this white paper we talk more about the platform requirements that allow for devops to be implemented.

Platform requirements to support business growth

Cloud native platforms that enable CSPs to quickly scale up and scale down, add new components without impact to the existing solution, and support continuous development are essential to not only monetise 5G but also control cost while doing this.

Platform requirements to support business growth

It is important to have the right capabilities available in your platform to be able to cope with the new business requirements and enable business to monetise on the opportunity.

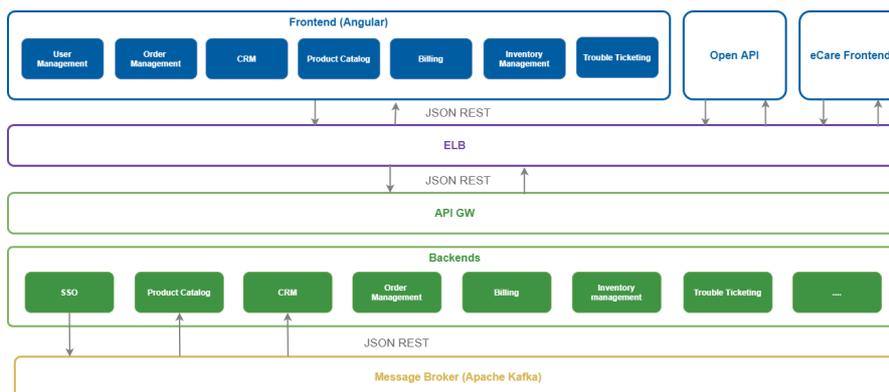
But that is just part of the story.

Equally important to capabilities is the technology used to build the platform. This will determine how quick you can grow, how fast you can integrate, how fast you can launch new service and how fast can you scale your solution (up and down) if required to align cost with benefits and value.

In the next sections we describe some of the key technologies the solution should support to maximise the benefits and ensure the business support system is future proof.

Microservices based design to create agility and mass scalability

Solutions based on Microservice architecture, therefore components designed to be loosely coupled. This is achieved by designing fully autonomous components with integrations based on publish-subscribe pattern through event stream. Each component has its own front-end, application layer and data persistence layer.



Layered architecture for maximum flexibility & scalability

Components log state changes in event log and any other components can read these events and act upon them. Or simply build their own read-only copy of required data in their own data store. When events are stored to event log, there is no need for subscriber application to be present and provide response. This also works the other way around, after publisher has published his events, all required state for subscriber components is present in event log. Therefore, different application components do not need to have direct communication links, in worst case scenarios components handle failures gracefully and continue to operate even while failed components are being restored.

Platform requirements to support business growth

Improves scalability & performance

Having autonomous services with individual data stores which gather all required data from event stream, minimises shared resource usage in system, which improves scalability.

As there is no central data store that must be replicated while trying to ensure consistency. Moreover, such component integration approach greatly reduces the need for remote API calls to get any additional required data, since all the data already will be present inside the component data store.

This improves not only ability to scale but also the single node performance, as components use minimum amount of time to consume network-based calls.

Such approach also allows introducing additional instances of each component in order to scale-out without additional effort.

As it was noted such design greatly reduces shared resources and remote API calls required, this greatly reduces application level dependencies for each component.

Improves availability

This in turn improves availability and resiliency, since if some components are taken down such incidents do not break other applications because applications already have all resources required in their data stores. In order to further improve availability more instances of each application can be deployed without additional effort and such instances can run in an active – active mode reducing the impact if one of the instances would have any issues or is taken down for a software upgrade.

Improves failover handling

In request-response based integrations additional measures must be implemented such as circuit-breakers in order to handle fail-over. When shared resources are not present this will directly impact another components ability to function.

However, when event-based integrations are implemented, and components are able to function without other components present any additional fail-over handling is not required. Event log ensures persistent event storage therefore if one of the components is down and some other components publish events, these events are stored in event log and will be automatically read after subscriber components are restored without any data loss.

Platform requirements to support business growth

Reduces risk

Changes in systems are always considered as additional risk of introducing regression in systems, however with this design approach changes are isolated inside components. Therefore, and if event logs are consistent neither application level, nor data persistence layer changes would affect other components.

The fact that components are autonomous and integrated using event stream also introduces great flexibility in component composition, since each component can be functioning without other components present means that components can have independent delivery lifecycles.

Enables Agile delivery process

Therefore, without major system upgrades or shutdowns it is possible to independently update existing components or introduce completely new components.

Enables flexible composition

Such loose coupling between components also introduces great flexibility in introducing additional third-party integrations, as new adapters which read event log and implement new third-party integrations can be added any time without affecting other components.

Decoupled front-end and back-end applications

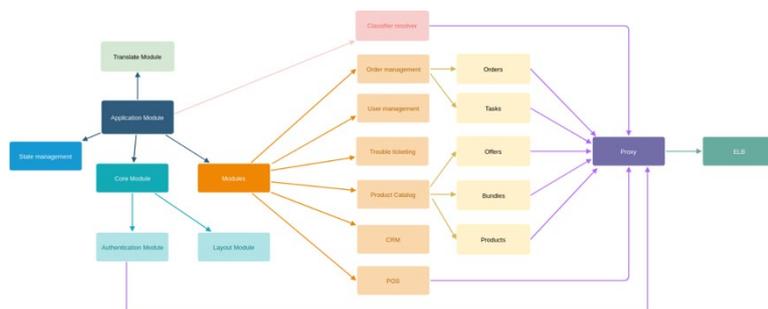
Decoupling of front-end and back-end applications leads to the possibility to select the best technology for both without any restrictions that an integrated environment would have.

Next to that, it allows agile teams to separate development at the front-end and back-end, leading to more flexibility in the way new features are being deployed and less dependencies between teams.

It also allows for a template based modular approach in the front-end where assets like widgets being created once can be reused in multiple front-end pages.

Front-end

The Core module contains components that are commonly used in all modules (panels, buttons, breadcrumbs etc.) whenever a new page or front-end application is created these items can easily be reused.



Front end application design with maximum reuse of component

Platform requirements to support business growth

The front-end is built on top of a multi-layer architecture. Components get data from store; the store is populated by requesting data from the back-end and maps it according to the front-end models using mappers.

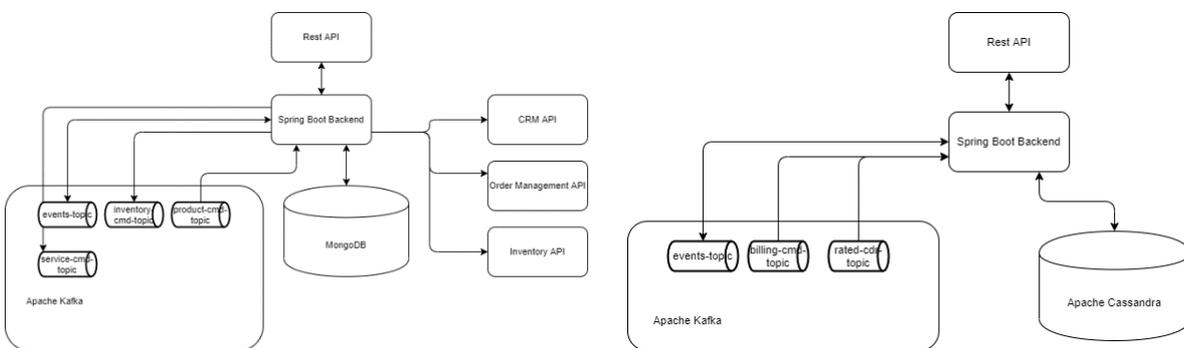
An authentication module is used to access SSO service to authenticate. This also manages unauthorized access, password confirmation, etc.

Each module communicates with its back-end service(s) through a proxy. The classifier resolver communicates with all back-end services and provides classifiers for the module on loading. Some modules load classifiers from multiple services. State management is responsible for not relying on components to load data but use a redux pattern for data handling centralisation.

“The layout module contains components to build layout, side navigation panel, modules, routes. This is again a component that is used to reuse components over multiple front-end applications and ensures consistency.”

The translation module is responsible for fetching translations from json file. To easily create a multi-language user interface.

Back-end



Back end application designs, based on micro service principles

The back-end application publishes events to the event bus and subscribes to events it requires.

It has its own database, one of the benefits of having a separate database per component is that every component can use the data base technology that suits its purpose.

Components that require processing of high volumes of data like the billing component can utilise a different database technology then components that require lower volumes but different data structures.

Platform requirements to support business growth

The application exposes REST APIs that can be used by either the front-end application or directly by exposing the API to a 3rd party.

This principle is important for achieve Time to Market for different scenarios.

In some scenarios, like with the point of sale system the back-end application integrates directly to another component using the exposed REST APIs. This for example to create an order in the Order Management component.

Open API framework for easy integration

Integrations are typically the most time consuming and expensive part of any business support system deployment. Next to the vast amount of documentation and alignment required upfront there is the effort to develop and test the interfaces.

In this last stage it is typical that the design specs as agreed for at least one of the parties does not align with the actual interface being delivered. This then leads to delay of the overall project. Integration typically also has the most impact on actual Time to Market for launching new services.

Within the Telco industry TMForum has together with suppliers and CSPs invested ample efforts in trying to stream line the interface specification and provides certifications to suppliers once they adhere to the TMF standard. Their Open API and Open Digital Architecture (ODA) are the key outputs of that.

Although this is a vast improvement compared to the previous situation, reality is that suppliers still use different variations of the interfaces and add their own parameters to them.

We therefore suggest focussing on tools that allow for easy adaptation of interfaces and automate the creation of documentation and API mocks that can be used for testing early in the process.

Swagger (<https://swagger.io/>) is one of these tools that is easy to use for REST interfaces.

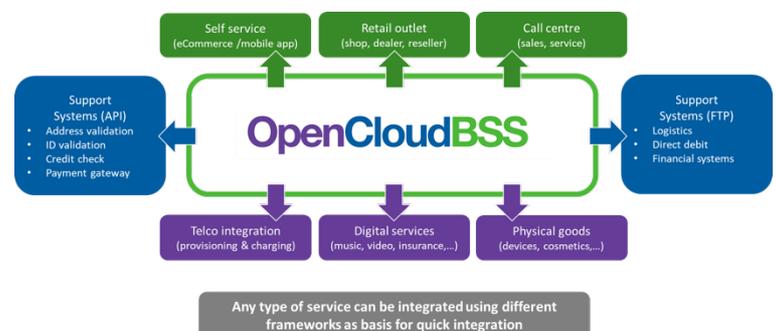
Converged platform, offering 2C and 2B over any type of service

To maximise monetisation and return on investment CSPs should build converged platforms.

One platform that can support

- ✓ All services to ensure flexibility around the combination of services sold to customers
- ✓ B2B, B2C, B2B2X, integrating new services once and sell them to any customer type

By bundling all services and customer types on one platform, every investment in integration and new capabilities can be reused for all business scenarios.



Single platform to support any service and any customer type

Platform requirements to support business growth

Multi-tenant capabilities

Multi-tenant capabilities provide the possibility to CSPs to create a virtual environment inside their business support system.

These virtual environments reuse all capabilities, functionality and integration of the overall system but provide the possibility to

- ✓ Separate customer data base
- ✓ Differentiate product catalogue configuration
- ✓ Differentiate branding and messaging

Multi-tenant environments are ideal to

- Separate B2C from B2B
- Run different brands within the same CSP
- Launch a reseller that has its own customer base (MVNO or OTT player)

Having the right multi-tenant environment makes setting up a new tenant an easy task, which allows CSPs to experiment with new partners without big investment of money and time. If experiments did not provide the desired results, customers can be moved to a different tenant without any difficult migration and the tenant used for the experiment can be closed.

Summary

5G will bring ample opportunities to CSPs to enhance their revenues and differentiate their product portfolios.

It will be important to not only invest in technology but also work on organisational change and define a clear strategy, detailing where the CSP wants to go and what the road to get there will be.

Trying to serve every market and every opportunity might be a road to failure, making bold choices on what the CSP will become, selecting the use cases and build a roadmap on supporting them, will help to channel investment in technology, branding, marketing and sales.

Next to the required investments in network for the MNOs, the MNOs, MVNOs and other CSPs will have to invest in their business support systems to be able to monetise the opportunities.

This to ensure that the back bone of the organisation is ready to support the CSPs strategy and can easily adapt to small changes in direction when the strategy is being implemented and fine-tuned. Or can even support a pivot in direction if this is required.

Selecting a platform that is build using the technologies to grow and scale your business and contains the right capabilities to support your use cases is of paramount importance.

About us

We are passionate about Telco & subscription management!

In our view 5G will have a massive impact on the Telco industry. It creates a huge opportunity to take the industry in to new directions. Moving from selling connectivity into becoming full service and experience providers. As far as we are concerned the sky is the limit in this new exciting world that we are entering.

We love being part of that process!

Our team is a great mixture of people with a background in Marketing and Sales within service providers and great, creative technical engineers that love to make simple to use solutions. This allowed us to build a platform that you will love to use.

We're always looking forward to new business opportunities!

Interested in our platform, services or looking for more information? Feel free to drop me a message or give me a call!



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