Market Context
### Non-traditional approaches are much more efficient

<table>
<thead>
<tr>
<th>CSP takes 3-6 months to stand up a service</th>
<th>CSP with 38,000 employees adds less than 5,000 customers daily</th>
<th>CSP has thousands of customer service reps and low NPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10,000X</td>
<td>1,000X</td>
<td>100X</td>
</tr>
</tbody>
</table>

- Amazon can provision a service every 11 seconds
- WhatsApp with 55 employees adds roughly 1 million users daily
- giffgaff crowdsources customer service and has high NPS
A world of interconnected ecosystems presents opportunities for all

Massive scaling: 10x / 100x / 1,000x
Faster & more agile: 10 x 10 x 10
On-demand, shared talent

DRAMATIC SHIFTS ARE REQUIRED TO COMPETE IN THE DIGITAL WORLD
TRANSFORMATION TO A PLATFORM BUSINESS

Providing the blueprint for success through member-driven collaboration

COTS Era 2001 - 2011

Digital Era 2012 - 2015

Platform Era 2016+
Technology change – 5G

Multiple virtual networks carried on a single physical infrastructure

Source: Ericsson

5G will widen the scope of connectivity, enabling businesses not well served by current technology
TM Forum Agile Programs
Three Pillars of Digital Transformation

- **Open Digital / IoE (inter-organization)**
  - Internet of Everything Mgmt.
  - Rapid Partnering & Scaling
  - B2B2x Best Practice Guidance
  - Innovation Incubator

- **Agile IT & Ops (intra-organization)**
  - Agile IT & Hybrid Management
  - Zero-touch Operations Orchestration & Management (ZOOM)
  - DevOps; Procurement
  - Continuous Business Transformation

- **Customer Centricity & Analytics**
  - Customer Experience Management
  - Omnichannel retail, care, service
  - Cognitive / AI Customer Care

How do I simplify / accelerate partnering in the digital world?
- Internet of Everything Mgmt.
- Rapid Partnering & Scaling
- B2B2x Best Practice Guidance
- Innovation Incubator

How do I transform my business to be fit for the digital world?
- Agile IT & Hybrid Management
- Zero-touch Operations Orchestration & Management (ZOOM)
- DevOps; Procurement
- Continuous Business Transformation

How do I gain and retain customers in the digital world?
- Customer Experience Management
- Omnichannel retail, care, service
- Cognitive / AI Customer Care

How do I provide Revenue Management, Security and Privacy?
- Analytics
- Metrics & SLAs
- Security & Privacy
TM Forum Agile Business and IT Program
The Drivers of Change

Business and Process Transformation
• Ready to play a role in an ecosystem
• Agile processes
• Embracing constant change

IT Transformation
• From static integration to dynamic orchestration
• From monolithic applications to platform services
• From telco paradigms to hybrid management
Focus on customers and services, not network infrastructure

Extensive liaisons with ecosystem partners both as providers and channels

Agile working, frequent incremental changes incorporated using a DevOps approach

Automation driven by data analytics and policies to reduce cycle time and cost

*End-to-end operations of a digital services platform*
Operational and Business IT Evolved

Current State
Traditional systems are a static integration of thousands of applications. As new appliances are added new integrations are needed.

- Users
- OSS Integration
- Network Appliances

Change Agents
- **Agile** – able to accommodate constant change and support DevOps
- **Part of an ecosystem** - services are provided by partners or owned or rented
- **Managing** virtual and legacy functions seamlessly
- **Componentised** – Service components are granular and so are the supporting services
- **Secure and private** – multiple separate slices
- **Highly automated** – processes are increasingly zero touch

Future State
The future will be based on supporting platform services exposed by each component. New services will be dynamically added with their associated support service.

Self Service Dominates
- Services
- PaaS
- IaaS
- Catalog
- Performance
- Billing
- Analytics
Building the Digital Operations Center of the Future

The Agile Business & IT Program helps service providers and enterprises continuously optimize their IT and operations to deliver the speed and flexibility needed to succeed in the digital world – dramatically reducing costs, risks, and time-to-market.

100+ leading companies involved including:

- 130,000 subscribers to our Agile Business & IT newsletter
The Agile Business & IT Roadmap

**Planned Development for IT**
- Frameworx enhancements
- Architecture principals
- Technical reports

**Planned Development for Business Process**
- Procurement transformation
- Operational readiness
- Agile product lifecycles

**Implementation Engineering detail**
- Industry standard network resource information model
- APIs for virtual networks
- Service Orchestration reference architecture
- Evolved process models for hybrid IT / telco management
- VNF packaging for procurement and operations

**Future Research**
- Fine grained component architectures
- Intent based policy automation
- Towards a true DevOps paradigm
- Managing intent based policy automation

*TM Forum collaborative development is matched to our members’ transformation journey*
Creating the Operations Center of the Future

Current State
The business opportunities of the future are not best served by today’s network operations models

- Product Management
- Service Management
- Resource Management

Strategy, Planning
Fulfillment, Assurance Billing
Systems

TM Forum Workstreams
- Key operational principles of the future
- Evolved process and model definitions (eTOM) to support
  - Agile Product Lifecycle management
  - Federated product and service catalogs
  - Policy based management
- Procurement models for complete enabled Virtual functions
- Business to Business partnering guides

Future State
A future operations center will require a complete business transformation to an agile partnership model supporting constant change

Future Operations Center
Agile Operations Catalysts

- Agile NaaS Leveraging LSO, SDN and NFV
- Delivering Open Cloud Eco-Systems for The Digital SME
- Future State: Virtualizing Carrier Operations
- Maximizing Profitability with NFV Orchestration
- NFV Ecosystem Enabler: a well-enabled VNF package
- NFV/SDN – A fresh approach to the business of Business Data Services

https://www.tmforum.org/collaboration/catalyst-program/current-catalysts/
Specific Deliverables

Updates to the existing Application Framework to support NFV, building on extensive existing work

- IG1130 (IG1130 Future TAM Impacts by SDN/NFV)
- IG1117 “OSS/BSS Futures
- IG1118 “OSS/BSS Futures: Preparing the Future Mode of Operations”
Hybrid Management

Current State
Adoption of NFV is a vital first step on the road to but is not efficiently supported by today’s management systems.

TM Forum Workstreams
- Industry standard NFV Information models for interoperability
- Consistent standardised APIs
- An overarching service orchestration reference architecture
- A reference architecture for a Hybrid Network Platform as a Service (end to end NFV management)

Future State
A digital service provider will require a new standards based hybrid orchestration based solution, delivered cost effectively.
Hybrid NFV/SDN Catalysts

- Agile NaaS Leveraging LSO, SDN and NFV
- API Simulator
- Building Model-Driven Service Orchestration via an FMO Architecture
- Delivering Open Cloud Eco-Systems for The Digital SME
- Future State: Virtualizing Carrier Operations
- Maximizing Profitability with NFV Orchestration
- OpenMano resource and service orchestration

https://www.tmforum.org/collaboration/catalyst-program/current-catalysts/
Specific Deliverables

- Information Framework extensions to support a hybrid Network which defines four concepts fundamental to modelling NFV-based systems
  - VirtualResource
  - NetworkFunction
  - NetworkService
  - Graph

- Material is currently being reviewed and further refined to align with existing model

- Will form the basis multi-SDO common model work
IT Transformation

Current State
A “traditional” OSS is an integration of thousands of applications into a system. Adding each new appliance requires fresh integration.

- Users
- OSS Integration
- Network Appliances

TM Forum Workstreams
- Reference architecture with well defined platform services
- Future Mode of Operations (FMO) architecture requirements & principals
  - FMO component APIs & interfaces
  - Management-Control Continuum (MCC) components, architecture and lifecycles
- Intent based policy automation assets
  - Policy information models

Future State
A future OSS will be based on supporting platform services exposed by each component platform by APIs. New services will be automatically added.

Self Service Dominates
- Services
- PaaS
- IaaS
- Catalog
- Performance
- Billing
- Analytics
IT Transformation

- API Simulator
- Building Model-Driven Service Orchestration via an FMO Architecture
- E2E Orchestration for advanced IoT services
- Future State: Virtualizing Carrier Operations
- NFV Ecosystem Enabler: a well-enabled VNF package
- NFV/SDN – A fresh approach to the business of Business Data Services
- OpenMano resource and service orchestration

https://www.tmforum.org/collaboration/catalyst-program/current-catalysts/
End to End multi level orchestration

- Proposes an architecture based on orchestration accomplished through a federation of domains and autonomic control loops.
- Very much a first iteration and additional participants are welcome.
Specific Deliverables

Closed Loop control architecture

- Presents some practical closed-loop use cases as presented in TM Forum catalysts during 2015.

- The main concepts used by these catalysts are analyzed as a step forward to achieving a more dynamic control-loop architecture.
Connecting Everything Together via APIs

The TM Forum API portal provides a complete set of developer resources to rapidly implement management interfaces using standardised REST interfaces covering:

- Trouble Ticket
- Customer Management
- Product Catalog Management
- Product Inventory Management
- Product Ordering
- Billing Management
- Party Management
- SLA Management
- Usage Management
- Performance Management
At TM Forum Live! 2016, TM Forum announced that nine of the world’s leading service providers – Axiata, Bharti Airtel, BT, China Mobile, China Unicom, NTT-Group, Orange, Telefónica and Vodafone – have officially adopted TM Forum’s suite of Open APIs for digital service management.

https://www.tmforum.org/open-apis/
API development this year

- Extending the portfolio
  - Address Management API
  - Appointment API
  - Agreement API
  - Onboarding API

- Assets to support rapid adoption
  - TR258 Mapping MEF LSO to TMF APIs:
  - GB990 API Data Model and Information Framework Mapping Guide Book
  - Crowdsourcing template to allow easier contributions
The Future of End-to-End Management

In a 5G world, digital services providers will be platform-based businesses operating as part of an ecosystem.

Operational and business management will be through dynamic orchestration of platform services across ecosystem partners.

Platform components will become finer grained and more generic and abstract with business logic moving to the policies that drive orchestration.

Automation will dominate, driven by intent-based policies using data analytics across a wide range of business and technical sources.

Change will be the only constant
5G Catalysts

- Maximizing Profitability with NFV Orchestration
- Building Model-Driven Service Orchestration via an FMO Architecture

https://www.tmforum.org/collaboration/catalyst-program/current-catalysts/
Agile Business and IT

H2 2016 priorities
16.5 Strategic outline

**Operations Centre of the Future**
A vision for the operations centre of the future driving
Evolution of the process models to support the vision
Evolution of the application to a functional model
Packaging procuring and lifecycle management on virtual functions

**Hybrid NFV Management**
Practical assets for large scale multi vendor deployment
An industry common Information model
A complete reference model for Hybrid network platform as a Service

**IT transformation**
Reference Model for an end to end orchestration architecture
Creating key frameworks for future architectures
Microservices architecture principles
Automation principles
Action Week - Connect. Collaborate. Create

**Action Week Vancouver** (July 11-15) is an exclusive opportunity to join forces with like-minded individuals within the TM Forum members’ community to work hand-in-hand with industry experts committed to addressing those challenges delivering real results with specific outcomes.

**3 Reasons to attend**

1. Opportunity to network with your peers in a workshop, friendly, environment

2. Be inspired by keynotes, proof-of-concept Catalysts, and more!

3. Take home specific ideas and strategies that can be applied to your own business to reduce costs, accelerate innovation, improve efficiency, and foster growth

[actionweek.tmforum.org](http://actionweek.tmforum.org)
At a TM Forum Action Week 2016 in Lisbon, BT showed how by adopting these principles they have:

- Reduced 4,500 systems to 26 platforms and 700 systems
- Reduced news service introduction from 8 months to mere hours in some cases
Past attendees include:

- orange
- AT&T
- Huawei
- Ericsson
- Vodafone
- BT
- T-Mobile
- China Mobile
- Verizon
- NTT
- Infor
- Telefonica
- Liberty Global
- Cvidya
- Amdocs (embrace challenge experience success)
- TELUS
- Salesforce
- Microsoft
## TAW Agile Agenda at a Glance

<table>
<thead>
<tr>
<th></th>
<th>AM</th>
<th>PM</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MON</td>
<td>Opening Session</td>
<td>Zoom 16.5 Introduction &amp; Overview</td>
<td></td>
<td>Hackathon</td>
<td></td>
</tr>
<tr>
<td>TUE</td>
<td>AM</td>
<td>Hybrid Network Platform-aaS - Cross Zoom team session</td>
<td>PM</td>
<td>Hybrid Network Platform-aaS</td>
<td>Procurement &amp; auto-on-boarding</td>
</tr>
<tr>
<td>WED</td>
<td>AM</td>
<td>Op-Centre of the Future - Vision</td>
<td>PM</td>
<td>CNWRM</td>
<td>Frameworx</td>
</tr>
<tr>
<td>THUR</td>
<td>AM</td>
<td>Orchestration (IG1139 v2)</td>
<td>PM</td>
<td>Common Network Resource Model</td>
<td>Frameworx</td>
</tr>
<tr>
<td>FRI</td>
<td>AM</td>
<td></td>
<td></td>
<td>Operations Centre of the Future - Frameworx</td>
<td>API</td>
</tr>
</tbody>
</table>

### Individual Team Overflow / Wrap-up

© 2016 TM Forum | 35
Conclusion

These are exciting times for digital services, especially the established communications service providers.

The TM Forum Agile Business and IT program is working on both business and technical aspects of the changes needed to thrive in this new reality, creating real assets.

Get involved
actionweek.tmforum.org
www.tmforum.org/training-certification