



Executive insight paper

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and



Building a data-savvy digital infrastructure

Fujitsu's MetaArc and NetApp's
Data Fabric in context

Freeform Dynamics, 2017

Management Summary

About this Document

The insights presented in this document are derived from ongoing independent research, coupled with specific briefings from Fujitsu and NetApp on their MetaArc and Data Fabric offerings. While specific technologies and partnership details are used to illustrate how key generic principles translate to practical reality, nothing in this paper should be taken as a validation or endorsement of any product or supplier.

To deliver on the huge promise and high expectations in a sustainable manner requires an agile and coordinated approach, embracing past and future investments. We refer to this as 'Hybrid IT'.

Using technology to redefine how your business operates, what it delivers, and the way it engages with customers, suppliers and partners can drive step-changes in business performance and organisational agility. Many refer to this as 'digital transformation'. But unlocking the benefits in a sustainable way in an increasingly unpredictable world can be hard without the right systems infrastructure in place. What's needed is a technology environment that enables full, flexible leverage of existing IT capability as well as modern platforms, applications and services. And as you lay such 'Hybrid IT' foundations, liberating your data safely and securely is key.

Key points

Hybrid IT underpins longer-term digital transformation success

Technology is clearly central to digital transformation, but rushing headlong into digital initiatives in a tactical and disjointed manner is a recipe for short term gain followed by longer term pain and constraint. In the digital world, the old adage that 'change is the only constant' has never been truer. Even legacy systems are likely to be exploited in new and unexpected ways as modern cloud-based digital solutions draw upon the functionality and data held in core business applications. To deliver on the huge promise and high expectations in a sustainable manner therefore requires an agile, coordinated architectural approach, embracing all past and future investments. We call this 'Hybrid IT', and implemented well, it can speed digital transformation, as well as improve overall IT operational efficiency and flexibility.

Effective Hybrid IT depends on addressing five key imperatives

As you move forward with your Hybrid IT strategy, it's important to be clear on what it needs to include. At a high level, here are the most critical imperatives:

- A 'cloud first' approach, for delivering new digital solutions
- An open enterprise architecture, with a focus on componentisation and APIs
- Legacy liberation, to make existing systems accessible from the digital world
- Management of dynamic distribution, as components move over their lifetime
- Dynamic, distributed data management, to maintain flexible but safe access

The last of these imperatives is as critical as the others, but it's arguably the one that's talked about the least – perhaps because it is one of the hardest to deal with.

Making your Hybrid IT environment more 'data-savvy' is becoming easier

The Hybrid IT approach allows applications and components to interoperate across location boundaries (e.g. cloud versus on-premise), as well as between cloud instances, and even different architectures (e.g. traditional versus modern digital). The same level of distribution and access flexibility is also required for data. Furthermore, whether it's workloads or data sets, in the dynamic digital world, you can expect things to move around in response to evolving needs - where something lives today, may not be the best place for it to reside in a month, six months, and so on. Against this backdrop, we will be using a joint solution from Fujitsu and NetApp to illustrate how, with the right approach, data access flexibility can be achieved in a Hybrid IT environment while keeping security and compliance risks under control.

Introduction

Phrases such as 'data is the currency of the digital economy' tend to resonate well with business leaders.

The importance of anytime, anywhere data access is well understood, and in today's fast-moving business environment, phrases such as 'data is the currency of the digital economy' tend to resonate well with business leaders. But managing data and meeting business expectations in relation to access, performance, protection, security and compliance in the context of a modern, dynamic, Hybrid IT environment can be extremely challenging. There are lots of moving parts and dependencies, and nothing stays still for very long. The traditional approach of mapping applications and data in a relatively static manner is inadequate to keep up with the level of complexity and the pace of change.

Yet solving this problem is critical to unlock the full potential of digital transformation, because if you don't, you'll either encounter a set of constraints that will act as a brake on progress, or will be tempted to ease up on the controls and live with escalating cost and risk. If you tackle the dynamic, distributed data management issue in a sustainable manner, however, you are much more likely to free up your business to make the most of the digital opportunity, and all of the rewards that come with it.

In the remainder of this report, we will explore what's needed to move forward confidently, effectively and efficiently in this highly important area. As part of this, we will be looking at an example of a specific solution set from two important vendors in the marketplace - Fujitsu and NetApp - to illustrate current state-of-the-art, and what can be achieved in practical terms.

If you tackle the dynamic, distributed data management issue in a sustainable manner, you will free up your business to make the most of the digital opportunity.

Before getting into this, however, we need to take some time to look at the broader context within which the data management conversation needs to take place. Let's therefore start out by considering how the IT environment is evolving to meet digital transformation needs and expectations.

The evolving IT landscape

Our studies and surveys suggest that you'll already be experiencing the impact and implications of changes taking place in the management of enterprise data in complex, multi-cloud, Hybrid IT environments. The challenge, of course, is finding the time to stand back, consider the significance of what's happening, then to map-out a course of action that your organisation can follow with confidence.

To help you move forward, we'll walk through some of the key considerations that warrant your attention in relation to architecture, platform and infrastructure level enablers, with a particular emphasis on the data management dimension.

Cloud is arguably the most intensely discussed technology and service category at the moment.

The need for a robust multi-cloud strategy

Cloud is arguably the most intensely discussed technology and service category at the moment. In its various forms, it offers a range of approaches for dealing with business problems and opportunities in new and different ways, often accelerating your time-to-value from digital initiatives, while simultaneously driving operational efficiency.

One form of cloud is IT infrastructure as a service (IaaS), which is now mainstream for meeting many compute, storage and networking needs. Evolving in parallel are two other 'cloud layers': platform-as-a-service (PaaS), providing development platforms and associated runtime operating environments, and software-as-a-service (SaaS),

Each flavour of cloud comes with its own set of models, vendors, ecosystems, and target use-cases.

concerned with full-function application services (CRM, email, collaboration, etc). Microservices, accessed through APIs, are also part of this evolving continuum, and with this in mind some are even starting to talk about function-as-a-service (FaaS).

Each flavour of cloud comes with its own set of models, vendors, ecosystems, and target use-cases that can be exploited in myriad ways to construct, build, deploy, migrate, enhance, and extend IT systems, applications, and digital services. Overlaying this richness (or complexity, depending on how you look at it), is the fact that some of these cloud architectures can exist on-premise (within your own datacentre) or be delivered as a service by a cloud or managed service provider.

It would be highly unusual if your organisation wasn't already taking advantage of cloud computing, but it's also probably the case that your adoption activity hasn't been as coordinated and harmonious as you would ideally want. As various cloud options are used throughout the software and service delivery cycle, different teams and groups representing different parts of the business will likely have made different decisions for different reasons. You may even have individual parts of the business making their own cloud arrangements, especially in relation to SaaS based business solutions (some refer to this as 'shadow IT').

While exploiting the benefits of cloud will be critical to digital initiatives, a piecemeal adoption approach is not sustainable over the longer term.

While exploiting the benefits of cloud will be critical to the huge majority of digital initiatives, and even optimising activity within your existing application portfolio, continuing with a piecemeal adoption approach is not sustainable over the longer term. The need is for what many are referring to as an integrated 'hybrid cloud' or 'multi-cloud' strategy to avoid fragmentation and disjoints coming back to bite in the form of unmanageable costs and/or unacceptable levels of risk, lock-in and rigidity.

From multi-cloud to Hybrid IT

While taming your clouds is critical to achieve digital platform readiness, this only deals with one part of the requirement.

For established enterprises, especially those with a mix of on-premise systems and cloud infrastructure, 'going digital' in a scalable, manageable and sustainable manner requires a broader architectural approach known as 'Hybrid IT'. The idea is to create an environment in which every element of your IT landscape, regardless of architecture type and generation, can work together as seamlessly, efficiently and flexibly as possible.

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Why is this important? Because no application or service operates in isolation, and modern digital/cloud-based solutions are no exception. The more critical and strategic that digital customer engagement system, or Internet of Things (IoT) based offering, the more likely it is that it will be dependent on functionality and data residing in existing systems running on traditional platforms and architectures. Without an architectural approach to open interoperability, integration issues alone will act as a huge brake on progress and an impediment to agility and responsiveness.

And as you think through the requirements here, it's important not to forget the data dimension. It's essential to define an efficient and effective data strategy that spans traditional IT, cloud, and native digital applications. This must ensure appropriate data protection, governance, and access, regardless of where applications and data reside, and how they might move over time as requirements evolve. Just like applications and workloads, in a fast-moving digital environment, the 'right' place for a particular piece of data to reside is very likely to change over time.

Developing a digital platform strategy

It is possible to call out a range of imperatives to achieve a state of what we might call 'digital platform readiness'.

Applications, services, components and functions will need to interoperate across physical locations and architectures.

Where something resides today, may not be the best place for it to live tomorrow, next month or in 6 months' time.

A critical question is how to manage the risk while delivering data access flexibility.

Pulling together some of the threads we have been discussing, it is possible to call out a range of imperatives to achieve a state of what we might call 'digital platform readiness'. These include:

A 'cloud first' approach: The principle of exploiting cloud platforms and the cloud deployment model by default for all new digital applications and services to ensure maximum scalability, efficiency and flexibility. It doesn't matter whether the clouds you use are private on-premise, privately hosted, public hosted or any combination of these. If you design for one type of cloud, while portability can never be assumed, migration between clouds will always be easier than switching architectures.

An open enterprise architecture: When designing and building new applications, commissioning someone to do so for you, or even buying packages or adopting SaaS solutions, make sure you end up with something that's integration-friendly. Put a heavy focus on component-based architectures, the use of open APIs (secured where appropriate), and relevant industry or de-facto standards. The trick is to avoid creating new silos wherever possible.

Legacy liberation: Picking up on the need to deal with application and service dependencies, you need to find ways to surface functionality and data held in traditional systems so they are accessible from a modern cloud/digital environment. The aim here is to leverage past investments and the richness and robustness of existing core business systems. You don't want to be continually reinventing the wheel, then having to manage unnecessary duplication and the disjoints that often follow. Enabling solutions in this area include various forms of integration middleware, but the basic principle you are often aiming for is to 'wrap' your legacy in a layer of standard APIs so they effectively 'mimic' modern service components.

Management of dynamic distribution: Based on our discussion so far, it will be clear that applications, services, components and functions will need to interoperate across physical locations and architectures. Beyond the integration imperative here, we also need to consider that where something resides today, may not be the best place for it to live tomorrow, next month or in 6 months' time. This may be because of evolving capacity or performance needs, or changes in security, compliance or other operational constraints. Modern workload management and orchestration systems that understand Hybrid IT environments are generally the answer here, at least for the application and 'compute' part of the equation.

Dynamic, distributed data management: One of biggest challenges in a multi-cloud, Hybrid IT environment is that the same data often needs to be accessed and manipulated via multiple applications and services that may be running on different architectures in different locations. The last thing you want is uncontrolled replication, fragmentation and movement of data in order to meet this need, as the result will be runaway security and compliance risks, not to mention excessive management costs. Add the ever-changing nature of digital environments into the mix, and the magnitude of the challenge is clear, as is the need for dynamic data management.

The last of these imperatives is probably the least talked about in the industry, and most frequently overlooked from a strategy perspective, particularly the question of how to manage the risk while delivering access flexibility. But what risks are we referring to here? We need to address this question in more detail before continuing.

Data related risks in more detail

The EU's General Data Protection Regulation (GDPR) has put many businesses and service providers on high alert.

Technology trends, such as cloud, object storage, open source, containers, and converged infrastructures present myriad ways for IT departments to accelerate and support the digital aspirations of the enterprise. Public and private cloud resources are combining with more traditional on-premise IT delivery models to create Hybrid IT environments replete with function and capability. But while the consumption of compute and business function services are almost considered 'the new normal', some business execs are still wary of storing and processing data in the cloud, particularly when 'cloud' is a non-determinant location and legal jurisdiction is 'fuzzy'.

The May 2018 enforcement date of the EU's General Data Protection Regulation (GDPR) has put many businesses – and their cloud and IT service providers – on high alert, as they consider the changes that may be required to their enterprise data management strategies. The EU isn't the only region gearing-up for new data privacy regulations, but the impact of GDPR is expected to be felt way beyond the region, as GDPR applies to any organisation, located on any continent, if it handles the data of EU citizens or businesses.

No matter how far along you are in your Hybrid IT journey, the reality is that suppliers are likely to always be several steps ahead in terms of thinking and best practice in specific areas.

CEOs, CIOs, IT architects, business application owners, and cloud service providers all have a vested interest in the effective and efficient management of data, but each has a different view of the issues. Ultimately, however, 'the company' carries the legal burden, with the CEO and executive board the 'named persons' responsible for overseeing corporate governance and compliance. This constituency sees data, especially the data about its customers/citizens/clients, as a business resource, and, just as with company finances and the CFO, it expects the CIO to facilitate optimum use of it, ensuring it is protected in line with established business and regulatory requirements. A strong focus on security and access controls is implicit in this.

What to look for from suppliers

No matter how far along you are in your Hybrid IT journey, the reality is that suppliers are likely to always be several steps ahead in terms of thinking and best practice in specific areas. This is partly because they need a sharp focus on moving the state-of-the-art forward as they continue to develop their solution portfolios in a competitive and relevant manner. In addition to this, while you might be encountering a specific problem or opportunity for the first time, the chances are that your vendor partners, looking across their entire customer base, will have been through the relevant loop many times before. It makes sense to tap into this broader base of knowledge and experience, so choosing partners who understand not just the technology domain, but the industry in which you are working, can have significant benefits.

Some are currently talking about the idea of 'co-creation', i.e. involving partners to define your digital agenda and solutions within it.

Building on this, some are currently talking about the concept of 'co-creation'. The idea here is to take things one step further and actually involve partners in helping to define your digital agenda and solutions within it. Again, it's about bringing together a broader set of experiences and perspectives to drive innovation and business advantage in a collaborative manner.

Lastly with regard to suppliers, it's clear that implementing Hybrid IT involves pulling together lots of different technologies and disciplines. Therefore, always look out for joint propositions from complementary vendors that can accelerate your time to value by leveraging strategic partnerships and pre-integrated solutions.

Fujitsu and NetApp: An example of a strategic Hybrid IT partnership in action

Fujitsu has a reputation for working with customers collaboratively to drive technology-enabled innovation.

To offer a sense of the approaches being taken by suppliers in the market, we are going to use a set of offerings from Fujitsu and NetApp as an example of what can be achieved, particularly when vendors and service providers work together in strategic partnership. In the interests of full disclosure, we are using Fujitsu and NetApp as reference points as they have been kind enough to co-sponsor this paper. They are not the only vendors addressing the needs in this space, however, so their inclusion should not be construed as Freeform Dynamics validating or endorsing their offerings.

MetaArc as a foundation for Hybrid IT

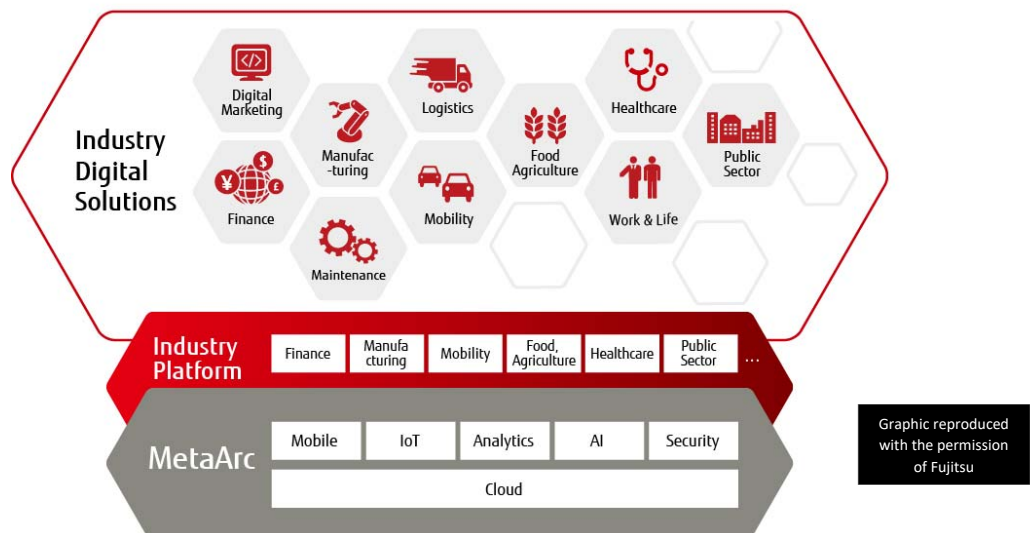
Those involved in transformation initiatives are increasingly looking for active partners rather than passive suppliers to help develop and support their digital agenda.

For many years, Fujitsu has been a trusted partner to many large enterprises. Through its professional and managed service capability, coupled with deep industry expertise, it is capable of doing the heavy lifting from both a systems and services perspective.

Beyond this, Fujitsu also has a reputation for working with customers collaboratively to drive technology-enabled innovation and advantage into their business. The term sometimes used for this is ‘co-creation’, and from a strategic engagement perspective, it fits very well with the expectations of senior IT and business people. Those involved in transformation initiatives are increasingly looking for active partners rather than passive suppliers to help develop and support their digital agenda.

To accelerate time to value when engaged around digital transformation initiatives, Fujitsu has developed a suite of offerings ranging from high level industry solutions, through a number of key platform services, to an underlying orchestration framework known as MetaArc (Figure 1).

Figure 1
Fujitsu’s MetaArc Hybrid IT platform in the broader digital context



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While this diagram provides some important context, and underlines Fujitsu’s broader capability, the part of this diagram we are mostly interested in for our discussion in this paper is the MetaArc layer. This provides a comprehensive framework for creating, orchestrating and managing a Hybrid IT environment. In this respect, it delivers most of what’s required for effective workload and resource management when multiple clouds are used in conjunction with traditional IT systems.

Fujitsu’s technology strategy in this space is to provide a set of ‘connected services’ to, in its own words, enable its customers to “digitalise with confidence”.

Business leaders are much more likely to accept the idea of ‘failing fast’ if they can do it safely, cheaply, and efficiently.

It is beyond the scope of this paper to go into the details of MetaArc from a technology perspective. It’s worth noting, however, that as part of the solution, Fujitsu offers a fully integrated hybrid cloud capability in the form of ‘Cloud Service K5’. The idea of this is to provide a consistent cloud architecture that operates the same way whether deployed in your datacentre (on a fully managed basis) or delivered as a private hosted or public cloud service. Inherent in the architecture is an ability to freely migrate workloads between different cloud instances as requirements evolve.

Coming back to MetaArc, one of its critical attributes is the ability to embrace all mainstream forms of cloud. Indeed, if your cloud estate is made up of platforms and/or services from the likes of Microsoft, VMware and Amazon, potentially sitting alongside Fujitsu’s K5, then MetaArc can provide an orchestration overlay so everything can be managed as a coherent single environment. The idea is to drive operational and cost efficiency regardless of your mix of clouds.

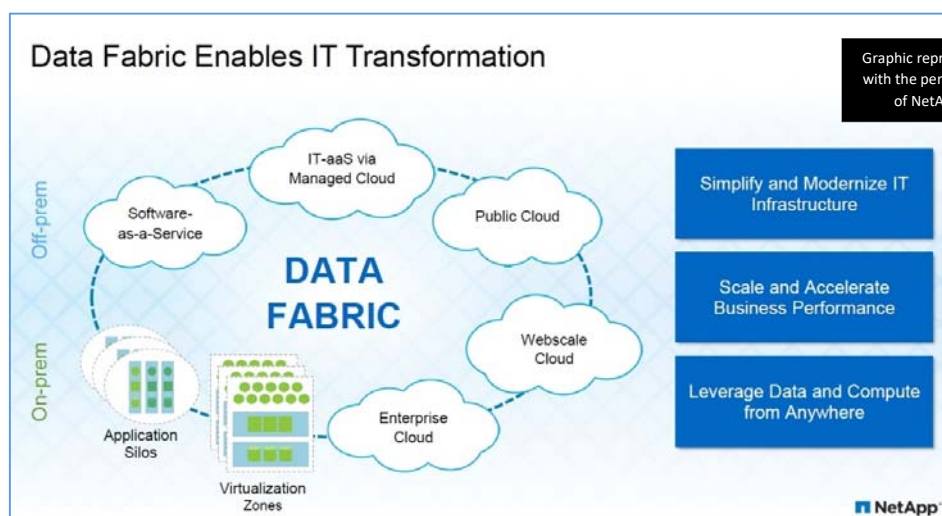
Taking a step back, Fujitsu’s technology strategy in this space is to provide a set of ‘connected services’ to, in its own words, enable its customers to “digitalise with confidence”. While such language might sound like marketing speak to many in the IT professional community, it does encapsulate what business managers want to feel as they consider moving into the exciting but often uncertain world of digital. This is particularly true as digital activity extends into new territories, such as IoT, advanced analytics, and AI. Business leaders are much more likely to accept the idea of ‘failing fast’ if they can do it safely, cheaply, and efficiently.

But what about the data? Enter NetApp Data Fabric

A digital business is a data-driven business, so managing this fundamental element is critical to success. Moving compute workloads between clouds and technology stacks certainly presents the IT department with a range of challenges, and the orchestration elements of MetaArc are designed to deal with these. Moving and managing access to the data associated with dynamic workloads is a bigger challenge, which requires a different set of capabilities from a technology perspective.

In recognition of this, Fujitsu has partnered with NetApp to bring what’s needed to the MetaArc environment. The specific solution here is ‘Data Fabric’, which is NetApp’s answer to the dynamic, distributed data management problem (Figure 2).

Figure 2
NetApp’s Data Fabric, now delivered as an integrated part of MetaArc



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With Data Fabric in place, the application shouldn't know or care where the data physically resides.

A key objective is to be able to migrate data as necessary in a fast-moving Hybrid IT environment with minimal application disruption.

Whether it's backups, snapshotting, or replication, Data Fabric supports data protection in a totally agnostic manner.

Fujitsu and NetApp would seem to be offering a comprehensive set of solutions and services to address the needs of Hybrid IT delivery.

Again, there's a limit to how much technical detail we can go into on the solution, but a good way to gain an appreciation of at least part of what Data Fabric does is to consider some of the common scenarios and use cases it deals with. These include:

- **Storage abstraction:** Presenting a diverse set of data sources, e.g. across different physical architectures, clouds, and locations, in a standard and consistent manner to simplify application access, and protect applications from changes and movements at the physical storage level. With Data Fabric in place, the application shouldn't know or care whether a particular data set lives in AWS or some other hosted cloud environment, or on a traditional storage array or modern all-flash system in the datacentre.
- **Non-disruptive data movement:** Data Fabric includes migration tools to move data quickly and easily in response to changing needs. This could be triggered by new compliance constraints (e.g. a need to move data from a public cloud to another location), evolving QoS requirements (e.g. greater performance, scalability or resiliency to deal with new usage patterns), or even economics (e.g. to switch clouds because of unfavourable charging models, or to move data to cheaper storage as it 'cools' from an access frequency perspective). Together with storage abstraction, this provides the freedom required to migrate data as necessary in a fast-moving Hybrid IT environment with minimal application disruption, regardless of the original source and target destination.
- **Flexible data replication and protection:** Whether it's backups, snapshotting, or replication, Data Fabric supports this kind of data protection functionality in a totally agnostic manner, i.e. the nature of the source and destination can be quite different. Example use cases here include backing-up on-premise systems to the cloud, and vice versa, though in a dynamic, critical digital application context, the ability to rapidly fail-over from one data source to the other is particularly valuable. Even cloud-to-cloud scenarios are supported here, e.g. failing-over from Amazon to Azure, or from one private hosted service to another.
- **Visibility and tracking:** Picking up on the earlier mention of security and compliance requirements, with Data Fabric in place, it's possible to track the usage and movement of data for reporting purposes. Furthermore, usage data is invaluable for monitoring, assessing and optimising performance.

This is just a glimpse of the kind of capability NetApp offers with Data Fabric, and that is now embedded into MetaArc. Even based on this, however, the combined solution appears to be a pretty good overall fit for many of the Hybrid IT requirements we outlined earlier in this paper.

It's all about synergy

Zooming out from the technology, it's worth noting that the strategic initiative and joint proposition on offer from Fujitsu and NetApp around Hybrid IT builds on an established partnership that has been in place for many years. And when you look at their joint R&D efforts, and the way they are both giving back to the community (e.g. via the OpenStack OSS project), these two enterprise-focused, global players are well-aligned in terms of philosophy and their approach to supporting customers.

Even though we can't endorse their specific solutions, Fujitsu and NetApp would seem to be offering a comprehensive set of solutions and services to address the needs of Hybrid IT delivery.

Final thoughts and advice

If designed and built in a sustainable manner, you'll enjoy the fruits of your data-savvy digital platform for many years to come.

Vendors, consultancies, and integrators are saying it's time to embrace Hybrid IT, but the practicalities of supporting 'legacy applications', on-premise IT stacks, and public/private/managed cloud services are easier said than done. Every IT department wants to be innovative, agile, efficient and responsive, but budgets demand getting the most from existing IT investments too. And by the way, those 'legacy applications' we speak of are, of course, core business, mission-critical applications.

Every technology stack tends to come with its own provisioning, management, and monitoring tools, and the cloud is no different. However, the real challenge as we see it – aside from managing the complexities of compute, storage, networking, applications, and services on-premise and cloud – is that of enterprise data management. If this issue is not addressed efficiently and effectively, digital transformation initiatives will stall and falter. If it is tackled in a sustainable manner, however, you'll enjoy the fruits of your data-savvy digital platform for many years to come.

About Freeform Dynamics

Freeform Dynamics is an IT industry analyst firm. Through our research and insights, we aim to help busy IT and business professionals get up to speed on the latest technology developments, and make better-informed investment decisions.

For more information, please visit www.freeformdynamics.com.

About Fujitsu

Fujitsu is the leading Japanese information and communication technology (ICT) company offering a full range of technology products, solutions and services. Approximately 162,000 Fujitsu people support customers in more than 100 countries. We use our experience and the power of ICT to shape the future of society with our customers.

For more information, please see: www.fujitsu.com.

About NetApp

Leading organizations worldwide count on NetApp for software, systems and services to manage and store data. We help customers capitalize on the value of their data in the hybrid cloud through our Data Fabric strategy, data management expertise, portfolio and ecosystem.

For more information, please see: www.netapp.com.

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