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The Impact of Early Automation Tools on Efficiency in Enterprise Financial and Risk Advisory Services

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Abstract: ***The financial and risk advisory services (FRAS) sector has experienced an upsurge in demand for new methodologies, technologies, and products as a result of globalization and growing customer needs. In this regard, automation is predicted to boost compliance efficiency exponentially. In the sector of FRAS, as compared to traditional auditing, fewer literature reviews have been conducted in the context of automation tools, although fully automated auditing procedures might be implemented in the future. It is critically important to understand the impact of pre - RPA and RPS on efficiency improvements in these sectors. This research aims to fill this gap. Moreover, it examines the interrelatedness of automation tools and analyzes how sophisticated automation tools impact a higher efficiency increase. In this regard, it emphasizes its contribution to both scholarly literature and societal practice. End - to - end process automations and robotic process automations (RPA) solutions as innovative processes are considered. For RPA solutions, rigid, desktop - based automation tools and multi - tiered, high - level solutions are differentiated. A pioneering quasi - experiment deployed by measuring real process runtimes with the aid of an experimental process group is introduced. A cross - industry study is carried out in which field expert interviews augmenting quantitative data pave the way to uncovering the routine increment while mitigating the biases of the self - reporting character of survey questions. In terms of per - process evaluation of the efficiency improvement rate, thriving efficiencies are found in the sector of FRAS from automating processes with automation tools – especially RPA solutions. The degree of the efficiency increase is reported, and higher efficiency increases are highlighted based on the experience of the automation process as well as the sophistication level of the automation tool. Impacts of automation tools among pre - RPA, RPA, and DPA have strong but differing relationships on efficiency improvement in the FRAS sector. Pre - RPA and RPS have positive impacts on the efficiency increase. The latter has a more considerable impact on efficiency improvements. The relative efficiency decrease rates of processes with annual run times lower or higher than a specified threshold are modeled, emphasized, and validated. Board examination, which is among the junior automation processes sacrificed due to its satisfaction of efficiency improvements in automation, is proposed for further research and to mitigate organizational resistance. These findings assist FRAS audit firms in determining which processes to deploy automation tools on the one hand and supporting process managers in the FRAS sector in further success modeling the relationship of the automation tool on process efficiency increase on the other hand.***

Keywords: Automation tools, Enterprise efficiency, Financial advisory, Risk management, Process automation, Early - stage automation, Digital transformation, Financial services technology, Risk advisory services, Workflow optimization, AI in finance, Robotic process automation (RPA), Operational efficiency, Compliance automation, Technology adoption in enterprises

1. Introduction

The unique requirements of clients in the financial advisory and risk advisory areas, compared to clients in other segments, are considered in the crisis caused by the COVID - 19 pandemic not only from the point of view of private banks, but also from the view of large international commercial banks. Suggestions for the use of helper programs for a wider dissemination of automation tools are provided based on the non - cooperation of many enterprises in introducing automation tools in the activities of financial advisory and risk management activities, it can be concluded that it is necessary to implement corporate tools for modern systems of automation of mandatory financial reporting, the scope of which will be significantly wider than current enterprise - level software.

The COVID - 19 pandemic has created a crisis of unprecedented proportions. In early 2020, it spread worldwide, covering almost all countries. This created significant challenges and difficulties for the activities of almost all enterprises and companies. In the new reality, in addition to operational, strategic, legal and regulatory changes, there is one more difficulty, which is the non - cooperation of many enterprises in the introduction of automation tools in the production of financial advice and management of financial risks. Despite the fact that all works on non - standard financial projects are carried out in large companies - international commercial banks in accordance with corporate methodologies, all files are created in proprietary materials, templates, standard clauses, etc. Since the templates have a unique design and layout - they are presented in the form of written texts in the format of docx. Text documents or plan - in the format of xlsx. Spreadsheet documents with extremely small amounts of cells with built - in formulas. Excel spreadsheets are used mainly for the preparation of financial models and other result sheets with the calculation of estimates of advisory services, the conclusion on the market cost of financial assets, etc.

Figure 1: Automating Risk Management

1.1 Background and Significance

The modern economy is in the midst of a radical change due to the rapid development of information and communication technologies. Enterprises and their support functions (management, finance, logistics) are primarily responsible for this change. Interest in this change methodology is growing rapidly. Reengineering is the fundamental rethink and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed. Long - standing companies were finding themselves incapable of achieving this goal due to inflexible organization and work processes. Such enterprises often build corporate structures to reduce the effects of long - standing company traditions. This generally results in the creation of multiple unmitigated satellite companies having uncertainty in their processes and unclear management of their financial and operational risks.
There were a few attempts to shed more light on the processes and their role in an enterprise or a support function, their nature and lifecycle, and their relationships with models, structures, and policies. No conception exists which can unite all components of a company in one general model. Each of the various strands appears to address similar modeling issues from a particular perspective and has not led yet to a well understood and broadly accepted theory in the field. As a consequence of this confusion and the resulting fragmentation, it is difficult even for the community of experts, to comprehend this complex field as a whole. Consequently, opinions on what a process is and does not differ quite widely. This makes enterprise process modeling a far not clear endeavor and casts doubt on the language of the numerous methodologies known and used to date.

The general purpose of this paper is to present an authoritative insight into the nature of business processes, as cradle concepts for a framework for business and enterprise modeling (BEM). The understanding of these concepts is further refined by a brief look into the traditions from which BEM grew, as systems theory, modeling contributory disciplines, the field of business modeling and re - engineering, the area of enterprise - wide information systems, and the domain of enterprise architecture. On the one hand, the paper provides a bird's - eye overview of business processes, as opposed to other company components like structures and agents. On the other hand, it presents these concepts in important details. Moreover, these concepts are directly useful for practitioners in the field of enterprise modeling, so that their implementation is straightforward and self - supportive.

Equ: 1 Efficiency Gain Equation

$$E_g = \frac{(T_m - T_a)}{T_m} \times 100$$

- E_g = Efficiency gain (%)
- T_m = Time spent on manual processes (pre-automation)
- T_a = Time spent on automated processes

2. Historical Overview of Automation in Financial Services

The sector of financial services has undergone major changes over the past decades, as a result of microeconomic trends, macroeconomic advancements, and regulatory upheaval. The range of operations offered in the financial sector in response to these evolutions, though, has changed significantly. Especially, the operations of banking institutions cover new banking, investment and insurance products, as well as new financing tools and additional corporate finance practices. As a counterbalance to this widening of operations, the sector has been increasingly relying on new technologies for both improving the services offered to clients and enhancing intra organizational decision making, risk analysis, monitoring, and reporting. Notably, regarding the intraorganizational side, traditional finance relied on normative and descriptive approaches. Certain prescriptive and predictive systems, however, are becoming of vital importance for proper decision making in the financial services sector. These systems, which are acting as operational tools that provide operational guidance to the decision makers of organizations, have been tested and successfully adopted in various other fields. Nevertheless, in finance, there are certain unique characteristics that hinder both the development and the widespread adoption of adaptable and robust systems. The existence of deep uncertainties, as well as the plethora of available evidence via heterogeneous and unstructured information, raise questions and computational issues. These issues become even more topical in cases where the decision support needed is of real - time nature.

Financial services have been one of the earliest sectors being dominated by robotics and automation. It is almost impossible to find a financial firm that doesn't apply any computer or system in its operations. Automations in financial services can be divided into some major categories based on the robot operation fields. Claim Robots focus on the customer claim and suo - moto claim of consumers as per applicable insurance policy clauses. Credit Robots had gained good popularity during the 2008 financial crisis. Many top banks started brand new automated credit risk management provision availability to their clients. Policy Robots familiarize the newly launched financial service policy provisions to potential clients of the bank. RPA robots help in

detecting fake claims, double entries, embarrassing complaints, misbehavior of insurance agents, etc. Pricing Robots calculate optimum selling pricing for a selected stock depending on the competition analysis. It needs to analyze vast unstructured data to fine - tune the prices within a very short period.

3. Types of Automation Tools

Initially and primarily, these tools were aimed at testing and validating technology solutions. Noteworthy is that this proven concept was already adopted by financial advisory service providers for their audit testing. Although a desk - based testing approach appeared valid, it proved to further hinder existing efficiency. It obviated additional investments that could improve the testing experience up the technology adoption maturity curve. Instead, these audit service providers broadened their utilization of existing automation testing tools to include the generation and documentation of test and business requirements. A side effect was that it also led to an extensive divergence in live environments where some of the production and testing instances were vastly different from each other. The results of successful test decision creation were revealed in testing discrepancies that further impaired productivity on both the client and audit service provider sides. Given overlapping time frames between financial statement sign - off, it was a welcome trend for audit service providers as opportunities to employ higher risk measures became more accessible. Thankfully, an awareness of the adverse effects of this widened use of automation testing tools did emerge.

However, considering the current functioning of advisory service providers, there are far worse sins. Irrespective, configurable products are pre - built technology solutions that can be tailored. The audit service providers' extra customizable components by advancing the definite clients will be audited instead. Audit scripting is an unavoidable alternative to traditional auditing. An audit is an engagement between a client and a provider of audit services by an advisory firm. It is the business processes and controls selected to determine how test cases are defined and decision results documented. Business process documentation may consist of assets and deliverables. Explicitly linking test decisions to business requirements to ensure traceability is still in its infancy.

Figure 2: Automation Testing Tools

3.1 Robotic Process Automation (RPA)

Robotic Process Automation (RPA) is an automation technology consisting of software robots or "bots" and is aimed to capture a user's actions in the same way that a human would. These bots are programmed to automate triggering other applications, moving files, and manipulating data and communicating with other systems. RPA's outputs include mouse clicks, keystrokes, and other actions executed by a desktop automation tool. RPA is an unattended automation technology that enhances an enterprise's productivity and efficiency in its operations as it can maintain a round - the - clock operational schedule without requiring time off. RPA is comprehensive in nature as it is able to automate end - to - end processes, and is highly adaptable in regard to altering stakeholder needs for the automated process. RPA reflects a new type of productivity - and efficiency - improving general - purpose median technology and a potential disruptive technology that fundamentally alters the way enterprise financial and risk advisory services are delivered to clients. The programs will be able to perform nearly all quantitative work for the clients' financial reports and the vehicles of the investments, aside from serving as interfaces for communication and explanations. A tollgate is established, following the implementation of the Proof of Concept (POC) on chosen RPA processes selected from prior descriptions of suitable processes where automation can enhance efficiency. At the tollgate, stakeholders representing the select RPA process assess if the created implementation for the RPA process meets the specifications set at the approval of the POC. If it does, and the benefits observed from the POC add to those outlined in the business case, it will proceed with the full implementation of RPA in the enterprise service group. The latter requires the addressment of scope extensions of the RPA process undertaken in the POC. In general, the examination of business appetite, a thorough assessment of data gathering capability around reporting, and considerations of process control upgrades, just to name a few, are areas the full RPA implementation will primarily focus on. Overall, if RPA does not become more widely adopted, simpler quick - fixes of automation technologies will develop and end users of an enterprise service will operate, with the same risk of internal control flaws and availability of services as if there were no services.

3.2 Artificial Intelligence and Machine Learning

AI refers to a system's ability to sense, think, and act. Digitalization of finance opens space for AI in hedge funds and similar organizations due to automation of numerical information processing. Also, the need for personal digital assistants, designed to carry a conversation, proactively report on investment performance and make trades, or even to analyze vast databases of research insights and seek signals for investment opportunities. Implementation of artificial intelligence would affect every aspect of investment funds' organization: audit, compliance, portfolio management (and execution), risk management to back office functions. Traditional artificial intelligence systems are able to analyze hundreds of disparate signals daily, but rather than producing a concrete investment idea, they signal anomalous movements in relevant databases for further research by specialized personnel. Moreover, by searching through these databases, they report fresh insights from specialists not directly involved in the corporation. Traditional AI systems are also able to pro - actively alert on new stock or index ETFs which could cause a short squeeze in a stock loaned out to

hedge funds short sellers, or even discover a fresh log regarding a company's borrowing. On the one hand, AI is seen as a threat to human existence. For instance, computer scientist Stephen Hawking stated: "The development of full artificial intelligence could spell the end of the human race. It would take off on its own, and redesign itself at an ever - increasing rate. Humans, who are limited by slow biological evolution, couldn't compete, and would be superseded". Conversely, on the other side, every imaginable task in modern life is being either currently automated or becomes digitally turbid. As widely known, many nations attempted to maintain a monopoly on an empirical utility of AGI research and development by either regulating or outlawing it.

3.3 Data Analytics Tools

The use of data analytics in an audit varies not just in how the analytics are accessed but in the underlying framework through which they are derived and disseminated. Utilization of data analytics can also range from a simple numerical query to a sophisticated model that incorporates business knowledge and environment factors. A single query may be assigned to junior staff, while a complex model might not be assigned out of concern that its use could take too long for the amount of audit work being completed. Audit teams can also vary in how queries are distributed. Queries can be adopted by a team as a whole or teams can divide the overall effort amongst members.

In conjunction with how the audit teams access data analytics, the architecture and content of the underlying analytic framework can vary as well. The options available for analytics tool providers will continuously change and improve as new developments are found and implemented in tools. Therefore, teams can benefit greatly from being aware of the options from analytics tool vendors since this can expand the types of analytics available for their use. Changes in how query code is generated/obtained, in how code is configured in tool software, and in how code is distributed and accessed by audit teams can each result in dramatic time and efficiency savings. In addition, as the efficiency and complexity of analytic querying options increases, care must be taken to select the options that yield optimal solutions for the particular situation.

Although the list of prescribed policy elements for data analytics use in audits is wide - ranging, it becomes less clear how teams decide to apply them. As options for auditors' choice in query type, analytic platform, code distribution, degree of complexity, roles involved, and diversity of query application are vast, firms could benefit from considerations that help them to select appropriate options.

4. Impact on Efficiency

The development of automated tools in the early 1990s intended to increase efficiency in enterprise financial and risk advisory services has been visible. A small number of organizations developed innovative tools to replace repetitive and standardized tasks. However, it is not as evident whether repetitive and standardized tasks turned into efficiency gains. One of the most significant impacts of early automation tools in enterprise financial and risk advisory services was increased productivity in completing standard tasks in certain markets, then a general resolution or a gradual transition into a more judgmental approach and analysis in the remaining markets. As the early tools did not result in significant reductions in matters of resource quantities, substantial changes in the monetary value of the services could also be expected. Hence, the monetary value of standard tasks in enterprise financial and risk advisory services had not changed significantly at the same time as the productivity percentage in completing the tasks had tripled or quadrupled.

4.1 Time Savings

The ERA teams' time savings created by the automation tools had both substantive and hush savings effects. All automation users in the front - office roles in QA and CF showed significant decreases in the time spent making the deliverable outputs after the implementation of the automation tools. Overall, all ERA teams using the automation tools produced deliverable output within a shorter timeframe right after automation. In terms of significance levels, an F4 team's improvement was the most considerable; thus, it can be said that the time savings were directly and closely attributable to implementing the automation tools.

Substantive savings effects were significant in CF and QA. The grants waiting drawdown report was automated right after the automated report was introduced, resulting in huge time savings for copy and paste deliverables into the flagship client reporting prepared in Excel. The team initially rolled out the report to one client and, after one month, began to report on all the relevant flagship clients. It took three to four hours instead of 30 to 40 hours previously.

The bulk of the JSON parsing of the transformed Excel files for client data aggregation were all pre - built by the developer role after obtaining training. The CF team needed only to input the downloaded raw JSON files into the template, which took around 15 minutes. However, without automation, it would take about four hours of work.

For QA team members, timeliness was preserved as the submission turnaround time was reduced with automation usage; thus, all error checks in the 215 - hour effort reporting could be performed during the client billing period without giving additional time. A 90 - minute agenda item in a bi - weekly meeting was eliminated as the session of the ID cache was automated.

The work involved several checks of forensic errors and quality assurance of the client's share counts used in the gloves - on fee calculations. The automation user of the 45% yawning percentage converted the hand - written and handwritten markings check into macros, significantly boosting timeliness.

Apart from monitoring and ongoing oversight on the automated outputs for QA reports and templates, no substantive savings effects in terms of time were observed in either CF or QA. This means that both teams using automation tools' output were as time - consuming as before automation.

Equ: 2 Cost Savings from Automation

$$C_s = (H \times W \times T_m) - (H \times W \times T_a + C_a)$$

- C_s = Total cost savings
- H = Number of staff involved
- W = Average hourly wage
- T_m = Manual hours required
- T_a = Automated hours required
- C_a = Cost of automation tool (e.g. license, training)

4.2 Cost Reduction

In terms of cost tighter control of the pre - and post - automation situation with early automation tools and variable in the T2 design, with a focus on the cost structure of the pre - and post - automation period. The new situation and the pre automation in an emergency department of a large general hospital are analyzed. Cost increase compared to the pre automation situation is shown, as expected, although the precondition period was a momentary peak for the level of activity. The analysis considers a lot of performance variables, such as the number of specimens processed in a TAT hour, the workload measured in tests per hour, and, more generally, the patient traffic in the emergency department, as well as some cost variables, such as the cost on PC systems, the cost of workstations, and system maintenance.

The analysis is focused on business process reengineering in feedback systems. It was conducted in close contact with department staff. The process was mapped using several data gathering techniques. The modeling language is notation. The new situation is specified based on the lean method, according to which several KPIs are developed. The proposed quality verification method is superior to previous benchmarks in terms of verifiability and interpretability, and both adaptation prediction performance and execution time are significantly improved after optimization.

The analysis focuses instead on a specific batch extraction phase involving an assembly of data source, through which average costs, total costs and unit costs are calculated. The efficiency of the daily procedure compared with that of direct system retrieval and periods without batch extraction, is defined in terms of the degree of temporal inconsistency of the data stored in business databases. Information handled in member retention is also analyzed with emphasis on business process reengineering. The analysis is extended to a refrigeration system engaging heat exchange appearances, electrical power consumption and temperatures, with nearby off - quadrant evaluation of possibly variable cost substitution analysis as for enhanced configurations.

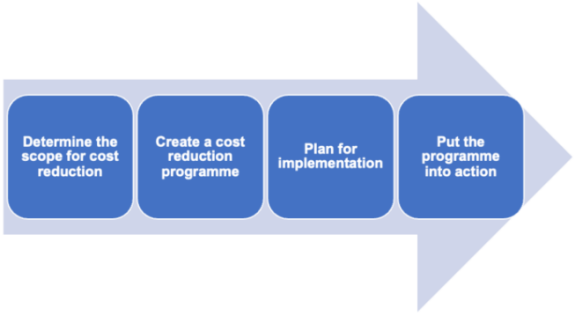

Figure 3: Cost Reduction

4.3. Quality Improvement

The expectations of the business executives from Audit Innovation Team was to improve the efficiency of the first process of the engagements as well as the quality of the output report. The Automation tools can help in regaining various existing manual processes for efficiency improvement. Moreover, the quality of output report can be improved by re - designing and implementing Automation tools on the existing manual excel based output. Software quality is one of the most important parameters in assessing any product, and its importance grows with the complexities and scale of any software. The cost of defects, if detected late in the life cycle, becomes prohibitive. The bugs which are detected in the later stages of the software lead to heavy business loss including reputation loss. It is very crucial to ensure the quality of the software/product before releasing it to the production and thereby to the final users in order to avoid an adverse situation.

Business Application is a large, multi - tiered, distributed, and tightly integrated application. However the above - mentioned Operations & Maintenance (O&M) quality methodologies adopted rely heavily on manual software quality assurance. Manual testing makes the application vulnerable to defects as it is inefficient, cumbersome and is prone to human error. With manual testing it is hard to perform a complete regression test. Regression test – which is to test the entire application or a large chunk of it ensures that no new bug is introduced (i. e. all old bugs are fixed) when fixes or changes in the software are made or when new modules are integrated with the existing system. Because of the large number of existing test cases, it is infeasible to run a complete validation after every change or fix. The conventional testing process as adopted so far requires a large number of man hours for getting proper testing with desired pass percentage, and hence the cost involved in assuring the quality is high.

Moreover the manual tests consist of several steps, most of which are repeated all over again. Therefore a few subjects are prone to human error, which makes such tests less reliable. With temporary workload shifts it takes much more time to run the test. The time taken for running the tests each time is directly proportional to the number of test cases and measures the efficiency of the testing process. Presently there is great pressure from the top management to release newer products sooner in the market; the result of which is often sacrificing the quality of the product. The test teams, on the other hand, spend most of their effort and time running a large number of test cases and at the end of which the pass percentage is often

below the threshold for a go - live. As a result a new feature to be tested often takes a whole day to test. Even for the recently merged module, it often takes around 3 - 4 days to finally arrive at a Go - live decision and this comes at the cost of a huge volume of revenue had to be given up. Full regression tests have many such drawbacks and teams try to avoid them whenever possible.

5. Challenges in Implementation

The enterprise resource planning (ERP) system of an enterprise is considered an important organizational tool, as it integrates various organizational functions. Consequently, with the assistance of the ERP system, many organizations can produce results faster, more efficiently, and with fewer errors. Furthermore, in order to use an ERP system efficiently, the IT functions of the ERP system and developed applications should be accompanied by corresponding controls, which reduce the likelihood of risks in the above - mentioned internal processes. In this context, the term IT controls means controls related to the functionality of IT systems. Examples of these would be controls which restrict access to the ERP system to specific persons or controls which require an accounting entry to be approved by a superior. Effective IT controls testing is an important process, as it allows for gaining reasonable assurance as to the efficacy of the IT controls. However, the IT controls testing process is complex. In recent years, due to reasons specified in the following sections, IT controls testing is becoming a hot topic in enterprises. EvolveIT is designed to code and improve the entire automated IT controls testing process. Manual testing can be done on most systems and applications. Manual testing requires a great amount of human interference and returns repeated results. This type is most often slow, inaccurate, low - frequency, and low - covered. The testing process is not very smooth and does not rely on the ability of the tester, meaning that there are often too few testers to test huge architectures. The audit of testing is often not adequate, meaning that important processes can be out of the test area. When manual testing is done without much care and improvement, it is highly likely that one day the work will not be good enough anymore. This too can lead to further reputational complications, making the risk of a big error or even fraud on the application systems high. Either way, addressing these challenges is costly and thus the cost of challenges related to automated testing is serious too. Automated testing too is a complex process. Flexible testing approaches can waste an enormous number of resources, and a large part of the scope of the automated testing process is repetitive. Testing approaches are becoming outdated very frequently. With highly rapid development and very high changes on the system architectures, an automated testing approach can be out of the picture on the next business day. The testing process can be too manual. Further controls can be out of the approach as once implemented. An unsuited approach can lead to huge and unsuited test scripts and environments, which are not used and maintained, just remaining drawbacks for future developments. An automated testing approach is a development process, too, and it can have lower quality work in organizations where robustness of code is not required. In case the automated test scripts are not maintained as the system changes, they are useless too. In case different people have written the code, there might be different approaches for designing and structuring the algorithms created, everything resulting in untransparent test scripts and further general efficiency loss.

5.1. Resistance to Change

Resistance to change has received a great deal of attention in the organizational change literature. Businesses undergoing a change effort face quite predictable obstacles. The greatest of these is an organization's own people. While leadership teams are seized by the urgency of the transition and enthusiastically spread the word, the majority of employees are not so easily swayed. They are not "bad apples. " They are people who resist the change for reasons that likely have little to do with the merits of the initiative. To outsmart resistance to change, leadership teams must first become adept at detecting it.

When change is first covered in a leadership team meeting, it is too early in the effort to identify resistance. Leadership teams tend to be enthusiastic about the change and, initially at least, "talk a good game. " Early implementation of the change is rapidly in the works, with leaders focused on energizing the organization for a successful launch. Since this is when motivations for change are most fervent and resistant voices are least vocal, leadership teams routinely overlook resistance. Rather than bolster the effort and energize the organization, most leadership teams mistakenly assume that excitement will seduce the dreamers, naysayers, critics, and resistors into complying.

This is a fundamental fallacy about the nature of resistance to change. Change causes loss. Until the loss can be reframed in a positive way, the inevitable sorrow must run its course. Therefore, a successful change initiative must be developed, refined, and rolled out with this aversion to loss in mind. Change efforts fail even before they are implemented because they neglect to design entire component processes and structures to prevent the falling of resistance to change, rather than focusing solely on the design of end - state processes and behaviors to replace existing processes and procedures. Resistance awareness must be built both formally and informally into every phase of any change process.

Figure 4: Employee resistance to change in the workplace

5.2 Integration Issues

The challenges and considerations involved in integrating automation tools in enterprise financial and risk advisory services are examined. The integration of automation tools in enterprise financial and risk advisory services is a critical undertaking. To maximize the impact of automation tools on efficiency in enterprise financial and risk advisory services, these tools need to be integrated into the underlying information systems of the advisory services they support. Integration is necessary to facilitate the seamless flow of data and information among the various middleware tools, enterprise information systems, and advisory teams. All four automation tools that were investigated in this research have integration considerations, albeit to varying degrees. The first three automation tools address data extraction and formatting only, which means they can be utilized independently from the enterprise information systems that have been established. As a result, their integration is not as crucial. However, the automation tool for the automatic generation of reports, which is that gearing audit teams with the capabilities of generating automated financial statements is essential to face the most pressing integration considerations. As the last step of the audit process, financial statements consisting of thousands of numbers need to be generated, which is mostly completed by the teams themselves. Hence, the integration of this automation tool in the enterprise information systems of audit report generation is necessary to facilitate the seamless flow of information and improve the efficiency of report writing and generation. The challenges faced while integrating the automation tool into the enterprise information systems is highlighted.

The automation tool for the automatic generation of reports is designed to assist audit teams in generating automated financial statements. This tool utilizes RPA together with cognitive learning. The generation of financial statements is the last step of the audit process, and these statements are mostly generated and written by the audit teams themselves. As a result, this tool faces the most pressing integration considerations. The enterprise information systems of audit report generation need to be integrated with this automation tool to facilitate the seamless flow of information and make it easier for teams to utilize the tool for writing and generating financial statements. The automation tool for the automatic generation of reports involves two programming languages: SQL and Python. The first programming language, SQL, is used to extract data from the databases of enterprise information systems, while the second language, Python, is utilized to process the data efficiently. For the automation tool for the automatic generation of reports to be integrated into the enterprise information systems of audit report generation, several challenges need to be overcome.

5.3. Skill Gaps

Born towards the end of the last century, the vast majority of today's knowledge services are the result of incremental but real innovations over time by its predecessors: consulting companies. The early tools only included word processors and spreadsheets. In recent decades, they have developed into more complicated software that include e - mail and instant messaging, cost estimation tools, document management systems, resource planning systems, finance tools, and more. During this period, computer - savvy employees carefully assessed the available applications in relation to existing business problems, finally selecting and critically scrutinizing those they might find helpful. The most suitable ones were implemented in a technically competent manner through a mixture of exploration and trial and error.

The arrival of at least moderately intelligent automation tools is about to change everything. IT innovation has shed its nature as a black box. It has become not only an apparent threat but also an enabler. Whereas in the past, knowledge services could only be implemented using complex systems to which ordinary employees had no access, under the new regime they are not only as accessible to every layman as a simple spreadsheet is, but in fact may only be within reach when designed accordingly. This new boundary of discourse can result in substantial capabilities for change, and currently beneficial processes may soon become intolerable burdens. Consequently, employees in knowledge services must either learn to curtail computer - suggested automation or acquire the knowledge required to ensure compliance with their predecessors' competence and protect against legal exposures. Thus, the demand for IT knowledge among employees has multiplied. Furthermore, the toolkit is rapidly expanding, and the quasi - simplicity includes risk and creates consequences that even computer specialists are ill prepared to address.

Equ: 3 Error Rate Reduction

$$R_e = \frac{E_m - E_a}{E_m}$$

- R_e = Reduction in error rate (proportion)
- E_m = Errors in manual process
- E_a = Errors in automated process

6. Case Studies

Two case studies are presented to demonstrate the effectiveness of AP tool usage. The first case study succeeded in a task where clients and teams were highly experienced in using TMC and TM1, and tools had been successfully applied to both historical and recurring situations. The second case study is about a failed application of AP tools in a market stressed by the financial crisis. In this case study results, teams were under duress and panicking, while clients were maintaining a shred of normalcy and were wary of disclosed information.

The first study refers to an IPO Analysis, where the client was an existing client company from a banking group that wanted to maintain its presence in the financial system. It had used TMC and TM1 for the first listing with a stock exchange company and had an experienced team who chose these, together with the client. The advisorship was structured through a first stage road show analysis. The objective was to

evaluate the financial impact of potential ratios and to disclose their acumen through a document validated by software and interfaces in which the tables were programmed. The resulting product needed to be presented to top management in less than 48 hours, and a team split was arranged based on an earlier division of tasks.

A second large Excel file showed alternative scenarios. A database had been created from gathering large amounts of unprocessed data. Simulation was much simpler in both tools, requiring less specific knowledge from users compared to earlier versions of models. The client was very satisfied with the final tool, and the engine application and formatting required less than a third of the time for the first case. It was underlined that "the case could not have been HR without the application of these tools. " Improvements to the final report were suggested instead of general comments on results.

6.1 Successful Implementations

The current generation of financial and risk advisory service teams at Big 4 firms are heavily reliant on Excel for delivering on complex engagements involving predictive analytics, forecasting, Monte Carlo simulations, credit risk, interest or foreign exchange risk assessment, and structured finance. Although Excel is a proficient tool for many tasks, it often leads to inefficiencies, data integrity issues, and aggregation challenges due to its limited capabilities in many of the challenging decisions faced by FRAS teams. Recognizing these drawbacks, FRAS teams at one of the Big 4 firms implemented automation tools in addition to Excel for increasing efficiency and helping auditors focus on higher value analytical decisions, thereby increasing the quality of the audit engagements. To achieve this goal, the initial focus was on proof - of - concept projects that would demonstrate the enhanced intelligence and efficiency of some of the decision models if implemented through software tools. Advanced programming languages such as Python and AI - enabled programming approaches, which eased the overall programming process and could be cost - effective compared to in - house developed models. The team initially developed models for around ten processes. The leading implementation was on the credit portfolio of a multinational bank, where 20 distinct credit decisions across 20 countries were automated and the performance, accuracy, and time of the overall process significantly improved. The competitive advantage gained was used to steal additional credit portfolios of large banks across Europe, ultimately turning the tool into a revenue stream for the firm. Since then, there have been many successful automation implementations with similar metrics. Based on the experiences from the initial implementations, the characteristics of currently successful decision models in finance and FRAS organizations are described. Assistive tools are changing in these contexts for speeding up the identification of diagnostic errors and involving wider stakeholders in model evaluation and scenario analysis. Enhanced automation tools are expected to provide quick and correct decisions, transparent and explainable designs, and extensive controllability. Nevertheless, fast and automatic outcomes may also increase the agency and incompleteness tensions among stakeholders, e. g. potential delivery of biased results due to over - relaxed constraints.

Figure 5: Role of Effective Strategy Implementation

6.2 Lessons Learned from Failures

The easiest way to explain the models and technologies detected in the case studies, and to inspire researchers to build similar solutions misuses the similar 'form and function' that is common in much of the academic work explaining knowledge models and technologies in formal or informal ways. The 'form and function' takes the form of a layered architecture, requiring users to understand selected pieces of an (explicit or implicit) architectural model. The model can be very detailed or abstract, at least in initial publications. This matches current industry and academic thinking about how to create an effective 'conversation' (form) and how to obtain new knowledge through it (function), although it is now nearly trite to deploy these 'thinking tools'. This paper sketches out a second way of explaining technologies and models that has been gathered in answering a call for more textual presentations of the media through which knowledge models and technologies have been presented.

The hope is that it will inspire a more theoretical approach to the modelling and understanding of systems for efficiency in financial and risk advisory services. Sources are drawn from personal experiences of being influenced by the FINNO model as a linguistic knowledge model and by AI driven voice recognition systems. The knowledge models and technologies selected are well - known in the field but engaging them in the chosen form of representation seems relatively unexplored. Addressed are the shortcomings of the earlier decision trees approach and the reasons for conducting this inquiry in textual terms rather than in the more widely used means of layered architectures. The adaptations needed to set the knowledge models and technologies chosen for analyses in motion are also considered.

7. Future Trends in Automation

Even before the 2020 COVID - 19 Pandemic, businesses were under pressure to create better solutions with less. The world's dynamic environment called for solutions that added value faster and with less effort. The speed of societal evolution and digital communication meant that organizations had insufficient time to adjust to the rapid changes. Clients started asking organizations to create exclusive solutions for them, which increased complexity. Also, the global economy forced us to lower costs and pass on the savings to the clients. Organizations were flooded with quality issues, compliance issues, stakeholder dissatisfaction, and other problems. Few organizations were added value in normal circumstances; the Pandemic put a stop to the first steps in creating a solution - focused business. Therefore, all problems were going to double, and finding solutions was going to be even harder.

A worldwide need arose for a technical solution that could help organizations speed up the long cycles of value - added creation. In all industries, basic repetitive tasks were identified to be dealt with technology. These tasks were taken out of the tasks employees did. Several well - known organizations created the first technology and organizations. In Holland, it was Blue Prism; worldwide it was UiPath. What were called virtual workers, digital workers, or robots replaced the (less) interesting hard work effort. Tasks were analyzed, normalized, incorporated into the new technology, and automated. By the end of 2016, 2017, and the start of 2018, while all this was happening, excitement grew all around. Almost all business leaders attended presentations about RPA hoping for a solution to their challenges. Business leaders were optimistic and thought that with RPA all would be solved. Best practice analyses were introduced. Organizations started automating almost everything, often with no thought whether it made any sense. Some organizations introduced a land grab approach and hired as many business consultants as possible. Many organizations relied more on business technology consultants. After some time, the excitement wore off as organizations saw the results. Human jobs were often lost without the expected cost savings. Bots had a lower quality due to the basic approach, on average around five rules. Since everything went too fast, there was a lack of understanding of the technology, possibilities, and limits. Expectations were set too high. Parts of management had no idea what they had bought. Business consultants missed or avoided complexity issues that led to long negotiations and dissatisfaction on both sides. There were numerous quality issues in the implementation of the first robot, which hurt trust. Organizations got to lessons learned, but these insights were often too little too late. These organizations missed the first movers' advantage.

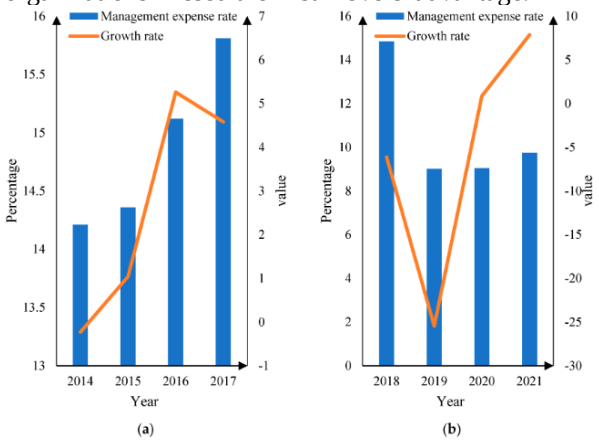

Figure 6: Enterprise Digital Management Efficiency under Cloud Computing and Big Data

7.1 Emerging Technologies

Having explained the main concepts of automation tools and their limits, this chapter will empirically evaluate the impact of two individual automation tools that are already in use and that have both evident ROI metrics and potential qualitative gains on EFRAS KDs missing in the extrapolated scrutiny of the literature. The analysis will take care to align with the scope of the study, looking in depth at early automation tools that affect KDs fundamental to the EFRAS value proposition: spreadsheets – as represented by software or features characteristic of high - end spreadsheet applications – and database querying as facilitated by generic tools.

The distinction between the two classes of automation tools has to do with their very nature: while desktop applications use algorithms to process information already integrated in the system more efficiently, RPA – the whole class of automation tools that contains UiPath, Automation Anywhere, Blue Prism and the very native power automate – automates human exogenous actions on preferring software only. The first class directly affects KDs by enhancing how those KDs are executed, while the second one permits a complete substitution of human actions that threaten the EFRAS value proposition. The impact evaluation will simultaneously consider these tools in action, in order to paint a holistic picture of their implementation at EFRAS.

The timeframe of the impact evaluation is limited to a seven - month window with significant EFRAS KDs automated. Although implementation of the discussed automation tools has mostly occurred over a different time frame, their impacts are believed to be equally relevant in the 2021 - 2023 EFRAS KDs scope of efforts, given similarities in KDs. The new insights from and implications of the analysis will help to let future research projects quantitatively assess the impact of automation tools at EFRAS. For future quantitative impact assessments, adopting the segmentation of KDs will aid in configuring a detailed comparative analysis of the full range of GED digitization technologies. As the nature, complexity and uncertainty of RPA relative to desktop automation tools differ, different performance metrics can be devised to quantify their impacts.

7.2 Regulatory Changes

The beginning of 2024 marks a seismic shift in the landscape for the provision of audit and assurance services, with the UK's Financial Reporting Council moving to a new audit and accounting regulator, the Audit, Reporting and Governance Authority (ARGA). In light of this regulatory change, the UK's decision to restore the upper threshold to the tender requirement for statutory audits on all FTSE 350 companies to £8 million and to undertake a review of the current implementation of FRC Statutory Audit Review procedures, it is expected this will trigger another cross - industry review of audit quality as witnessed with the Brydon review. It cannot be ignored that a complete re - alignment of the cost - benefit structure of advancing inspection technology is urgently warranted in light of these substantial macro changes to the markets.

The implications of previous, Technological change has been a constant threat as well as an opportunity for accounting professionals. Despite the scepticism surrounding the accounting profession, the emergence of accounting and financial technology remains a disruptive threat to traditional business models. There are compliance risks associated with the big data era, in the storage, transmission and use of sensitive data. Reporting and auditing standards have yet to catch up and be adopted. The materiality and timeliness of a breached data layer are not insignificant. This enactment builds on prior calls for more "RegTech & SupTech"

partnerships post - GFC and in light of a growing acceptance of data's role in sustainability.

8. Impact on Workforce Dynamics

Many actors are currently transforming the finance function based on the introduction of robotics and cognitive technologies. Financial automation is rapidly moving along the automation maturity curve, driving many finance functions to rethink their targets, structures, and operations. Early investment in robotic process automation could deliver shorter pay - back periods and greater returns, while enhancing the attractiveness of the finance function in the eyes of future graduates.

Robotic process automation relies on a combination of software and capabilities that govern, control, and optimize finance processes by automating repetitive tasks across systems. In contrast to traditional automation, robotics mimics humans. However, its implementation often overlaps with traditional automation approaches. RPA is distinct from business process management, a software - based approach to managing end - to - end processes. It is also different from "screen scraping", which focuses on simple automation of data input. Cognition and deep learning enhance process automation by eliminating the need for a human - like interface.

The actors in the financial robotic automation ecosystem can be classified in three categories: enablers (software/ technology vendors, consulting firms), providers of user - licenses (software vendors), and in - house automation (and creation of associated capabilities). The interactions and engagements among actors differ significantly. Transformation requirements and motives vary considerably, both within the categories and from company to company. Antecedents, initial investments, and emerging capabilities are also significantly different depending on type of actor and strategies. In heterogeneous contexts, some are opting to build in - house capabilities and systems while others are engaging intensively early on with enabler organizations.

8.1 Job Displacement

Automating advisory services: general business process automation and astronomical growth of automation tools. Advisory services sector: high knowledge work, overall standards, structure, and processes, but with an explosive market of e. g. crisis management The punctual execution and sustainability of advisory processes. Rapid execution and temporary automation, e. g. templates, calculation tools, to note. End of basic advisory process and no re - evaluation or updates thereafter. The vast product portfolio of no - code automation and low - code automation tools. Early automation tools, the proof of feasibility. Knowledge gaps of client tasks and movement analysis of advisory outcomes. Business processes viewed through information processing and knowledge work maturity perspectives.

Notes on a case study of a big four consulting company's early automation tools of enterprise financial and risk advisory services in second half of 2022: interviewees, advisory services and workloads, both client tasks and advisory outputs. The business process view and categorization of the early automation tools of advisory services: 50 tools in 10 themes. The information processing view of the early automation tools and KCAST - model mapping in a prescriptive manner. A knowledge work maturity perspective view to categorize the early automation tools and the asymmetry of business process and information processing views: maturity level - 3 tools (41), level - 4 tools (9), and a level - 5 tool.

The intended impact of early automation tools on efficiency in enterprise financial and risk advisory services: the first wave after the process and scope mapping phase, the day - after burden of timely utility and upgrades, and idle tools immediately after no or timely utility. Cautionary notes on tool smokescreens. Validation of results with informants. Future research prospects like measurement and quantification of speed gain and rework prevention, and the effect of myriad automation tools in one sector. Availability of 50 themed early automation tools of the advisory services examined.

Job displacement: plenty of past estimates on a likely need for job growth among ever increasing jobs lost to automation—big - picture estimates of labor market shifts yet to surface. RPA automates any repetitive digital task, a crucial low - cost enabler of digital transformation thriving in and beyond large corporations, accounting and auditing in particular, and a clear game changer for any worker performing a rule - based task.

8.2 New Job Creation

If history is any guide, automation induced by AI will lead to net new job creation. Automating the financial efficiency work performed at the client's premises by the clients themselves through Excel and other ad - hoc tools leads to improved financial and risk advisory service delivery. Better solutions, delivered faster, would create opportunities for new, different services. However, it is also possible to see how this may change the competencies required from its personnel. Increased reliance on package solutions would require fewer finance and regulatory specialists, but ones with more up - to - date product knowledge. More importantly, it would require IT and accounting personnel who can tune and maintain the systems, as well as think critically about such systems and their implications.

If new solutions are only provided via a package solution, the roles of the financial and risk experts may diminish significantly. More interesting structures, combining packages and custom codes could create a middle path where system and finance personnel work closely together. The latter would become a majority, and probably more traditional employees of the firms when competing outside the firm. Package dependence also raises a question of vendor lock - in. Subsequently, the scenario of limited new job creation has a few variations: on some dimensions it is slow or not visible (flat); the organizations drift towards a worst - of - both - world scenario (weakness); they receive too few investment job or just unfavorable ones (unfortunate). The preferable scenario is depicted as an upward spiral, where wealth and

strength is created, and even financial and risk advisory services become a growth industry.

Compared with past waves of automation, the impending AI transition is striking for its combination of potency, reach, and speed. Many tasks involving cognition, and even creativity, will be disrupted or transformed in ways that are difficult to imagine now. But history suggests that human workers are more adaptable, resilient, and innovative than most have assumed. While many jobs will change radically or disappear, many new tasks and jobs will emerge from the creative destruction of the AI revolution. The mix of old and new work will vary greatly across occupations and industries. Ideally, there will be a transition.

8.3 Skill Development Needs

Automation is not a simple finish line but rather the beginning of a new journey. As the pace of work is rapidly accelerating, there is a call for talent to become familiar with Enterprise Financial and Risk Advisory Services and RegTech automation trends, processes, and tools. This means upskilling will not just be an expectation but rather an imperative for professionals working with post - M&As. A vision is to train more than 500 employees in Enterprise Financial and Risk Advisory Services and RegTech tools within the next two years. A blend of experience, personalized plan, and gamified experiences is considered key to ensuring maximum efficiency and delivery - quality improvement; reduction of employee turnover; and quicker ramp - up of newly acquired talent.

This objective can be achieved by implementing a gamified training plan that involves three components. The first step is to create a catalog of training sessions for automation tools, programming techniques, Enterprise Financial and Risk Advisory Services, and the RegTech landscape. Training sessions should be designed with intensity, duration, and contents adjusted based on the targeted groups of personnel. Employees with 3+ years of experience will receive focused training on tools relevant to their technical skills, while early - career employees will be trained on topics including but not limited to general guidance on automation tools before delving into specific programming protocols.

The second step is to conduct online training through virtual greenhouses, combining regular education with gamification techniques. All assigned training sessions will take place in the greenhouse format where technical and process - oriented discussions and online quizzes will be held continuously as one module. Employees will be given two weeks to read the assigned report and make automation suggestions for efficiency improvement. Group work will be assigned on specific sessions, motivating a competitive and collaborative atmosphere through tracking of the delivery quality of each group’s output.

9. Ethical Considerations

Automation systems streamlining the delivery of enterprise financial and risk advisory services (EF&RA) typically comprise widely used data management systems implemented by multiple large enterprises. This context exposes pressing questions regarding the ethical performance of automation systems which they persist due to numerous challenges in addressing ethics - related concerns. Intelligent Data Analysis Tools (IDATs) augment data management systems in early phases of EF&RA, where their ethical performance hinges on automated decisions made on possibly sensitive exploitative data. Perception of these tools is system - oriented rather than service - oriented, overlooking human - centered ethical considerations. Hence, there is a need to research the impact of early automation systems on efficiency in enterprise financial and risk advisory services (EF&RA). The nature and essence of the problem begin with the identification of intelligence and system boundaries, resulting in a need to decompose intelligent systems into system components. The research context becomes an imperative setting for narrowing down the scope of automation systems. IDATs based on AI ML constitute the core of inquiry. Additionally, the context characterizing services in terms of data processes is incorporated to supply necessary information on automation systems developing intelligence overtime and prompt information surges. To investigate the impact of automation systems by establishing patterns and insights for service design and development, a mixed methodology comprising case study and simulation modeling is employed. Multiple large enterprises representative of the inquiry focus are selected to compose target - specific longitudinal case studies. The ways of automating kinship are elucidated by analyzing video - recorded automation design team meetings, transcripts of which are supplemented with additional data. The validity of the finding is enhanced by conducting qualitative cross - case comparison with similar reasoning but contrasting settings. The service delivery process is recreated and simulated for (i) understanding and illustrating the structure and evolution of the socio - technical ecology, (ii) revealing and validating underlying mechanisms of automation engrossing activity types and patterns, (iii) measuring and analyzing qualitative and quantitative performance metrics, and (iv) establishing findings related to broader contexts. The inquiry has profound implications on theories, authorities and enterprises, ethics - based auditing of automated decision - making systems, to illustrate automation opportunities and concerns.

9.1 Data Privacy

The EU General Data Protection Regulation (GDPR) has had a substantial impact on the legal processing of personal data, placing obligations on both data controllers and processors to provide a series of safeguards aimed at promoting conditions for the lawful processing of data. However, the increasing development and application of pervasive technologies such as artificial intelligence, machine learning and natural language processing has outpaced these measures, leading to many loopholes within GDPR - compatible systems. Further, compliance as an approach to moral and ethical concerns continues to galvanise an adversarial model of cyber security. This raises questions of the purpose and surfacing of privacy conflicts at the design stage of systems, or their associated interaction flows.

Advances in technology have resulted in increasingly pervasive systems capable of collecting personal data on a mass scale, the development of data analytics tools, and

widespread data processing, with few restraints on what data could be collected. The regulation of systems capable of mass surveillance has consequently failed to inscribe formal scrutiny across the domain. In addition, extensive system use has been normalised, and therefore renders utterances of intent and concerns regarding privacy defunct. The obfuscation of the systems involved in a commercial transaction means there remains no formal accountability on the part of both organisations and individuals involved in the processing of data. This incapacity to successfully regulate cyber privacy presents a clear and imminent danger to the future of the democratic nation states, although it remains an open field for continued debate.

9.2 Bias in Algorithms

The efficiency gains expected from algorithms in public sector decision - making could be limited by different mechanisms that undermine these anticipated gains. The risk of reliance on inaccurate algorithms may be exacerbated by bureaucratic factors that dampen human vigilance. This is because human sensitivity to the reliability of advice and the inclination to disregard blatantly faulty guidance appears to be mitigated in bureaucratic settings. The latter is consistent with research on the bounded reliability and rationality of bureaucratic actors and the blurring of responsibility within bureaucratic structures.

Automation Bias refers to undue deference to automated systems by human actors that disregard contradictory information from other sources or do not search for additional information. It is manifest both in not acting in contravention to algorithmic advice even when experiencing doubt and in the use of automation as a heuristic replacement for vigilant information seeking and processing. In terms of decision - making processes, task automation may be accompanied by less intensive processing of automatically generated outputs, while decisions may be based on less critical consideration of the automated advice.

The robustness of Automation Bias finds further support in studies of emergent artificial incompetence in other circumstances and technologies as well as in expected impediment to accountability in algorithmically - complex environments. By investing effort in algorithmic input - disconfirmation, individuals involved bound the chances of issuing an untimely or faulty decision while also signalling proactivity. However, in contrast to Automation Bias, decision makers fail to browse automated guidance individually. Instead, decentralized structures of information aggregating and deference may arise. In consequence, there could be mass deference to faulty binary information provision that may originate stronger and more widespread failure than according to the majority of errors paradigm/Collective Ignorance.

10. Measuring Success of Automation Tools

Automation testing involves a test team's development of scripts that test a functionality or feature whenever it changes, and it is executed repeatedly to validate the new changes in the application. Automation testing is searching for bugs after the last completed department, now the query is how to check the script correctness. The success of automation testing is largely dependable upon the right testing tool. Therefore, it is highly recommendable to look for the strengths and weaknesses of your current project, pick and review the selection criteria, and discuss with your team all the selection criteria before opting for an automation testing tool.

Several factors go into determining if a testing tool is worth the investment. The first step in answering this critical question is to develop a well - rounded list of criteria that provides a roadmap to assess the pros and cons of a tool against the specific needs of the project or organization. The following partially represent lists of criteria for consideration, but each team must adjust the criteria to fit its specific needs and circumstances.

The most crucial factor is if the tool just works. Firstly, no tool is going to work for 100% of applications, so flexibility in adapting to unique development environments is necessary. Secondly, how easy it is to use and to learn for the testers who will be using it? Most commercial tools will require some training for novice testers to get up to speed after the tool is acquired. There will generally be difficulty ramping up experienced testers on a new tool.

Is the tool worth the investment in terms of its cost? It is imperative to examine what is included in the cost. It is advantageous if the tool comes with tools both for development and execution of tests, as well as for reporting and project management. The additional module is generally required beyond the initial purchase and is usually expensive. It is important to differentiate between bugs in the actual application and bugs in the testing tool. If a testing tool does not find bugs, but the application does? What kind of bugs do the tool catch on average? What proof do you have on hypothesis exercises? Testing automation is not a solution to a problem, so even if it is automated, the test test team is still the one responsible for the automatic testing system.

10.1 Key Performance Indicators (KPIs)

Key Performance Indicators (KPIs) affect investment decisions of outside investors and impact the company's future development. As KPIs represent numerical facts they need to be true concerning what they express, factual correctness, and consistent over time, numeric consistency. At the same time, authenticity is of immense importance, as the processes that generate numerical values need to be respected, because otherwise, they would be easy to manipulate and produce "fake" numbers. However, the report generation process is prone to numeric inconsistency. To reduce numeric errors in disclosure documents while speeding up the cross - checking process, companies and auditing firms are interested in an often - used approach to detect numeric errors, manual cross - checking. Despite good training, cross - checking is a tedious effort that requires extensive and time - consuming work and can result in the competencies of the auditors being exhaustively used. Hence, an automated support for the auditors is required, that spots inconsistencies before audit doing manual controls. A capable Natural Language Processing (NLP) solution able to extract and cross - check semantically equivalent KPIs in German financial documents would expand semi - automated checks

to a larger level. Automated checks could decrease the number of inconsistencies. And lastly, pairing the automated checks with an understanding of the findings is hoped would aid the auditors to explain the decisions made.

To automatically cross - check summed up numerical facts, it is crucial to determine whether or not the numeric facts are semantically equivalent. If they are determined as such, an additional task assigns whether the relationship is a basic or complex one. This approach on financial documents will allow an efficiency improvement for the auditors, as they would detect issues otherwise missed before starting the audit. It will furthermore give the auditors information on how similar the different items are, indicating if a manual cross - check is required. The monetary size would also aid concentration on large differences rather than on numerous minor violations.

10.2 Return on Investment (ROI)

Baseline IQ competes in the assurance services advisory market which is dominated by the Big Four firms, supported by independent firms with different levels of service and geographic coverage all the way to affiliated regional and local firms. Likewise, in the financial advisory service market, there are Big Four firms which rank high on other capabilities, regional firms which have scaled down practices in some markets and pursued new service offerings, and independent firms with either broad geographic coverage or market specialization. Changing client and market needs, added to growing legislative pressure on finance and independently reviewed financial reporting, has opened new service offerings and stiff competition for all firms. All firms are committed to investing in by simultaneous cost reduction resources capability on the other. Services are increasingly labor intensive and some process automation software tools co - exist with ever - present pressure on growth through quality costs to process compliance. By modelling profits, it can be shown that for a fixed revenue level improving service quality on the expensive tasks — quite sensibly — has little impact on ratcheting up profits and hence announcing aggressive new hiring and spending plans. Rather, there is a large need and reward for eliminating compliance and on - pro - scope over servicing efforts which cost consistent with valid profit models. A persuasive case for optimal improvement from current practice is built solidly on the above profit modelling. Understanding of an examination assist tool and its expected impacts makes for informed evaluation. Then, through a ‘carpet - negotiating’ exercise and sensitivity analysis of the NFE, alternative IMS solutions can be formulated with desired levels of process adherence and loss acceptance. In choosing from these options, the issue of implementation incentive subsets is raised. Further, alternative observation and audit metrics, based on win - lose penalty payments, maintained over time are advanced.

11. Conclusion

Automating operational processes and tasks have been undertaken by various organizations, often through Robotic Process Automation (RPA) tools, which can replicate actions in different applications. RPA tools are entirely or partially task - descriptive automation systems, meaning any interested organization can easily implement them using existing systems without re - engineering efforts, with expected benefits. Although RPA is just the start of an emerging market for software development, during the initial in - blind stage of RPA growth, many leading and potential users may be substantially misinformed about the new market and technology alternatives. Therefore, early RPA adopters during 2017 - 2019 have been examined to characterize their motivations and the results of their RPA implementation projects. The Automation Anywhere, Blue Prism, and UIPath software packages – mostly first - time and trial versions and purchased or rented at minimal costs – are the main RPA tools of early adopters. It was found that Automation Anywhere is superior for email applications and Excel document handling. Blue Prism is superior for automating organizational enterprise systems, although these systems require more work around workflows. UIPath has cloud - based supporting tools, making it possible to download and use the basic tool without individual installations, providing the best understanding of how to build software robots across conventional email tasks, other office applications, and the Robinson cases.

Unfortunately, all first movers have poorly predicted cost and ROI. By far, most operators have a deep understanding of a few low - level tasks, while the vision, strategies, and upscaling potential for increasing the RPA architectural range are ignored. Although one full - time robot accountant working over the weekends is producing excellent weekly reports, an organization failed to identify what finance or auditing - related RPA tasks are better to automate moving forward and what additional productivity, insight benefits, prices, turnover, or customer satisfaction improvements can be maximized. Furthermore, most organizations have no prior knowledge of appropriate upskilling efforts to be prepared for onboarding RPA or what mass employment reductions or issue resolution are required for conceiving the need for co - creating an enabling socio - technical environment. This seems to be the challenge of straddling the local commercial automating and the upper segment of strategizing addressing the underlying gap through soft - skill, socially related research uptake.

11.1 Future Trends

Given the uncertainty regarding performance output following the development of the Solution statement approach, built - in performance measures would allow the model comprehensiveness to be established via the successful simulation of a wide operating parameters range. Parameters might include the levels/ratios of Major and Minor targets, maximum deviations, adjustment speeds, propagation time delays, and the ratio of Target reported Blocks to Normal Off - Facility. Potentially through the targeted use of mass simulations, it should be possible to define comprehensive ranges of operating parameter values that are plausible and likely.

As a corollary, the provision of worst - case situational output data relative to consequences on Output and Recovery would allow charts of the response surface to be generated for recovery method design alternative evaluation. A similar approach might be optimal if this model were to be used to evaluate and ameliorate the impacts of Major Block or Major

Target Miss on Choice. Still, the new approach may not allow the best case specification of operating circumstances that led to recovery method design alternatives. Hard design constraints or operational roadblocks must be validated/worked around in any complex system like this. Consequently, there are scale issues with respect to applying rockets to pull down into a smaller body without breaking any software. Similarly, there is doubt about achieving calibration of existing data.

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