Robotic Process Automation & Cognitive Technologies

Where they all come from and what they mean for your business!
EMPOWERING BUSINESS WITH AUTOMATION TECHNOLOGY

Automation has been around within the Software Industry since the early 1990’s. The big PC revolution during the late 1980’s and early 1990’s seeded the Client/Server software development revolution within the Enterprise world. The age-old mainframe technology was expensive and required massive infrastructure investments, which made it out of reach for many Enterprises. The Client/Server Technology revolution made it possible for Businesses (no matter how big or small) to build Applications that could be deployed quickly using mass-scale Operating Systems such as Windows, Mac, etc. In the late 90’s, the internet was commercialized and Internet based Web Applications became the standard for most Enterprise Software projects.

Almost immediately there was a need to integrate the new breed of Client/Server and Web applications with mainframe-based legacy systems. Many solutions addressed the integration issues, but the quick-and-dirty solution in many cases was “Screen-Scraping” technology.

SCREEN-SCRAPING

Screen-Scraping is normally associated with the programmatic collection of visual data from a source instead of parsing data, as in Web scraping. Originally, Screen-Scraping referred to the practice of reading text data from a computer display terminal’s screen. The term Screen-Scraping is also commonly used to refer to the bidirectional exchange of data. This could be a simple case in which the controlling program navigates through the user interface, or a more complex scenario in which the controlling program enters data into an interface meant for use by a Human.

Although Screen-Scraping was a viable option in many cases, the end product lacked common features, tied companies to old hardware, could not address changing business needs, and was difficult to maintain. In the end, though Screen Scraping required a considerable investment of resources, it left companies worse off than when they started. In addition, Screen-Scraping was never a scalable solution.
ENTERPRISE APPLICATION INTEGRATION

To integrate disparate mainframe, Client/Server, and Web-based applications, a new breed of EAI Tools, also referred as “middleware”, evolved rapidly during the late 90’s. These tools were based on Hub & Spoke or Service Bus-based integration approaches. However, many EAI projects were not as successful in integrating many Enterprise Applications due to change management challenges, competing standards, a lack of coordination, and conflicting priorities between various Business and IT groups.

BUSINESS PROCESS AUTOMATION (BPA) & BUSINESS PROCESS MANAGEMENT (BPMS)

The ERP Software revolution of the 1990’s created a massive multi-billion-dollar industry for an integrated suite of Business Applications. ERP (Enterprise Resource Planning) Systems initially focused on the back office (General Ledger, Finance Reporting, Supply Chain, etc.) but quickly expanded to include front-end business functions such as CRM (Customer Relationship Management) technologies. For those processes beyond the reach of ERP standardization and automation, a new industry emerged – Business Process Outsourcing (BPO). Between these two approaches, workflow costs were transformed, at least for companies large enough to justify an ERP investment and/or global labor arbitrage. BPO Offshoring Industry today is a $63 Billion industry and there is plenty of opportunity to automate a large chunk of the work using RPA and Cognitive Technologies.

As most IT systems are inherently automation engines in themselves, a valid option is to extend their functionality to enable the desired automation, creating customized linkages between the disparate application systems, including ERP systems, where needed. Business Process Automation is an all-encompassing term which includes Enterprise ERP systems and other systems that automate processes around the ERP systems, e.g., an OCR-based Document Imaging and Workflow management system integrated with an ERP system.

In the late 90’s and early 2000’s, another Workflow process-centric approach was evolving, namely, BPM (Business Process Management). BPM software is more comprehensive than BPA software because it is designed to manage multiple workflows within an organization. Rather than focusing on automating a single process, BPM software allows businesses to achieve greater overall efficiency and evolve along with changing business needs. Another result of a successful BPM software implementation is a reduction in Human error (because, for instance, less manual data entry is typically involved) and a clearer understanding of roles and responsibilities.

With Screen-Scraping, data from mainframe “green screens” could be scraped and consumed in Client/Server or Web Applications.

EAI tools evolved during the late 90’s as a way to integrate disparate applications such as ERP, CRM, etc.
If you are a Business practitioner, the information provided above is enough to give you a headache. A Business uses IT to either increase revenue (by marketing its products and services through new channels or optimizing existing ones) or to decrease costs (by creating efficiencies through the deployment of the type of software mentioned above). Although there is no doubt that technology approaches like ERP, EAI, BPA and BPM have made the Business World tremendously powerful and scalable, the fact remains that such technology solutions in many cases have created their own overhead infrastructure as well as a need for expensive IT staff. Today, whenever Business goes to IT for solving any type of Business challenge, the answer usually involves complex Business process re-engineering, custom software development or any other Enterprise Software deployment. The advent of the Cloud in some ways democratizes access to Technology solutions (Salesforce.com vs. an in-house CRM or BPMS solution) to Business, but there are many Business processes for which a simpler solution is needed.

This is where RPA and the emerging Cognitive Technologies come into play. For example, consider a workflow involving the processing of a large number of Invoices in the Accounts Payable department. The Invoices can be received in any available format, including Excel, PDF, image files or paper (which would need to be processed through OCR software). The downstream ERP system would be ready to receive the standardized input, but in between, some sort of IT solution must be put in place to standardize the data and the data entry. RPA-trained Business Analysts could potentially use RPA software, which itself uses a rules-based GUI interface to quickly put together a solution. In addition, if
the Invoice images received are not standardized, it is possible for Cognitive technology to extract the information and standardize it.

WHY RPA?

The acronym RPA was introduced to the market only a few years ago. This is not something new, but was formalized over time by combining the capabilities provided by a combination of traditional automation tools, including screen scraping, API integration, Macros, Scripts, etc. RPA brings all those capabilities within a GUI-based platform with the ability to orchestrate a Business Process and the various steps and workflows required to execute that Process. The Processes can be linked together or performed individually to formulate an “assembly line” or workflow. In addition, the RPA platform provides a full audit trail for actions performed by the Robots.

RPA technology is not going to replace any of the ERP or BPM platforms, but it does enable the Business to achieve a very high level of automation ROI within a very short period of time. RPA Platforms do not require extensive Coding or Technical capabilities; however, the Business must partner with IT to make sure IT Security concerns are addressed and that Governance processes are put in place. This is important because the Robots must be provisioned as Humans. Yes, you can name your Robot “Leo” or whatever your heart desires (last name is optional). IT must work with Business to ensure that the Robotic workforce is subject to security and audit requirements that are similar to those of its Human counterparts.

RPA VS BPM TECHNOLOGY

BPM (Business Process Management) isn’t a specific piece of software but an approach to streamlining business processes for maximum efficiency and value. It is an in-depth look at how processes are operating, identifying areas for improvement and building solutions – usually from the ground up. BPM is about making sure the infrastructure of your business processes is solid.

RPA, on the other hand, is designed to operate processes as a Human would, so it exists on a more surface level. It’s faster to implement, ready to use with almost any software, and easily altered or updated to adapt to the changing world. RPA and BPM have the same goal with different implementation strategies.

While you could certainly use RPA to handle high-frequency processes previously performed by Humans, perhaps what is really needed is an overhaul of your workflow. If a certain type of transaction constitutes the bread-and-butter of your organization’s service, for example, you’ll want to make sure the process is as tight, efficient and self-contained as possible. There are times when you must transform the process itself rather than rely
on a surface-level fix. BPM is a more comprehensive option for such situations.

We know that given enough time and money, any large-scale solution can be implemented. However, we also know that transforming a business structure isn’t always feasible. That’s where RPA can potentially provide quick ROI. If nothing else, you can use RPA to continue operations while investigating a deeper fix.

**COGNITIVE TECHNOLOGIES**

Cognitive Technologies come into play when we are dealing with semi-structured or non-structured input data. Traditional RPA technology is very good at processing structured data based on the rules and the process orchestration.

Cognitive Technologies exist in different forms. The prepackaged software available on the market today includes OCR (Optical Character Recognition), Handwriting recognition, Image recognition, Natural Language Processing and much more. Such prepackaged software, when combined with RPA technology, can be very powerful. Self-learning-enabled RPA tools can be trained to handle Processes using built-in Machine Learning technology. In such systems, the software “learns” based on the historical input data and iterative observation of new data (sometimes referred to as neural networks) For example, a Robot can be trained to recognize multiple Invoice formats and standardize the Invoice data before feeding into an ERP system. Although Cognitive technologies are emerging very quickly, it won’t be long before Humans, coupled with RPA and Cognitive technology, can take Enterprise productivity to new levels.
WHAT’S NEXT?

It is important to understand that although these technologies may have a “rocket-science” feel to them, they are much simpler to implement. For example, when we consume Internet on our Browser, no one really cares much about the underlying TCP/IP protocols which form the Internet’s backbone. Or when you press the switch to turn on the light, you don’t really care where the electricity comes from.

RPA Tools are powerful because they are relatively easy to implement and empower the Business. RPA can be put to good use very quickly in an array of use cases and over time can developed to utilize evolving cognitive technologies in a multi-layered approach. For example, Invoices received in any format can be processed by Robot for data entry, parsed by an OCR system (capable of recognizing handwriting and/or images). Any exceptions that the systems are not able to process can be handled by self-learning Robots, which will use a combination of structured and unstructured data to recognize patterns of input data and, ultimately, handle the exceptions themselves.

Lastly, another important point is that it is rare for a cognitive RPA implementation to completely automate the process end to end, as cognitive tools are hardly ever 100% accurate. Cognitive Robotic automation is Human-assisted. Most data-entry-driven processes consist of two stages: the maker, in which an operator enters data into a system, and the checker, in which the accuracy of the data is verified. The manual effort in the maker stage can usually be eliminated, but a Human checker stage is required in most cases.

Lastly... What About Security?

Security concerns of “Robots run amok” in your enterprise are often overstated. After all, Robots,
by design, are intended to do ONLY what they are told to do and nothing else. They do not get distracted by catchy email subjects and open virus-laden attachments, nor do they leave the desktop unattended or leave their passwords written on Post-It notes under the keyboard. The real concern is audit and controls. Issues surface when Robots and Humans share credentials to perform similar tasks, or when Robots hand over a process to Humans and Humans hand that process back over to Robots.

Best practices suggest that security and audit policies be applied to Robots exactly the way they are applied to Human workers. This includes individual credentialing and access provisioning. Security is further strengthened by ensuring that automated processes run on virtual machines inside the data center.

However, process automation is also prone to erroneous logic and Human design errors. Exhaustive process analysis and documentation, stringent standards for development, a rigorous testing process and strict source code control governance policies are required to ensure that automated processes are accurately implemented and tamper-proof.

Experts conclude that when implemented using the best practices mentioned above, Robotic process automation results in a net reduction of the security risk by removing the risk associated with Humans.

ABOUT AUTOMATEWORK

At AutomateWork, we are laser focused on new-age Business Process Automation Technologies. Our Teams engage with Clients to develop tactical and strategic Business Process Automation roadmaps as well as to engage with implementations, maintenance and training.
WHERE RPA CAN HELP IN THE REAL WORLD

Use cases for the deployment of RPA technology abound. Solutions vary depending on the maturity of the existing Business Process Automation and the systems in use. In organizations that are newly exploring the efficiencies that can be gained by automation, it would be wise to start with a simple, repeatable process that has well-defined rules and data, such as data entry from CRM to the Accounting system or follow-up of AR pending Invoices via email.

The next level of automation involves both Humans and Robots working together to complete a task. The Robot handles well-defined tasks such as data extraction, collation and entry, whereas the Human performs the intelligent operation of making decisions based on this information, then handing the decision back to the Robot for further processing. A good example of this is the KYC process at a Bank for a customer opening an Account. This requires the extraction of data from various systems and websites as well as the collation of this data into a single report. The Robot is well-suited to collecting this information and collating it into a single report. This report can then be emailed to the decision maker for final Processing.

The highest level of automation involves the use of AI and Machine Learning capabilities whereby the automated worker understands unstructured data such as PDF documents in different formats, or Human conversations, and responds to such inputs by executing an appropriate workflow. For example, a Robot can monitor a mailbox that receives various types of documents. The Robot is able to “read” the document and execute a given workflow, e.g., “This is an Invoice so enter this Invoice into the accounting system” or “This is a new customer form so start a new customer onboarding case in the CRM”. Such systems require seed data and “learn” from Humans when they encounter data that has not been previously observed.

Another example of such “intelligent” automation is a “chatbot”. A chatbot is able to converse with a Human and to respond with data or actions as required. For example, a bank may use a chatbot to respond to customer queries. When a customer says, “I want to check the status of a check I wrote,” the chatbot recognizes that the customer wants the check status and responds with “Could you please give me the check number?” Once received, the chatbot interacts with the bank’s internal systems to retrieve the relevant information and present it to the customer.

CASE STUDIES
ACCOUNTING – AR AGING FOLLOW-UP
Complexity – Simple

AR Staff spends a considerable amount of time chasing payable Invoices. An out-of-control or aging AR can result in considerable strain on business cash flows; hence, accounting teams are under intense pressure to keep AR current. This “chasing Invoice” activity includes:

1. Running the AR Aging report
2. Opening each Invoice to check Invoice details
3. Accessing the customer record to retrieve contact information
4. Writing an email to the customer, including a copy of the Invoice

The Automated solution is able to access both the accounting and email systems and perform all these actions in an automated fashion, giving your Accounting staff more time to address customer responses to these follow-ups.

2
Week Implementation

90%
Manual Labor Reduction

$12K
Implementation Cost
ACCOUNTING – AR INVOICE PROCESSING
Complexity: High

Invoice processing is a time-consuming task. Invoices must be scanned and read, and various checks must be applied before they can be entered into the Accounting System.

The process generally includes:

1. Receiving and reading the Invoice
2. Checking the Invoice against the vendor and PO
3. Sending for approval if discrepancies are found
4. Entering the Invoice into the accounting system
5. Marking purchase orders as complete

The Automated solution is able to receive Invoice documents and access the accounting system to perform the Vendor Name and PO validations. If any discrepancies are found, these are escalated for Human intervention. Once all validations pass, the Invoice is entered into the accounting system and the PO status is updated.
HR – EMPLOYEE ONBOARDING
Complexity: Medium to High

Employee Onboarding requires various verifications and data entry into multiple systems. These include employment and background verification and payroll and IT provisioning systems, to name a few. This can be a time-consuming process.

A typical Employee Onboarding process may include:

1. Sending and receiving onboarding documents from the new employee
2. Performing employment eligibility verification
3. Creating an employee record in the payroll system
4. Entering the employee’s tax information in the payroll system
5. Creating IT system accounts (login, email, etc.) for the new employee

The Automated solution is able to access and receive verified documents via email or a file folder, and perform the various checks required, including E-Verify or background verification. Upon completion of these checks, the bots access various internal systems to perform the actions necessary to onboard the employee.

Week Implementation
4
Manual Labor Reduction
75%
Implementation Cost
$36K
CRM to Accounting Data Migration
Complexity: Simple to Medium

Data migration or updates between systems can be a hassle requiring extensive IT involvement. The usual solution to this dilemma is manual Human processes which are time consuming, expensive and error-prone.

For example, new entries or updates of customer records from a CRM to Accounting Systems require manual data entries and emails between Sales and Accounting teams. In high-volume businesses, this can create an extensive backlog for the Accounting teams and can lead to customer onboarding delays.

The process generally includes:

1. The Sales team sends a new customer email to the Accounting team.
2. The Accounting team receives new customer data via spreadsheets or email.
3. The Accounting team creates a new customer record.

The Automated solution polls the CRM periodically to look for new and updated customer records. Once a record is found, an automated process is kicked off to update the customer data in the accounting system.

**Automated Process**

- **Check CRM for records**
  - **New or Update Found**
    - **Yes**
      - **Get new/updated record from CRM**
      - **Update Account System**
    - **No**

- **3 Week Implementation**
- **40% Manual Labor Reduction**
- **$18K Implementation Cost**