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Software Bots - The Next Frontier for Shared Services and Functional Excellence

Vipin K. Suri¹, Marianne Elia¹, and Jos van Hillegersberg^{2()}

¹ Shared Services International Inc., Mississauga, ON, Canada
{vipinsuri,mariane.elia}@ssinsights.com

² Faculty of Behavioural, Management and Social Sciences, Industrial Engineering and Business Information Systems, University of Twente, Woodbridge, ON, Canada
j.vanhillegersberg@utwente.nl

Abstract. A Software Bot is a fundamental element of Robotics Process Automation (RPA). RPA can be deployed to automate repeatable, mundane, rules-based work-flowed process tasks across multiple functions in an organization, including Shared Services. While RPA holds high promise, using Software Bots for process automation is not straightforward. The purposes of this research are to (1) examine where Software Bots currently are being deployed in Shared Services organizations and (2) understand the business case, drivers and challenges. We conducted a survey involving Shared Services leaders, functional leaders and RPA experts and discuss the best practices for analysing and optimizing the business benefits of implementing Software Bots. The majority of the companies surveyed have limited application of Software Bots in automating their business processes and are finding difficulties in quantifying tangible savings and identifying cost of implementation. Based on these results we identify functional processes which are candidates for automation using Software Bots and outline implementation steps to automate processes beyond business process optimization.

Keywords: Shared Services · Functional services · Robotic Process Automation · Software Bots

1 Introduction

Robotic Process Automation (RPA) is the concept of using a software platform of “virtual robots” to manipulate existing application software in the same way that a human does to process a transaction [1]. Imagine a world in which the meaning of “work” has been redefined for millions of people. Where our service economy can actually focus on providing services, delivered by an engaged talent pool that is innovating such services. In this new world, work would no longer be a “four-letter word” associated with functioning within repeatable systems with mundane transactional processes. Instead, this other world would have workers who re-think end-to-end processes on a more holistic level with the goal of simultaneously impacting several factors: quality, efficiency, cost-effectiveness, functionality, customer satisfaction and compliance while creating remarkable delivery of business support services. 2015 was to RPA what 1994

was to the Internet - an auspicious start, but we haven't seen anything yet. Thanks to RPA, we are well on our way to creating the business operations of the future. However, none of us can really predict just how revolutionary it will be [2].

Using a combination of literature study, discussions with RPA experts, survey and in-depth interviews we address the following research questions:

1. What is the value potential of process automation using Software Bots?
2. How is the business case approved and by whom?
3. Which processes have been automated using Software Bots and in what functional areas of Shared Services organizations?
4. What are the challenges with implementing Software Bots in Shared Services organizations?
5. What benefits have been achieved by using Software Bots in Shared Services organizations?

This paper is organized in following sections: Sect. 1 has just provided an introduction to Robotic Process Automation and set the stage for our study. Section 2 is a review of literature related to Software Bots and RPA. Section 3 presents data collection methods. Section 4 provides findings and analysis of data collected and Sect. 5 outlines the conclusions and future research.

2 Literature Review

There is often a tension between business operations needs and the allocation of IT resources. While the overarching mandate of an organization is to improve service and reduce costs, the resources and priorities of the two groups are often misaligned. This can result in constrained business growth and performance. Willcocks and Lacity conclude that in pursuit of reduced costs and improved services, businesses have transformed over the past few decades using the principles of Centralization, Standardization, Optimization, Relocation and Technology Enablement. The researchers conclude that the next logical step is to automate [3]. For most businesses, the best candidates for automation are often "back office" processes, where the goal is to provide faster, customer focused service to customers and to reduce high processing costs and error rates; these are processes that are mundane and require entering repetitive data into multiple systems where the systems don't talk to each other [4].

Back offices are where the operational support systems for services are created, managed, and delivered. Back offices are always under pressure to contain costs in highly competitive industries like insurance and financial services, but cost efficiency must be balanced with other performance imperatives such as service excellence, business enablement, scalability, flexibility, security, and compliance. From years of research on back offices, we have learned that low-performing back offices can be transformed to high-performing back offices through six transformation levers: centralized physical facilities and budgets, standardized processes across business units, optimized processes to reduce errors and waste, work relocation from high cost to low cost destinations, technology enablement with, for example, self-service portals, and automate services [3].

The business disruption caused by artificial intelligence and related technologies (cognitive, machine learning and RPA) is already here and more business disruption is on the way. In 1999, the big business disruption was the use of offshoring to create labor arbitrage. The new disruptor is automation arbitrage, a term Gartner is using to describe the recalibration of human labor to drive business outcomes. The initial low-hanging fruit in this arena is RPA. It is relatively low cost, quick to implement and unobtrusive; thus it starts what will likely be one of the most important conversations in the next five years regarding how automation will change the value proposition in all organizations [5].

Major business functions that offer opportunities for process improvement through RPA include supply chain management, sales, finance and accounting, and human resources. RPA is ideal for preventing error rates, reducing variability, improving cycle time, and increasing productivity in processes that follow a standard procedure with minimal deviation. Software Bots can perform repetitive, monotonous, high-volume tasks, freeing workers to focus on activities that require higher-order thinking. High-volume bulk processing functions within tools such as enterprise resource planning (ERP) systems or core databases are ideal candidates for RPA, as are desktop applications and workflows that require information gathering from multiple sources. For tasks too small and diverse for IT changes, RPA offers an alternative to outsourcing and offshoring [6].

Finance functions are under significant pressure across all industries and specifically in the financial services sector. Some of the major challenges in the financial services sector are to reduce costs and support decreasing margins, to improve speed, volumes and quality of information provided to focus on delivery of value adding insights to the business. The RPA implementation burdens (costs and timelines) are relatively insignificant, compared to major IT platform updates. Therefore, it is likely that RPA will quite quickly convert from a differentiator delivering a competitive advantage to a standard practice that needs to be followed for survival. RPA provides a competitive advantage by helping to meet today's challenges by radically improving cost efficiency under growing pressure on costs, helping to remain in control in the constantly changing environment and allowing to focus skilled resources on driving value creation for the business. RPA is quickly evolving into a new hot topic in the Finance world as significant potential has become evident. And most of large players in the financial services sector are either assessing possibilities to benefit from RPA or even proceeding with the first implementations [7].

Finance leaders obsess about transformation levers - people, process and technology. However, today's solutions save the requisite investment in an expensive ERP platform, have typically leaned heavily on the equation of people and process. Less expensive resources located offshore delivering transactions, plus added process improvement equals significant savings. Up until now the technology component has mainly been limited to communication widgets that facilitate workflow and e-invoicing.

RPA is the application of flexible tools to automate manual activity for the delivery of business processes or IT services. It is most applicable to rules driven, data-intensive processes that are repetitive in nature. They can cross multiple systems, and include multiple decision points/calculations. They require an electronic input or trigger to

commence working, yet the underlying technologies are still emerging, each taking a different approach [8]. RPA is a way to automate repetitive and often rules-based processes. These transactional processes are typically located within a Shared Services centre or another part of the back office. Software, commonly known as ‘Robot’ or “Bot”, is used to capture and interpret existing IT applications to enable transaction processing, data manipulation and communication across multiple IT systems. Multiple robots can be seen as a virtual workforce, working as a back-office processing centre but without the human resources. Software Bots undertake processes similar to human counterparts and can work on multiple processes just like a Shared Services staff member can learn to work on an accounts payable process and a travel and expenses process. The robots use a ‘virtual machine’ and dedicated logins to interact with different applications and systems in the same way as human teams [9].

RPA does not replace Business Process Management (BPM), but rather complements it. RPA and BPM are each suited to automating different types of processes. BPM solutions are best suited for processes requiring IT expertise on high-valued IT investments like ERP and Customer Relationship Management (CRM) systems. BPM solutions are developed by IT staff. The two distinguishing attributes of RPA software are that it is designed for non-programmers to use and it does not disturb existing systems. This means that the threshold of business processes worth automating are substantially lowered. Now, those swivel chair processes that are owned by operations and are too small to justify the use of IT development resources can be automated by business operations staff. RPA solutions are typically deployed by business operations staff with IT oversight (but not with IT developers) for processes that require business and process expertise. The significantly lower IT investment costs now makes automating these processes financially beneficial. Pat Geary, CMO for Blue Prism, said: “We are not trying to replace enterprise IT, and we are not really trying to compete with BPMS. It’s really this long tail of processes that are typically deployed by humans that are most suitable for RPA. Humans can be redeployed to more intelligent decision-making tasks” [3, 10].

For many enterprises considering Robotic Process Automation, concerns around security are preventing action. While RPA is one of the most popular enablers of services, there is plenty of mistrust, and sometimes fear, around the idea of unleashing an army of robots on enterprise systems. In many cases, it is the IT department, often for right reasons, that presents the main hurdle. While an often touted ‘benefit’ of RPA is that the business itself can implement robotic solutions with little input required from IT, the truth of the matter is that an organization will need engagement of IT in design and deployment if it needs them to partner on a solution, especially when things go wrong. Despite these concerns, the market for RPA is undoubtedly growing. The danger is that in the current feeding frenzy, it is tempting for companies to build a ‘quick and dirty’ robotic capability that lacks security, scalability, and sustainability. While there may be cost benefits in the short-term, there is a good chance that the company will pay for it in risk and scale, in the long-run [11].

An example of potential reduction in Finance & Accounting (F&A) operations costs shows the impact of RPA as reported in [12]:

- Baseline cost of onshore F&A operations 100%
- Cost reduction due to offshoring (43%)
- Reduced cost of off-shored F&A operations 57%
- Cost reduction due to RPA implementation (15–22%)
- RPA implementation and running cost (2%)
- Reduced cost of optimized F&A operations 33–40%

Gartner estimates that by 2017, autonomics and Robotic Process Automation (RPA) will drive a 60% reduction in the cost of many IT services, primarily through automating repetitive tasks currently performed by humans. Potential applications of RPA solutions include traditionally labour intensive areas such as service desks and customer care centres, as well as a broader range of functions in IT operations, such as network, storage, server and application management, database administration, virtual machine provisioning, process orchestration and teleconferencing. Service delivery model options include partnering directly with a software provider such as Arago, BluePrism or IPsoft; working with a service provider that licenses smart software; or working with a provider that offers a home-grown solution [13].

The stewardship responsibilities of CFOs often make them, understandably, quite conservative. Though there is some evidence of uptick in embracing newer concepts such as cloud and mobile in the finance organization, is untested robotics software a stretch too far for finance leaders? What assurances does the CFO need to move forward? Does the controls environment change? What are the implications of RPA upon the organization? Proponents of robots in the finance functions must be prepared to answer these questions [8].

Robotic Process Automation (RPA) is being deployed in shared service organizations as the next transformation lever beyond centralization, standardization, optimization, relocation to low cost areas, and use of enabling technologies. Although shared service organizations have long-deployed enabling technologies like standard Enterprise Resource Planning (ERP) packages, self-service portals, and low-level automation tools like scripting and screen scraping, RPA is a new breed of software that allows enterprise-safe automation of processes [14].

In industries ranging from banking and insurance to healthcare and the life sciences, robotics offer companies benefits that include [6]:

- **Fast ROI:** Robotics tools are fast, easy and relatively inexpensive to implement - development in six to eight weeks is typical for faster realization of return on investment. Outsourcing consultancy Everest Group reports that RPA can reduce costs by up to 65%. And RPA's ability to log data at the transactional level enables ongoing decision-making that is fast, accurate and predictive.
- **Flexibility:** Depending on project requirements, robotic tools can be developed either in "batch mode" to complete end-to-end processes or when human intervention is indispensable, in "assisted mode."
- **Security:** RPA can be integrated with multiple applications at the presentation layer, ensuring that clients' applications are not modified or enhanced by the robot. It also carries no risk of unauthorized data access: Since the business function leverages the

already-available underlying application, access authorization concepts are automatically inherited.

Robotic Process Automation is not a temporary trend and it is an evolution of technology in support of automating processes. One of the great potential advantages of robotics is that it offers an affordable, relatively easy to implement and a cost-effective solution.

3 Data Collection Methods

Despite the huge potential for RPA and software bots in shared services, little is known of their application and business value in this area. In this study, we address the five research questions stated in the introduction by conducting a survey of RPA Professionals, Shared Services Leaders and Functional Leaders in USA, Europe, Canada, China, Singapore and India. The survey was sent to over 150 leaders and 42 respondents from companies in nine industries participated in the survey. To gain additional insights, in-depth interviews were conducted with 12 respondents who have implemented Software Bots. Figures 1 and 2 show the distribution of respondents by industry and by revenue.

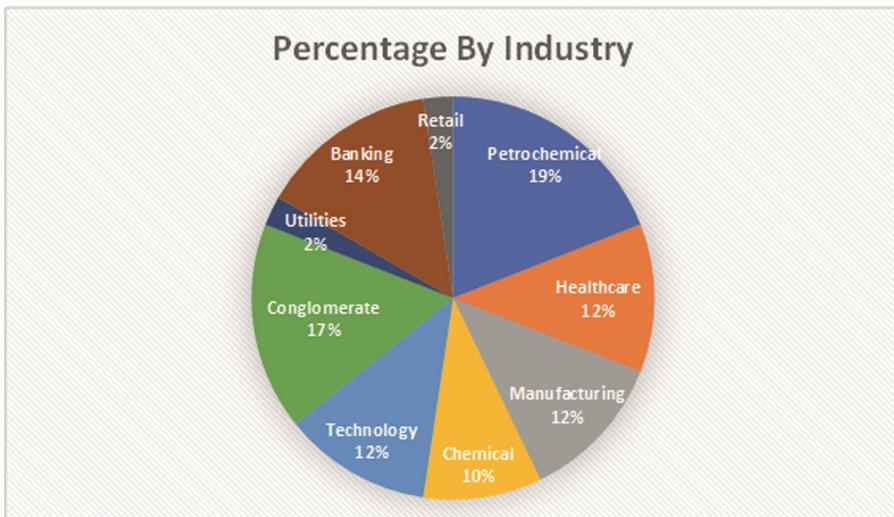


Fig. 1. Distribution of respondents by industry

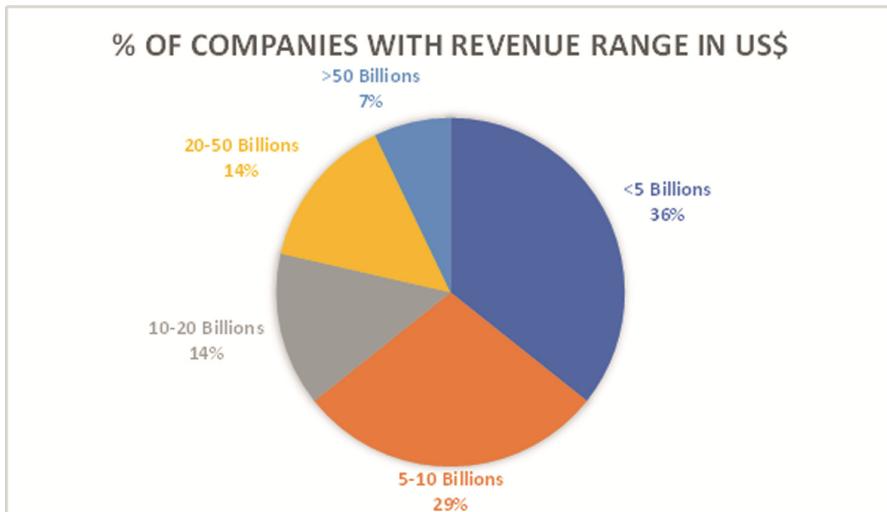


Fig. 2. Distribution of respondents by revenue

In addition to the demographic questions asked in the survey, the survey participants were asked 21 questions. The questions asked were:

1. Have you heard about RPA?
2. Have you heard about Software Bots?
3. How can RPA be defined and classified?
4. Do Software Bots have the potential for automating processes within your shared services organization?
5. Have Software Bots been implemented within your company?
6. If Software Bots have been implemented within your company, who developed the software for you?
7. What is the current status of implementing Software Bots in your shared services and functions within your company (please check all applicable answers)?
8. Have you received tangible or intangible savings through implementation of Software Bots (please check all applicable answers)?
9. When were Software Bots adopted within your company (please check all applicable answers)?
10. Did you create a business case for Software Bots?
11. What was the basis of your business case?
12. Who approved the business case for adopting Software Bots?
13. What were the difficulties in developing the business case for adopting Software Bots anywhere within your company (please check all applicable answers)?
14. What non-financial factors were considered critically important in the development of the business case for Software Bots?
15. Which functional processes do you think are candidates for automation using Software Robots (please check all applicable answers)?

16. What processes should not be considered for automation using Software Bots (please check all applicable answers)?
17. What are the challenges for automating processes using Software Bots (please check all applicable answers)?
18. What are the perceived/actual benefits of Software Bots (please check all applicable answers)?
19. What are the key shortcomings of Software Bots (please check all applicable answers)?
20. If you were to further automate your processes, what methodology will you use?
21. Which one of the following outcomes is most important in automating processes in your functions and shared services within your company?

Survey responses were summarized in an Excel spreadsheet for analysis purposes.

4 Results

4.1 What Is the Value Potential of Process Automation Using Software Bots?

All of the respondents indicated that they have heard about RPA and Software Bots. They were divided in their views about the value potential of Software Bots for automating processes within their Shared Services organizations. 28.5% indicated that the Software Bots have vast potential whereas 43% and 28.5% indicated Software Bots have large and small potential respectively within their organizations. These results indicate the diversity in organizational operations and organizational maturity levels. In response to the question regarding how RPA can be defined and classified, the following answers were provided. Definitions provided were used to assess the degree to which respondents were familiar with RPA. This was used for analysis purposes including the assessment of the validity of participants' responses to the other questions contained in the survey:

- As Peter Moller from Deloitte often says “these are macros on steroids”. They enable to automate and speed up the data processing across systems.
- Software that performs faster, error free, devoid of human challenges of time/age/health
- Replicating human activities through the use of a computer based system
- RPA is the application of technology that allows employees in a company to configure computer software or a “robot” to capture and interpret existing applications for processing a transaction, manipulating data, triggering responses and communicating with other digital systems.
- Semi-automatic, run book automaton
- Robot Process Automation or a software to let a robot mimic what a human is operating from a computer

4.2 How Is the Business Case Approved and by Whom?

70% of the respondents mentioned that a business case for Software Bots was created within their organizations and the primary basis of their business case was reduced

operational costs (33%), FTE reduction (33%), improved customer service (17%) and improved quality (17%). The business case for adopting Software Bots was approved by the CEO in 28% of the cases and in other cases it was approved by the COO or the Shared Services Leader. Based on responses received, the common primary difficulties in developing the business case for adopting Software Bots anywhere within their companies can be summarized as:

- Difficulty in quantifying tangible savings (57%)
- Difficulty in estimating FTE reductions (29%)
- Difficulty in identifying cost of implementation (14%)
- Lack of co-operation from IT group (29%)

These findings are similar to those cited in the literature: Finance directors are unclear about the hard benefits of RPA. They see the numbers in other processes such as claims management, but can only imagine the business case for the Finance function [8].

Similarly, the most common non-financial factors considered as critically important in the development of the business case for Software Bots can be summarized as;

- Existence of controls environment (71%)
- Governance Structure (29%)
- Approval of external auditors (29%)
- Disruption in operations (14%)
- Motivation of employees (71%)

4.3 Which Processes Have Been Automated Using Software Bots and in What Functional Areas of Shared Services Organizations?

The respondents thought that the following functional processes are candidates for automation using “Software Robots” (see Table 1):

Table 1. Functional processes are candidates for automation using “Software Robots”

Finance function	HR function	IT function
Accounts Payable	Payroll	Ticket Management
Order-to-Cash	Hire-to-Retire	Database
Procure-to-Pay		Management
General Ledger		
Financial Analysis		
Financial Reporting		

57% of respondents also mentioned that processes requiring intelligence in the first phase of roll out, all processes requiring judgement (except parts of these which can be automated) and recruitment processes should not be considered for automation using Software Bots.

4.4 What Are the Challenges with Implementing Software Bots in Shared Services Organizations?

The respondents identified the following challenges for automating processes using Software Bots:

- Lack of resources (29%)
- Fear of job loss by employees (43%)
- Unclear division of responsibilities between IT and Functional organizations (29%)
- Lack of standard processes (43%)
- Budget constraints (29%)
- Lack of management support (14%)
- No viable business case (14%)
- The fear to automate a messy process instead of streamlining it - and the potential issues with future changes and regression testing (14%)
- RPA solutions are very expensive and pricing policy very obscure (14%)
- Weak change management process across the organisation and most precisely in IT operations (14%)
- Lack of understanding of what RPA means and where it can be applied (14%)

The key challenges identified for automating processes using Software Bots are fear of job loss by employees, lack of standard processes, unclear division of responsibilities between IT and functional organizations, lack of resources and budget constraints. These implementation challenges are similar to those cited in the literature: the biggest challenge is the kind of cultural change that you need for automation. The challenge is that bridge between RPA being an IT tool and the business side of it (Lacity and Willcocks 2016).

4.5 What Benefits Have Been Achieved by Using Software Bots in Shared Services Organizations?

The respondents identified the perceived/actual benefits of Software Bots as follows:

- Reduction in FTEs (71%)
- Elimination of errors (86%)
- Increased speed of operations (100%)
- Utilization of FTEs on more value-added activities (86%)
- Improved customer service (57%)
- Improved agility (14%)
- Improved capacity management (14%)
- Increased customer satisfaction (71%)
- Increased agility to handle more work during peak periods (57%)
- Increased Quality (57%)
- Well-being of Operators as they are off-loaded of non-rewarding tasks (14%)
- Better auditing of all transactions (14%)
- Reduced fraud (14%)

Key shortcomings of Software Bots were identified as follows:

- Business disruption (43%)
- Employee anxiety (43%)
- No tangible benefits (29%)
- Difficult to implement (29%)
- By reducing the processing costs even further than offshoring, RPA will reduce the incentive to further optimize processes, creating the risk of complexity and reducing the implementation speed of future changes (14%)
- Capacity of existing systems to handle increased volumes (14%)

In summary, responses received identified, the key benefits associated with Software Bots as increased speed of operations, elimination of errors, utilization of FTEs on more value-added activities, increased customer satisfaction, reduction in FTEs, improved customer service, increased quality and increased agility to handle more work during peak periods whereas the key associated shortcoming were identified as business disruption, employee anxiety, no tangible benefits and difficult to implement. The benefits cited in literature are similar: RPA software programs are faster and more accurate than humans. They have super-human stamina, offering 24/7 productivity with no processing handoffs due to shift changes. They can be scaled up quickly to handle seasonal or unanticipated spikes in work volume. And if they need to be shut down temporarily, they can simply “go to sleep” [6].

Our survey and in-depth interviews reveal that there needs to be a business case for the implementation of Software Bots in Shared Services. Forward-looking organizations seeking to drive long-term value are finding many advantages to implementing Software Bots in Shared Services. In 47% of the companies, external solution providers in conjunction with internal IT organizations were used to develop the software necessary for implementing Software Bots within their shared services organizations.

In one of the respondent company’s canteen there is a poster which says “Drink coffee and make stupid things faster and with more energy”. The concern is that they see RPA a bit like that. That does not mean RPA cannot be useful, and it may prove an interesting temporary solution to lots of problems. However, they are also concerned about the risk of complexity it will create and the added dependency on external software providers. Process standardization, improvement in service quality and cost reduction are the most important outcomes in automating processes in Shared Services. Some organizations still feel that if they were to further automate their processes, they will use ERP and/or other enterprise management systems instead of Software Bots. They think that RPA is not the solution to all needs as ERP and BPM can be alternate ways to automate processes.

The results clearly show that Software Bots are a very new phenomenon. The bots were adopted in Shared Services organizations about 6–12 months ago in 30% of the companies whereas 30% of the companies have not implemented any Software Bots in their Shared Services organizations. The adoption rate for Software Bots in European Shared Services organizations is much higher than those in North American organizations whereas it is much smaller in Asian organizations. Also, the adoption rate in larger companies (annual revenue greater than US\$10 Billions) is higher than those in smaller

companies. Based on the results, there was no differentiation by industry. The implementation in other companies is at various stages with most of them conducting pilot tests or developing business cases. Governance is a key and so is a stable IT infrastructure. New type of skills (Change Managers, RPA Developers, and Robot Farm Managers etc.) are emerging.

In this paper, we have indicated both possibilities and limitations of what Software Bots can do in the arena of Shared Services. What this means is that in future years, we will see much more transformation in the nature of Shared Services work. It is difficult to assess the impact of Software Bots on jobs but as automation of low-level jobs continues, fewer people will be needed in these job categories. A backlash from employees is expected due to increased adoption of Software Bots but as the new job categories emerge, the employees will begin understanding the economics of service delivery and the opportunities to work in higher decision-making environments.

5 Conclusions and Future Research

In this research paper we have focused on understanding the use and experiences of RPA and Software Bots in automating processes within Shared Service organizations. The results indicate that currently Software Bots have been implemented to a limited extent in Shared Services organizations although the value potential is being increasingly recognized by these organizations.

Economic growth will result in faster adoption of Software Bots but will have limits to their applicability due to greater demand for specific skills required to oversee the work done by Software Bots. Companies will need to deal with inevitable growth in data in future and Software Bots will provide only a partial solution. Our prediction is that some of the work being outsourced today will be brought in-house as the adoption of Software Bots increases in companies.

The key benefits of Software Bots that have been identified by the service organizations participating in this research, including increased speed of operations, elimination of errors, utilization of FTEs on more value-added activities, increased customer satisfaction, reduction in FTEs, improved customer service, increased quality and increased agility to handle more work during peak periods are similar to those benefits cited in the literature by non-Shared Services organizations. The key implementation challenges identified through this research are unclear division of responsibilities between IT and functional organizations, lack of understanding of what RPA means and where it can be applied, lack of management support and weak change management process across the organisation. These identified key implementation challenges are the same as those cited in the literature by non-service organizations.

For many processes, RPA can take the human touch point out of the equation and eliminates subjective errors. The RPA experts conclude that rather than cutting back on FTEs, staff can be redeployed into roles where, free of the routine, transactional work, they can leverage their know-how and expertise to deliver far greater value. While RPA can drive down errors, duplications, or high processing costs, the additional benefit of refocusing staff in Shared Services organizations on analytics means that all-important

business insights and intelligence can be leveraged for improved decision-making. This means improving end-to-end process efficiency and effectiveness. Software Bots provide an alternative career path that retains the best talent by offering the opportunity to develop new, in-demand skillsets within a Center of Excellence (CoE).

In order to maximize benefits from the implementation of Software Bots an organization should start where there is volume and not where there are problems, and then centralize, standardize repeatable processes, run a pilot, optimize for immediate value and optimize for future value. A responsibility relationship chart should be developed to clarify the roles and responsibilities of business groups and IT groups during implementation of Software Bots so that the business processes are owned by the process owners and technical issues are addressed by IT. A RACI (Responsible, Accountable, Consult and Inform) chart is a good tool to document the division of responsibilities.

Research is known to yield insights that are ripe for further research. While there are many questions that could be raised, we suggest three future research areas namely: (1) Role of IT in implementing Software Bots in Shared Services organizations, (2) Components of a compelling business case for implementing Software Bots in Shared Services organizations and (3) As Software Bots alter the “social dynamics” of organizations, exploration of the theoretical underpinning of Sociomateriality Theory to better understand how Software Bots alter the human-technology relationship [15].

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