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Introduction

IBM launched the AS/400 platform in 1988, a lifetime ago in the technology timeline. This was over three decades ago, before the Cloud and the client-server revolution that saw networked computers on every desk in the office – in the era when the secretary was a universal feature of the office, we sent each other letters, and working from home was the exclusive preserve of novelists.

Today many businesses are still powering their business-critical applications on the platform now known as IBM i. The unsung hero of many an IT department, IBM i is a complete platform that brings together a powerful combination of networking, database, hypervisor, inbuilt security and mass storage. Long before the fabled internet-connected fridge, IBM i was ordering its own spare parts, and was so easy to run it was often described as 'driverless'.

Today organisations running IBM i tend to have a longstanding commitment to the platform, with applications built in-house running alongside vendor software for ERP, BI, supply chain, finance and even some web applications. Yet while many enterprises continue to run IBM i servers with tailored and tightly bound mission-critical applications, modernisation is on the horizon, and with it a new set of challenges.

Inevitably, with a platform that has been around for three decades, many IBM i SysAdmins are older than the average for IT staff. This means many in-house experts are nearing retirement age and IT support teams are dwindling, meaning system issues and upgrades may struggle to be addressed efficiently and effectively. At the same time, there's an increased demand for digital transformation to meet the growing need for remote working, to embrace Cloud technology, adapt to the new UI design mantra and to enable automation with APIs.

So where to now for IBM i? And how can IT chiefs manage system upgrade costs, continue to optimise and modernise, while facing an emerging skills gap and keeping the business running. *Computing* surveyed 130 organisations running IBM i to find out.

Key findings

- Organisations running IBM i systems are typically very large. Just 4% have fewer than 500 employees – at the opposite end of the scale, 41% have more than 2,000.

- A high proportion of business-critical applications run on the IBM i platform: over half of IBM i users have more than half of their core business apps running on the platform

- Data and application interoperability can be a challenge for businesses running IBM i.

- Managed service providers are in demand – with a clear majority using them already or considering doing so.

Large organisations, small teams, and behind the curve on hybrid

Computing surveyed a wide cross-section of organisations in the UK that are using IBM i today to understand the challenges businesses face in modernising the platform. Of the 130 respondents, the majority are in senior IT positions, with 51% at IT director or above, and a further 40% in management roles. The sample covers a wide range of industries, with less than 4% coming from organisations with fewer than 500 employees and 41% in organisations with more than 2000 employees (fig 1).

Fig. 1 : How many employees are there in your company?
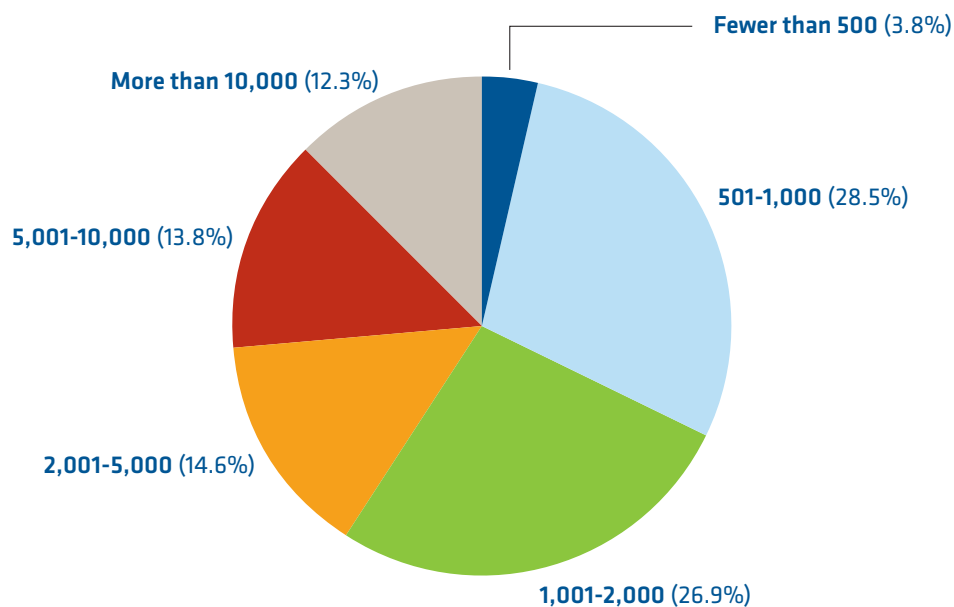
Whilst the original AS/400 technology might be 30 years old, the platform has kept pace with the rapid and wholesale changes in enterprise technology: today's IBM i is undeniably a powerful, robust platform. However, our research shows that businesses using IBM i have been held back from modernising this part of the organisation's IT infrastructure.
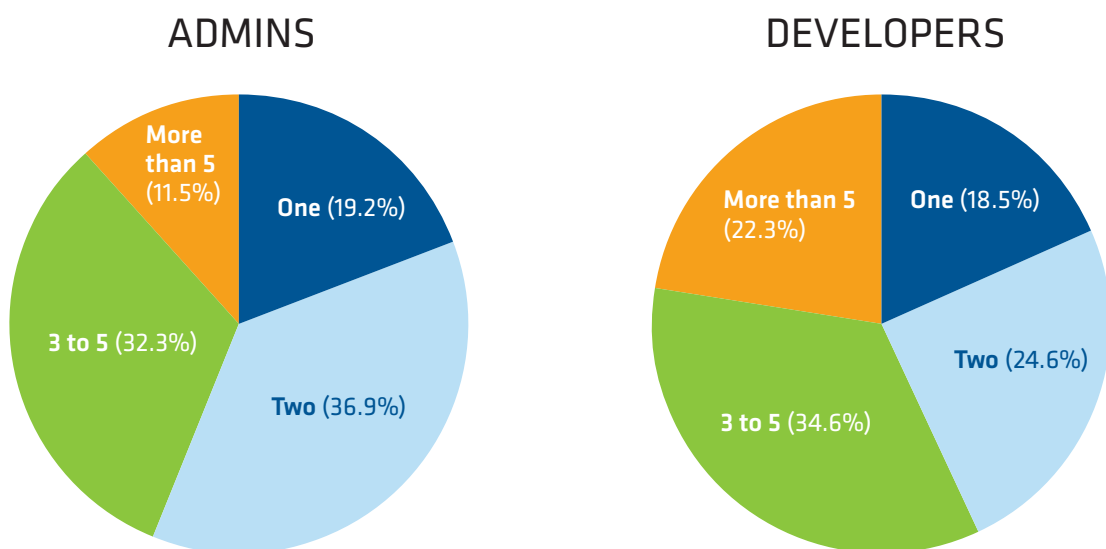
Typically, *Computing* research has found that around 70% of organisations have a hybrid on-premises and Cloud network set-up. By comparison, 40% of respondents have their IBM i infrastructure on premises, while just 31.5% are hybrid, with the remaining 28.5% in the Cloud (fig2).

Fig. 2 : Where does your IBM i infrastructure reside?

Hybrid (both cloud and
on-premise) (31.5%)

On-premise only (40.0%)

Cloud (28.5%)
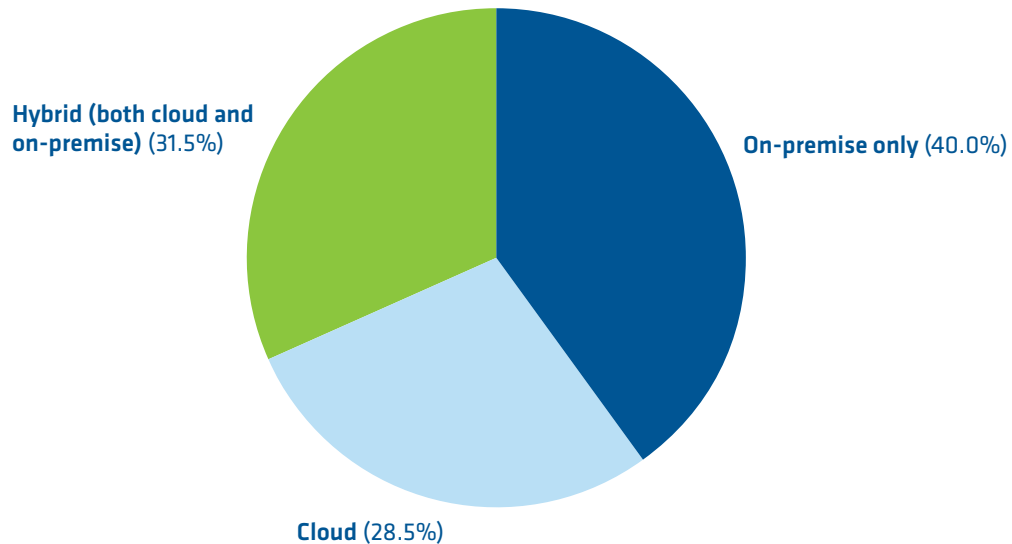
The research also shows the difficulty in maintaining and updating IBM i technology as a result
of low numbers of support staff. Enterprises running IBM i typically report small numbers of
administrators and developers dedicated to the platform, with just 11.5% of respondents having
more than five administrators and just 22% having more than five developers (fig 3). The low
number of SysAdmins running – as we will see – critical infrastructure is inevitably going to
generate issues with holiday and sickness cover, and, when staff leave or retire, they take their
knowledge with them. As the platform does not have the same popularity as Public Cloud for those
at an earlier stage in their career, when gaps emerge, may stick around for a while/long periods of
time. It would be surprisingly easy for many large enterprises to develop support problems.

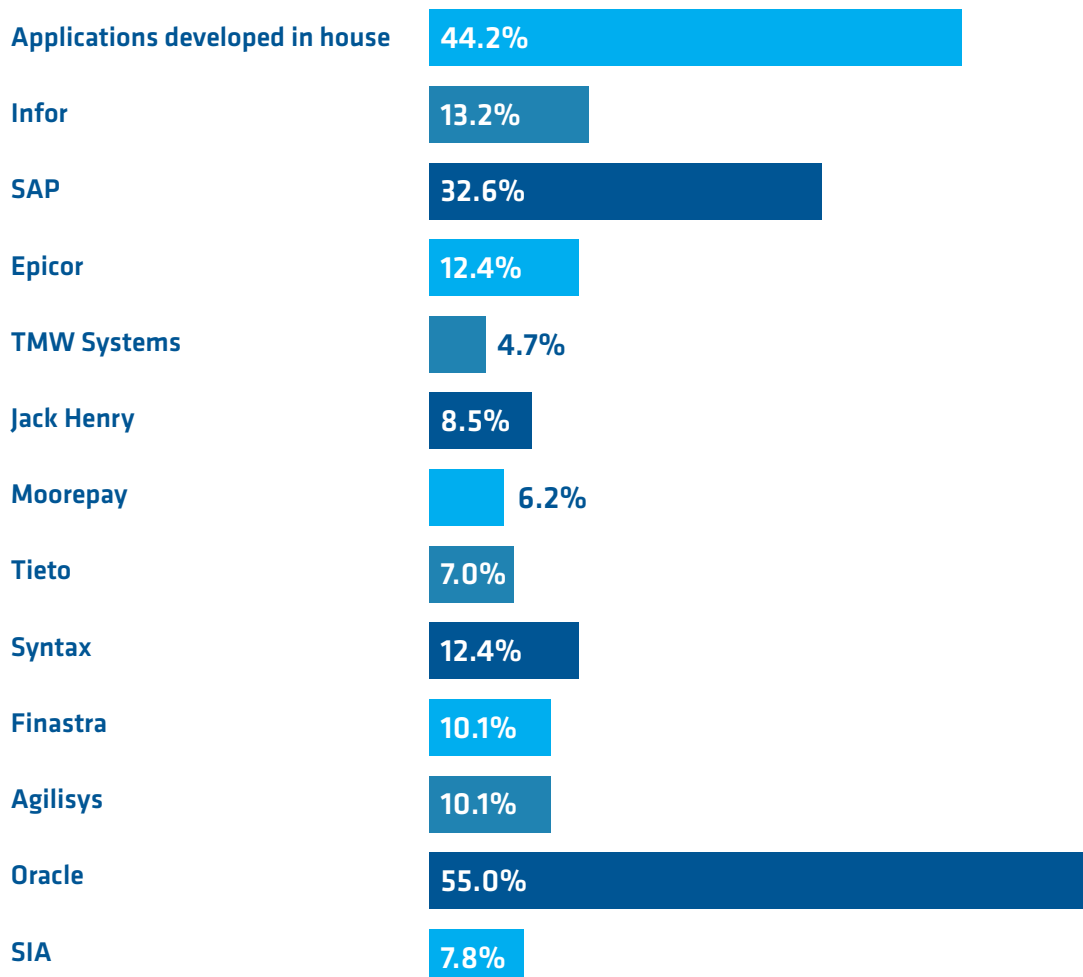## Fig. 3 : How many administrators and developers do you have for IBM i?

ADMINS

More
than 5
(11.5%)

One (19.2%)

3 to 5 (32.3%)

Two (36.9%)

DEVELOPERS

More than 5
(22.3%)

One (18.5%)

Two (24.6%)

3 to 5 (34.6%)

There is a clear skills gap, with the number of highly skilled staff able to support IBM i diminishing, whilst experienced engineers are approaching retirement age. Enterprises are facing a real a challenge in their capacity to execute change and support applications over the long - or even medium - term.

Managing mission-critical applications on IBM i

As you might very well expect with a long established platform, enterprises using IBM i are running business critical apps on it. The most frequently cited apps are Oracle, followed by applications developed in-house, and a slew of vendors from ERP giants like SAP, through to smaller players such as Infor. Banking specialist Jack Henry is also cited, along with payroll and HR providers Moorepay (fig 4). The one thing these names have in common is the mission critical processes they underpin – many IBM i users are running large parts of their business on it. The combination of business-critical apps, and very small support teams is difficult to view as an acceptable risk.

Fig. 4 : Which business applications are you running on IBM i? Please tick all that apply

Application	%
Applications developed in house	44.2%
Infor	13.2%
SAP	32.6%
Epicor	12.4%
TMW Systems	4.7%
Jack Henry	8.5%
Moorepay	6.2%
Tieto	7.0%
Syntax	12.4%
Finastra	10.1%
Agilisys	10.1%
Oracle	55.0%
SIA	7.8%

In fact, the survey data shows that huge numbers of mission critical work is on IBM i. *Computing* asked what percentage of core business applications run on IBM i – over half of IBM i users have more than half of their core business apps running on the platform.

Given the low numbers of developers and support staff dedicated to IBM i, it shouldn't come as a huge surprise that achieving connectivity with IBM i can be something of a challenge. Full API connectivity is rare, with the survey revealing that less than a third have fully connected data from IBM i with other systems (fig5).

Fig. 5 : Which of the following statements corresponds with your experience of connecting data from applications held on IBM i to other systems? Please tick all that apply

| 30.8%	37.7%	42.3%	36.9%	10.0%	4.6%
We have full API connectivity between IBM i and other systems on-premise	We have full API connectivity between IBM i and our cloud based systems	We have some connectivity, but find connecting data from IBM i tricky	We can manage connectivity between IBM i and other systems easily	We have serious challenges with IBM i data portability	IBM i is an island
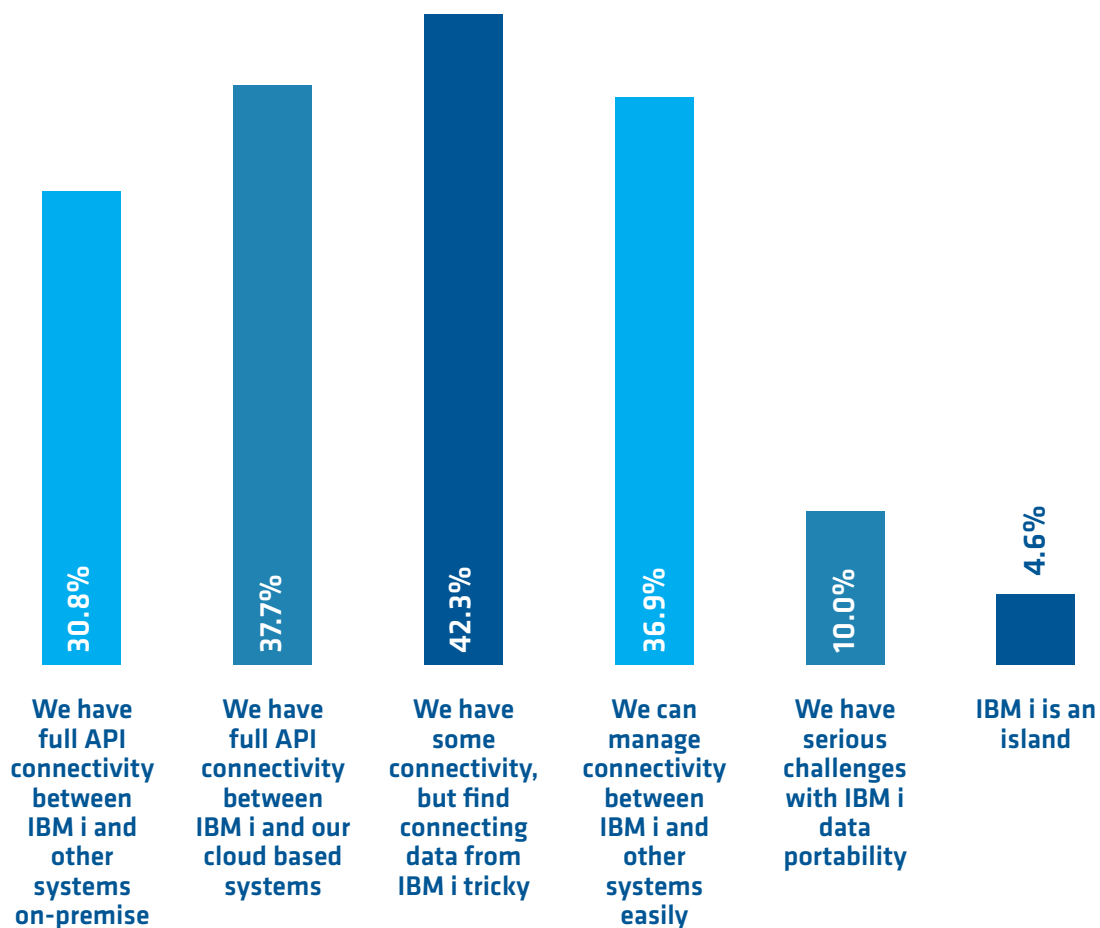
Data portability is a serious challenge for 10% of organisations, and a further 5% where there is no connectivity at all, and 'IBM i is an island'. Overall, half of those surveyed have none, some or difficult connections between IBM i and other applications, indicating a significant modernisation challenge for many enterprises. It is highly desirable to make data from many of the applications shown earlier in fig 4 available to other applications and processes. In the modern era, where customers expect to be able to access data rapidly, and where the quality of their online experience depends on movement of data between applications, this challenge is likely to present a serious

competitive disadvantage – it basically means many IBM i users when it comes to delivering a state of the art online customer experience in comparison with peers not encumbered by legacy technology.

In the era of UI design with a focus on maximising usability, one of the other modernisation challenges for IBM i is an old interface design. Some IBM i systems are still running interfaces using terminal emulation or greenscreen, much as they were when the AS/400 platform launched in the late 1980s. fig 6.

Fig. 6 : What type of interface are you using to connect to your IBM i business applications?

GUI (Graphical User Interface) (26.2%)

Green screen / terminal emulation (23.1%)
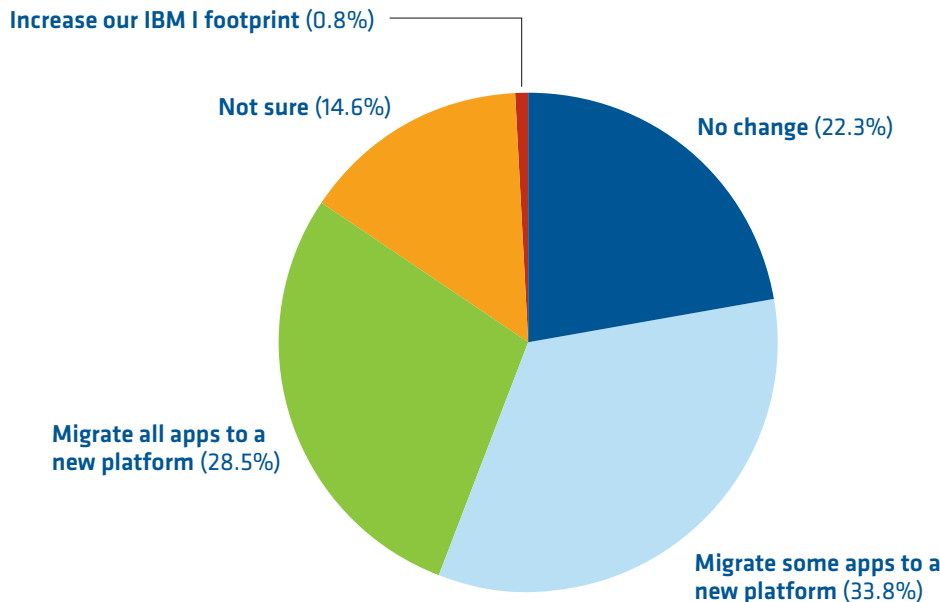
Web based (50.8%)
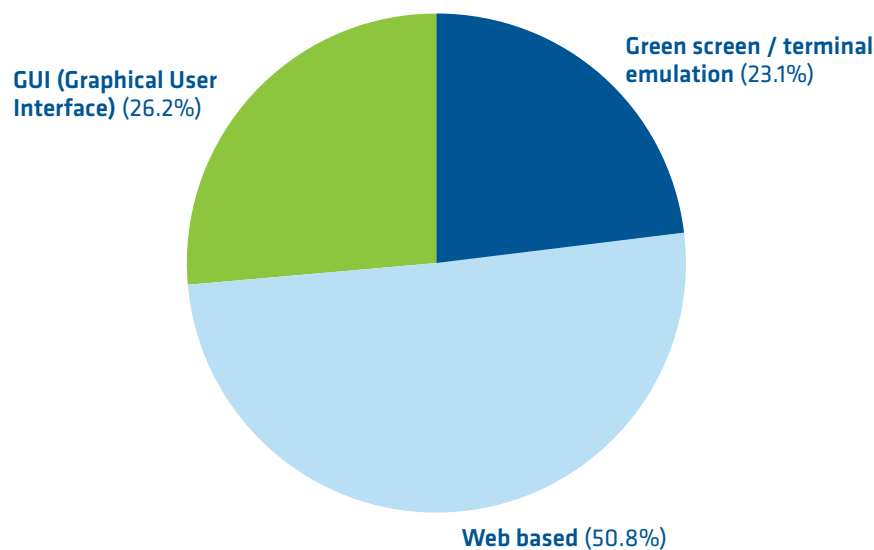
Surprisingly, almost a quarter of organisations are using greenscreen and/or terminal emulation a significant minority at 23%. For the experienced engineer this may very well be a preference and the most convenient way to execute commands that are familiar through years of use. For the new and uninitiated its likely to be at best off-putting – and at worst a signifier of obsolescence.

IBM i and succession planning

Computing asked respondents what their plans for the future of their IBM i infrastructure are. Nearly a quarter – 22% plan to keep things as they are. Just 1% are planning to increase their footprint. 15% aren't sure what they will do – but a clear majority, nearly two thirds at 62%, think they will move some or all of their apps from the platform (fig 7). We didn't ask 'when' – so the time of migration is not specified, and its unlikely to be a rapid transition – particularly given the nature of the applications currently running on the platform. It is however, a really quite telling statistic.

Fig. 7 : What are your plans for the IBM i platform?

Increase our IBM I footprint (0.8%)

Not sure (14.6%)

No change (22.3%)

Migrate all apps to a
new platform (28.5%)

Migrate some apps to a
new platform (33.8%)

All IT infrastructure needs to be maintained and updated in an ongoing program of work. In this
case, the decision to migrate is arguably driven by the challenges in managing the platform and
the need to open up to other applications.

Migrating business-critical applications to new platform – in public cloud, on-premise or as SaaS
brings its own engineering challenges and accompanying risks. Do you stay with your existing
software vendors or potentially change? Do you replace applications written in house with off-the-
shelf equivalents? How will you connect data? Will there be downtime? How will we retrain staff?
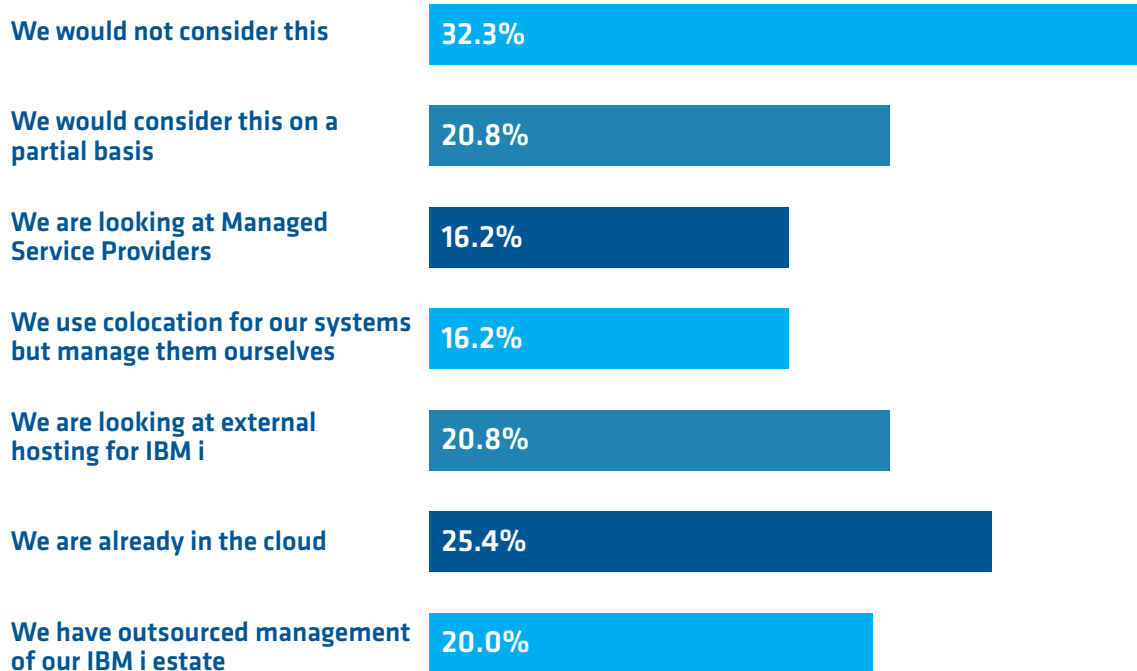What will we *not* do while this work is ongoing?

With any change comes risk, and the greater the change, the greater the risk. Shifting from IBM
i will be fraught with risks, and enterprises will not be keen on doing it in a hurry. Relatively few
appear comfortable with the idea of doing it on their own without specialist help (fig 8).

The data shown here makes bleak reading for IBM i SysAdmins – who are well known for their
often deep affection for the platform - and is marked contrast to other research covering
IBM i[2]. The sample *Computing* has used is organisations running IBM i – but not the actual staff
supporting it. Hence the viewpoint shown here is not the view of IBM i SysAdmins, but of their
colleagues in IT. That viewpoint can be regarded as a default attitude to all "legacy" technology.
Clearly, there would be a strong benefit for existing support staff to open up a dialogue on IBM i's
surprising possibility for modernization – that default attitude could be successfully challenged,
particularly with help from a third party who can help mitigate migration and modernization risks.
Many third parties invest in IBM i as a service offering and develop internal educational programs
for a modernised workforce for new Sysadmins to ensure there is no service interruption and that
they have the skills to help clients move forward with their digital transformation.

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[2]   https://static.helpsystems.com/hs/pdfs/guides/marketplace/ibmi-marketplace-survey-results.pdf

Fig. 8 : Which of the following describes your approach to outsourcing your IBM i estate? Please tick all that apply

We would not consider this — **32.3%**

We would consider this on a partial basis — **20.8%**

We are looking at Managed Service Providers — **16.2%**

We use colocation for our systems but manage them ourselves — **16.2%**

We are looking at external hosting for IBM i — **20.8%**

We are already in the cloud — **25.4%**

We have outsourced management of our IBM i estate — **20.0%**

The largest answer shown here on the question of outsourcing the IBM i estate is "we would not consider this" at 32%. In aggregate that means that – in one shape or another – 68% would. The vast majority. One in five have already outsourced wholesale – the whole kit and caboodle with a third party. Many are considering partial outsourcing or looking for a friendly MSP. Some have moved their IBM i into co-location – more still are looking to do so.

Conclusion

In 1988 IBM made history when it launched a new family of 'mid-range' business hardware that was easy to use, while simultaneously releasing a brand new suite of applications. The AS/400 servers boosted storage capacity, performance and processing speed, sold by the hundreds of thousands, and became the most popular mid-range system in the industry.

Since then, the platform has been renamed numerous times, becoming more powerful and more deeply embedded in corporate infrastructure at every step. Today IBM i – the platform formerly known as AS/400 - remains a critical part of IT infrastructure for many organisations more than three decades after it was introduced.

Although it remains scalable and secure, businesses nevertheless face a substantial modernisation challenge. With knowledgeable and experienced support staff approaching retirement age and the number of support staff and skilled developers dwindling, there is a very real question of whether IBM i is viable in the long term: hence the high levels shown here with the intention of migration.

Organisations running IBM i will increasingly face the challenge of modernising IT systems to meet growing connectivity and usability demands, while ensuring business continuity in a competitive landscape. The research data shows that for many the answers to this conundrum to lie in outsourcing and managed service provision.

Skilled managed service providers can help enterprises find the best way forward, providing support and management when in-house resources are limited, offer strong capabilities with modernisation, and minimise the risk involved in change by bringing to bear the lessons learned with a wide client base – whatever way forward you choose.

About the sponsor, Ensono

Ensono helps IT leaders be the catalyst for change by harnessing the power of hybrid IT to transform their businesses. We accelerate digital transformation by increasing agility and scalability through infrastructure modernization and migration to public cloud. Our broad services portfolio, from mainframe to cloud, is powered by an award-winning IT insights platform and is designed to help our clients operate for today and optimize for tomorrow. We are certified experts in AWS and Azure and recognized as Microsoft Datacenter Transformation Partner of the Year. Ensono has over 2,000 associates around the world and is headquartered in greater Chicago.

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