The Impact of Automation on IT Operations

Are you ready for the software-defined datacentre?

Freeform Dynamics, July 2017

Life in IT ops is not getting any easier

Some equate IT operations with 'keeping the lights on'. The implication is that it's a passive function that runs behind the scenes to ensure that applications and services continue to tick-over as they should. This line may suit those trying to drive agendas around things like cloud and DevOps, but it demonstrates a poor understanding of what actually goes on in today's operational environment. Sure, there's an element of keeping existing systems running,

but this is against the backdrop of a hugely dynamic IT landscape and a constantly evolving set of demands from the business. Keeping up with service level requirements and changes is challenge enough in relation to core business systems, departmental applications, end-user collaboration solutions, etc. But, the critical and demanding

How is pressure on your IT infrastructure and operational processes trending, e.g. in relation to changing business demands and expectations?

MORE PRESSURE ← → LESS PRESSURE

32%	46%	18%	3%	2%
Growing rapidly	Growing steadily	No change	Easing steadily	Easing rapidly

role of IT ops teams is further underlined when you add support for fast-moving new initiatives into the mix, e.g. implementation, monitoring and management activity associated with digital customer engagement, IoT, machine-learning, and so on. Not surprising then, that over three quarters of those providing feedback in a recent multi-national survey of senior IT professionals said the pressure on operational processes is increasing.
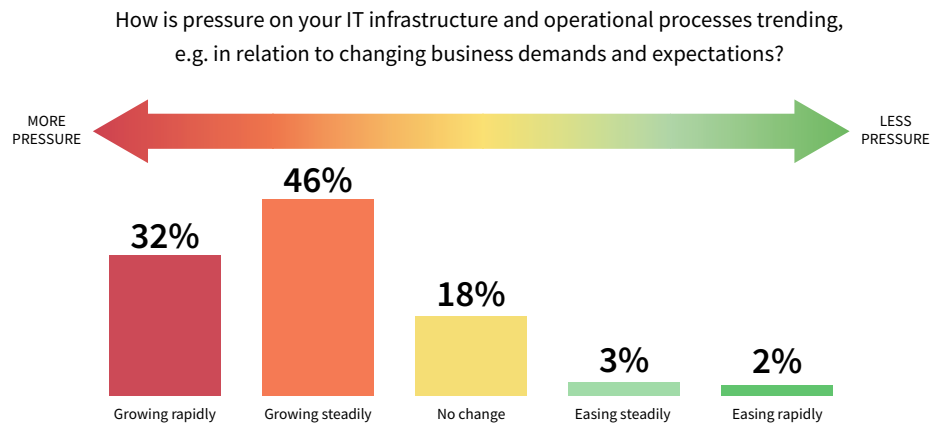
How operations staff currently spend their time

With everyting that needs covering, IT ops teams have to balance their time and effort across a number of areas. Firstly there's the administration and management of both the core infrastructure (servers, storage devices,

Roughly speaking, how much time do your operations staff spend on the following?

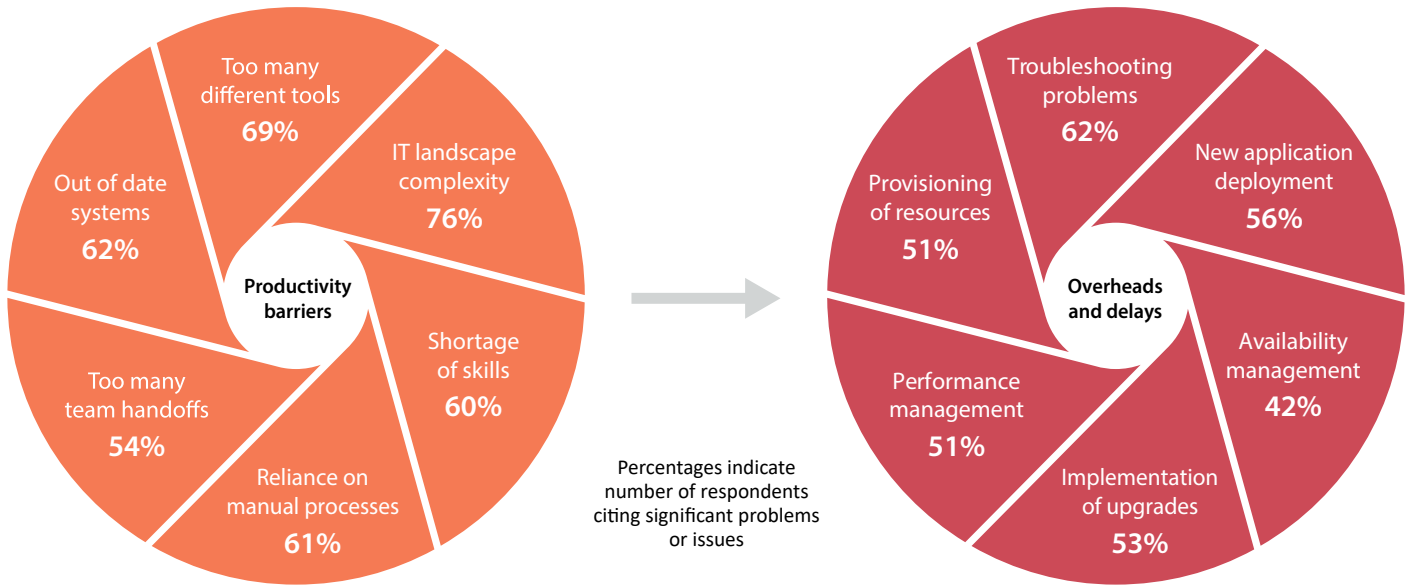| **73%** Spend significant time	Infrastructure or platform admin and management
80% Spend significant time	Business application-level operations activity
79% Spend significant time	Coordination and collaboration with others
76% Spend significant time	Infrastructure or platform projects and programs
69% Spend significant time	Investigation and forward-planning activities

databases, middleware, security, etc), and the business application estate (ERP, CRM, email and collaboration systems, and so on). Much of this is concerned with routine activity such as ongoing monitoring, tuning, resource management and general maintenance, but there's also more event-driven activity, including troubleshooting, remedial work, and dealing with change requests. A lot of this relies on coordinating with other teams - passing jobs around via various hand-off mechanisms. You then have more discrete pieces of work in the form of projects and programs. These are often associated with new system implementations or significant infrastructure or platform upgrades. Finally, if you have any time left, you can get into forward planning, and perhaps investigate new tools and technologies to help you modernise and improve the environment. This probably all sounds very familiar, but the question is, how effectively and efficiently are you really working?

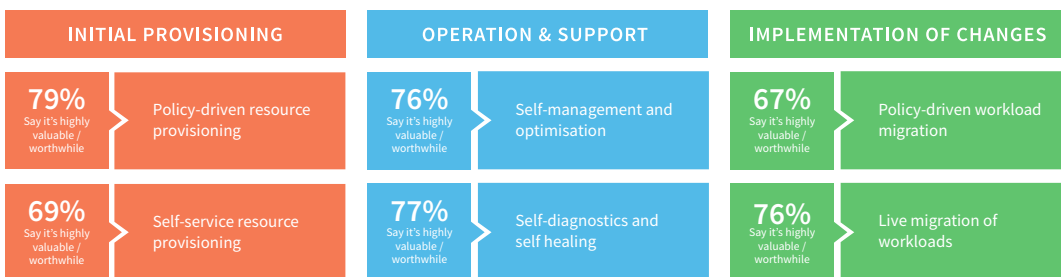# Productivity barriers lead to overheads and delays

In order to keep up, productivity is key, but a range of barriers often get in the way. Notable here is the time spent working around old systems, fragmented tool-chains, and general infrastructure complexity. Together with skills issues, inefficient handoffs and a reliance on manual processing, the end result is significant overhead and delay.

Productivity barriers

- Too many different tools 69%
- IT landscape complexity 76%
- Out of date systems 62%
- Shortage of skills 60%
- Too many team handoffs 54%
- Reliance on manual processes 61%

Percentages indicate number of respondents citing significant problems or issues

Overheads and delays

- Troubleshooting problems 62%
- New application deployment 56%
- Provisioning of resources 51%
- Availability management 42%
- Performance management 51%
- Implementation of upgrades 53%

The need for automation is recognised, but it isn't always in place

One way of driving better productivity and efficiency is to automate key operations activities. Beyond speeding up activities and immediately freeing up the time of IT operations staff, automation has the added benefit of helping to minimise mistakes caused by human error. Th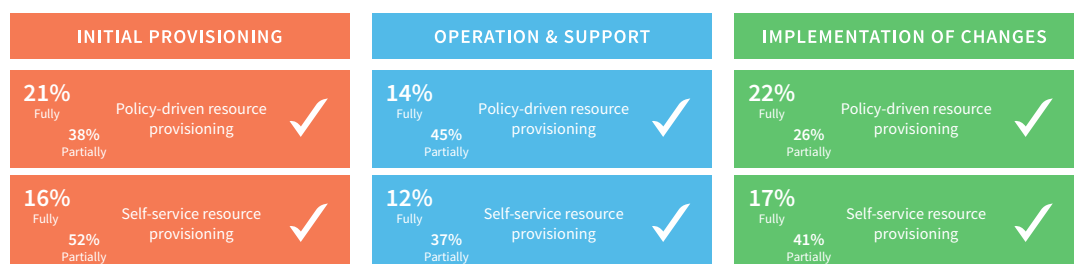is in turn means fewer outages and less remedial work, with a corresponding reduction in the time and distraction associated with this. During the research, most respondents (around 3 out of 4) highlighted the value of automation in relation to all key aspects of IT operations work. However, a relatively small minority (typically 1 in 5 or fewer) said automation had been fully implemented in a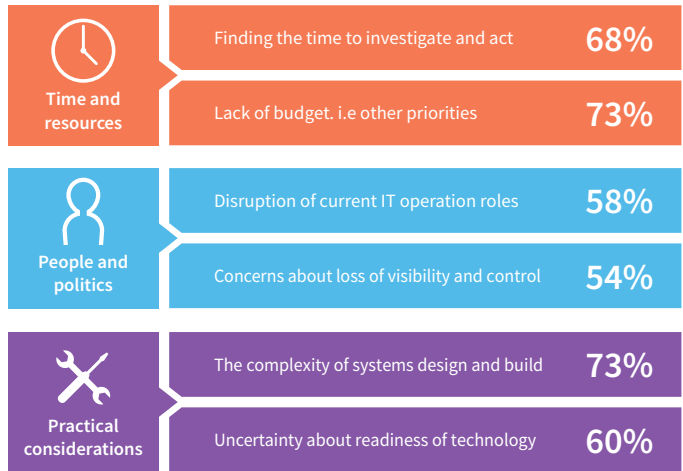reas such as systems and resource provisioning, ongoing operation and support, and the routine implementation of changes. So what's preventing Ops teams automating more of their work?

The need for automation in key areas is widely recognised

INITIAL PROVISIONING	OPERATION & SUPPORT	IMPLEMENTATION OF CHANGES
79% Say it's highly valuable / worthwhile — Policy-driven resource provisioning	**76%** Say it's highly valuable / worthwhile — Self-management and optimisation	**67%** Say it's highly valuable / worthwhile — Policy-driven workload migration
69% Say it's highly valuable / worthwhile — Self-service resource provisioning	**77%** Say it's highly valuable / worthwhile — Self-diagnostics and self healing	**76%** Say it's highly valuable / worthwhile — Live migration of workloads

To what degree have you implemented the following types of automation in a production environment?

INITIAL PROVISIONING	OPERATION & SUPPORT	IMPLEMENTATION OF CHANGES
21% Fully / 38% Partially — Policy-driven resource provisioning ✓	**14%** Fully / 45% Partially — Policy-driven resource provisioning ✓	**22%** Fully / 26% Partially — Policy-driven resource provisioning ✓
16% Fully / 52% Partially — Self-service resource provisioning ✓	**12%** Fully / 37% Partially — Self-service resource provisioning ✓	**17%** Fully / 41% Partially — Self-service resource provisioning ✓

Driving for improvement

Tools and techniques for automating pretty much every aspect of IT operations have been around for many years, and infrastructure compoments, e.g. servers, storage devices and network equipment, have increasingly been offered with automation features built in. But with a complex landscape of options, it can be hard for busy IT professionals to spend the time to keep up with developments, let alone to investigate how solutions might work in their environment without aggravating the problem of fragmentation and disjoints highlighted earlier. Even if you find the time, however, and overcome the frequent shortages of budget, you still need to get past some of the human issues. These include concerns about loss of control, and even the possibility of losing your job. Together with practical considerations, such as ensuring the readiness of more advanced solutions for production deployment, and then actually doing the design, build and integration work required to create an automated systems environment, the relatively slow progress towards full automation is perfectly understandable.
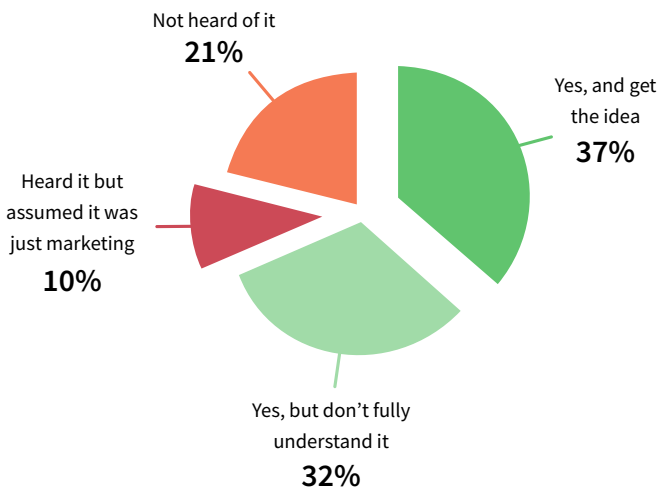
Which of the following potentially stand in the way of progress?

Time and resources	Finding the time to investigate and act	68%
	Lack of budget. i.e other priorities	73%
People and politics	Disruption of current IT operation roles	58%
	Concerns about loss of visibility and control	54%
Practical considerations	The complexity of systems design and build	73%
	Uncertainty about readiness of technology	60%

## Enter the software-defined datacentre

It's against this background that we have seen the emergence of 'The Software-Defined Datacentre' (SDDC). The idea is to use software to automate as many aspects of operations as possible in a fully integrated manner. While the term might imply a 'rip and replace' across the entire datacentre, the reality is that SDDC is typically implemented at an individual systems level. The appeal of this was confirmed during the research.

The kind of automation capability we have just been through is often associated with the concept of the 'Software-Defined Datacentre'. Are you familiar with this term?

- Not heard of it **21%**
- Heard it but assumed it was just marketing **10%**
- Yes, but don't fully understand it **32%**
- Yes, and get the idea **37%**

Do you see the software-defined datacentre concept being relevant in your environment?

- Don't know **3%**
- Yes, already adopting **24%**
- Probably not **10%**
- Possibly **38%**
- Yes, it's in the plan **24%**

Whether you refer to this kind of proposition as SDDC, or just think of it as part of the general march towards intelligent automation and self-managing systems, there can be no doubt that solutions in this space are already starting to be incorporated into IT plans and activities.
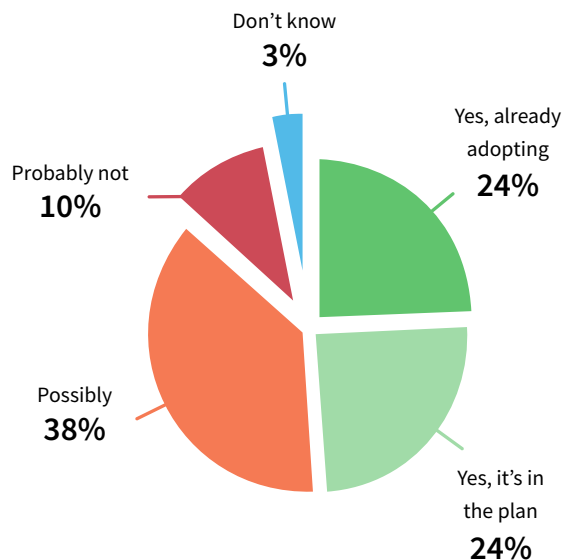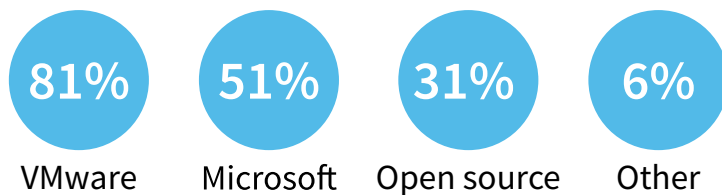
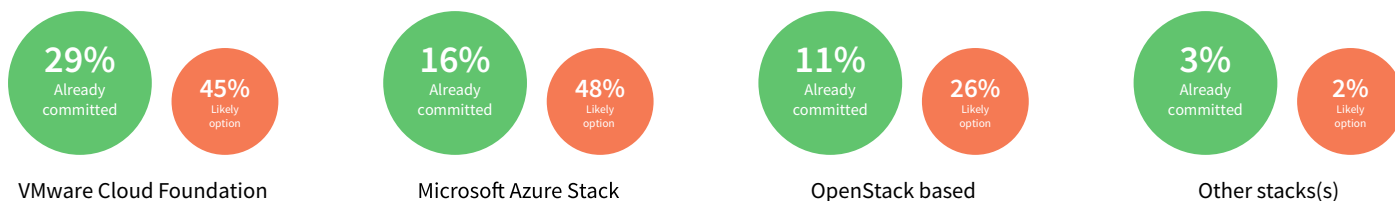# SDDC set to build on existing skills and investments

In many ways, SDDC solutions build on the foundation laid by the various virtualisation stacks that are commonplace in mainstream IT landscapes. Over the years, these have moved from supporting virtual servers in a relatively static manner (e.g. to facilitate server and application consolidation) to richer platforms allowing workloads to be managed much more dynamically.

Do you currently make significant use of any of the following virtualisation stacks?

81%	51%	31%	6%
VMware	Microsoft	Open source	Other

Along the way, capabilities have evolved to embrace storage and network virtualisation, and even live migration of virtual machines and resources to allow in-flight optimisation of the virtualised systems. It's a short step from here to delivering a fully automated environment similar to the platforms operated by cloud service providers. Indeed it's no coincidence that VMware's SDDC offering, 'Cloud Foundation', has the 'C word' in its name, and Microsoft calls its SDDC solution the 'Azure Stack', positioning it as an on-premise incarnation of its Azure public cloud service. And if the research is anything to go by, these two mainstream commercial vendors have hit the mark with their SDDC propositions; some are already committed to implementing their respective solutions, with many others acknowleding them as a likely option. And the same is true of OpenStack coming from the open source arena.

Do these solutions figure in your plans and activities for on-premise IT?

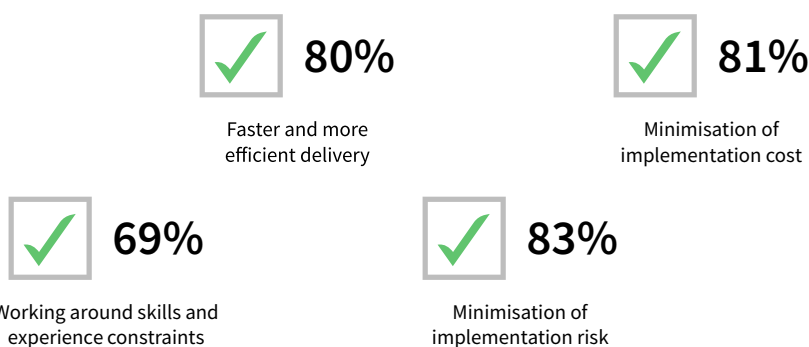| 29% Already committed	45% Likely option	16% Already committed	48% Likely option	11% Already committed	26% Likely option	3% Already committed	2% Likely option
VMware Cloud Foundation		Microsoft Azure Stack		OpenStack based		Other stacks(s)	

Implementation considerations

While SDDC clearly puts the emphasis on software, hardware obviously remains an essential ingredient in the platform mix. The reality is therefore that you are still left with the question of how you design and construct a fully-working system. An option here is to take one of the above software platforms and bring it together with a separately aquired set of hardware, then do the necessary work yourself to integrate and configure everything appropriately. A variation on this DIY approach is to get a systems integrator to put the components together for you. If you want to move more quickly with less cost and risk, however, and have a single vendor support your SDDC environment as a working whole, then pre-integration is the way to go. Standard appliances based on mainstream SDDC stacks are

Benefits of pre-integration
(seen as compelling or worthwhile)

✓ 80% Faster and more efficient delivery

✓ 81% Minimisation of implementation cost

✓ 69% Working around skills and experience constraints

✓ 83% Minimisation of implementation risk

now available in various sizes and configurations. Alternatively, some suppliers will build a system to order based on a reference architecture or your requirements, then fully support it thereafter.

Impact on IT teams

One of the most obvious consequences of SDDC-style integrated automation is that it can dramatically reduce the time you need to spend on routine administration work. It obviously takes time to develop confidence in an automated system to the point where you are happy for it to take care of detailed monitoring, tuning and management activity with little or no human intervention. Once you get used to it and learn to trust it, however, then the time, skills and experience of operations staff can be redirected towards higher level activities. After a while, the job becomes less about managing the uptime and performance of the IT infrastructure and the components

Percentages are those who strongly agree or agree

78%

Automation means a lot of routine administration work will no longer be necessary

71%
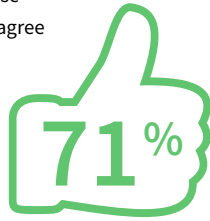
There's a great opportunity to refocus operations staff on higher value activities

63%

With escalating demands, it doesn't make sense to reduce the number of IT staff

within it, and more about service delivery and assurance at a business level. In a similar way, storage management evolves to become more about managing and protecting the organisation's information assets, again at a business level. Think of all those higher level jobs and processes operations teams would love to pay more attention to if they weren't spending all of their time on systems level drudgery, fire-fighting and other activities no one ever thanks them for anyway.

Time to prepare for cultural and structural change

Building on the notion that SDDC means IT operations staff will end up spending their time in different ways, increased automation is set to have an even more profound impact at a cultural and structural level. If compute or storage resources can be provisioned with just a few clicks (selecting size, volume and service-level parameters without having to worry about how these relate to the selection and configuration of physical devices), then you no longer need a specialist do it. A developer creating a system for prototyping, for example, or an application manager

How likely is it that increased IT ops automation will lead to more integrated teams that are application and business focused rather than organised around system-level specialisms?

Unsure **3%**

This has already happened **6%**

Not expecting this **8%**

Expecting this **32%**

Heading in this direction **51%**

setting up a new staging environment, can get what they need through a self-service portal rather than raising tickets to various operations teams. With automation taking place in other areas as well - software development and testing, release and deployment,
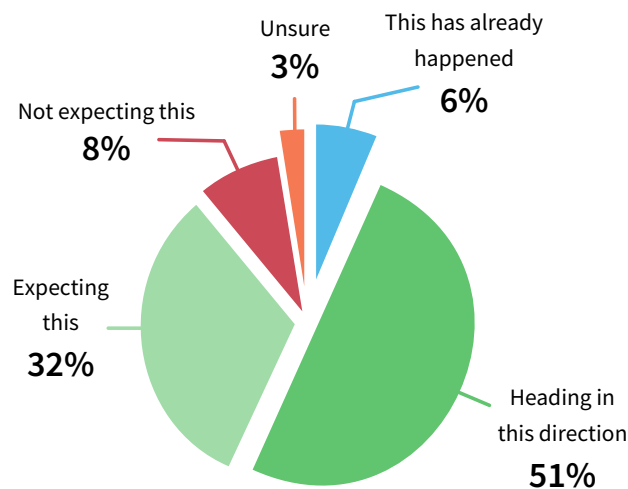
security management, information management, and so on - SDDC is part of a broader set of changes that are set to shake up IT in many different ways. Against this background, SDDC is likely to be a key component of your overall IT transformation plans and activities.

About the Research

The research upon which this report is based was designed and executed on an independent basis by Freeform Dynamics. Data was collected from 156 senior IT professionals via a telephone survey. The respondents were drawn from a variety of industry sectors, including Manufacturing, Retail, Travel / Transport, Financial Services, Telecoms, Healthcare / Life Sciences and Automotive. The organisations in which they worked had at least 2,500 employees, and/or revenues equivalent to of $500 million (USD) or more. The study, which was completed in June 2017, was sponsored by Fujitsu.

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