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Robotic Process Automation Software Robots & Chatbots

Centralizing and Streamlining through Key Trends

Introduction

Robotic processing automation (RPA) and primitive forms of AI used in conjunction with automation got their start early in the 1990s and 2000s, quickly taking over industries such as manufacturing. RPA, which is as much a service as a technology, proves most useful for back-office functions. It focuses on deploying virtual workforces of software robots to process routine tasks. The ability to automate high-volume, repeatable tasks is attractive in the financial sector, because it allows mortgage and banking professionals to conduct credit checks and allows insurance agents to more efficiently and accurately process claims in a hands-off manner. Chatbots are a relatively new phenomenon in terms of market awareness, but the ability to chat with computers is decades old. Advances in natural language processing and artificial intelligence are leading the conversational revolution, and we're experiencing mass-market excitement and hype around the automation, chatbots, and AI. Early developer-led experiments yielded mixed results, but didn't account for the end-to-end components needed to build chatbots that work for diverse user populations, tasks, communication channels and enterprise systems, nor how they'd protect and manage chatbots throughout their lifecycle. Nevertheless, more mature chatbots and bot platforms are proving themselves highly useful for both frontend and backend use cases - from providing customers with great sales and service experiences to simplifying and streamlining an organization's supply chain processes.

.The core ideas behind RPA and chatbots are simple. However, rapid innovation in technology and capabilities in both fields demands greater awareness from enterprises and can lead to confusion between the differences between the similarly coined robots, software bots, and chatbots. So what's the key difference between RPA and chatbots? RPA seeks to mimic and replace human-driven workflows by assigning tasks and transactions (also known as processes) to a tool or script, also known as a "software bot," to execute on in a fully automated or semi-automated environment. Chatbots are instead used to provide a conversational interface between systems or things and users, augment human workflows, and help streamline and simplify the completion of tasks. Promising research has shown that chatbots may, much like RPA today, even be used to perform automated tasks for users.

While the methods used by each technology appear to be at odds at first glance (replace workers with RPA and aid workers with chatbots), many of the end results are the same: lower costs, increased flexibility, and improved productivity. While RPA, and by extension chatbots, may be transformational and can create compelling value for the enterprise - they can't do everything. This creates a new, previously impossible, opportunity for two emerging technologies to work together to revolutionize frontend and backend operations and deliver outstanding results.

This white paper seeks to create a common frame of reference for RPA and chatbots, define how they can be used and the benefits and limitations of each, and provide practical ideas for how they can complement each other within the enterprise to clear up common misconceptions in the market.

Robotic Process Automation

What is robotic process automation? RPA is a tool or method of automating manual, time-consuming, and complex, rule-based workflows using software robots. These software robots, which are traditionally used for back-end administrative IT work, can perform various tasks and transactions in databases, enterprise systems, and websites more efficiently than humans and other automation solutions by reducing cycle times. They are often used to either replace the people who interact these applications, or replace the responsibility to interact with them

Examples of tasks alleviated by RPA robots:

• Field entry

• Copy & pasting

• Logging in and out of applications

• Database queries

• Screen scraping

• Web service invocations

"Why RPA Is Used by the Enterprise

- To replace or reduce human labor

- To supplement and enhance existing human resources

- As an integration tool for legacy and future systems that can't be connect through traditional IT options

- To eliminate the need to build APIs or modify existing systems that don't expose APIs

- As a midterm solution (3-5 years on average)

- As a stopgap for future tech deployments

These logic-driven and algorithmic robots execute pre-programmed rules on structured and semi-structured data, although the former is still the most common. RPAs mimic humans and the manner in which they interact with applications, the decisions they make in relation to these applications, and the logical processes they follow. Unlike chatbots, they do not require active human intelligence to manage, except in the case of exemptions or errors and during initial deployment. More complex implementations have focused on robots and employees working on semi-automated processes. Traditional, simple RPA robots run scripts on individual desktops and laptops, and an be started and stopped by the user. More modern, enterprise RPA robots run in virtual machines hosted on servers in a data center, which removes the need to individual start, stop, or monitor every bot.

These software robots can conduct important operations like conduct calculations, trigger down-stream activities, and more. They also tend to be technology-agnostic, meaning they can use most systems with a graphical or command line interface, and they play well with an organization's technology. Other common examples of RPA in action include the application of discounts automatically based on customer agreements and the checking of new purchase orders.

How it Works

RPA software products are typically composed of three fundamental elements:

- · Developer tools to model business processes
- · A robot controller to handle the prioritization of workflows
- · A software robot template or framework to actually carry out the tasks and transactions.

Developer Tools

Most RPA products provide various tools that are used to model and define bot assignments or jobs at either the individual user level (via work desktop/ laptop) or enterprise level (via centralized dashboard). These assignments or jobs, which are recorded manually or automatically, consist of detailed step-by-step instructions that the bot must follow in order to successfully replicate the business process being modelled. The detailed instructions are composed of rules or conditional logic such as if/then or if/then/else statements and are often encapsulated within scripts, business objects, or other containers. Most developer tools for RPA provide visual decision tree editors, configuration wizards, and drag and-drop controls.

Application/System 1

Application/System 2

Application/System 3

User Interface X3
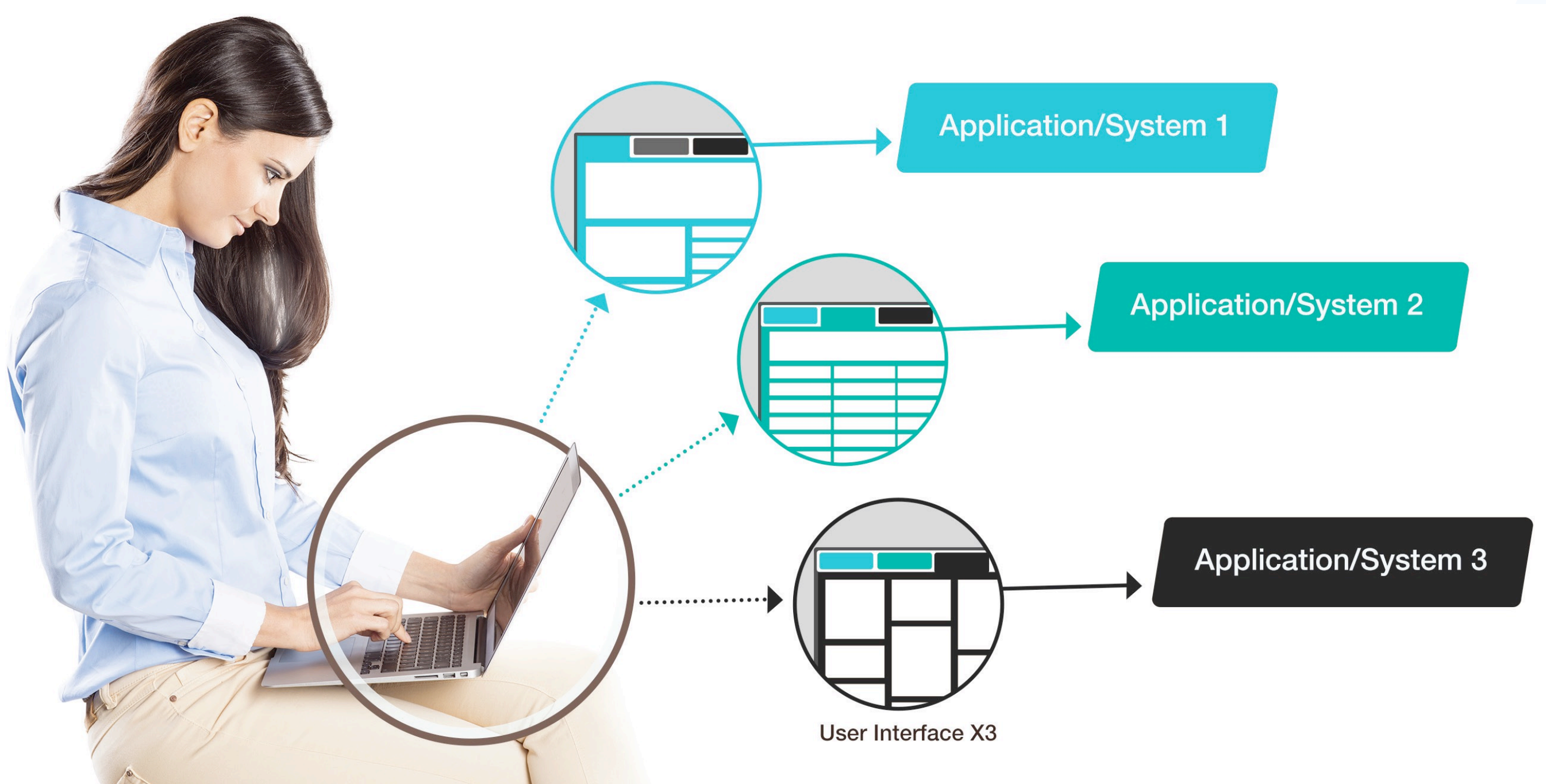
Robot Controller

The robot controller acts as the eyes and ears of your software robot by playing three roles. The controller serves as a repository for all bot assignments by storing performance data, history, and bot credentials. It provides built-in controls and workflows to help govern the creation, testing, approval, and deployment of new assignments and provides a versioning system to track ongoing configuration changes. The robot controller can also monitor and report on the status of bot activities and transactions to the operations manager or other designated employees.

Software Robots

Software robots interact directly with enterprise back-end systems and applications to process transactions and other tasks. Most RPA products provide at least some pre-built bot functionality with the ability to custom-code additional capabilities. Software robots are also typically designed to automatically identify the important elements of a business systems user interface, such as buttons and input fields, by examining the application code in order to simplify the deployment process. For virtualized desktops, however, software robots must sometimes rely on less-effective techniques such as searching for pixel-based object locations.
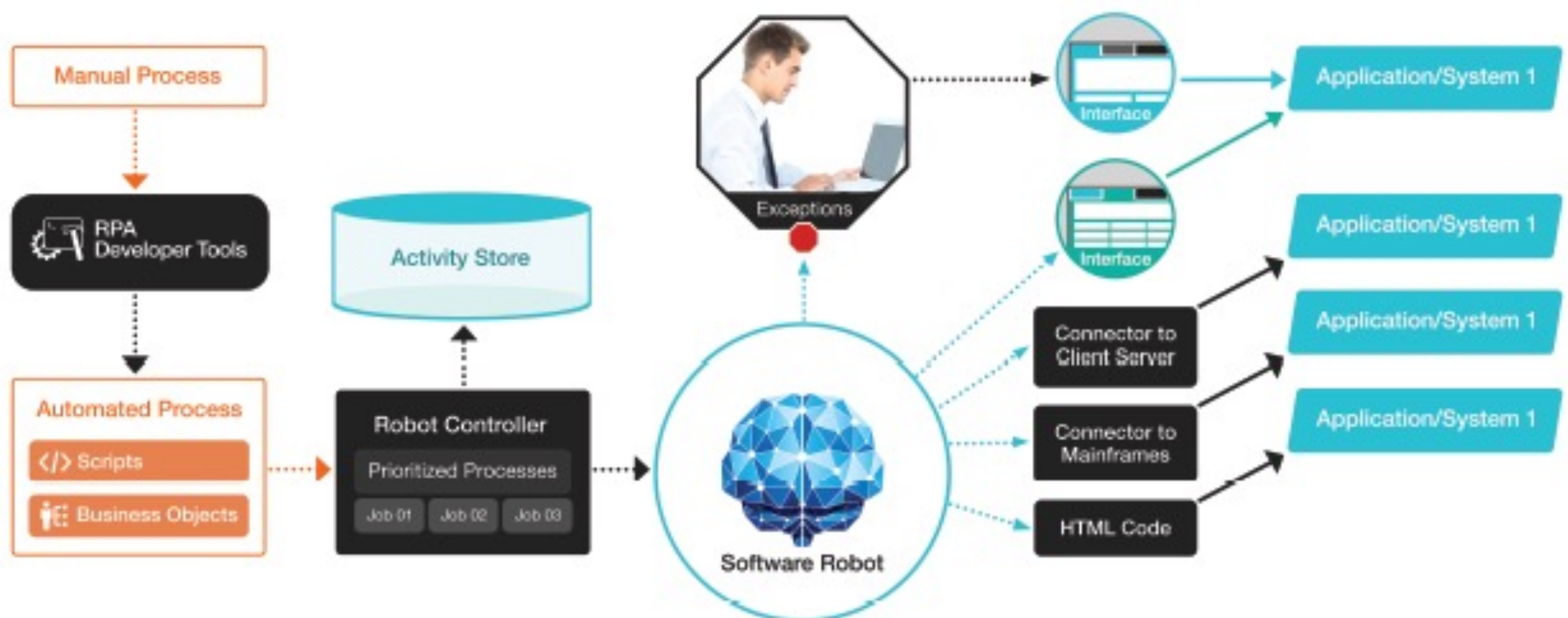
The benefits of RPA

Like chatbots, RPA can be a powerful tool for digital transformation by providing the following benefits:

• Reduce labor & operational costs: Frees up employees to focus on higher-level work and optimizing resources. Allows for the elimination of lower-level positions that primarily focus on functions such as data input and output or data rekeying.

• Increase processing speed: Reduces average transaction times by handling repetitive tasks across multiple systems. Helps accelerate digital transformation programs.

• Improve customer experiences: Reduces avoidable errors that frustrate customers and can lead to faster service times. Enables employees to focus on complex issues that may require human intervention.

• Extend service hours: RPA bots, and processes, can be run 24/7 at a fraction of the cost of human workers. Software robots can also set aside exceptions for later human attention and continue working.

• Reduce human errors: Minimizes or eliminates common mistakes via the standardization of processes. Increases business continuity and enhances disaster recover since processes can be switched to other servers when needed.

• Rapid, non-invasive integration & deployment: RPA solutions can be integrated at the presentation level and deployed on your architecture with minimal need to change underlying systems or technology. They can ensure that client applications are not modified or enhanced by the solution and may sometimes automatically inherit access authorization concepts, reducing security concerns and avoiding traditional process integration challenges.

• Provide comprehensive operational visibility: Many RPA solutions provide detailed logs of transactions or actions performed within the enterprise, improving efficiency by automatically digitizing process data and history. This data can be used and manipulated to help identify flaws, slow areas, or bottlenecks.

• Increase security & compliance: Simplifies adherence to regulation via automated processes. Reduces auditing and reporting burden for security and compliance, reducing overall operational risk.

The Limitations of RPA

Despite the benefits of RPA and similar solutions for the enterprise, automation is not always the right choice. Common disadvantages or weakness of RPA include:

• Employee support/morale: Fear of layoffs and redundancy can hinder operations and increase employee and institutional knowledge attrition.

• Complex nonlinear processes: Automating processes that are too variable, unpredictable, or infrequent can raise the complexity and cost of associated robot algorithms and subsequent deployments. Human touch points may still be required, but not all products offer assisted or semi-automated processes.

• Error creep: Since most RPAs automatically execute the instructions found within scripts or business objects, errors can replicate hundreds or thousands of times before the problem is spotted and corrected.

• Management challenges: While some RPA solutions provide dashboards for supervising robot queues and workflows, managing thousands of bots executing transactions across an enterprise presents a challenge. Especially since it is common to have many robot instances executing the same business processes in different locations.

• Hidden costs: Some RPA solutions require additional Virtual Machines (VM) or Virtual Desktop Infrastructures (VDI), which raises the virtualization/OS cost for each new bot or process after the initial go-live. Scaling may cost more than originally anticipated.

• Additional governance: Most RPA software bots, or at least those that take a script-based approach to automation, are designed to never deviate from established algorithms. Any changes to an internal or external aspect of an existing business process are thus likely to cause the software bot to fail to perform the intended function. This often necessitates additional centralization, standardization, and optimization of processes prior to deployment or shortly after.

Sample Use Cases

Financial Services, Insurance, & Accounting

• Streamlining basic data entry

• Checking order entry data

• Compiling monthly/yearly regulatory compliance reports

• Automating the auditing of expense reports

• Maintaining master data repository

• Moving data for claim processing

• Performing credit checks

• Initiating formal investigation processes

• Ordering replacements for lost/stolen cards

• Reversing charges and resubmitting failed payment requests

• Updating customer or business information across portals

Transportation

• Updating internal and external transportation management systems

• Auto scheduling of shipments

• Tracking updates on shipments

• Updating asset locations

IT Tasks

• Monitoring network devices

• Sending exception reports

• Auto creation of backups

Customer Management

• Collating customer data from systems

• Checking systems for new price and delivery offers (to alert customers)

• Automating the submission and handling

Common Pitfalls Associated with Traditional RPA Implementations

• Making rigid all-or-nothing automation decisions

• Existing business process documentation is nonexistent, outdated, or poor

• Selecting processes to automate that should remain human-drive or that don't involve a significant volume of rule-based work

• Lacking a mature automation strategy

• Unrealistic expectation (automation won't solve dysfunctional business operations and processes)

• Automating either too soon or too late

Chatbots

What are chatbots and how do they differ from software robots? Unlike RPA solutions, chatbots are intermediaries between systems that you can talk to. They communicate with applications, things, and people to take action on revenue generating activities immediately.

A chatbot is basically a program that's designed to talk to you and collect information from your conversation. Depending on how it's developed or how intelligently it's been built, a bot can use that information to do things for you, such as book you a flight, suggest personalized offers or promotions, pass you along to a human in times of frustration, based on how you'd like the bot to help. Common examples of chatbots for customer use include providing one-to-one guidance, triaging customer service and support requests, assisting in the completion of transactions or data entry, the delivery of right-time, right-fit offers and promotions, and much more. And for businesses, similarly, chatbots can activate any number of tasks - ranging from routine to complex – or workflows across people, channel partners, applications, and systems. Imagine bots as messengers of actionable data to-and-from business critical systems in real time. Common examples of chatbots for internal employee use include password resets, providing incident reports to IT managers, receiving alerts on network outages, inputting sales pipeline data, updating purchase orders, and much more.

How it Works

Chatbots are typically composed of (#) fundamental elements that serve to provide rich conversational interfaces for customers and employees:

• Tasks

• Channels

• NLP & Speech

• Intelligence

Advanced chatbot platforms also provide the following fundamental elements:

• Bot & Dialog Development Tools

• Platform Middleware

• Enterprise Capabilities (advanced encryption, administration, and compliance functionality)

Chatbot Tasks

Tasks are the complex and simple jobs chatbots perform to collect information, provide information, or to help customers or employees complete frustrating tasks - in a fraction of the time. Cutting-edge chatbot offerings provide both pre-built chatbots that address specific use cases, such as scheduling shipments or submitting important forms, and a comprehensive task execution framework for creating custom chatbots that can handle multi-step workflows and processes, such as accepting questions and finding answers in an FAQ, documents, or websites, delivering personalized alerts, and pulling reports/data via APIs, web services, and other methods.

Channels

One thing that sets chatbots apart is that they can be channel agnostic - meaning people can engage a chatbot in the communication channels they use daily, such as on a website, in SMS, email, Skype, Cisco Spark, Slack, and many others. Cutting-edge chatbot offerings provide pre-built bot connectors and SDKs that handle channel specific APIs and can automatically adapt messages to channel specific formats - allowing a single configuration to be used across multiple channels. More common, chatbot offerings expose channels using channel-specific third-party Bot Kits for each channel.

NLP and Speech Recognition

Chatbots are distinct from traditional UIs and software robots in that commands can be given by a user or produced in natural language via NLP and Machine Learning. NLP allows humans to bypass programming languages to speak to computers and instead use normal human speech. It basically breaks down the barriers of communication by allowing anyone, whether they have computing knowledge or not, to talk to bots, systems, apps, or any kind of software. Chatbots, through the use of advanced NLP and Speech Recognition Engines, can maintain accurate, content-rich, two-way conversations using text and speech.

Machine learning, by definition, is a type of artificial intelligence that provides computers the ability to learn without being explicitly programmed. It's similar to data mining - both systems search data to look for patterns. Machine learning can help NLP powered systems adjust actions according to the historical context and patterns it picks up in a conversation. For instance, if I ask a banking bot "pay my electric bill" and that request happens to fall near the 25th of each month for three straight months, the bot can then anticipate my request and automate the task. Chatbot platforms that combine fundamental meaning, a method of fundamentally understanding what is being said by the user, and ML deliver the most optimal results, recognizing intent and extracting entities to understand meaning. NLP technology is human-like in the sense that more conversations can lead to better comprehension. GUI interfaces won't understand me better the more I use them, they'll only know that I'm reacting to them similarly or differently. If I don't perform the intended response, a developer will have to change the visual indicator. You can start to see how this might cause problems for companies developing customer facing apps and websites. With conversational assistants, these systems can get real-time feedback on the user experience in their own words.

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These are other steps natural language processing engines use to better comprehend human speech:

Input parsing: Unlike keyword searches where word order is important, NLP systems actually parse your input because they can understand subject-verb-object. "I want to buy a diamond ring not mined in South Africa" isn't something you could hand over to Amazon's search and expect it to get the proper results. But a commerce bot with NLP could search through the fine print of product entries and exclude South Africa from the choices.

Synonyms: Just like when you talk with a friend, you can use dozens of words interchangeably as a verb, noun, or any other part of speech. Mapping keywords and triggering synonyms for tasks is essential to more advanced human-to-computer communication.

Interactivity: The conversational nature of NLP not only helps create a more enjoyable user experience, but it helps clarify requests, prompt for missing data, summarize request results, and asks permission to proceed in some cases.
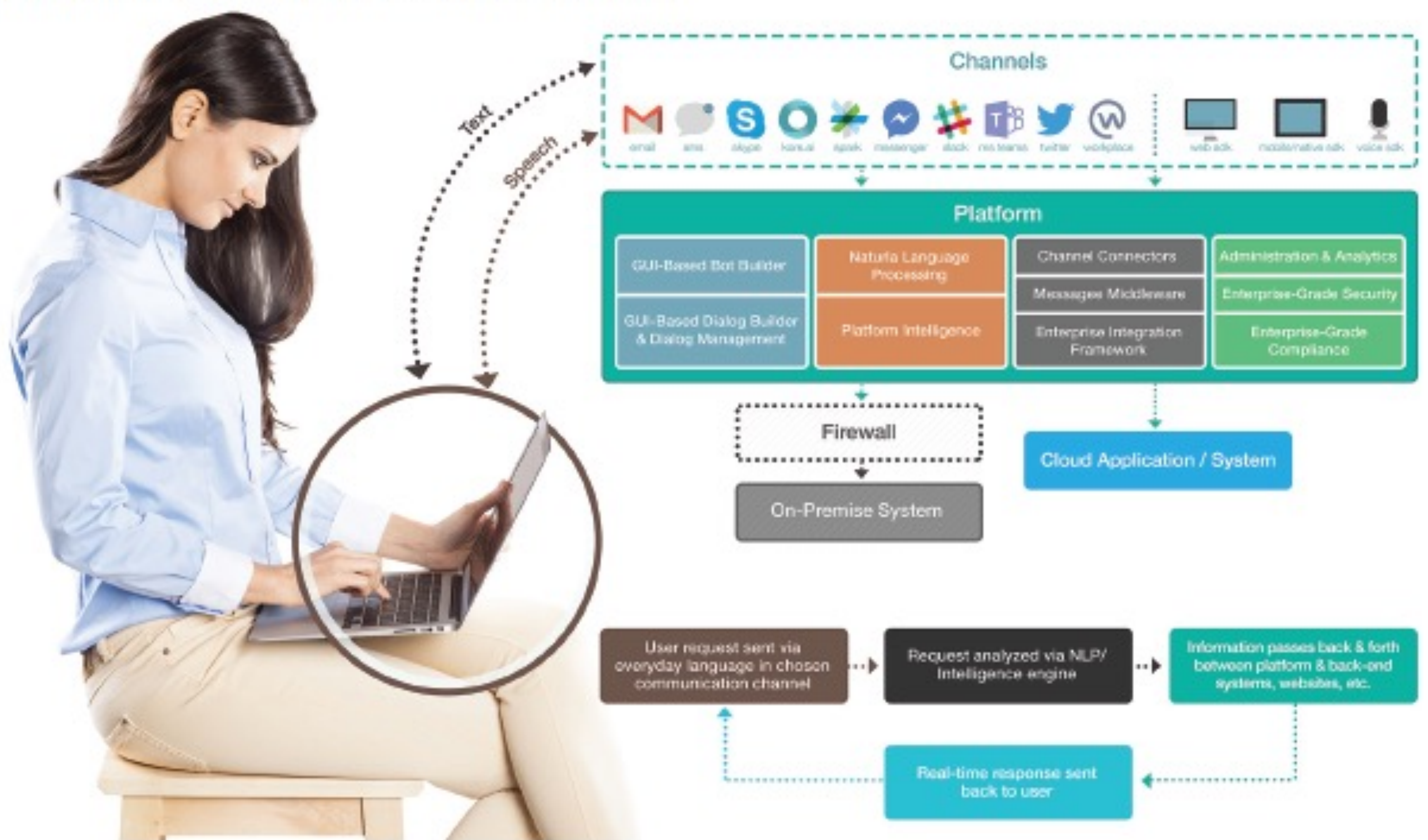
Chatbot Intelligence

The most advanced chatbot offerings provide AI capabilities that make chatbots more intelligent and interactions more helpful and human-like. With an intelligence capability, chatbots can be designed to remember context, analyze human emotions, and learn from information gathered during each interaction. An intelligence engine could allow the chatbots to maintain the context of a user's inquiry or request throughout a chat session. It also allows developers to use unsupervised and automated ML to perfect a chatbots NLP configuration.
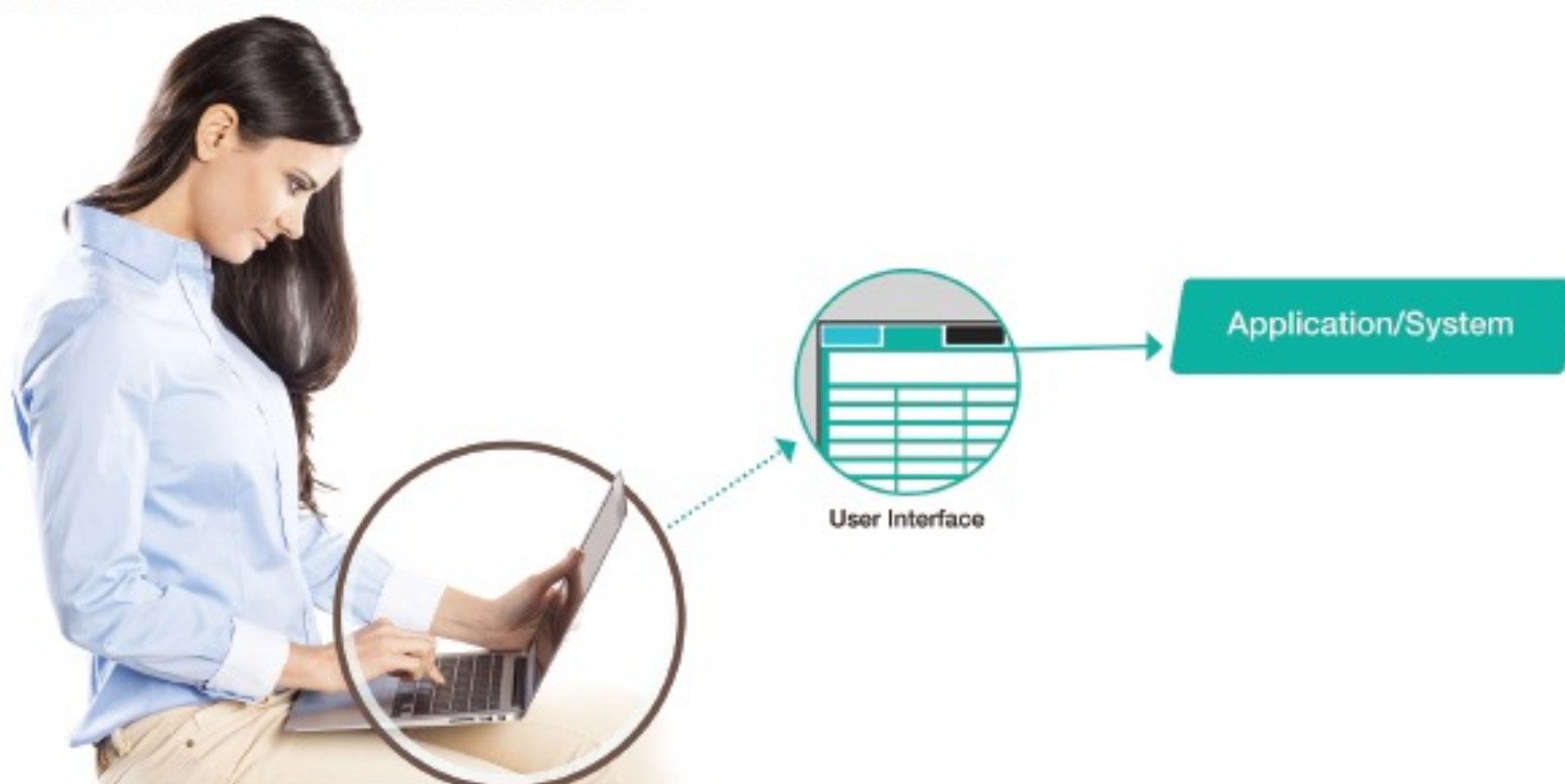
New Process With Chatbots- High-Level View

The Benefits of Chatbots

AI-rich chatbots facilitate intelligent dialogue between people and systems and provide the following benefits:

• Enhance digital: Create higher-value purchases and

service interactions for your customers. Chatbots can access more customers and open new sales outlets.

• Reduce app fatigue: Sync brands and systems with the communication channels customers already use. Help customers by cutting down on the number of apps and interfaces that must be mastered.

• Unlock efficiencies: Minimize manual, resource-intensive

business and supply chain processes.

• Simplify complex interfaces: Form-intensive interfaces can be broken down into easily digestible, natural language driven conversations via popular

communication channels such as websites, email, SMS, messaging platforms, and more.

• Streamline work: Let employees get routine tasks done in less time, with communication tools they know and love - enhancing productivity and efficiency. Allows for better resource allocation an decreases calls and emails to support services.

• Reduce communication overload: Decrease first line support calls and emails. Allows for better resource allocation, faster support, and better user experiences. Chatbots provide 24/7 customer support and immediate answers.

• Provide comprehensive visibility: Analytics generated from chatbots can provide unmatched visibility into customer and employee behavior.

• Retain human feel: Chatbots deliver personalized, memorable conversations and experiences through natural language while helping to connect people and systems. They can sound and act like humans, which leads to higher customer and employee engagement when compared to static forms and information sources. Plus, human agents are usually only a click away, ensuring

" *The Engagement Value of Chatbots*

For companies that are customer engagement leaders, there are tangible returns. Engagement "magnets" see measurably higher profit margins and increased rates of advocacy and loyalty than companies outside of the leadership quadrant.

Engaged customers are

big business:

• 90% make likely to make more

frequent purchases

• Spending 300% more than non-engaged customers

• 5x more likely to choose brands for

future purchases

• 7x more likely to respond to a

brand's promotional offers

• Spending 60% more on each transaction

• Have 3x higher annual customer

lifetime value

• 6x more likely to try a new product

Key Differences Between RPA Robots and Chatbots

By now you've probably noticed that there are some big differences between RPA software robots and chatbots. Understanding these differences can be the key between a successful rollout that cuts costs, drives efficiency, and improves quality or a wrong problem-product solution fit. Let's break down the major differences:

Robotic Process Automation	Chatbots
Process Automation	
Used to fully automate workflows. Can partially automate processes (humans initiate or approve actions)	Used to simplify manual processes
	Used to more effectively handle processes that have some automation and some human elements
	Can be used to automate workflows
	Can drive smarter human decisions and proactively change human behavior
Best suited for processes that are perfectly understood and/or documented. Little-to-no room for deviation	Can connect, automate, or enable a more effective way to respond for processes that are ill-defined or documented, that are uncommon, or that involves deviation and/or human intervention
Human Involvement	
Primarily limited to initial configuration/ scripting/ implementation and error/ exception handling	Humans engaging directly with systems
System Interaction	
Primarily limited to initial configuration/ scripting/ implementation and error/ exception handling	Replaces existing (often complex) GUIs with conversational interfaces across channels
Intelligence	
Primarily limited to initial configuration/ scripting/ implementation and error/ exception handling	Can add intelligence to a process via natural language. Has the ability to understand, remember and learn from the information gathered during each interaction

Blending Together Chatbots & RPA in the Enterprise

Enterprises are constantly faced with new threats to nearly every aspect of their businesses, from emerging technology to never ending media hype surrounding new products to tectonic shifts in consumer preferences and disposable income. Cutting-edge businesses and start-ups have always been at the forefront of innovation, with many choosing the role of the early adopter of promising, potentially paradigm shifting technology. But, like most new tech, high costs, long development times, functionality issues, and integration challenges from fragmented legacy systems often delay implementation and reduce the likelihood of a successful rollout. Chatbots and automation solutions, such as RPA robots, largely avoid these stereotypes, and in many ways, exist as a direct result of these challenges. While chatbot technology and robotic process automation have advanced significantly in just a few short years, there are some limitations to the usability and impact of each. With a focused and systemic approach, however, both solutions can act in concert to address and solve key pain points in back-end systems (RPA), such as Enterprise Resource Planning suites, front-end systems (chatbots), such as Customer Relationship Management applications, and on the front lines directly interacting with customers (chatbots). Both technologies are relatively low cost. Both can be deployed quickly, and both can offer both cost-savings and operational flexibility. It's likely we will see more organizations deploy either chatbots or RPA tools to complement an existing legacy deployment of one of these solutions or even consider a dual-deployment in some fashion. Here are two example use cases to show how these technologies could work to help transform your organization, drive greater efficiencies, and improve your bottom-line:

Service & Support Sample Use Case

Problem
• Only 5% of customers report their sales and service experiences exceed expectations.
• 30% of customers indicate their attempts at self-service fail.
• 45% will abandon an online purchase if they cannot find a quick answer to a question.
• 50% switch providers if their time isn't valued or encounter rude or multiple agents or don't get answers.
• 82% of customers are likely to stop spending with a company due to a bad service experience.

Chatbot Solution
Deploy chatbots to provide 24/7, personalized customer support. Chatbots can answer common questions, streamline the purchase of products or the completion of tasks, and can deliver real-time status updates. Chatbots can free up customer service agents and call center employees to focus on the most complex cases, and even hand-off a customer to a human agent when the chatbot detects customer frustration. They can also be used to streamline workflows and give agents more time to receive, process, and respond to service requests, freeing up your support team to focus on delivering top-notch experiences.

RPA Solution
RPA bots can provide back-office IT support by automating critical system administration tasks including validation, testing, diagnostics, and fault remediation. RPA bots can provide back-office and front-end automation for accounting, inventory management, and high-volume help desk tasks, such as password resets. RPA bots and other automation tools could be used to give employees more time to focus on managing exceptions, optimizing current processes, and completing tasks via conversational interfaces
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Sales Sample Use Case

Problem
• Sales reps are only spending 33% of their time with customers
• 71% of sales reps say they spend too much time on data entry
• It can take 10 months or more for a sales rep to reach full productivity
• The average company loses 10 to 30% of its customer base each year

Chatbot Solution
Deploy chatbots using built-in integration with Salesforce Sales Cloud and other key systems to simplify complex data entry and more efficiently complete tasks associated with leads and contacts, activities, quotes, cases, opportunities, and more. Chatbots can be used to provide instant lead and opportunity updates as deals progress, keeping sales reps and managers in the know at all times. Omni-channel capabilities allow sales reps to engage with systems and customers from your company portal, SMS, email, and popular social and messaging apps - maximizing productivity and ultimately enhancing prospect and customer experiences. Chatbots can also be used for sales rep education and onboarding by proving easy access to support, training manuals, and other important documentation and reducing the time needed to learn complex or byzantine UIs commonly associated with legacy systems.

RPA Solution
RPA software robots could be used to convert the account information inputted by sales reps within Salesforce Sales Cloud and other key systems into a readable format and automatically enter that information into back-end fulfillment systems. This would create a more effective bridge between sales and supply chain operations. Automation could then be extended to procurement and inventory management processes to further reduce the time between closed won deals to ultimate delivery.

Potential Results

From chatbots
• 15% improved access and faster processes
• 24% potential revenue growth
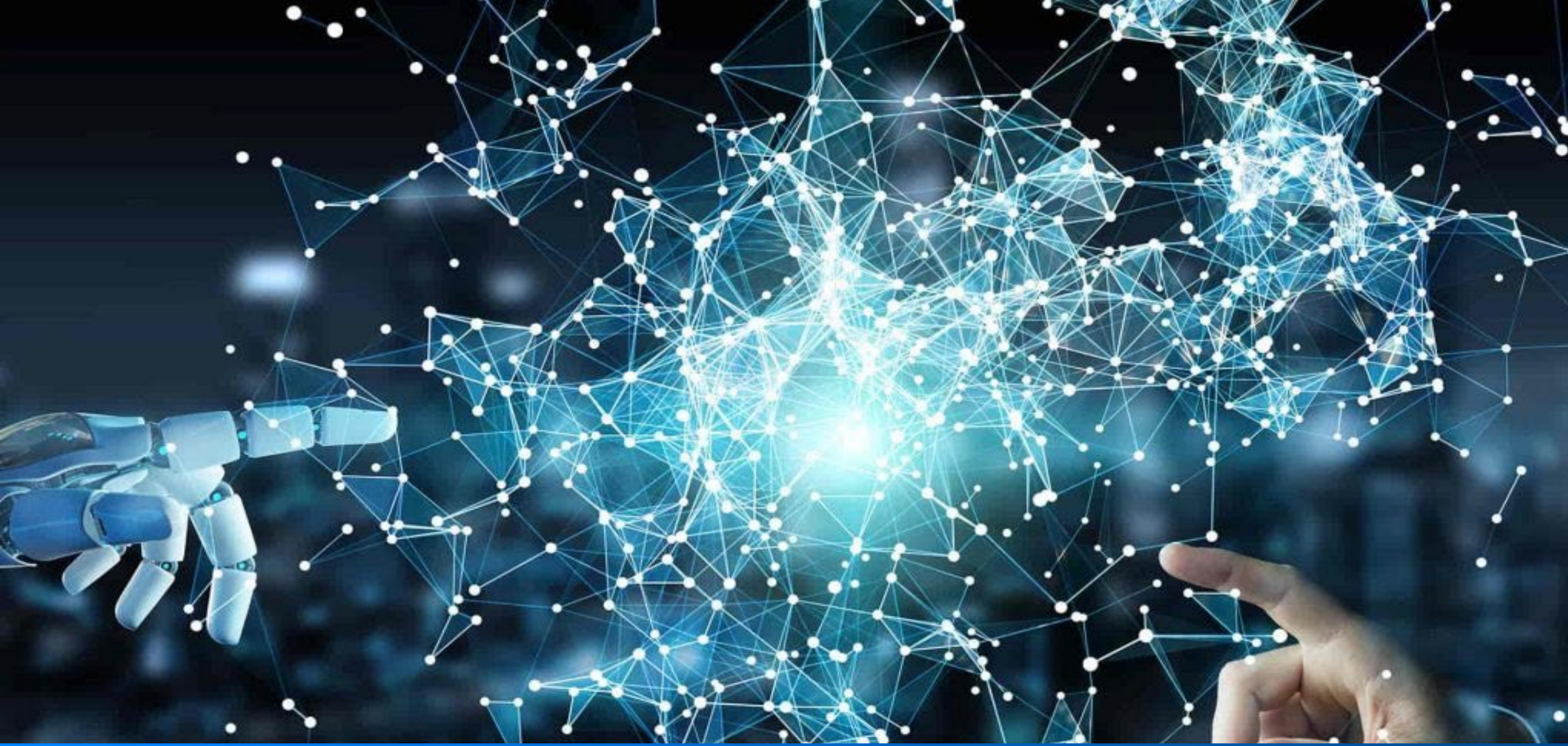• 500% improved repeat transaction potential

From RPA
• Major reduction in time spent on manual data entry & data conversion activities
• Increased operational flexibility
• RPA software can generate additional insights on sales and supply chain operations using content analytics

Get Prepared: What to Do

How should your organization prepare for the digital future?

Think differently and don't reinvent the wheel: With the right technology in place, businesses can improve efficiency, increase sales, better serve their customers and employees, and be in a strong position to face future paradigm shifts. Chatbots can provide intelligent, personalized and efficient automated self-service and the human touch and feel many customers desire. Chatbots can also facilitate simple and intelligent dialogues between employees and systems, so getting tasks done is as fast and simple as sending a text. Pioneering companies can even use them to overcome the limitations of RPA implementations. Such chatbot deployments can streamline the completion of complex, nonlinear, or infrequent tasks that may require human judgement or customized actions - tasks and transactions that software robots struggle to automate efficiently or in a cost-effective manner. The bottom line: An enterprise chatbot strategy offers clear advantages for customers and workforces alike. Whether chatbots are used alone or in conjunction with software robots, the

Thank You