Towards stability, predictability, and quality of intelligent automation services*:

product journey from on-premise to as-a-service at ECIT Group

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ABSTRACT

The intensive transformations of software products have been widely discussed in academia and business from various perspectives, yet with limited reference to low-code technologies, such as robotic process automation (RPA). The intensive growth in the size and importance of RPA and low-code industry puts their offering transitions from traditional on-premise to modern software-as-a-service models at the core of its paradigm evolution. Our single case study presents the transformation from 'On-Prem' to 'RaaS-P' product for intelligent automation (IA) services, conducted by the leading Nordic consultancy ECIT Group, elaborating on its triggers, journey, stakeholders, as well as implications on cost, quality, and customer satisfaction. Triggered by internal experiences, cost, and market pressures, the case allowed us to discover that while RPA technology has rapidly grown to become a commodity at a wide amount of business organizations, the RPA service providers need to aim at resolving the issues and addressing challenges of their customers, not technology itself. It brings forward the 'Robot as a Service - Process Automation' product, with a novel approach to SLA, focused on availability, job stability, recovery, and transaction quality.

CCS CONCEPTS

• Information Systems Applications • Software Creation and Management •

KEYWORDS

Robotic Process Automation, Low Code, Business Models

ACM Reference format:

*Towards stability, predictability, and quality of intelligent automation services: ECIT product journey from on-premise to as-a-service.

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IWSiB '24: 2024 ACM/IEEE International Workshop on Software-intensive Business Proceedings © 2024 Copyright is held by the owner/author(s). ACM ISBN 979-8-4007-0571-7/24/04. https://doi.org/10.1145/3643690.3648595

1 Introduction

Software product transformations are widely discussed in industry and academia. It is often a multifaceted and compounded process, influenced by technological, organizational, and market factors investigating emerging domains with the flexibility of 'smart ecosystems' [9]. Its managerial complexity has been commonly emphasized, including the role and importance of software ecosystems in transforming software products [23]. Exploring insights of product model transformation in the software industry, particularly the shift towards 'software-as-a-service' (SaaS) and cloud computing have been reported [8]. As SaaS platforms are usually part of larger software ecosystems [34], their multi-sidedness and point-to-point integrability enable them to orchestrate sourced cloud services, often referred to as Platform-as-a-Service (PaaS). The 'aaS' paradigm and its implications on software ecosystems has been studied by Hess et al. [14]. Their comparative case study revealed how 'aaS'-based ecosystems differ from traditional 'on-premise' ones, and how the roles of market stakeholders might change due to the increasing transformations onto 'aaS' models [4]. Moreover, the survey conducted among software companies conducted in 2021 by Mäkilä et al. [31] discovered that while a significant number of companies technically produce SaaS, pure SaaS-based business models are still not as common.

At the same time, the low-code and robotic process automation (RPA) market is one of the fastest-growing software domains, with $2.9 billion in revenue generated by 2022 [12],[18]. Software robots have allowed various organizations to become more competitive by lowering costs and, at the same time improving quality, and releasing employees from boredom at work [20]. The paradigm shift from a traditional product-centric design to a line-centric, product focus adds complication to the change process [2][5]. From the perspective of organizational design, the advantages of transitioning onto ‘automation as a service’ solutions transcend the realm of cost-effective innovation through operational optimization, including cost reduction. As indicated by Loukis et al. [29], a noteworthy aspect of such transformations applies to the relational transition between the customer and vendor. This transition marks the inception of an enhancement in the technological proficiency of end-users who were not directly engaged in product development within the previous 'on-premise' model [4]. When the perspective of people and culture gets integrated into this discourse, it becomes evident that the introduction of a new product model for automation services enables novel social domains within the offering formulation process involving various stakeholders, including the client, service provider, and end-users [26].

Hess et al. [14] discovered the shift towards a higher level of market coordination in ‘as-a-service’ ecosystems compared to ‘on-premise’ ones and encouraged further exploration of products and solutions, shifting their orientation from ‘on-prem’ to ‘aaS’, where organizations initially focused on building custom software hosted at their local servers progressively orienting towards an open SaaS paradigm. Xiao et al. [47] recommended further examining product strategies for SaaS products in various domains, from the perspective of their modification and customization techniques. Ylä-Kujala et al. [46] studied the schemes of RPA services from the perspective of investment appraisals and recommended further exploration of possible delivery models, including performance-based designs. Building upon these insights, a noticeable need for research emerges in the academic discourse surrounding RPA's intersection with the ‘as-a-service’ model. The transition from traditional models to ‘aaS’ in enterprise software encompasses more than just technological shifts; it encapsulates broader organizational dynamics, market-driven changes, and strategic realignments enhancing the discussion around the ownership over technological solutions and developing aaS-driven business models [37]. Yet, the broader implications of such a shift, especially concerning cost structures, service quality, and customer satisfaction, remain scarcely researched [35]. These differences between ‘as-a-service’ ecosystems and their ‘on-premise’ counterparts, as delineated by Hess et al. [14], further underscore the complexities inherent in such transitions.

Given all these observations, our research seeks to address the following research questions:

RQ1: How can automation providers effectively navigate transitions from traditional models to ‘as-a-service’?

RQ2: What are the implications for the ‘automation as a service’ model for cost, quality, and customer experience?

2 Related research

2.1. On-Prem to SaaS product transitions

Software product transformation refers to the evolutionary changes that software products undergo, driven by factors such as advancements in technology, business environment alterations, and shifts in user preferences [33]. An important and novel aspect of software product transformation is the transition towards SaaS. Komssi et al. [25] explored the transformations of a solution strategy within a medium-sized Finnish SaaS company. Their findings highlight that the solution strategy underwent four distinct stages over nine years, reflecting the changing market dynamics and customers' needs. This study reinforces the idea that the evolution of a software product is not a static process but an ongoing journey, with strategy playing a crucial role. Furthermore, Manikas [30] extended this discourse by illustrating the transformation of a market leader product series in water-related calculation and modelling from a traditional business-as-usual series to an evolutionary software ecosystem. The report proposes that software product transformation can involve radical changes that disrupt both software engineering and organizational and business aspects [30]. Leenen et al. [27] delve into another critical aspect of software transformation: productization, which can be understood as the transition process from customer-specific software to a standardized product.

2.2. Process Automation Software

RPA technology is a type of software that mimics operational tasks formerly performed by humans by automating rule-based procedures and offering deterministic results [45]. Such low-code solutions, often referred to as ‘software robots’, perform business processes by executing transactions, manipulating data, generating reports, filling forms, copying, pasting, and clicking [21]. It

is constantly evolving, getting integrated with artificial intelligence elements of machine learning (ML), natural language processing (NLP), as well as process mining, data reporting, and analytics, at the same time allowing business experts to gradually transform onto 'citizen developers' [39]. Aside from RPA, automation software has been rapidly growing as part of low code development platforms (LCDPs) that enable non-technical users to rapidly develop diverse apps, by accelerating software development and deployment process [1],[9]. Based on the process logic interface, as well as wide integrations to various data services, and effective reusability of components, LCDPs substantially reduce time required for the development of software applications [23].

3 Research method

Our single-case (single-subject) study followed the guidelines of a revelatory case by Benbasat et al [3], putting it in the context of the continuous controlled experimentation with data and creation of abstract theoretical concepts, with the desire to examine and discover the product formulation process [40]. Our choice of the single case study method was grounded in its proven effectiveness in studying the experiences of a singular entity within the Information Technology (IT) sector. The adoption of agile work methods represents a paradigm shift from linear project management of software products, towards a lateral approach [6] where innovative solutions are crafted based on emerging organizational experiences, as a case study analyses a phenomenon in its natural setting [3] to explore the phenomenon and answer "why" and "how" questions. To secure research validity, the authors focused on structure simplicity, accountability, and objectivity in the collection and analysis of data [15], [41]. Methods of data collection included: analysis of documentation & archival records (incl. product models, pricings, contractual packages, and branding material), qualitative interviews (3), and direct observation during in-house project meetings (17), as well as retrospection sessions (10). These actions supported our method for exploratory analysis of the dynamic landscape at a software consultancy engaged in transformative software product endeavour [40],[17].

3.1. Case Organization

ECIT Group is a leading Nordic provider of accounting, finance, payroll, and IT services. Founded in 2013, it has its headquarters in Oslo, Norway, and consists of over 2300 employees at 100 locations in Norway, Sweden, Denmark, Finland, UK, Germany, Serbia, Lithuania, and Poland. The unit focusing on process automation services was established in Bergen, Norway in 2022 with 25 employees with strong experience in RPA and Low-Code, located in Germany, Lithuania, Poland, Finland, and Norway. Its mission is to "automate processes and integrations for customers, to save them time and money, at the same time increasing quality on essential business processes". Its organization has a relatively flat structure and a strong focus on research and development in ICT systems and automation software.

The case company started to deliver automation services in 2016, based on the stack and toolset of UiPath that is currently considered to be a global leader of RPA market, valued at 8.9 billion USD [12]. The team was one of the pioneers in using UiPath technology, the 3rd partner of UiPath in the history, and the first to commercially implement automation of a business process in production as part of a cloud model [43]. From the beginning, the company offered two main process automation products: cloud automation and 'on-prem' automation.

3.2. Case Description

The main research took place between March - December 2023, and entailed a review of product documentation and interviews with selected key stakeholders. After reviewing the data and internal product materials, multiple meetings with Andrzej Knioła, Product Manager based in Warsaw, Poland, as well as Simon E. Jorn, Managing Director based in Bergen, Norway got organized. It allowed the research team for a deeper understanding of old products, reasons for product change, transformation process, a new product, as well as internal insights and opinions. One of the authors had worked at the case organization during the product transformation exercise that took place in the second half of 2022, being able to observe and feedback on the transitional actions, yet it is important to emphasize that the ownership of the transformation and accountability of the product work was solely with Product Manager. Next, retrospective sessions took place in November 2023. After the text was written, case organization was called for feedback and improvement suggestions. The results of the analysis and interpretation were adopted by the research group by consensus.

4 Findings

In this section we elaborate on the key findings, together with synthesis of the results, and additional data obtained along the research process.

4.1 On-Prem and Cloud Automation

The 'on-prem' automation model was initially chosen by the majority of ECIT Group's customers, due to the data protection requirements and internal policies where the purchaser had to own the infrastructure required for data processing. Nonetheless, the adoption of this delivery model was more demanding for clients, as it required more resources, time, and upfront investment [28]. The customer company was obliged to source licenses, high-availability servers, setup software stack and security mechanisms at the platform, implement robots, train IT administration, and organize maintenance. The case company was naturally supporting its customers in all these actions (building and maintaining the environment, developing, and maintaining robots, reselling UiPath licenses, training and engaging the involved workforce, and implementing required changes and upgrades), but in practice, the endeavour of the customer was comparable to building their own, customizable Centre of Excellence (CoE).

Cloud Automation was primarily targeted at customers who did not wish to invest their resources and build internal automation competences, nor their own automation platform, development experts, as well as maintenance capabilities. It could have been understood as a classical outsourcing of office work, where customer company would transfer the accountability for delivery of their operational processes to an external provider, while in this case it would be executed by a virtual employee (software robot), that is available 24/7, never on vacation, never tired, late, absent, frustrated, nor mistaken. The only effort required from the customer after signing the contract was the transfer of process knowledge, as well as opening VPN connections required for software robots. The test and production environments were hosted, secured, and operated by the case company on a monthly fixed fee. Each process candidate, with automation potential, was individually assessed and estimated by dedicated analyst and developer, to implement it at a one-time fee. Moreover, software robots were maintained by the case company on a fixed monthly fee and reported by means of data visualization and business intelligence tools, such as MS Power BI. The customer company had three tiers for the fixed monthly maintenance fee: low, medium, and complex. Hence, before process implementation started, the customer was offered its estimation of implementation project, as well as monthly maintenance fee, based on the evaluated process complexity and system dependencies. We list specific service components together with their pricing schema at Table 1.

Table 1: Product Components and Pricing Approach

Services Component	Explanation	Pricing approach
Process Evaluation and Estimation	• Impact assessment • System Pre-Check • Challenges analysis • Governance and communication	Case by case
IA Platform	• Networks and firewall settings • Orchestrator setup • Robot VM setup • Post-installation and maintenance	Setup of platform was charged as a one-time fee. Maintenance of the platform was charged as a fixed monthly fee.
Implementation of IA Process	• Robot design and implementation • Project level documentation • Testing and Hand-Over to PROD	After evaluation and estimation of each process, implementation project was charged as a one-time fee.
Robot monitoring and support	• Monitoring • Meetings and communication • Debugging and bug-fixing • Windows updates • Migration of one former process	The monthly fee was based on the complexity of the process (low/medium/complex).

4.2 Product Transformation Process

The need for changing the product originated from the sales and service management experiences of the company, as well as global market trends. The robot licenses were getting more and more expensive, creating a risk of running costs to be higher than costs of human employee executing processes manually, particularly those customized ones with low volumes. After the start of COVID-19 pandemic, the inflation brought higher office and salary expenses. As a result, the entry commitment from the potential customers was getting higher and higher. The market of RPA service providers was also becoming more and more competitive, as the pandemic has opened previously hidden or blocked remote work and remote service delivery opportunities. The remote evaluation and design of processes, implementation of a robot, and remote maintenance become more natural and widely accepted among customers, who started to consider remote collaborations with RPA service providers, irrespective of their physical location. After the first years of the rapid growth curve in the automation area, so-called 'quick-wins' or 'low-hanging-fruits' were done, so bigger

and more sophisticated processes had to be found at the customers' side to overcome the growing running costs.

The 3 levels of process maintenance offered were creating some misunderstandings and challenges, as stated by Product Manager: *"In principle, our estimations on maintaining robots were accurate and straightforward. Most of the time we correctly estimated if a given process will be less or more time-consuming when it comes to monthly maintenance effort. Still, it was often challenging when we needed to explain to each customer about reasons for maintenance levelling for each process and convincing them to understand our perspective. Also, the 'maintenance: complex' process sounded quite bad to some customers, as they were thinking that it would be a hard and expensive process to robotize, which was not necessarily the case."* Another reason related to the paradigm shift in a delivery mode was expressed by Managing Director: *"We have been seeing that more and more customers are interested at moving from on-prem to as-a-service automation. We already negotiated and migrated some of them, yet more and more queries were coming. Also, platform vendors, such as UiPath, were gradually shifting their licensing models from on-prem to cloud (private or public). Hence, we were expecting our future automation services to shift more and more onto 'as-a-service-model."*

2022 was the turning point, when the company's organization got restructured, and the Product Manager embarked on a mission of formulating the automation offering of ECIT Group for the future. In close collaboration with the Managing Director, another Product Manager (primarily responsible for non-RPA low-code solutions), as well as Sales and Service Management Teams, the Product Manager started his work from analysing past experiences and lessons learned from sales and service delivery cases. Moreover, comparative research on the market with the newest RPA technologies and product offerings was conducted, to look for insights and ideas for delivery and pricing models. In Q2 2022, an experiment model was developed and tested, named 'robot per hour'. The deployment of 'robot per hour' was triggered by the query from a customer, but the model was one of the options that ECIT Group wanted to test and was framed around the concept that no matter what processes, setups, volumes, or systems are involved, only for the time capacity used by the robot is chargeable. As it ended up being the suboptimal solution, the final new product was developed by the case company in the second half of 2022, was named 'Robot as a Service - Process Automation' or shortly 'RaaS-P'.

4.3 Robot as a Service - Process Automation

The new product for automation services was supposed to be a simple and predictable answer to the constantly rising complexity of automation for organizations that want the benefits of RPA, without the need to become experts in it themselves. As stated by Product Manager: *"RaaS-P would bring automation for those customers that start and end with the business problem expressed as 'this is what I need to be done automatically, how much will it cost and when can you do it?' and expect a concrete and fixed answer for both implementation and running costs."*

Hence, Robot as a Service - Process Automation product was designed around 2 core principles: simplicity and predictability. When it comes to simplicity, all aspects of Robot as a Service - Process Automation had to be understandable and digestible for a person who wants to get things done, but not become an expert and scholar in enterprise automation. It would cover all areas of the product, from the first meeting, through negotiation and contract, pricing, implementations, production support and off-boarding. In regards predictability, the product was supposed to be straightforward, with no surprises, no hidden clauses. Not only on cost levels, but also on quality – the customers were supposed to rely on the automation outputs, as they must arrive as planned. Those principles aligned with overall goals of all ECIT products and services being easy, affordable, and sustainable. The product would be suitable for any target audience. From a pricing perspective, it would work for both smaller and larger companies, although their drivers and goals for automation would not necessarily be the same. For large companies, these are mostly cost savings, throughput, quality, and compliance. For smaller companies, automations are often triggered by the need of freeing up the time (and mind) of their core employees, so they can focus on things they should be doing, instead of the things they must do.

At Robot as a Service - Process Automation, the work environment represented virtual machines (VMs) at which the robots perform their work, and usually one environment fits multiple robots. There are 2 types of environments: self-hosted (where environment was installed on the premise of customer), or ECIT-hosted (where ECIT Group would be fully accountable for it). When it comes to process evaluation and analysis, they got standardized into templated process workshops, charged at a fixed price. In regards the robots' performance, each robot would be able to execute 1 process, and its implementation costs would be charged as a one-time fee, after prior evaluation during process workshop. When it comes to maintenance, it would

charge with a fixed monthly fee for maintenance and unlimited transaction volume. What is important, there are 2 process types that dictate maintenance effort and cost levels: click-less and standard. Automated Processes are charged on a fixed, monthly basis, and always include maintenance of the implemented automation to keep it in a working state for agreed scope.

Standard Automated Process represented the typical RPA implementation, with Graphical User Interface (GUI) interactions (clicks, typing etc.), while Click-less Automated Process represents a more technically advanced, but easier to maintain, automation, where GUI interactions are replaced with API calls and other automation methods that do not require a display at all. An important alteration at the new product was the new approach to service level agreement (SLA) measured by updated key performance indicators (KPIs). It got formulated with the goal to focus on what matters for the customers, as the standard SLA's (e.g. uptime 99,9%) often is too vendor focused, not Customer focused. We summarize its components, explanation, and measurements at Table 2.

Table. 2: SLA of Robot as a Service - Process Automation

Component	Commitment Explanation	Measurement
Availability	Service Provider shall ensure that the services are available on the platform when needed.	Time between Automation start request and actual start.
Job Stability and Recovery	Service Provider shall ensure that Automated Process Runs complete as expected and, in case of interruptions, be resumed without delay.	Automation Job Run recovery time.
Transaction Quality	Service Provider shall ensure that Transactions will be processed successfully according to specified rules.	Percentage of Successfully processed transactions.

The SLA of Robot as a Service - Process Automation assumed that it is much more valuable for customers to have a guarantee that their automation will start at most X time after the triggering event than to have a 99,9% platform uptime measured by the vendor. A 99,9% availability means that for every 1000 minutes, it could be down for 1 minute, or every calendar day it could be down for 1m26s. If expanded to a month, that would be 45 minutes of unplanned downtime per month. It might have been perceived as minor value, unless it hit the 30-minute window when some business-critical process should have been executed, but it had not. Let us also quote a practical example of the Robot as a Service - Process Automation SLA approach, as described by Product Manager: *"We take responsibility for the impact to Customer, the full uptime, etc. is not important in that context since it's the "it's there when I need it for as long as I need it" that's crucial. Similarly, with our other SLA* metrics, we focus on recovery speed (not uncommon, but important) and *transaction completion % (which is uncommon). Every job that stops, and every transaction that fails can and does have an impact. Our efforts are laser-focused on minimizing the actual business impact of automation disruptions, not just keeping a metric high."*

4.4 The culture of experimentation at the core of the RaaSP model development

Generative business modelling necessitates the cultivation of an innovative culture [16], one that fosters an environment useful for the experimentation and validation of novel solutions [11]. 'Experimentation Evolution Model' [10] confirms the way of continuous innovation through controlled experimentation at scale. When it comes to the genesis of the innovative delivery model within ECIT Group offering, our interviews conducted with key stakeholders revealed the below lenses for RaaS-P.

Firstly, the approach to Customer-Centric Design (C-CD) for product got identified, as the case company tried to adopt the definition of 'process' from the client to simplify the 'glossary' of the project [30][42]. C-CD necessitates continuous information exchange, ongoing Client Perception Assessment, and confrontational conversations about expectations, with the clients being referred to as 'Sparring Partners'. A significant aspect of this 'sparring partnering' approach is the evaluation of how clients perceive cost and quality within the context of the new cooperative approach.

Secondly, Experimentation, Rapid Prototyping, and Adaptive Solutions are the cornerstone in the product development process, exposed by the willingness of ECIT to embrace experimentation. The words "*Let's try something completely different*," serve as an illustration of the organization's positive approach toward change. A particularly worth-mentioning experiment involved a model where clients paid according to the robot capacity they utilized. The experiences affirm the context-dependent nature of this approach, with some companies continuing to favour this perceived "cost-efficient" cooperative model tailored to their specific requirements. Interestingly, in a long-term perspective, such model was not continued due to its commercial dependencies.

Finally, Transparency in Direction expressed with The Value-Based Model (V-BM), characterized by a fully predictable framework with static costs calibrated after the implementation of pilot projects, embodies a commitment to transparency. The intrinsic value of processes to both: clients and the IT company was articulated with the

statement, "[…] *this is how much the process is worth to you*" mentioned by Product Manager.

The organization remains open to further innovation and the extension of Service Level Agreements (SLAs), exemplified by the consideration of click-less automation as a next-step option. This multifaceted exploration into the genesis and operationalization of the innovative service model underscores the company's commitment to adaptability, client-centricity mentioned by Product Manager. A culture that actively embraces change and experimentation as integral elements of its business strategy that actively embraces change and experimentation, which are also seen as prerequisites for creating sustainable software, was a viewpoint emphasized by Klotins [24].

5 Conclusions

The market of RPA has been rapidly growing over past few years, being a part of the global business trend of the low-code solutions usage. At the same time, products and services offered by some vendors have been evolving from the 'on-premise' towards 'software-as-a-service' solutions. Studying the case of ECIT Group allowed us to explore the process of gradual transition from 'on-prem' to 'as-a-service' offering, from the perspective of its triggers and implications for the vendor organisation, as well as cost, quality, and customer experience.

When it comes to the triggers, the case company had been observing the industry trends, as well as capturing internal lessons learned, similarly to the capability development model reported by Jovanovic et al. [19]. The ubiquitous cost pressures, resulting from the COVID-19 pandemic, as well as rising inflation and salaries expectations were important factors, like the ones discussed already by Kedziora et al. [22]. The interesting finding was the natural evolution of the automation landscape at the customer organization, as following the market. It has not been discussed yet, but the fact that when a company starts a robotization program, it gradually gets increasingly difficult to implement new robots, and the solutions applied for automation need to get more technically sophisticated [7]. As the RPA market has over the past few years reached its peak, this technology has become a commodity for business organizations, so the RPA software providers should aim at resolving the issues and addressing the needs of customers, not the technology itself. As the technological stack gets less important and relevant for users of RPA products, our study contributed to the debate on the shift towards a more customer-centric approach, where Process Automation is at the core of the service product, not RPA technology itself. The endeavour for an affordable and simplified service model was conceptualized as the avenue through which the company drives market innovation and experimentation [13]. Central to this conceptualization is the assumption that the innovative model for customer automation will establish a framework for navigating collaborations on multiplicative RPA initiatives across diverse scales and industries. Furthermore, it is expected to yield a novel taxonomy for automation strategies.

The shift in the license offering that had been dictated among others, by the industry transitions from 'on-premise-to 'as-a-service', as well as the role of macroeconomic factors, and expanding remoteness of work. A very important finding was the novel approach to SLA, based on availability, job stability, and recovery, as well as transaction quality, stemming from the core principles of simplicity and predictability. The important was the concept of a 'click-less' SLA for process maintenance, as the data manipulation was run at the back end of the process, not at a GUI, as stated by most RPA research [45]. The emphasis on the role of the standardized process discovery process, as a critically important part of the automation journey, was like the previously mentioned works, such as Seppänen et al. [38] and Weder et al. [44].

When it comes to the work on the novel cooperative delivery model, Product Manager outlined several key advantages. Firstly, the model fosters transparency and minimises discretionary decisions, aligning stakeholders with the project's direction. This approach is resonating with Münch et al.'s roadmap-based maturity model [32]. Additionally, when it comes to metrics and measurement, it offers a stable source of recurring revenue for the software vendor. Thirdly, the model serves as a risk mitigation mechanism in estimating the Return on Investment (ROI), supporting various research perspectives. This includes implementing safeguards like soft limits and a "pay per process" system, marking a significant shift from traditional IT project methods. Product Manager highlighted the proactive management of risks from the project's start, leading to a Value-Based project estimation framework within the Service Level Agreement (SLA). This not only ensures quality but also represents an "innovation alignment" between parties, in line with the work of Jayakody and Wijayanayake [17].

Our limitations come from only one, single study, being based on a single organization. Inherent in this approach, the constraints are also related to the capacity and availability of responders, as well as quality of the materials collected from ECIT Group. However, the overall case provides important lessons for any organization considering automation initiatives. The practical implications are applicable not only to commercial, but also public and non-governmental organisations (NGOs) that aim to automate processes with internal capabilities, or external consultancy vendors. Hence, we encourage further research to replicate and study the risks and impacts of RPA implementations in multiple settings, cultures, and domains. We also recommend comparing the results of our case with other technologies being part of software ecosystems. Moreover, we direct future research on exploring what can be the other product models in which automation software can be delivered, as well as how product choices influence digital transformation strategies and results on the customer side.

References

[1] Md Abdullah Al Alamin, Gias Uddin, Sanjay Malakar, Sadia Afroz, Tameem Haider, and Anindya Iqbal. 2023. Developer discussion topics on the adoption and barriers of low code software development platforms. Empirical Software Engineering, 28(1), 1–59.

[2] Peter Artz, Inge van de Weerd, Sjaak Brinkkemper, and Joost Fieggen. 2010. Productization: Transforming from developing customer-specific software to product software. In Proceedings of the International Conference on Software Business (ICSOB 2010), Lecture Notes in Business Information Processing, Vol. 51, Pasi Tyrväinen, Slinger Jansen, and Michael A. Cusumano (Eds.). Springer, Berlin, Heidelberg, June 21-23, 2010, 90-102.

[3] Izak Benbasat, David K. Goldstein, and Melissa Mead. 1987. The Case Research Strategy in Studies of Information Systems. MIS Quarterly: Management Information Systems 11 (3): 369-386.

[4] Michael Boniface et al., Platform-as-a-Service Architecture for Real-Time Quality of Service Management in Clouds. 2010. Fifth International Conference on Internet and Web Applications and Services, Barcelona, Spain, 2010, 155-160

[5] Jan Bosch, Petra M. Bosch-Sijtsema. 2010. Software Product Lines, Global Development and Ecosystems: Collaboration in Software Engineering. Berlin, Heidelberg: Springer.

[6] Robert C. H. Chia and Robin Holt. 2009. Strategy without design: The silent efficacy of indirect action. Cambridge University Press.

[7] Donal Cooper, Pamela Schindler. 2013. Business Research Methods. New York: McGrawHill Education

[8] Michael Cusumano. 2010. Technology Strategy and Management: Cloud Computing and SaaS as New Computing Platforms. Communications of the ACM 53 (4): 27–29. doi:10.1145/1721654.1721667

[9] Edona Elshan, Olivia Druihin, Niklas Schmidt, Dominik Siemon, Damian Kedziora. 2024. Unveiling Challenges and Opportunities in Low Code Development Platforms: A StackOverflow Analysis. In Proceedings of the 57th Hawaii International Conference on System Sciences (HICSS), pp. 4244-4253.

[10] Aleksander Fabijan, Pavel Dmitriev, Jan Bosch, and Helena Holmström Olsson. 2022. Chapter 12 The Evolution of Continuous Experimentation in Software Product Development: From Data to a Data-Driven Organization at Scale. Cham: Springer International Publishing.

[11] Aleksander Fabijan, Pavel Dmitriev, Helena Olsson, Jan Bosch. 2017. The evolution of continuous experimentation in software product development: from data to a data-driven organization at scale. 39th International Conference on Software Engineering (ICSE), 770-780

[12] Gartner. 2023. Magic Quadrant for Robotic Process Automation. https://www.gartner.com/reviews/market/robotic-process-automation-software Retrieved January 18, 2024

[13] Andrei Hagiu, Julian Wright. 2015. Multi-sided platforms. International Journal of Industrial Organization, 43, 162-174.

[14] Thomas Hess, Alexander Benlian, Christian M. Wolf, and Daniel Hilkert. "The 'As-a-Service'-Paradigm and Its Implications for the Software Industry – Insights from a Comparative Case Study in CRM Software Ecosystems," January 1, 2010. In P. Tyrväinen, S. Jansen, & M.A. Cusumano (Eds.), Software Business. ICSOB 2010. Lecture Notes in Business Information Processing, 51. Springer, Berlin, Heidelberg.

[15] Dietmar Janetzko. 2008. Objectivity, reliability, and validity of search engine count estimates. International Journal of Internet Science, 3(1), 7-33.

[16] Slinger Jansen, Anthony Finkelstein, and Sjaak Brinkkemper. A Sense of Community: A Research Agenda for Software Ecosystems In Proceedings of the 31st International Conference on Software Engineering - Companion Volume, January 1, 2009. Vancouver, BC, Canada, 187-190.

[17] Vihara Jayakody and Janaka Wijayanayake. 2023. Critical success factors for DevOps adoption in information systems development. International Journal of Information Systems & Project Management, 11(3), 60–82.

[18] Connor Jones. 2022. RPA Software Market will continue to grow as business demand increases. ITPro. https://www.itpro.com/business-strategy/automation/368688/gartner-rpa-software-market-will-continue-to-grow-as-business-demand-increases Retrieved January 18, 2024

[19] Marin Jovanovic, Jawwad Z. Raja, Ivanka Visnjic, Rank Wiengarten. 2019. Service Capability Development for Servitization: Examining an Internal Service Ecosystem." Journal of business research 104: 472–485.

[20] Damian Kedziora and Esko Penttinen. 2020. Governance models for robotic process automation: The case of Nordea Bank. Journal of Information Technology Teaching Cases, 11(1), 20-29.

[21] Damian Kedziora. 2022. Botsourcing, Roboshoring or Virtual Backoffice? Perspectives on implementing robotic process automation (RPA) and artificial intelligence (AI). Human Technology, 18(2), 92–97.

[22] Damian Kedziora, Arja Leivonen, Wojciech Piotrowicz, Anssi Öörni. 2021. Robotic process automation (RPA) implementation drivers: Evidence of selected Nordic companies. Issues in Information Systems, 22(2), 21-40.

[23] Faezeh Khorram, Jean-Marie Mottu and Gerson Sunyé. 2020. Challenges & Opportunities in Low-Code Testing. In Proceedings of the 23rd ACM/IEEE International Conference on Model Driven Engineering Languages and Systems: Companion Proceedings.

[24] Eriks Klotins, Einav Peretz-Andersson. 2022. The Unified Perspective of Digital Transformation and Continuous Software Engineering." In Proceedings - 5th International Workshop on Software-Intensive Business: Towards Sustainable Software Business, IWSiB 2022, 75-82–82.

[25] Knut H. Rolland, Lars Mathiassen, Arun Rai. 2018. Managing Digital Platforms in User Organizations: The Interactions Between Digital Options and Digital Debt. Information Systems Research, 29(2), 419– 443.

[26] Marko Komssi, Marjo Kauppinen, Matti Ropponen and Pirkka Palomäki. 2011. Transformations of a solution strategy: A case study. In B. Regnell, I. van de Weerd, & O. De Troyer (Eds.), Software Business. ICSOB 2011. Lecture Notes in Business Information Processing, 80. Springer, Berlin, Heidelberg.

[27] Sachin Kumar. 2019. An extensive review on sensing as a service paradigm in IoT: Architecture, research challenges, lessons learned and future directions. International Journal of Applied Engineering Research, 14(6), 1220-1243.

[28] Euripidis Loukis, Marijn Janssen, Ianislav Mintchev. 2019. "Determinants of Software-as-a-Service Benefits and Impact on Firm Performance." Decision Support Systems 117 (February): 38–47.

[29] Wouter Leenen, Kevin Vlaanderen, Inge van de Weerd, and Sjaak Brinkkemper. 2012. Transforming to Product Software: The Evolution of Software Product Management Processes during the Stages of Productization. Vol. 114. Lecture Notes in Business Information Processing. 114. Berlin, Heidelberg: Springer Berlin Heidelberg.

[30] Sebastian Lins, Konstantin D. Pandl, Heiner Teigeler, Scott Thiebes, Calvin Bayer, and Ali Sunyaev. 2021. Artificial Intelligence as a Service: Classification and Research Directions. Business & information systems engineering, 63(4): 441–456.

[31] Konstantinos Manikas. 2017. Evolving Software Products, the Design of a Water-Related Modeling Software Ecosystem. Vol. 304. Lecture Notes in Business Information Processing. 304. Cham: Springer International Publishing.

[32] Tomas Mäkilä, Mikko Rönkkö, Antero Järvi, and Jussi Nissilä. 2010. How to Define Software-as-a-Service – An Empirical Study of Finnish SaaS Providers, In Proceedings of the First International Conference on Software Business (ICSOB 2010) pp. 115-124. Springer, Berlin, Heidelberg.

[33] Jürgen Münch, Dominic Lang, and Stefan Trieflinger. 2019. The Product Roadmap Maturity Model DEEP: Validation of a Method for Assessing the Product Roadmap Capabilities of Organizations. In Proceedings of the 2nd ACM SIGSOFT International Workshop on Software-Intensive Business: Start-Ups, Platforms, and Ecosystems, Co-Located with ESEC/FSE 2019, IWSiB 2019, 19-24–24.

[34] Vaclav Rajlich. 2012. Software engineering: The current practice (1st ed.). Chapman and Hall/CRC, London.

[35] Corinna Rutschi, Jens Dibbern. 2020. Towards a Framework of Implementing Software Robots: Transforming Human-Executed Routines into Machines. ACM SIGMIS Database: the DATABASE for Advances in Information Systems, 51(1): 104–128.

[36] Rodrigo Santos, Pablo Antonino, Antonia Bertolino, Doo-Hwan Bae. 2023. Report on the 11th ACM/IEEE International Workshop on Software Engineering for Systems-of-Systems and Software Ecosystems - SESoS@ICSE 2023. ACM SIGSOFT Software Engineering Notes. 49:1. (34-37). Online publication date: 21-Dec-2023. https://doi.org/10.1145/3635439.3635447

[37] Maximilian Schreieck, Manuel Wiesche, Thomas Kude, Helmut Krcmar. 2019. Shifting to the Cloud-How SAP's Partners Cope with the Change. In Proceedings of the 52nd Hawaii International Conference on System Sciences (HICSS), pp. 6084-6093.

[38] Pertti Seppänen, Kari Liukkunen, and Markku Oivo. 2018. Opportunity Exploitation in Software Startups. A Human Capital View. Vol. 336. Lecture Notes in Business Information Processing. 336. Cham: Springer International Publishing

[39] Dominik Siemon and Damian Kedziora. 2023. From accountant to software developer – Transforming employees with robotic process automation (RPA). In Proceedings of the 56th Hawaii International Conference on System Sciences (HICSS) pp. 4244-4253.

[40] Marta Strumińska-Kutra, Izabela Koładkiewicz. 2017. Case Study. Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-65442-3_1.

[41] Rehan Syed, Suriadi Suriadi, Michael Adams, Wasana Bandara, Sander J.J. Leemans, Chun Ouyang, Arthur H.M. ter Hofstede, Inge van de Weerd, Moe Thandar Wynn, and Hajo A. Reijers. 2020. Robotic Process Automation: Contemporary Themes and Challenges. Computers in industry 115, doi: 10.1016/j.compind.2019.103162.

[42] Stefan Trieflinger, Jurgen.Munch, Lukas Weiss, Bastian Roling, and Dominic Lang. 2022. Transformation Towards a Product-Led Company: Case Studies from Industry. In Proceedings - 5th International Workshop on Software-Intensive Business: Towards Sustainable Software Business, IWSiB 2022, 9-16–16.

[43] UiPath. 2023. RPA at work in Finnish organization. Retrieved from https://www.uipath.com/blog Retrieved January 18, 2024

[44] Karl Werder, Benedikt Zobel, and Alexander Maedche. 2016. PDISC – Towards a method for software product DISCovery. In A. Maglyas & A.L. Lamprecht (Eds.), Software Business. ICSOB 2016. Vol. 240. Lecture Notes in Business Information Processing. 240. Cham: Springer International Publishing.

[45] Leslie Willcocks, Mary Lacity, and Andrew Craig. 2017. Robotic process automation: Strategic transformation lever for global business services? Journal of Information Technology Teaching Cases, 7(1), 17-28.
[46] Antti Ylä-Kujala, Damian Kedziora, Lasse Metso, Timo Kärri, Ari Happonen, and Wojciech Piotrowicz. 2023. Robotic Process Automation Deployments: A Step-by-Step Method to Investment Appraisal. Business Process Management Journal 29 (8): 163–87.
[47] Xiao, Zhongdong, Wenjun Shu, and Abigail Osei Owusu. 2021. “An Analysis of Product Strategy in Cloud Transition Considering SaaS Customization.” Information Systems and E-Business Management 19 (1): 281–311.