Rocket® software

# Low Automation Sinks Innovation

## How IBM® i and IBM Z® Continuous Transformation Supports the Evolution of Work

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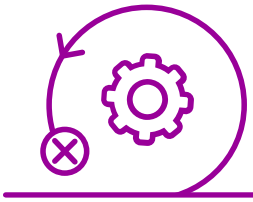
# Introduction

More than 11,200 Americans will turn 65 every day — or over 4.1 million every year — from 2024 through 2027, according to estimates from the Retirement Income Institute at the Alliance for Lifetime Income. With so many people leaving the workforce, the skills gap for IBM® i and IBM Z® systems is only widening.

Many organizations' IT systems are aging alongside the workforce, adding to the challenge. On average, 31% of an organization's technology comprises outdated IT systems and homegrown applications, programs, and scripts that few people are adept at maintaining or using. Many organizations are also saddled with dated processes, inefficient coding practices, siloed data, complex tools, or no documented processes. Alongside everyday problems such as slow performance, system errors, data loss, and high costs, there are also hidden dangers to relying on outmoded technology.

Aging IT processes and tools make it difficult for businesses to stay agile in the face of rapid market changes and uncertainties, such as widespread concerns about a recession, expressed by 84% of respondents in a recent Aberdeen Strategy & Research and Spiceworks survey. Despite economic uncertainty and the lingering effects of the pandemic, worldwide IT spending is projected to total $5.1 trillion in 2024, an increase of 8% from 2023, according to the latest forecast by Gartner, Inc. We believe this signifies a strategic decision to propel new initiatives forward and modernize aging infrastructure.

**31%**
of an organization's technology comprises outdated IT systems



**84%**
of respondents say aging tools make it difficult to stay agile

**8%**
IT spending growth in 2024, approx $4.5 trillion

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# Three competitive imperatives

Businesses must prioritize continuous transformation to thrive and surpass competitors in an era of uncertainty, particularly on three fronts:

## 01

### Put employees first

Businesses must embrace the evolution of work now or fall behind competitors. Characteristics of the new work landscape include lateral versus top-down structures, flexible versus strict work schedules, cloud-based versus on-premises tech, convenient communication tools versus just email, creating the ladder versus climbing it, interdepartmental engagement and collaboration, remote and hybrid work, and diversity and inclusion.

The evolution of work requires keeping knowledge workers engaged and energized. After all, they invent new products, develop new strategies, lead negotiations, and help keep you ahead of competitors. Knowledge workers are your most expensive and valuable asset, and replacing just one costs 50 to 60 percent of an employee's annual salary.

In a world where more remote work is available, knowledge workers have myriad opportunities to find jobs that meet their expectations, including flexible work schedules, intuitive user interfaces, consumer-friendly devices, and access to information whenever and wherever they need it. They also expect workflows and processes to be automated as much as possible so they can spend time on high-value, innovative tasks versus repetition and tedium.

The need to keep workers engaged and enthusiastic is even more pressing in companies reliant on IBM i and IBM Z systems for their critical workloads. People skilled in working with these systems are leaving the workforce, so it is essential to retain IT workers and provide tools that help employees stay productive and maintain various systems.

**Knowledge workers are your most expensive and valuable asset, and replacing just one costs 50 to 60 percent of an employee's annual salary.**

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# 02

## Modernize and embrace emerging technologies

Technology is essential in the modern workplace, so cutting back doesn't make sense from a business perspective. More than just a cost, companies today view technology as a valuable investment because it can boost productivity and offer long-term benefits like efficiency. Innovative businesses take a pragmatic approach by strategically applying their IT budgets with an eye on a future that includes modern technologies such as artificial intelligence, data analytics, and the cloud.

To surpass competitors, enterprises must improve their ability to anticipate and deliver on customer expectations and pivot to take advantage of emerging opportunities — with everything changing in real-time. Only data-driven insights can enable businesses to keep pace, stay agile, and see around corners.

Additionally, it is critical to have processes and technology in place to translate those insights into action. This includes everything from leveraging APIs to improving access to business logic and data and streaming system performance data into graphical UIs for analysis and better decision-making. Only data can lead to measurable workflow improvements.

The pressure to continuously modernize is even more acute in the many businesses that rely on IBM i and IBM Z systems for critical workloads — especially considering the skills shortage of IT professionals experienced in working with these platforms. With a strategic, continuous approach to modernization that includes process discovery, the right tools, and collaboration with the business, you can approach IT modernization in a nuanced, data-driven way with a genuine impact.

# 03

## Automate for continuous improvement

Automation is essential to business productivity and efficiency and keeping employees engaged and impactful. Automated processes can take over lower-skill tasks, freeing humans to focus on more creative and transformative work. It can increase the quality of products, reduce the learning curve for new hires, free up workers to move into more rewarding roles, and more.

Automation also can break down functional barriers and eliminate inefficient handoffs, enabling IT and other groups to be more agile and innovative. Once a solid automation foundation is set, it can pave the way for more advanced automation technologies like AI or hyperautomation.

But first, leaders need data insights to know how and where to use automation to improve the work experience and derive the most value. What aspects of employees' jobs or workflows create the most stress or are the least productive?

Although some fear that automation will eliminate jobs, the Paradox of Automation states that "the more efficient the automated system, the more crucial the human contribution of the operators. Humans are less involved, but their involvement becomes crucial." So, rather than worry about how automation will change the workplace, embrace its possibilities.

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# Achieving the competitive imperatives

When businesses decide to transform, they often wonder how to start and what to expect. Change is never easy, but the rewards can be tremendous. Here are a few areas where your business can achieve rapid ROI.

## Start with automation

Automation is the foundation of continuous transformation. Achieving the other two competitive imperatives without automation is difficult, if not impossible. As companies work to develop remote and hybrid models that keep employees motivated and keep the business on target, employees are overwhelmed with systems, platforms, and notifications. Automation can alleviate the complexity, overwork, and communication bottlenecks.

Automation is also an essential factor in better decision-making and business agility. When businesses can analyze, automate, and govern the most common business decisions, employees and leaders can spend time formulating more complex strategies that spur the business forward.

## Adopt AI

AI is taking off as a transformative force with many applications — from automated data entry and analysis to customer service inquiries — and benefits such as cost savings, faster decision-making, and improved customer satisfaction. AI can also maximize talents, improve safety and risk management, and deliver better user experiences.

### A Tip from Gartner®

"Automation is the key enabler for IT productivity, where eliminating repetitive manual tasks must be a top priority. To achieve best results, IT teams must blend automated application development and infrastructure pipelines."

"This use case extends automation tools and processes throughout your IT enterprise. Agility and speed can be achieved without additional headcount."

### A Tip from Gartner

"AI is growing in popularity. Much of this is driven by the cloud providers, where their hardware and frameworks are driving interest and adoption. The mainframe can also become a part of the solution."

"Besides utilizing on-chip AI hardware acceleration that can handle massive volume with low latency, this use case involves training AI models in the cloud (which is heavily resource intensive), but running and refining them on the mainframe, where the data is. It leverages the mainframe's [1] architecture and hardware in providing high performance; using the mainframe to do what it does best."

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# Think about modernization as a journey, not a destination

Winning companies are strategically propelling new initiatives forward and modernizing aging infrastructure. The need to continuously modernize is even more dire for the many businesses that rely on IBM i and IBM Z systems for critical workloads. In pursuit of modern application development, organizations must identify workflows burdened by legacy green screens slowing down user experience (UX). By creating user interfaces (UIs) tailored to user workflows, featuring practical moving fields and intuitive flows, modernization efforts deliver improved user experiences and help alleviate skills shortages related to IBM i and IBM Z systems.

## A Tip from Gartner

### Developer Experience

**"The traditional interface for mainframe developers has not changed in decades. This interface is inefficient when compared to interfaces used by developers in cloud and distributed environments."**

"This modernization use case involves providing mainframe developers the same modern experience as distributed developers. In this scenario, a common integrated development environment (IDE) would be used by mainframe developers that provides enhanced tooling (e.g., coding, debugging, testing applications), while allowing use of their respective programming language. This results in enhanced developer productivity with a better interface and toolset."

### DevOps Implementation

**"For most enterprises, the mainframe is isolated and on the sideline for many enterprise digital initiatives. This represents a missed opportunity, as the mainframe is best for critical workload. The ability to select the best environment for each workload through use of a common developer pipeline can be powerful."**

"This use case builds a common application pipeline for all compute environments. Enterprises can efficiently leverage a common toolset while bringing the mainframe into the conversation as the preferred platform for critical workload. This can also incorporate open-source offerings, such as Linux and/or Kubernetes on the mainframe, or the use of the extensive Zowe framework. The use case also delivers staff efficiencies, where in some instances you can eliminate duplication of effort across the different compute environments."

## Democratize data and analytics

By democratizing data and analytics, businesses can unlock greater agility, enable more intelligent decision-making, and respond faster to change. Through data democratization, employees can streamline operations, improve strategy, and drive superior customer experience. The good news is that AI technologies like chatbots will further democratize and surface data, making it more easily digestible and actionable.

First, organizations must integrate data across hybrid IT infrastructures and ensure storage interoperability and efficient performance. They must enable real-time access to trusted data wherever it lives, on the mainframe, distributed systems, or in the cloud. And they must ensure storage interoperability and efficient performance across all systems.

### A Tip from Gartner

"Data stored on the mainframe is a huge enterprise asset. It is also "sticky" (i.e., tough to remove). Even when data is migrated off the mainframe, it is often done in a manner where access to the data is not dynamic (e.g., periodic file transfers). The ability to enable real-time access to mainframe data can be powerful."

"In this instance, a real-time cache is continually updated with mainframe data. This data is curated and provided to business users, application developers, and other applications and systems."

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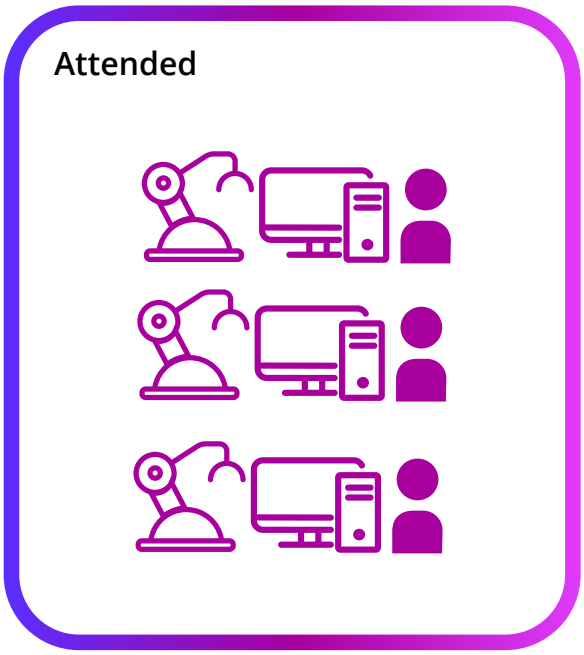
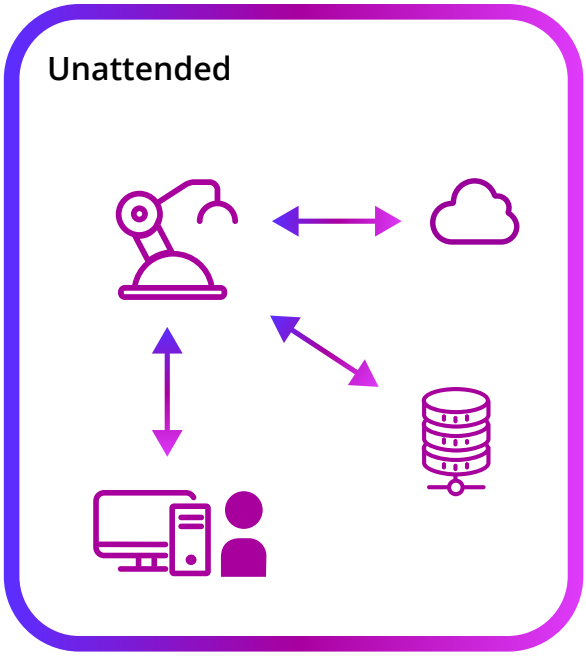
# Automation deep dive

Automation isn't an all-or-nothing proposition; instead, there is a spectrum from "attended" automation, when a human is needed to continue a workflow, to "unattended," when a workflow executes without human intervention.




An example of attended automation is auto adjudication in insurance, when an automated robot flags potential claim issues, but the claim is not denied without human review. An unattended example in insurance would be when the address for an approved provider doesn't match the address in the claim — perhaps there is a period omitted or an abbreviation. A bot would update the provider's address on the claim to mirror the insurance company's address. The bot then processes the claim automatically without human intervention. Often, these automation types work best in coordination. Or they can be executed in sequence.

How do you decide where an automated workflow should land on the spectrum from attended to unattended? Businesses can only assess workflows and environments through process discovery to gain comprehensive insights into application utilization, providing a solid foundation for automation efforts. Data involved in process discovery should include industry regulations, policies, and corporate governance rules. Once the data is in and you have end-to-end visibility into workflows that need automation, the ultimate decision must balance the potential for human error with the need for human knowledge and insight.

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# Steps in the automation cycle

## Process discovery and documentation

A form of automation itself, process discovery unveils how users engage with applications and datasets, including the steps they take in workflows, such as what data is accessed when, how long employees spend at specific points in the workflow, steps skipped, shortcuts used, and so on. For example, process discovery takes the guesswork out of what is needed to develop and test, accelerating the execution of automated testing.

Process discovery previously required analysts to shadow workers, input data, ask questions, and write up reports, a months-long process. Automated discovery works in the background as workers conduct their day-to-day tasks without interrupting that flow. Process discovery occurs over time and focuses on specific parts of the business or particular use cases, such as customer care or order management.

## Analyze the data and information

The next step is to determine where human engagement is needed most. Analysis is required to make informed decisions that factor in business strategy, whether to move a workflow and associated data to the cloud, and other questions. These decisions need analytics of the process documentation information collected.

For example, if a particular workflow happens 80 times a day and another workflow happens 200 times a day, does the 200x warrant more automation for a more significant business impact? What if the process is shorter? Which one will have a more substantial effect? Organizations must apply human knowledge and judgment to decide, but process discovery and analytics supply the data and information to make intelligent decisions.

**Data in its simplest form consists of raw alphanumeric values. Information is created when data is processed, organized, or structured to provide context and meaning. Knowledge goes beyond information in that it involves understanding and expertise.**

## Choose the right automation tool

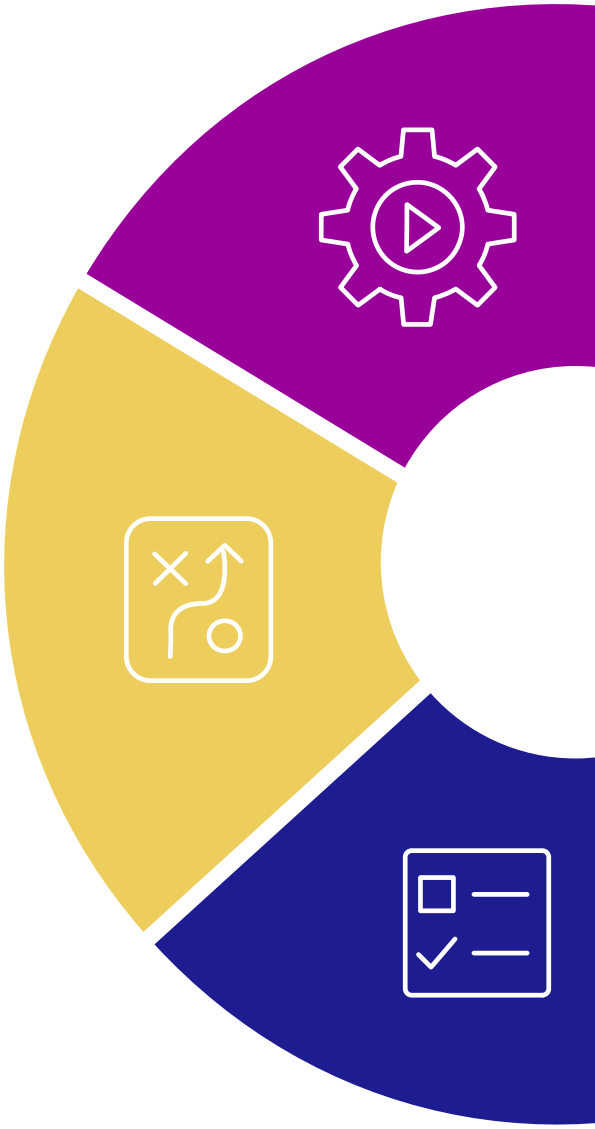
The automation tool will differ based on what the business needs to automate. A variety of automation technologies are available, each designed for different purposes. They vary from simple tools to complex systems for large-scale mainframe or workflow automation. Do your research and make an informed choice — but be sure the tool you select integrates into existing workflows and can handle future requirements.

## Execute your automation strategy

Map out the workflows that require automation and detail how the automation will occur and the expected outcomes. Implementation often requires an iterative approach, so start by piloting the automation on a small scale first to minimize business disruption.

## Analyze and adapt

Analyze the results to determine the impact and identify areas for improvement. Continually adjust your automation strategy based on the insights collected from your analysis.



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# How to automate for quick ROI

Once you have mastered the steps required for automation, it's time to start. One of the best places to look for opportunities is IT. The technology team's time is precious and can be fraught with tedious tasks. Here are a few ways to free them to focus on innovating for the business.

## Automated storage management

Many organizations struggle to manage system performance as workloads increase and optimize storage as data grows. Adopting automation solutions can streamline many performance and storage-related tasks, from backup and recovery to proactive monitoring and issue identification across IBM i, IBM Z, distributed, and cloud systems.

## App and cross-system integration

Organizations with IBM i and IBM Z systems in their IT environment run critical business applications on them, such as their ERP or CRM programs, including customer-facing engagements, whether digitally through self-serve or through a call center. Typically, they also have distributed or cloud-based applications that need to update or pull data from the IBM i and IBM Z applications. Often, this connection is done through a manual process, usually a batch update. Someone downloads a .csv file from one system, runs macros in Microsoft Excel to adjust the data format, and then uploads the .csv to the other application.

This manual approach is tedious and error-prone, but there are new solutions for automating it, reducing batch processing times and resource consumption. This is relevant whether you are connecting data, applications, or systems.

## Robotic Process Automation (RPA)

RPA is the process of automating repetitive, mundane tasks. In the unattended automation example above, RPA was used to fix the provider's address listed on the claim, so the insurance company didn't need to rely on a worker to make a minor update. The robot is often given a defined set of instructions or rules on how to run, such as "If the address field ends in a period, then delete the period," or "If the address field includes 'Rd' replace with 'Road.'" Typically, RPA is implemented in use cases when there is a high volume of similar tasks. For instance, insurance companies process a flood of claims daily — a task that would be too time-consuming and expensive without RPA.

## Development

Organizations today seek to implement true CI/CD (continuous integration/continuous deployment) and help developers focus on rapid iteration and testing. DevOps software achieves CI/CD by incorporating automation throughout its structure like pipeline builds and authorization controls, freeing developers from time-consuming and repetitive tasks. The

more you automate across your DevOps processes, the more you can free talent to try new tech, tools, UX, and processes or develop innovative tools and experiences for users.

CI/CD relies on automated testing, release management, deployment, and sometimes delivery delivered through automated pipelines. Through automated CI/CD, businesses can extend holistic DevSecOps best practices to IBM i/Z systems, pursue innovative experimentation, efficiently respond to compliance audits, and adapt to the ever-changing expectations of process, technology, and experience.

## Workload Automation

As today's dynamic enterprise IT environments increase in complexity, so does the challenge of seamlessly managing your multi-platform development and operations processes end-to-end. With the skills gap across IBMi/Z only widening, organizations must address the islands of automation across their workloads. It's imperative to orchestrate end-to-end processes across multiple technology stacks and applications supporting your Operations or DevOps strategies, and to integrate with enterprise cloud utilities such as Amazon Web Services (AWS), Microsoft Azure, and Google Cloud.

Through centralized automation and full orchestration across workloads, you have full management control of your development and operational value streams, coordinating work from on premises systems to cloud. Meanwhile, your tasks are now automated and integrated between all technologies your value streams require from other critical enterprise services such as SAP, Oracle, PeopleSoft, Dropbox, Microsoft SQL Server, and more.

## UX

UX automation can take several forms, including:

- Automating "multiple channels of engagement" or the development of user interfaces on different endpoints. Although this type of automation is old news for some, it is still valuable.
- Screen navigation – This type of automation makes the green screen less cumbersome. In this instance, macros help users go from screen one to screen ten quickly, for example, instead of tabbing their way through all the screens from one to ten.
- Screen consolidation – An evolution of screen navigation, screen consolidation builds the user interface so what the user needs on screen one and screen ten is all on the same screen, resulting in significant workflow improvements.
- Environment-specific automation – This type of automation is used when the work environment complicates workflow navigation. For example, a user would need automation on a tablet if t hey're interacting with a mainframe-based "green screen" application because the tablet has no function keys. "In this case, the tablet UI would either include a digital function key, automate the function key being pressed on the back end, or leverage one of the above screen-based automation techniques."

## Compliance

Automation around compliance is related to CI/CD because much of the reporting gets pulled out of CI/CD environments. Still, it warrants its own explanation because of its importance. Upwards of 20% of IT budgets can be spent on compliance and responding to audits. The ability to automate compliance and its reporting – even just a fraction – can save organizations the risk of regulatory fines and a potentially significant cost in the budget. Automated permissions, access controls, and report creation from systems that can see across the IT environment are invaluable automation capabilities.

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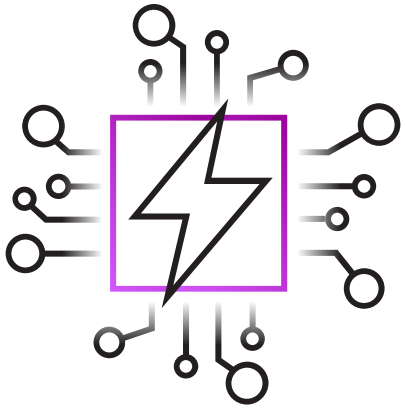
# AI is transforming IT

Once you have automated as much as possible, you've set the stage for AI. AI is particularly important in IT organizations, and this is no less true in the IBM i and IBM Z space. With automation and AI, IT leaders have the information, insight, and recommendations to optimize and modernize their IT environments.

AI also has the potential to take over the role of developing and testing RPG or COBOL applications, which can minimize the resource challenges associated with IBM i and IBM Z development. AI could even reach a point where it alone becomes the IT admin, developer, and quality assurance teams for RPG applications — but the need for human oversight will remain high.

In reality, most companies will not be comfortable handing over complete control to AI for tasks such as development and QA. They will only want to provide partial control in healthcare or HR decisions. The level of human oversight should be proportional to the potential impact and severity of harm the AI system could cause. That level should be calculated based on your organization's geographic location, industry, risk tolerance, and your internal governance policies on AI.



## AI needs IA

Organizations need to know where to start with all the hype surrounding AI. It's essential to remember that AI needs information architecture (IA). Businesses have collected overwhelming amounts of data while AI has been lagging, creating a gap between the amount of data and the insights derived from it — often referred to as the "cost of not knowing." AI is catching up with new tools and applications, making it easier for non-technical people to interact with data. The key, however, is to ensure that the IA is well-defined, and the data inputs are accurate and consistent before embarking on the AI journey.

Here are a few of the many examples of AI in action in IT environments that illustrate how transformative it can be:

## Performance Optimization

AI algorithms can analyze workloads and predict resource requirements, enabling systems like mainframes to allocate resources based on demand dynamically. This helps optimize performance and ensure critical tasks receive the necessary computing power.

## Predictive Maintenance

AI-powered analytics can monitor the health of system hardware and predict potential failures before they occur. This proactive approach to maintenance helps minimize downtime and ensures the reliability of systems.

## Automated Operations

AI-driven automation can streamline routine system tasks, such as job scheduling, resource allocation, and system monitoring. This reduces manual intervention, improves efficiency, and frees up IT staff to focus on more strategic initiatives.

## Machine Learning for Workload Management

By employing machine learning algorithms, IT systems can more accurately analyze historical workload data to predict future resource requirements. This enables proactive capacity planning and ensures sufficient resources are available to meet workload demands.

## Application UX and workflow automation

Organizations are taking an evolutionary approach to application development, going from monoliths to API/REST services and eventually to microservices via refactoring. To smartly modernize and automate applications and workflows, organizations want a detailed and accurate understanding of how they use IBM i/Z applications and data. A thoughtful, data-driven assessment of IBM i/Z application workflows enables you to gauge the time and effort required for your project and reduce the possibility of cost overruns. With greater visibility of your workflow and processes, you can identify hot spots for automation and modernization improvements to drive real value for the business.

Process discovery is the process of understanding how users engage an application and dataset, including the specific steps they take in workflows, what data are accessed when, how long they spend at certain points in the workflow, steps skipped, shortcuts used, and more. It is a prerequisite for accurate AI enablement.

With data from process discovery, AI can support:

## Modern UI

In addition to making recommendations on the layout, a chatbot could be the new user interface to an application.

## Application integration

AI will integrate modern applications with other systems and services, such as APIs, databases, and third-party applications, improving interoperability and data exchange.

## Microservices

AI can identify opportunities to break up monolithic applications into smaller, more manageable microservices, improving scalability and flexibility.

## CI/CD

Introducing AI to CI/CD accelerates the development and release of apps without the need for a larger DevOps team. It could even improve the quality of code. The secret is AI-empowered testing. AI is progressing from automated, guided, and predictive code testing to making code recommendations and intelligent fixes.

### How RAG can improve LLMs

Large Language Models (LLMs) are powerful, but they do not understand your domain and processes. RAG, or retrieval-augmented generation, is an emerging AI technique designed to improve the output of LLMs by incorporating external information outside their training datasets before generating a response. RAG is crucial because it helps combat the nagging issue of hallucinations and enhances data security and privacy. And, by augmenting users' questions and prompts with relevant data retrieved from external data sources, RAG gives the model domain-specific facts and details on which to base its responses.

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# Top six best practices for supporting the evolution of work through automation

Now that we've discussed the competitive imperatives and the tools to achieve them, here are the best ways to avoid the potential pitfalls and alleviate skills shortages as you embark on continuous transformation initiatives.

## 01

**Start with process discovery to drive returns.** Process discovery ensures that modernization efforts are focused on the right things to make a difference to the users, customers, and the business. Find a tool that helps you capture and understand the information to make a knowledgeable decision.

## 02

**Stop thinking in silos.** Think holistically across IT and the business when implementing automation and AI. Take a broader view that incorporates hyperautomation, which Gartner defines as the orchestrated use of multiple technologies, tools, or platforms, including artificial intelligence (AI), machine learning, event-driven software architecture, robotic process automation (RPA), business process management (BPM) and intelligent business process management suites (iBPMS), integration platform as a service (iPaaS), low-code/no-code tools, packaged software, and other types of decision, process, and task automation tools.

## 03

**Identify your top talent and free up their time as much as possible** so they can work on innovative and experimental projects that help the business surpass competitors.

## 04

**Automate as much as you can**, but be strategic about it. Remember the Paradox of Automation: "The more efficient the automated system, the more crucial the human contribution of the operators.

## 05

**Start collecting data the moment you start automating.** For instance, if you automate order processing, why not store logs so you can train your future AI models with accurate historical data?

## 06

**Think of automation as a continuous cycle, not a journey with an end state.** The automation process is cyclical. Remember that automation requires regular review and improvement — and constant adaptation based on the insights collected from ongoing analyses.

# Conclusion

The evolution of work is here, now. Businesses must energize knowledge workers, adopt automation, apply AI, derive insights from data, and deliver the technologies that drive agility and enable rapid adaptation to stay competitive and thrive. This may seem insurmountable, but not if your business transforms one step at a time, starting with the most obvious opportunities. The name of the game is ongoing transformation enabled by the right processes and tools. Only with a continuous mindset and tools that provide insights into where to improve will you be ready for the evolution of work. And only then can employees — your most valuable asset — innovate with clarity and purpose.

## Rocket Software Solutions for Optimizing Skills and Efficiency

No matter where you are on your path to modernization, Rocket Software lets you continually optimize your business potential. With Rocket Software's Skills and Efficiency solutions for system performance, productivity, and workflows, your talent can do their best work on your biggest problems. You can automate to maximize efficiency and be ready for anything. And the nimble business you've been striving to build? It's well within reach.

No one else in the market offers the full breadth of talent enablement, automation, and business agility capabilities across the tech stack for both IBM i and Z systems. And, Rocket is the best at delivering feature-rich products that "just work" without heavy reliance on services contracts.

Gartner, How to Pursue Mainframe Modernization Patterns, Dennis Smith, 23 October 2023
Gartner Press Release, Gartner Forecasts Worldwide IT Spending to Grow 8% in 2024, Gartner Public Relations team, October 18, 2023


## About Rocket Software

Rocket Software partners with the largest Fortune 1000 organizations to solve their most complex IT challenges across Applications, Data, and Infrastructure.

Rocket Software brings customers from where they are in their modernization journey to where they want to be, by architecting innovative solutions that deliver next-generation experiences. Over 10 million global IT and business professionals trust Rocket Software to deliver solutions that improve responsiveness to change and optimize workloads. Rocket Software enables organizations to modernize in place with a hybrid cloud strategy that protects investment, decreases risk, and reduces time to value.

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