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ROBOTIC PROCESS AUTOMATION:
RISE OF THE MACHINES

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ROBOTIC PROCESS AUTOMATION:
RISE OF THE MACHINES

We hope you enjoy the report and, most importantly, will find ways to use the ideas, concepts and recommendations detailed within. You can send your feedback to the editorial team at TM Forum at **editor@tmforum.org**

THE BIG PICTURE

The future is highly automated

Employing staff is the biggest operating expense for digital service providers and most other businesses. Employees are also their greatest asset. Advances in automation technology are providing businesses with new ways to maximize employee productivity, revenue and customer satisfaction, while minimizing human error.

One of those advances is robotic process automation (RPA), a broad, deep category of tools for automating business, network and operational processes. For example, one RPA vendor and consultancy, Prodapt Solutions, says its Telebots platform can complete business processes three times faster than humans, and enable automation levels between 50 and 80 percent. This efficiency and expediency has several benefits, including maximizing:

Customer satisfaction.

By providing what customers seek faster than a live agent can, RPA eliminates one of their major complaints: wasting minutes on hold to speak with an agent, or hours or days for a work order to be processed manually, to name just two examples. RPA also gives businesses new ways to enable the self-service options that most consumers say they prefer. And with more customers helping themselves, live agents now have more time to provide a 'white-glove service' for those who prefer human interaction or whose needs are too complex for automated processes to handle.

Employee satisfaction.

RPA can automate mundane processes which are tiring and boring for a human to do all day long – the kind of fatigue that results in mistakes and expensive turnover. "It enables the people behind the scenes to pivot and do other things," says Dave Morfas, Director of Product Marketing at Plex Systems, a provider of cloud solutions for manufacturers. "It doesn't make people expendable. It makes them available to do other things."

Revenue and profits.

With inexpensive robots doing the grunt work, employees are freed to focus on tasks that have more revenue and profit potential. When live agents aren't constantly overloaded with inquiries that could be handled by RPA-enabled self-service, they're better able to make upsell pitches to the customers they do interact with. Happy customers are also more receptive to those pitches, whether they're made by a live or virtual agent.

Security and reliability.

Robots don't make mistakes, unlike humans. They do what they're programmed to do the same way every time, and they're easier to track. "Every action that a robot takes is recorded and monitored," says Michael Laurenson, Global Head of Alliances and Channels at Blue Prism, an RPA software vendor. "There's actually a lot more security and governance around a robot doing it than if a human is doing it." That means the security and reliability of the processes they handle can be significantly higher than with manual control. Even the processes they don't handle benefit because employees now have more time and attention to focus on them. The bottom line: lower risk of something – or someone, in the case of customers – falling through the cracks.

To identify these and other benefits, as well as the keys to a successful RPA implementation, we interviewed a representative sampling of vendors and service providers from around the world.

Read this report to understand:

How RPA works and how it differs from other types of automation, including macros and business process management.

Where to start implementing RPA.

How to approach an RPA pilot and expand automation throughout an organization.

Why multi-vendor environments, complex applications and legacy platforms don't necessarily make it difficult, expensive or time-consuming to implement RPA.

The major challenges to RPA adoption and how to overcome them, such as concerns about security risks and backlash about anticipated job layoffs.

"Every action that a robot takes is recorded and monitored."

IMPLEMENTING AUTOMATION

Automation isn't a new concept. The fact that there are many types, and that they've been used for decades, is both a positive and a negative for service providers considering it and for the vendors offering it. On the plus side, those implementations provide plenty of real-world examples for prospective users to learn from, and proof points for vendors to tout. But they can also be a barrier to adoption when businesses assume that they already have the automation tools they need.

However, RPA is significantly different from other forms of automation, such as business process management (BPM) and macros. "They say we already have a BPM solution, so we don't need to look at RPA," says Pradeep Balakrishnan, who handles channel sales and partner strategy at Prodapt Solutions. "We start by showing how RPA is different from and complementary with BPM."

Business process automation vs robotics process automation

BPM	RPA
Re-engineer processes	Automate existing processes
Create a new application	Use existing applications
Access business logic layer	Access the presentation layer of existing applications
Software developers	Business operations
System testing	Output verification

Source: Adapted from University of Missouri, St Louis

For example, when a telco chooses a BPM solution for a large-scale IT transformation project, it often excludes some processes where it can't justify the cost of automation. Those are left for the operations team to handle manually. One way to automate those is with macros, which record frequent processes and then serve them up to, say, a contact center agent so they don't have to waste time – theirs and the customer's – doing them manually.

Robotics process automation complements
Macros are also attractive because they don't require programming skills, which operations teams typically don't have. One drawback is that if the application changes even slightly – such as the position of a field on one screen – the macro has to be recreated. There's also no centralized way of managing macros in an organization.

These drawbacks are among the reasons why a digital service provider would choose RPA over macros. In the process, it also illustrates why, like macros, RPA is complementary to BPM rather than a replacement.

"RPA should not be recommended as a tool for automating processes that can be automated through BPM," Balakrishnan says. "It should be treated as a complementary solution to BPM. RPA fixes all of the problems with macros-based environments and script-based environments. Even if there are slight changes to the fields or apps, the RPA doesn't need to undergo a major change. It doesn't require any coding."

The last point means that like macros, RPA is something that operations teams can implement on their own, without the help of their IT colleagues. That eliminates the barrier to adoption that would exist if IT had to play a major role but couldn't or wouldn't. Instead, IT's role is limited to maintaining and securing the servers that house the robots.

How RPA is designed and implemented

As with any technology, RPA's design and implement-ation varies significantly by vendor and the company deploying it. This section uses Prodapt's Telebot solution as an example of the primary steps, costs and options.

The vendor begins by either helping the customer identify the processes that could be automated, or by analyzing the ones that the customer has already chosen. Prodapt says this consulting step can take up to two months.

This initial step isn't as simple as it might appear. When identifying which processes to automate, businesses new to RPA often focus on just one, and want to use that as a pilot before deciding whether and where to automate further. Sometimes this approach is based on costs: They don't want to spend a lot on the RPA pilot in case it turns out not to make business sense.

That concern is understandable, but it has major flaws. For example, the business could pick a process that isn't the ideal candidate for automation, and the bad experience scuppers any scope to use RPA elsewhere in the organization. This risk also highlights the importance of choosing the right vendor: one that's worked with other companies in that vertical and thus can advise where best to start. In fact, even when the RPA pilot is successful enough to roll out elsewhere, the consulting role should be ongoing indefinitely as the vendor helps identify other candidates.

However, avoiding the 'one-and-done' problem isn't the only reason why the initial RPA implementation should span multiple processes. The cost and time to develop a set of robots often decreases incrementally with each subsequent process. "If it takes about eight weeks to develop your first process, you don't necessarily have to go through [another] eight weeks of development when developing the seventh or eighth process," Balakrishnan says.

Avoid making robots jump through hoops

One factor in development time is the number of screens that pop up in an application because each of them is automated. Another factor is security: it's easier to automate a process when the robots don't have to jump through security hoops every time they need to do something.

Other factors aren't necessarily expensive or difficult to contend with. For example, businesses often assume that their multi-vendor environment, legacy systems, complex processes or all of the above will limit their ability to implement RPA. But that's often not the case, which highlights why it's worth talking with vendors before simply ruling out RPA.

"If it takes about eight weeks to develop your first process, you don't necessarily have to go through [another] eight weeks of development when developing the seventh or eighth process."

"There's no restriction to the type of process that can be automated," Balakrishnan says. "There's no restriction on the type of application we can connect the robots to."

Why? One reason is because the robots don't need low-level access to get and do things. Instead, they mimic humans in the sense that they're viewing and acting screens. "The robots are completely vendor-agnostic," Balakrishnan says. "We don't need to get them exposed to APIs."

What's a reasonable ROI expectation?

Pricing is one factor to consider when calculating an RPA solution's ROI. Another obvious one is how many employees can be retasked.

"Telefónica were doing in the region of 400,000 to 500,000 transactions in their back office for customer service," says Michael Laurenson, Global Head of Alliances and Channels at Blue Prism. "The robots represented nearly 40 percent of their back office in customer services. Now they're doing closer to a million transactions per month. The ROI is 650-800 percent in a three-year period."

One that's tougher to pin down is additional revenue. For example, as discussed elsewhere in this report, RPA can improve customer satisfaction by eliminating delays and other frustrations that occur when human agents are involved with an application. That satisfaction can make those customers more receptive to upsell pitches, thus driving additional revenue.

Where to begin?

In the case of digital service providers, RPA implementations often include directory assistance, level 1 network triage and other applications that are highly repetitive, mundane and labor-intensive. But other implementations involve accounts receivables and payroll – perhaps not areas you would expect, which is another example of why service providers shouldn't be surprised when the vendor suggests a few apparently unlikely candidates.

Windstream recently launched its first RPA implementation, for directory assistance. "We started with something I thought would be very simple – taking the request from the customer that's flowing through the back-office system," says Chris McCasland, Vice President, SVD Operations. "Once it triggers a certain task, the robot goes in, watches the task, picks out all of the information it needs, loads that into the directory listing system, makes sure everything is there and closes out everything. I can immediately see a return on my investment, and it proves whether the concept will work."

Although RPA's ability to accommodate legacy systems makes it a good fit for decades-old businesses, sometimes incumbents' implementations are thwarted by culture. One example is telecom's traditional five-nines (99.999 percent) reliability goal, which some potential users fear missing if they automate widely. A second example is the mindset within one or more departments that, "We've done it manually for eons, and it works fine, so why rock the boat now?"

AUTOMATION AT TELEFÓNICA O2

CORE PROCESSES AUTOMATED: 15

RPA TRANSACTIONS PER MONTH: 500,000

NUMBER OF ROBOTS: 160+

EMPLOYEES SAVED OR REDEPLOYED: HUNDREDS

PAYBACK PERIOD: 12 MONTHS

3-YEAR ROI: 650-800%

Source: University of Missouri, St Louis

By comparison, startups and young companies aren't saddled with the second barrier. Take the example of Masergy, a provider of managed enterprise network services that launched in 2001. Early on, management realized that automation would be key for competing against incumbents.

"We automated a lot of provisioning of the network and the creation of the MPLS (Multiprotocol Label Switching) meshes and the tunnel creation [in] the 2004 time frame," says CTO Tim Naramore. "We did that not because we thought it was cool, and we had no idea it was going to be called SDN [software-defined networking]. We did it because we were competing against some really large companies like AT&T and Verizon. We could never out-people them. They had armies of people. We were a VC-backed company. We had the luck of starting with a clean slate."

"We automated a lot of provisioning of the network and the creation of the MPLS (Multiprotocol Label Switching) meshes and the tunnel creation [in] the 2004 time frame."

SMART BPM: ENABLING DIGITAL TRANSFORMATION

The *SMART BPM enabling digital transformation* Catalyst project at TM Forum has demonstrated the value of automated processes.

The team used business 'process mining' along with intelligent discovery, orchestration and choreography of business processes. The use of analytics and big data also bring insights which help to leverage customer experience and network optimization.

The first two iterations of the *SMART BPM* Catalyst focused on of service fulfilment and service assurance scenarios. The latest iteration explored how smart BPM can be beneficial in areas such as billing and SDN (software-defined networking)/NFV (network functions virtualization).

Other benefits include improved customer experience, enhanced 'right first time', improved efficiency and reduced operational costs.

The resulting best practices, tools and methodologies from this Catalyst will be applicable to digital enterprises of all sizes and in all industry sectors.

Watch this video interview with Shailesh Potdar, Customer Delivery Head – BPM, Tech Mahindra, a participant in the Catalyst.
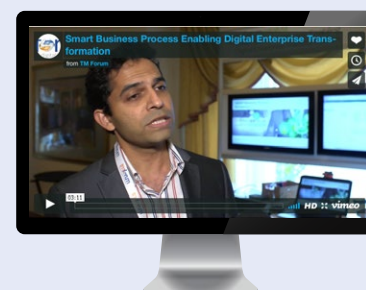
SECTION 2:

OVERCOMING THE BARRIERS OF MINDSETS AND MISCONCEPTIONS

Even when businesses recognize all of RPA's benefits, some are still hesitant to implement automation – widely or even at all. This section analyzes the major reasons for that reluctance and how to overcome them.

What RPA does – and doesn't do

When companies consider implementing a new technology or process, they obviously focus on what it can do for them, such as increasing revenue or decreasing overhead. RPA is an example of why it's often equally important to focus on all of the things that a new technology or process can't do. Overlooking that aspect can result it in never being implemented.

With all forms of automation, one common perception is that they inevitably cost a lot of employees their jobs – to the point that this savings is why businesses consider automation in the first place. After all, for service providers and just about every other type of business, labor costs are their biggest operating expense.

This perception often provides unions, politicians and pundits with ammunition for attacking businesses that are considering automation. If the backlash is big enough, sometimes those companies scale back or abandon automation plans.

But reducing headcount often isn't the primary motivation, or even a secondary or tertiary one. Yes, companies see automation as a way to improve their bottom line, but doing so doesn't have to come at the expense of jobs.

"When manufacturers first get the notion of moving to something that automates their processes, they get worried because they feel like that takes them out of the loop," says Dave Morfas, Director of Product Marketing at Plex Systems, a provider of cloud solutions for manufacturers. "But in fact what it really does is allow them to do other things that they couldn't before because they were pushing paper and manually entering data. Automation ultimately makes employees more valuable, and the company far more efficient. Doing more with the same can help companies beat the competition profitably."

This analysis applies to RPA, too.

"Rather than having humans do repetitive, mundane stuff, take that away and have humans do the custom exceptions," says Michael Laurenson, Global Head of Alliances and Channels at Blue Prism. "It increases the capacity of what that company can do."

Service providers that already use RPA and other forms of automation agree.

"The endpoint of automation isn't necessarily elimination of headcount," says Tim Naramore, Masergy CTO. His company uses automation to, for example, enable enterprise customers to make virtual routing and forwarding (VRF) changes on their own instead of submitting an order and then waiting for Masergy to implement it.

48%
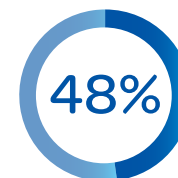
The number of experts who expect robots to displace a significant number of blue- and white-collar jobs by 2025

52%
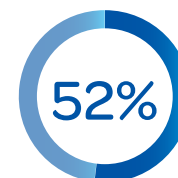
The number of experts who expect technology to create more jobs than it replaces by 2025

Source: Pew Research

"It has a huge benefit for the customer in terms of responsiveness and agility, which is what customers really like about our solution," Naramore says. "We never really looked at it as cost savings. We looked it as an agility enabler for the customer."

RPA also can benefit a service provider's bottom line by maximizing revenue, customer satisfaction or both. For example, Masergy is among the service providers using automation to enable self-service, which surveys show is an option that consumers and businesses users prefer over a live agent. For customers who prefer the human touch, or who have needs too complex for self-service, automation means the contact center, technical support and other staff now have more time to provide a white-glove service.

The common denominator for all of these examples is increased customer satisfaction, which reduces churn and all the costs associated with replacing lost customers. Satisfied customers are also more receptive to upsell pitches, meaning more revenue for the company. These savings and increased revenue help pay for the cost of implementing automation, and they don't require laying off employees.
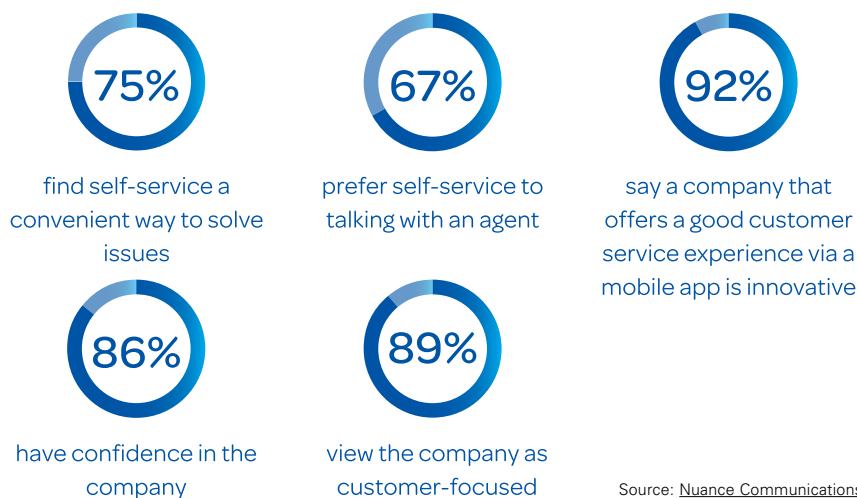
Time to let go
Mindset is another common barrier to all forms of automation: specifically, the fear of losing control over important processes. This mindset is a major reason why, for example, businesses and service providers don't implement software-defined networking (SDN) as widely as they could. So even though SDN is proven to be much

faster and less error-prone than humans when it comes to responding to security threats and traffic loads, many implementations still center around alerts going to people who then decide what to do.

For years, Windstream grappled with the challenge of letting go. "We've used some outsourcing vendors in the past, and we've always been reluctant to let anybody into our network or make changes in our network," says Chris McCasland, Vice President, SVD Operations.

Windstream recently launched its first RPA implementation for directory assistance, where it expects an automation rate of about 95 percent. Order entry might be its next RPA implementation, potentially paving the way for use in the network itself.

SELF-SERVICE SATISFIES

75%
find self-service a convenient way to solve issues

67%
prefer self-service to talking with an agent

92%
say a company that offers a good customer service experience via a mobile app is innovative

86%
have confidence in the company

89%
view the company as customer-focused

Source: Nuance Communications

"Having the robot may take it to the next step to where I can start to let the robot make changes in the network," McCasland says. He sees a framework of rules – such as for when to alert a human, and how to ensure the Telebots get all of the information they need to perform each task correctly – as a way to get comfortable enough to let go in more areas.

"I think if you have clean information and a very clean process, the possibilities are endless," McCasland says.

RPA implementations have at least some humans overseeing things. For example, Prodapt users typically have one person monitoring roughly 32 robots.

Although RPA solutions such as Telebots are designed to accommodate multi-vendor environments, some service providers seek additional peace of mind by configuring the robots to alert humans when there's concern that something could slip through the cracks. Ditto for concerns about automation enabling security breaches. But to avoid having a deluge of false alarms, it's important to consider what could trigger them.

For example, when Masergy turned on its system, some of the initial alarms were about traffic from China. Those were quickly disabled because the company has POPs there. This kind of rule tuning is common after deploying RPA and other forms of automation. Minimizing human intervention helps minimize human errors, including those that occur when employees are fatigued by a system that keeps crying wolf, allowing the real problems to slip through.

"It's quickly becoming impossible to have a human look at the volume of data," Naramore says. "Even trying to understand the topology created by the SDN is becoming very difficult for a human."

Finally, unlike employees and contractors, robots don't go rogue, and it's easier to track their every move.

"Every action that a robot takes is recorded and monitored," says Blue Prism's Laurenson. "There's actually a lot more security and governance around a robot doing it than if a human is doing it."

That makes it easier to identify and fix automation errors than with humans, where there are more variables.

"If you have a computer do it, it's going to do it the same way every time," Naramore says. "If it's wrong, it's going to break it the same way every time, but at least it's consistent."

"Having the robot may take it to the next step to where I can start to let the robot make changes in the network."

SECTION 3:

MAKE IT HAPPEN: HOW TO SUCCEED WITH RPA

Although automation has been around for decades in a variety of forms, there are several reasons why digital service providers are increasing their use of it. One is that artificial intelligence and other automation fundamentals keep getting more sophisticated, enabling businesses to rely on them for more applications. Two others are deregulation and the rise of IP, both of which have fueled competition. RPA helps service providers increase quality while maximizing profitability via reduced overhead.

Yet another automation driver is the Internet of Everything (IoE), which fundamentally changes the service paradigm. For example, today service providers each have millions of customers with one or two devices each. With IoE, each customer could have dozens, hundreds or thousands of devices each. Automation is the only financially sound and employee-friendly way that service providers can support the IoE paradigm.

If you're ready to implement RPA, here are four essentials to consider when developing and implementing your strategy.

Cast a wide net

Deployments at Telefónica and other service providers show that many processes can be automated. Yet many operators choose only one to pilot or to implement because, for example, they're concerned about the cost of doing more. But that cost often is incremental, while the benefits snowball. So work with your vendor partner to identify all of the processes that could and should be automated.

Don't be afraid to let go

Telcos and other verticals have used automation for the better part of a century. RPA and other automation technologies keep getting more sophisticated, to the point that, for example, financial services firms increasingly rely on them to make trades and other decisions faster and better than humans can. So don't use fears such as robots running amok and automation-induced security breaches as reasons -- and unfounded ones, at that -- for not implementing RPA widely or at all.

Be prepared to educate your workforce and government

Another barrier to adoption is the belief that automation is a job killer. Real-world deployments show that's typically not the case. But to ensure that unions, politicians and others don't create a backlash based on this misconception, be prepared to educate them about the labor benefits. One example is freedom from mundane tasks.

Get involved in a TM Forum project

TM Forum Catalysts act as an accelerator to complement the R&D efforts of the companies involved by bringing them together to address specific business and technology challenges. In the case of automation, one example is the _Smart BPM Catalyst (see page 11)._

Prodapt Presents Telebots™
The leading Robotic Process Automation Framework
for Communications and Digital Service Providers

Prodapt
powering
global telecom

Prodapt at a glance

Prodapt is a global technology and operations innovator with a singular focus on the communications service provider ecosystem, with a presence in four continents. Prodapt was among the first services companies to launch a specialized RPA framework for CSPs and DSPs.

The need for robotic process automation

The first rule of any technology used in business is that automation applied to an efficient operation will magnify the efficiency. In the case of robotic process automation (RPA), which is expected to automate over 230 million knowledge workers (roughly 9% of the global workforce) by 2017, according to Forrester, this can be entirely true. Global CSP/DSPs are still testing the waters in the RPA space with various levels of maturity to address some of the core challenges faced by them. The faster and cheaper way to tackle the typical challenges faced by CSPs is to automate business processes so that they involve minimum human intervention.

Some of the key challenges faced by CSP/DSPs driving the trend toward increased adoption of RPA include:

- Heavy dependency on manual interventions that are time-consuming, error-prone, repetitive, and constrained by human capabilities

- Need for consolidation/integration of multiple systems post mergers and acquisitions which impact seamless process flows
- Constant struggle to increase ARPU while lowering OPEX—which can impact the bottom line
- Compliance requirements to statutory and regulatory changes from the government
- Constraints in the current business processes due to legacy systems and the unwillingness of CSPs to dole out CAPEX to streamline applications

Telebots

Prodapt's Robotic Process Automation Framework

Telebots™ minimizes or completely removes the human intervention, making processes interact amongst themselves and bring out the required transformations. Telebots™ CoE helps organizations take RPA deep into their ecosystem, revamping processes and pumping adrenaline into the go-to-market strategies. This also allows organizations to free up the human capital and deploy it in more intellectual and rewarding tasks, thus enhancing employee satisfaction and efficiency.

The framework goes beyond the commercially available RPA features to include the following:

1. **Pre-built process stacks** – Prodapt's eTOM-based workflows for several CSP/DSP processes help bring down development time and cost by 15% to 20% (approx.). Some of the sample CSP/DSP processes developed include:

   a. Number portability
   b. Pre-bill checks
   c. Order management for triple-play services
   d. Sim activations
   e. Complaint form management
   f. Toll-free management
   g. Network ticket resolution

2. **Enhanced analytics layer on top of COTS RPA products** – Enables CSP/DSPs to generate deeper insights such as time taken to task in the transaction, most commonly occurring fallouts, etc – completely customizable based on required insights

Telebots™ success stories

Telebots™ has been instrumental in automation successes for several of Prodapt's global customers.

1. **Customer: Leading US wireline service provider**
   75% of order management tasks made touchless

Prodapt Presents Telebots™
The leading Robotic Process Automation Framework
for Communications and Digital Service Providers

o Orders are downloaded from 15 different portals
o Information aggregated from multiple screens
o Automated order validation & capture

2. Customer: Leading European wireline service provider

44% time savings achieved in number portability process

o Order fetched from multiple portals
o Search and data aggregation from various web and Citrix-based applications
o Automated number portability request in legacy application

3. Customer: Leading European wireline service provider

47% time savings in pre-bill check

o Information aggregation from disparate applications
o Built database for the product vs price validation
o Auto movement of orders to fallout queue

4. Customer: Leading US wireless service provider

56% efficiency in billing collections

o Automatic listing of the defaulting customers
o Reminder calls replaced with auto dialers
o Auto generation of reminders

o Management notification and service termination on the due date

5. Customer: Leading US wireline service provider

58% time savings in incident management – alarm monitoring

o Telebots to monitor the NMS 24x7
o Creates incidents for faults and assigns them to L1/L2/L3 based on severity table
o Alarm suppression
o Creates resolution and run configuration
o Closes tickets/incidents in Remedy

What are the other reasons that make Telebots™ special?

- **CSP/DSP focus:** Built to address the challenges faced by CSP/DSPs
- **Holistic methodology:** Helps CSP/DSPs prioritize "right" processes for RPA and achieve faster and more efficient automation through "utility bots" concept (building robots that do common tasks across core processes)
- **Continuous improvement:** Packaged with process leaning assessment and improvement services that have delivered 10% to 20% of improvements through process optimizations alone, during and after the implementation of RPA
- **Meticulous change management:** Ongoing back-office support and training to better manage fallout or manual operations post RPA implementation

About Business Process Services

Business Process Services is a global team within Prodapt that provides cutting-edge operations and back-office management services to global telecom players. The services provided by the division is aligned to the TM Forum's eTOM framework include the fulfillment, assurance, billing, and network management. These services are spread across process consulting, business intelligence & analytics, and process documentation. This practice has received several global recognitions for its products and services.

Prodapt - quick facts

- Singular focus on the communications industry with major global telecom players as long-term clients
- Liberty Global awarded Prodapt with the best vendor award in 2015
- Recognized by Gartner as a key player in robotic process automation for the communications industry
- Recognized by Everest Group and Zinnov as a leading services company in IoT
- Recognized by Deloitte as one of the fastest growing companies in India and APAC in 2011, 2015, and 2016
- ISO 9001:2008, ISO 27001:2015, SSAE16, and CMMI Level 3 certified

More about Prodapt: **www.prodapt.com**

TM FORUM TOOLKIT FOR ENSURING QUALITY
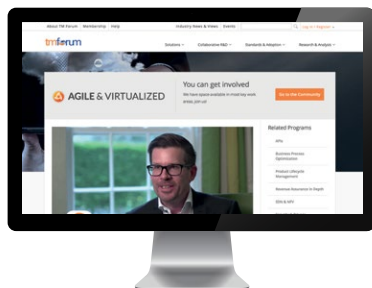
AGILE & VIRTUALIZED

REST APIs
TM Forum offers 31 open, REST APIs (with more under development) to manage services end to end and throughout their lifecycle in a multi-partner environment.

End-to-End Virtualization Management: Impact on E2E Service Assurance and SLA Management for Hybrid Networks
This information guide looks at the challenges and impacts on end-to-end service assurance and management of service level agreements in a hybrid physical/virtualized environment.

ZOOM NFV Security Fabric Overview
This information guide outlines the TM Forum view on where the security fabric needs to be to support virtualized services.
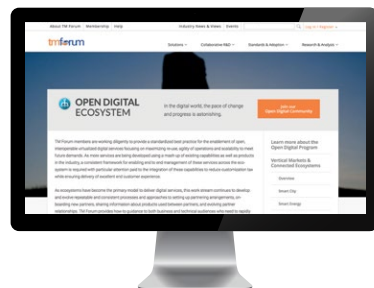
OPEN & PARTNER EFFECTIVELY

Digital Services Toolkit
Currently under development, this toolkit will help companies rapidly address business problems using a collection of interlinked assets based on Frameworx.

Online B2B2X Step-by-Step Partnering Guide
This guide explains the five stages required to build a partner relationship. Each stage provides key concepts, strategy and approach, worksheets, examples and exit criteria to enable streamlined and repeatable implementation.
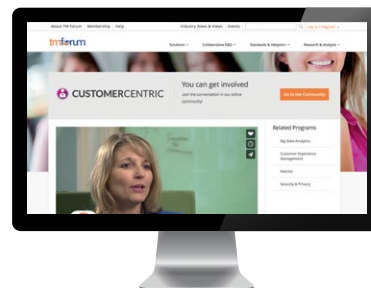
CUSTOMER CENTRICITY

Customer Experience Management Solution Suite
This set of tools consists of six components: a guidebook, more than 550 metrics, a maturity model, a lifecycle model, more than 10 implementation use cases and an ROI model.

Big Data Analytics Solution Suite
This set of tools includes a big data reference model, a guidebook containing 65 use cases and 1700+ pre-defined metrics.

RESEARCH & PUBLICATIONS

Extra Insights
Collaborate to innovate: A universal approach to winning in the digital world

Building the Operations Center of the Future

NFV: What does it take to be agile? Transforming operations for the digital ecosystem

NFV: Are you prepared? Operations and procurement readiness

Insights Research
NFV: Bridging the chasm

Delivering end-to-end services in a hyper-connected world

Customer experience and analytics in a digital world

Quick Insights
Agile operations: Moving to the Operations Center of the Future

NFV: What does it mean for customer experience?

Virtualization: How to manage performance

FRAMEWORX 16.5
ADVANCES DIGITAL TRANSFORMATION THROUGH COLLABORATIVE R&D

Since May 2016 hundreds of individuals from a diverse range of member companies have worked in TM Forum's unique collaborative environment to deliver new features in TM Forum Frameworx™ 16.5 The projects were all within the context of the Forum's strategic programs: Open APIs & Digital Platforms, Agile Business & IT, the Internet of Everything and Customer Centricity & Analytics.

Customer Centricity & Analytics

This program focuses on development of the Forum's extensive library of customer experience management (CEM) assets, metrics and best practices for big data analytics. New features include:

- the Big Data Analytics Guidebook, which provides a new automated toolkit for data analytics maturity to provide a starting point for assessing an organization's current state and identifying opportunities for closing critical analytics gaps;
- evolution of the TM Forum Information Framework to help operational support systems scale with increasing quantities

of transactional data;
- enhancements to the Analytics Big Data Repository (ABDR), which address critical domains such as the customer and billing;
- an important Catalyst project called Cognitive Digital Agent, which demonstrated how to create the next generation of customer care services through machine learning and artificial intelligence; and
- a new version of the Guidebook on a 360 Degree view of the Customer, which includes a new method for outside-in scoring of customer experience – this approach helps service providers move beyond the traditional Net Promoter Score (NPS) in measuring customer sentiment.

Contact Robert Walker, Senior Director, Customer Centricity & Analytics Program, TM Forum for more information or if you'd like to get involved via rwalker@tmforum.org

Open APIs

Building on the release of the new API crowd sourcing template in June 2016 and phase two of the Open API Manifesto, which now includes
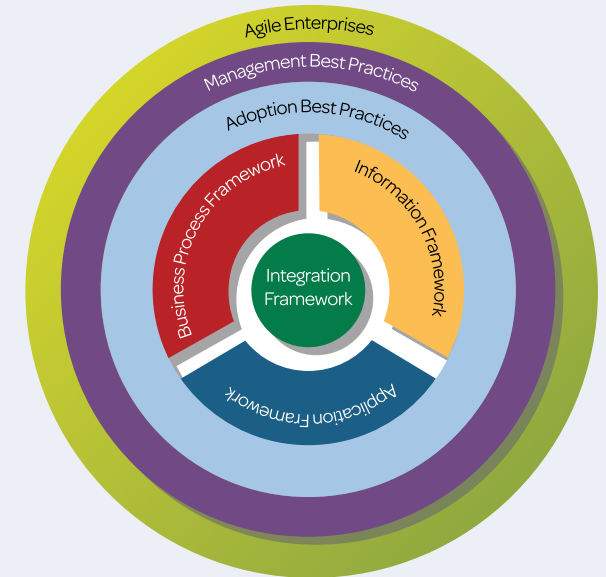
19 of the world's largest service providers and technology ecosystem partners, this team has delivered:

- an additional 13 API specifications bringing the total number of Open APIs to 31 – new APIs include balance management, loyalty management and change management;
- three conformance profiles and test scripts for the Product Catalog API, Trouble Ticket API and Entity Provisioning API; and
- an Open API governance guidebook, specifically designed to ensure consistency.

Contact Joann O'Brien, Vice President, Open APIs & Ecosystems, TM Forum, for more information or to get involved via jobrien@tmforum.org

Agile Business & IT

This program, which includes the Zero-touch Orchestration, Operations and Management (ZOOM) project, helps organizations continuously optimize their IT and business operations.

Additions include:

- the first release of a blueprint for a Hybrid Network Management Platform, providing a guide to creating a management platform – this forms the foundation for major work in 2017 to bring together multiple open-source groups to demonstrate how to implement such a platform;
- an information guide about procuring and onboarding virtual network functions, which draws on work in an important Catalyst proof-of-concept project called *Enabling the Digital Services Marketplace with Onboarding Automation*;
- continued collaborative work on introducing DevOps methodologies into traditional network operations, including a study on the impacts of working across multiple partners in such an environment;
- a refresh of established Frameworx training courses to ensure they remain fully up-to-date with the latest uses of the Forum's Business Process (eTOM), Information (SID) and Application (TAM) frameworks for digital transformation initiatives.

If you'd like to know more about ZOOM, contact Ken Dilbeck, Vice President, Collaborative R&D, TM Forum via kdilbeck@tmforum.org

The Internet of Everything

The goal of this program is to enable an open digital ecosystem where new services can be delivered quickly, easily and securely using a wide range of business models and partners. New additions include:

- the hugely popular recent ebook *Navigating the IoE Roadmap of Challenges: Insights and opinions for digital businesses*, which provides a reference listing of the top 20 business, technology and market challenges facing all companies in the digital economy;
- an important Catalyst project called *Smart life: My home, my city, my planet*, which demonstrated the foundation for an agile IoE ecosystem;
- enhancement of the Digital Services Reference Architecture (DSRA) with a new Privacy Management service definition, which for the first time provides privacy management support across the DSRA and introduces the Privacy Management API; and
- extensions of the widely successful TR211 Online B2B2X Partnering Step-by-Step Guide and TR424 B2B2X Business Scenario Template to include new sections on monetization and the platform economy.

Contact Craig Bachmann, Senior Director, Open Digital Program, TM Forum, via cbachmann@tmforum.org if you'd like to find out more or get involved.

What are you waiting for?

TM Forum's members can download Frameworx 16.5's assets and deliverables right now.

As Nik Willetts, Deputy CEO, TM Forum, explains, "All TM Forum members can now leverage new toolkits, best practices, maturity models, guides and technical reports to help them tackle the most pressing challenges their businesses are facing.

"Whether you're looking to transform your networks to achieve business and IT agility, drive true customer centricity, or drive growth through new platform business models, TM Forum members are working together to deliver pragmatic, real-world solutions."

And if you're missing out because you're not a member, contact Tim Banham, Managing Director, Member Engagement & Sales, TM Forum via tbanham@tmforum.org NOW.

For more about the Forum's work on customer centricity, including how to get involved, contact Robert Walker, Senior Director, Customer Centiricty program, TM Forum, via **rwalker@tmforum.org**