Market
INSIGHT

RPA Software

- an independent study of Robotic Process Automation Software in Scandinavia

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About this marketINSIGHT report

A MarketINSIGHT on Robotic Process Automation

Robotic Process Automation (RPA) software is known for its capacity to support fast solutions with substantial potential of both cost minimising and increasing business value.

This MarketINSIGHT targets the market for RPA. It outlines the definition and relevance of RPA, the main characteristics of RPA software as well as the benefits and pitfalls of applying RPA.

The report also outlines the Scandinavian marketplace for RPA software, including the implementation partners able to assist with RPA. Furthermore, a typical process for getting started with RPA is introduced.

The intention of this report is to provide existing and potentially new users of Robotic Process Automation (RPA) with an overview of the relevance of RPA and the current market for RPA in Scandinavia.

This MarketINSIGHT should not form the sole basis for selecting software and/or a vendor, as a more detailed examination of the specific requirements of individual companies is necessary in order to make a concrete recommendation.

The publisher takes no responsibility for any conclusions or courses of action based exclusively on this report. The publisher also disclaims all responsibility with regards to incorrect, outdated or inadequate information received from the vendors, and the misinterpretation of received information.

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Introduction

Software for Robotic Process Automation (RPA) has established itself as a new category in the software market. As always with new categories, it is broadly discussed, with many definitions, opinions, and some confusion regarding what it entails.

Nevertheless, the RPA suppliers generally present the benefits of RPA as being immense and the approach is considered simple and convenient.

So, is software for RPA just the latest hype or is it really "the new thing" in which businesses should engage?

Many suppliers are engaging in RPA in the pursuit of new market opportunities. The global market expectation is projected to be approximately 8 BUSD by 2025, giving an average annual growth rate of approximately 800 MUSD for RPA software and RPA consulting services over the coming 10 years, with a 1:1 split between software and consulting services. This shows that RPA will be a significant new value generator for the software and service suppliers over the next few years.

One of the interesting aspects of RPA is that literally all industries are still using human labour to perform high volume, repeatable administrative tasks. These tasks are precisely the focus of RPA. By deploying RPA software, any company is capable of building RPA robots to replace human labour for the tasks through their automation.

There are many varieties of RPA software. The capabilities and features of the technologies vary considerably, and the strengths and weaknesses often depend on the business context in which the software is to be implemented.

The objective of this report is to offer an introduction to the relevance of RPA on the market by looking into key issues such as RPA features, where to apply RPA, possible business benefits to achieve and known pitfalls to avoid. Furthermore, a line of current RPA software is introduced and assessed and a way to get started with RPA is outlined.

Case: Insurance – Customer Risk Profiles

Insurance companies often use RPA to calculate customer risk profiles and insurance offers based on data from multiple sources.

Typically, the customer enters their data into a form on the supplier's website, in some cases these forms are filled out in dialogue with an insurance officer.

Using these data, an RPA robot extracts relevant information for the insurance calculation from other systems. This could be data from the official motor registry regarding the specific data of a car such as weight, type of engine, age, etc. Regarding insurance on houses and belongings, data are often extracted from the buildings and housing register on the size of the house, year, and any other available details. Using the available data, the RPA robot calculates risks and a price for the customer.

The RPA robot ensures that the customer receives a prompt response to a pricing request and that the company extends offers to as many potential clients as possible, while ensuring compliance with the company's risk strategy and policies.

Case: Transportation – Order Uptake and Fulfilment

A major global transport provider has used RPA to automate the order uptake and fulfilment for the majority of the providers' freight orders.

The company originally implemented a manually controlled rule-based RPA solution to augment/replace the manual order uptake and fulfilment.

Due to large periodic variations of workload as well as spikes caused by global and business events, it was hard to perform efficient capacity management and run control. This was conducted manually, causing a number of inefficiencies to manifest.

The IT solutions and platform provider was therefore contracted to re-architect the RPA solution to be a highly scalable Cloud-hosted solution.

The main business driver for the re-architected solution was a higher degree of automation giving fewer errors, cost savings by abandoning on-premise solutions and manual labour, a very high degree of scalability and a very high degree of business continuity due to global failover possibilities.

The ensuing solution is hosted in Azure using the smallest and cheapest virtual machines for worker nodes and re-architected in such a way that the original maintainers can work and understand the code. It fully automates workload prediction in order to comission or decommission worker nodes in increments of 10s, 100s or 1,000s as needed. Failed or crashed worked nodes are placed in an error queue for manual intervention.

What defines RPA?

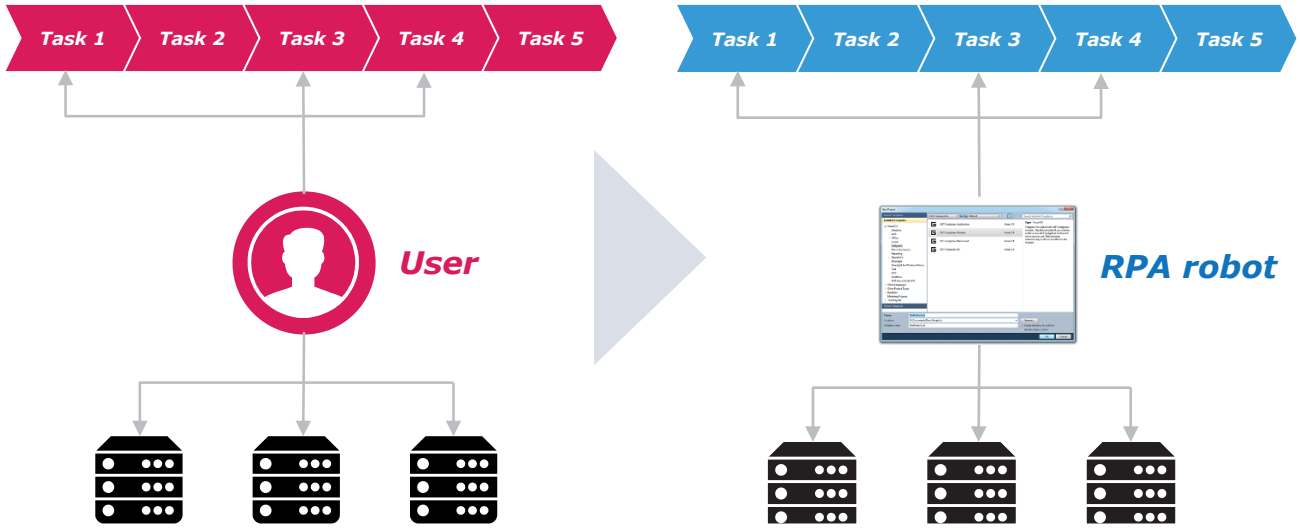
The term 'Robotic Process Automating' sounds full of promise. In reality, RPA is, however, much narrower in its application than suggested by the term itself.

A typical scenario for RPA is shown in figure 1. The pre-RPA scenario is that an employee performs a certain repeatable business process by using different systems and/or interfaces. This can be a time-consuming procedure, as the user typically must log onto several systems, wait for the response time to continue, change interface repeatedly, and so on.

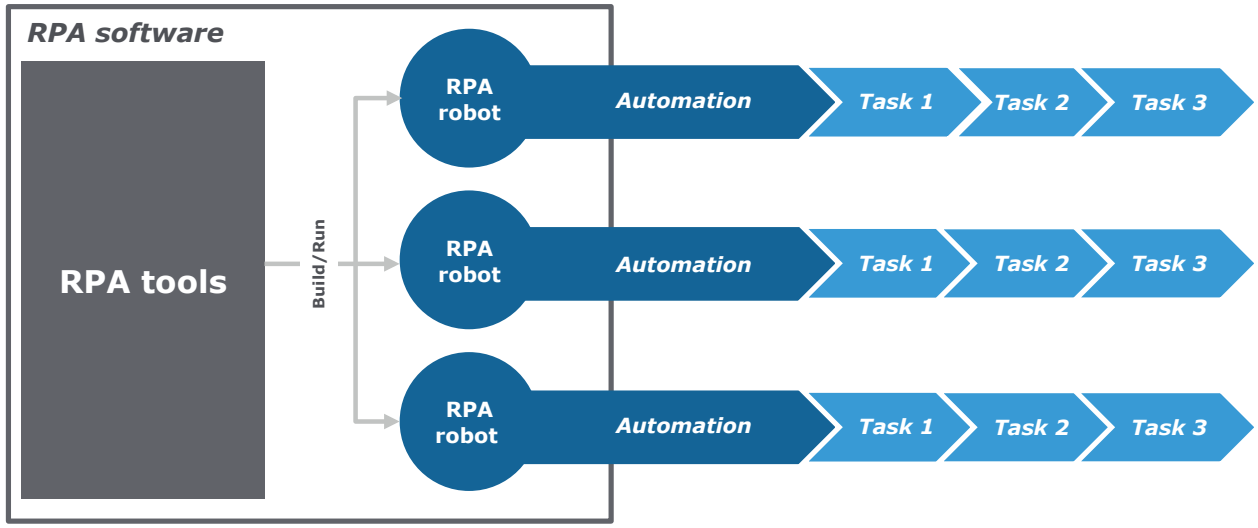
Using RPA software, the employee is replaced by a RPA robot performing the specified tasks using the same systems and/or interfaces according to the specified procedure. It works around the clock and is consistent in handling the tasks.

A very important aspect of this scenario is that the automation is achieved without applying any changes in the involved IT systems.

■ Figure 1. A RPA robot replacing and simulating a user



■ Figure 2. The full RPA picture



In understanding RPA, it is important to distinguish between the automation driver in terms of the RPA robot and the RPA software with RPA tools needed to create and run the robots.

We define it as follows:

- **'RPA robot'** is the specific software component used to automate high volume, repeatable tasks by simulating human interaction with IT systems.
- **'RPA software'** is the technology used to create and operate RPA robots.
- **'RPA tools'** are the different capabilities provided by RPA software that a robot developer can use to build, schedule and run RPA robots.

As such, the term *'RPA'* is used to describe the entire automation process where *RPA software* with its *RPA tools* is used to create and operate *RPA robots*. These robots are currently replacing human users in performing tasks as part of processes – hence 'automation' – with the purpose of achieving productivity gains and cost savings. The full picture is illustrated in Figure 2.

Sometimes the terms *Desktop Process Automation (DPA)* and *Enterprise RPA (ERPA*) are also used in the market space. DPA – also known as "attended RPA" – is RPA robots deployed on a desktop (or laptop) to assist the user in performing certain parts of a process – and attended by the user.

ERPA can be seen as a direct contrast to DPA, where RPA robots are deployed in an enterprise manner with a mind set and toolset of operating and controlling many high-volume robots across a complex business and IT setup. Both terms are subsets of RPA, as defined by this report.

Key characteristics of RPA robots and RPA tools

Robots created with RPA software have the following key characteristics:

- **User interface interaction**. An RPA robot can simulate human interaction with a user interface of an IT system. The robot performs a script that keys in information in fields, pushes buttons, makes cursor jumps, etc. The script may include rules and conditions to simulate actual user behaviour. The user interface script is either created by the robot developer or recorded directly by the RPA technology from a user interaction with the system.
- **Process execution**. An RPA robot can execute processes to simulate a human performing a business process – including user interface interaction. The RPA robot performs a process flow – including interactions with user interfaces – including rules and conditions to replicate the business process and its different options.
- **High volume data handling**. An RPA robot can transport and use high volumes of data – both in the process and the user interface interaction. These may be data resulting from a user interaction or data from external data stores.
- **Learning capability**. The more advanced RPA robots can utilise Machine Learning algorithms from the field of AI. Machine Learning allows the RPA robot to automatically learn and improve from experience without being explicitly told what to do by the robot developer.

RPA robots are built using the RPA tools provided by the RPA software. RPA tools also provide features to schedule and run the RPA robots.

Build:

- **Building of interface scripts**. This is a key feature of all RPA tools – although the capabilities vary between different RPA products. Some of the tools are very basic – close to traditional script programming – others are more advanced, with graphical tools for script processes. Some tools also have the potential to record and denote the behaviour of a user as the initial basis for an interface script. Additionally, an important feature is the ability to create metadata models to describe interfaces. This feature makes the interface scripts more robust to changes in the IT systems.
- **Building of process scripts**. This is also a general key feature of RPA tools. This feature is well known from many process and workflow management systems – the ability to design a flexible flow of tasks with conditions and rules to determine the exact flow. Moreover, the different tools from traditional scripting languages to graphical process engines with drag-and-drop for tasks and relationships can be found here. Compared to dedicated process management tools, RPA tools still, however, lack best-practice processes for specific functional processes as well as industry-based processes.
- **Data access and data use**. The ability to access and extract data from various sources as well as subsequently using and building logic around that data is key to building the process scripts. Most RPA tools can access data via a variety of industry standard interfaces and work with data in different formats. RPA tools differentiate themselves in regard to the ease of access to data and of subsequently working with these data. Some tools require a skillset close to that of an IT developer, while other tools are more intuitive for non-technical users without, or with only limited, programming experience.

- **Connectors**. Some of the RPA tools come with predefined connectors to the market-leading Business Suites such as SAP and Microsoft Dynamics, others are much more limited in this area. The connectors allow for a fast and well-proven access to these de facto standard solutions.
- **Security**. RPA software has its own database, including both metadata and actual data. It inherently deals with confidential business data including access rights to other IT systems. Therefore, RPA software typically includes security measures such as access control and encryptions technology,

Schedule:

- **Robot scheduling**. RPA tools include controlling capabilities for the robots, such as when the robot runs and under which conditions they should stop running.
- **Scheduling dashboard**. The most sophisticated RPA tools have a dedicated graphical dashboard to control the robots. Some dashboards also include more advanced options for controlling the interaction between robots and people.

Run:

- **Dedicated runtime system**. Most RPA tools provide their own proprietary runtime system for the execution of the robot scripts.
- **Robot monitoring**. Monitoring of the execution of the scripts during runtime. Some robots require frequent monitoring, other robots can run completely unattended.
- **Process trails**. Many of the RPA tools automatically track the actual execution of a robot – thereby providing an audit trail for critical business processes.
- **Performance reporting**. In addition, the ability to monitor and report the performance of a robot over a given period of time is part of most RPA tools.
- **Security**. RPA software is comparable to a traditional client/server environment – the RPA robot being the client (see Figure 2). Most of the tools use encryption technology to secure the connections as well as robot files – thus also preventing the hacking of the robots under execution.

Another important aspect of RPA robots is access management. As an RPA robot acts on behalf of a user as part of a business process, the robot basically needs the same access rights to the IT systems involved as the user. Typically, this is achieved by creating the RPA robot in the AD and/or other IAM Systems in the enterprise.

This also takes care of issues concerning the 'segregation of duties', where the robot should be handled like a normal user. The robot developer will be a 'privileged user' in the same manner as traditional IT developers – and must be handled accordingly.

The main difference between the different RPA software products is found in the build capabilities of the RPA tools. These differ considerably, ranging from very technical programming-like editors to more modern graphical editors.

Another difference is their flexibility, i.e. the ability to interact with different types of user interfaces, whether those are mainframe-based, UNIX-based, Windows-based or Java-based, and whether these possibilities are predefined or must be developed.

Automation

Automation – using a device or a computer system to perform a task instead of a human has been the core process of industrialisation since the beginning of the Industrial Revolution in the 18th century.

In the beginning of the Industrial Age, automation was quite primitive, substituting handcrafting with very simple mechanical machines. But with the development of engineering, the devices have become more mechanically advanced.

The car industry is an example of how automation is used in manufacturing processes – deriving from the standard product (Ford T) as the basis of automating manufacturing processes to the highly flexible mass-customisation technology of today's car manufacturers, being able to produce very different variants of a car on the same production line.

Today, the concept of automation is increasingly associated with computer-based automation – due to the growing digitalisation of both enterprises and society in general.

Historically, the main driver for automation has been to perform a task as efficiently as possible by getting as much done as possible, as quickly as possible, at the highest quality possible, with the most uniform quality possible and with the lowest use of resources, at the lowest cost, etc.

Today, another important driver for automation is to protect humans from tasks which are potentially harmful to them, for example, by shielding them from dangerous substances and environments.

To fully automate a task, both the control part (making the decisions about the task) and the execution part (the actual performance of the task) must be covered by the automation. The control part has, over the years, proven more difficult to automate than the execution part.

However, with the introduction of computer science – and thus the concept of software and algorithms – in the 1950s, more progress has been made in controlling tasks. Control loops and decision algorithms can control far more complex tasks including processes, i.e. collections of tasks with complex decision patterns, than any other mechanical or electronic control mechanism in the past.

During these years, many semi-automatic devices have been turned into fully automated ones due to improvements in the control part of the devices.

These improvements derive from a combination of industry-wide standardisations, developments in sensor technology, packaged control loops and networking Internet of Things (IoT), interaction technology, application of artificial intelligence, computing power, battery technology, etc.

An example of this is self-driving cars. Until recently, a car has been a semi-automated device for transportation – as it has been controlled by a human. The self-driving cars are, however, fully automated.

Robotics

Robotics is a field that deals with the design, construction, operation, and application of robots. In that sense, Robotics can be seen as a subfield of automation, while others will define Robotics as a separate field of science and technology that can be applied to achieve automation.

The word 'robot' was first used to denote a fictional humanoid in a 1920 play by the Czech writer Karel Čapek. The word 'robot' itself was derived from the Slavic word 'robota', a term which classified those peasants obligated to compulsory service under the feudal system widespread in 19th century Europe.

Due to this origin, most definitions of robots include a resemblance to a human as part of their definition. Today, however, a robot does not necessarily resemble a human. ISO 8373:2012 defines a robot as 'an automatically controlled, reprogrammable, multipurpose manipulator programmable in three or more axes, which can be either fixed in place or mobile for use in industrial automation applications'.

So, in the context of automation, a robot is simply defined as a device (a physical robot) or a software component (a software robot) replacing a human to automate a task.

Artificial Intelligence (AI)

*Artificial Intelligence (*AI) is a cross-scientific field aiming to develop devices that exhibit an intelligence resembling that of humans.

If this can be achieved, AI will also provide the ultimate answer to how the control part of a device will be able to handle those tasks so complex that only humans have been able to perform them.

The formal scientific field of AI was born in the 1950s, and ever since AI has pursued the vision of replicating human intelligence. However, it has yet to deliver on this promise. Whenever small progress had been made in a certain area, the difficulty in solving the remaining issues in that area appears to have been underestimated.

Therefore, the field of AI is currently dominated by a collection of minor and very specific research areas. In each of these areas, progress is made within its own well-defined scope – not attempting an overall simulation of human intelligence, but instead focusing on a specific area and taking full advantage of an ever-increasing computing power. The victories of IBM Deep Blue and Google DeepMind over the grandmasters in the games of chess and Go are examples of these progresses within well-defined contexts.

Some of the AI areas contribute to Automation and Robotics with techniques and tools. Examples of this are:

- Knowledge Representation – algorithms to organise and use knowledge concerning the context and the problems to be solved. This is a pivotal area of AI which is used by other AI areas.
- Machine Learning – algorithms which improve through experience without human intervention – also known as adaptive systems.
- Natural Language Processing – algorithms with the ability to read and understand human language. These include sub-fields such as text mining and machine translation.
- Machine Perception – algorithms to use and understand input from sensors, cameras, microphones, sonars, etc. These include sub-fields such as computer vision, speech recognition, facial recognition and object recognition.
- Planning, Motion and Manipulation – algorithms to solve problems in goal setting and evaluation, localisation, mapping, navigation and motion planning – all substantial issues to be dealt with in Robotics.

All the above areas are utilised in many aspects of automation, but Data Science also draws heavily on AI – and even traditional business application starts to utilise small parts of AI.

Data Science and Data-driven Automation

Data Science is an interdisciplinary field combining knowledge and approaches from computer science, mathematics, statistics, information science and AI. In Data Science, the analysis and understanding of data (and often large amounts of data) is turned into actionable insights to improve and automate decisions and processes.

The term Big Data is perhaps better known than Data Science, and is used to describe datasets so large and complex that traditional data processing capabilities are inadequate to handle them. Data Science provides the capabilities to handle Big Data.

From a business perspective, Data Science utilises data to aim for more diagnostic, predictive and prescriptive models (insight and foresight) of business issues than traditional reporting and business intelligence methods can provide (hindsight). The basic Data Science models can be complex to understand and utilise for businesses. Therefore, an important part of Data Science is to convert the basic models into deployable software solutions which then become vehicles for a Data-driven Automation and Data-driven and sometimes automated Decision making in an organisation.

Data Science requires a dedicated IT platform with specialised tools for the storage, processing and analysis of massive amounts of in-house and outhouse data.

A Data Science IT platform typically utilises massive parallelism and AI techniques and tools, both to handle the different kinds of data types and to provide analytical capabilities.

Where to apply RPA?

Virtually any industry or process – both back-office and front-office processes – fall within the scope of RPA.

As such, the main drivers for applying RPA are neither characterised by the industry nor the process dimension. Looking at the current applications of RPA, there are two key drivers for companies:

1. An inflexible IT situation
2. A high process automation potential

Of course, some companies have both drivers as the basis for their RPA initiative.

RPA to resolve inflexible IT situations

What qualifies as an inflexible IT situation? In the context of RPA, an inflexible IT situation is typically characterised by one of the following elements:

- A highly heterogeneous IT portfolio – based on best-of-breed IT systems
- Bespoke legacy IT systems
- Limited – or very expensive – resources (regarding both competence and capacity) for developing maintaining the IT systems and their integrations

In these situations, RPA can be used as a solution to problems that are too slow, too difficult or too expensive to resolve using the existing IT setup.

When the business case does not allow for the specification, development, test and deployment of traditional integration and data-manipulation programs, the potential can be realised with robots with little cost and effort, rapidly resulting in positive business outcomes.

As such, RPA can facilitate business units' access to creating local and ad hoc integrations and automations that may not be feasible for formal integration undertakings from the IT department. A long branch of such low hanging fruit may now be picked via the application of RPA, enabling the businesses to rapidly adapt to new ideas or business needs.

Legacy systems often inhibit integrations and data manipulation available in more modern and open systems. The restriction can be caused by lack of APIs, security models restricting programmatic access to databases, or proprietary data formats.

Alternatively, the issue can simply stem from the approaching end-of-life of the system and the vendor's reluctance to accommodate requests for changes to systems requiring the allocation of resources better spent working on next-generation product offerings. In such situations, RPA can be a feasible and accommodating integration mechanism available to the organisation.

In Denmark and the other Scandinavian countries, companies with inflexible IT situations are primarily to be found in the financial sector, the public sector, and in private industries traditionally focused on bespoke IT systems such as the transport industry and other service industries.

Case: Retail – Master Data Management

A major Danish retail company has used RPA for Master Data Management (MDM) by automating the process of updating articles in SAP.

A virtual worker has been implemented to go through the entire process in SAP by having a document structure with information for the robot to collect and update in the system.

Case: Generic – Data Loading

When implementing a new IT system, it is generally necessary to load a large amount of data from other systems onto the new system.

RPA can be used to perform these processes extracting data from multiple sources and copying them into the new systems – a time-consuming task when performed manually.

Case: Public sector – Master Data Management

RPA robots are often used to ensure that information typed into website forms is easily extracted and loaded onto the relevant systems.

This is used when website visitors subscribe to newsletters, posting, etc., by filling out forms. The robots collect the registered information and load it onto the Customer Relationship Management (CRM) system that creates the mailing lists and keeps track of customer activity.

A municipality in Denmark has used these features to process citizens' complaints about noise and odours in the city. The complaints are journalised when received, data are extracted and loaded onto the relevant systems, and the case is forwarded to the designated case workers for further processing.

This ensures speedy processing and eases the job of the case workers, as the cases are ready for further action by the morning.

RPA to realise a process automation potential

All repetitive, high-volume processes currently performed by employees will have a high potential in terms of a high return on investment when automated using RPA.

This could, for example, be front office processes involving requests from consumers or citizens – often found in BtC companies and in public sector organisations – or it could be high-volume back office processes found in larger companies in areas such as finance, HR and IT support. Accounts payable, accounts receivable, holiday administration, salary requests and password reset requests are all processes which, in larger organisations, can benefit from RPA – thereby achieving cost savings in their Shared Service Centres.

Where RPA is implemented with automation as a driver, the benefits are all rooted in the automatization process. The robots work around the clock, resulting in higher capacity and productivity, human resources freed for better utilisation, and processes performed at uniform quality. The more complicated and time-consuming the processes, the larger the outcomes and potential benefits. The larger the volume of processes, the greater the benefits.

Many of the existing processes that are candidates for automation using RPA have already been semi-automated using standard business applications such as ERP systems, financial systems, HR systems, ECM systems, etc. However, although supported by the business applications, the processes are still performed by employees, thus still constituting a high automation potential.

Moreover, the ongoing digitalisation of companies and organisations creates a need for automation initiatives. For example, the deployment of the IoT in devices and buildings may trigger high-volume processes which may only be automated using RPA. Security equipment such as cameras and other surveillance devices may trigger events which can be efficiently processed with RPA robots.

Looking forward, data-driven algorithms will also have an advantage in using RPA robots to process high-volume results.

In Denmark and the other Scandinavian countries, companies with a high automation potential in the front office will typically be BtC companies, whereas the high potential for automation in back office processes can be found across all medium- and large-sized companies in all industries.

Case: Finance – Customer Support

Running customer support often requires various administrative tasks, such as navigating several systems and updating information manually – tasks that increase time spent on executing calls. RPA has been used to perform these repetitive administrative tasks and to navigate applications, thereby improving efficiency, and reducing time and costs in terms of support resources.

Case: Retail – Administrative Processes

A major retail company has used RPA to improve several processes within finance, logistics and IT. Within finance, a short-term outcome was the automation of a monthly invoicing process to separate a document and correctly invoice, both internally and externally.

Furthermore, a process handling vendor account statements in various formats within several systems is now continuously managed by virtual workers and listed collectively in one document for balance tracking.

Within logistics, a short-term outcome was automation by a robot logging a container number, searching, and then returning values used to improve lead time and planning.

A long-term outcome within logistics was the automation of the collection of data from various data sources – a time-consuming task to perform manually due to the different allocation rules.

In regard to IT, a short-term outcome of RPA was the implementation of robots to resend electronic invoices when they failed, which required manual input in a system in order to find and resend the invoice.

A long-term outcome was the automation of setting up the Back-Office System and Point of Sales on personal computers in new stores, which otherwise required the IT department to go on-site and set up the systems.

Case: Public Sector – Automating Mail Handling

The municipality of Copenhagen uses RPA software to scan incoming emails with information and forms relating to sick leave. The information comes in different forms and types and has to be processed in order to ensure the correct funding for sick leave.

The RPA robot extracts the information, journalises it and forwards it to the right department or case worker for further processing. Processing 30,000 emails a year, the task was previously performed by two to three full-time employees. Now, however, the employees only have to process the emails that diverge too significantly from the standard and thus cannot be processed by the robot.

The RPA robot has reduced the task by half effectively freeing 0.5 to one employees for other tasks, supporting both increased efficiency and customer value.

Business benefits of RPA

RPA software is known for its capacity to support fast solutions that result in positive outcomes, which can be managed into visible and tangible benefits.

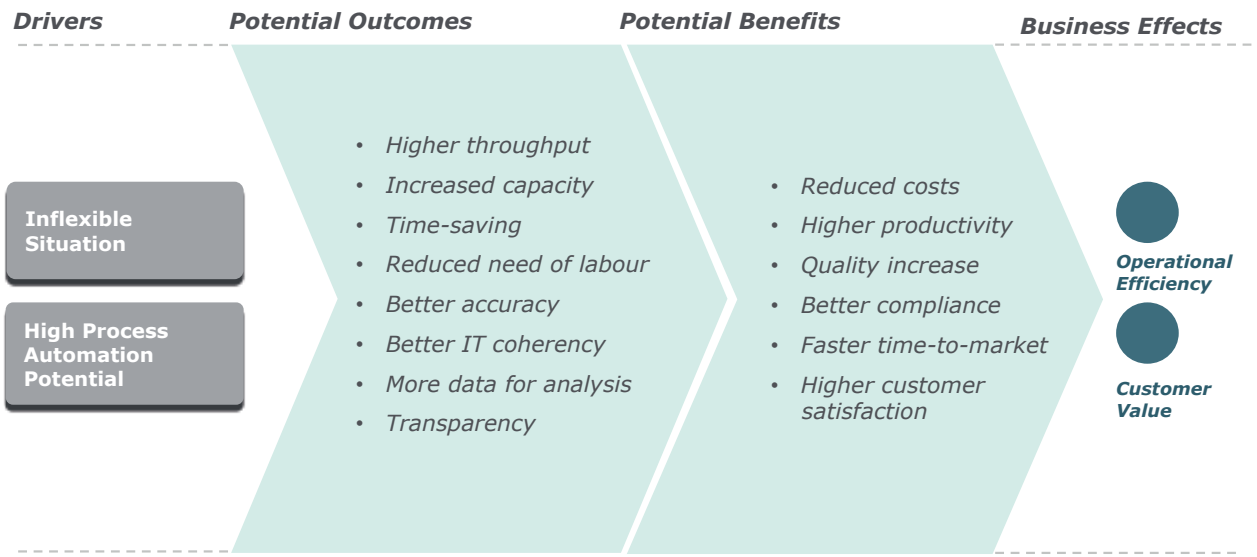
The business outcomes that arise from applying RPA enable new business capabilities. These capabilities can be transformed into business benefits. In various ways, the benefits support cost minimising or new business value, or, in some cases, both.

Whether the main driver for introducing RPA is a high automation potential or an inflexible IT situation, the potential outcomes are often similar. The extent of the outcome potential can, however, vary extensively depending on the IT situation and use of RPA.

The potential positive outcomes and benefits of RPA are listed below. In reality, these outcomes and benefits often overlap and they are, to a certain extent, chained together.

It is however, important to be aware of the different character of these in order to realise the full business potential of RPA.

Figure 3: From RPA use case to business effect



The typical potential outcomes of RPA initiatives are:

- **Higher throughput:** The RPA robots work around the clock, resulting in faster process performance. This enables a higher throughput of performed tasks and processes.
- **Increased capacity:** A higher throughput enables an increased capacity to perform more processes and tasks.
- **Time-saving:** RPA saves time both in regard to process execution and in terms of saving employees time on manual process handling.
- **Reduced need of labour:** The robots essentially take over tasks that were previously performed by employees, and while the RPA robots still need to be scheduled, run and monitored, the reduced need for human interaction is a key outcome of RPA initiatives.

- **Better accuracy:** RPA robots ensure that every process is handled accurately and similarly, thereby eliminating errors due to human process handling.
- **Better IT coherency:** Especially in cases with inflexible or complex IT situations, the coherency of the IT portfolio in scope can be improved considerably using RPA as integrator between otherwise incoherent IT systems.
- **Processed data for analysis:** The automation of the processes results in more processed data than when the processes were performed manually. These data enable detailed data analysis of the process execution and efficiency.
- **Transparency:** When using RPA, the processes leave a data trail providing full transparency into the process handling.

The main benefits that can be achieved with the RPA outcomes are:

- **Reduced costs:** Reduced costs can be the result of several of the outcomes, such as higher throughput, time saved, better accuracy and reduced need for labour.
- **Higher productivity:** The capability of a higher throughput enables a higher productivity in process handling. Furthermore, the reduced need for human interaction boosts productivity, as the employees can spend their valuable time on other tasks.
- **Quality increase:** Quality increases through better accuracy in the process handling.
- **Better compliance:** RPA is an effective tool to ensure process handling according to specific rules or laws, which can enable companies to comply with regulations that may have proved difficult to comply with manually.
- **Faster time-to-market:** The ability to increase production and reduce processing time makes it possible to launch products and services more rapidly.
- **Higher customer satisfaction:** Higher customer satisfaction can be enabled by a higher throughput and lower process time reducing the customers' waiting time, an increase in quality, and the ability to provide full transparency in processes. Furthermore, higher customer satisfaction can be achieved by using RPA outcomes to increase value to other business areas hence increasing the customer satisfaction.

Case: Public sector – Governing Processes

Public organisations in Denmark are obliged to disclose certain types of information as 'public access' when citizens or organisations request it. By law, these requests are required to be processed within specific deadlines.

Agencies are often challenged by this, as it is time-consuming to process the requests. It is therefore important that the requests are processed immediately when received.

To ensure this, Copenhagen Municipality has implemented an RPA robot to assist them in this task. The robot handles the straightforward and uncomplicated requests for public access requests within well-defined areas. When case workers receive the requests, they forward them to the robot. The robot then searches relevant documents in four different IT systems, where case documents and emails are journalised. The documents are gathered into one PDF, which is immediately forwarded for further processing by case handlers.

This enables the agency to better comply with the laws of disclosure within the tight deadlines, increasing both efficiency and customer value.

Case: Finance – Service Desk Processes

Service desks can suffer from repetitive workload, especially in regard to creating tickets from emails. RPA has been used to automate the process and extract information from emails to create tickets and showed a reduced workload of up to 98%.

Case: Public sector – Governing Processes

A department in public government made an assessment of the RPA potential in governing processes. The assessment showed significant potential for automation, especially within nine areas in customer service, including mail-handling, reprocessing cases and company registering. Up to 1,300 of 2,000 hours of manual labour could potentially be saved. The potential was further qualified by carrying out a Proof of Value on RPA applied on a small scale within a strict scope. This revealed a notable reduction in cost and hours spent on tasks.

Managing benefits to support the desired business goals

To reach the desired effect in relation to business goals, it is essential to focus on how the transformation of outcomes into benefits is managed. If the outcomes are not managed into benefits that support the business goals, the potential of the new capabilities may not be fully realised, and perhaps lost entirely.

For example, an outcome such as reduced need of labour can be realised as a benefit in several ways. For instance, one way is to cut down on employees to cost-minimise, while another could be to redirect employee resources to other tasks that add value for the customers, thus supporting business goals concerning customer value.

In the same manner, an outcome of higher throughput can not only be managed into gaining a faster time-to-market, but also increasing productivity. If, however, the potential to increase productivity is not utilised, it may be lost.

As such, it is imperative for an organisation to be clear about the main business goals of implementing RPA and to dedicate time and attention into realising the desired benefits. Moreover, clear communication of the desired goals and opportunities of implementing RPA is known to ameliorate potential fears among employees that the robots threaten to take over the employees' jobs.

Benefits management and realisation are typically the responsibility of the business units in close cooperation with RPA experts. They are the ones who run the RPA robots and, as such, are capable of managing the outcomes into the desirable benefits by dedicating their focus to making the most of day-to-day production. In other words, they own RPA transformation.

Close cooperation with the IT department is often necessary to ensure coherence with the IT portfolio, data management, IT security, etc.

Case: Generic – Data Migration and Conversion

In a specific case, 12 employees were employed to manually update information from their IT system to another system. Instead, RPA was implemented to perform these tasks.

The extensive backlog of cases to be migrated was cleared and cost reductions due to reduced manual labour were realised within the first 3 months.

Investment and running costs

The potential benefits of RPA are known to be achieved rapidly and with relatively low costs compared to traditional IT initiatives. Important factors that support the low costs of getting started with RPA are:

- Implementing RPA does not require a large IT technology investment
- No major IT changes to existing systems are needed
- Investments for development and operations setup are limited
- It is possible to implement RPA in a short period of time
- The organisational impact of the change is limited to only involving employees who are directly affiliated with the process handling

When investing in RPA software, it is important to be aware of the 'hidden' licence agreements and costs. Besides the expected licences for the RPA software itself, most commonly the RPA robots also need licences to access and operate the targeted IT systems and applications – just as any human user would. Moreover, if an Identity & Access Management solution has been deployed to control user access and rights, the RPA robots also need to be counted in that solution.

Case: Software Providers - Testing

RPA robots are efficient tools that can ease the technical burden and reduce the lengthy execution times which are often involved when testing new software.

Robots can be used to test the implementation of new software, applications, website updates, APIs, user interfaces, database, installation, network, and much more. Several RPA solutions have key features that support the testing of each process step, the performance of the solutions, integrations to other systems, and high-volume transaction tests.

The tests are performed rapidly and result in detailed data for the QA department to verify, make improvements if needed, and re-run the tests.

Case: Public Sector – Employee Contract Administration

In public administration, a line of requirements regarding employment contracts ensure that the contracts are compliant to the specific laws and regulations at the time.

As these regulations change regularly, it is necessary to ensure compliance checks on the existing contracts by reviewing the relevant documents.

Performing this manually is a time-consuming task due to the high volume of data involved. For this reason, the checks were often insufficiently carried out.

To ensure both efficiency and greater compliance, a Danish municipality developed an RPA robot which has been programmed to review all the contracts and related documents.

The RPA robot extracts the relevant information from different sources, checks for compliance according to the current set of rules, and highlights the contracts that need revising by the legal department.

Case: Public Sector – Process Compliance

RPA features can be used to follow process compliance after the implementation of new IT. For example, data on end users' actual use of the digital processes can indicate whether the processes are followed or whether there are user patterns that indicate problems with the process design.

This can be used to both improve the systems and to monitor compliance while gaining concrete facts on the realisation of the intended positive business outcomes and potential benefits.

The data generated from the RPA robots offer excellent material for forming and following business Key Performance Indicators (KPIs) for a longer period of time after the implementation supporting benefits realisation.

Can companies using BPS/BPO take advantage of RPA?

From the Millennium onwards, Business Process Shoring (BPS) and Business Process Outsourcing (BPO) to low-cost countries has been a preferred approach for many companies to lower their costs of business operations.

The BPS/BPO approach has been both used for core manufacturing processes leading to offshoring or nearshoring of entire production facilities, and for administrative back-office processes resulting in the creation of shared service centres, typically in nearshoring countries. Today, many larger international companies in the Nordics have a shared service centre in Eastern Europe.

Moving business processes to nearshore countries will typically lower the labour costs to around 30-50% of the comparable labour in a Nordic country. Moving the business processes to offshore countries will reduce labour costs to 15-30% of the comparable labour. Of course, the saving is offset by the investment required to move the business operation and by the costs to additional management resources needed to manage the BPS setup.

Compared to BPS/BPO, the deployment of RPA is not a large upfront 'lift & shift' investment or a major transition to an outsourcing partner, but instead a continuous series of smaller automations.

Consequently, the investment in RPA is considerably lower than an investment in BPS/BPO. In addition, no additional management resources are needed to manage RPA as with BPS/BPO, and with RPA, the comparable cost against the labour cost is lower than the 15-30% for offshoring.

Accordingly, the experience from companies already having a BPS/BPO operation is that here RPA is also able to drive further business benefits including further cost reductions.

Typical pitfalls of RPA

The fast time-to-market and ease of applying RPA robots to new automation and integration tasks is driving the proliferation of RPA. However, care should be taken to avoid a number of pitfalls endemic to the use of RPA:

- Instability of robotised processes
- Performance and stability of IT operations
- Eroding of Master Data Management (MDM)
- Risk of non-compliance with the General Data Protection Regulation (GDPR)
- Undermining of information security
- Robot sprawling
- Continuing inflexible IT due to RPA

Instability robotised processes. Changes to user interfaces may break the current programming of robots used for process automation. Recent advances in RPA have been aimed at reducing the risk of user interface changes affecting the software. However, as the nature of user interface changes can be complex, there is no guarantee that the robots can handle such changes. User interfaces can be considered delicate and somewhat flimsy compared to interfaces further down the application stack. Performance and breakdown of RPA processes must be monitored and subjected to an Service Level Agreement (SLA) equivalent to the SLA for classic integrations.

Performance and stability of IT operations. As RPA allows for the automation of tasks previously limited by the need of human interactions, e.g. in terms of performance load and the number of users involved, for instance the number of employees in accounting, there are risks related to the overall performance of the system when subjected to automated processes, possibly executed to a previously unparalleled extent. Performance and, for example, licensing issued, must be considered prior to using RPA in any larger undertakings.

Eroding of Master Data Management. Information architecture is a mature discipline with established best practices, for example, with regard to Master Data Management (MDM). A mature MDM involves ensuring that changes to master data are propagated and shared with consumers. In contrast, as RPA is based on user interfaces, there are often no built-in data patterns to ensure the timely discovery of new or altered master data, potentially resulting in the outdated and faulty distribution of data. While the MDM risk profile of initial endeavours into RPA may be low, over time the dependency and thus the criticality of MDM in the RPA setup will increase. Every application of RPA should be designed in accordance with the MDM policy for the data in question.

Risk of non-compliance with the General Data Protection Regulation. GDPR states that an organisation must protect and be able, upon request, to delete customer data. While classical integrations allow the organisation to understand and monitor the data flow and act accordingly, RPA toolkits may or may not support an overview of where data are at any time. The data governance capabilities of a RPA should be examined prior to investing in the technology.

Undermining of information security. Within the confinements of a system, great care has frequently been taken to implement a security model, thus ensuring the confidentiality of critical data. As business units may not be as well versed in information security, RPA processes implemented by a business unit may expose otherwise confidential data in new contexts, potentially resulting in security breaches of, among other concerns, pricing information, cost

information or confidential customer data, with little opportunity to detect such design flaws before the damage has been done.

Robot sprawling, the result of multi-local development and deployment of robots intensifies the risks addressed above. Without an overview and oversight, the ease of building and deploying robots may result in multitudes of robots operating in an uncoordinated manner. Previously, another multi-local technology, Microsoft Excel, has caused some of the same problems. However, as RPA does not just extract data but also perform data entry at scale without human interaction, the risks associated with RPA require additional attention.

Continuing inflexible IT due to RPA. When the 'symptoms' of an inflexible IT situation have been treated – using RPA to compensate for legacy development and missing integration – a temptation to disregard the underlying problems has been created. The business issues have been solved and the focus of the IT department has moved to other parts of the business – so why bother? Already by this early stage of the RPA era, this pitfall can be glimpsed in companies.
The pitfalls mentioned also represent the increasing complexity arising when moving from DPA to Enterprise RPA.

Governance to avoid typical pitfalls

The antidote to the pitfalls mentioned above is a mature approach to governance. The following remedies can be applied:

- Establish procedures for RPA use based on, for example, data sensitivity and the business value of doing RPA.
- Create and maintain awareness of do's and don'ts with regard to robots.
- Establish RPA Portfolio and Lifecycle management. Suggestions for new robots should be evaluated by a function with an overview of the information landscape.
- Robots should be identifiable as separate entities on the IT infrastructure, preferably automatically.
- Registering each robot, its inputs, outputs, timings and business rules should be mandatory in order to document and troubleshoot dataflows throughout the enterprise.

Many enterprises will have IT frameworks and governance in place able to handle the complexity of Enterprise RPA. The governance provided by Enterprise Architecture Management will be able to handle some of the deployment issues – and IT Service Management (ITIL) will be able to address the issues concerning operations and support of RPA robots.

Introduction to the market of RPA software

The market for RPA software is still relatively small, albeit with substantial potential for growth. In 2016, the market for RPA was only 250 MUSD. The IT markets analyst Forrester projects the market to reach 2.9 BUSD by 2021. With such continuous exponential growth, the market could reach a volume higher than 8 BUSD by 2025.

The market is still affected by the rapid growth of RPA as a discipline and the parallel discussion of what constitutes RPA. As a result of this, the definition of RPA is not used consistently in the market, which is reflected in the somewhat substantial differences in the features that RPA software suppliers offer.

As a consequence, the market can seem as something of a jungle and it can be difficult to assess the pros and cons of the different RPA solutions. As a potential buyer of RPA software, it is therefore essential to be aware of the level of workflow automation needed and which core RPA features the solutions offer.

In this report, we have limited our analysis of the RPA suppliers to those who are either specialised in RPA or dedicated to developing extensive RPA as an addition to their existing software suite. We have also limited our focus to the Scandinavian market.

This choice is made knowing that traditional suppliers of standard solutions such as ERP, CMS (Content Management System) and CRM systems often contain software components applying elements of RPA.

Furthermore, we have not included software solutions and platforms targeting the discipline of data science and data-driven automation such as Watson and Antworks as well as the Cloud platforms from Google, Amazon and Microsoft.

RPA software suppliers

The RPA software suppliers included in this assessment are:

- Automation Anywhere (US – privately owned) – automationanywhere.com
- Blue Prism (UK – listed on the London Stock Exchange) – blueprism.com
- Epiance RPA (India – privately owned) – epiplex500.com
- Jacada (US – listed on OTC Markets – OTCQB) – jacada.com
- Kryon Leo (Israel – privately owned) – kryon-systems.com
- Kofax Kapow (US – part of, and owned by, Lexmark, formerly ReadSoft) – kofax.com
- Nice RPA (Israel – listed on Nasdaq) – nice.com
- OpenConnect (US – privately owned) – open-connect.com
- Pegasystems Pega Robotics (US – listed on Nasdaq) – pega.com
- Redwood Software Robotics (NL – privately owned) – redwood.com
- UIPath (UK – owned by private equity funds) – uipath.com
- WorkFusion (US – owned by private equity funds) – workfusion.com
- Thoughtonomy (UK –privately owned) - thoughtonomy.com

Very few of these software suppliers have local offices in Scandinavia where they can support and market to their customers directly. Instead, they use different types of partners.

Implementation partners

There is a wide variety of implementation partners, ranging from small local companies to the large consulting firms and IT integrators that have formed partnerships with the RPA software suppliers.

The implementation partners are companies with a formal implementation partnership with the software suppliers. This does not cover independent management consulting firms advising on the use of RPA.

A consolidated list of the large implementation partners and IT integrators is provided in table 1. Please note that not all RPA software solutions are represented.

Also note that this is only a listing of the known partnerships, not a list reflecting actual RPA revenue generation or customer base. We do not have numbers for the different partners' revenue, customers or other types of market data.

■ Table 1: Implementation & Consulting Partners

RPA Software/ Implementation Partner	Automation Anywhere	Blue Prism	Jacada	Kofax Kapow	Nice RPA	Pegasystems Pega Robotics	Redwood Software Robotics	UIPath	WorkFusion	Thoughtonomy
Accenture	x	x	x		x	x				
Atos						x		x		
Avanade		x								
Cap Gemini		x			x	x		x	x	
Cognizant	x	x	x			x		x		
Dell	x									
Deloitte	x	x			x			x	x	
Devoteam|Globicon	x									
EY	x	x				x		x		
Fujitsu										x
HCL	x								x	
HGS	x									
IBM	x	x	x		x	x				
Infosys	x									x
ISG	x	x								
KPMG	x	x								
L&T Infotech	x									x
Microsoft				x		x	x			
Oracle						x		x		
PwC	x	x						x	x	
SAP						x	x			
Tata								x	x	
Wipro					x				x	

Assessing the RPA Software Suppliers

There is not one single RPA software solution that is best for every RPA scenario. The solutions all have different advantages, features and tools. Which solution will fit your organisation's needs depends on the IT and business contexts, the scope, and the business objectives of implementing RPA. Does the process handling need advanced tools, what are the points of attention in terms of the general IT portfolio, potential pitfalls, etc.?

We have based our assessment of the different suppliers' software on what we consider core features of RPA software:

- **Attended Automation**: Automation requiring human interaction.
- **Unattended Automation**: Automation not requiring any human interaction.
- **Performs end-to-end**: Automation on entire end-to-end processes.
- **Machine Learning**: The ability for the robots to enhance the performance of their tasks on their own without human influence.
- **Analysing data**: The robots provide analytics and insights of their work or other processes to be improved.
- **Pattern recognition**: The robots are able to recognise patterns in large amounts of data using advanced algorithms.
- **History collection**: The automation reports on historic changes in processes and data handling for the customer to review.

Table 2: Assessing the RPA software solutions

Suppliers Core features	Automation Anywhere	Blue Prism	Epiance RPA	Jacada	Kryon Leo	Kofax Kapow	NICE RPA	OpenConnect	Pegasystems	Redwod Software Robotics	Thoughtonomy	UiPath	Verint	WorkFusion
Attended Automation	x	x	x	x	x	x	x	(x)	x		x	x	x	x
Unattended Automation	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Performs end-to-end	x	x	x	x	x	x		x	x	x	x	x	x	x
Machine Learning	x	x	(x)		x	x	x				x	x		x
Analysing data	x	x	(x)		x	x	x	x	x			x	(x)	x
Pattern recognition	x	x			x	x		x	x		x	x	(x)	x
History collection	x	x	x	x	x	x	x	(x)				x		(x)

Table 2 offers our assessment of the software's support of those core RPA features. The assessment is based on the information available on the suppliers' websites.

The main features provided by the software are marked by an x, whereas features that are only partly supported are marked by (x).

Categorising the RPA Software Solutions

The solutions are categorised looking at two factors:

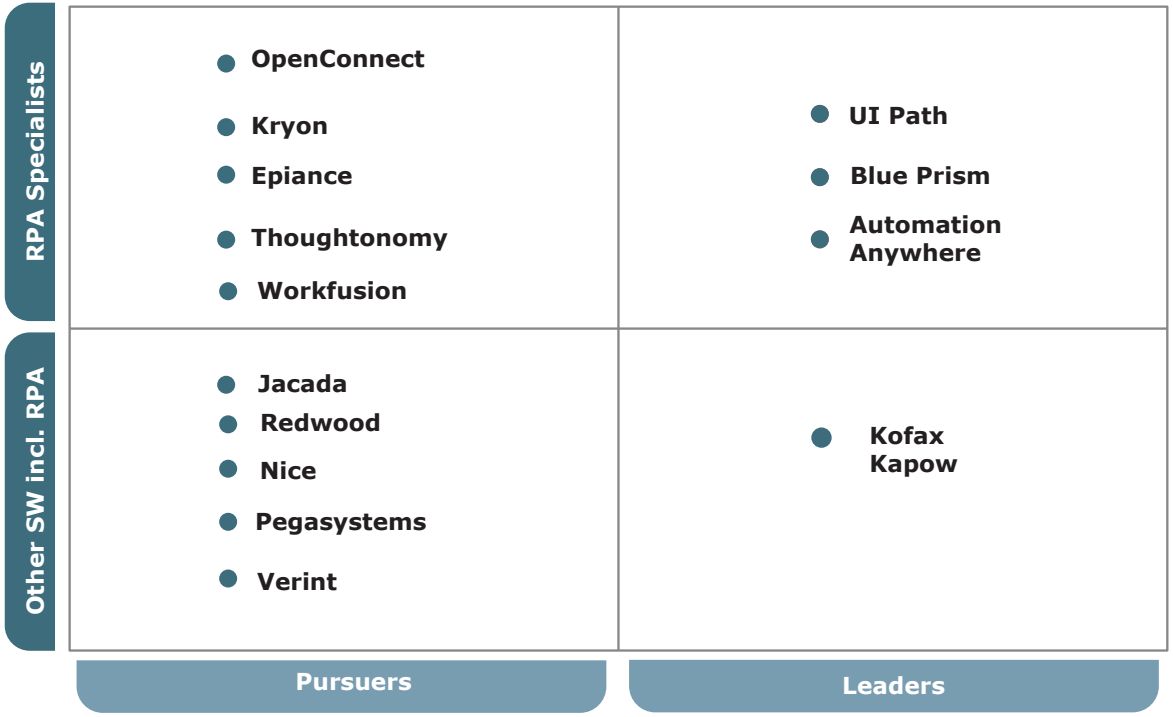
- Whether the solutions are specialised in RPA or develops RPA as an addition to their existing software suite.
- Whether the solutions can be considered as leaders or pursuers on the RPA market.

The four categories that emerge from this view on the RPA software solutions are:

- The leading RPA specialists
- The pursuing RPA specialists
- The leading other software providers that include RPA in their solutions
- The pursuing other software providers that include RPA in their solutions

The software solutions included in our assessment are situated according to these four categories as shown on figure 4.

Figure 4: Overview - RPA software suppliers



The leading RPA specialists:

This category of RPA solutions is characterised as being well-known solutions with a strong holding in the RPA market. The solutions are generally characterised by offering both attended and unattended automation of end-to-end processes with a variety of advanced RPA tools.

The tools of these solutions enable flexible process automation, thereby supporting a wide range of automation possibilities.

The tools include the ability to accumulate large amounts of data "experience" that can be used to analyse patterns in order to refine the process handling.

Automation Anywhere has, since 2003, helped customers to automate repetitive processes, both attended and unattended. The product suite includes add-on modules for analytics and Machine Learning for intelligent automation and complex decision-making. Automation Anywhere aims to shield users from the complexity of building RPA robots and has the aim of enabling non-technical users to build automations without the involvement of IT.

UiPath's RPA Enterprise Platform allows both attended and unattended automation. Through partnerships with ElasticSearch and Kibana, insights and analytics are monitored, collected and visualised. Partnerships with Microsoft and Google allow intelligent automation with Machine Learning capabilities and real-time learning among language meaning and emotions, and use it for complex decision-making.

Blue Prism delivers RPA which is designed towards enterprise organisations and built for multi-environment deployment. Their service allows attended and unattended automation and has code-free configuration. Analytics and Machine Learning are incorporated into the service and provide a full end-to-end solution, while storing historic data on access, configuration changes and process execution.

Furthermore, the solutions in this category are able to apply Machine Learning using advanced algorithms in order to analyse data and improve the process execution without human intervention.

UI Path, Blue Prism and Automation Anywhere are dedicated RPA solutions known for these features and current leaders on the market.

The pursuing RPA specialists:

The pursuing RPA specialists also include dedicated RPA software solutions. At this point, these solutions do not possess as strong a hold on the market as the leading RPA specialists. They are, however, dedicated to supporting the RPA discipline as their main objective and some solutions in this category are expected to potentially gain a leading position in the market in the coming year.

The solutions also offer both attended and unattended automation of end-to-end processes with advanced RPA tools. Accumulation of experience and Machine Learning are among the tools offered in these solutions.

OpenConnect, Kryon, Epiance, Thoughtonomy and WorkFusion are placed in this group.

The leading other software providers that include RPA in their solutions:

This category of RPA solutions is characterised by providing RPA as an addition to their existing software suite.

The RPA features and tools of some of these solutions enable both attended and unattended automation of end-to-end processes and advanced features

such as accumulation of experience, data analysis and Machine Learning.

Furthermore, some of these solutions are well integrated into the software, which supports the core business processes to which the systems are dedicated. This enables highly effective appliance of RPA on the processes this covers.

Kofax Kapov is the only software solution assessed to be in this category.

Kofax Kapow applies RPA as their support of Digital Workforce. Kapow can handle many different kinds of data in different formats and automate processes, both when attended and unattended.

When combined with Kofax's other services, the solution is also able to integrate Machine Learning into document classification, separation and extraction of all document types. Kofax Kapow is a part of the many services Kofax provides, of which most were integrated and benefit from each other.

The pursuing other software providers that include RPA in their solutions:

This category of RPA solutions is characterised by providing RPA as an addition to their existing software suite. These solutions are characterised by including less mature RPA tools than the similar solutions leading the market. However, some of the solutions in this category are well on the way to offering more sophisticated tools and are in the process of securing a stronger position on the market.

Pegasystems, Redwood, Jacada, Nice and Verint are some of the solutions assessed to be in this category.

Implementing RPA

Getting started with RPA is faster than implementing traditional IT systems and RPA initiatives can be implemented as rapidly as within 4-6 months on well-scoped processes.

RPA is characterised by being implemented in an agile step-by-step approach to ensure fast results on well-scoped initiatives with high benefit potential. Often a Proof of Value is initially carried out on a well-scoped area in order to assess the value of an RPA implementation.

The RPA initiatives are generally initiated, run and owned by the business units implementing RPA. In order to ensure RPA expertise in the initiatives, there appears to be two main tendencies on how organisations choose to approach this. The first is to facilitate an RPA Centre of Excellence in the IT department manned with the expertise of RPA specialists and IT specialists. The second is to root the RPA Center of Excellence as a part of the business units focused on RPA expertise with a limited inclusion of IT expertise.

The combination of expertise in business processes, RPA and IT is nevertheless essential.
The business units understand the business processes in depth. They are the ones who can assess both the potential and the possible pitfalls of the application of RPA software from a business point of view. This knowledge is crucial in order to ensure the right process design for the RPA solutions.

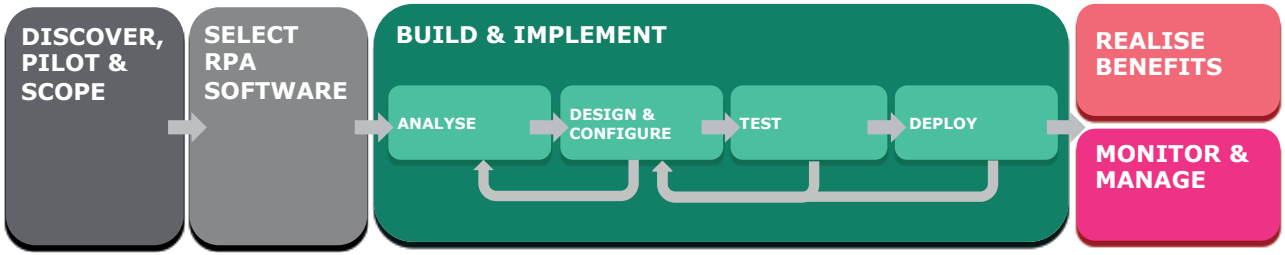
The IT department has important knowledge regarding the general IT portfolio of the organisation such as business systems and applications, IT architecture, existing IT infrastructure, data and governance on data management. This knowledge is essential in ensuring that the RPA software is applied in a manner where potential IT pitfalls are avoided.

An RPA implementation process will typically have five main activities, similar in nature to any other technology realisation process:

1. Discover, Pilot & Scope
2. Select RPA Software
3. Build & Implement
4. Monitor & Manage
5. Realise Benefits

An overview of the RPA realisation process is provided in Figure 5:

■ Figure 5: The 5 main activities of RPA Realisation



Activity 1: Discover, Pilot & Scope

RPA is a new discipline for many companies, and also a discipline where the actual benefits as well as the content are unknown territory. Therefore, many companies have started their RPA journey with an open process where the purpose has been to discover and learn about RPA.

The main approach to the discover process is to perform one or more pilots on RPA. These pilots form the Proof of Concept or Proof of Value for an upcoming RPA initiative in the company.

The knowledge of the employees who are currently involved in operating the business processes where RPA is considered is essential to include in this process, in order to distinguish and understand the potential for automation.

Once the potential of RPA has been identified, a more structured identification of business goals takes place in order to form the basis for a more formal decision to start an implementation of RPA. The business goal identification is not generally a lengthy process resulting in elaborate strategy papers, but is important in order to be clear about what is intended to be achieved by RPA. This is, not least, important in terms of the subsequent change management towards the employees whose work areas are affected.

When the business goals have been determined, the scope of the RPA initiative is defined clearly, including an assessment of the organisation's RPA potential in detail.

This can include creating an overview of the IT portfolio and processes in scope to identify the processes with a high potential for automation. Typically, the exact process handling on several areas are documented to a high level by step-by-step sketches – what is done, by whom, using which IT systems and how?

When the candidates for RPA are listed, the potential of each process is assessed according to the potential for automation, the potential benefits, and the expected effect on business goals. Based on this, one or more specific processes are chosen to support it.

Processes with an RPA potential are characterised by being:

- Rule-based and repetitive
- Manual
- High volume
- Time-critical
- Seasonal
- Triggered by a digital input and supported by digital data
- A low exception rate
- Causing rework

Subsequently, following the first activities, the companies feel comfortable that RPA can improve their business, they have learned about the technology, and they have identified the processes to be automated along with the potential expected benefits from the automation.

Activity 2: Select RPA Software

The next activity for most companies is to select the RPA software platform. When selecting the software, companies typically evaluate the following factors:

- Product maturity
- Functionality
- Breadth of the portfolio
- Ease of use
- Scalability
- Reliability
- Security and compliance
- Availability
- Enterprise support and services
- Costs: both initial investments and running costs

The compatibility of the RPA software with IT standards and architecture is an important issue for most companies. Furthermore, knowledge of the IT systems involved is essential. This could be in terms of stability, how often the systems undergo updates and changes, etc. If the IT system in scope is undergoing recurring changes in the user interface, it is essential that the RPA software can handle this.

Investment costs, implementation costs and ongoing costs for maintenance, RPA licences, system licences etc., are also analysed at this stage.

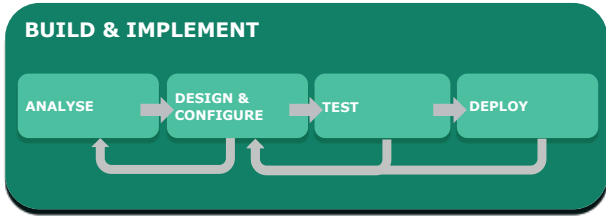
Selecting the right supplier and implementation partner can often be as difficult as selecting the software, as most of the RPA software suppliers do not have operations in Scandinavia and the consulting services supplier market is very fragmented.

Activity 3: Build & Implement

The build and implement activity for implementing RPA software consists of multiple steps. The companies, having implemented RPA, use different names for the steps but are all more or less going through the same processes. The approach is identified as agile, where steps are revisited in order to analyse problems further and find the right solution.

The detailed steps and their interaction are shown in Figure 6.

Figure 6: Build & Implement



Analyse

The first step is the comprehensive analysis of the processes in scope in order to understand each step and task in the process fully.

This includes detailed process mapping, identification of data inputs and variables, mistake patterns, possible process barriers, etc.

The analysis should be conducted in close collaboration between the business units and the RPA specialists. The results need to be documented on a detailed level in order to use it as a foundation to design an automated process with RPA.

Design & configure

Next, the automated process is designed in order to configure the software in terms of creating the business logic and rules, how to manage exceptions, etc.

Often, the software is configured simultaneously with the design step in an agile process between business experts and RPA experts. As such, the software is used to test the design of each process step in turn in order to create the most effective automation.

If more significant problems arise at this step in the implementation process, it may be necessary to revisit the analysis step in order to fully understand the problem and design the right solution.

Test

When the design is completed and the solutions are configured, testing of the full process automation is initiated, typically by performing a range of processes and monitoring the results.

If the tests show either problems or potential for further optimising, it may be necessary to take a step back and revisit the previous steps to understand the problems and perform the appropriate change in order to solve the problem.

Deploy

When the testing is completed, the solution is ready for deployment. It is important that the employees know how to handle the actual deployment and their tasks of interacting with the RPA robots and initiating adjustments if needed.

Data should be analysed on an ongoing basis in order to assess the stability and the performance of the RPA robot.

Many companies also define the KPIs of the process at this time. These KPIs are used to monitor the process performance accordingly. When the KPIs are defined often depends on the availability of data in order to establish a baseline for the KPIs prior to the RPA implementation.

Activity 4: Monitor & Manage

At this stage, companies organise the day-to-day operations of the RPA. These include factors such as:

- Deciding governance procedures where needed
- Setting up the monitoring of the robots – focus on the expected availability and performance of the robots
- Assigning the responsibility of running and supporting the robots

Activity 5: Realise the Benefits

There is also a strong focus on the benefits realisation using RPA. The responsibility for the benefit realisation typically lies with the business units, perhaps assisted by the IT department or RPA experts.

The benefits realisation activities include:

- Continuously monitoring the KPIs
- Adjusting the organisation to achieve real cost savings
- Following up on the business performance of the RPA robots and initiating adjustments through the determined channels when needed
- Following up on how the processes and changes are realised in the everyday cycle of the business units
- Reporting on performance and benefits progress to management according to baseline and goals
- Recognising potentials for unexpected business outcomes and ensuring they are utilised into benefits supporting the business goals

This phase does not conclude as long as the RPA robots are in use, and the activities should be implemented into the routines of the business organisation as persisting activities.

Key Considerations for RPA

The collective insight from this report – serving as advice for companies interested in RPA – is the following:

- RPA should be considered by almost any company in the struggle for continuous process optimisation. The relatively low investment combined with fast and tangible benefits makes RPA an attractive technology for most companies – including companies having already deployed Business Process Shoring and Outsourcing to lower their operational costs.
- It is important not to confuse RPA with other automation approaches such as data-driven automation. RPA is a very specific approach which is well-suited for (parts of) certain types of processes, but also as a tactical solution for companies dealing with a very inflexible IT situation.
- The knowledge gained from companies already having deployed RPA has already formed a well-defined approach for RPA, consisting of five main activities. Newcomers to RPA can benefit from this approach. Start with a discovery to learn about RPA, proceed with a Proof of Value and identify the processes in scope for RPA. Select the RPA software after your discovery work.
- Processes that are candidates for RPA have one or more of the following properties: rule-based, repetitive, manual, high volume, time-critical, seasonal, triggered by a digital input, supported by data, low exception rate, causing rework.
- The market place consists of both dedicated RPA software – along with other software solutions including RPA as part of their offering. Software solutions are developing very rapidly – but some clear market leaders can be identified in both categories. Many of the RPA software solutions have state-of-the-art tools to address the RPA business needs of most companies.
- The Scandinavian market essentially has the same RPA software solutions as the international market.

Consequently, the RPA market and the solutions today have a maturity, allowing companies to select and deploy the best RPA for their business needs.

Market INSIGHT

About HerbertNathan & Co

HerbertNathan & Co is a highly specialized management consulting firm and the most frequented impartial advisor in the Scandinavian market within the area of business applications (ERP-, HR-, CRM, BI-systems etc).
HerbertNathan & Co provides 100% independent advice and in-depth knowledge of the market and experiences from more than 500 projects over the past many years.
HerbertNathan & Co offer services in the full systems lifecycle, i.e. from initial strategy formulation, to systems selection into implementation and optimization - always as the advisor of the client. Furthermore HerbertNathan & Co publishes in-depth impartial analysis and reports of systems and vendors. HerbertNathan & Co has offices in Denmark, Sweden and Norway and employs more than 30 experienced consultants. HerbertNathan & Co. is now part of the European consulting company, Devoteam.

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ABOUT MARKETINSIGHT

The purpose of the HerbertNathan & Co MarketInsight is to give existing and potential coming users of business applications a short and crisp update of the market. The HerbertNathan & Co MarketInsight is developed through in-dept meetings, presentation, interviews and discussions with leading representatives of the potential vendor and provides the HerbertNathan & Co view of the major developments in the market. The MarketInsight will supplement our existing market publications on specific individual vendors.

OTHER MARKET RESEARCH FROM HERBERTNATHAN & CO.

- Invoice workflow systems in Denmark 2017
- HR market reports (HCM systems in Denmark, Sweden and Norway, 2017)
- WMS systems in Scandinavia 2016
- ERP in Denmark 2016
  (and ERP in Sweden and Norway 2016)
- ERP Cloud solutions in Scandinavia, 2015

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