Exploring Client and Vendor Perspective on Software-as-a-Service Adoption Decision

Paweł Lustofin
Krakow University of Economics
Krakow, Poland *plustofin@gmail.com*

Michał Kuciapski
University of Gdansk
Gdansk, Poland *m.kuciapski@ug.edu.pl*

Piotr Soja
Krakow University of Economics
Krakow, Poland *esoja@cyf-kr.edu.pl*

Abstract

The current paper investigates the role of a stakeholder group in the SaaS adoption decision. In the research approach adopted, two stakeholder groups have been examined: SaaS providers and SaaS adopters. Drawing from the opinions of 134 providers and 137 adopters and employing a multifaceted model explaining antecedents of the propensity to adopt SaaS, the current study examines the moderating role of a stakeholder group for the relationships between constructs. The adopted research approach is Partial Least Squares Multigroup Analysis (PLS-MGA). The preliminary results obtained in the PLS-MGA analysis demonstrate that SaaS providers and adopters differ significantly in their decision on SaaS adoption with respect to IT-business alignment and productivity. In particular, adopters appear to underestimate the role of productivity, while providers tend to underestimate the role of IT-business alignment.

Keywords: Technology adoption, Software-as-a-Service, Cloud Computing, Stakeholder group.

1. Introduction

The Software-as-a-Service (SaaS) model is one of the fastest growing IT delivery models, with the global market valued at 174.5 billion USD in 2022 [8], as compared to 103 billion USD in 2020, achieving 70% increase in just 2 years [7]. Further, global expenditures on SaaS are expected to grow to 244 billion USD in 2024, illustrating continued fast-paced growth in the adoption of this IT delivery model. These statistics point towards the growing importance of SaaS in the digitalization initiatives. In particular, key benefits and characteristics of SaaS solutions enable organizations to overcome some of the challenges to the effective realization of digital transformation initiatives. As SaaS refers to applications running on a cloud infrastructure and delivered as services over the Internet in a convenient, on-demand fashion, operational responsibilities lie on the IT vendor side which leaves CIOs more time for business-oriented activities [1]. In addition, SaaS comes with a subscription or usage-based payment model, which results in the reduction of up-front capital expenditures, thereby, allowing better use of limited IT budgets to provide a balanced portfolio of IT solutions.

Prior research provides many valuable insights into the driving forces behind the growth in the adoption of the SaaS model [23] and, yet, important questions remain rather unanswered. In particular, from the early days of cloud computing researchers emphasized the importance to understand the perspectives of both vendors and consumers of the cloud computing technology [24] to enable it to reach its potential. Extant studies stress the

importance of SaaS and cloud computing benefits which include cost savings [25], scalability [11], easy maintenance, rapid deployment, automatic access to the latest software [21] and increase in productivity [17], [34] as key factors behind the adoption of this sourcing model.

Prior studies on the factors influencing SaaS adoption decision incorporated the perspectives of both SaaS vendors and SaaS clients [21], [24]. However, to the best of our knowledge, quantitative studies exploring the perceptions of SaaS adoption decision determinants from both vendor and client perspectives appear lacking. To overcome this gap, we propose the SaaS adoption model, validate it using PLS-SEM technique, and conduct a multi-group analysis (MGA) to compare the perspective of both SaaS vendors and clients. In sum, our research has been guided by the following research question:

- How does the stakeholder group moderate the software-as-a-service adoption decision?

The paper is organized as follows. In the next section we present research background, next we describe our research method, which is followed by the presentation of results. We then discuss our findings and close the study with concluding remarks.

2. Research Background

The focus of stakeholder approach is integrating the relationships and interests of various stakeholders, including suppliers, in order to achieve long-term success of the firm. The growing interconnectedness which results in blurring boundaries between firms and other stakeholders increases the value of stakeholder approach [6]. This appears particularly relevant in the context of the SaaS model, where application services are provided by third parties. Further, it is not uncommon that the underlying infrastructure is provided by yet another provider increasing the complexity of relationships between clients and vendors.

The growing adoption of SaaS has already influenced the dynamics of interplay between various stakeholders, vendors and clients, in particular. A good case in point is multi-tenancy of SaaS solutions delivered from public clouds, which helps in achieving economies of scale for vendors, but also reduces customization options of IT solutions. Over time, however, SaaS providers have come up with viable solutions that provide clients with capabilities to customize applications according to their needs and goals [29]. This illustrates how important it is to understand the perspectives of both clients and vendors.

IT-business alignment plays a central role in IT governance. In this respect, De Haes and Van Grembergen [12] illustrated a clear relationship between the use of IT governance practices and IT alignment, while other studies highlighted the mediating effect of IT business alignment on effectiveness of IT investments [9]. Benefits of SaaS, such as system reliability, cost-performance levels, efficiency, interconnectivity, and flexibility have long been associated with higher levels of IT business alignment [30]. On the provider's side, SaaS applications are typically designed and programmed in either Service-Oriented Architecture or Microservices architecture [5], which reduces the application's complexity thereby contributing to a greater flexibility in developing new features, and extending the functional scope of applications. From the client's perspective, applications in the SaaS model are delivered as a service, which can be adjusted to client's needs both in terms of the number of users and IS functional scope [11], [21], [27]. This optionality is a key differentiating factor between on-premise and SaaS applications, and one of the top benefits of the SaaS model [e.g. 34].

In addition to increase in flexibility, a multi-tenant architecture of SaaS applications ensures the highest-levels of resource pooling and contributes to a significant cost advantage over the on-premise model [19]. In particular, SaaS providers support fewer versions of software, which translates into lower maintenance effort. Further, SaaS applications are shared among thousands of clients which leads to higher economies of scale. However, the cost advantage of SaaS does not guarantee lower prices for clients. In fact, literature provides mixed results in this respect [25], [17], [22].

Technology advantage of the SaaS model over the on-premise one has also been mentioned as one of key factors influencing propensity to adopt this sourcing model. In particular, SaaS is associated with easy and fast deployments [21], access to the latest software, and easy

maintenance [34]. Further, SaaS offers easier access to current technology [10]. Finally, extant literature provides evidence that adopting SaaS solution might have a positive influence on firm's productivity by introducing processes which are easier to work and increasing the coordination of activities within organization [17].

According to institutional theory, organizational change is driven by processes that make organizations more similar without necessarily making them more efficient [4]. Specifically, the influence of various stakeholders can take form of external pressures, comprising coercive (e.g. pricing strategies) and mimetic pressures (e.g. mimicking of actions undertaken by competitors), or normative pressures, which in our model are represented by the influence of professionals. A study by Saya et al. [27] highlights the influence of institutions on potential cloud computing adopters.

To sum up, we argue that the emergence of SaaS as one of key IS sourcing models introduces a higher level of complexity with respect to the relationships between key stakeholders, and, in particular, vendors and clients. In essence, high adoption level of SaaS model underpins the growing importance of business units as key stakeholders in IS sourcing decisions. Finally, as explained earlier, SaaS provides organizations with many tangible benefits, which may increase the IT-business alignment, thereby leading to higher productivity [23].

3. Research Method

As explained earlier, perceptions of factors that play an important role in the decision to adopt the SaaS delivery model in an organization may differ between clients and vendors. Thus, the significance and importance of determinants influencing SaaS adoption decision should also depend on the involved stakeholder group. Therefore, in our model, we propose a stakeholder group as a moderator for all connections between variables, allowing us to better explain the Software-as-a-Service adoption decision (Figure 1).

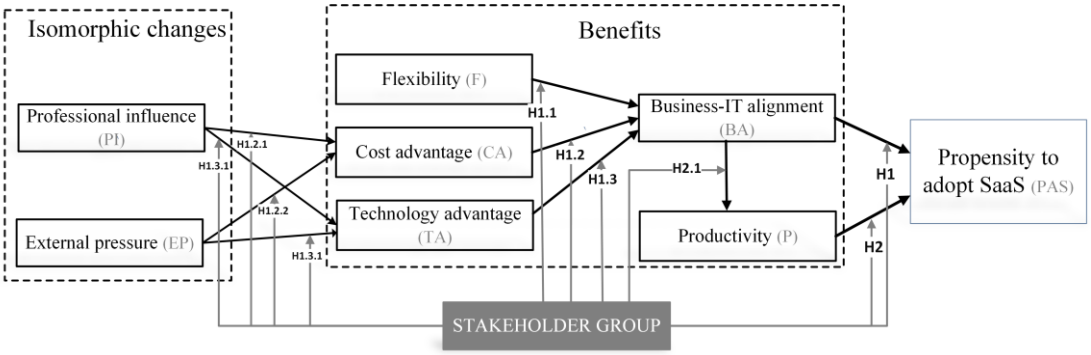

Fig. 1. Research model.

Stakeholders' groups generally refer to a collection of individuals, organizations, or entities that have an interest or concern in a particular project, initiative, organization, or decision [18]. In the research model proposed in Figure 1, the moderator we introduce can assume different values depending on the perspective of the key stakeholders in SaaS adoption - the client or the vendor. The existence of a stakeholder group moderating effect on dependency relationships between variables in the model (Figure 1) was verified through ten hypotheses capturing relationships between the constructs. For instance, the hypothesis H1 has been defined by the following description: "The influence of the perceived business-IT alignment of the Software-as-a-Service delivery model on the decision to adopt the SaaS is moderated by the stakeholder group".

To verify the defined hypotheses, a quantitative research approach was applied with data collection based on the survey as the research instrument. The gathering of responses was conducted with the help of a computer-assisted web interview (CAWI). The survey consisted of two sections: (1) a set of respondent classification questions and (2) 31 statement assertions formulated in accordance with referenced studies considering the SaaS perspective – 3-5 statements for each connection. Each question was measured using a 7-point Likert scale.

Similar to Wang et al. [32], this study adopted a non-random sampling technique (i.e. convenience sampling) to start collecting the sample data. A snowball sampling technique was additionally used to increase the number of responses and the diversity of sample. Business-oriented social media have also been utilized to receive responses from SaaS professionals representing different characteristics.

The proposed multidimensional model was verified using the Partial-Least-Squares Structural Equations Modelling (PLS-SEM) approach, a second-generation technique [13]. PLS-SEM is also appropriate for suggesting cause-effect relationships [26]. A three-step process was conducted [15], encompassing the assessment of the:

- outer model – evaluation of indicator reliability (loadings), internal consistency reliability (composite reliability, CR), convergent (Average variance extracted, AVE) and discriminant (Heterotrait - monotrait ratio, HTMT) validity [14];
- inner (structural) model – including criteria such as the coefficient of determination (R2), the blindfolding-based cross-validated redundancy measure (Q2), and the statistical significance and relevance of the path coefficients [15];
- multigroup analysis – Partial Least Squares Multigroup Analysis (PLS-MGA) allowed us to assess the equivalence of structural relationships between variables across stakeholder groups. It was achieved via a significance test for the difference of group-specific results that build on PLS-SEM bootstrapping results [3].

4. Research Results

The data gathering process lasted for an extended period and has been concluded in February 2024. As a result of the survey, 271 responses have been received: 134 from vendors and 137 from clients. The respondents varied with respect to several attributes: utilized service delivery methods (on-premise, SaaS, and hybrid), current use of SaaS (yes or no), job experience (from a couple of months up to 40 years), SaaS use experience (from beginners to seasoned practitioners), as well as the type of job position (specialists, management, and top management). Moreover, the survey participants represented a great spectrum of departments (19 have been distinguished), sectors (29 have been indicated), and company size (from below 9 employees to over 1000). Overall, we believe that obtaining responses from respondents representing such a wide spectrum of characteristics helped us in achieving the good representativeness of the research sample and enabled the questionnaire results to be generalized to a reasonable extent.

The outer model validation results proved the proposed model to be valid, as indicators satisfied the required threshold values: loadings (> 0.70), composite reliability (> 0.70 and < 0.90), average variance extracted (> 0.5) and heterotrait-monotrait ratio (< 0.9). Variance Inflation Factor (VIF) values for each indicator were below the conservative threshold of 3, which indicated a lack of collinearity issues. The positive result of the outer model validation enabled us to conduct Partial Least Squares Multigroup Analysis (PLS-MGA), and thus to verify the ten hypotheses. Figure 2 presents the synthesis of PLS-MGA results.

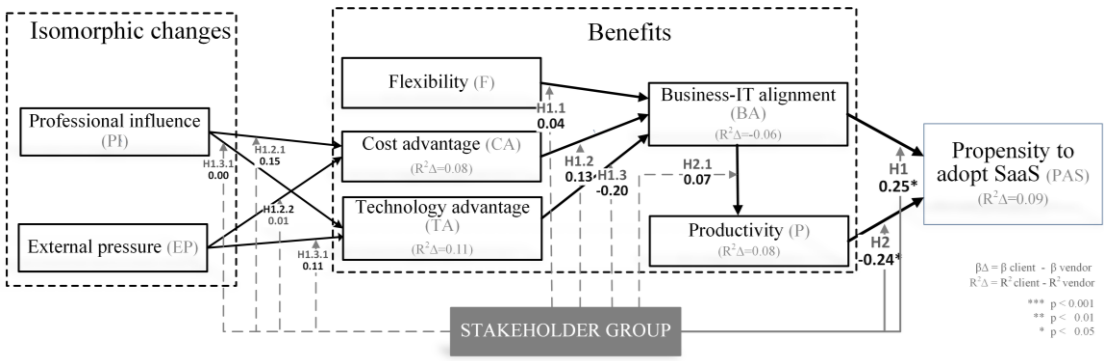

Fig. 2. Research model validation.

The solid lines originating from the stakeholder group represent supported hypotheses, while dashed ones indicate those not confirmed. As displayed in Figure 2, two out of ten

connections have been moderated by a stakeholder group ($p < 0.05$). Specifically, the perceived impact of Business-IT alignment (H1) and Productivity (H2) on the propensity to adopt SaaS solutions in an organization depends on the stakeholder perspective, i.e. whether the decision is made by the client or vendor. Delta values have been calculated for β-coefficient and the coefficient of determination (R^2) to compare the strength of relations between variables, as well as levels of explanations for variables, depending on stakeholder group (Figure 2).

5. Discussion and Implications

Based on our results we can conclude that only two out of ten connections between variables are moderated by the stakeholder group. These relations capture the influence of Business-IT alignment (BA) and Productivity (P) on Propensity to adopt SaaS (PAS), hence hypotheses H1 and H2 were supported as the p-value was below the reference value of 0.05.

For both relations, BA→PAS and P→PAS, the stakeholder group moderation strength was very similar, with the β-coefficient difference close to an absolute value of 0.25. Therefore, in both cases, the stakeholder group yields a moderate effect on SaaS adoption decisions by clients and vendors based on Productivity and Business-IT alignment factors. Interestingly, the coefficients of determination (R^2) for the dependent variable (PAS) and independent variables (BA, P, T, and CA) are highly convergent. The biggest difference in the level of variable explanation exists for Technology advantage (TA), whereas divergence is low: just 0.11. Importantly, all variables except BA (R^2 difference value is -0.06) are better explained for the clients' group.

To sum up, the confirmation of the moderation effect by the stakeholder group, at a moderate level of strength, for two relationships in the model allows us to answer affirmatively the formulated research question and state that the stakeholder group moderates the SaaS adoption decision. This corroborates the results of a study by Hoque et al. [16] pointing out that stakeholder approach allows to better explain the performance of sustainable technology adoption. Also, it is in line with the findings of Wang et al. [33] suggesting that multiple stakeholder perspective influences blockchain adoption in sustainable supply chains for Industry 5.0. Nevertheless, even though the stakeholder group was recognized as a significant SaaS adoption moderator, it has generally a low or at the most moderate impact on the decision to adopt SaaS solutions. Such a conclusion is supported by two key findings: eight out of ten hypotheses were not confirmed and R^2 levels were very similar for both clients and vendors. On the other hand, the stakeholder group could be recognized as a moderator with a medium level of importance as both moderated relationships (BA→PAS and P→PAS) are the ones directly influencing the dependent variable (PAS), as presented in Figure 2.

Although for both confirmed relations the stakeholder group moderation strength was very similar, the β-coefficient differences occurred to have an opposite sign, with values of 0.25 and -0.24 for BA→PAS and P→PAS respectively. This allows us to formulate two important observations. First, our study shows that, in comparison with clients, vendors perceive a greater increase in productivity resulting from the use of SaaS solutions compared to the on-premise options. This suggests that vendors may overestimate the actual impact of their SaaS solutions on firm's productivity in relation to clients' experience. Second, clients seem much more confident compared to suppliers about the possibility of using SaaS solutions in a wide range of business contexts. This might be due to the clients' lack of experience, in contrast to suppliers who are usually involved in implementing SaaS in various business conditions and observing a great number of adoption problems. Such a result supports the findings of a study by Shuraida and Titah [28] suggesting that cloud computing adopters' decisions account for perceived benefits while disregarding risks [17].

The current study results allow us to formulate several practical and theoretical implications. From a theoretical perspective, the study findings point out that there is a need for the integration of a multiple stakeholder approach in technology adoption models, not only regarding SaaS. This should support better explanations and understanding of decision-making processes regarding technology adoption. In this respect, our study results allow us to validate, to a certain extent, the widely utilized Unified Theory of Acceptance and Use of Technology

(UTAUT) model [31], as well as suggest the extension of its moderators. The significance of the influence of Performance Expectancy (PE) on Behavioral Intention to Use Technology (BI) in the UTAUT model is strengthened by study results, as our variable Productivity (P), having a similar meaning to UTAUT's PE, impacts the dependent variable in the proposed model (Figure 2). UTAUT's PE has several moderators, such as: Gender, Age, Experience and Voluntariness of Use. In the light of our study's results, the stakeholder group, a moderator in our model, might be considered as another moderator in the UTAUT-based models.

Regarding practical implications, the current study results highlight that SaaS developers should not consider SaaS adoption factors in isolation when introducing new products. Instead, they should consider them alongside key determinants, that is business alignment and productivity, taking into account the stakeholder group perspective. From the practitioners' standpoint, to win over clients, SaaS solutions' developers should place a greater emphasis on how their solutions can boost productivity. This can be achieved by showcasing specific use cases or conducting proof-of-concept projects that highlight the practical benefits of using SaaS applications. SaaS clients, on the other hand, should focus on proper change management to maximize benefits stemming from the use of SaaS applications. To increase productivity of employees and business process efficiency, adopters can define target business scenarios, in which new applications are used. Also, setting clear goals related to the improvement of key performance indicators before the adoption of SaaS applications could be helpful. Further, SaaS developers should ensure the alignment of their solutions to various business contexts and specifics by designing reference models supporting clients from various industries.

Our findings indicate three directions for further research. The first direction is the exploration of new variables that might influence the propensity to adopt SaaS and being moderated by the stakeholder group. The second one is a further study of the influence of Technology advantage (TA) on Business-IT alignment (BA) as the β-coefficient difference is appreciable (-0.20) and p-value (0.08) is close to the reference value. In this respect, some studies [e.g. 2] argue that p-values below 0.1 should also be accepted as significant. Finally, future studies should focus on increasing the pool of respondents due to the regional character of the current research sample and thus limited generalizability of findings.

6. Conclusions

Building on the stakeholder approach, our study makes an important contribution both to theory and practice by proposing and verifying SaaS adoption determinants from the client and vendor perspective. The research results illustrate important differences in perceptions of clients and vendors, yielding important implications for practitioners. On the one hand, providers underestimate the role of higher IT-business alignment, determined by SaaS cost advantage, flexibility, and technology advantage in shaping clients' intention to pursue the SaaS model. Specifically, our findings show that from the clients' perspective, the adoption of the SaaS model leads to a more efficient use of limited IT budgets. This enables clients to equip business units with applications that support a broad range of business processes. On the other hand, customers may underestimate potential productivity gains from using SaaS applications. Therefore, they should increase their focus on the most effective use of SaaS applications and ensure proper change management mechanisms to foster adoption and use of new technologies.

The study main limitation is its focus on SaaS benefits and institutional changes, while other studies suggest that perceptions of, for example, SaaS-related risks and trust, also play the role in the adoption of this IT sourcing model [20]. Still, by taking a more concentrated approach and focusing primarily on SaaS benefits, their antecedents, and potential effects of SaaS adoption, our findings unveil significant differences in the perceptions of vendors and clients, illustrating important implications for practitioners and theory. The study limitations point out another direction for further research which should also include an exploration and verification of other potential factors influencing the propensity to adopt the SaaS model. Future research could benefit from accounting for the potential influence of SaaS-related risks alongside SaaS benefits to obtain a more comprehensive view.

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