The Time is **Now**

Mainframe Modernization 2021

Research Whitepaper

Contents

Introduction

Findings of the Mainframe Modernization survey in 2019 and 2018 revealed that mainframe applications are still crucial to large organizations, even mission critical for some.

Modernization and migration were lacking, meaning that the mainframe applications were continuing to show signs of age.

The question is, how has this changed two years later?

In order to remain competitive, have organizations started to increase the pace of modernization within the IT department, and modernize their mainframe and legacy applications?

As time goes on, issues, and concerns they have with their mainframe applications are only going to become more apparent – what other technologies and solutions are IT decision makers considering, to ease the burden on these applications?

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Key
Findings

96%

Mainframe applications are still extremely important or critical to business operations and services, with **96%** saying so vs 99% in 2019 and 2018.

87% agree quicker applications changes can improve time to market.

87%

88%

88% say they are concerned about the potential skills gap in their mainframe teams

88% agree that their mainframe specialists remain important, even as their organization modernizes. 96% are interested in further training for their mainframe workforce in order to manage and maintain mainframe applications in cloud/open system environments

88%

71%

71% of organizations have been through or are currently going through an IT modernization process, compared to 64% in 2019 and 61% in 2018.

The cloud now has the highest proportion of IT modernization development occurring (**47%** in 2021 vs 32% in 2019 and 27% in 2018)

82%

82% say they would use public and/or hybrid cloud deployment models if they were to move their organization's applications off the mainframe

40% believe one of the main advantages to application development off the mainframe is freedom of choice over which tools to use

Research
Methodology

LzLabs commissioned independent technology market research specialist Vanson Bourne to take the pulse of organizations' attitudes towards mainframes.

2021 Research

A total of 650 senior IT decision makers, whose organization has a mainframe, were interviewed in August and September 2021 across the UK, France, DACH (Germany, Austria, and Switzerland), US, Canada, Italy, Spain, and the Nordics (Norway, Sweden, Denmark, and Finland).

The respondents were from private and public sector organizations with at least 250 employees.

Interviews were conducted online using a rigorous multi-level screening process to ensure that only suitable candidates were given the opportunity to participate.

Where applicable, historical comparisons have been made to data from the "Mainframe Modernization Survey 2019" and "Mainframe Modernization Survey 2018".

2019 Historical Data

For 2019, a total of 650 senior IT decision makers, whose organization has a mainframe, were interviewed in July and August 2019 across the UK, France, DACH (Germany, Austria, and Switzerland), US and Canada, Italy, Spain, and the Nordics (Norway, Sweden, Denmark, and Finland).

The respondents were from private and public sector organizations with at least 100 employees.

2018 Historical Data

For 2018, a total of 500 senior IT decision makers, whose organization has a mainframe, were interviewed in July and August 2018 across the UK, France, DACH (Germany, Austria, and Switzerland), US and Canada.

The respondents were from private and public sector organizations with at least 100 employees.

Foreword

by Dale Vecchio
Head of Cloud Alliances, LzLabs.

Constant innovation, whether radical or incremental, will be the reality for most organizations over the next decade.

While the global pandemic may have accelerated the need for certain types of innovation, a path was set long before this problem beset the world. Changing demographics of consumers, whether they are buying products, interacting with their banks or investing money, has been impacting the expectations of customer services across any industry or government sector.

Much of the traditional behaviour of consumers has been instantiated in the computer applications of the last 40-50 years. The features of those systems reflected those behaviours.

But as the inevitable differences appear from changing generations, the computer systems that reflect these expectations must evolve.

Survey after survey has shown the importance of the applications that run on legacy platforms.
This year's iteration is no different – 96% see their mainframe applications as at least important. That has never been a debate.
Whether those applications need to stay on the mainframe platform, in the face of evolving customer expectations, is the real question.

This mainframe modernization survey, the third over the last four years, continues to show the market dynamics that are impacting every company running a legacy platform.

It's not really about the technology underlying this historic computing platform. It's about the ability of an organization to respond to the demands of constant innovation!

The speed with which applications can be modified is a hallmark of modern computing environments, particularly the cloud.

87% of survey respondents agree quicker applications changes can improve time to market, and the cloud now shows the highest proportion of IT modernization development (47%), the highest in the four years we've conducted this survey with Vanson Bourne.

Furthermore, respondents overwhelmingly (82%) believe they would use public and/or hybrid cloud deployment models if they choose to move off the mainframe.
Not only is time-to-market critical, but the freedom to choose from a wide variety of tools to use is reported by 40% of respondents to be a key benefit of moving application development off the mainframe.

The continued concerns over the mainframe platform are pushing more and more organizations to act now. Procrastination is no longer an option. Many modernization options exist, but management must lead the IT organization forward to the world of cloud computing.

No one needs to be an apologist for the mainframe decisions of the past. They only need to recognize the future demands a shift to new environments supported by massive financial investment and a growing and vibrant technical workforce.

Leveraging the value of these legacy applications, while moving them to the cloud is the strength of LzLabs Software Define Mainframe® (SDM).
Regardless of your approach, this survey's results must drive organizations to action.

Section 1

Mainframe applications remain crucial, but organizations seek added value.

For large organizations across the world, mainframe applications remain hugely important.

This is highlighted by 96% of respondents who consider that mainframe applications remain at least important to business operations and services, compared to 99% in 2019 and 2018.

Of those, nearly three in ten (28%) suggest that mainframes are mission/highly critical, a figure which remains consistent over time (29% in 2018).

Altogether, even with a slight drop in importance in 2021, organizations are still hugely dependent on their mainframes and the applications embedded within.

While mainframe technology is crucial in all key sectors, all decision makers in the financial services sector say mainframe applications are at least important to their organization (100%).

Going a step further, organizations in this sector are most likely to report mainframe applications as mission/highly critical (38%).

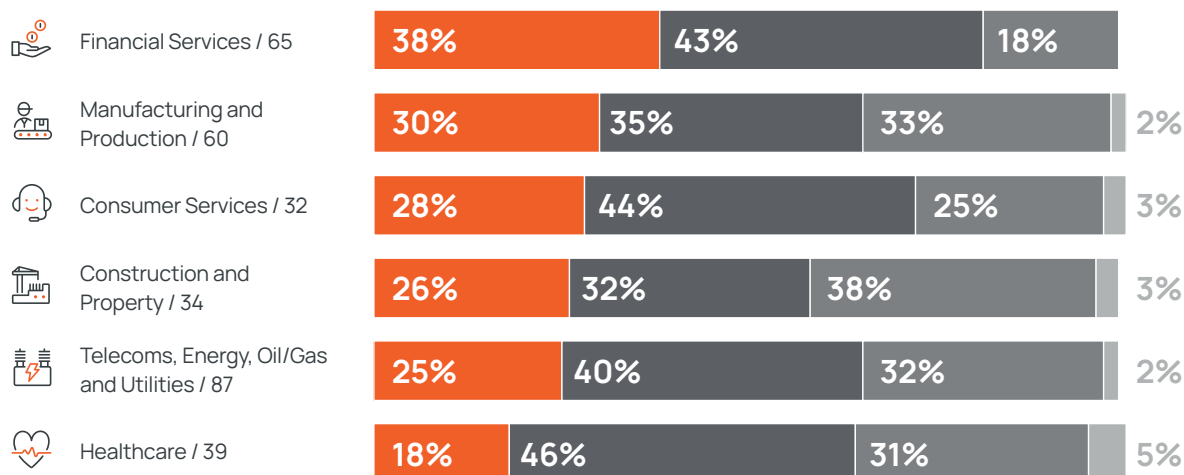Those in healthcare is one of the least likely (18%).

1.1 Criticality of mainframe applications

650 SURVEY TOTAL

28% Mission / Highly Critical

39% Critical

30% Important

4% Non-critical

96% Say mainframe applications **are important** to their organization.
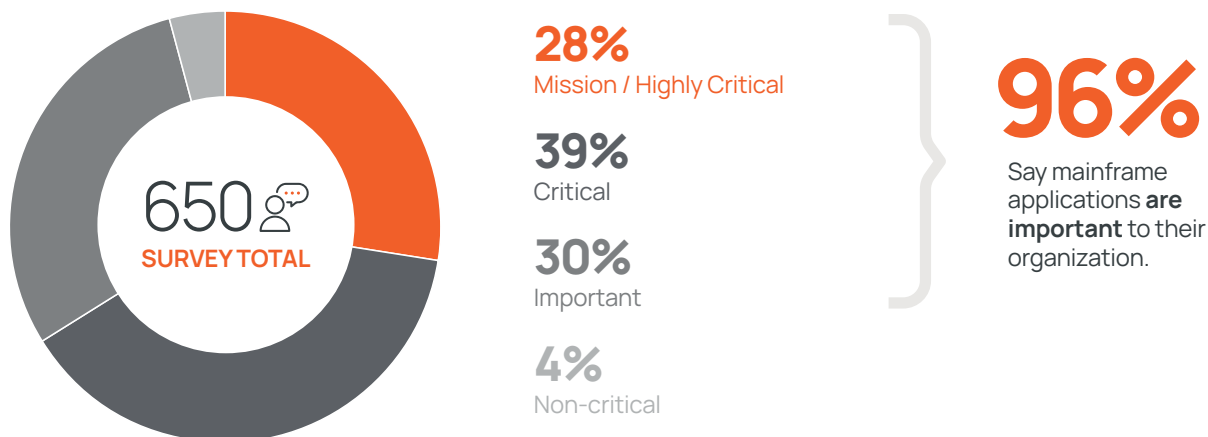
KEY SECTORS /

● Mission/Highly Critical ● Critical ● Important ● Non-critical

Sector	Mission/Highly Critical	Critical	Important	Non-critical
Financial Services / 65	38%	43%	18%	
Manufacturing and Production / 60	30%	35%	33%	2%
Consumer Services / 32	28%	44%	25%	3%
Construction and Property / 34	26%	32%	38%	3%
Telecoms, Energy, Oil/Gas and Utilities / 87	25%	40%	32%	2%
Healthcare / 39	18%	46%	31%	5%

Figure 1: How critical are your organization's mainframe applications to your business operations and services?

Another indication of reliance on the mainframe is the age of the mainframe applications. Senior IT decision makers reveal that the oldest mainframe application still in use is 40 years old.

Thus, it would appear that organizations are comfortable with what they know, especially with regards to technology that has served them well over years, if not decades.

However, decision makers keep one eye on the future. Indeed, a strong majority (87%) agree that quicker mainframe application changes would improve their time to market for many products.

The amount stating this is high across all key sectors, but particularly so in telecoms, energy, oil and gas and utilities (92%) and consumer services (91%).

While reliance on the mainframe and applications remains strong, organizations are keen to derive as much value from their mainframes as possible – not surprising given the importance placed upon them. In order to maximise this value, organizations will undoubtedly look at mainframe modernization.

Organizations who have been, are currently going through, or plan to go through a modernization process cite faster application development and therefore, time to market (47%) as the most common reason for modernizing their IT function, signifying that modernization is a crucial way of ensuring the

mainframe can support the business in the best way possible.

The vast majority (92%) of organizations have started or plan to reduce their dependency on the mainframe, a figure which has remained consistent over time (92% in 2019, 94% in 2018). Of that figure, nearly two thirds (65%) have already started the process while 27% say they still plan to do so.

A small minority (7%) say they their organization has no plans to reduce their dependency.
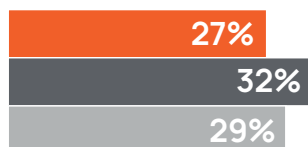
1.2 Reducing dependency on the mainframe

We...

Figure 2: % of respondents whose organization has started, still plans to, or has no plans to reduce dependency.

Out of the key sectors, those in construction and property are most likely to have started reducing their dependency on the mainframe (79%). At the other end of the spectrum, those in healthcare (54%), financial services (55%) and manufacturing and production (57%) are the least likely.

Furthermore, respondents believe they should have started reducing their dependency on the mainframe platform on average three years ago, a figure which has stayed the same since 2018.

As seen, there is motivation to add value to the mainframe, yet the size of the challenge to reduce dependency on the mainframe can perhaps lead to some organizations not knowing where to start.

What remains unavoidably clear however, is that the importance of mainframe applications has not diminished over time.

Despite this ongoing reliance, the mainframe environment contains barriers that will need to be overcome to support modernization and reduce dependency.

Section 2

**Barriers to innovation and knowledge transfer challenges are key concerns over current environments**

Senior IT decision makers are apprehensive about their current mainframe environment - highlighted by the fact 93% express concerns overall.

The top three biggest concerns are the business losing competitive advantage because of IT failure to keep pace with business demands (58%), loss of necessary skills to operate on the platform (57%) and loss of necessary skills to support the applications (56%).

Those in EMEA appear most concerned about the loss of skills to operate the platform (60%), comparative to those in US & Canada (50%).

Organizations that are in US & Canada are most concerned about the inability to move away from legacy systems due to a lack of application knowledge (59%).

2.1 Concerns over current mainframe environment

1.

Business losing competitive advantage because of IT **failure to keep pace with business demands**.

58%
58%
57%

2.

Loss of necessary skills to **operate the platform**.

57%
50%
60%

3.

Loss of necessary skills to **support the applications**.

56%
56%
57%

● Survey Total
650

● US & Canada
200

● EMEA
450
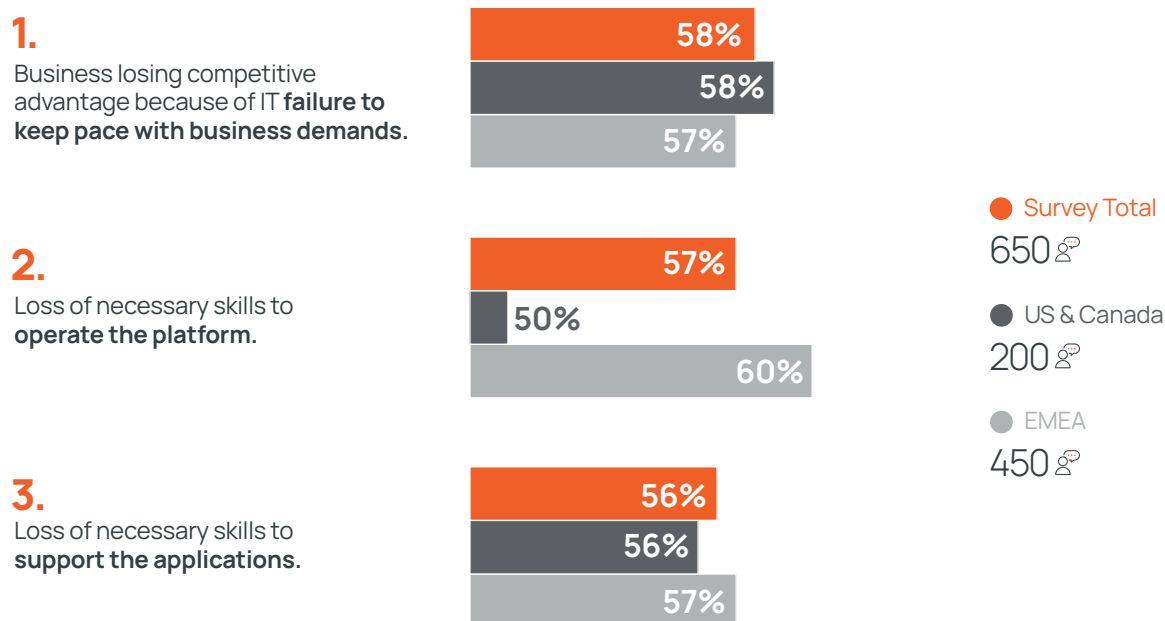
Figure 3: What are your three biggest concerns around your organization's existing mainframe environment specifically?

Despite the regional differences, there are clear underlying themes emerging here as crucial weaknesses in the current mainframe environment – a lack of innovation and a loss of skills/knowledge among mainframe staff.

2.2 A lack of innovation

The current status quo in mainframe platform is a major obstacle to innovation. As such, more than two thirds (67%) of decision makers believe their organization's mainframe holds them back in their innovation journey.

This figure rises to 76% in the US & Canada, compared to 62% in the EMEA – highlighting in particular how legacy technology acts as a restrictive force for large organizations in North America.

Given this finding, it is therefore no surprise that the vast majority (90%) believe it is difficult to change mainframe applications when supporting innovation objectives and more than four-fifths (84%) report it is difficult to build, develop and test applications on the mainframe quickly.
Examples of innovation initiatives being prevented

due to legacy technology include: "**Data analytics and real-time content management**", "**Integration of all business applications in the cloud**", "**Web services and cloud computing**".

Using legacy technology is clearly a major stumbling block when it comes to innovation – it's easy to understand why decision makers report they're apprehensive that their organization may be losing a competitive advantage.

Given this, it's pleasing to see organizations are focused on reducing their dependency on the mainframe as reported above. However, improvements will still be needed for them to be more flexible and inventive.

2.3 Knowledge transfer challenges

Organizations predict major staffing changes within their mainframe workforce. Senior decision makers foresee this to be fast approaching, with changes happening within the next two years.
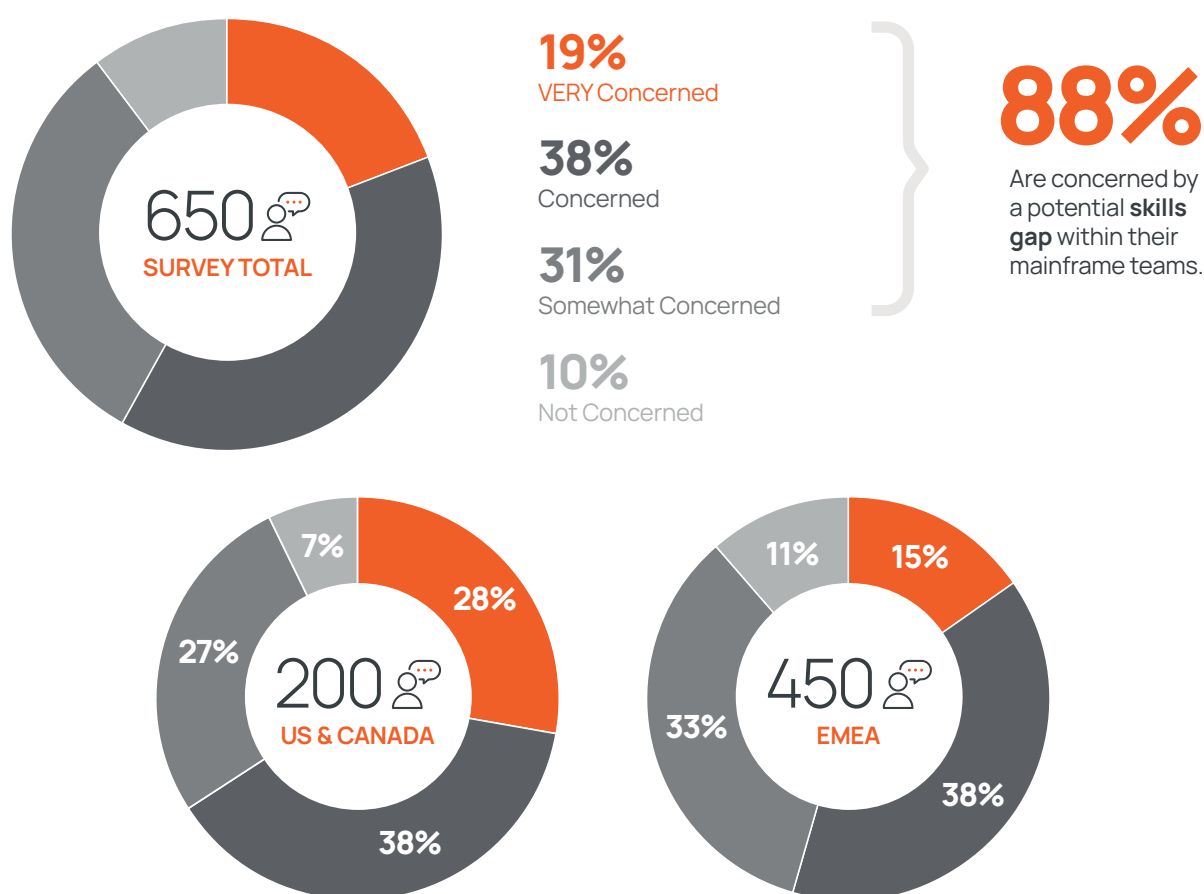
For around one in ten (11%), the changes have already started to have an impact.

This change in workforce dynamic will happen as quickly in both the US & Canada as across EMEA, with significant impact predicted to be in two years' time. The shift in workforce will no doubt require a huge amount of planning for decision makers to ensure knowledge is not lost.

Understandably, these staffing changes and the potential knowledge loss between experienced and junior staff are leading to a large amount of anxiety, and it is not surprising that the vast majority (88%) of respondents say they are concerned about the potential skills gap in their mainframe teams.

This level of concern appears particularly high in the US & Canada, where it rises to 92%, compared to EMEA (87%), indicating decision makers here are especially aware of the need to ensure knowledge is transferred between mainframe staff.

2.4 Level of concern with skills gap

650 SURVEY TOTAL

19% VERY Concerned

38% Concerned

31% Somewhat Concerned

10% Not Concerned

88% Are concerned by a potential **skills gap** within their mainframe teams.

200 US & CANADA — 28%, 38%, 27%, 7%
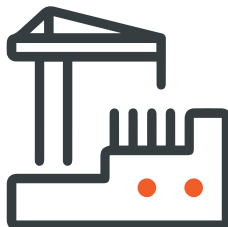
450 EMEA — 15%, 38%, 33%, 11%

Figure 4: How concerned are you by the potential skills gap between the experienced and junior members within your organization's mainframe teams?

Those from telecoms, energy, oil/gas and utilities appear to have the most concern, with 95% saying so, followed by those construction and property (94%) and consumer services (91%).
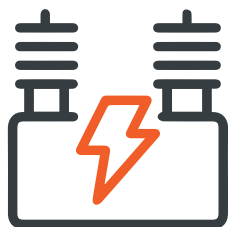
95%   **94%**   **91%**

This concern perhaps explains why over half (56%) agree their organization has not properly implemented a succession plan for younger employees to absorb the knowledge required to maintain legacy mainframe architectures.

The apprehension is even further magnified when considering how mainframe specialists are currently distributed in their wider teams.

Seven in ten (70%) say they have staff whose role is to work solely on the mainframe, while only just over a

quarter (26%) report their mainframe specialists' roles are mixed. US & Canada report the highest level of staff who solely work on the main frame (82%) compared to EMEA (65%), which perhaps explains the high level of concern decision makers have over the potential knowledge gap.

The predicted upcoming staffing changes will be most felt by organizations with the greatest divide in skillset. The question remains what these organizations can do to minimize the disruption caused, especially within the context of modernization.

2.5 The mainframe workforce and the future

When looking to the future, as discussed, decision makers have concerns over the amount of technical knowledge that may be lost between more experienced and junior employees that work on the mainframe. However, there is a clear willingness among senior decision makers to look for solutions to the upcoming issues within their mainframe workforce team.

One of the key elements to resolve this challenge is through training.

In fact, there are more organizations in 2021 delivering IT training on the mainframe monthly and quarterly than in 2018 (17% in 2021 monthly vs 13% in 2018, 42% in 2021 quarterly vs 40% in 2018).

These improvements relating to frequency are also mirrored in the proportion of IT training which relates to mainframes, which has risen from both 2018 and 2019 (41% in 2021, 32% in 2019 and 36% in 2018).

This steady increase is likely as a result of organizations becoming more aware of knowledge gaps within their mainframe teams.

As organizations modernize, the role of mainframes and applications may change within an organization. This will likely have a knock-on effect on mainframe employees, especially those who solely work on the mainframe.

However, decision makers are planning for the future and it's clear their mainframe employees will be central to these plans. Indeed, 88% agree that the specialist knowledge of mainframe employees will remain very important.

This demonstrates how pivotal mainframe employees will be as organizations transition through the modernization process.

With the context of modernization, decision makers are keen to explore avenues to ensure the transition to new environments is as smooth as possible.

Almost all (96%) report their organization would be interested in further training for the mainframe workforce team in order to manage and maintain mainframe applications in cloud/open system environments. This interest in further training is widespread in both the US/Canada and EMEA (both 96%).

Interest in further training is also high across all key sectors, especially so in consumer services (100%), and telecoms, energy, oil/gas and utilities (98%).

This shows organizations from all regions and sectors will look to use their mainframe specialists to help them successfully transition to more modern environments.

However, with only 2% already providing this further training, it's clear that organizations do need support to

ensure key mainframe skills and knowledge aren't lost.

As discussed, although mainframe applications remain critical to large organizations and their business operations, senior IT decision makers are looking to maximize value in their mainframe infrastructure.

Key concerns over the current environment such as a lack of innovation and a loss of skills/knowledge are central to the need to modernize. Organizations are looking to the future, with mainframe specialists playing a crucial role.

How are IT departments modernizing as a whole, and what solutions are decision makers looking at to replace legacy architecture?

Section 3

IT modernization gathers pace, with cloud deployment increasing in importance

IT Modernization

IT modernization is gathering pace, albeit slowly.

More organizations have been through or are going through an IT modernization process compared to three years ago (71% in 2021 vs 61% in 2018) the amount who have specifically completed the process has risen from 21% in 2018 to 26% in 2021.

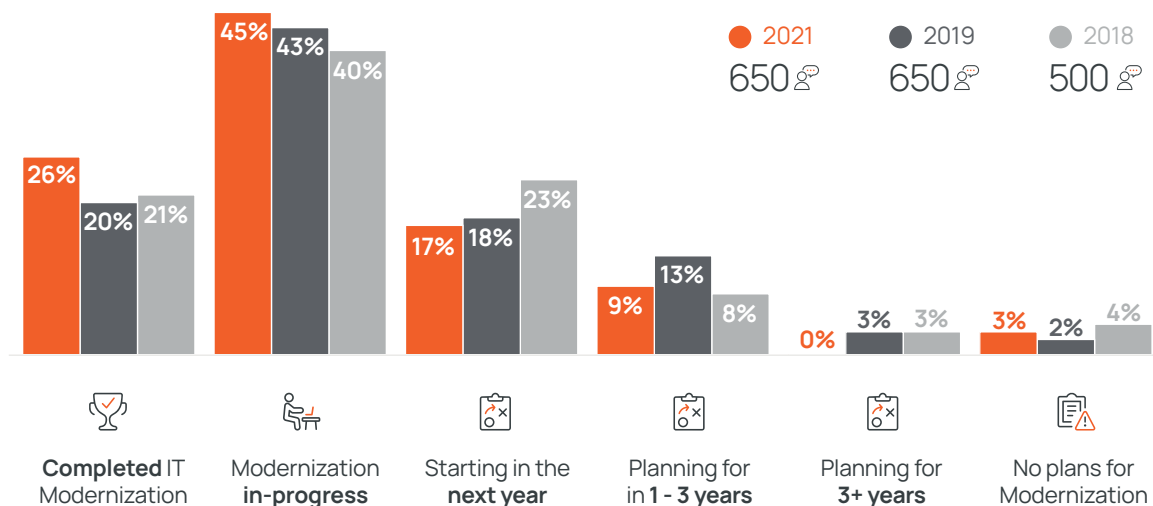Furthermore, there has been a reduction in the amount who

report they have not yet started but plan to modernize within the next three years (25% in 2021 vs 34% in 2018).

Concerningly however, there are still a minority of organizations who have no plans to modernize (3% in 2021 vs 4% in 2018).

It's likely that the Covid-19 pandemic is somewhat behind this increase in IT modernization, with a swift transition to a remote workforce increasing the pressure to accelerate modernization efforts.

3.1 Level of IT modernization

2021 — 650 👥   2019 — 650 👥   2018 — 500 👥

Completed IT Modernization	Modernization in-progress	Starting in the next year	Planning for in 1 - 3 years	Planning for 3+ years	No plans for Modernization
26%	45%	17%	9%	0%	3%
20%	43%	18%	13%	3%	2%
21%	40%	23%	8%	3%	4%

Figure 5: Is your organization currently going through or are there plans to go through an IT modernization process?

The US & Canada are most likely to report the most progress with IT modernization, with 77% having completed or going through the process, compared to their EMEA counterparts (69%).

This may be related to their higher levels of concern about the knowledge gap in their workforce, indicating their plans are more advanced to negate any impacts on their organization.

In terms of key sectors, construction and property has the highest number of organizations who have been through or are going through an IT modernization process (79%), closely followed by consumer services, financial services and manufacturing and production (all 78%).

Organizations who are currently going through or plan to go through a modernization process believe it will take 3 years on average to complete (this average is the same as 2019 and 2018).

Clearly, it is evolution rather than revolution. Although modernization takes it's time for most, progress is being made.
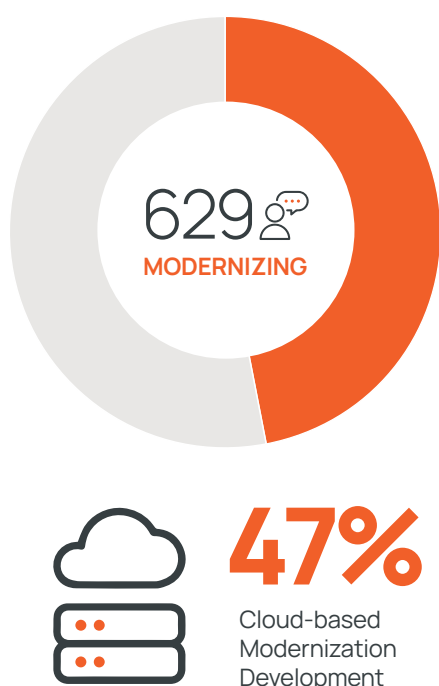
3.2 Alternatives to mainframe legacy platform

The platforms organizations will use to host IT modernization has seen a dramatic shift.

Out of those who are currently going through, plan to go through or have already been through an IT modernization process, the cloud (either public or hybrid) has the highest proportion of IT modernization taking place on it on average (47% in 2021, 32% in 2019, 27% in 2018) – an increase of 20% in 3 years.

The standard operating system has seen a substantial fall in the last three years (21% in 2021, 32% in 2019, 33% in 2018), indicating organizations are looking to other solutions for the future.

Manufacturing and production and healthcare (both 49%) are the key sectors which report the highest proportion of IT modernization likely to take place in the cloud.

3.3 Proportion of IT modernization development taking place on the cloud

629
MODERNIZING

47%
Cloud-based Modernization Development

KEY SECTORS /

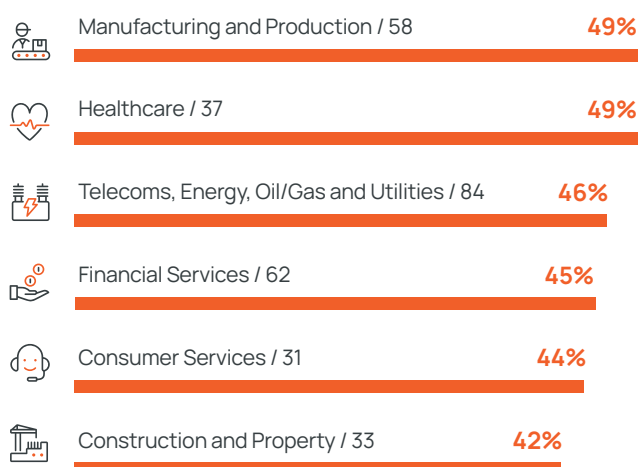|		
Manufacturing and Production / 58		**49%**
Healthcare / 37		**49%**
Telecoms, Energy, Oil/Gas and Utilities / 84		**46%**
Financial Services / 62		**45%**
Consumer Services / 31		**44%**
Construction and Property / 33		**42%**

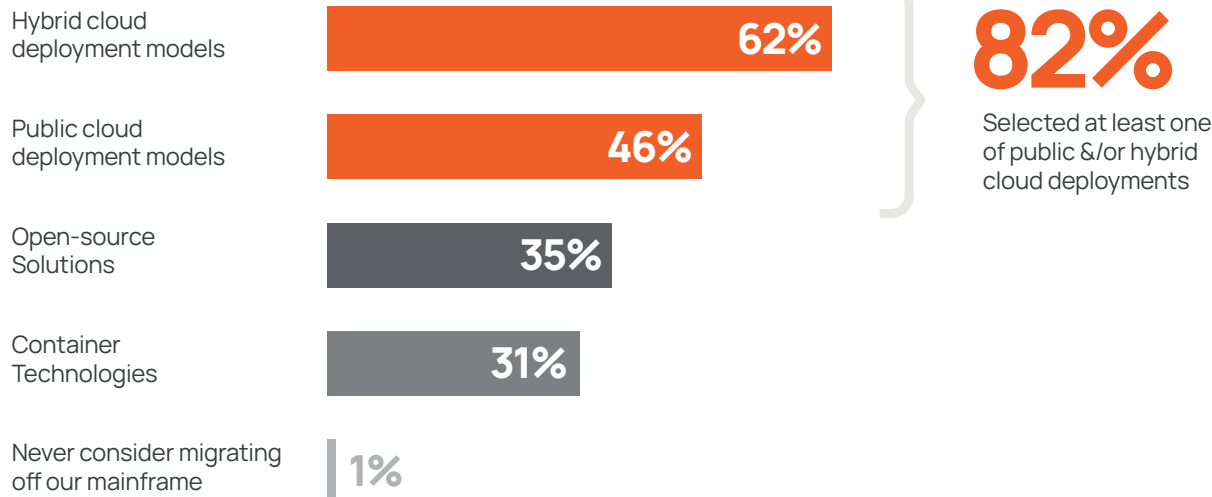**Figure 6:** The proportion of IT modernization development that is taking place on the cloud

As with IT modernization, organizations are keen to reduce their organization's dependency on the mainframe, with many either having started the process or planning to do so, as referenced earlier.

The overwhelming majority report they would consider migrating their applications away from the mainframe completely (98%).

When considering technologies, decision makers note that they would use the cloud the most after migration, with over four fifths (82%) saying they would consider public and/or hybrid cloud deployment models.

A further 35% report they would focus on open-source solutions, followed by container technologies (31%).

3.4 Technologies considered away from the mainframe

Hybrid cloud deployment models — **62%**

Public cloud deployment models — **46%**

Open-source Solutions — **35%**

Container Technologies — **31%**

Never consider migrating off our mainframe — **1%**

82%
Selected at least one of public &/or hybrid cloud deployments

Figure 7: If your organization were to migrate its existing mainframe applications off the mainframe, which technologies would you consider using?

Organizations in consumer services are the most likely the report the cloud as the technology they would consider using (94%), compared to those in financial services (77%).

These results show a clear appetite among large organizations to use the cloud for mainframe applications, with this being further supplemented by 89% who agree that new applications and systems should be built with cloud deployment and agile development and testing in mind.

Besides the cloud, organizations are also considering other technologies as playing a role in their future.

Almost all decision makers (97%) note open-source software will play at least some role in their organization's future IT initiatives, a figure which hasn't changed much since 2018 (96% in 2019 and 96% in 2018). A third in 2021 (33%) report open-source will be their primary approach, while less than a half (44%) report it will be their secondary approach.

Considering the results, it's likely that open-source will feature within their infrastructure in the future.

Organizations also continue to plan to leverage containers as a means for testing their applications, with 94% reporting they either have or plan to have an application development environment with containers.

The number who say they already have such an environment has substantially increased since 2019 (64% compared to 51%), meaning they are already better able to improve the environment they are working within.

The cloud, however, remains the most popular.

When it comes the ideal future IT state, respondents are most likely to rank cloud deployment models in their top three characteristics, with over two-thirds (68%) doing so, although this has reduced from 2019 (80%).

Other characteristics which also rank highly include legacy code re-written into modern formats (47%) and packaged software (46%). Dev-Ops toolchains has seen a substantial rise in popularity, with 44% saying it would be in their top three characteristics in 2021 compared to 19% in 2019.

Cloud also features highly in ideal future IT state for all key sectors, including financial services (77%), healthcare and consumer services (both 72%), indicating how important it will be to organizations in all sectors.

3.5 Reaping the benefits

The desire to move away from the mainframe is clear. In order to reach this ideal future IT state, more needs to be done to encourage organizations to commit fully to migration. Once IT modernization and application migration has been completed, it's clear the benefits are widespread.

Almost all senior IT decision makers see benefits to moving away from the mainframe (98% in 2021, 95% in 2019), with the top advantages including there being a better ability to leverage cloud (52%), increased speed in application development and testing agility (44%) as

well as reallocation of IT spend to innovation (39%).

Similarly, almost all see there being benefits to application development off the mainframe (98% in 2021 and 2019).

Key among them would appear to be faster development times (46%), the fact applications would be easier to deploy (42%) and that organizations would have more freedom over the tools they can use when selecting new environments (40%).

3.6 Advantages of application development off the mainframe
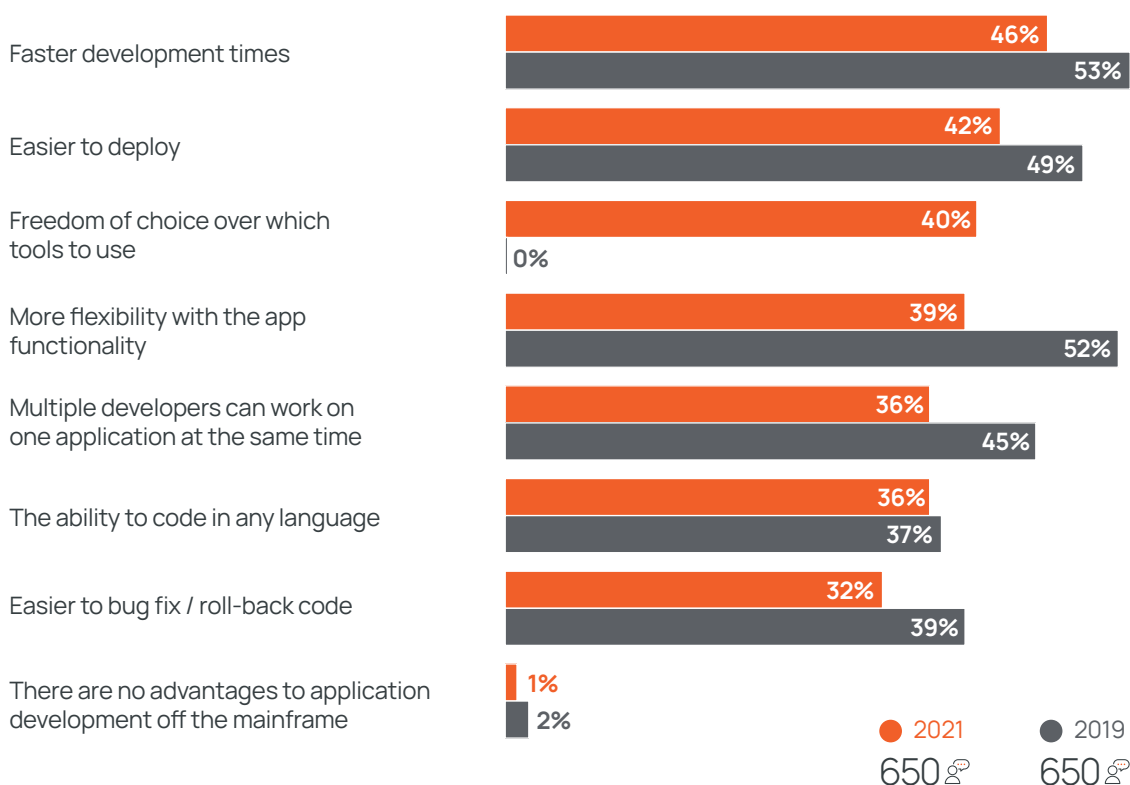
Figure 8: Generally, what do you think are the main advantages to application development off the mainframe?

The advantages of fully committing to migration are numerous and shows the value that can be maximized away from mainframes. Perhaps most key among them solves the top concern respondents have about their current mainframe environment – namely that it improves competitive advantage.

Conclusion

The status quo remains the same – mainframe applications are still extremely critical to organizations and their business operations and services as they were three years ago.

However, organizations are now looking to the future – they know that change is needed in order to support modernization and maximizing value from the mainframe is at the forefront of decision makers minds.

Doing this will ensure that key concerns over their current mainframe platform makes innovation more challenging, (and therefore impacts their organizations competitiveness) and that there is an impending

skills gap as staffing changes will soon impact their organization if nothing is done.

IT modernization is gathering pace as a result, and decision makers are focused on the cloud, as well as other technologies, in order to support this process.

They are aware that their organization's mainframe employees will be crucial to a successful transition.

Organizations want to tap into the numerous benefits that come with migration and development away from the mainframe.

However, it could be argued that modernization is not happening quickly enough. More needs to be done to help organizations fully commit.

Special mention to the 650 IT leaders for their valuable industry-based IT insights and input into this research project. **Thank you.**

About LzLabs

Our Vision
To unlock the value embedded in legacy systems.

Our Mission
Our unique software transforms existing IT into a modern computing environment and we are passionate about leading our customers to technology that is fit for the future.

Our Story
We love technology, but it's what people do with it that really gets us excited.

Since 2011, we have built and refined technology that revolutionizes how our customers do business.

Along the way we have helped organizations on their modernization journeys, joined forces with partners that help us deliver on our mission and built a team of 100+ brilliantly different people across the world.

About Vanson Bourne

Vanson Bourne is an independent specialist in market research for the technology sector.

Their reputation for robust and credible research-based analysis is founded upon rigorous research principles and their ability to seek the opinions of senior decision makers across technical and business functions, in all business sectors and all major markets.

For more information,
visit www.vansonbourne.com.

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