



# Why 70% of NFV and Digital Transformation Projects Fail

And what we can do to fix this



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## Overview

The TMForum group [released](#) results of a survey which provide lots of interesting insights on the state of the CSP market in the context of the overall Digital Transformation (a.k.a DX) trend.

### DX 101 - What is Digital Transformation?

According to the IDC report on the same subject [Designing Tomorrow](#) IDC defines digital transformation as *“transforming your decision making with technology — utilizing new sources of innovation and creativity to enhance experiences and improve financial performance”*.

### Network transformation as a catalyst

In 2011, concepts such as network functions virtualization ([NFV](#)) and software-defined networking (SDN) were new, but in the last five years the industry has embraced both. The question now is when, not if, CSPs will evolve their networks and infrastructures into a system that resembles cloud computing.

With both IT and networks embracing cloud, there is a strong case for merging IT and network functions.

A large number of transformation initiatives are being led by chief technology information officers (CTIOs), a relatively new role within CSPs created to make sure the company's technology strategy serves its business strategy.

In some cases, network transformation is a trigger for wider digitalization within a CSP. This is because the true benefits of network virtualization can only be realized when OSS/BSS is modernized and if organizational culture, practices and software skillsets change with the network.

# Network plays a crucial role in digital transformation

Network automation and orchestration has been mostly driven by CSPs, but according to the Gartner 2018 "Strategic Roadmap for Networking" report and [this TechTarget report](#) there are clear indicators that enterprises start to realize that they can't achieve full automation without addressing the network piece. According to the report the number of enterprises that will adopt vCPE and SD-WAN will grow from 2% (today) to 40% (2018).

## Networking plays crucial role in digital transformation

**How IT and business digital transformation priorities align**

Priority	IT (%)	BUSINESS (%)
Gain competitive advantage	51%	52%
Improve customer experience	42%	47%
Select right technology	53%	46%
Secure budget	37%	37%
Reduce cost	40%	37%
Find the right talent	33%	37%
Market the transformation	35%	34%
Generate revenue	27%	31%

SOURCE: "EMERGES ANNUAL DIGITAL TRANSFORMATION 2017/18," EMERGES RESEARCH, N=706

**Top five advantages of digital transformation among network pros**

Advantage	Percentage (%)
Enhance product or service innovation	61%
Enable agile and real-time cross-business collaboration	55%
Increase internal process efficiency	52%
Increase worker productivity	55%
Streamline operations and process management	36%

SOURCE: "2017 PRIORITY SURVEY," TECHTARGET IN Q3, RESPONDENTS COULD CHOOSE MORE THAN ONE

**Networking tools will undergo transformation**

Network operations teams will rely less on command-line interface as their primary interface:

55%

projected drop in use of CLI as network management interface by 2020

SOURCE: "2017 STRATEGIC ROADMAP FOR NETWORKING," GARTNER

**Business in the digital transformation planning stages**

Planning Stage	Percentage (%)
Have completed or planning a digital transformation strategy	74%
Are unsure or have no plans to begin a digital transformation strategy	12% 14%

Are evaluating a potential digital transformation strategy

SOURCE: "EMERGES ANNUAL DIGITAL TRANSFORMATION 2017/18," EMERGES RESEARCH, N=706

**55%** of network ops see agile and real time cross-business collaboration as a key priority

"Enterprises are adopting new IT delivery models and applications that are imposing fundamental network changes from device access to core..."

**Networking tools will undergo transformation**

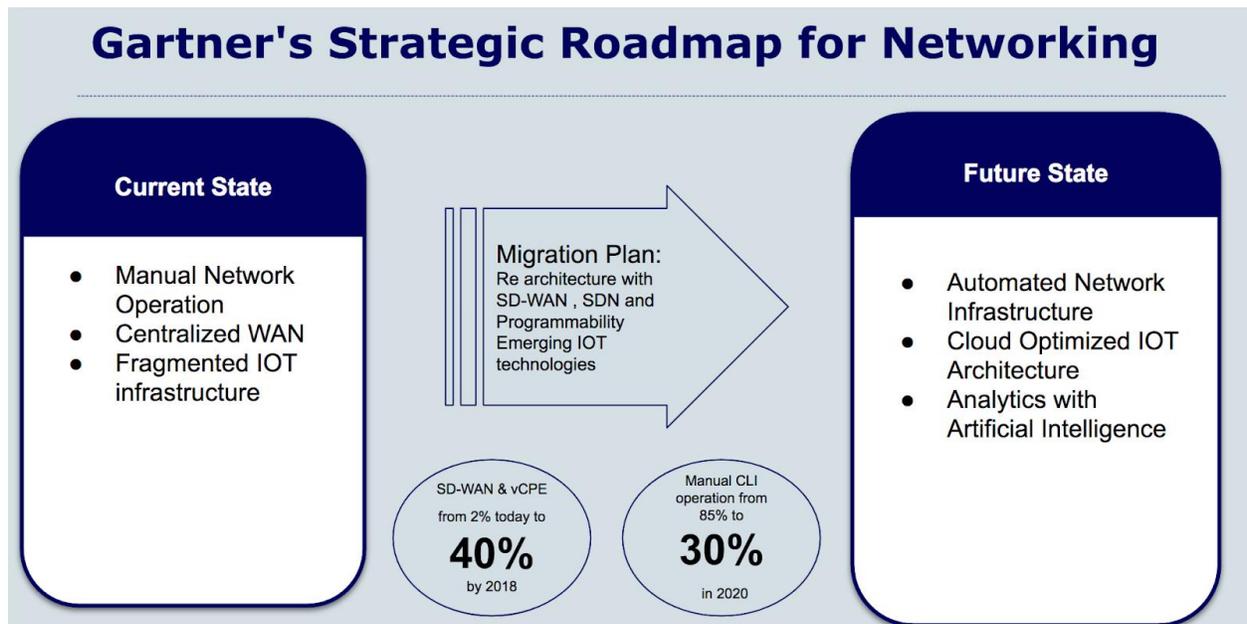
Network operations teams will rely less on command-line interface as their primary interface:

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SOURCE: "2017 STRATEGIC ROADMAP FOR NETWORKING," GARTNER

# The Future of Network Automation



Source: Gartner's' 2017 "Strategic Roadmap for Networking"

In my post [Is Networking becoming cool again](#), I examined the next evolution beyond the current wave of SD-WAN and vCPE, and pointed out that the next steps in the evolution will be the move from closed SD-WAN that are still largely driven by human users to open and programmable networking driven by DevOps process and APIs. [Sebastian Grabski's](#) post on [declarative networking](#) provides an excellent example of how this actually works.

This seems to be now aligned with the Gartner 2018 post that describe the future of [intent-based networking](#) : “the next big thing on the networking horizon promises to be .... wait for it ... intent-based networking.”

## Why do 70% of NFV and DX initiatives fail?

While the need for network automation is becoming a key part of the overall digital transformation agenda, the reality is that the success rate behind previous attempts to drive network automation (a.k.a NFV) is only at **about 30%**, where the statistics show that **70% of transformation projects fail!**

The TMF report points to two primary reasons for the failure rate:

1. Rip and Replace Approach
2. Relying on Traditional Vendors

## Rip and replace approach

Most NFV transformation projects have been driven by the ETSI model that largely dictates starting with a complete replacement of the infrastructure known as the (NFVI) and network functions (known as VNFs). This transformation often leads to a huge undertaking and cost investment which starts with the NFVI and VNF vendor selection (many times a long RFP processes), but doesn't take into account the implication of the skillset and operational practices needed to drive such a transition. This leads to the fact that such processes can take anything from 12 to 18 months just to get started, before it can even begin delivering any kind of business value to the organization.

This makes the time to business value of the this "Rip and Replace" approach way too long, especially in an environment that is being disrupted at such a rate that the 12-18 months often renders the technologies initially chosen as no longer relevant by the end of the process. What often times ends up happening midway down the road with such projects is the realization that many of the initial working assumptions when the project was kicked off have changed, and the projects never reach completion. In addition, constant reorgs make the ability to execute on such long projects virtually mission impossible.

## Relying on traditional vendors

Many CSPs rely on long RFI processes in which the list of criteria tries to meets every possible future use case. Because of the complexity of such a process most RFIs end up quoting the ETSI specification as the criteria for RFIs which many times does not even fit with the specific organizational needs. This leads to a fairly long and expensive evaluation process which caters mostly to their existing list of vendors such as Ericsson, HP, Cisco and the likes, that have the organizational structure to support such a process. The issue is that these vendors also have the most at stake to lose by such transformation processes, and are therefore by definition disincentivized to lead such a disruption and end up offering the same set of products under a different guise.

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# 70%

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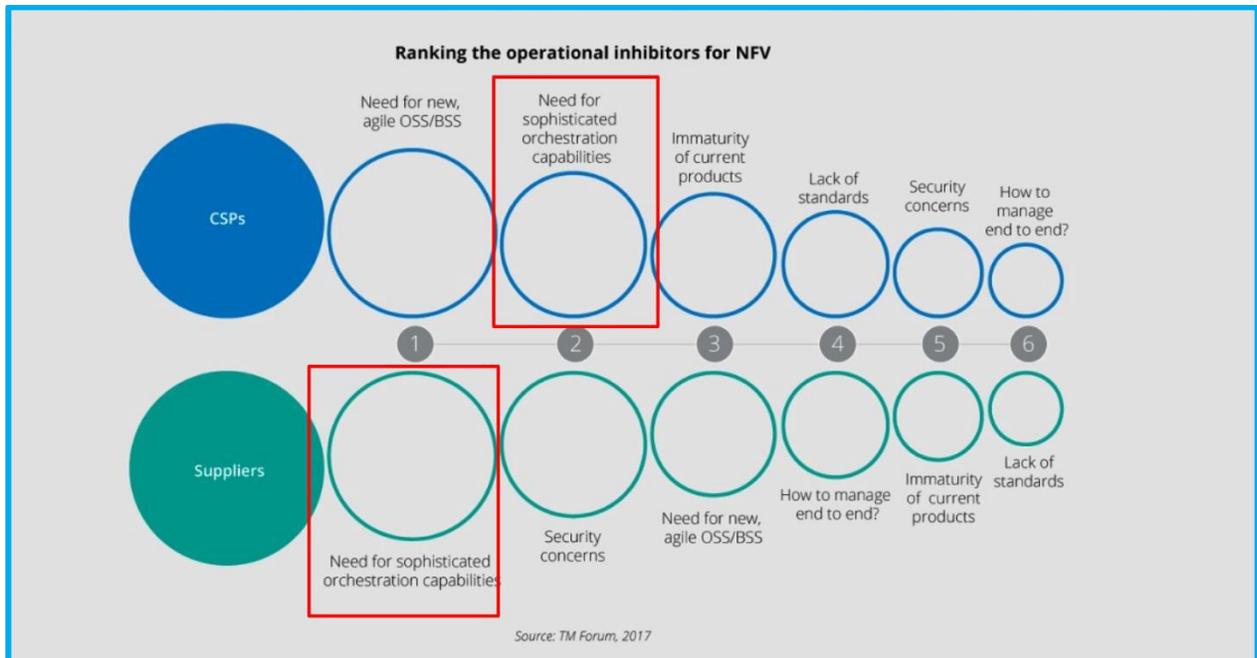
of all transformation projects fail

*Source: McKinsey*

"IT transformation has proven difficult because most CSPs **can't afford to simply rip out and replace all their old systems**. As such, they try to work with suppliers to improve existing systems, but **there is little incentive for suppliers** when their revenue streams are at stake."

## What are the key technical challenges?

According to the TMF report the key technical challenge for suppliers is the **lack of sophisticated orchestration capabilities**, as well as a lack of agile OSS/BSS (ranking third). On the other hand, CSPs define the leading technical challenge as a lack of agile OSS/BSS and lack of sophisticated orchestration as their secondary challenge. This is interesting to note, especially when considering that the industry consensus is that orchestration is evolving into the next generation OSS/BSS where the differences are largely anecdotal, and the biggest gap within the category of "lack of agile OSS/BSS" is for the most part the lack of sophisticated orchestration at its core.



## A recipe for successful NFV & DX transformation

Many of the reports mentioned here do a pretty good job in outlining the challenges and sources for failure, but are less helpful when looking to overcome or address these challenges.

To address this question in more practical terms, it's helpful to examine real world [use cases](#) delivered by Cloudify over the past few years, and learn the actual lessons from these experiences.

Some of the relevant use cases we can take a look at and learn from:

- **Partner Communications - V-NET Project**, delivering open vCPE/SD-WAN to a leading EMEA mobile operator. The approach taken here is “automation-first” to deliver an end-to-end open vCPE/SD-WAN in record time and at low-cost by integrating with existing VMware infrastructure and Juniper CPE devices. This enabled Partner to deliver DevOps agility on top of existing technology investments, vs. a migration-first approach which would have started with replacing VMware with OpenStack, and Juniper with an alternative vCPE, a lengthy overhaul.
- **Telstra - Network Evolution 2020 SDN/NFV Evolution Network (SEN) Project**. where we started with a bottom up approach in which we were brought in through a specific VNF vendor to address MPLS network utilization challenge and only after proving the value and product we started expanding into the other strategic NFV projects.

- **Proximus - Telco Cloud Project.** This project is a real-world example of a fully open best of breed approach, that combines traditional technologies and vendors such as Cisco, Nokia, Huawei under a common open automation & orchestration framework that glues all of the pieces of technology stack together.
- **MetaSwitch - Cloud Native VNF Management Project.** A great testimony to how a close partnership with VNF vendors makes it possible to accelerate process of VNF virtualization and cloud readiness with the VNF vendors, and not wait for slower moving CSPs.

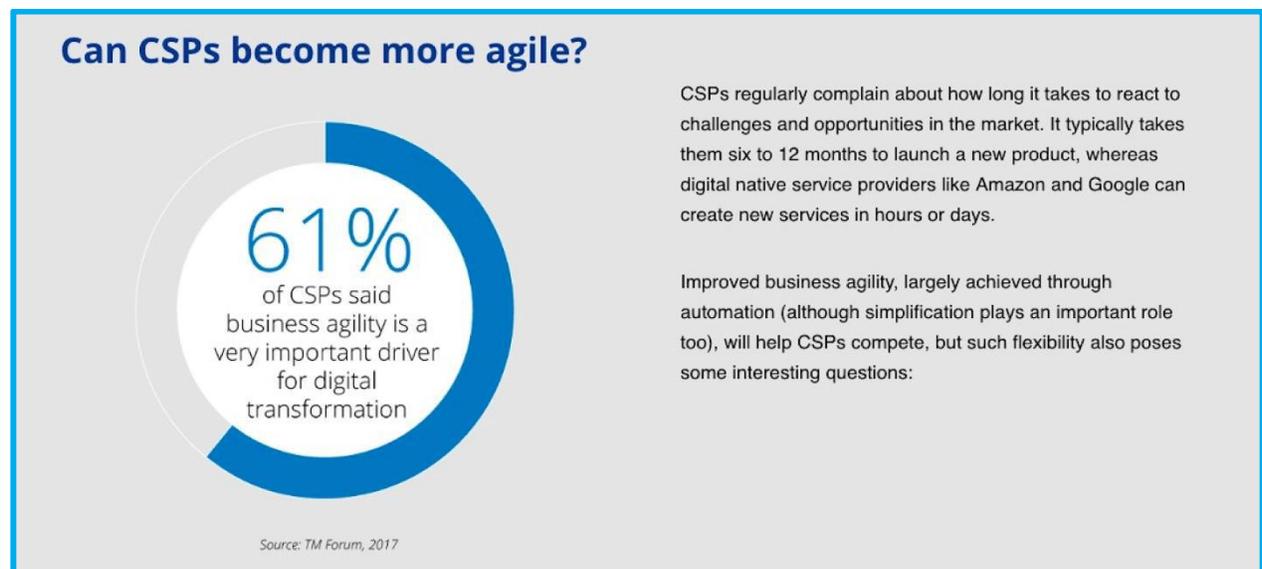
The key lessons from the collective experience of these projects can be attributed to **agile transformation**, that is summarized below.

## Agile transformation vs. “Big Bang” transformation

Focusing on time to value vs. standard compliance

The typical syndrome through all of the transformation projects is that they often get sidetracked by technology and lose sight of the business goals that drove them to start the transformation in the first place.

In a nutshell, the reason CSPs and other organizations are driving digital transformation projects is to achieve the agility that will allow them to launch new services faster and be much more responsive to their customer and market demands, as noted in the TMF report. Powerful automation coupled with deeply intelligent orchestration is a means to achieve this end, in that order.



The reality however, is that many of the NFV transformation projects put lots of focus on standard compliance with the assumption that standardization is a mandatory requirement to achieve automation and avoid lock-in.

The key lesson that we have learned through these diverse projects, is that none of them fall into an exact cookie cutter NFV architecture diagram, as outlined in the ETSI model. The reality is that each organization's environment is a mix of existing and new infrastructure, existing and new VNFs alongside PNFs. Each VNF comes with a different degree of automation and management, and that's often the reality we need to build upon.

Expecting a successful NFV transformation to begin by forcing all the vendors to comply with a standard is unrealistic. Instead, taking an automation-first approach, enabled the focus to be on the shortest path to delivering business value by integrating the existing network, infrastructure and services with new network services and infrastructure, while taking more incremental steps ([MVP](#)) toward full transformation.

For example, with Partner Communications, we focused first on the open vCPE use case and chose to deliver the CPE automation based on their existing Juniper CPE and VMware infrastructure, rather than starting with an entire infrastructure and VNF transformation replacement as the first step. In the case of Proximus, we used a mix of VMware and OpenStack infrastructure, and therefore avoid the need to transform their entire stack to be OpenStack compatible, but rather keep the existing OSS/BSS and some of their network services on VMware, and run only their new VNFs on OpenStack. Interestingly enough, this level of flexibility also enabled the gluing together of a variety of network services from competing vendors such as Nokia, Huawei, Cisco - not typically powering the same stack, making a real best of breed approach possible.

## A pragmatic approach to standardization

### Interoperability vs. compliance

By pragmatic approach, the idea refers to breaking up the dependency between standardization and automation. Standards simplify the automation process, but at the same time expecting everyone to comply to a specific standard or modeling language as a prerequisite for automation is a non starter, as noted in "[Driving standards in a fragmented networking landscape](#)". Having said that, standards are still important to drive interoperability and reduce lock-in.

So how do you balance between the two?

During the implementation phases of transformation projects, we quickly came to realize that trying to convert everything to TOSCA, or assuming that all of the VNFs will comply with YANG (or any other standard for that matter) as a prerequisite for automation, were going to stretch out the delivery substantially, and even put the entire project at risk.

Instead we learned how we can achieve interoperability between TOSCA and existing modeling languages and configuration formats using a set of plugins, such as the [configuration plugin](#), [REST plugin \(Restful VNF example\)](#), [terminal plugin](#). This type of pragmatic approach enables the integration of TOSCA as the end-to-end automation model that calls the native device format and protocol from this model, all without having to conform to a common format for all the network services.

## Top Down vs. Bottom Up Approach

**Another way to achieve agile transformation is through a bottom up approach.**

With a bottom up approach we start by automating a specific VNF and expand incrementally to other VNFs as opposed to the classic top-down process of selecting a generic NFVO that can cater to many use cases at once.

The issue with the top-down NFVO led process is with the assumption that VNF automation can be forced from the outside without a commitment from the VNF vendor. This assumption works with simple VNF's but in many cases automating a more complex VNF externally without getting the commitment from the VNF vendors using an external G-VNFM approach, is likely to break, as the VNF tends to change substantially between releases. In addition, it's safe to assume that VNFs require a specific set of optimizations to run a fully-automated and virtual environment, and that cannot be done easily from the outside.

This realization led us to work more closely with the VNF vendor ecosystem and equip them with the [tools to build their VNF automation](#) as part of their own VNF management package.

The partnership with Metaswitch is a great working example of this case in point. Leveraging this experience, Cloudify has expanded this type of partnership to many additional VNF vendors and partners.

## A mix of new vendors alongside traditional vendors

### The best of breed approach

As the TMF report highlighted one of the main reasons for 70% project failure is a direct result of CSP reliance on traditional vendors to lead the transformation, all while not realizing that such vendors have conflicts of interest with the CSP transformation agenda.

At the same time, introducing new vendors, and especially open source vendors, while much more aligned with the CSP transformation agenda imposes another degree of risk on the ability to support the CSP. This, as well as building the skillset of the organization to learn new frameworks and tooling imposes a huge culture challenge.

The approach that Proximus, Partner, and Telstra took was to combine traditional vendors (mostly at the VIM and VNF layer) and new vendors (mostly at the orchestration layer).

This combination allowed them to use the new vendor as a “change agent” within their organization that could bring fresh methods and ideas from the cloud native and open source worlds, alongside traditional vendors. The “pure play” orchestration made it possible to deliver a true best of breed selection of VNFs rather than compromising on a single vendor stack.

This pragmatic approach allows CSPs to minimize the degree of operational and culture change that is required to drive this kind of transformation, and essentially de-risk those factors.

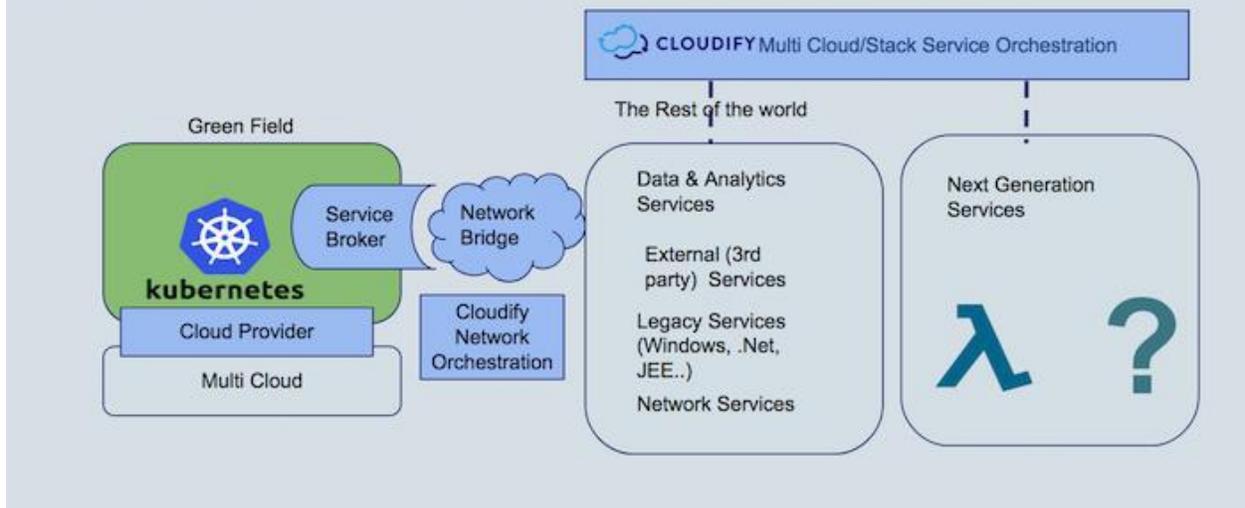
## Simplifying the cloud native transformation

A cloud native transformation is often synonymous with moving to containers, microservices architecture and now serverless architecture, adopting DevOps methodology and other such trends. Kubernetes is largely becoming the de-facto target platform for achieving all of the above.

The reality however, is that many of the CSP backend, as well as network services were built as a set of monolithic services that don't fit in well with this paradigm shift toward cloud native-ness. Therefore, starting a transformation journey with these services into a cloud native stack is going to be a long and painful journey.

By enabling integration of Kubernetes with external services, we can smooth this transition and enable end-to-end automation between services that runs in Kubernetes, and services that runs external to Kubernetes and haven't yet undergone the full cloud-native transformation process as outlined in this post: [How to Manage All Your Legacy, Network, Container, and Serverless Services Directly from Kubernetes](#).

## Integrate vs Migrate



## Final notes: Crossing the transformation chasm

Today there is no need to convince anyone that digital transformation is critical to the survival of many industries that are now being disrupted by new cloud-native companies.

CSPs are one of those industries that have already recognized this need, and have introduced NFV as the way to overcome these challenges some years ago - with many camps defining different methods, standards and best practices for taking this from theory to practice. And this noise and fragmentation has led to the large bulk of projects failing.

The key lesson from all this is that since transformation is often a complex and painful process, it's important to set out on the journey being mindful of the fact that there are all too many ways in which organizations can fail during that process.

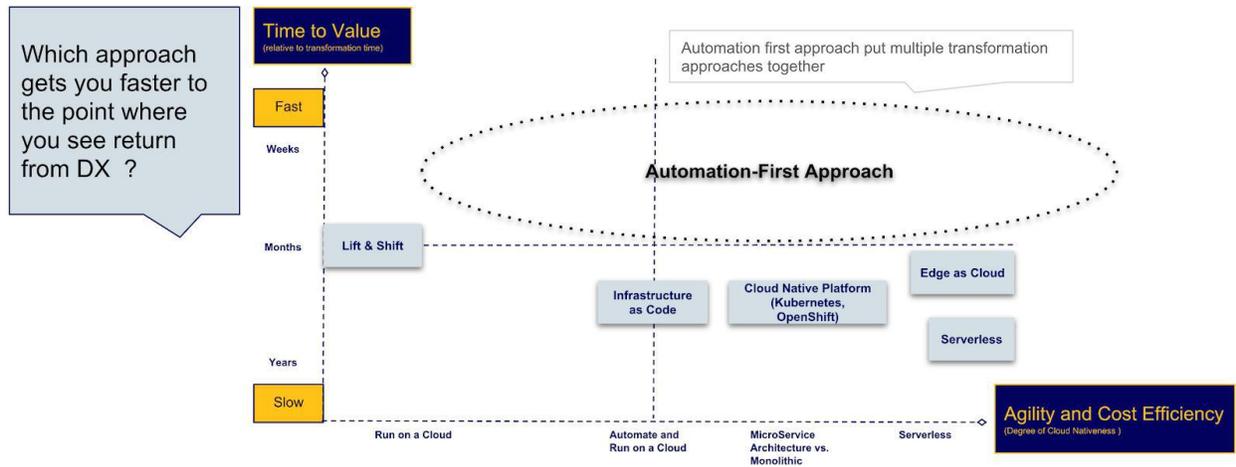
The way to navigate these challenges successfully is to adopt agile methodologies (MVP) on how to drive this process, and always focus on rolling out these projects in small increments that immediately demonstrate business value for each increment.

To drive business value faster we need to take a pragmatic approach and combine multiple approaches and technologies, rather than expecting that there to be a single standard or a platform everyone will comply with.

The automation-first approach represents a practical model that can combine automation of existing services alongside new generation micro-services and serverless architecture.

The diagram below shows a compilation of those approaches on two axes:

## Cloud / NFV Transformation Approaches



**Time to business value:** This axis shows how fast we can drive business value from a particular approach.

**Agility:** Measure the impact and fit of a particular technology on agility.

What this diagram illustrates is that with the automation-first approach we can combine all of those technologies together under a common automation umbrella, and as a result have a higher degree of flexibility to choose the right tool for the job.

For example, we can choose to automate our existing business services first, before we go through any re-architecture and rewrite exercise, and accelerate the time it takes to deploy and deliver these applications. For some of our customers we were able to use this approach to reduce deployment and setup from weeks to **minutes** or from months to **hours**!

This allowed the business to gain immediate value by increasing their sales rollout, improving their customer satisfaction, relieve engineering from handling manual operations, and other such immediate benefits.

At the same time, it was possible to launch new services using agile platforms such as Kubernetes and Serverless. By combining the two approaches it's possible to deliver much more rapidly significant business value, all without getting stuck in huge transformation and re-architecture projects that stagnate and fail.

## References:

- [TMF - Future CSP business models](#)
- IDC take on DX: [Designing Tomorrow](#)
- Mckinsey Report: [The seven decisions that matter in a digital transformation: A CEO's guide to reinvention](#)
- [Is Networking becoming cool again](#)
- [Driving Open Standards in a Fragmented Networking Landscape](#)
- [Declarative networking](#)
- [How to Manage All Your Legacy, Network, Container, and Serverless Services Directly from Kubernetes](#)



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