

Guide to automation for the Enterprise

The new era of digital automation is in its early days. It will drive disruption over the next ten years. The industrial revolution transformed economies and improved lives, and the digital automation revolution will bring similar productivity leaps, changing how we work for good.

Multiple global catalysts are fueling new demand for automation across all types of organizations:

- The global pandemic forced businesses to learn new operational modes and rethink how workers complete tasks.
- also alerted company leaders to the potential of unpredictable market upheaval, and the need for more adaptability and resilience.
- More data is available to businesses than ever before.
- Key technology growth, such as the cloud, SaaS in particular, and AI and ML has accelerated.

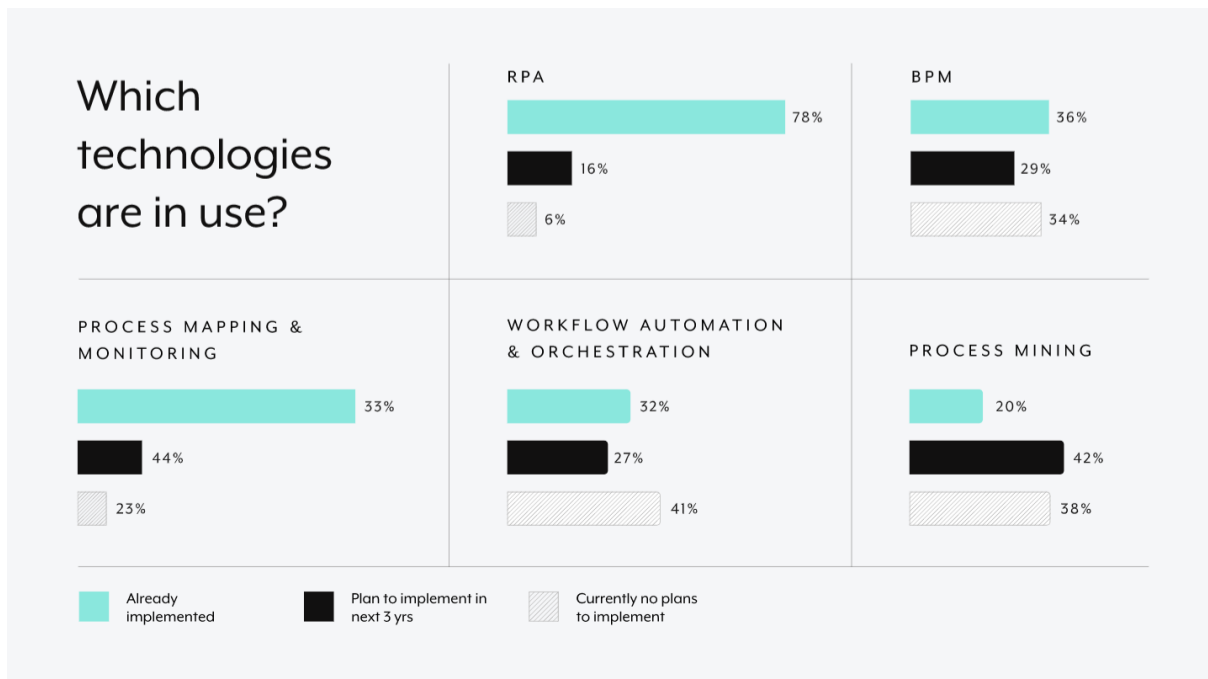
New categories of technology have sprung up, and old categories have repositioned themselves to address these trends for customers. The result is a confusing landscape of categories that make similar promises and sound alike. Many vendors have made acquisitions across category boundaries, adding to the confusion by blurring category lines.

Despite the confusion, category lines in automation still matter. The very architecture or DNA of platforms, even after M&A activity, is still rooted in their category, and that will dictate outcomes for businesses. This guide is designed to help business leaders distinguish between solutions in the automation landscape. We'll talk about several major categories in depth, and plot them on an automation maturity model to illustrate just how far each technology will take companies into the future.

While the term automation has many meanings, this guide will focus on automation of business processes.

The categories

Let's take a look at which categories are worth discussing and why. The [Deloitte 2021 automation survey](#) paints some of the most popular categories in broad strokes. For the purposes of this ebook, we will discuss these categories with one addition. Deloitte breaks the market down into robotic process automation (RPA), business process management (BPM), process monitoring, orchestration, and process mining. To that list, we will add integration platform as a service (iPaaS).



Throughout this paper, we'll talk about who uses each category of software and why, what their strengths and weaknesses are, and ultimately compare them to enterprise automation.

Enterprise automation

The major categories in today’s market are not zero-sum games. In other words, companies do not exclusively choose one category of software for their automation needs. Today, most companies patch together a collection of tools across categories to accomplish their goals. Analysts have attempted to name this puzzle patchwork strategy in various ways, such as Gartner speaking about “hyperautomation” or HFS Research referring to “OneOffice automation.” Another common name for the collection approach is “intelligent automation.”

But companies are becoming increasingly savvy to the challenges posed by this patchwork solution of tools. It is ironic that each category of tools promises to reduce fragmentation and transform the enterprise, yet the patchwork approach is a new form of fragmentation. While the promise of each individual solution is to break down silos, the end result is new silos across the different software solutions:



Recognizing the challenges with the patchwork approach, leading organizations are turning to a new category called enterprise automation that empowers end-to-end automation without the problems that come from the patchwork of tools. To keep up, many category players are turning to m&a activity to attempt to bolt together a solution that meets customer demands.

In *The New Push for Enterprise Automation*, [Morgan Stanley](#) research explains the trend well: “Companies are prioritizing resilience in the wake of the pandemic, and that’s driving demand for end-to-end automation...the next phase of readiness promises to be far more comprehensive—and it’s spurring a new era in automation software. To make the transition, a once siloed collection of technologies is coming together with a new category of infrastructure software to create end-to-end enterprise automation platforms.” The authors go on to explain: “wrangling an ever-growing portfolio of automation applications and services is challenging. Customers are increasingly interested in finding efficiencies between applications and saving money by consolidating their tools under one or two vendors.”

In this ebook, we’ll take a look at the state of each major category in the automation market, and compare them to the new category of infrastructure software that Morgan Stanley addresses: enterprise automation.

A key ingredient that some of these categories have while others don’t is low code/ no code (LCNC). This is a foundational pillar of enterprise automation, which allows automations to be created by people across the enterprise rather than being restricted to a small percentage of business processes handled by a small group of software experts.

Business Process Management

Origins: “Business Process Reengineering” or BPR, a concept first described in a 1990 issue of Harvard Business Review

Age: 30+ years old

Aliases (other names & acronyms): Business Process Management (BPM), Intelligent Business Process Management System (iBPMs), Business Process Automation (BPA), Business Process Outsourcing (BPO), Business Rules Management System (BRMS)

Focus: Consistent execution of complex events, processing of real-time events, efficiency for existing processes, reduced operational costs, streamlined systems and tasks, increased profit margin.

In-depth: Business Process Management, or BPM is not so much a category as it is a discipline that encompasses all of the acronyms above, and is often used as a blanket term for several software categories. A company can choose to manage their business processes in a variety of ways - they can outsource them to a third party (BPO) as often happens with payroll, human resources or call centers. They can draw out the process visually with process mapping tools, or they can capitalize on business events, interconnect systems, and define rules-based automations using iBPMs, BRMS, or BPA software.

BPM platforms were developed to help organizations better understand their processes and design strategies and tactics to effect improvements. On the other hand, Business Rules Management Systems (BRMS) are designed to manage complex business rules. These systems leverage rule sets created by business analysts and other experts that control and dictate the state of business operations and functions.

While BPA platforms were designed to automate business processes, the same capabilities to customize and automate workflows were built into function-specific applications. These applications are focused on streamlining a set of specific processes within a business function or department. CRM and ERP systems are good examples of these types of applications.

The outcomes achievable with BPM are powerful - and slow. Success is measured in years, and accomplishing the thorough reimagining of major processes with a group of experts, developers, and more. While BPM vendors see a positive outlook on their market growth, a huge percentage of the service providers and consultants in the space have begun focusing their energy on Robotic Process Automation, or RPA, which has been offering quicker wins and growing leaps and bounds over the past several years.

How does it stack up to enterprise automation: BPM tools are sometimes described as “big iron” software, or solutions brought to bear on really mission critical processes that require well-trained experts to help keep them running. While BPM can achieve significant outcomes, it unfortunately is being left behind as more organizations turn to other categories including enterprise automation.

Robotic Process Automation (RPA)

Origins: Software test automation, “green screen” scraping, and macros: a technique of recording a series of actions via graphical user interface (GUI) and playing them back on repeat to automate manual tasks

Age: 40+ years old

Aliases (other names & acronyms): Bots, process automation, robotic desktop automation (RDA), task automation

Focus: pure efficiency. Saving human work hours on manual tasks. “Better, faster, cheaper” as the mantra

In-depth: RPA is an on-premise tool that mimics the actions of a human. RPA can take the form of an attended automation which must be triggered by a person who kicks off the process, or unattended automation, which happens on a recurring schedule. 2021 was a big year for Robotic Process Automation (RPA). A blockbuster IPO, mergers and acquisitions, and talks of upcoming events set the stage for an even bigger 2022. Market growth for RPA is projected to expand from 1.7b in 2020 to \$9B by 2025 according to IDC.

Despite all the movement, there are signs that something strange is happening in the RPA category. For instance, the Sapphire Ventures CIO index reported that RPA is one of the top technologies that companies are hoping to spend less on in 2022. Troubling data suggests the software is not living up to its transformational hype. Forrester reports that RPA market growth will flatten as soon as 2023. And IDC reports that the overall enterprise automation market potential of \$40B dwarfs the \$9B projected for RPA.

RPA is most successful when used to access hard to reach systems or unstructured data with no way to connect to the cloud. RPA struggles when it is handed an entire transformation agenda, as some hapless technologists have attempted. If you think about it, this approach is another form of outsourcing - “botsourcing.” Transformation-minded enterprises are recognizing that they need to look beyond task automation to end-to-end, enterprise-wide opportunities.

How does it stack up to enterprise automation: While RPA can be used to complete tasks, buyers end up preferring enterprise automation over robotic process automation for several reasons:

It does not scale well: often companies struggle with broad automation initiatives based entirely on RPA. RPA bots capture UI tasks, and they become more fragile as more get deployed. Significant time is required to maintain a large volume of bots. Even if a platform has bolted on API, OCR, AI, or process mining capabilities, the bolt-ons bring another layer of maintenance. “Maintenance-hungry” automation impedes the pace of deployment and scalability.

It is difficult to govern across the enterprise: success at the enterprise level requires solid governance, but RPA platforms inherently wrestle with org-wide governance problems (both by IT and the business). Bots offer a great advantage of quick efficiencies, but as the number of bots increases, IT-driven governance & security best practices become harder to implement.

It can turn into tech & economic debt: RPA is the best fit for quick tasks where something repetitive needs to be done quickly. The collection of bots will grow, and so too will the maintenance needs. In essence, the army of bots demands another army of bot-managers. While the bot was supposed to take a load off the humans, the humans end up needing to take a load off of the bots.

It is worth noting that although RPA often gets lumped into “low code” software, it does not belong in the “easy to use” category. In addition to embodying the governance problems mentioned above, the technology still requires specialists to build and maintain the automations, and does not often see wide adoption by line-of-business organizations as a result.

Process mapping

Origins: the flow chart, which was first explained by Frank Gilbreth in 1921 to the American Society of Mechanical Engineers

Age: 100+ years old

Aliases (other names & acronyms): Flow charts, process mapping, process monitoring

Focus: pure efficiency. saving hours on manual tasks. “Better, faster, cheaper” as the mantra

In-depth: Flow charts have undergone quite the transformation in the last 100 years. From being hand drawn on drafting tables to being created with expensive on-prem software to today, where they are sketched out in drag-and-drop interfaces within the browser. Flow charts are a quintessential way to lay out a process visually and cultivate shared understanding with others of how something in a business works.

Process mapping is closely related to BPM. In the 1980s and 1990s, businesses would hire expensive consultants to come in, conduct interviews and research, and deliver process maps that illustrate how something was being done in the company, and a second map that illustrated how it should be done in the company. The company would then go try to implement that proposal to varying degrees of success.

Today, analysts still rely on process maps in a variety of ways, and now many software vendors have added on the ability to connect the maps to data, and monitor processes by keeping tabs on key milestones. Many organizations have begun to automate the process of creating the representation of the flow chart automatically with AI based on real data, which has led to the explosion of process mining platforms in the last few years.

How does it stack up to enterprise automation: This category is not a direct comparison to enterprise automation as most businesses today are not turning to process mapping tools to transform their businesses with the advent of so many automation technologies. However, it is an adjacent category that many organizations will still purchase as projects demand the need to manually map out processes or monitor the performance of that process over time.

Process mining

Origins: Wil van der Aalst, the 'godfather of process mining' spent years alone researching in the discipline, but it has grown into a major software category 20 years later

Age: 20+ years old

Aliases (other names & acronyms): Flow charts, process mapping, process monitoring

Focus: an objective, data-driven view of how processes are done within the company conducted by software with an eye on improvement.

In-depth: The IBM definition of process mining is apt: "Process mining applies data science to discover, validate and improve workflows. By combining data mining and process analytics, organizations can mine log data from their information systems to understand the performance of their processes, revealing bottlenecks and other areas of improvement. Process mining leverages a data-driven approach to process optimization, allowing managers to remain objective in their decision-making around resource allocation for existing processes."

Process mining technology is powerful and the market for these tools is red-hot today. It is also closely tied to automation, as naturally once process mining tools expose what is happening in your organization, it will prompt rethinking of how those processes are done. In fact some of the biggest players in this market have acquired integration and automation vendors to attempt to fill that need for customers once the areas for improvement are exposed.

How does it stack up to enterprise automation: If in fact improvement of pre-existing processes is a key part of the transformation plans for a business, process mining and enterprise automation technology can work hand in hand. However, the technology has a myopic focus on the processes an organization is already doing, which can lock a transformation initiative into focusing on efficiency at the expense of the other business outcomes of enterprise automation: innovation, growth, and greenfield opportunity. Companies looking to harness enterprise automation in their organization are cautioned to keep process mining technology in a balanced view, ensuring that they don't follow it so deeply that they become exclusively focused on efficiency and savings at the expense of all else.

Integration & Orchestration

Origins: Middleware. The original player in this space was Teknekron Information Bus, followed by Tibco.

Age: 20+ years old

Aliases (other names & acronyms): Integration Platform as a Service (iPaaS), Extract, Transform, and Load (ETL & ELT), data pipelines

Focus: often referred to as “plumbing,” integration technology is exclusively focused on ensuring data is moved between platforms, often via APIs.

In-depth: These software platforms integrate multiple applications via APIs so they can work together in an end to end process. These systems are enabling data to move from one system to another in real time. These pipelines are great for connecting analytics engines with data stores.

Integration is dependent on data, typically different types of data. In many cases this data is not in the same place. Software solutions are needed to route data across systems to support automation processes and strategies.

ELT/ETL is a closely related category that automates the process of extracting data and transforming data and loading it into another system. This transformation may include reformatting or cleaning the data based on rules. The only difference between ETL and ELT is the order in which data is transformed. In ETL the data is transformed before it is loaded into the new system. In ELT the data is transformed after it is loaded into the new system. Traditional ETL tools run on local hardware but more modern cloud-based ETL tools are also available.

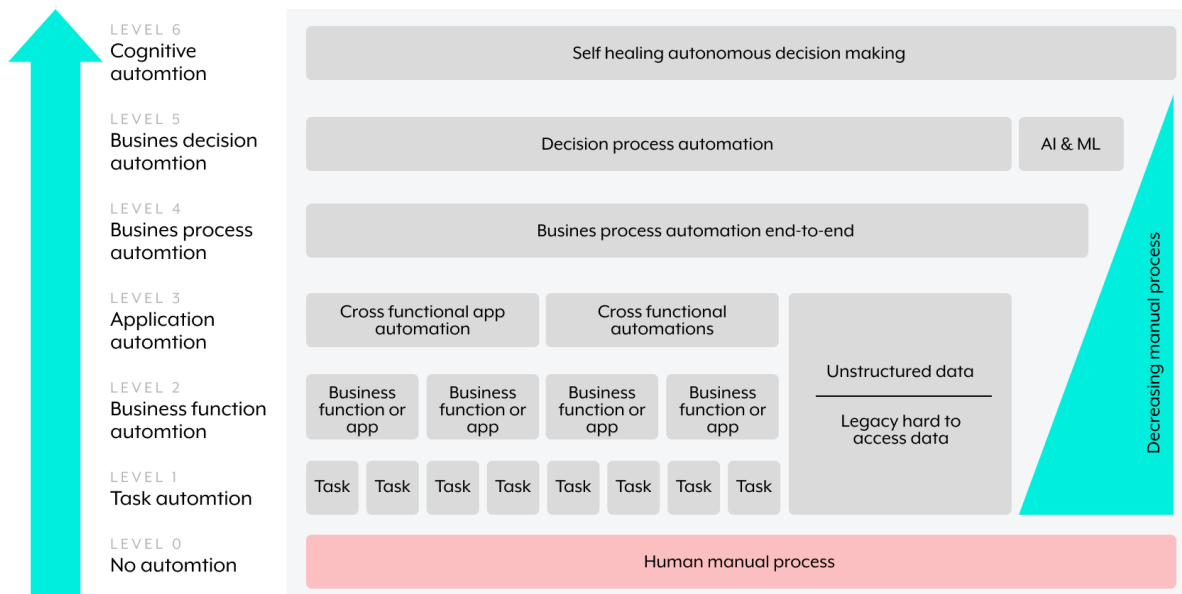
How does it stack up to enterprise automation: Integration and orchestration is an important category, because it forms the foundation of enterprise automation. However, traditional integration platforms have struggled to evolve into this new space. Like BPM, integration platforms fall into the “big iron” description, and are weighed down by technical complexity that requires experts with computer science degrees and wizard hats to ensure they stay running. Coding, development, and long wait times characterize the outcomes resulting from traditional integration. The software has a large install base and has been used to accomplish great things over the years, but as more of the market migrates to enterprise automation, the traditional integration play will have to work harder to keep up.

Automation Maturity Model - where do they all fall?

As the automation landscape evolves rapidly, in many cases, success will be determined by how mature an organization's automations strategy is. We have presented this model so operators can better understand how mature their current processes are and what steps need to be taken to evolve their strategy.

As automation strategies mature, three things happen

- 1) They address more complex processes in the organization
- 2) Humans are less involved
- 3) Processes, workflows and data get more connected



Typically there are 7 stages of realization and investment that lead to significant increases in efficiency. There are 7 stages that are the basis of our maturity model.

- 0** **The first stage** is really not a stage at all. In this stage, organizations rely on humans to perform all the work with no automation at all.
- 1** **The first real stage** of the automation maturity model is where single tedious tasks are automated. This could be as simple as a recorded Macro in an excel spreadsheet or an RPA Bot.
- 2** **The second stage** is where tasks get connected together into workflows or business function-specific automation.
- 3** **The third stage** of the automation maturity model is the combination of multiple function-specific workflows into a more complex process within an application. A good example is a CRM application that automates processes around customer management and sales.
- 4** **The fourth stage** of automation is creating workflows and processes that span multiple applications and systems and deliver end-to-end processes.

At this stage of the maturity model, managing an end-to-end process can get very complex. Vertically focused applications do not have the functionality to automate processes outside their focus. At this stage organizations typically invest in integration strategies to tie applications together or shift to a horizontally focused BPA platform, or a combination of both. Enterprises can leverage native app integrations to tightly tie two applications together or an orchestration platform can leverage APIs to tie together existing investments into an end-to-end process. BPA platforms can enable enterprises to build processes from scratch.

- 5** **The fifth stage** of the maturity model leverages AI and ML for more effective decision making. With so many functions, data, and processes integrated together, not only are complex processes connected but significant amounts of data is accessible. Predictive models that can access real-time data across an organization can support better decision making. Pricing algorithms that leverage automation processes across CRM systems and accounting systems and fulfillment systems is just one example.
- 6** **The sixth stage** is a bit more theoretical but builds on the concept of increased integration and intelligence. In this stage, the majority of decisions are made autonomously with very little human intervention. With this level of automation maturity, humans are only involved in the most complex decisions or unique situations and will be able to quickly render decisions within their existing workflow. Essentially we envision an environment where complex decisions are surfaced to the right decision-maker with the right data in an interface that they are most comfortable with. At this level of cognitive automation, systems would also be able to manage themselves and self heal when something breaks.

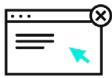
Building a Foundation For Maturing

While many technologies are coming together to support a winning strategy, the foundation on which you build this strategy is paramount. Strategies that are built around platforms that are too restrictive or brittle will eventually limit opportunities to evolve your automation strategy.

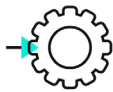
To effectively position your operation to evolve, grow, and mature you need to consider the foundation of your strategy. The DNA of each type of vendor is an important consideration



Bot-based - RPA solutions evolved from screen scraping and macros and focus on reducing manual tasks. These solutions are less focused on innovating new processes that leverage new technologies but were originally designed to focus on digitizing existing manual processes.



Application based - Whether it is a function specific application like a CRM or a BPA, these solutions are based on processes that are designed and planned out in a holistic manner. These platforms are evolving but are based on single integrated application platforms that manage data and processes in a single place. This approach is much less flexible and adopting new best of breed technology is difficult.



Enterprise Automation-based - DataIntegration is at the heart of these solutions and focuses on integratingsharing data and processes across applications. They combine integration and automation to harness the collective power of each disparate system in the automation of work.

Today, the three components of any process, people, data and processes are tightly integrated into rigid applications. LinkedIn, Salesforce, Marketo, and Slack are three examples of best of breed tightly integrated applications. Tomorrow, each dataset, process and user experience interface will be accessible individually through APIs to create dynamic end-to-end processes. User interfaces in one application will access processes in another and data in a third. For example, data created by LinkedIn can be processed by Salesforce, then Marketo and a report can be delivered to a sales person in the app they use the most, Slack. The key to this approach is a solid integration layer that can orchestrate these steps across each application. These experiences will be created and managed from a single platform and the complexity will be invisible to the user. Building this integrated enterprise wide workflow requires a best of breed integration technology at its core.

Consider automation as a journey or evolution. As additional processes are connected and become more intelligent, organizations will become more efficient. Greater maturity brings complexity and more dependencies; having a flexible and resilient automation scaffolding is key.