tmforum

ACTION WEEK ROUNDUP

DEREK FLEXER

Contents

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

Action Week in Lisbon

There was a fantastic buzz at Action Week Lisbon 2018. We had 197 attendees from 76 companies travelling from 26 different countries, spanning the globe. Of the 197 attendees, 109 are returning from previous years and 30% are Director level or above. There were 76 attendees representing CSPs from 24 unique CSP companies.

Monday morning started with keynote presentations setting the scene for the week

- The opening keynote was given by Nik Willetts, CEO, TM Forum, welcoming all to the week ahead and setting the context and TM Forum's 2018 agenda for digital transformation. This features the three critical challenges for the industry: to navigate the complexities of digital transformation, to dramatically improve business agility to be able to adapt and improve at speed, and digital ecosystem management to do business in the world of partners and ecosystem value fabrics. To accelerate industry developments to address these three challenges, TM Forum has grouped its activities into 5 focus areas: digital maturity, digital leadership, simplification, automation and intelligence, game-changing technologies, and digital ecosystem creation.
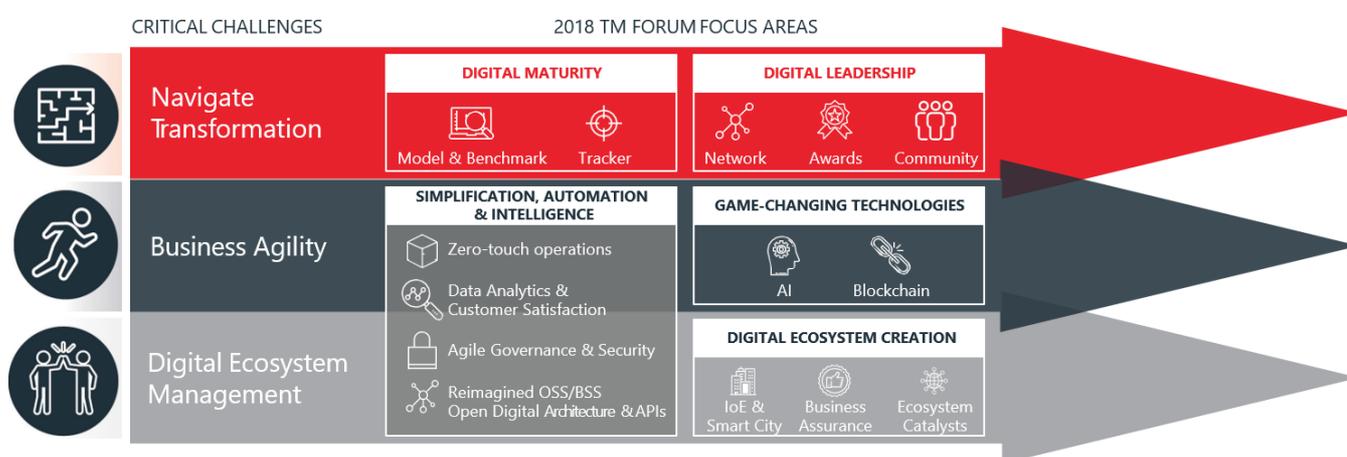
There were two more keynote presentations:
- Orange Transformation Enabled by APIs - Laurent Leboucher, *Vice President Architecture Enablers and Security*, **Orange Labs Services**
- L.A.M.A. Life After a Maturity Assessment - David Vasquez, *Director of International IOT Business Development*, **Verizon International**

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

Open Digital Architecture (ODA)

TM Forum announced the launch of its Open Digital Architecture (ODA) program. The ODA is envisioned as a more agile replacement for traditional operational and business support systems (OSS/BSS) architecture. "The telecoms industry is at a crossroads," says TM Forum CEO Nik Willetts. "There is a window of opportunity to move beyond connectivity and embrace new opportunities for growth. To succeed, the industry must radically simplify and automate core business operations to deliver the agility and efficiency needed to compete in today's market." Indeed, business-to-consumer markets have been transformed by social media and commerce platforms, enabled by communications service providers' (CSPs') multi-billion-dollar investments in global communications networks. But CSPs' piece of the pie is shrinking, as ubiquitous connectivity has driven down prices, eroded profit margins and lengthened the time it takes for new infrastructure to pay back. This in turn slows the cycle of innovation. To read more about this, see: https://inform.tmforum.org/future-oss-bss/2018/02/action-week-tm-forum-unveils-open-digital-architecture/

With the launch of the Open Digital Architecture program, the general session was followed by a series of project sessions to kick off detailed collaboration work. To see the white paper published ahead of Action Week, see: https://www.tmforum.org/resources/whitepapers/open-digital-architecture/

If you are not already a project member, you may join the **ODA** project (in the 'Core Project Area') here: https://community.tmforum.org/projects/coreprojectarea/default.aspx
Members wishing to get involved in the **ODA** project may access the working area on the project Wiki, Confluence, here: https://projects.tmforum.org/wiki/display/ODA/Open+Digital+Architecture+Project+Home
See the meeting notes from Action Week, Lisbon and working calls here: https://projects.tmforum.org/wiki/display/ODA/Lisbon+TAW+2018+Meeting+Notes

Summary of ODA Sessions at Action Week:
MEETING TITLE: Open Digital Architecture (ODA) Key Requirements & Principles:
OBJECTIVE: Following on from workshops in 2017. What are the key principals ODA should obey? What key requirements should a CSP be applying to all vendors? Review previous examples of Concepts & Principles documents – establish template for R18 output. Plan work to: Migrate existing material to new template. Identify key gaps. Identify previous work for inclusion. Identify contributors and development plan for new work. Specific focus on plan to develop priority areas already identified. Intent principle. Common data vertical.
> OUTCOME: A very well attended room heard a summary of how the project had been developed to this point and the work already done on guiding principles. It was agreed a rigorous engineering standard of principles, unique to the ODA project, should be determined and written using the TOGAF templates. Several Member contributions were explored and support for ongoing work in Release 18 agreed, along with a new document editor volunteering, brave sole.

MEETING TITLE: Open Digital Architecture (ODA) Eco-System Capabilities:
OBJECTIVE: Building on DSRA / DPRA existing work and understanding. How do I ensure that my systems are optimized for an ecosystem based market? Define the problem space for this workstream to be explored in R18. Set out what existing materials should be considered as input to R18. The creation of diagrams showing how a number of ecosystems use cases work. Resolve terminology / taxonomy issues between DPRA / DSRA and ODA projects.
> OUTCOME: It was recommended that the current B2B2X use cases address most of the ecosystem use cases with the exception of SLA and Big Apps to Big Apps store exchanges. The Team Leads will coordinate the B2B2X workstream picking up these use cases. A recommendation to the Functional Architecture group responsible for the ODA diagram is to put up two equal "diagrams" rather than the current "in the corner" diagram. The Team Leads to create a tiger team to define the relationship between DPRA/DSRA & ODA. It was apparent the efforts are answering related but different questions and we do need to bring them together.

MEETING TITLE: Open Digital Architecture (ODA) Functional Architecture:
OBJECTIVE: New stream of work to be started at Lisbon. What are the implications of the key principals for the ODA on its design? What is the top-level reference diagram for my system of the future? Agree scope of R18 workstream deliverables. Revised ODA

diagram – built on v1. Feedback since and a draft v2 for discussion & development. Agree how to capture Intent principle, Common data vertical and other principles. Need architects from ODA team and FX experts.

> OUTCOME: The session was roundup of a number of great suggestions to bring the ODA Architecture to the next phase of maturity. Suggestion to populate the top layers of the ODA main diagram with groups of functions (that needs further clarification) enhancements regarding customer centricity, a suggested view on the depiction of data aspects and a suggestion to add additional functionality, like Operational Domain Manager. Also, the discussion surfaced solid points that will need further clarification such is HIP aspect and SID concern.

MEETING TITLE: AI & Open Digital Architecture:

OBJECTIVE: Technical requirements that AI imposes on ODA. AI and Machine Learning requirements on ODA will be extracting data from the data layer and interacting with the Domains via an API capable of carrying intent based instructions. The session will be the first step in identifying what the technical requirements for this type of interface are. The session will also consider what requirements ODA would place on an AI system if it wanted to run as an ODA managed component. We will also survey the industry for existing solutions from the cloud computing space. Considerations might include; Metrics for AI, machine learning sets, data streaming, generic API requirements, data requirements, Intent requirements. Prepared Materials: Draft survey of existing AI industry solutions. Proposed output: Draft document on technical requirements for an API between an AI and ODA components. Initial list of existing potential solutions that exist and recommendations on how to test and validate them. R18 plan: How to take forward in R18?

> OUTCOME: A series of thought-provoking presentations, based on practical experience, led to a healthy debate on the potential impact of AI on ODA. It was proposed that next steps should include investigation of an Event Bus and AI Cognitive Services, a focus on Intent, and the inclusion of a Lifecycle/Deployment view. The use of discussion threads in Confluence were suggested, to minimize the number of calls and involve members from around the world.

MEETING TITLE: Open Digital Architecture (ODA) Service & Resource Management:

OBJECTIVE: How are end-to-end hybrid networks and other resources managed? Understand the work planned by the ZOOM HM team and how it will contribute to the overall ODA project. Agree appropriate points in ODA documents to reference out to detailed work produced by ZOOM.

> OUTCOME: This session took the form of a workstream alignment meeting between ODA, ZOOM and Frameworx. A review of the OSS/BSS Evolution, followed by an overview of the ZOOM Project, with a particular focus on the Hybrid Infrastructure Platform (HIP) assets, led to a discussion around platform, domain and component capabilities. Attendees identified the need for consistent terminology that is more meaningful to the market, accepting that different views might require different language. It was agreed that ZOOM should engage with the API team to help define the network grouping of APIs (suites).

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

Explore AI

Artificial Intelligence systems are being developed and deployed to address a wide area of business and technical challenges, with intensive research and development helping to drive rapid progress and adoption. In order for companies investing in developing these solutions to address the needs of the CSPs efficiently then there will need to be standards for how these systems will interact. Many AI companies would find the requirements to have to customize and maintain individual solutions for individual CSPs a major barrier to addressing this market and therefore may focus on addressing other application areas such as Fintech or medical applications which could offer an easier path to revenue generation. At Action week there were four sessions addressing key areas for rapid and efficient CSP adoption of AI:

- AI and Telecommunications Bridging the Ecosystems
- AI & Customer Experience; Key Application Areas
- AI Service and Network Management
- AI & Open Digital Architecture; Technical Requirements that AI imposes on ODA

If you are not already a project member, you may join the **Explore-AI** project (in the 'Application Project Area') here: https://community.tmforum.org/projects/applicationsprojectarea/default.aspx
Members wishing to get involved in the **Explore-AI** project may access the working area on the project Wiki, Confluence, here: https://projects.tmforum.org/wiki/display/EA/Explore+AI+Home
See the meeting notes from Action Week, Lisbon and working calls here: https://projects.tmforum.org/wiki/display/EA/Artificial+Intelligence+Lisbon+2018+TAW+Meeting+Notes

Summary of Explore-AI Sessions at Action Week:
MEETING TITLE: AI and Telecommunications Bridging the Ecosystems
OBJECTIVE: The role of the TM Forum in building a bridge between the Telecoms and AI industries – presentation and discussion around the draft AI TOR. To attract the interest of leading AI technology suppliers, CSPs must make it easier and cheaper to interconnect their respective systems. The session explored the landscape and context of the AI and telecommunications industries.

OUTCOME: The pair of sessions started with a summary of the proposed terms of reference by which the TM Forum will help the telecom industry engage with the AI industry and help bridge the gap between them, this was followed by an insightful view taken from the TM Forum's survey of the telecom state-of-the-nation in using AI. There then followed a CSP view (Telefonica) and a vendor view (Microsoft). Having set the scene, there was a round the table poll of views taken from all those present, to help build a detailed common understanding of perspectives. We concluded that NOW is the time to start putting AI into our core processes from CEM to Network Automation. AI is not easy or fast, ML takes time and investment. Reuse of broader industry solutions will be key. Need to carefully consider what other SDOs and Organizations are doing and leverage their work and avoid duplication. Commonality of data coming from Telco as an Industry would lower the integration and "learning" curve. This can be done 1-1 but having a common Data model would make pumping data into a commercial AI engine and Data lake would less costly. Except at the Network Equipment level Telco use case seem to be specializations of "normal" use cases from other industries. Reusing vs specifying new approaches will be key. Broadly, we concluded the role of the TM Forum is to:
- connect its members to the developing AI/ML ecosystem so that both sides gain greater understanding of opportunities,
- enable the creation of Innovation Catalyst projects, between current TM Forum members and AI/ML vendors (both existing members and companies from the wider developing AI/ML ecosystem),
- develop the open standards required for AI/ML systems to connect to ODA thus allowing the AI industry to develop products with applicability across the whole CSP ecosystem.

MEETING TITLE: AI & Customer Experience; Key Application Areas
OBJECTIVE: AI point solutions are well established in the general Customer Experience (CX) application area. However, there are specific requirements for service providers. We will investigate in this session the capabilities of current AI based CX applications

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

and potential use cases. We will establish the top use cases for further investigation. In the session we will have both external views and a summary of TM Forum work to-date in the CX area.

> OUTCOME: TM Forum members discussed the impacts of Artificial Intelligence. The focus was around the customer journey and being able to improve the experience using cognitive experience. Members from Deloitte and Microsoft talked about how their respective companies were incorporating the customer experience when focusing on Artificial Intelligence. Wolfgang Maass was guest speaker from the German Research Centre for Artificial Intelligence, who reiterated the need to innovating the customer experience through AI as CX is becoming disruptive and will only become more disruptive as we "inject" AI into the equation.

MEETING TITLE: AI Service and Network Management

OBJECTIVE: TM Forum Catalysts show radically simplified OSS/BSS can be achieved by repeated use of simple patterns. Intent demand with SLA management applied at all levels, network, resource & service. We will investigate in this session the complex interplay between services and network, how to manage both to ensure maximum efficiency in SLA management and network optimization, remediation etc.

> OUTCOME: During the Tuesday 2nd quarter, members worked on creating or enhancing existing Use Cases to include AI/ML aspect. Members have requested the Use Case template be updated to include AI and ML as part of the value proposition. The CEM workstream will work to update the template for R18.0 as well as enhance the UC discussed at TAW.

MEETING TITLE: AI & Open Digital Architecture; Technical Requirements that AI imposes on ODA

OBJECTIVE: AI and Machine Learning systems will be extracting data from the unified data layer of ODA and interacting with the domains via intent-based instructions. The session will be the first step in identifying the technical requirements for the data input and intent output from AI systems to ODA. Additionally, we will investigate the wider requirements around the interconnection of AI systems and ODA.

> OUTCOME: A series of thought-provoking presentations, based on practical experience, led to a healthy debate on the potential impact of AI on ODA. It was proposed that next steps should include investigation of an Event Bus and AI Cognitive Services, a focus on Intent, and the inclusion of a Lifecycle/Deployment view. The use of discussion threads in Confluence were suggested, to minimize the number of calls and involve members from around the world.

Open APIs

TM Forum Open APIs provide the critical enablers to build an ecosystem or marketplace for partner onboarding, monitoring and management of digital services across business boundaries, including revenue sharing, monetization and settlement.

If you are not already a project member, you may join the API project (in the 'Core Project Area') here:

https://community.tmforum.org/projects/coreprojectarea/default.aspx

Members wishing to get involved in the **API** project may access the working area on the project Wiki, Confluence, here:

https://projects.tmforum.org/wiki/display/AP/API+Project+Home

See the meeting notes from Action Week, Lisbon and working calls here:

https://projects.tmforum.org/wiki/display/AP/2018+Lisbon

Summary of API Sessions at Action Week:
MEETING TITLE: API introduction / welcome / update on status for the API program
OBJECTIVE: Overview of the agenda for the week. Status of the Open API Roadmap, in-progress APIs, Apache 2.0 mode licensing, task forces (RI/CTKs & API/SID mapping) and API Governance status
> OUTCOME: An engaged audience of members new to the TM Forum Open-API program attended, and got an overview of how to join the project, the "internal" API catalog, the JIRA database, Confluence pages and governance process.

MEETING TITLE: Open JIRA issue review (Steve Harrop)
OBJECTIVE: Learn about the recent developments to the JIRA management process, understand how to use this information in preparing work plans for API revisions and for team approvals of API updates.
> OUTCOME: Stephen Harrop, gave an overview of the remaining open JIRA issues, and the team closed down a further 16 issues during the session, as well as linking owners and APIs for further issues that will be addressed in upcoming API developments.

MEETING TITLE: Introduce newcomers to API program & API roadmap review
OBJECTIVE: Consider content in Open API Roadmap, in-progress APIs, help derive new priorities for R18, especially sets of APIs to support current initiatives such as Apache 2.0 migration, DG 3.0 support, ODA, ONAP, AI
> OUTCOME: Members new to the TM Forum Open-API program attended and got an overview of how to join the project, the "internal" API catalog, the JIRA database, Confluence pages and governance process.

MEETING TITLE: Open API MicroService Lab Developments
OBJECTIVE: The Open API lab is a space for communications service providers (CSPs) and their partners to develop end-to-end solutions and services rapidly, usually through Catalyst projects. (For more detail, see: https://inform.tmforum.org/open-apis/2017/12/open-api-lab-spark-rapid-innovation/) In this session, learn how the Open API lab will help our members to accelerate their digital transformation strategy by providing a great environment for experimentation and prototype development, supporting;
- Faster scaling – no months/years of manual migration
- Lower costs – developers don't need to provision, configure and manage the infrastructure so it's less expensive
- More security – controlled access, cybersecurity expertise and thorough and frequent checks
> OUTCOME: Axel Pieuchot and Tom Flynn gave an overview of the Neural Net Optimus stack to help with hosting and testing of TM Forum Open-APIs in the IBM-Cloud. Pierre Gauthier also gave an overview of the aspiration for the lab to host catalysts and reference implementations.

MEETING TITLE: Event Streaming and Messaging APIs
OBJECTIVE: Many current initiatives (ODA, ONAP, etc.) create new requirements for sophisticated event management to harvest the correct data streams in the correct way - network events, business events, routine events and alarm or emergency events. What new requirements does this create and what are the options to manage them? What solutions are already proposed, what approach should TM Forum take?

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

OUTCOME: Lots of good discussion on event models, APIs and potential uses. There is an opportunity to create a TM Forum Open-API with hypermedia features to allow interoperability with technical ONAP events and TM Forum business events. Deepak DS: Good to have filtering during subscription to event hub. Filtering should not get limited to Events. A thought I am having is use the search conditions as subscription filtering.

Bartosz Michalik: My thoughts: The top-level concepts are events and actions (messages). I think that with action it is crucial to have data payload definition consistent (the same if possible) with REST based APIs (@types). This could help integration/co-existence of the streaming and REST based systems. As I mentioned, action paradigm realization using pub-sub pattern is the most elastic realization, thus if we assure that API definition is compatible with pub-sub pattern we can make it easy adaptable for systems architectures based on e.g. RPC + Service registry. Somebody mentioned about additional properties in action envelope (e.g. max response timeout). There might be other attributes that can be useful in specific scenarios. Maybe it would be consider defining envelope data model and suggest some possible extensions (additional features). Maybe some mechanism of discovery of such features would be interesting (e.g. similar to NETCONF capabilities). It is important to suggest the same authentication/authorization technologies for REST/messaging based APIs (e.g. OAuth 2.0 is a good match). From the realization standpoint, it might be interesting to look into messaging/event base API definition languages, after quick search I have found one (https://www.asyncapi.com/v1/guide/) - maybe there are better. It might be also worth exploring whether we can reuse Swagger API definitions (maybe with extra metadata <3rd party extension>) as a model for event base ones (there are some discussions in Open API group around this topic https://github.com/OAI/OpenAPI-Specification/issues/777).

MEETING TITLE: SID / API mapping: Frameworx Mapping Task Force
OBJECTIVE: Update on the status of the task force, mapping the APIs and the API data model against the SID, observations noted to date - common observations, lessons for API authors, the R18 plans to continue the mapping process, call for more volunteers to take on mappings. Discuss governance for new APIs to keep up to date with their mappings as we develop more APIs in the portfolio. The SID team to present to the Open API team the rules used to drive the mapping of the API Data Model to the SID Information Model
OUTCOME: There were discussions and decisions on how to improve the process and on agreeing on how to prioritise the sequence order of the APIs to map (as the team in charge of doing the mapping has only few participants).

MEETING TITLE: SID / API Mapping: Service Catalog Management/ Service Inventory Management/ Service Ordering Management
OBJECTIVE: The initiative to work with ONAP creates demand these APIs; check progress and resolve issues on the SID mapping to these APIs. Interactive session for the SID team to present to the Open API team review comments about 3 APIs recently for which the Data Model was recently mapped to the SID (Service Ordering, Service Catalog, Service Inventory).
OUTCOME: This session was very well attended, and the participants were able to take decisions on the various proposals suggested by the SID team during their review process. when it was confirmed that a change is needed, a JIRA CR will have to be created.

MEETING TITLE: APIs Towards API Component Suites
OBJECTIVE: ODA needs to be event driven and intent based - in relation to how network management is likely to work in the future given AI & ML and the need for fully automated and self-healing networks. These capabilities should be ubiquitous throughout our future architecture.
OUTCOME: Lots of positive proposals for the potential uses of 'Component Suites': TM Forum sanctioned API facades on top of existing TM Forum Open-APIs, to present a simplified subset of capabilities for more vertical use-cases. Suggested uses included Mobile-Self-Care (presented by Telefonica); Network Service Management (presented by Telstra), relevance to ONAP and IoT also noted. This will also help to shape common micro-services. Axel Pieuchot noted the benefit to vendors to simplify and focus their Open-API support on relevant use-cases, rather than having to cover a wider breadth of support. Further discussion needed on principles of definition and dependency management to the underlying Open-APIs.

MEETING TITLE: API & NFV support; continued joint working with the ZOOM HIP team
OBJECTIVE: API Platform for enabling Virtual Networks and SDN: Work on defining the components for enabling the ZOOM HIP API Platform and for services and resource management in an ODA platform
OUTCOME: Discussions centred on a series of sequence charts and use cases for 5G network slice management, based on existing TM Forum assets. It was agreed that this could be developed as three views. A Business view using CurateFx, an Enterprise Architecture view using UML, and a suite of API Components using Swagger. The ZOOM and API teams will collaborate to develop the 5G example with activity diagrams and refactoring, if required, leading to the creation of an API component suite.

Other API meeting sessions at Action Week;
Meeting Title: Kick off for the development for an IoT API suite

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

Objective: Kick off for the development for an IoT API suite. Issues include: Open API for IoT: O.catalyst APIs + IoT Data Mngt API. FIWARE vs. TM Forum Open API alignment + IoT business needs vs Telco business needs - use of possible API suite in API lab

Meeting Title: Trouble Ticket API Refactoring
Objective: Discussion on how to restart and refactor the existing Trouble Ticket API.

Meeting Title: Crowdsourcing of new TM Forum Open APIs based on member contributions
Objective: Consider suggestions for Crowdsourced APIs, review against the API roadmap and existing APIs, provide advice and feedback. If you wish to contribute a new API, please contribute a completed crowdsourcing template before Monday 25 January 2018 to be included in the crowdsourcing agenda at action week - here: Contributions

Meeting Title: Microservices, Open APIs and Design Guidelines
Objective: Review the next planned developments for the API Design Guidelines, after the hypermedia support in DG 3.0, what are the developments needed for Microservices support. What are the requirements from current initiatives such as ODA, AI and ONAP, how will these impact the development patterns for APIs in R18 and beyond?

Meeting Title: Mapping API operations in Frameworx
Objective: Define a process to capture the API operations in the Frameworx Model in repeatable manner

Meeting Title: API Evolution New Patterns Towards Version 3.0 - Migration of APIs to DG 3.0
Objective: Learn about the patterns defined in DG 3.0 and their importance & significance and how to evolve existing APIs or crowdsourced APIs to take full advantage of these new techniques and approaches.

Meeting Title: RI / CTK (Reference Implementation / Compliance Tool Kit) Developments and Tooling Support
Objective: Learn how to use the new tooling to help create RIs and CTKs from existing Swagger files and possibly help contribute towards improving the tooling.

Meeting Title: ONAP Open APIs Technical Architecture
Objective: What generic API patterns and behaviors does the requirements of ONAP project suggest as inputs to the API technical architecture? What changes should be made, when & how to the Open API Design Guidelines?

Customer Centricity & Data Analytics

Over the past several years, work stream collaboration has resulted in a robust, reusable set of Customer Centricity assets and tools. Historically the Customer Centricity program has been focused on Customer Experience Management (CEM), Data Analytics and Metrics. Telcos also struggle today to easily identify, extract and analyse meaningful data from the massive cache they own. TM Forum's Data Analytics Program is working to help organizations make the best use out of business intelligence and data analytics tools in the enterprise-wide activities of revenue management and customer experience management. The focus of the work is on bridging the gap between 'raw' Data Analytics technology and the specific business needs of your company.

If you are not already a project member, you may join the **Customer Experience Management** project (in the 'Application Project Area') here: https://community.tmforum.org/projects/applicationsprojectarea/default.aspx
Members wishing to get involved in the **CUSTOMER CENTRICITY** project may access the working area on the project Wiki, Confluence, here: https://projects.tmforum.org/wiki/display/CEM/Work+In+Progress
See the meeting notes from Action Week Lisbon and working calls here: https://projects.tmforum.org/wiki/display/CEM/Customer+Centricity+Lisbon+2018+TAW+Meeting+Notes

If you are not already a project member, you may join the **Data Analytics** project (in the 'Application Project Area') here: https://community.tmforum.org/projects/applicationsprojectarea/default.aspx
Members wishing to get involved in the **DATA ANALYTICS** project may access the working area on the project Wiki, Confluence, here: https://projects.tmforum.org/wiki/display/DATA/Work+In+Progress
See the meeting notes from Action Week Lisbon and working calls here: https://projects.tmforum.org/wiki/display/DATA/Customer+Centricity+-+Data+Analytics+-+Lisbon+2018+TAW+Notes

Summary of Customer Centricity Sessions at Action Week:

MEETING TITLE: CEM Use Cases and IoE Business Scenarios
OBJECTIVE: X-team collaboration on Customer Experience and IoE. Indexing & Alignment of Use Cases and Business Scenarios. Recapture the B2B2X BS that can be jointly developed with CEM UCs. Prioritize or focus on BSs that involve (Monetizing) IoE and CEM.

> OUTCOME: Members discussed the CEM Use Case process from end-to-end. With the changes taking place at TM Forum and the ability for catalyst members to use Catalyst, the Use Case team is focusing on taking the 2017 CEM catalyst and creating CEM Use Cases. The CEM Use Case template is heavily used amongst members; however, there is a need for a common template between CX and B2B. Adding AI/ML aspects to the template was also discussed as a need on the template. Release 18.0 will see a new template to the Use Cases and further discussion with 2017 CEM catalyst to help enhance the Use Case Library.

MEETING TITLE: CEM and Monetization
OBJECTIVE: X-team collaboration on Customer Experience, Monetizing IoE and 5G to determine relationship between customer experience, monetization and IoE/5G technologies.

> OUTCOME: Thorough, well prepared presentation of the CEM impacts to monetization and 5G. Good focus and participation to discuss role of CEM and how to frame CEM across ODA and Digital Ecosystems. Next steps were outlined and proposed for workstream participation in TR271 and TR276. Some work items may be delayed beyond R18.0.

MEETING TITLE: Evolution of CRM in Customer Centric World
OBJECTIVE: Understand the evolution of the CRM tool in a digital transformation world and how it should evolve to ensure CX

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

OUTCOME: Presentation of Evolution of the CRM Approach in a digital world was outlined with recommendations for additional dimensions to enhance GB994. Great real-world examples were shared on the issues and challenges of rolling out new ecosystems with new partners who are all at different levels of enablement. These result in variety of Customer Experiences which reflect back on the service provider.

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

Frameworx

The Frameworx project is continuing to evolve the core frameworks to support both the latest technology, such as virtualized network functionality, but also the latest business processes, such as DevOps approaches.

Summary of Frameworx Sessions at Action Week - The week had a focus on meetings with other project teams from across the strategic programs. The Frameworx team has used the week to cooperate and coordinate with the ODA team in an effort to help the materializing ODA work. In particular, the group has unveiled a suggestion for a conceptual component for ODA, it discussed and decided on a new phase in the development of the Functional Model and participated in ODA architecture sessions to absorbed and improve its output.

MEETING TITLE: Frameworx Mapping
OBJECTIVE: Resolve challenges in the mapping endeavour of Frameworx
> OUTCOME: The session first explained the current direction in the Frameworx mapping effort. The discussion then continued to options of how to move forward: Options are to map when requested or do a partial Mapping e.g. eTOM to SID. We are have not decided yet on how to go forward but noted that a good practice must include mapping to Functions and other Frameworx components at the creation and completion of the API.

MEETING TITLE: ODA Component Model Definition
OBJECTIVE: How is an ODA component accurately described? What would make a well-defined component with all the attributes? Scope the R18 planned work
> OUTCOME: An important session that examined key requirements for the ODA Component. A proposed skeleton was showcased and contemplated. The discussion considered such aspects as the need for a Lifecyle of a component, licensing and procurement, its size and boundaries. Consideration was given to who is going to use it what is its purpose.

MEETING TITLE: Functional Framework
OBJECTIVE: An ODA component will need a formal definition of functionality that is not possible with the current framework models. Define the R18 deliverable. Review 17.5 progress to date – identify limitations for component definition.
> OUTCOME: The session was focusing on the creation of a functional Framework. From the discussion it seems that subsequent discussion is needed to determine the size of the functions in the functional model. This due to the fact that we might aggregate more than one current function as it appears in the functional model. It is also clear that some duplication needs to be cleaned. Also, a considerable number of functions will need to be added of types we did not have in the original Application Framework.

MEETING TITLE: TAM Joint Meeting TAM and ZOOM OCF on IG1130D
OBJECTIVE: Develop the document
> OUTCOME: A review of current and previous documentation was followed by a demonstration of the clickable model and its use to analyze changes that might be required to Resource Test Management. Although the current document title refers to SDN/NFV it was noted that updates to TAM may be required for other reasons. Attendees were encouraged to participate in the weekly collaboration calls.

MEETING TITLE: Mapping API operations in Frameworx
OBJECTIVE: Define a process to capture the API operations in the Frameworx Model in repeatable manner
> OUTCOME: This started as a tooling session trying to create a process to represent the APIs in the Casewise model so that it will assist in mapping of APIs to Frameworx. We then looked at possible mapping options and examine the information currently available in the APIs.

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

MEETING TITLE: eTOM Business Processes implemented with Smart Contracts

OBJECTIVE: Overview of Frameworx and exploration of new processes and definitions needed in Frameworx as a result of a SmartContract environment.

> OUTCOME: A thought provoking informative session that explain blockchain in particular and more generally distributed ledgers. Plans to amend the Business Process Framework are underway, including a consideration for a creation of an example business flow that entail a disturbed ledger.

MEETING TITLE: joint with ODA on Functional Architecture

OBJECTIVE: New stream of work to be started at Lisbon. What are the implications of the key principals for the ODA on its design? What is the top-level reference diagram for my system of the future? Agree scope of R18 workstream deliverables. Revised ODA diagram – built on v1. Feedback since and a draft v2 for discussion & development. Agree how to capture Intent principle, Common data vertical and other principles. Need architects from ODA team and FX experts.

> OUTCOME: The session was roundup of a number of great suggestions to bring the ODA Architecture to the next phase of maturity. Suggestion to populate the top layers of the ODA main diagram with groups of functions (that needs further clarification) enhancements regarding customer centricity, a suggested view on the depiction of data aspects and a suggestion to add additional functionality, like Operational Domain Manager. Also, the discussion surfaced solid points that will need further clarification such is HIP aspect and SID concern.

MEETING TITLE: eTOM Joint Meeting with ZOOM OCF on IG1145

OBJECTIVE: Analysis of Dynamic/Adaptive Processes and impacts on eTOM (IG1145)

> OUTCOME: Following an overview of the OCF Workstream and contributions from team members, attendees reviewed recent additions to the IG1145 document and proposed a sub-section for Continuous Improvement. The scope of the document may be reduced to focus on the core requirements for Release 18.0.

MEETING TITLE: SID-Characteristics Clean-up Related (charter 18.0: 2c20)

OBJECTIVE: Develop the document

> OUTCOME: This session introduces the need to rationalise the use of the "Characteristic" pattern. This pattern was used 13 times in a specific way for different entities. In 4 cases the entities concerned inherit from Entity / EntitySpec and 9 cases did not. More recently, this pattern was made "generic" by applying it to the Entity / EntitySpecification. It then makes sense to rationalise the usage of this pattern by reusing the generic classes related to Entity / EntitySpecification whenever possible without losing the specific adaptations when necessary. As a first step, the focus will be on the use of this patter for the ProductSpecCharacteristic.

MEETING TITLE: SID - Mapping ETSI NFV to SID-Related to Charter 18.0 2C14

OBJECTIVE: Improve Mapping of SID to ETSI NFV

> OUTCOME: In Rel 17.0, the SID team approached the modelling of virtualized functions in a more generalised way by creating the concept of Network Functions and other related artefacts. This approach is very flexible and can apply in many different contexts. However, it is agreed to be useful to show how the key concepts from the ETSI-NFV model (e.g. IFA15) can map to the SID ResourceFunction model. This session introduced the objective of this chartered work and made references to the key documents on the ETSI and TM Forum side.

MEETING TITLE: Modelling Requirements for 5G Network Slices

OBJECTIVE: Introduce the key aspects of 5G Network Slices and capture the modelling requirements

> OUTCOME: Good presentations and discussions. The number of participants on this very technical topic and the questions raised indicate that there is a clear desire to better understand the concept of Network Slices, how it is used and how it should be managed. More discussions expected in the near future. No doubt that the experience of Catalyst projects will help.

MEETING TITLE: SID / API mapping: Frameworx Mapping Task Force

OBJECTIVE: Update on the status of the task force, mapping the APIs and the API data model against the SID, observations noted to date - common observations, lessons for API authors, the R18 plans to continue the mapping process, call for more volunteers to take on mappings. Discuss governance for new APIs to keep up to date with their mappings as we develop more APIs in the portfolio. The SID team to present to the Open API team the rules used to drive the mapping of the API Data Model to the SID Information Model

> OUTCOME: There were discussions and decisions on how to improve the process and on agreeing how to prioritise the sequence order of the APIs to map (as the team in charge of doing the mapping has only few participants).

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

MEETING TITLE: SID / API Mapping: Service Catalog Management/ Service Inventory Management/ Service Ordering Management
OBJECTIVE: The initiative to work with ONAP creates demand these APIs; check progress and resolve issues on the SID mapping to these APIs. Interactive session for the SID team to present to the Open API team review comments about 3 APIs recently for which the Data Model was recently mapped to the SID (Service Ordering, Service Catalog, Service Inventory).
> OUTCOME: This session was very well attended and the participants were able to take decisions on the various proposals suggested by the SID team during their review process. When it is confirmed that a change is needed, a JIRA CR will have to be created.

MEETING TITLE: SID Business Interaction
OBJECTIVE: Business Interaction and BI Item hold relationships for which the semantic meaning is relevant only to some specific subclasses
> OUTCOME: The problem this contribution addresses is that Business Interaction and BI Item hold relationships for which the semantic meaning is relevant only to some specific subclasses. The proposal is to rationalize the semantics and create relevant relationships and attributes for the concrete subclasses when not generally applicable. Cécile proposed an approach, using Excel spreadsheets to identify the relevance of every association to the subclasses in the hierarchies of BusinessInteraction and BusinessInteractionItem.

MEETING TITLE: SID-POP (Product Offering Price - charter 18.0 2C3)
OBJECTIVE: Discuss various aspects of the SID-POP, such as; the exact meaning of the attribute "validFor" in the context of a POP and the relationship between ProductSpecification and ProductOfferingPrice.
> OUTCOME: Very technical discussion about clarifying and improving the modelling of artefacts related to ProductOfferingPrice (aka. POP).

MEETING TITLE: Engaged Party ABE development and Customer domain updates (Charter 18 2C7)
OBJECTIVE: Discuss and resolve two separate streams of interactions about difference between CustomerOrder and PartyOrder.
> OUTCOME: Very good interactive session where participants exchanged their interpretation of CustomerOrder versus PartyOrder from looking at the Information Model and the EngagedParty GB. Beyond the Order entities other entities present in both the Customer domain and the EngagedParty domain were also analysed. All participants confirmed that clarification is needed, and future contributions will be produced with this objective.

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

Internet of Everything and Digital Ecosystems

As the connected world of Internet of Everything (IoE) and Digital Ecosystems digital business becomes the new norm for consumer and enterprise applications and services, the aim of this project is to create a set of guidelines, best practices, models, metrics and other tools that enable successful monetization of new digital services spanning any industry vertical, facilitate management of complex digital ecosystems of partners needed to deliver these services and generate trust among stakeholders and users.

For 2018, a specific focus is on defining digital business scenarios; facilitating ecosystem partnerships; enabling monetization of digital services; customer experience aspects of trust (privacy & security); fostering the application of business assurance disciplines in the context of digital business; and applied innovation. In addition, exploration will continue on Business Ecosystem Architecture business requirements as they relate to Open Digital Architecture. Innovation work in the smart contract and blockchain technologies will continue.

If you are not already a project member, you may join the **Internet of Everything** project (in the 'Application Project Area') here:

https://community.tmforum.org/projects/applicationsprojectarea/default.aspx

Members wishing to get involved in the **INTERNET OF EVERYTHING** project may access the project Wiki, Confluence, here:

https://projects.tmforum.org/wiki/display/ODEP/Internet+of+Everything+%28IOE%29+Project+Home

See the meeting notes from Action Week, Lisbon here:

https://projects.tmforum.org/wiki/display/ODEP/2018-02-05+Lisbon+2018+Team+Action+Week+Meeting+Minutes

---

The Internet of Everything Sessions have focused on Business Scenarios, Monetization & Trust and Blockchain at Action Week:

MEETING TITLE: Blockchain Sandbox
Sessions focusing on distributed ledger technology like blockchain drew full and engaged audiences here at Action Week, as communications service providers (CSPs) consider whether a shared blockchain-like framework is needed for the telecom industry – and if so how to build it.

Why is blockchain important for telecom? As the internet of everything (IoE) grows, CSPs increasingly are looking at disruptive billing and settlement technologies as a way of monetizing services and verifying service level agreements (SLAs). The graphics below from a 'blockchain sandbox' workshop presented by John Wilmes, Director of IoE Projects, TM Forum, explain how blockchain and other distributed ledger technologies work, and how the telecom industry envisions using them to manage fraud, deliver identity as a service, enable 5G services and enable peer-to-peer connectivity for IoT devices. To read more, see:
https://inform.tmforum.org/internet-of-everything/2018/02/action-week-telecom-industry-need-blockchain/

MEETING TITLE: Ecosystem Management Training Preview and Feedback (2 Sessions)
OBJECTIVE: Get input from the team and any other attendees on the content of the new Ecosystem Management training that educates on the main best practices developed in TM Forum's IoE program.
> OUTCOME: The first face-to-face delivery of TM Forum's new Business Ecosystem Foundation course took place over two sessions. Both sessions were attended by a good cross section of representatives from Service Providers and vendors. The first session of the morning focused on the key terms and components associated with Digital Transformation, Business Ecosystems, Business Models and how they specifically related to the Telco sector. The response to the course was extremely positive and many were very pleased at the amount of knowledge gained. Many also expressed a keen interest in getting access to the CurateFx tool.

MEETING TITLE: Explore: Value of Trust through Identity Relationship Management in the Internet of Everything
OBJECTIVE: Explore the Identify Relationship Management concepts in Digital Ecosystem capturing the implications/opportunities and challenges appropriate to be addressed by TM Forum.
> OUTCOME: A comprehensive look at identity management in the context of 5G, the digital, connected economy and services delivered across ecosystems of partners from a business and trust perspective. GDPR became a central part of the

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

animated discussion within the group of attendees. The session wrapped up with a positive note on the opportunity for CSPs to become trusted partners and monetize this.

MEETING TITLE: Monetization: Facilitating/automating Micropayments (Blockchain/Smart Contracts/Distributed Ledger Technology)
OBJECTIVE: Explore the Micropayments DLT in Blockchain Technology concepts in Digital Ecosystem capturing implications/opportunities and challenges appropriate to be addressed by TM Forum.

OUTCOME: This session was an in-depth analysis of payments vs. micro-payments in the ecosystem context, the risks/challenges, as well as the possible solutions, in particular distributed ledger technology, or blockchain. Various use cases were put forward during the discussion and several further considerations were highlighted. The next step to move this on within the Forum will be to draft a series of requirements to enable profitable micropayments and look at how best to work with the industry to fulfil these as a second step. This will be discussed with the monetization & management collaboration team.

Emmanual Otchere (Huawei): It was an interesting session with a full room of peaked interest. One point that became apparent very quickly was the tendency for people to immediately assume "micropayment" as purely relevant to the unbanked, and therefore Africa/Asia/LATAM as the markets for this type of payments. This misconception may be driven by "marketing" headlines with "mobile payments" and need to be diffused in order to embrace the true potential Micropayments has on business model changes. Apple iTunes store has been using Micropayments strategy in selling songs at fractions of a dollar ($0.99) compared to a whole album to dominate the music industry. That's a real Micropayment strategy that changed the business model in the music space. Make the amount so small that it attracts consumption, reduces pirating and increases stickiness through a platform effect. The "world" of IoT/IoE and "commerce-of-transactions" is beginning to drive everything-as-a-service, which points to new "payment" business models that require rethinking underpinning capabilities for monetization, trust and management - across revenue generation, revenue assurance, fraud management, device management, catalog management, account management, device management etc. The capabilities CSPs and other Service Providers in this space require to overcoming the regular overheads with traditional payment models will include the ability to mitigate the cost of processing transactions through clearinghouses, Card providers, Gateway providers and the slew of "middle-man" players, that for every transaction require transaction fee. In a micropayment business model, transaction fees cannot be scaled down given the existing technical and business infrastructure outlay. A whitepaper to the wider community to further the conversation and awareness will be a good thing, I think. Similarly, TR271 and TR279 could outline the micropayment business models and examples as well as capture the implementation strategies using Distributed Ledger Technology and Smart Contracts to begin reflecting the impact on Frameworx.

MEETING TITLE: Monetizing 5G
OBJECTIVE: in a collaborative approach, describe in-depth promising and characteristic 5G use cases from "Factory of the Future" vertical. For each use case, describe the Customer Facing Service (CFS) that will be ordered to the 5G network.
These are pre-requisite to ecosystem building and monetization consideration.
Description: Review of the "5G monetizing" white paper (TR276 R17.5.0.); general introduction to "Factory of the Future" vertical. Reminder about the "5G capability triangle"; detailed description of 5 typical use cases; description of the "Customer Facing Services" that should be ordered to 5G network for enabling these use cases. Next steps will be explored.

OUTCOME: 5G technology is upon us and CSP are looking to enhance their networks to provide the services. TM Forum and its members are working closely to realize the commercial launch of the next generation network as well as what TM Forum's role will be to help members along the journey. Karim Jammal pointed out 5G is exploring the limits of 4G and introduced new capabilities enabling new use cases represented in a so-called "triangle of capabilities." Five different use cases were introduced during the presentation to explore the development of 5G. Members are now looking to next steps to understand all the areas in which development will evolve and build on the use cases discussed. Members to explore TM Forum's role as the development of 5G continues.

MEETING TITLE: Blockchain: Enabling and growing IoE & Digital Business (Depth & Breadth)
OBJECTIVE: Review the current use cases as documented in TR279; solicit input for additional blockchain use cases; Incorporate input from other TAW Sessions; Identify and prioritize the next steps for adding value to TR279.

OUTCOME: Great presentation on overview of blockchain and distributed ledger technologies. Review and discussion of the CSP use cases were presented. Great questions and advice on how CSPs could move forward to making the appropriate decisions on what use cases makes sense for blockchain and which ones may not be as appropriate. Looking forward to Nice 2018 and learning more about the issues and challenges encountered by the catalysts planning to do proof of concepts with blockchain.

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

Business Assurance

The TM Forum Business Assurance Project is a multidisciplinary group, addressing the full spectrum of issues embracing Revenue Assurance, Fraud Management, Charging and Billing, Asset Management, Security and Privacy to underpin all the strategic programs. Business assurance (BA) is often viewed as a back-office function, but it is an important overall business requirement. After all, what's more important than ensuring that revenue is collected and that customers experience a level of service that inspires loyalty and entices them to subscribe to additional services?

To promote recognition of this among the leadership of communications service providers (CSPs) and across divisions and departments within the companies, 15 members of the TM Forum Open Innovate Initiative on Business Assurance in the context of IoE and digital ecosystems signed a Business Assurance Manifesto at Action Week in Lisbon this week. By bringing attention to the importance of business assurance, the team hopes to attract more people to sign the manifesto. Another goal is to promote cross-team projects within TM Forum collaboration groups such as Customer Centricity, Digital Trust and Monetization. To read more about this see: https://inform.tmforum.org/news/2018/02/action-week-participants-support-manifesto-business-assurance/

If you are not already a project member, you may join the **Business Assurance** project (in the 'Application Project Area') here: https://community.tmforum.org/projects/applicationsprojectarea/default.aspx
Members wishing to get involved in the **BUSINESS ASSURANCE** project may access the working area on the project Wiki, Confluence, here: https://projects.tmforum.org/wiki/display/RM/Revenue+Management+Project+Home
See the meeting notes from Action Week, Lisbon here: https://projects.tmforum.org/wiki/display/RM/2018+Lisbon+TAW+Meeting+Minutes

Summary of Business Assurance Sessions at Action Week:

MEETING TITLE: Business Assurance: Overview of the BA Initiative and Workstream
OBJECTIVE: Gather additional momentum and participation in this exciting initiative.
> OUTCOME: Lively discussions to align the team with the overall purpose of the BA initiative and the role of the Manifesto. More discussions to follow this week as the team works through details of workstreams and further discussions on the manifesto.

MEETING TITLE: Business Assurance: RA Survey Results in a Nutshell & Deep Dive in RA Transformation
OBJECTIVE: Setting the stage for the current initiative based on insights from the Survey and Workgroup discussions to date.
> OUTCOME: Great discussions and suggestions on interpretations of RA Survey results as well as suggestions for capturing the data in the next survey. Team looking for promotion opportunities of the RA Survey results. Discussions for follow on to build out DMM with RA/BA and member volunteers to make video clips this week for future use when RA survey is finalized. RA survey discussion to be completed in later session. We discussed open format importance to ensure ideas sharing between experts within industry to gain more insights and value. We also need modern collaborative tool to support effective communications.

MEETING TITLE: Overview of RA Balanced scorecard (current version); Feedback from participants (Usability, Applicability, Easiness for implementation; Management understanding), Treatment of Credit Notes as part of RA KPIs, Proposal for changes of financial KPIs; Other KPIs to be introduced
OBJECTIVE: Understanding Business Assurance Metrics & KPIs from CSP & TM Forum Workstream Perspectives
> OUTCOME: Great presentation on three topics of the RA Balanced scorecard, utilizing Credit Notes and challenging the current KPI naming conventions. Great participation from all attendees. Expect results of this session to result in enhancements to GB941A.

MEETING TITLE: Business Assurance Topics: Manifesto, eTOM and Priority Working Groups
OBJECTIVE: Review Manifesto, eTOM and priority for working groups to align and define next steps.

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

OUTCOME: Lively team discussions to capture final comments on the RA Survey results write-up with goal to finalize the writeups within a week for final review and make plans for publication. Also, discussion of plans for publicizing results of the survey results through use of TM Forum community blogs and videos. Team objectives defined in 3 areas to lead to definition of BA working group activities.

MEETING TITLE: RA/BA & Catalyst Teams Evolution of the BA Catalyst
OBJECTIVE: Review breadth and depth of use cases exploring additional use cases.
OUTCOME: These morning sessions open catalyst sessions for Empowering Business Assurance with AI. The team made great progress to clarify what was expected presentations for nice and a plan for how that was to happen. They continue to work toward further identification of use cases.

MEETING TITLE: Revenue Assurance: Impact of Digital Transformation on Revenue Assurance
OBJECTIVE: Review and discuss significant Revenue Assurance areas that will change with digital transformation.
OUTCOME: Productive session which included breakout team identification of additional BA Digital Ecosystem Use cases for further exploration as well as introduction of eTOM assessment from BA perspective. More work to be done on both but session resulted in great team participation, dynamics and discussions. Anticipate impacts to GB941D and cross teaming with Frameworx TAM.

MEETING TITLE: Fraud Management: AI and ML Techniques applied to Fraud Scenario
OBJECTIVE: Review draft version of the new annex for the fraud classification guide (GB954) with fraud scenario to be addressed using AI and machine learning (ML) techniques
OUTCOME: An interactive session working on the Fraud Management team's contribution to the ABDR. Much input and discussion leading to progress in the contribution. A great discussion around the contribution of fraud management team to data analytics work at the TM Forum as an appendix to GB954. Run through and further detailing of use cases put forward in the presentation provided by Luis for this session. Working out the domain of the use cases including RA, FM, customer, legal... including overlaps/duplications. Discussion around how to further enhance and which companies might add value to the initiative.

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

ZOOM

Although different businesses are following different paths, for CSPs it is clear that deployment of virtualized and software defined network technology is well underway. CSPs must now start to maximize the benefits of this technology over and above simple substitution of existing functionality. For the ZOOM project (Zero-touch Orchestration, Operations and Management), this means a move from artefacts that enable transformation, to assets that can be used in the design and realization of systems, and enable the procurement, deployment and operation of them as part of a profitable business.

If you are not already a project member, you may join the **ZOOM** project (in the 'Core Project Area') here: https://community.tmforum.org/projects/coreprojectarea/default.aspx
Members wishing to get involved in the **ZOOM** project may access the working area on the project Wiki, Confluence, here: https://projects.tmforum.org/wiki/pages/viewpage.action?pageId=88580256
See the meeting notes from Action Week, Lisbon here: https://projects.tmforum.org/wiki/display/ZOOM/Lisbon+TAW+2018+Meeting+Notes
And working call meeting notes here: https://projects.tmforum.org/wiki/display/ZOOM/Meeting+notes

Summary of ZOOM Sessions at Action Week:

MEETING TITLE: Newcomers Introduction to the ZOOM Project
OBJECTIVE: To welcome new comers to the ZOOM project and provide an overview of the project workstreams, topics and deliverables via the document roadmap. Align the team on ZOOM AW Scope, Charter intent and Document Roadmap. Output: common goals and aims and understanding - especially about creating output that can be adopted and/or consumed in an impactful way. Reminder for participants to join the ZOOM Core Project Area.
> OUTCOME: As always, it is a pleasure to meet those who are attending Action Week for the first time, are interested in learning more about the project, keen to attend further session during the week, and willing to participate in the ongoing collaboration work.

MEETING TITLE: Onboarding and Lifecycle Management (OLM) – Virtualized Function (VF) Metadata
OBJECTIVE: Review of survey results and progress key metadata definitions, e.g. license, metrics, package type, orchestration type.
> OUTCOME: Discussions between a diverse group of attendees identified the need for a review of ETSI IFA010, further analysis of Product Use Rights (PUR), improved use cases, and a decision on whether to couple or decouple licenses from software.

MEETING TITLE: Operations Centre of the Future (OCF) - Impact on TAM in service platforms ecosystem (IG1130D)
OBJECTIVE: Review Operations Centre of the Future work with respect to Impact on Frameworx to continue work for R18.0.
> OUTCOME: A review of current and previous documentation was followed by a demonstration of the clickable model and its use to analyze changes that might be required to Resource Test Management. Although the current document title refers to SDN/NFV it was noted that updates to TAM may be required for other reasons. Attendees were encouraged to participate in the weekly collaboration calls.

MEETING TITLE: ONAP Working Group
OBJECTIVE: We will report the progress of the various work teams, next steps and places effort needs to be focused. TM Forum Beijing contributions, way of working, ONAP related catalyst projects for Nice, ONAP R3 contribution candidates.
> OUTCOME: This well-attended session reviewed the process for contributing to ONAP, and the submission deadlines for the Beijing and Casablanca releases. A discussion on Maturity Models and minimum requirements identified the need for a volunteer with a software background to assess our process.

MEETING TITLE: Operations Centre of the Future (OCF) - Impacts on eTOM BPF in Service Platforms ecosystem (IG1145)
OBJECTIVE: Analysis of Dynamic/Adaptive Processes and impacts on eTOM (IG1145)
> OUTCOME: Following an overview of the OCF Workstream and contributions from team members, attendees reviewed recent additions to the IG1145 document and proposed a sub-section for Continuous Improvement. The scope of the document may be reduced to focus on the core requirements for Release 18.0.

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

MEETING TITLE: Operations Centre of the Future (OCF) - DevOps Practical Guide (IG1151)
OBJECTIVE: To review, edit and expand a practical guide to DevOps implementation, referencing IG1137 and other documents as required.

     OUTCOME: A small group of experienced DevOps practitioners reviewed the current draft document and discussed how it could be developed and improved for Release 18.0.

MEETING TITLE: ZOOM - Model Driven Software Development (MDSD), Cloud Native OSS/BSS & TOSCA Requirements
OBJECTIVE: Discuss automation of the linkage between Service Design Centers and Run-time platforms e.g. ONAP Assumption is the need to move to a dynamic data configuration approach for the Run-time derived automatically from the Design Studio Centers' output. Investigate whether service and resource management Domain requirements in the Design view can be implemented by a simple Cloud Native run time module similar to that proposed in TR 262 for Autonomic computing, Policy and AI that can be used recursively.

     OUTCOME: This comprehensive presentation and review of Information from a variety of sources (old and new) and its relevance to current ODA, ZOOM and Frameworx activities was well received by attendees and will provide a useful reference for future work.

MEETING TITLE: API & NFV support; continued joint working with the ZOOM HIP team
OBJECTIVE: API Platform for enabling Virtual Networks and SDN: Work on defining the components for enabling the ZOOM HIP API Platform.

     OUTCOME: Discussions centred on a series of sequence charts and use cases for 5G network slice management, based on existing TM Forum assets. It was agreed that this could be developed as three views. A Business view using CurateFx, an Enterprise Architecture view using UML, and a suite of API Components using Swagger. The ZOOM and API teams will collaborate to develop the 5G example with activity diagrams and refactoring, if required, leading to the creation of an API component suite.

MEETING TITLE: Cross Team Retrospective on TAW (hosted by ZOOM team)
OBJECTIVE: Derive any implications on scope and Charter, agree plans for ongoing work, formulate meeting plans.

     OUTCOME: This open wrap-up session gave attendees the opportunity to review the week's activities, pulling together the various discussion threads and decisions regarding ODA, ZOOM and API projects.

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

Catalysts

TM Forum's Catalyst Program explored the next steps for a new set of collaborative proof-of-concept projects at Action Week. Catalysts tackle tough business and technology challenges - How can communications service providers (CSPs) use artificial intelligence (AI) to improve business assurance, reduce OpEx and increase quality of service? How can they anonymize and protect sensitive customer data in the cloud? How will they use blockchain technology or 5G network slices in the internet of everything (IoE)? How can they enable smart city digital ecosystems, and can they play a role in helping music industry partners monetize digital music? The latest round of TM Forum Catalyst projects to be demonstrated at Digital Transformation World in Nice, France, May 14-16 will offer solutions to these and many other challenges CSPs are facing. At Action Week in Lisbon this week, team members from more than 25 projects pitched their ideas, lobbied to attract additional participants and champions, and began the collaborative work that will result in live demonstrations.

During several panel discussions, Catalyst champions (these are typically CSPs but in some cases government organizations or enterprises from outside the telecom industry) and participants (usually technology suppliers) discussed their projects, highlighting the business and technology challenges they're trying to address. The panels were grouped into three focus areas: Digital ecosystems, 5G and Customer centricity. To read more about Catalysts at Action week, see: https://inform.tmforum.org/catalyst/2018/02/action-week-catalysts-tackle-tough-business-technology-challenges/

> If you are interested in joining a catalyst project, you may see a summary of planned projects and their requirements for additional members here:
>
> https://projects.tmforum.org/wiki/display/CS/Catalyst+Projects+Seeking+Participants+-+Digital+Transformation+World+2018

There follows a summary of the proposed Catalyst Projects that were represented at Action Week in Lisbon;

5G Service Operations - Real Time Service Assurance and Capacity Optimisation using AI - Agile real time Service Assurance and Capacity optimization operations assisted by AI for 5G and other network capabilities delivered as assured NaaS into multiple industry verticals supporting multiple assured 5G service classes e.g. uRLL mMTC and eMBB.

> As a Digital Communications Service Provider, I need to support new service and business model opportunities enabled by 5G in in an agile, and cost-effective manner, so that I can operationalize and monetize the 5G service opportunities that cover a wide range of service characteristics addressing a wide range of business segments and industry verticals as described and categorized by the NGMN whilst optimizing the utilization of the 5G Infrastructure. To do this I need to Deliver 'Network as a Service' with a wide range of SLA assured characteristics based on multiple 5G and legacy network technologies suitable for multiple industry verticals outlined in TR 262 Hybrid Network Management Platform (extends DPRA Platform principles). Validate that these NaaS solutions can be integrated using TM Forum Open APIs into a new generation of operations management and monetization capabilities. (Operations Center of the Future). I know that I am successful when we achieve the initial goal of assuring multiple 5G NaaS service classes operating on a common shared 5G infrastructure ensuring that each class' SLA commitment are met concurrently with optimal use of 5G infrastructure resources. And subsequently when we can repeatably compose (network) services for industry verticals in hours with zero friction integration into OSS /BSS Operations center of the future by dynamically and autonomously fulfilling numerous concurrent slice instances (in parallel) with total isolation and security to meet carrier-grade standards.

Artificial Intelligence makes Smart BPM Smarter - Nice 2018 iteration - Extending SmartBPM to leverage decision management modelling and execution.

> As a Provider, I need to _incorporate Decision Management Modelling & Execution to AI for beyond SDN & Customer Support throughout the organization so that I can define, model, simulate and manage business rules, automate processes, reduce costs and focus on customer optimization. To do this I need to leverage our Artificial Intelligence, Explainable Artificial Intelligence and   standards-based Decision Management through a tool. I know that I am successful when I can leverage my platform as a corporate asset, and execute shared solutions as cloud based services across the enterprise

Agile OSS for New Age Services in Hybrid Network

> As a Digital Service Provider, I need to provide seamless services to our customers across hybrid network, so that I can quickly put new network functions into service. To do this I need to be able to automate aspects of physical network plan and build. I know that I am successful when I am able to reduce time to market for new network functions and services. Also, as a Digital Service Provider, I need to provide seamless services to our customers across hybrid network so that I can

provide best in class customer experience with optimal agility and efficiency. To do this I need to be able to configure and enforce policies to drive service delivery across physical and virtual network ecosystem. I know that I am successful when I am able to support business agility through policy driven operations.

Auto Discovery Catalyst - This effort is part of our overall Digital Ordering theme to improve the customer experience. Specifically, this project will auto discover the information from customer premise network and gather the information and send through Quote-to-Cash process allowing AT&T to leverage information already know, incorporate rules as part of the gathering process and minimize the effort required by the customer.

As a Network sales team user, I need to be able to use a widget that creates a link for the customer with an ID & send the email with link and instructions to use the network auto discovery application can click the link to download a network scan executable application that will run on their local machine. To do this customer need to enter userid password, subnet, etc. I know that I am successful when Network is queried, network data is collected and secure database is updated so that meaningful reports can be generated from which sales & operations decisions can be made.

Automated Optimization of Customer QoE (quality of experience) - By automating the detection, troubleshooting, and resolution of subscriber QoE issues, operators can better differentiate themselves against rivals while simultaneously reducing operating expenses.

We wish to demonstrate how operators and vendors can collaborate to overcome challenges tied to automation. We aim to show how:

- Actionable intelligence from a CEM/CEA system can be shared with 3rd party systems (orchestrator, policy service, provisioning, or other) to drive actions that improve QoE
- This information is used by 3rd party systems to take action
- Improvements in QoE across subscribers are measured/validated
- Data from multiple systems is shared in a data science environment to facilitate machine learning and improvement

The economic benefits of this shift to automation are massive, and revolve around customer care call avoidance and handling time reduction, engineering MTTR reduction or avoidance, reduced churn, ARPU stability, and more.
AT&T will realize success here when it can use data to validate that its automated actions are improving the customer experience. AT&T, Cisco and Spirent will all realize success here if the methodology, processes, and APIs tied to this effort can be further standardized across the industry, allowing more widespread use of these innovative use cases.

Blade Runner- Unified Service Modelling to allow for Chaining and Configuration across different markets and business entities, using industry standards (TOSCA and YANG)

The modelling of cloud services using standard template languages and configuration (TOSCA and YANG) is nothing new. However, none of the telecommunication providers have managed to simplify their onboarding and chaining processes by fully utilizing the standards and understanding the relationship between them and the solutions involved to provide a service. The processes may be further polluted by some suppliers who may not follow the standards completely and may choose to push for alternatives, further confusing the industry. This attitude does not solve the problem of creating a vendor agnostic proposal for cloud services, creating a dependency on certain tools and methodologies. The problem gets much bigger when a telecommunication provider needs to quickly enable services across more than one operational market or functions within the same organization and across different orchestration and configuration systems.

Blockchain Unleashed - Unlocking blockchain potentials beyond FinTech industry

For this catalyst on blockchain, the user stories would reflect the use cases that would be explored. At this moment, the use cases are not finalized yet but there are some interesting ones to be explored such as fraud management & identity management. The idea of this catalyst is really about exploring relevant usages of blockchain technology to disrupt solutions which CSPs have been traditionally using to support their business operations.

Connected Citizen Phase 2 - Smart city enabler - Upgrade of a new service provider business platform for delivering innovative and smart services for improving the quality of life and safety of all citizens; Support TM Forum City as a platform manifesto; New smart IoT network capabilities; Enhance identification of citizen with blockchain; Enable quick digital services build for MVP definition.

As a service provider, I need to quickly deliver new services, so that I can be competitive, innovative, and increase revenue streams. To do this I need to design, build, and implement a new business platform model. I know that I am successful when the platform is built and we are delivering new smart services to residents, cities, and B2B following Manifesto definitions.

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

Customer Centric Service Assurance - Phase II - Driving next generation Service Assurance around Customer Centricity through Service Automation.

> Our vision enables you to utilise environmental information (weather, utilities, flooding, traffic and social media feeds) to visually identify causes for network faults. (Vision). Utilise Platform Vision and Touch to manage your network in a Customer Centric way.   (Vision & Touch). Mapping faults on your network to overlaying services and the services to your customers. Utilise this information to prioritise fixes based on customer impact rather than network impact. (Touch) Pre-emptive and automatic notifications sent to customers in real-time with on-going updates. (Touch) Automated fault remediation (utilising run-book experience) (Touch).

Data Anonymizing API -Phase II - To provide a set of APIs to anonymize data coming to and from private cloud to public cloud.

> As a Service Provider, I need to have a set of configurable, "two-way", API that can anonymize data, so that I can use public cloud machine-learning/AI platforms without the risk of exposing network/user data. To do this I need to develop open-API that can translate data between my network and any public cloud. I know that I am successful when I can use public cloud machine-learning/AI platforms without exposing user/network data.

Digital Organisation and Culture Transformation - To bring to life how to bridge the gap between digital strategy and organisational execution through realigning work, people and their capabilities to truly transform into a digital business.

> As a communications service provider in the midst of adopting new digital technologies, both for new ways of operating pre-existing services (front and back office, customer facing and essential support) as well as for new digital services, I need to realign our processes, people, capabilities / skills and culture to change the way things are done so that we take full advantage of the technology and become a true digital business. To do this I need to understand our organisation, its people, the work they do and the skills they have; I must determine the work, skills and organisation that are required in the new operating model with the new technologies; I need to identify the changes required; and then manage the organisational and cultural change to the new model in line with the technology portfolio roadmap. Ongoing, I need the ability to redeploy scarce resources across changing business priorities in a dynamic and interactive way. I know that I am successful when our people, the work they do and the skills to do that work with and the new technology are aligned and support an ongoing dynamic business demand, and together are delivering the digital vision.

Empowering Business Assurance with Artificial Intelligence - Phase II - Enabling Revenue Assurance and Fraud Management to cope with the highly demanding requirements of the business, by using the latest Artificial Intelligence, Machine Learning and Big Data Analytics technologies to improve customer experience and Service Providers' revenue and margins. This is critical to execute the new business models created by digital transformation.

> As a Digital Service Provider 'C' level executive in the digital era, I need to enable and support my company digital transformation process so I can ensure that our business goals in terms of customer satisfaction, market share and EBIDTA are achieved. Current RA&FM technologies and operations are challenged by the new digital eco-system. In order to support the new business needs I have to adopt new technologies that are based on AI, Machine Learning, and Big Data Analytics. I know that I am successful when the power and benefits of these innovative technologies are helping me to better detect and prevent revenue leakages and to ensure our customers experience.

Interconnecting business with sponsored data - This catalyst will deliver a fabric for providers connecting a broad set of enterprises from different verticals into a mobile sponsored data offering. The catalyst delivers a blueprint that can bring together enterprise, brands and CSP to offer complete sponsored data offerings to end users.

> As a Digital Provider, I need to monetize my mobile platform using innovative offerings such as having various 3rd parties sponsor mobile connectivity for specific user activities, so that I can generate additional growth. To do this I need to use standards to make it easy for a broad set of interested parties (enterprises, media firms, advertising agencies) to purchase and consume sponsored data on my network as well as other digital provider's networks allowing the parties to access capabilities across digital providers. I know that I am successful when a complete walk-through of the base use cases for Mobile Sponsored Data are complete and illustrate how the TM Forum assets come together to enable this fabric, any gaps in APIs or materials are identified with plans for resolution, and a working multi-Digital Provider to multi-Enterprise demonstration is available.

Maximising engagement with predictive customer journeys - Phase II - Demonstrate how communications service providers can deliver an effortless, consistent omnichannel sales process experience, easily adapt to change and convert a higher percentage of sales opportunities by maximizing the personalized customer engagement through leveraging omnichannel customer journey information with rich referential customer metadata combined with user generated content.

> 95% of customers said they have not bought in-store and 85% say they have abandoned a shopping cart online despite their buying intent; many never go beyond the first stage of "awareness". Telco customers typically visit multiple channels (e.g. social, web, retail, contact center, ecommerce, etc.) before completing their purchases. While the vast majority of

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

customers start their shopping journey online (69%) of them turn to retail stores to complete their purchase. This means that retail stores have a huge impact on customers' buying decisions. However, without real-time access to rich metadata about customers' user journeys, profile, behavioral and usage information, service providers find it difficult to motivate the customer at the right time for a next step in a sales opportunity process. Service providers who fail to provide customers a consistent, effortless omnichannel sales process experience and maximize every interaction during the purchase journey – or win-back journey, especially in the high-impact retail store channel – are vulnerable to digital service providers who can.

As a company offering an omnichannel (self-service) shopping; We need to know in what phase the customer stops the user journey; So that We can better understand how to motivate the customer to complete the sales process, leveraging and combining unique capabilities of online and offline channels. To do this, we need to be present in the initial stages of the sales process, identify customers / prospects across touchpoints and demonstrate that service providers can leverage the knowledge about the customers and utilize user generated content within customer-process-phase specific engagements. We want to do this within the GDPR context, managing user privacy. We know that we are successful when the customer experiences a seamless, consistent and personalized sales journey across all sales channels; there are a higher percentage of completed sales opportunities, including in the retail store; and customer trust is built with user permissions

Offer Canvas: Dynamic offer creating with NFV IoT and Cloud - Two of the key promises of Network Function Virtualization is Product Innovation and Reduced Time to Market (Agility). The TM Forum ZOOM project has defined the concept of the Hybrid Infrastructure Platform (HIP) that describes use cases and functionality to enable an OSS/BSS ecosystem to interact with NFV Infrastructure. This catalyst will explore how an implementation of the HIP supports use cases based on commercial requirements of a Product Manager in order to discover network capabilities, build those capabilities into commercial product offerings and bring them to market rapidly.

Description:

What makes this a significant problem to be solved? There has been a lot of work already done and in progress around network service and resource modelling. Projects like Open ECOMP, Open-O, ETSI-NFV, etc. are focused on how do we model and orchestrate network and cloud services. However, not much work has been done to take this modelling approach up into the business stack to make sure we can take these services to the market in the form of products and offers faster. These projects assume integration with BSS systems, which is still highly manual and requires a lot of time and effort to introduce new offers or make changes to existing offers. Ideally, when a network or cloud service is available in the services Catalogue offer managers should be able to discover these network services, encapsulate them in commercial models to make them available as products and offers. All this is done without heavy integration and development effort by IT. The following is a high-level view of the proposed Catalyst problem space.

On-Demand Monetization - Enabling platform-based business models by implementing on-demand monetization and orchestration over on-demand networks.

As a Telecom Operator, I need to monetize and orchestrate my IT, network and infrastructure investments, so that I can collaborate to create value and compete within the digital ecosystem. To do this I need to be able to harness the IoT opportunity by opening my repositories, systems, networks and services to producers and consumers through my Telco Business Platform, moreover I need to put in the hands of producers real-time rich charging and policy management capabilities so they can articulate their best monetization policies in their own catalogs. To assure the monetization and end-to-end orchestration of my IT capabilities, on-demand networks and services while upgrading my real-time charging and policy management systems to be able to transform my current customer bases in to communities of consumers and producers over my Telco Business Platform. I know that I am successful when I can easily orchestrate the deployment of fully stack of elastic and IT network capabilities to fulfil the needs of IoT producers including flexible and automatic monetization for all the variations of utilization of my Telco Platform.

OSS TAG- Re-inventing OSS for NFV - Re-invent all OSS functions based on Telecom Data Analytics

As a Communication Service Provider, I need to re-invent all OSS functions based on Telecom Data Analytics to provide new Fault Management features, new Performance Management features, New service Quality Management Features provide a service usage trends on NFV infrastructure, so that I can provide new fault detection, new predictive analytics for capacity planning, service simulation, automatic network changes with Telco operators policies control. To do this I need to build a machine learning model and its behaviour patterns based on gathered data to detect/predict NFV Capacity planning growth patterns (changes): when the NFVi will required capacity upgrade? Performance pattern detection: which VNF is impacting my traffic when a NFVi fault is detected? Simulating new services implementations: does my resource support this new service? Where it will be potentially overloaded? I know that I am successful when I provide a clear representation of an end-user service into my VNF and NFVi.

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

Using TM Forum Open APIs and MEF LSO for diverse operational network domains (Partnering Platforms for MEF services) **- Phase III -** To show the use of TM Forum assets applied to the MEF use cases identified in the LSO Architecture and then follow through with implementation of standardised specifications.

As a Network Operator or Service Provider, I need to see how finalized MEF Sonata specifications look implemented so that I can have a reference implementation to follow to help with industry conformance. To do this I need to update the initial project with the now agreed sonata specification. I know that I am successful when we have an integration with the Orange MEF Sonata reference implementation.

As a Network Operator or Service Provider I need to see how ONAP integrates with the MEF LSO Architecture through TM Forum APIs for Order, Inventory & Catalog so that the model driven ambitions of ONAP can be realized. To do this I need to update the initial project to include an integration with ONAP via TMF APIs. I know that I am successful when we can retrieve models, provision VNFs and query inventory which is resident in ONAP through TMF APIs

As a Network Operator and Service Provider I need to be able to build global layer and 3 solutions conformant to MEF Carrier Ethernet and SD WAN service specifications through a combination of my own network elements and elements provided by partners so that I can deliver functional layer 2 & 3 solutions with the efficacy of NFV. To do this I need an end to end order to activate to bill reference implementation that pulls together all of these aspects.

As a Network Operator and Service Provider I need to be able to abstract a mix of legacy and new network types for consistent presentation so that I can present all network assets through one common set of APIs. To do this I need to implement a range of network types/platforms through a common set of interfaces. I know that I am successful when the Telstra Network 2020 program accepts the implementation as an acceptable model/representation of their vision.

Smart Customer Assistance Platform - Building a smart customer assistant platform that will enable zero touch customer care.

As a Customer Service Representative, I need to assist my customers coming from various channels e.g. chatbot, email, mobile app, IVR, web and social media in an autonomous and self-service manner, so that I can assist my customers in a more efficient, automated, standard and cost-effective way. To do this I need to build a smart customer assistance platform that is capable of interacting, helping and guiding customers with no or limited human intervention by leveraging Artificial Intelligence, Machine Learning and Natural Language Processing techniques. I know that I am successful when through the use of the smart customer assistance platform, customers can mostly accomplish their requests through without having to dial a call center or go to a store and automated customer problem resolution is enabled. Also, as a Customer Sales Representative I need to sell the best fit, personalized offers to my customers, so that I can ensure that my customers buy exactly what they really need. To do this I need to build a smart customer assistance platform that is capable of offering personalized products to customers based on usage, social media entries, history and customer journey by leveraging Artificial Intelligence, Machine Learning, Predictive Analysis and Natural Language Processing techniques. I know that I am successful when customers are happy with their products.

5G Intelligent Service Planning & Optimisation (Stretching Telco boundaries with 5G: API, Automation & Analytics**) -** This Catalyst envisages demonstration of 5G communication services as a transformer of other industry verticals by leveraging Automation, Analytics & APIs.

5G services have the capability to transform not just communication verticals, but also other verticals. To do this CSPs should not only have a highly flexible end to end Telco network based on technologies like NFV, SDN, MCE, Massive MIMO etc., but also a management which leverages this flexibility, efficiently and rapidly enough to be able to provide the communication service as part of the core solution of other industry verticals. Hence a successful solution from a CSP would not only enable in time creation and continued assurance of a communication service but also enable easy API based integration of such services as part of bigger solution. The catalyst is therefore addressing the platform based approach to digital services in which telco-based service components will need bundling into digital services

The digital and interactive one-stop shop - Phase II - In a partnership-driven environment, facing customers with increasing digital expectations and privacy concerns, CSPs need to build a fully integrated ecosystem for building new revenues as well as offering an interactive, seamless and innovative experience.

A single point of contact - As a customer with digital expectations, I need to be able to buy, manage my account, get help from my mobile, so that I don't waste time looking for the contact information/website/application. To do this, I will have access to a unique mobile application. I know I am successful when I can do everything easily from my mobile

The store, for a real-life experience - As a Digital Service Provider, I need to continue attracting customers to the store So that I can leverage my retail distribution and generate more revenues. To do this, we must reduce the waiting time in store and offer to customers a large range of services (test and experience new products, "instant" delivery, get personal advice, pick up devices). I know I am successful when the conversion rate of customers visiting the stores is increasing.

An unmatched customer experience - As a Digital Service Provider, I need to deliver an unmatched customer experience, so that I can differentiate myself from other service providers in a very competitive context. To do this, I can use a robot as a

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA

welcoming agent in the store. This will bring fun interaction to the customers and help reduce labor costs. I know I am successful when the NPS (Net Promotor Score) is increasing in our markets.

Co-created system to support new business - As a Digital Service Provider, I need to create an integrated solution, GDPR compliant, so that I can develop new business models with 3rd parties. To do this, I have to provide trusted integrated systems between all parties (customer, operator, 3rd parties). I know I am successful when seamless transactions are performed between all parties.

Transcend Boundaries - Transcending boundaries via AR/VR to achieve operational excellence.

For this particular catalyst on AR/VR, the user stories would reflect the use cases that would be explored. At this moment, the use cases are not finalized yet but there are some interesting ones to be explored such as applying AR/VR in data center operations, field work, customer service & training. AR/VR has been widely used in consumer electronics and it may seem that this is all to it. The idea of this catalyst is really about exploring relevant usages of AR/VR technology to improve internal day-to-day operations and to bring about a new level of user experience to internal employees as well as contractors or partners. Potential use cases that could be explored are Field operations & services, Manufacturing, CAD and Training aids.

Voice channel and social media cognitive care - Artificial Intelligence will be the most disruptive technology in the coming years, and CSPs/DSPs must be ready for taking a step forward and incorporate it into the way they interact with their customers to enhance customer experience and reduce operational costs.

As a Customer Experience VP of CSP, I need to deliver an outstanding customer experience by reducing average operation times in voice channel interaction and shifting interactions to social channel so that I can improve customers experience and engagement. To do this I need to integrate voice channel platform and social media channel with our cognitive/IA platform and BSS to deliver a highly personalized experience and propose next best action based on customer context and historical information. I know that I am successful when I meet my expectation in reducing operation time in voice interaction and meet my goals of shifting shop/contact center interactions to social media channels.

Website
www.tmforum.org

Phone
+1 973-944-5100

Address
4 Century Drive Suite 100 Parsippany, NJ 07054 USA