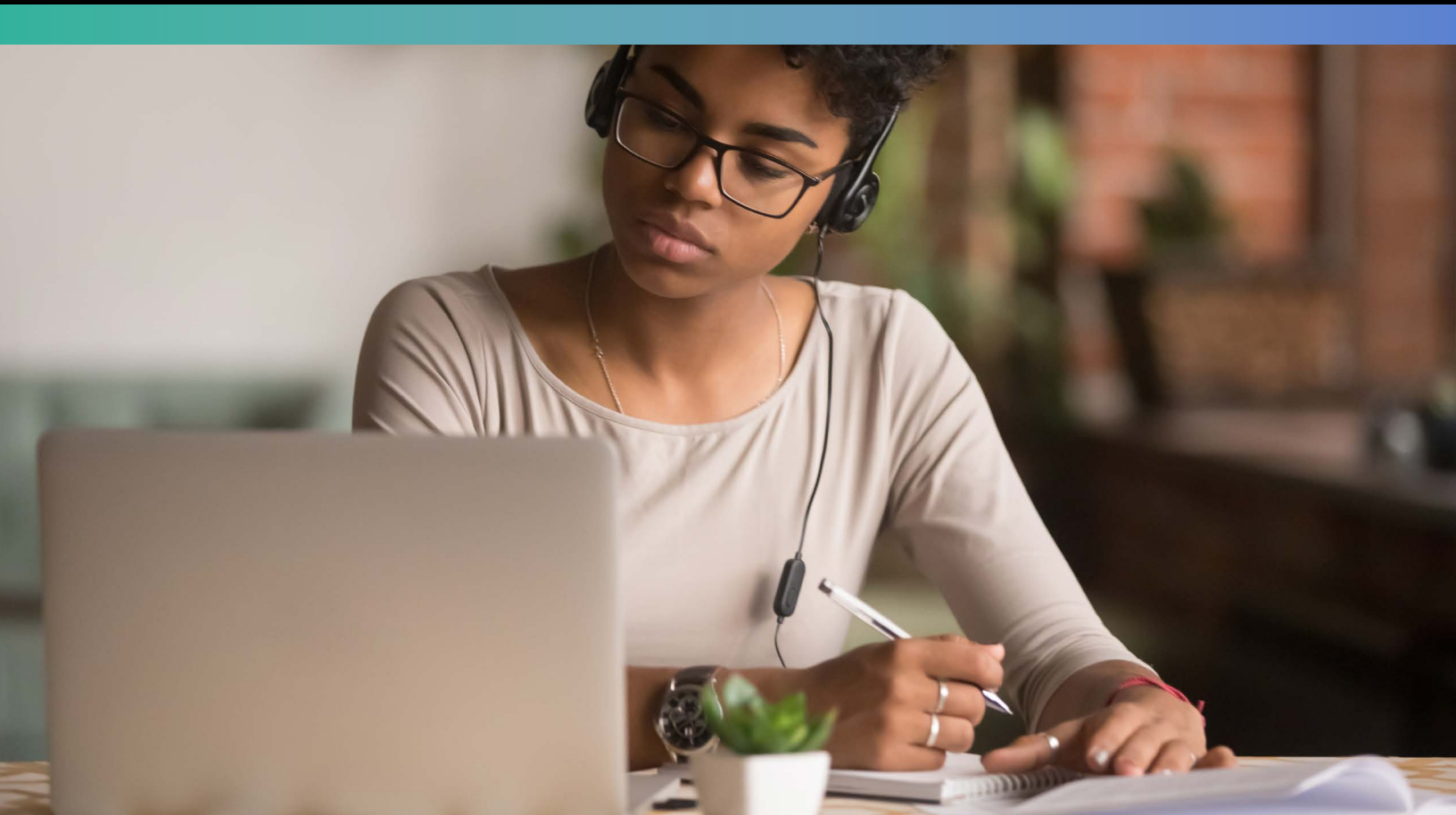


# A New Future for Data Storage in Higher Education & Research

Exploring storage and data requirements  
for education's tech leaders



## Technology leaders in the education sector have undergone two profound periods of change in recent years.

One is long-lasting, complex and ongoing. The exponential growth in data storage requirements has changed the game for IT departments. Technological advances, remote capabilities, and the acquisition and usage of new and emerging apps and tools as part of wider digital transformation initiatives are all playing a part in this nuanced strategic challenge.

The other is short-term and was unexpected – but is no less complex for it. The pandemic demanded fast action to enable education to continue in challenging circumstances. In many cases, this meant years of digital change crammed into months, and previously alternative teaching methods like remote and e-learning becoming suddenly very mainstream.

As ever in IT, change means challenge. And one of the most pressing concerns for IT leaders today is data management, including handling and storing data.

To explore and understand the role storage plays, Western Digital carried out an in-depth research program with IT leaders from universities and research institutes across North, Central and Eastern Europe.

Speaking exclusively with IT leaders who are exploring the flexibility, scalability and efficiencies of Software-Defined Storage – a storage architecture that decouples storage from hardware – we asked about the IT priorities for their respective institutions.

We also explored the challenges they face today, as well as the challenges they will likely face in the future.

### Our interviews covered:

- How they see data growing
- What kinds of data will grow
- How they plan to support that growth, including the use of on-premise and cloud storage

This report lays out their thinking, and details how leaders in this sector are responding to the myriad challenges and changes they're facing.



# Tech Typologies

The research indicates six potential 'personas' of IT leader when it comes to storage management. Importantly, any department might be made up of a mix of these people, and must work together collaboratively, regardless of the size of your institute and workplace culture.

## The Speed Demon



- They prioritize quick access because of the type and size of data one uses
- They work in a non-specialized institution
- The institution tends to share research data with others

## The Secret Keeper



- They manage and maintain highly sensitive data, like medical and patient research records, financial information and student records
- They're thinking about increasing use of secure cloud solutions because of the need to enable remote workers

## The Compliance Captive



- They work in a market or region where legislation mandates on-premise storage, and this isn't going to change any time soon

## The Utility Guardian



- They work in a larger, multi-faceted university
- While the institution is switching over to cloud storage, it still needs on-premise solutions for certain functions

## The Cloud Collaborator



- Their institution's reliance on data sharing means they prefer cloud use and adoption
- The university has an international scope, which affects their work by necessitating sharing relationships with global partners with different regulations governing data

## The Cloud Cruncher



- Their institution has specialized needs for cloud computation, meaning they favor cloud usage
- This means storage is heavily cloud-based, too

# Understanding Storage Priorities

According to the research, there's a necessary level of performance where storage is concerned, with many stating that getting storage right is a need to have, not a nice to have.

Indeed, the factors that tie storage to GDPR, data risk and legislation mean that storage is always a high priority element of every digital strategy. Primarily because effective storage solutions go some way to mitigating or even stopping user behavior that can compromise an institution's data. This is why users shouldn't just install their own storage solutions.

## Statements on storage

"It's a hygiene factor to a large extent."

Public university in London

"They [notice] if we have problems with speed or if we lose data, and things like that. But they're really not interested in everything [else]."

Research University in France

"It just works in the back. And, if you're an academic, just wanting to get on with that research [you] just want [it] available 24/7."

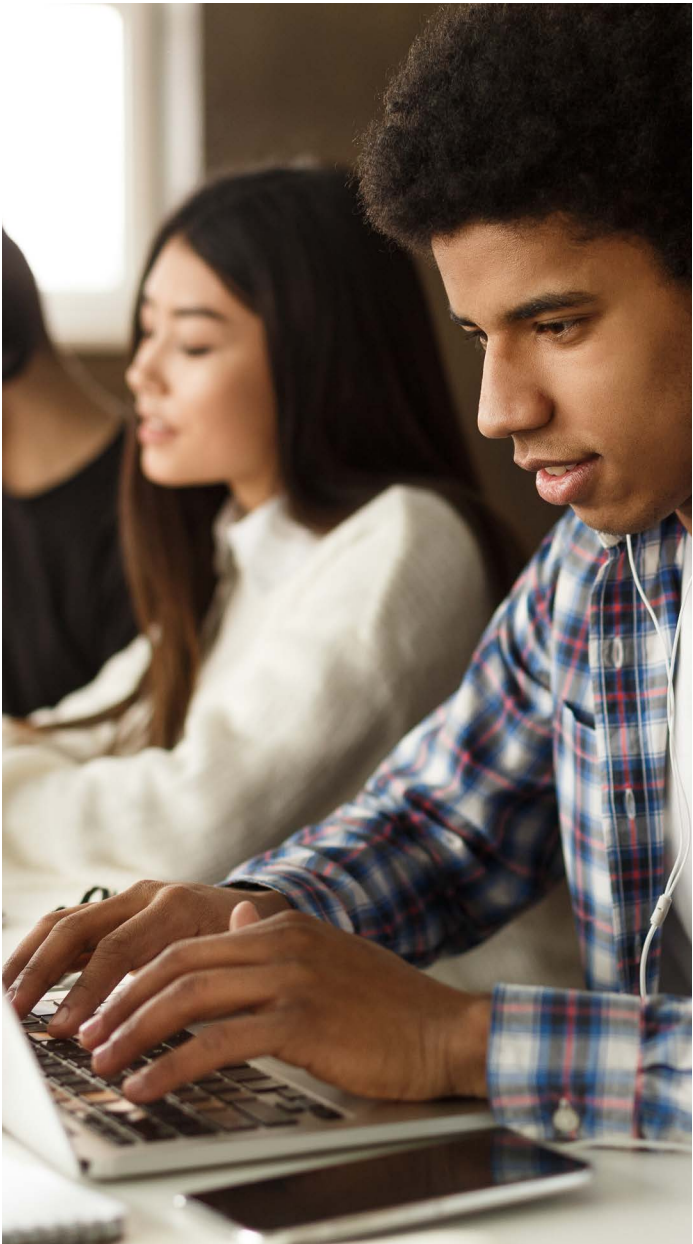
Public university in Scotland

## Focus on user behavior

"If it took too long [for us] to provide, let's say, a storage solution ... many researchers found ways, for their own solutions."

They used Dropbox accounts or stuff like that or installed in their own laptops."

Public research university in The Netherlands



The research shows that data storage needs in education are growing in complexity. And not just because of technological developments. On the one hand, everyone in an institution expects secure, effective storage. But they're not always prepared to play their part in making sure that happens.

For IT leaders in the sector, it means balancing various needs: today's necessities, tomorrow's priorities, and a sector that's evolving in the data it uses and how it uses it. This is where data governance comes in.

Exploring data governance

Most universities surveyed have some element of data governance in place. Policies vary in complexity, and frequently 'tier' data types according to sensitivity and value.

They also determine whether data can be stored in the cloud, or on-premise. It's also linked to GDPR, which is a notable concern for European universities.

GDPR sensitive	Low priority data
<ul style="list-style-type: none"><li>• Individual student data</li><li>• Operational data (financial data)</li><li>• Patient research data</li></ul>	<ul style="list-style-type: none"><li>• Historical data</li><li>• Data to be archived but not often used</li></ul>
High-speed data	Sharing data
<ul style="list-style-type: none"><li>• Research data that needs to be accessed without latency</li><li>• Potentially enormous individual files</li></ul>	<ul style="list-style-type: none"><li>• Research data that needs to be shared with partners, often geographically distant, in real-time</li></ul>

The pandemic and data storage

The early stages of the pandemic were largely reactive, due to the lack of 'coping' methods such as policies for long term remote working and data access in pre-existing IT strategies. This included data storage. And although things have settled, IT leaders may be dealing with the aftershock of this for some time – creating yet more complexity in their roles.

"We didn't have time even to think about that [strategy] because, everything was crashing down, we had to implement all [sorts] of resolutions for our problems."

Public research university in The Netherlands







## Education Data Attributes

A key part of the storage challenge education IT leaders face is determined by the types of data they're working with (e.g. smart video, video conferences and other media rich files). Naturally, this impacts the storage solutions IT leaders choose to work with, and the capabilities these technologies can provide in terms of security, sharing and compliance.

Beyond an IT leader's own data challenge, there is also a stakeholder challenge. End users like researchers have an interest in data storage systems, as do partner universities.

### Research Data Volume

"The volumes of research data, the size of even one file can sometimes be enormous."

Research Institute in Germany

### Organisational Diversity

"Universities can be different because they've got so many functions – if you think about it, they have to operate a hotel – I'm speaking about the student lodging."

Public university in Scotland

### Committee Decision-Making

"I think that decision-making is more decentralised in education vs a commercial entity."

Research Institute in Sweden

### Collaboration Culture

"Data is more likely to need to be shared, with other research universities vs a business that mostly tries to protect and keep its data secret to maintain competitive advantage."

Public university in London

Data sharing is a key requirement in academia and can drive the requirements in choosing IT solutions.

So, it's vital that IT leaders are able to select storage solutions that address their requirements today, yet ones that are flexible enough to evolve as their work and collaborations do as well.

## Education, Data and the Cloud

Given the data attributes education IT leaders work with, and their storage priorities, it's no surprise that cloud usage is mixed.

Right now, under a third of data in total is stored in the cloud – less sometimes for research institutes. For the Research Institute in Germany, this amounted to around 15 times more data stored on-premise as compared to the cloud.

And while some are looking to move the dial (going from two thirds on-premise storage to having two thirds in the cloud, in one case), both scale and the sensitivity of data stored remain pain points that can hamper greater cloud adoption.

Naturally, this varies between the types of institutes and the data attributes. For example, the research found that cloud use is more heavily favored in cases where there is much data sharing, and in smaller universities.

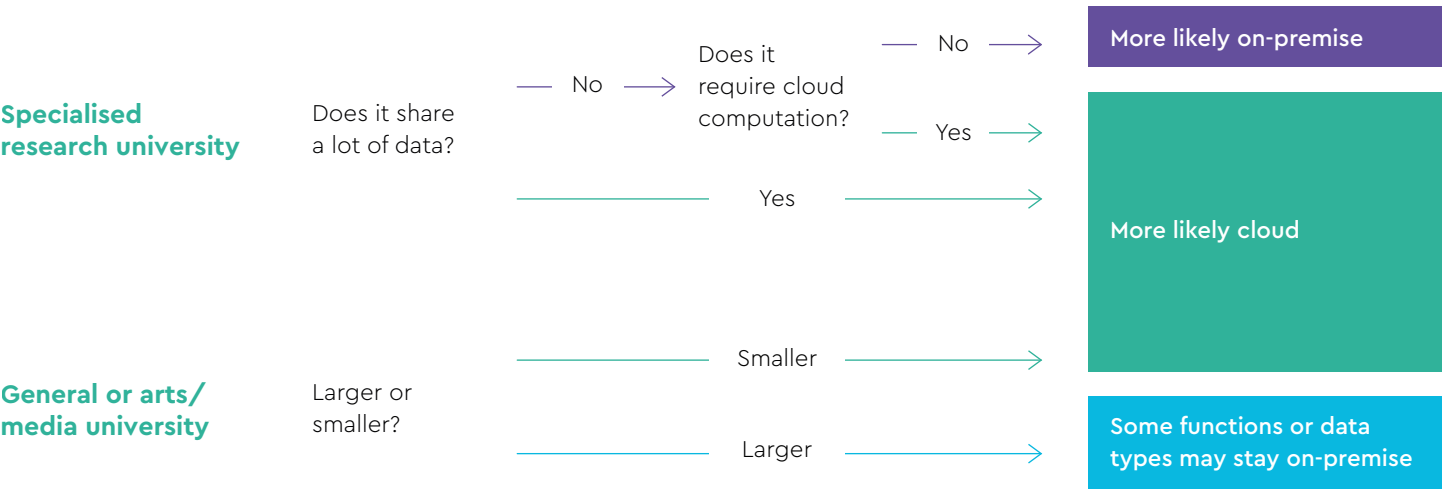
### Cloud cover

"We need very large chunks of storage. It should basically be on-premise and directly interface with whatever's processing the data on them as cluster or various other data, crunchy things of that possibly high throughput, computing, and then the rest is just our cloud storage issues of the things that people use in their daily work, which is much smaller."

Research Institute in Germany

"In terms of the day-to-day operational data use on campus, we're still seeing that as mostly on-premise for the foreseeable future."

Public university in Scotland



Despite the mixed picture today, what is clear is that cloud is generally viewed as the direction of travel among most respondents. This then impacts storage, as well as the decisions around it that IT leaders are making today.

Every IT leader has to demonstrate value and be an enabler of the future priorities and plans of their employer.

So, as universities and other educational institutes move towards digital ways of working, partner institution collaboration and teaching that increasingly relies on cloud, IT leaders must back this up, ensuring they're working with capable cloud storage partners who can offer high levels of security, as well as smooth workflows for users.





## The cloud future

"Cloud is going to continue to grow in importance – the only things stopping it now is, one, the cost, and two, the performance characteristics."

Public university in London

"For the future, the location of the storage will not be so important because I think that new architectures... will be the future in which a university focuses on the application, relies on third parties for how the data [is] managed [and] that on-premise is close to its end."

Public university in southern Italy



# The Future of Data Storage in Education

The research shines a light on a complicated world for IT leaders in education. Over the past year or so, their role as change enablers has been put under increased focus due to the e-learning boom during the pandemic. Meanwhile, the transformation efforts they've been working on for five, or even ten years, continue apace. Threats to data security evolve, and the data needs of their institutions are constantly changing.

So how does this affect storage? Based on the research, we see four key factors to be aware of.

- Broad order of importance
- 1

Remote working / learning heavily reliant on video storage
- 2

Some research universities expect data sizes to grow
- 3

Research requiring quicker retrieval times
- 4

European privacy law

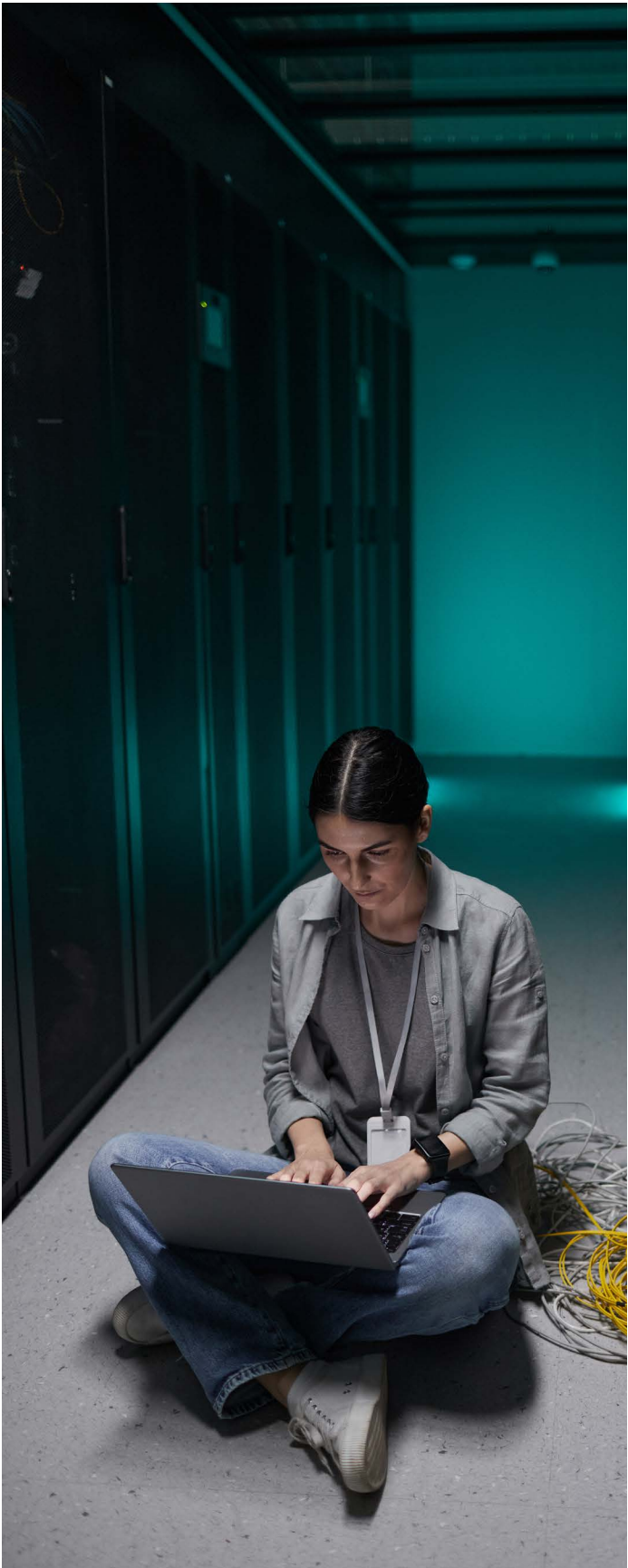
## Thinking about the future of storage

"We are expecting [a move away from] traditional on-premise teaching so that we will have some hybrid teaching where at least a half of the class is not [physically] attending." –

Private, non-profit university in Germany

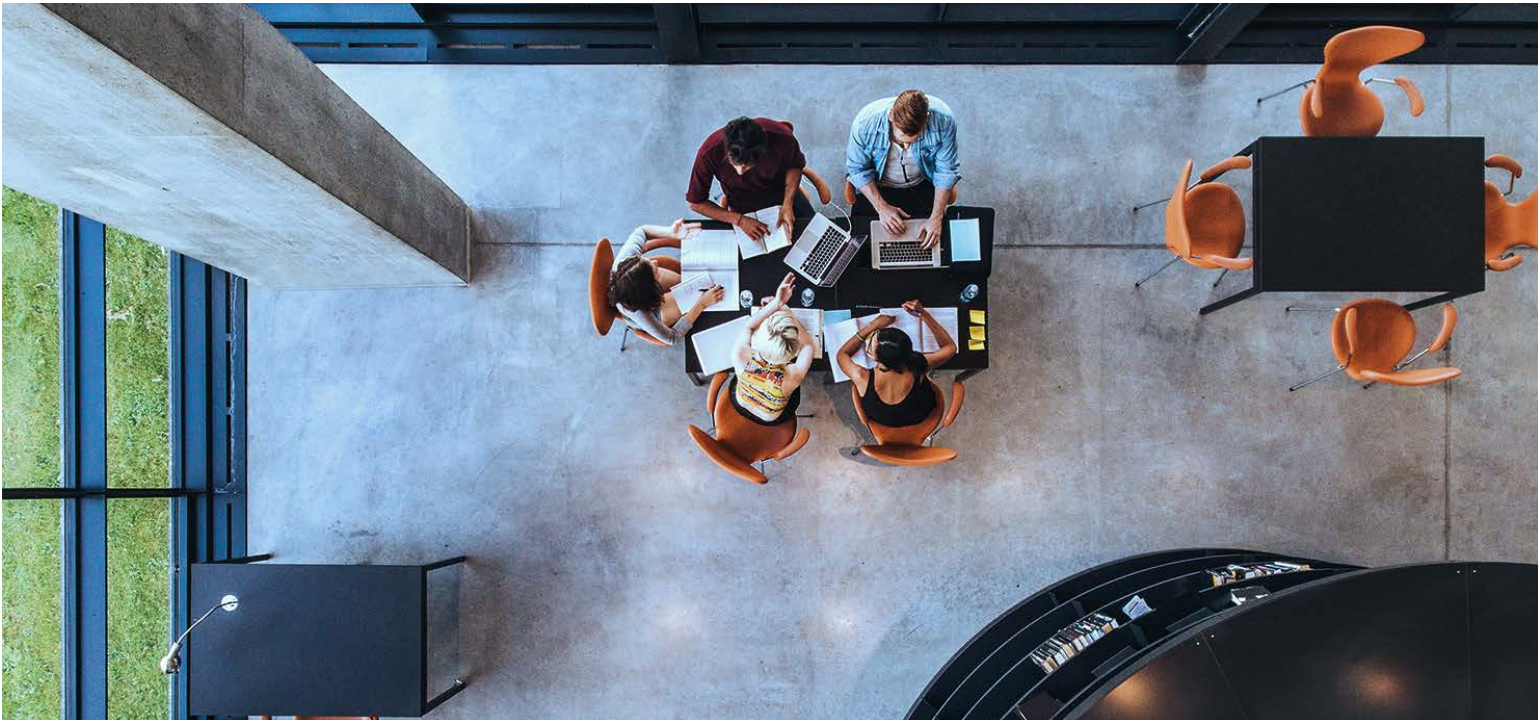
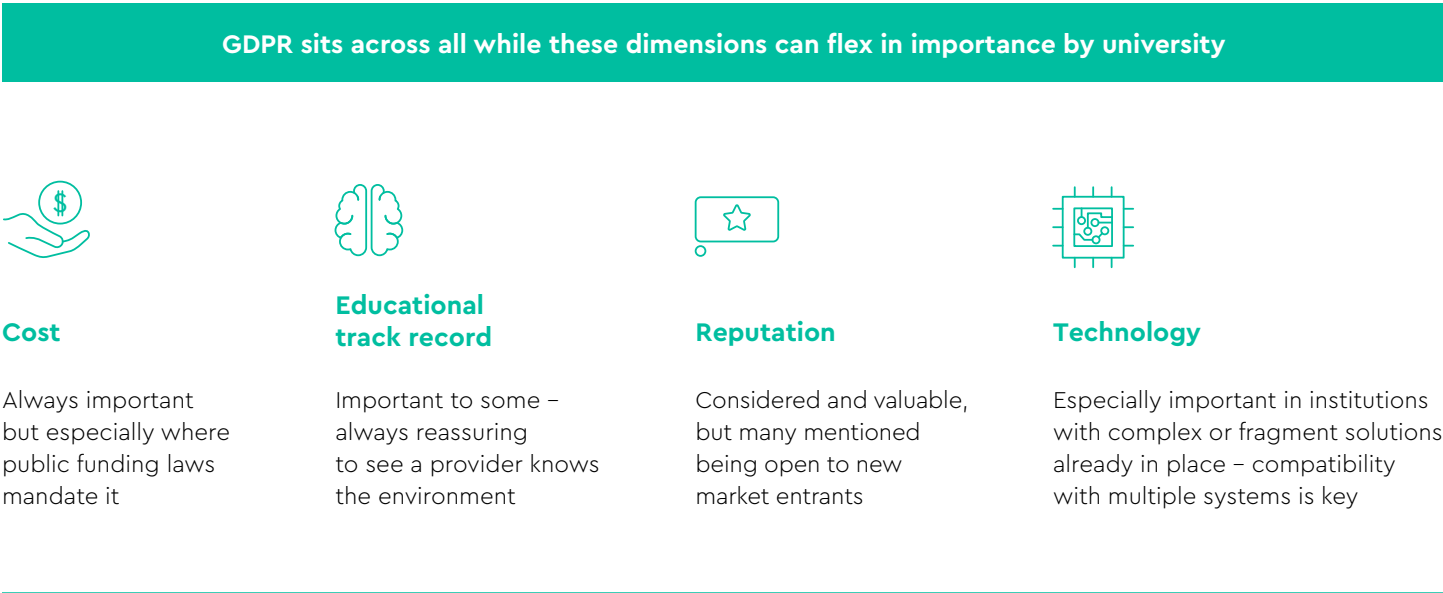
"The real challenge is for storage is simply the growth rate of research data."

Public research university in the north of England



What this means is a new role for data storage partners in education, as they work with IT leaders to help them manage their challenges, embrace the increase in remote working, and ensure that the pace of change in education doesn't also create security risks.

Today, leaders are looking for either singular providers to reduce cost and admin burdens, or multiple providers, chosen on a 'best fit' basis to decentralize processes. Whatever the case, there are certain qualities that every education storage partner must have (as the graphic below demonstrates).





The expansive and wide-ranging digital evolutions in education show that IT's role in the sector will become only more important over the coming years. As education continues to consider digital ways of delivering services and interacts in new ways with partners across borders, tech leaders will be enablers of vital work like never before.

A huge part of that is data storage. And the decisions being made around providers and solutions today will have ramifications well into the future. The research clearly shows that this is top of mind for many IT leaders, and while they have some idea of how technologies will evolve, their future challenges, and their own roles, questions remain.

Above all, this research among education IT leaders has shown that the right storage provider will be a vital partner for institutions that are serious about keeping their data secure, while continuing to transform and modernize IT.



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