The Aragon Research Globe™ for Digital Business Platforms, 2018

Racing to Automation Innovation with Coordinated Digital Technologies

14 August 2018 | Research Note 2018-33

Author: Jim Sinur

Topic: Digital Business Platforms

Issue: Who are the DBP providers and how are they evolving?

Summary

Digital Business Platforms (DBPs) manage digital processes, applications, and transactions in a predominantly electronic manner, and offer a pleasing customer experience. This is accomplished by leveraging the latest or emerging digital technologies for intelligent automation. We evaluate 27 key providers who are leading the charge in the DBP market.

Introduction

Traditionally, organizations have conducted business with standard or best-practice processes, applications, and transactions without the benefit of new and emerging digital technologies. While Digital Business Platforms are all about accomplishing work digitally, they are, more importantly, about dynamic, goal-driven processes. These processes pursue business outcomes and application components that leverage emerging patterns of business while dynamically adjusting the goals as work is completed. More importantly, these platforms adapt to changing customer needs through the resources that service customers, processes, and applications that dynamically adapt and optimize in a predictive manner.

RESEARCH NOTE

Number: 2018-33
August 14, 2018

The Aragon Research Globe™ for Digital Business Platforms, 2018 – Racing to Automation Innovation with Coordinated Digital Technologies

TABLE OF CONTENTS

Automating the Adaptable Business

The race to the digital workplace involves eliminating analog processes. DBPs coordinate goal-directed work and support interactions between people, software, and machines in a most intelligent manner. DBPs are inclusive of many legacy processes and applications that have served enterprises in the past and can, in part, be leveraged in future digital solutions.

As more processes move to the digital domain, we will see a reduction in the use of people to complete low-level tasks in those processes. It is not that people will not be necessary; it is that people will be super-charged with cognitive powers, predictive analytics, big or fast data, and advanced visualization while interacting with the Internet of Things (IoT). Additionally, DBPs will deliver better development environments that leverage model-directed component assembly and Robotic Program Automation (RPA).

Why DBPs for Automation and Digitization?

There are three reasons to embrace the shift to DBPs: business automation leads to less complexity, faster time to revenue, and overall cost reduction. The primary driver for the rise in DBPs is the need to make business processes faster while dealing with frequent changes and increasing demands for customer-driven approaches. The aim of DBPs is to make resources smarter while leveraging vast amounts of fast data to recognize emerging business patterns, make informed decisions quickly, and take the next best action for better outcomes.

Processes and rigid applications remain one of the largest cost centers in the enterprise. The total cost to create, maintain, and run processes falls in the range of three to five percent of enterprise revenues. The need for differentiating and self-adapting work and process management is high, so DBPs are poised for growth. Aragon expects that the DBP market will grow into a U.S. $50 billion market by 2022.

Business Transformation

Digital transformation is about the speed of business. The DBP is about making business activity fully digital. In many cases, optimizing work is tactical, but the impact on the business is strategic. Exploring the full capabilities of a DBP within the scope of desired outcomes and an organization's business model adds strategic value. In some cases, organizations will alter their business models to leverage the digital advantages offered by DBPs. Enterprises increasingly understand that leveraging a DBP quickly speeds up processes while enhancing the customer experience. This signifies that the shift to going fully digital is already starting to occur. The challenge is that the DBP has many on-ramps to digital success, so picking first steps will likely require a digital transformation plan

that describes long-term outcomes and intermediate steps to deliver benefits. Listed below are some possible starting points for digital efforts leveraging a DBP (see the research note on mini journeys, Top Ten Foolproof Trailblazing Digital Journeys):

- Journey mapping (customer, employee, or partner)
- New user experience (UX, mobile, or workbench)
- Eliminate paper (electronic first mile process)
- Automated processes (RPA, bots, machines, and agents)
- Improved visualization (real-time, augmented reality, dashboards/alerts, and SLAs)
- Better exception management (process and rule adjustments)
- Decision and knowledge assists (predictive and cognitive)
- Real-time pattern recognition (IoT, big data, and rules)
- Low-code development (COGs, services, components, and microservices)
- Scenario planning (simulation, goal-driven, and planned responses)

Prediction: *By YE 2020, 65% of enterprises will augment or retire 40% of legacy processes in favor of those processes or applications based on one or more DBPs.*

Business Leaders Driving Change

The race to compete in the digital era means the rate of change and innovation in enterprises will reach unprecedented levels. CEOs and their senior executives are driving the shift to digital processes, meaning an extreme makeover of processes will abound. Conducting business faster is one of these shifts. In many cases, Aragon has witnessed CEOs pushing for DBP-based processes and applications because they have seen DBP action in other markets. The key reasons for pushing the DBP at the executive level include:

- Creating new products, services, or business models
- Accelerating revenue
- Driving efficiencies through automation
- Improving profitability
- Enhancing the customer experience
- Ensuring compliancy
- Linking to ecosystems for revenue or operational improvement

Key Digital Business Platform Trends

1. Customer Experience Is a Priority

Nearly all organizations want a "customer for life," unless a particular customer is difficult to work with over time. If you want the best customers, you have to treat your customers the best in your industry sector, at the very least. In order to maximize the lifetime value of a customer, you have to be proactive to attract repeat business. This means you need to explore ways to improve and future-proof your customer experiences. While better leveraging of websites, mobile/social channels, CRM systems, and self-service tasks will always be additive, these efforts will not future-proof the customer experience.

There is a big disconnect between what customers want and what organizations provide at key touchpoints in a customer's journey. Customers want organizations understand what they want and adjust to their specific needs. Instead, what customers frequently get is the challenge of navigating organizational silos, dealing with standard transaction-focused systems, and having to repeat their history to a customer service representative that has no freedom to handle exceptions. Worst of all, customers have to answer rigid surveys that really do not allow for intimate feedback.

Journey mapping is a great way to explore alternative approaches that can be implemented in a phased way. Leveraging analytics that consider past journeys/cases and learn from them is a great first step. However, this approach is not predictive, but reactive. While it is better than doing nothing, steps should be taken to predict what customers will want and how they will behave. Exceptions can also be anticipated, categorized, and predicted in terms of arrival rates and potential responses. Better customer partitioning combined with predictive analytics will allow for more precise personalization. Predicting and personalizing in real-time through more flexible processes and applications will win customers' hearts. DBP vendors are either partnering with or buying Customer Journey Mapping (CJM) vendors to provide a better customer experience.

2. Automation Is Pervasive

There are a number of automation opportunities in an organization, but recently, bots have grasped market attention thanks to three popular sources. Chatbots are strategic for simple tasks, such as looking up and responding to basic requests (like asking for a particular music group, the daily weather, and the latest news). Since these chatbots are first-generation, complex questions confuse them, but their understanding will improve over time. Certain bot capabilities, like obtaining customer service by bypassing a voice response system, will make or break the bot movement. However, bots also have certain drawbacks, like their ability to listen to all conversations and interject when they are not wanted, which happens in rare situations.

Robotic Process Automation (RPA) bots are usually performing behind-the-scenes work for organizations or customers. Typically, the kind of work that RPA does today includes traversing different systems and data sources to compile an integrated set of views and data necessary to support customer and business outcomes. As RPA matures, it will broaden in scope and increase productivity. It will likely start with the integration of user interfaces, systems, and structured data. Over time, RPA will include more unstructured data and add analytics, machine learning, and deep learning and grow to become the knowledge worker's best friend in particular specialties.

Digital Assistants will evolve like RPA and become smarter to the level of calling on other bots to resolve an inquiry, a specific goal, or a complex set of outcomes. At first, these assistants will bond to individuals or individual specialty work pools, but over time, these assistants will offer general skill capabilities. There will still be deep specialty assistants, but the emergence of general purpose, intelligent bots will happen, too. Bots are here to assist us and will be prospering in the foreseeable future. DBP vendors are either partnering with or buying bot-related technologies to supercharge their automation capabilities.

3. Intelligence Supercharges Outcomes

While algorithms have and will continue to make people, processes, and applications smart, Artificial Intelligence (AI) is gaining momentum. Cognitive AI will help organizations in at least seven areas of concern and can deal with the endless combinations and permutations facing us. If you want to master digital work, you need cognitive AI.

a. Grokking Big and Fast Data

The number of data sources—even without additional ones generated by the IoT—and the depth of the data lakes are unknown. Text, voice, image, and video data, combined with unstructured data, contribute to the overwhelming size and scope of data. Cognitive AI, with or without machine learning, can sort through this barrage of data to find patterns of interest and triggers for decisions and actions.

b. Managing the IoT Population Explosion

It's clear that the number of devices is exploding and the signals they emit create an even bigger big data problem. However, managing these devices without rigid or flexible chips will be an even greater challenge. These devices will be deciding and acting alone or in concert with other devices on the edge, driving toward changeable goals without violating constraint boundaries. This means that these devices need to be smart so we can pass control to the edge to create smart and dynamic swarming agents guided by AI.

c. Leveraging Opportunities and Risks

Signals and patterns need to be quickly sifted through and aggregated into patterns of interest so that managers can reach a decision for optimizing an organization's opportunities or protecting it from emerging risks. This sifting, aggregating, and learning can be assisted and supercharged by cognitive AI. Cognitive AI can verify appropriate responses for wise organizations that have anticipated key triggers and patterns and have planned responses on the shelf.

d. Divining Great Decisions

Today, optimal decisions can be made by applying the right set of algorithms in the proper sequence. Analytics, or poly-analytics, can be further leveraged by using cognitive assists to decide on new combinations and sequences, thus replacing the human trial-and-error application of filters and algorithms. Even predictive algorithms can be enhanced by AI.

e. Delivering on Shifting Goals

Goals not only conflict and compete, but they continually shift. As this shifting takes on a new speed of change, cognitive AI can create the right balance for emerging situations. As processes and swarming agents become more goal-directed than flow-directed, organizations can act on shifting goals that leverage constraints. Cognitive AI can play a role in setting these goals and constraints.

f. Complying with Growing Governance

The problem with governance standards is that they stand alone in nature. Organizations are usually barraged with multiple governance standards that have to be mixed with the organization's desired outcomes, represented in goals and constraints. Cognitive AI can be leveraged in sorting out the complexities of overlapping governance standards while they change in-flight.

Keeping Actions on Point

All of the above contribute to the right action taken at the right time, but constituent desires also need to be added to the mix. Cognitive AI can represent customer, employee, partner, and vendor goals that need to be considered. This gives a dimension of just-in-time satisfaction that keeps an organization's desired outcomes in dynamic balance with constituent-desired outcomes.

Cognitive AI offers humans the advantage of staying up-to-speed with various tasks. It starts with digital assistants, then supercharges the competence of every person and

program through the use of Cognitive Services (COGs), and finally moves control to the edge through smart and agile agents that may include robotics.

Key Aspects of Digital Business Platforms

Digital Business Platforms are new and emerging. DBPs are the convergence of major technology streams and are extremely open so that they can serve as a cornerstone platform. This platform is inclusive of many legacy processes and applications that have served enterprises well in the past and can, in part, be leveraged in new digital solutions. The new digital solutions will include IoT, vast amounts of new data, new interactions or sensing, better human interaction, business and IT collaboration features, improved ecosystem connections, superior security, and a continuous stream of emerging digital technologies. Most DBPs are not at 100% complete functionality at this point in time, so they may have to be augmented by other technologies or even another specialty-featured DBP.

The most important difference with DBPs is that they are smart in many different ways and can self-adapt over time. Each organization can architect and build their own DBP, but Aragon believes that most organizations will buy one or a few open DBPs and link them together along with their legacy and specialty satellite vendors. In general, organizations do not have the time or capital to build a DBP from scratch and their legacy platforms will deteriorate over time. The good parts of legacy may survive, but most organizations are using either fossilized or burning platforms.

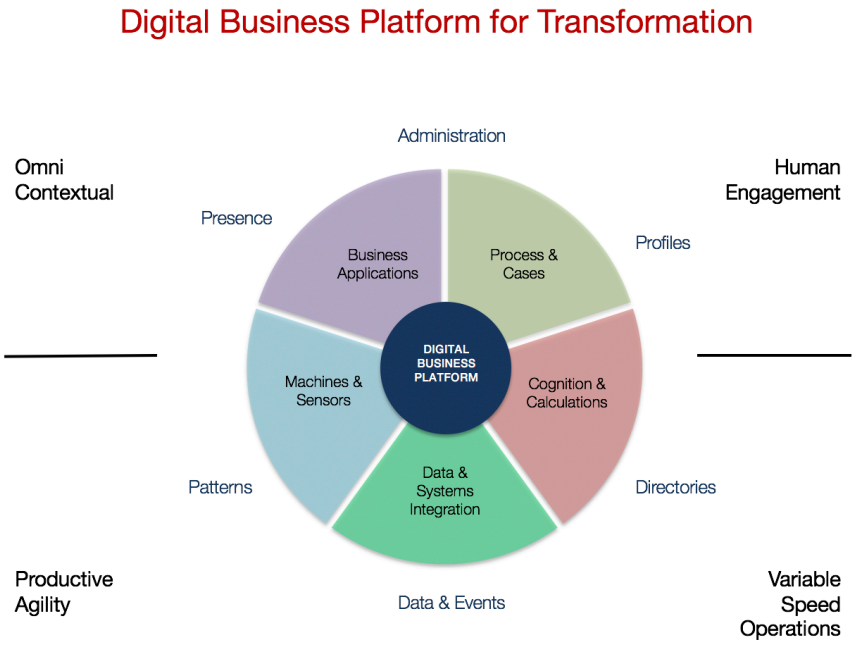

Figure 1: The Digital Business Platform for Transformation.

The key features that buyers are looking for in a Digital Business Platform include:

- Work management capabilities (process, cases, workbenches, collaboration, mobile, superior human/machine engagement, and physical/logical representation)
- Smart/teachable capabilities, AI, decision optimizing, and action features (poly-analytics, cognition, machine learning, pattern recognition, simulation/optimization, and prediction)
- Universal big and fast data and ecosystem linkage capabilities (integration, transformation, interfaces, model-driven, component assembly, low-code, and Robotic Process/Program Automation)
- Machine and sensor management (signal/event management, smart controllers, swarm collaboration, perception, and autonomous contextual behavior)
- Reusable application function (packages, templates, process snippets, components, cognitive components (COGs), services, APIs, policies, rules/constraints, and microservices)
- Emerging technology inclusion (sandboxes, parallel environments, emerging feature simulation, scenario support, digital twin enablement, and change management support)
- Security administration (global/local identifiers, profiles/preferences, bio-authentication, device authentication, and data isolation)

A critical step includes examining which processes and associated resources should be fully digital. Making it easy for end users is also important, which includes separating the technical backbone of how things happen from what users need to accomplish. This is also why Aragon named this platform a Digital Business Platform, not a Digital Technical Platform, though DBPs leverage many technologies.

Vendor	Work Management	Proactive Intelligence	Integration & Development	IoT Enablement & Edge Behavior	Business Functionality
Adobe	✓	✓	✓		
Appian	✓		✓	✓	
AuraPortal	✓	✓	✓	✓	
Bizagi	✓	✓	✓		
Bonitasoft	✓	✓	✓		
Bosch	✓	✓	✓	✓	
Cisco	✓	✓	✓	✓	
GE		✓	✓	✓	
Genpact	✓	✓	✓	✓	
Google	✓	✓	✓	✓	
IBM	✓	✓	✓	✓	
Intel			✓	✓	

ITESOFT/W4	✓	✓	✓		✓
iVEDiX	✓	✓	✓	✓	
K2	✓		✓		✓
Kofax	✓	✓	✓		✓
Microsoft	✓	✓	✓	✓	✓
Nintex	✓	✓	✓		✓
Nvidia		✓	✓	✓	
Oracle	✓		✓	✓	✓
Pegasystems	✓	✓	✓	✓	✓
Red Hat	✓		✓	✓	
SAG	✓	✓	✓	✓	
Salesforce	✓	✓	✓		✓
SAP	✓	✓	✓	✓	✓
TIBCO	✓	✓	✓	✓	
XMPro	✓	✓	✓	✓	✓

The Aragon Research Globe Overview

The Aragon Research Globe graphically represents our analysis of a specific market and its component vendors. We do a rigorous analysis of each vendor, using three dimensions that enable comparative evaluation of the participants in a given market.

The Aragon Research Globe looks beyond size and market share, which often dominate this type of analysis, and instead uses those as comparative factors in evaluating providers' product-oriented capabilities. Positioning in the Globe will reflect how complete a provider's future strategy is relative to their performance in fulfilling that strategy in the market.

A further differentiating factor is the global market reach of each vendor. This allows all vendors with similar strategy and performance to be compared, regardless of their size and market share. It will improve recognition of providers with a comprehensive strategy and strong performance, but limited or targeted global penetration, which will be compared more directly to others with similar perspectives.

Dimensions of Analysis

The following parameters are tracked in this analysis:

Strategy reflects the degree to which a vendor has the market understanding and strategic intent that are at the forefront of market direction. That includes providing the capabilities that customers want in the current offering and recognizing where the market is headed. The strategy evaluation includes:

- Product

- Product strategy
- Market understanding and how well product roadmaps reflect that understanding
- Marketing
- Management team, including time in the job and understanding of the market

Performance represents a vendor's effectiveness in executing its defined strategy. This includes selling and supporting the defined product offering or service. The performance evaluation includes:

- **Awareness**: Market awareness of the firm and its product.
- **Customer Experience**: Feedback on the product, installs, upgrades, and overall satisfaction.
- **Viability**: Financial viability of the provider as measured by financial statements.
- **Pricing and Packaging**: Is the offering priced and packaged competitively?
- **Product**: The mix of features tied to the frequency and quality of releases and updates.
- **R&D**: Investment in research and development as evidenced by overall architecture.

Reach is a measure of the global capability that a vendor can deliver. Reach can have one of three values: *national*, *international,* or *global*. Being able to offer products and services in one of the following three regions is the third dimension of the Globe analysis:

- **Americas** (North America and Latin America)
- **EMEA** (Europe, Middle East, and Africa)
- **APAC** (Asia Pacific: including but not limited to Australia, China, India, Japan, Korea, Russia, Singapore, etc.)

The market reach evaluation includes:

- Sales and support offices worldwide
- Time zone and location of support centers
- Support for languages
- References in respective hemispheres
- Data center locations

The Four Sectors of the Globe

The Globe is segmented into four sectors, representing high and low in both the strategy and performance dimensions. When the analysis is complete, each vendor will be in one

of four groups: *leaders*, *contenders*, *innovators,* or *specialists*. We define these as follows:

- **Leaders** have comprehensive strategies that align with industry direction and market demand and effectively perform against those strategies.
- **Contenders** have strong performance, but more limited or less complete strategies. Their performance positions them well to challenge for leadership by expanding their strategic focus.
- **Innovators** have strong strategic understanding and objectives but have yet to perform effectively across all elements of that strategy.
- **Specialists** fulfill their strategy well but have a narrower or more targeted emphasis with regard to overall industry and user expectations. Specialists may excel in a certain market or vertical application.

Inclusion Criteria

The Aragon Research Globe for Digital Business Platforms, 2018 will help clients differentiate the many vendors that offer enterprises the tools for pursuing business outcomes while dynamically adjusting goals as work is completed.

The inclusion criteria for the Aragon Research Globe are:

- **Revenue:** A minimum of $10 million in primary revenue for digital business or a minimum of $8 million in revenue in a related market (process/work management, AI/analytics, IoT/edge computing, cloud integration/development/RPA, and smart business applications/microservices).
    - DBP, as defined by Aragon, is an evolving market. A vendor needs to have at least 80% of the modules to be evaluated. DBP modules include: process/work management, AI/analytics, low-code integration/development, IoT/edge computing, and business function.
- **Shipping product:** must be announced and available.
- **Customer references:** Vendor must produce a minimum of three customer references in each hemisphere in which the vendor participates.

Aragon Research evaluates markets and the major technology providers that participate in those markets. Aragon makes the determination about including vendors in our Aragon Research Globes with or without their participation in the Aragon Research Globe process. Aragon's analysis is based on its research and use of other valid sources including:

- Publicly available information

- Discussion with enterprises that use the product

Non-participation by technology providers in the Aragon Research Globe process does not affect their inclusion in this research note. The inclusion criteria listed in this research note is the determining factor.

Inclusions

This is the inaugural DBP Globe, so all vendors are new to this rating. In 2017, Aragon produced an early market rating, The Aragon Research Tech Spectrum™ for Digital Business Platforms.

Exclusions:

The following vendors were not included in the report, but are notable for future potential:

- ***Amazon***
- ***Appway***
- ***AT&T***
- ***Axway***
- ***Dell/VMware***
- ***Drishti***
- ***Infosys***
- ***Infor***
- ***Informatica***
- ***OpenText***
- ***ServiceNow***
- ***Workday***
- ***Zoho One***

The Aragon Research Globe™ for Digital Business Platforms, 2018
(As of 8/14/18)

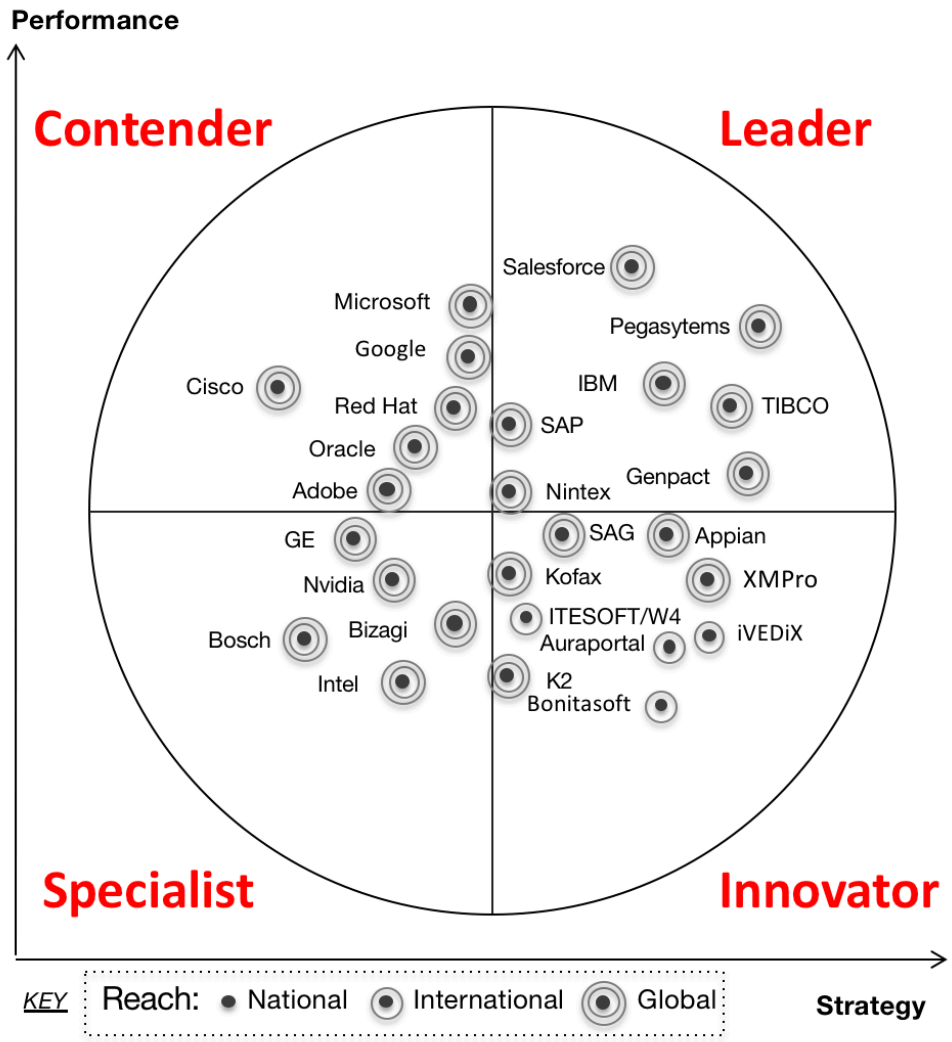

Figure 2: The Aragon Research Globe for Digital Business Platforms, 2018.

Leaders

Genpact

Genpact, based in New York, focuses on digital transformation through leveraging adaptive techniques driven by AI and analytics. Genpact was founded as a business unit of GE in 1997, and in 2005, became a successful, independent service-driven company that is now listed on the NYSE. Genpact has a number of large clients on a worldwide basis.

With acquisitions of leaders in the process management (PNMsoft) and Customer Journey Mapping (TandemSeven) sectors, plus the building of an operationally-focused AI platform called Cora, Genpact now has a Digital Business Platform that can compete successfully for digital transformation efforts. Cora can assist automation-focused, analytics-focused, and AI-enabled efforts. While initially used as a digital sandbox, the Cora platform combined with other technologies has been used in successful and adaptive digital journeys.

Strengths

- Great vision for digital business
- Significant customer journey experience
- Strong experience in operational excellence
- Advanced analytics for real-time insights
- AI is a significant factor in recent solutions.

Challenges

- Worldwide market awareness
- More well-known implementations
- Fewer service-driven engagements

IBM

IBM, based in New York, was a pioneer in and continues to push the story around AI and cloud-focused Digital Business Platforms. IBM Watson business units focus on smart digital solutions by leveraging both deep analytic and AI capabilities. IBM has an industrial-strength cloud operations platform that also includes a successful and prolific component assembly approach to digital experimentation that can smoothly transition to production operations.

IBM is moving strongly toward a multi-directional AI-assisted approach—called augmented intelligence—with traditional, non-traditional, and visionary digital delivery. IBM has a big bet on AI in an industrial-strength cloud platform while pushing forward with multiple emerging technologies new to digital delivery. IBM is bringing together a large portfolio of existing products with new and non-traditional digital technologies.

Strengths

- Great brand, worldwide presence
- Great vision for digital business
- Rapidly growing industrial cloud presence
- Significant software portfolio
- Already present in many organizations
- Emerging cognitive AI presence with Watson

Challenges

- Complex offering with overlapping features
- Integration of its formidable portfolio
- Creating well-known success with digital journeys
- Buyers often have to avail themselves of IBM consulting to achieve success

Nintex

Nintex, based in Bellevue, Washington, focuses on leveraging quick and easy development of workflow and process by incrementally delivering digital results leveraging point solutions to a growing digital journey. This allows organizations to turn tactical results into strategic efforts. Nintex focuses on human processes and workflows to move organizations toward aggregate operational productivity and excellence.

In 2016, Nintex launched its Workflow Cloud platform, which integrates traditional BPM and document generation capabilities into one platform and is positioned to offer advanced DTM capabilities for Workflow and Content Automation (WCA). Nintex has been growing, in part due to its global reseller network and because of its brand awareness in Microsoft environments. As a pioneer in Workflow and Content Automation, Nintex is one to watch.

Strengths

- Easy provider to work with for results
- Significant customer success to promote
- Easy to get a quick start for business results
- Advanced speed development features
- Strong workflow analytics

Challenges

- Worldwide market awareness
- Amping up AI usage
- Spreading the word on digital successes

Pegasystems

Pegasystems, based in Boston, Massachusetts, has been a driving force in the shift to Digital Business Platforms. The company pioneered the shift to applying a smart platform to real business solutions and desired outcomes. This approach has driven broad international awareness and rapid growth of smart platforms that leverage process, intelligence, decisions, and predictive next best action for operational efficiency while providing an adaptable platform that organizations can build with change in mind. Change is the fuel of digital transformation and Pegasystems is one of the best at adapting to change.

Pegasystems is leveraging its ability to transform and is now aimed at incremental digital transformation through its Pega Infinity digital transformation suite. To that end, RPA is being embedded in the base product to boost incremental automation. The practical approach to leveraging AI is now yielding self-optimizing marketing campaigns, dynamic customer journeys, and email assistants. Pegasystems is also boosting its automated programming and testing capabilities, making it more capable of processing in faster increments.

Strengths

- Innovative management
- Strong brand recognition and presence
- Smoothly integrated functionality
- Innovative yet practical use of AI for workforce management and customer engagement
- Strong Robotic Process Automation
- Pre-built smart solutions
- Change-enabled architecture

Challenges

- Complex to use (a lot of levers), but Pega Express is making things easier
- Gravitates toward central control solutions

Salesforce

Salesforce, based in San Francisco, California, focuses on customer relationships via its sales, marketing, service, and community management clouds built on a powerful, yet easy to use business platform. This platform has significant potential to help organizations in their digital transformation journeys. Salesforce inherently embodies digital business processes and now is being enhanced to support a comprehensive DBP to expand into more areas of business.

In 2018, Salesforce bought MuleSoft, which allows Salesforce to draw data from almost any software system. As a result, the Salesforce platform is being expanded and will become more integrative in nature. This will allow clients to leverage the Salesforce analytics and predictive capabilities. Salesforce also bolstered its AI potential through a stronger partnership with IBM.

Strengths

- Great brand and worldwide presence
- Large partner network
- Out-of-the-box solutions for sales and marketing
- Easy to use and open platform
- People-centric culture that is socially sensitive
- Practically embedded (AI) for discovery, analytics, and bots
- Journey builder for Customer Journey Mapping

Challenges

- Complex offering with overlapping partners
- Expensive customization often required

SAP

SAP, based in Walldorf, Germany, focuses on providing business applications in the cloud. Vertically, SAP has prowess in ERP, CRM, and various vertical industries. SAP is building an infrastructure leveraging the cloud and big data for business visibility leveraging advanced visualization approaches. Some of the world's largest enterprises depend on SAP's ERP capabilities because of the size and scope of the transaction capabilities it offers.

SAP has been actively building digital centers worldwide with a methodology that is "linked" to software under the name SAP Leonardo. SAP Leonardo wants to enable enterprises to create better outcomes through industry innovation kits and intelligent technologies like machine learning, IoT, blockchain, and embedded analytics. With the acquisition of Plat.One in 2016, the partnering with Mendix, and the acquisition of Recast.AI this year, SAP now has some software assets that it can leverage in bots, low-code, and IoT for digital transformation journeys.

Strengths

- Brand and awareness
- Worldwide presence
- Significant inventory of applications and quick starts to leverage
- ERP install base
- Proven BI and analytics capabilities
- Emerging SAP Leonardo method and intelligent technology including bots, low-code, and IoT
- Emerging digital innovation focus

Challenges

- Complex offering with overlapping features
- Expensive to implement, store data, and upgrade
- Early with digital success

TIBCO

TIBCO, based in Palo Alto, California, focuses on linking various digital assets and ecosystems in an adaptive, fast, and smart way to allow organizations to evolve digitally. With its strong analytic assets applied to applications and processes, TIBCO is looking to place organizations on a path toward digital that leverages speedy adaptability and intelligence driven by poly-analytics. TIBCO has significant case studies in real-time management of IoT networks in transportation and utility management.

TIBCO has been enhancing its analytics offering, Spotfire, to go beyond BI to leverage visual and streaming analytics. Of significance is its ability to have different layers of analytics interconnected with its flagship integration offering, TIBCO Cloud Integration. TIBCO's component approach to development leverages data, APIs, and process fragments to help automate enterprises. With the recent acquisition of Scribe Software, a cloud integration company, TIBCO extends its reach to more user personas and data sources. While TIBCO focuses its marketing message on integration and analytics, it extends its capabilities with process management and low-code development for automation.

Strengths

- Worldwide presence
- Great vision for smart digital business
- Proven analytic and statistical chops
- Significant experience in real-time speed
- Strong IoT and edge computing support
- Significant software portfolio
- Already present in many organizations

Challenges

- Complex offering with overlapping features
- High skill levels are required to create solutions
- Limited integration of AI capabilities

Contenders

Adobe

Adobe continues to grow its Adobe Experience Cloud that was designed to give enterprises the ability to provide exceptional customer experiences. This includes marketing, advertising, and sales support functions. Supported by a strong analytics capability, organizations can fine-tune their offerings to increase their sales results. Adobe leverages AI and machine learning to assist these efforts.

With the recent acquisition of Magento, Adobe adds a proven digital commerce platform that can be used to deliver commerce cloud innovations. Magento brings a portfolio of cloud-based omnichannel solutions that empowers merchants to successfully integrate digital and physical shopping experiences.

Strengths

- Brand and financial stability
- Advanced creative processes
- Advanced DTM capabilities
- Significant new commerce platform
- Strong applied analytics

Challenges

- Complex offering with overlapping features
- Digital awareness beyond core product

Cisco

Cisco, based in San Jose, California, focuses on the IoT-based delivery of applications and systems for connected things. Its IoT delivery offering leverages its network presence in collaborative communications and work management. Cisco bought leading IoT provider Jasper in 2015 and it has continued to invest in IoT primarily via acquisitions. Cisco Jasper has a large number of customers leveraging its solutions in multiple industries, including agriculture, automotive, healthcare, industrial, cities, and transportation.

Cisco's acquisition of AppDynamics allowed it to leverage its presence through the measurement of the multitude of devices in the network of connected things. In May 2018, Cisco completed its acquisition of Accompany, a provider of AI technology, to bolster its collaborations capabilities. It remains to be seen if the AI technology will be applied to other aspects of Cisco's offerings.

Strengths

- Worldwide brand and presence
- Collaboration and communications capabilities
- Network optimization
- Focus on IoT
- Presence at the edge
- Partner channel

Challenges

- Foggy digital strategy
- Needs digital momentum
- Limited in process automation scope

Google

Google, based in Mountain View, California, focuses on internet services supported by the cloud. While the Google Cloud has a sizable portfolio of solid software that is growing in integrated capability, each one stands on its own. The Google Cloud Platform serves as core infrastructure for enterprises wanting to build next-generation applications. This includes computing, storage, database access, networking, and Google's flagship capabilities in big data, and machine and deep learning.

Google has thousands of companies running applications on the Google Cloud, but many large enterprises are still learning about all of the capabilities Google has to offer. With Google's investments in machine learning and support staff for creating usable solution sets of Google technology, we expect to see more focus on overall platform capabilities. Recently, Google demonstrated a conversational AI assistant that shows the potential of AI in action. This required bringing a number of its technologies together for strong business outcomes.

Strengths

- Brand
- Innovative practices
- Universal presence
- Significant portfolio of software
- Visionary in AI
- Open technologies
- Easy to start with a freemium model

Challenges

- Awareness of full capabilities
- Combining individual components into a full platform

Microsoft

Microsoft, based in Redmond, Washington, focuses on providing software for a multitude of devices locally and an industrial-strength cloud platform to support digital business. Microsoft has significant functionality that soundly represents software needed in a digital transformation, despite a lack of seamless integration.

Microsoft has been investing heavily in its Azure Cloud Platform, which has a number of options for machine learning and cognitive processes marketed as a service. Both Office 365 and Dynamics 365 can leverage the Cortana Intelligence Suite, as well as integrations from partners. Many enterprises and Microsoft partners leverage the Microsoft Cloud Platform for building digital business applications. In fact, AI is one of the three pillars of Microsoft's strategy and most of Microsoft's resulting applications will contain AI.

Strengths

- Brand and awareness
- Building a strength in IoT with intelligent gateways
- Worldwide presence
- Great execution in the cloud arena
- Significant inventory of software products
- AI delivery
- Already in many organizations

Challenges

- Product silos interfere with customer success
- Limited digital success stories
- More of a generic cloud platform than a provider of business automated tools

Oracle

Oracle, based in Redwood City, California, focuses on creating an industrial-strength cloud approach to support its vertical applications and its technological infrastructure software. Oracle has a reputation for database, integration, and horizontal enterprise management software. Vertically, Oracle has prowess in ERP, CRM, sales management, and merchant operations that embody many digital processes.

Oracle continues expanding its customer base and adding richness to applications as it continues to migrate customers to its cloud offering. The Oracle Cloud offers a complete set of applications that allows for the building of digital business applications that can be customized with its process management functionality. One of Oracle's key strengths is in Oracle Policy Automation (OPA), which is one of the more advanced offerings on the market to automate policy. Oracle has started to leverage its 2016 acquisition of NetSuite, which uses AI in a limited number of verticals.

Strengths

- Brand and awareness
- Worldwide presence
- Significant inventory of applications to leverage
- Significant inventory of infrastructure software
- Emerging cloud presence

Challenges

- Software and hardware silos
- Need other Oracle components for a solution
- Vertically-focused and limited AI

Red Hat

Red Hat, based in Raleigh, North Carolina, focuses on creating an industrial-strength cloud approach aimed at an adaptable digital infrastructure with significant integration assets for data interchange. Using an open-source approach, Red Hat has turned the collaboratively built assets into a true digital platform but seems to have momentum on the digital infrastructure play.

While Red Hat has significant process management, case management, decision management, and application development assets, there is little momentum behind using these together and creating innovative case studies.

Strengths

- Brand and awareness
- Worldwide presence
- Strong cloud presence
- Significant inventory of integration software
- Process, case, and decision management software

Challenges

- Single focus on IT infrastructure
- Limited vision for digital business
- Limited vision for AI

Innovators

Appian

Appian, based in Washington, D.C., was one of the early pioneers in cloud-based BPM. Today, Appian focuses on helping customers with their digital transformation journeys by leveraging a cloud-based, low-code development environment to deliver speed to market business outcomes. Because of a delivery focus, Appian has a significant inventory of customer successes in digital delivery.

In 2017, Appian made a move to partner with Blue Prism to leverage RPA as a new on-ramp to digital transformation and this has helped Appian gain another tactical revenue stream that links well to the low-code tactic. Appian is doubling down on partner dependence and wants to compete with Salesforce by going head-to-head with Force.com.

Strengths

- Great on-ramps for digital business
- Significant customer success to promote
- Easy to get a quick start for business results
- Momentum on RPA
- Advanced speed development features
- Easy provider to work with for results

Challenges

- Little vision for AI
- Betting on tactical low-code and RPA as a strategy

AuraPortal

AuraPortal, based in Valencia, Spain, is a process-centric business platform that is dialed into real-time feedback assisted by analytics. Today, AuraPortal focuses on helping customers with their digital transformation journeys by leveraging incremental process improvement enabled by quick-change capabilities. Because of a delivery focus and an inventory of solution jump-starts, AuraPortal has a significant inventory of customer successes in digital delivery.

AurPortal has been successful in partnering to expand into Latin America and will leverage this experience where possible to grow its worldwide presence. We expect AuraPortal to leverage GDPR to pick up European partners as well.

Strengths

- Great vision for incremental change
- Significant customer success to promote
- Easy to get a quick start for business results
- Advanced quick-change features
- Easy provider to work with for results

Challenges

- Just emerging in the U.S. market
- IoT features lagging competition

Bonitasoft

Bonitasoft, based in Paris, France, has a strong history and background in BPM, with a focus on fast incremental development of digital processes and applications. Bonita helps clients with the tactical delivery of digital processes leading to a habit of positive digital outcomes and an enabled digital journey.

One of Bonita's core strengths is its speed of modeling and implementing core processes. The platform permits rapid end-to-end development and deployment for DevOps teams, on-premise, and in the cloud. Recently, Bonita has demonstrated success with RPA, leveraging UiPath as a key partner in this digital on-ramp to strong automation.

Strengths

- Build for innovation and rapid development
- Large partner ecosystem
- Easy to get a quick start for business results
- Significant customer successes

Challenges

- Market awareness worldwide
- Smart work assignment

ITESOFT/W4

ITESOFT, based in Paris, France, focuses on smart process applications and has an infrastructure designed for business agility and process optimization. ITESOFT is aimed at giving organizations a jump-start with backend process solutions, content, and first mile capture.

The combination of first mile capture solutions, an end-to-end process automation and management capability, and some significant investment in emerging technologies (linkages with IoT and a significant rule engine) has allowed ITESOFT to excel in areas such as customer interaction solutions, storage and records assignment, supplier collaboration, and fraud detection.

Strengths

- Strong integrated architecture
- Euro presence
- Success with content leveraged processes
- Demonstrating early use of AI assistants
- Inventory of customizable applications

Challenges

- Market awareness outside Europe
- Larger install base

iVEDiX

iVEDiX, based in Rochester, New York, focuses on creating a mobile workbench experience for job roles. These workbenches contain instant state data combined with operational data and trends to initiate appropriate business actions for the situations presented. iVEDiX has a sweet spot around secure IoT data and serves well in office settings, too.

iVEDiX offers a dynamically adaptable data structure (meta-meta model) that defines the workbench-like experience and inclusion of new knowledge, information, and data related to the actual experience or the workflow being managed. iVEDiX applications are eminently adaptable and include use cases in the healthcare, retail, energy, public sector, and manufacturing sectors. These applications provide users with comprehensive insight into real-time information and the ability to predict future outcomes. Enterprises that are looking to find or build specific applications and workflows driven by the combination of analytics, and an engaging mobile experience, would be wise to look at iVEDiX.

Strengths

- People-centric, workbench-like interface
- Excellent integrated dashboards
- Strong analytic features
- IoT strength
- Emerging AI usage

Challenges

- Overall market awareness
- Leverage customer success stories

K2

K2, based in Bellevue, Washington, is a process-focused digital platform that delivers results rapidly. With the ability to leverage jump-start and reuse processes, the time-to-market results speak for themselves. The resulting processes are visible, as is the development environment for process creation.

In recent years, K2 has been working hard to expand its partnering program and accelerate its progress to be a strong, cloud-based digital platform. These efforts will continue to grow K2 and keep its current high growth rate.

Strengths

- Highly visual for quick results
- Significant customer success to promote
- Emphasis on low-code speedy results
- Large inventory of jump-start templates
- Enhances features for reuse

Challenges

- Messaging and positioning
- Limited vision for AI and IoT

Kofax

Kofax, located in Irvine, California, focuses on Robotic Process Automation and first mile capture processes that fit well with content management strengths. Kofax can support connection with first mile experiences through completion of backend processes with end-to-end visibility. The overall product family now can focus on digital platform capabilities.

The Kofax backend analytics and adapter set are significant strengths that can be leveraged in the future. Kofax offers a number of smart process capabilities as part of its smart process platform, which includes areas such as claims, onboarding, mortgage, and trading. While Kofax Kapow provides low-level Robotic Process Automation, Kofax still needs to focus on its roadmap for Artificial Intelligence, though it has a good start with machine learning.

Strengths

- DBP offering completeness
- Inventory of excellence software
- Strong, smart RPA digital on-ramp
- Significant customer success to promote
- Process intelligence and business intelligence

Challenges

- Messaging and positioning
- Convert RPA momentum to platform sales

Software AG (SAG)

Software AG, based in Darmstadt, Germany, offers a full Digital Business Platform that serves multiple industries and leverages its rich software inventory and key partnerships with IoT to deliver Industry 4.0 and digital solutions. Software AG has a sweet spot in linking companies in commerce ecosystems through shared processes and integration. Software AG has a particular strength in helping organizations with business architecture and customer journeys.

Recently, Software AG announced a bevy of IoT partnerships to extend its impact on dynamic supply and value chains. To that end, Software AG announced its acquisition of TrendMiner, which leverages advanced and predictive analytics from time series data utilized by Cumulocity and Zementis, Software AG's current AI tools.

Strengths

- Worldwide presence
- Emerging IoT strength
- Significant experience in real-time speed
- Customer Journey Mapping strength
- Significant software portfolio
- Great linking ecosystems

Challenges

- Complex offering with overlapping features
- High skill levels are required to create solutions.

XMPro

XMPro, based in Dallas, Texas, focuses on creating and running IoT-focused processes. XMPro delivers great visibility and allows organizations to respond to real-time events through an excellent event detection. Although XMPro has a sweet spot for device management, it can equally be used for all kinds of processes.

XMPro recently announced its participation in the Industrial Internet Consortium (IIC) Smart Factory Machine Learning for Predictive Maintenance Testbed. The testbed aims to evaluate and validate machine learning techniques for predictive maintenance on high-volume production machinery. Its objectives also include improving uptime and energy efficiency by using machine learning to enable the early detection of anomalies and fault conditions.

Strengths

- IoT-focused processes
- Sweet spot in infrastructure maintenance
- Excellent integrated dashboards
- Strong analytic features
- Emerging AI usage

Challenges

- Overall market awareness
- Leverage customer success stories

Specialists

Bizagi

Bizagi, based in Buckinghamshire, United Kingdom, focuses on process automation-based solutions. Bizagi is ideal as a Digital Business Platform for small to mid-sized organizations based on its proven track record of delivery.

Bizagi has taken cash infusions and delivered on its expansion plans, showing great promise for continued growth based on ease of use and implementation.

Strengths

- Highly visual for quick results
- Significant customer success to promote
- Emphasis on low-code speedy results
- Strong in Latin America

Challenges

- Messaging and positioning
- Limited vision for AI and IoT

Bosch

Bosch, based in Stuttgart, Germany, focuses on IoT-based solutions helping to deliver Industry 4.0 solutions in manufacturing-heavy industries: mobility, industrial, consumer, and energy/building technology. Bosch seeks to leverage connected things to take advantage of sensing, measuring, deciding, and acting on the behavior of things and their related software and firmware.

Bosch focuses on extreme quality and IoT situations with industrial integration of both primary and subsystems in areas such as automotive for optimizing manufacturing lines and real-time automotive implementation.

Strengths

- Great vision for Industry 4.0 and IoT
- Strong AI research
- Great presence in the auto industry
- Partnering for software portion with SAG

Challenges

- Needs worldwide DBP awareness
- Broader industry adoption of its DBP

GE

GE, based in Boston, Massachusetts, focuses on managing and optimizing networks of connected things, particularly those of things that are manufactured by GE. GE is also building significant intelligence in its own products so it can self-optimize and self-mange. Given the GE product lines and its historical focus in areas such as transportation, it has a keen focus on industrial IoT.

GE has been primarily offering its Predix Platform as the core offering. One of its key strengths is being able to process large amounts of key data in real time. The key focus areas for Predix include asset management, manufacturing, cybersecurity, and manufacturing operations like HMI and SCADA. In 2016, GE bought Wyse, an AI provider focused on service and ServiceMax, a leading service provider that integrates with Salesforce. Right now, GE is dependent on outside process and application management software.

Strengths

- Brand and awareness
- Worldwide presence
- Great execution in the IoT arena
- Great vision for connected things
- Emerging connected devices strategy

Challenges

- Not known for software excellence
- More case studies outside of GE's product lines
- Narrow industry and process focus

Intel

Intel, based in Santa Clara, California, focuses on making computing chips that drive various devices. As more control is pushed to the edge, programmable and smart chips will play a bigger role in digital solutions. IoT and security will be greatly impacted by new and emerging chips.

Intel has doubled down on its investments in its IoT group, which is chartered with designing and building chips for various connected devices. Some of its focus includes the automated driving group and its retail group. Intel is leveraging its overall Intel IoT Platform, which it positions as its reference architecture. Overall, Intel is as much of a supplier as it is a participant in the Digital Business Platform.

Strengths

- Worldwide presence and financial strength
- In many solutions already
- Programmable processors
- IoT focus

Challenges

- Software presence
- Limited AI case studies in the public domain

Nvidia

Nvidia, based in Santa Clara, California, focuses on producing computing chips for various devices. As control moves toward the edge, programmable and smart chips will become increasingly important in digital solutions. IoT and security will be greatly impacted by new and emerging chips.

Nvidia has doubled down on its investments in its AI efforts, pushing intelligence to the edge through its use of both AI and analytics. Nvidia is the leader in GPU leverage. This includes embedding in IBM's award-winning supercomputers.

Strengths

- Worldwide presence
- Graphic/video leverage capturing action in real time
- Leader in GPU chips for computational rich processes and applications
- AI focus at the edge including deep learning

Challenges

- Creating a software platform with GPUs
- Expanding usage to traditional industries

Aragon Advisory

- Organizations can use the DBP as either an architecture or framework for comparing the functionality of various vendors.
- Organizations will likely pick one or two cornerstone DBP vendors to augment with customizations to support their business model.
- Enterprises need to look at both short-term and long-term DBP needs when selecting a provider.
- Enterprises need to ensure that any DBP provider is open, cooperative, easy to use, supports agile change, smart, predictive, works at real-time speeds, is built for innovation, is context-sensitive, and is enterprise cloud-based.
- Enterprises need to look at their customer, employee, and partner journeys to identify preferences to consider mobile workbench approaches.

Bottom Line

The DBP has emerged as the most effective way to support digital transformations and simultaneously reduce costs. Enterprises should evaluate the DBP providers in this report to see how they can drive and increase business results. Beware of vendors who possess all the components themselves or through partners, but do not excel at integrating the functions and features in a workable set of digital journeys.