Comparison of Traditional Perpetual Licensing and SaaS Licensing ICT Models: A Case Study

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This article is based on a case study conducted in a large chemical company, focusing on their five non-integrated business-critical IT-systems. These systems are transitioning from perpetual licensing and in-house hosting models to a SaaS model. The case study examines both the financial impact and the impact on the IT-organization. Financial impacts were studied over a five-years period, comparing both perpetual in-house hosting and SaaS services, including the implementation of both delivery types. Additionally, the study investigates the impact on the IT organization, considering the new roles and skill sets needed for procurement and continuous IT services.

Keywords: license agreement, perpetual licensing, SaaS, IT organization, procurement, cost-comparison, roles, skills

INTRODUCTION

Currently increasing number of organizations are moving to a subscription-based model to source their IT systems. The increasingly faster and dependable internet connections are facilitating widespread use of systems and software from locations other than the imminent local area network of any given company. This move has continued for some time and the first step was the centralization of computing capacity to an IT hosting provider. They were traditionally located in the same geographical area as the client organization and connecting with the customer via dedicated Multi-Protocol Label Switching (MPLS) technology. Today, with faster and more reliable internet connections the computing capacity is concentrated on large scale cloud computing centers. From them, the system providers can deliver IT systems to the client as a software as a service, SaaS, utilizing the elasticity of the cloud computing. The change in IT systems delivery type has been from perpetual tailor made or customized licenses to systems that are delivered as services requiring very little customer configuration and in the most extreme cases, on multitenant SaaS platforms, with no customer specific configuration required.

In a short time, SaaS offerings have replaced the traditional perpetual IT system licensing model and currently, for some IT system providers, the SaaS licensing is the only type of software model offered to the clients. The primary objective of this case study is to examine the evolution of the IT software delivery model over the recent years, with a focus on its financial and IT-organizational perspective.

This change inevitably influences client organizations both financially and organizationally. The literature points out some key changes and to verify those this article contains a case study with real world data from the client organization. This case study reflects on financial data and organizational impact of transitioning from perpetually licensed in-house supported IT systems to SaaS offerings.

This case study focuses on studying the financial and organizational change because of implementing SaaS. All other aspects of SaaS services are excluded from this study. Interesting topics around SaaS for further study would be information security, continuity or accessibility and availability but they are out of scope for this article and any one of those further areas could be an article in themselves.

In this article the primary research question considers the financial superiority of SaaS licensing model, as suggested by numerous literature sources, over the perpetual licensing model. A perpetual license is treated as an investment, not as an expense, and recorded on the balance sheet as an asset depreciated over five years. SaaS, on the other hand, is considered an operating expense, in an income statement, rather than a capital expense. For comparison, SaaS contracts considered here are for the identical period of five years. Secondary research question is the impact on the client company's IT organization while transitioning from perpetual in-house supported IT systems to SaaS services.

Three hypotheses are tested in the case study with real-world data:

1. IT systems as a service, SaaS, are elastic in computing capacity and user changes. Both capacity and number of users can be easily adjusted to reflect the changing business needs.
2. IT systems as a service, SaaS, can be implemented easily and without large implementation projects in the end user organization.
3. As a result of the elasticity and ability to optimize the number of users, SaaS service can be a cost-efficient way for a company to run its business applications.

These three hypotheses, extracted from the literature representing the defining attributes of SaaS services which are typically perceived as easy to use, affordable and capable of being discarded when not needed. This case study aims to prove these attributes.

THEORETICAL BACKGROUND

Definition of SaaS Services

Technological advancement and world economic situation are both driving forces behind the change in IT systems usage and procurement. The traditional IT systems procurement as perpetual licenses together with annual maintenance fee has already, in some cases, changed to subscription based licensing model that includes the actual usage license and updates, patches and new versions of the software (Thorsen, 2014). With the necessary infrastructure in place to host applications, the era of SaaS services has transitioned into the mainstream, extending beyond commodity applications such as email or office applications to encompass business applications as well. Organizations are increasingly moving towards SaaS services replacing the procurement of perpetual licensing, hosting and supporting of in-house applications. SaaS is a complete application delivered as a service to the customer (Kavis 2014, p. 17). In this article, the SaaS licensing model and SaaS service is considered synonyms as complete application as a service always includes the licensing of the application. SaaS services typically offer service consumers a limited set of application-specific parameters for configuration. (Kavis, 2014, pp. 17-18). The minimum configuration needed makes deployment of a SaaS application easy and fast compared to the traditional implementation project of an IT system.

Technical advancements in the internet era have enabled some providers such as Amazon, Apple, Google and Microsoft to start offering services which contain the complete set of cloud-based resources and services required to support the deployment and operation of applications in a cloud environment. This is referred to as cloud computing. Cloud computing includes both the applications delivered as services

over the internet and the hardware as well as systems software in the datacenters that provide those services (Armbrust, et al., 2009, p. 4). Cloud computing can be further divided into two models: public cloud and private cloud. SaaS services can be run on either of the two models. Cloud computing, regardless of deployment model, is attractive for financial reasons (Marinescu, 2013, p. 99). Additionally, technological advancements have led to the expectation of accessing applications and services, not only from company networks and desktop computers, but also from mobile devices, anytime and anywhere. Those services will be moved to the cloud, not only because they must be readily available, but also because they often rely on large data sets that are most conveniently hosted in large datacenters rather than private single end user company datacenter. (Armbrust, et al., 2009, p. 7)

Public cloud is defined as a cloud infrastructure or service provisioned for open use for the public, without needing explicit permission or approval for each usage, as multitenant or multi-customer environment. In public cloud, the end user pays for usage of the resources in the same shared grid alongside other customers. In a traditional setup, you know exactly where each server running software is located, and you manage them individually. However, with cloud computing, you do not need to know the physical location of the servers. You only need to know where your data is stored in the data center, but you do not have to worry about the specific servers running the software. Two of the most desirable advantages of public clouds are pricing and elasticity. The user only pays for the actual capacity used and the end user has seemingly endless pool of resources at their disposal. (Kavis, 2014, pp. 18-19.) Elasticity and usage pricing creates a pay-as-you-go model where the pricing reflects the current consumption of resources and can be scaled up and down, in some cases in very short intervals as the consumption changes.

Private cloud is the opposite of public cloud and is provisioned solely for the use of a single client such as an organization. Private cloud addresses the disadvantages of the public cloud such as control, potential regulatory issues and limited customization. Private cloud has its own disadvantages. With private cloud implementation, the end user sacrifices some of the core advantages of cloud computing, namely elasticity, resource pooling and pay-as-you-go pricing. Private cloud allows users to scale up and down over a shared pool of resources, but those resources are limited to the amount of procured infrastructure, as opposed to utilizing a seemingly endless grid of computer resources that are readily available. This increases costs and reduces agility as the capacity must be procured in advance to be available. (Kavis, 2014, pp. 19-20.) When sacrificing the elasticity of computing resources and pay-as-you-go pricing, the private cloud becomes almost like an on-premises hosting of IT infrastructure or having a traditional third-party hosting service. The exception being that it is not accessible to users or systems outside of the company's boundaries.

Based on the above definitions, the use of private cloud and defining the delivery model as SaaS should be approached with caution. Only services delivered from public cloud services can truly conform to the pay-as-you-go pricing model and require minimal effort for deployment within the end user organization.

Many organizations have discovered the benefits, financial and organizational, that can be realized using SaaS applications providing the opportunity for third-party organizations to manage all the resources required to run complex applications (Hurwitz, 2012, p. 83). As an experience of using SaaS applications grows, many organizations begin to see a pattern of characteristics among the more successful SaaS solutions. (Hurwitz, 2012, p. 84) According to Hurwitz, these characteristics include:

1. Customizable applications that combine shared services to suit different organizational needs.
2. True multi-tenancy, where all users share the same software codebase.
3. Highly flexible and scalable SaaS applications, capable of adapting to changing business needs, including user numbers and capacity requirements.
4. Regular upgrades and fast releases of new features and capabilities

Implementation of IT Systems

IT system implementation should always mean also implementing a change to the business process, not merely the technical system implementation. Both, the system implementation itself and the change, are essential components of the information systems strategic planning activity (Belkhamza, 2015, p. 11). Information systems implementation projects, like any projects, come with uncertainties. However, these projects pose additional challenges regarding duration. This is because they involve specialists with diverse

skill sets collaborating and more significantly, they require creating something tangible, which is difficult to estimate accurately. (Olson, 2014, pp. 4-5). Projects also vary in terms of uncertainty, especially when it comes to predicting the time and effort required for tasks that are being done for the first time. (Olson, 2014, p. 5). For SaaS services, the implementation activities are typically repeated in a similar or nearly identical manner across different customers, with only minor configurations permitted.

To understand the IT system implementation and its importance, the traditional procurement model must also be looked at. In this context, rather than providing SaaS solutions that can be used with minimal or no implementation effort, the traditional model is significantly more complex. The client organization procures the licenses to use the software, deploys the technical environments in which the system runs and finally installs and configures or customizes the software to reflect the business processes of the organization. In addition to the technical systems part, implementation also includes other aspects of organizational reality, such as strategic and managerial aspects (Belkhamza, 2015, p. 11).

IT system implementation projects are usually long-term, expensive and resource consuming. IT systems implementation projects, while utilizing a standard methodology are never exactly alike. Typically, the standard methodology involves identifying user requirements, designing the system, producing the system through coding from scratch or utilizing commercial off-the-shelf systems as a basis for development, testing the system to ensure it meets requirements, and finally implementing the system along with the necessary technical environments and providing user training. (Olson, 2014, p. 4.) All the phases need, in addition of business process experts, IT specialists from various fields such as systems analysts, programmers or software developers, infrastructure specialists and testers. All these experts are in short supply to recruit and expensive resources for organizations to keep. The challenge with the resourcing is that once the implementation project is completed, there is uncertainty of what competences and resource allocations are needed for maintaining the system. The organization may not have similar other projects where that expertise gained can be utilized.

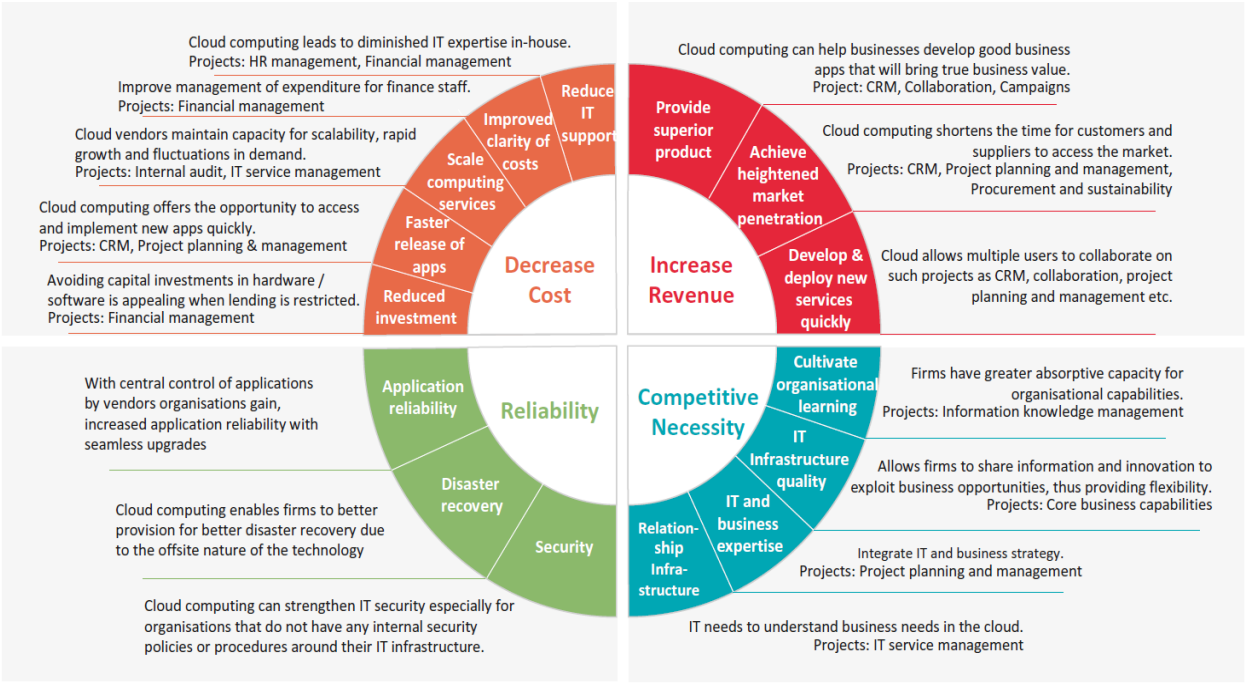
In perpetual procurement model, where IT systems are implemented to the client organization, the implementation project is usually a first time for that organization to engage in such a project with the selected product and thus very difficult to predict how much time and other resources are needed. Thus, projects take longer than expected as well as require more resources than estimated. (Olson, 2014, p. 5.)

Implementations, when using SaaS solutions can be very fast, which is one of the advantages of SaaS service but only if the SaaS service is suitable to use without customization (Järvi, Karttunen, Mäkilä, & Ipatti, 2011, p. 102).

Motivations to Move to SaaS Services

As mentioned, the enhancement of online connectivity allows the utilization of IT systems beyond a company's proprietary ones. But what motivates companies to transition to SaaS services? The motivation of moving towards SaaS instead of traditional licensing model can be drawn from Figure 1. showing the four potential areas of strategic alignment of cloud computing and the potential benefits in those categories. Organizations should assess and identify the ones that may apply in their specific context (Lynn, Morrison, & Kenny, 2018, p. 4).

FIGURE 1
IC4 CLOUD COMPUTING STRATEGIC ALIGNMENT MODEL



(Lynn, Morrison, & Kenny, 2018)

Particularly interesting strategic considerations for this are in the cost decrease quadrant of the Figure 1. where scalability, improved clarity of costs and reduced IT support are highlighted.

To understand the motivation to transition from perpetual licensing to SaaS, we must first understand the drawbacks of the perpetual model as well as the benefits of the new SaaS model and finally draw conclusions whether the new SaaS model has same drawbacks as the old perpetual model (Saito, 2022).

The primary issue with the perpetual licensing model is the likelihood and even certainty, of implementing the system and then persisting with it for a very long time without making any changes. The problem is two folded. Firstly, technically it is problematic when the older versions are no longer supported and will not be updated with security patches making the systems of the organization vulnerable to cybersecurity threats. Secondly, the licensing model itself poses a problem to organizations that need licenses in large quantities, which means managing and distributing a large number of licenses and ensuring that all purchased licenses are in use and no money is wasted in paying for unused licenses (Saito, 2022). An advantage of subscription based licensing is the matching of licenses to the actual users as the licensing needs fluctuate (Thorsen, 2014).

The problem of selling perpetual licenses to licensor is self-evident, even though it seems like a perfect business to develop a software and then sell it repeatedly with little or no extra costs. The perpetual model means that the licensee owns the right to use the software indefinitely. That makes the earnings of the licensor unstable and unpredictable as revenue only comes when a new client is purchasing the software. (Saito, 2022).

The benefits of the new SaaS model, on the other hand, are largely addressing the above-mentioned problems. For the licensee, the biggest benefit of SaaS delivered IT system, is the use of the latest version with the latest features as the system automatically updates in the background. Also, the agility of subscribing for the time when the software is needed instead of committing to predetermined rigid number of licenses and as a result either having too few with the constant need of purchasing extra licenses or alternatively having too many licenses that are spare and still paying for them. Additionally, there is the

perspective of the IT organization, where license management and software installations are handled. In the case of SaaS, this simply means users have the credentials to access the software and can do so in a self-service manner. For the licensor, the benefits equally counteract the drawbacks of the perpetual model. The primary advantage lies in revenue, which is higher due to the recurring nature of subscription fees. Furthermore, this revenue is consistent and more predictable. For example, Adobe quadrupled their revenue when moving from Creative suite, perpetually licensed software to Creative cloud, SaaS delivered software stated Adobe's GFO Mark Garrett in 2015 (Saito, 2022).

For the licensee, financing is an equally important driver in changing the procurement model of the systems used. As SaaS subscriptions are categorized as operating expenses rather than capital expenses, companies can enhance the allocation of costs to products, services, or expense periods. Also, the licensee no longer has the large upfront cost of acquiring the software as the cost is cost is part of the subscription fee (Thorsen, 2014).

Based on the above, one might think that there are only positive implications with SaaS model but there are some issues that must be addressed on both sides, licensor, and licensee, of the SaaS model. For software providers, despite the financial benefits, transitioning to SaaS offerings entails significant changes. They must fundamentally alter their development models and go-to-market approaches when offering the solution as a service, rather than as a package that the client is responsible for installing and configuring. For the licensee, the drawback of the model lies in cost consciousness, adding to the burden of IT organization to manage the cloud solution. Additionally, as the solution is elastic, continuous optimization is necessary; otherwise, the situation mirrors that of the perpetual model. Also, the use of SaaS services will bring complexity to the organization's IT architecture and open the organizations network to new types of cyberthreats (Saito, 2022).

While moving towards SaaS licensed services the purpose of each service and the effects to the organisation have to be considered. For example, considering the total cost of ownership, the annual license fees of SaaS licensed service may be more expensive than running the perpetually licensed service in-house. However, the savings may be realised with lesser need of hardware and software maintenance and support requirements and resourcing (Hurwitz, 2012, p. 271).

Another motivator for utilising SaaS services is the focus of the organisation. SaaS services allows it to concentrate on the companys core business values, drivers and business model without having a large IT department as an overhead (Nayan, 2016, s. 164).

Transitioning to SaaS Services: Changes in IT Systems Procurement

While transitioning to SaaS services, in addition to the change in service delivery model, there is also a considerable change in IT systems procurement. In traditional IT systems procurement sourcing, it was the personnel who were negotiating the initial licensing investment and then also negotiating the annual maintenance subscription. Industry norm for annual maintenance fees is approximately 20 % of the original licensing investment. The hosting, where applicable, was negotiated separately as part of larger IT hosting contract. In the traditional procurement model, it was important to understand the relation between the number of licenses and original investment and maintenance costs. Also, understanding the required number of licenses and ensuring compliant use of them, is a key factor when procuring perpetual licenses (Saito, 2022). System maintenance was typically performed by the IT employees and therefore service component was often missing altogether from any contract. Additionally, understanding the system lifecycle in terms of commitment duration is straightforward. It refers to the period during which maintenance is paid for the software, granting access to updates and bug fixes published by the software developer. The usage of the software is somewhat distinct from the commitment, as the system can be utilized without ongoing maintenance due to perpetual licenses. However, this leaves the issue of unsupported software and the absence of security patches unresolved, particularly if new features are not required and critical bugs are not discovered. (Saito, 2022).

In SaaS service procurement, the situation has changed dramatically since *many SaaS providers are presenting key contract terms as non-negotiable* (Anand & Liversidge, 2022). When negotiating SaaS contracts, several distinct terms compared to the traditional model need to be considered. These include

contract renewal price caps, service level agreements (SLAs) and remedies, data extraction, service description, data and security governance, post-termination assistance and identification and resolution of potential hidden fees as integral parts of the contract.

Price Cap for Renewals

Given that the service often leads to a lock-in scenario for clients, transitioning to another provider would necessitate a project and organizational change. Consequently, clients face substantial price increases upon contract renewal. In initial negotiations, where the service provider's certainty of client commitment is lower, it is advisable to promote a low-price renewal cap - ideally tied to the consumer price index or set at less than 5%, whichever is lower. Additionally, negotiating for no price increase during the first renewal can ensure longer-term pricing stability. (Anand & Liversidge, 2022.)

Service Level Agreements (SLAs) and Effective Remedies

A service level agreement (SLA) is a document that outlines the mutual expectations between a service user and provider concerning the uptime, availability and performance of the service. This contractual agreement defines the rules for potential remedies to the client should the SLA be breached (Hurwitz, 2012, p. 241).

Most common aspect of SLAs is the system availability, although in some cases even this may not be offered. However, SLAs should cover a broader range of attributes. Key service levels for a solid contract should include incident response and resolution times, disaster recovery objectives and security standards adhered to by the service provider. Also, it is vital to define how the availability downtime is measured: whether it is service providers infrastructure or end-to-end, where the client has access to the system. In addition to SLA metrics, contracts should also include adequate remedies, potentially up to 100% of the service fees. When negotiating penalties, it is important to align them with criticality and value of the service, ensuring that penalties for highly business-critical services are proportionately higher. An important aspect to negotiate in the contract is the termination clause if the service level falls below the target for a certain number of consecutive months. Additionally, it is crucial to include the right to terminate the agreement if the service level is unacceptably low at any point in the measurement period. (Anand & Liversidge, 2022.)

Client Data Extraction upon Expiry or Termination

Utilizing SaaS service accumulates business-critical data within the service providers environment. It is essential for the client to ensure the ability to extract this data in the event of SaaS service expiry or termination. Hence, it is imperative to include terms concerning the data extraction in the SaaS contract. This includes specifying the format in which data is available to the client, outlining any associated costs and defining the timeframe for completing the extraction. Equally important is that after extraction, the service provider deletes all client data as agreed upon and provides proof of deletion. (Anand & Liversidge, 2022.)

Service Descriptions often on Request only

It is often overlooked when purchasing a service that there should be a clear service description of what you are buying. Surprisingly, many service providers fail to include that in their contracts unless specifically requested. It is important to include descriptions of purchased capabilities rather than just product names in the order form. This ensures accountability from the provider for the capabilities performing as expected throughout the subscription term, especially since some service providers frequently change their product names. (Anand & Liversidge, 2022.)

Data and Security Governance

The standard contract terms of SaaS providers in regarding data governance or information security may differ considerably from what the client considers compliant. During contract negotiations, it is crucial for both parties to clarify the standards, if any, the provider is adhering to. Ideally, the contract should

include a termination clause allowing termination if the service provider fails to adhere to the agreed standard, such as ISO 27001. Another critical contract issue relates to data privacy, which has become increasingly important in recent years. Failure by the service provider to comply with data privacy regulations can cause significant problems for the client. (Anand & Liversidge, 2022.)

Post-Termination Assistance

By including specific terms for post-termination assistance in the contract, such as with data extraction, clients can protect themselves from being locked into another renewal period without leverage. Additionally, having a clear rate card for transitioning the service to alternative SaaS provider, particularly in cases of contract termination due to provider's breach, is crucial. In such instances, there should be a free-of-charge assistance in transitioning the service to another provider. (Anand & Liversidge, 2022.)

Hidden Fees

During contract negotiations, it is crucial to review the service descriptions to understand the offering fully. Additionally, it is important to be aware of any potential hidden fees, which refer to limitations or charges that the service provider may not include in the standard service. These limitations, such as storage, connectors, application programming interface (API) calls or custom objects, could result in additional charges beyond the committed service rates, including premium rates. Hidden fees should be identified during the sourcing process and negotiated alongside. This should include a comprehensive rate card for any additional time and material work that the provider may undertake beyond the service agreement. (Anand & Liversidge, 2022.)

Business Value of IT Systems

Strategic Alignment

Utilizing SaaS services and transitioning to SaaS licensing model is a strategic choice. As utilization of available services evolves, the company's resource requirements, both in terms of staffing needs and the necessary skills must align with personnel strategy of the IT function. Similarly, when utilizing cloud-based services, there are various impacts to consider, including service governance, financial, IT architectural and information security among others. Decision to utilize cloud delivered services must be made strategically (Smith, 2023).

A cloud strategy provides an insight on the role of cloud and SaaS services within your organization (Smith, 2023). The cloud strategy ensures that the motivations and business outcomes for utilizing cloud services, such as SaaS services, are aligned. Derived from business strategies, the cloud strategy aligns business priorities with operational cloud adoption. This ensures that moving to the cloud is not solely an IT effort but rather a strategic decision by the company to transform the operations of the IT function (Smith, 2023).

In this article, the financial and organizational impacts are studied, with a particular focus on personnel strategy. For any company transitioning from perpetual licensed and on-premises hosted IT system to SaaS services, it is essential to consider the IT needs and plan the workforce accordingly (Menken, 2009). The planning process may mean upskilling or re-skilling individuals for new roles with different skill sets, such as transitioning from a system administrator to a service manager. Furthermore, with the move towards SaaS services there may also be a need to provide training for completely new skills to business users (Menken, 2009).

THE CASE STUDY

This case study is conducted for a company with a long history of perpetually licensing COTS (commercial off the shelve) systems with minor customization as necessary. Systems have been utilized for several years with different vendor determined service, upgrade and renewal cycles. This case study examines the replacement of five IT non-integrated systems with SaaS solutions in a large chemical company over the last four years. The systems cater to various business processes and exhibit significant

differences. However, all five cases share the common denominator of transitioning from perpetual licensing and hosting the system through a third-party infrastructure vendor to a complete SaaS service. The purpose of this study is to investigate the financial impact of the transitioning from perpetual licensing to a SaaS-licensing model. Additionally, this study aims to assess the impact for IT resourcing and test three hypothesis derived from literature using real-world evidence. Finally, conclusions and recommendations will be made to refine the strategy and position towards SaaS procurement model from a financial perspective.

The costs associated with perpetual licensing model stem from several factors. Initially, there is the original investment required for the necessary amount and level of licenses, as well as the implementation project for the system and the infrastructure needed to run it. Subsequently, ongoing maintenance costs occur annually if the customer wishes to keep the system up to date, along with the need to organize the support activities related to the system. Additionally, system upgrades are typically required every third year, depending on the lifecycle of selected infrastructure and any changes or enhancements needed for the system, such as new functionalities introduced by the vendor in newer versions. IT system sourcing and implementations are considered investments, and thus, the large up-front payments for licenses and implementation costs are spread out over several years, five in this study. The following graphs illustrate the cashflow out of the company.

In the case study's SaaS licensing model systems, the same five-year horizon is calculated using the contract terms and figures, as none of the systems have been in use for the entire five-year period. However, since all the contracts span a period of five years, it is reasonable to assume that the costs for each period are known. The same principle applies to workloads. While historical data provides workload information for the perpetual licensing periods in all cases, all SaaS systems in the case study have been in use long enough to validate the accuracy of resourcing needs, enabling the prediction of future resourcing needs for the five-year period. For SaaS systems, the required resourcing typically follows a similar pattern. The implementation project consumes more resources, as it involves more than just IT work. To obtain more accurate and comparable information, the workloads of the entire implementation project are considered in both cases, perpetual and SaaS, not just IT related work.

The resourcing challenge for perpetually licensed systems throughout their lifecycle arises from the requirement of having multiple resources available during implementation and upgrade projects, followed by *significantly fewer resources needed during the continuous service period. Furthermore, resource availability is problematic as backup resourcing must be arranged for business-critical systems during holidays and other absences.* Additionally, there needs to be sufficient resourcing to accommodate varying needs, as the calculated resourcing is not constant throughout the year but fluctuates depending on the support or system change needs.

To ensure a comprehensive perspective and mitigate the risk of drawing conclusions from a single case, this study includes five distinct cases. The systems described in the case study are intentionally described in a vague manner, with real brand names omitted. Additionally, the case study is based on real world financial data. However, the data presented in this study undergoes manipulation to ensure confidentiality. The original data is altered in such a way that it cannot be distinguished but the costs of perpetual licensing and SaaS costs are proportionate in each case. Furthermore, different manipulation keys are applied to each case to obscure the original data. This data manipulation is conducted solely for confidentiality purposes, respecting the confidentiality agreements between the company under study and its vendors.

The Chemical Safety System

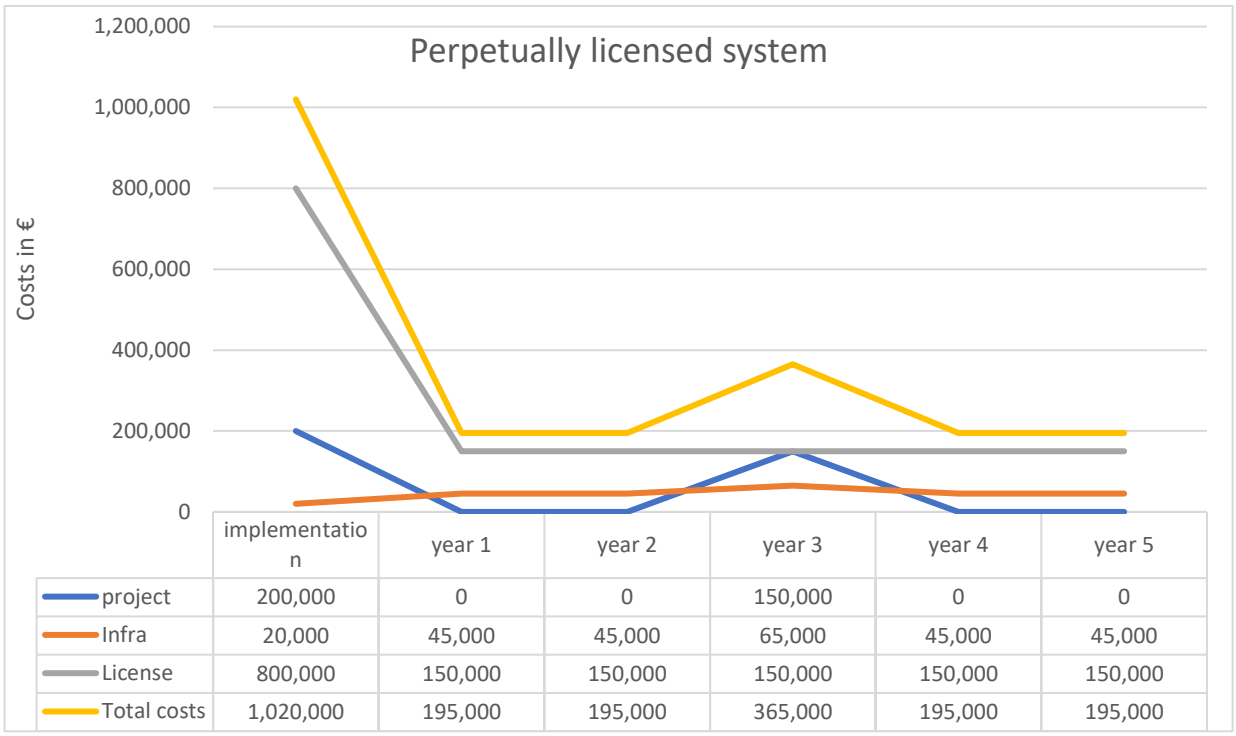
Chemical safety is an integral part of any chemical company, and the process and requirements are heavily regulated. Therefore, an IT-system for that purpose is de facto for any such company. These systems have been in use for decades already, serving as a prime example of the perpetual licensing model and costs as well as the required resources are well known.

Traditionally, chemical safety systems have been commercially available off the shelve systems, but they have also been customized to fit each customer's specific processes and needs. However, this *customization approach has led to lengthy and complex implementation projects.* Configurations and

customizations have made the implementation and testing particularly challenging. Furthermore, these *customizations have necessitated organizations to staff their IT with specialists possessing system specific skills.* These roles, such as system specialists or solution experts, are crucial not only during the implementation phase bur but also throughout the system's lifecycle for support and development work. In addition to the initial implementation, system upgrades have been lengthy and resource intensive from an IT perspective, even when no major changes to business logic are involved. On the business side, resources needed for upgrades have primarily been focused on testing related tasks.

The most significant cost for a chemical safety system is associated with the license investment. The cost of implementation project is influenced by *the fact that it primarily utilizes inhouse resources with only cases requiring actual system programming being outsourced to the vendor*. The same approach applies to upgrades where certain customizations must be migrated to the newer version and codebase (see figure 2.)

FIGURE 2
PERPETUALLY LICENSED COSTS – CHEMICAL SAFETY SYSTEM



	implementation	year 1	year 2	year 3	year 4	year 5
project	200,000	0	0	150,000	0	0
Infra	20,000	45,000	45,000	65,000	45,000	45,000
License	800,000	150,000	150,000	150,000	150,000	150,000
Total costs	1,020,000	195,000	195,000	365,000	195,000	195,000

Resource allocation and consumption for perpetually licensed system follow a similar pattern. The original implementation project represents the largest single effort, whilst upgrade is mostly IT related work. Since business logic changes are minimal or non-existent during upgrades, the workload is smaller compared to the original implementation project (see figure 3).

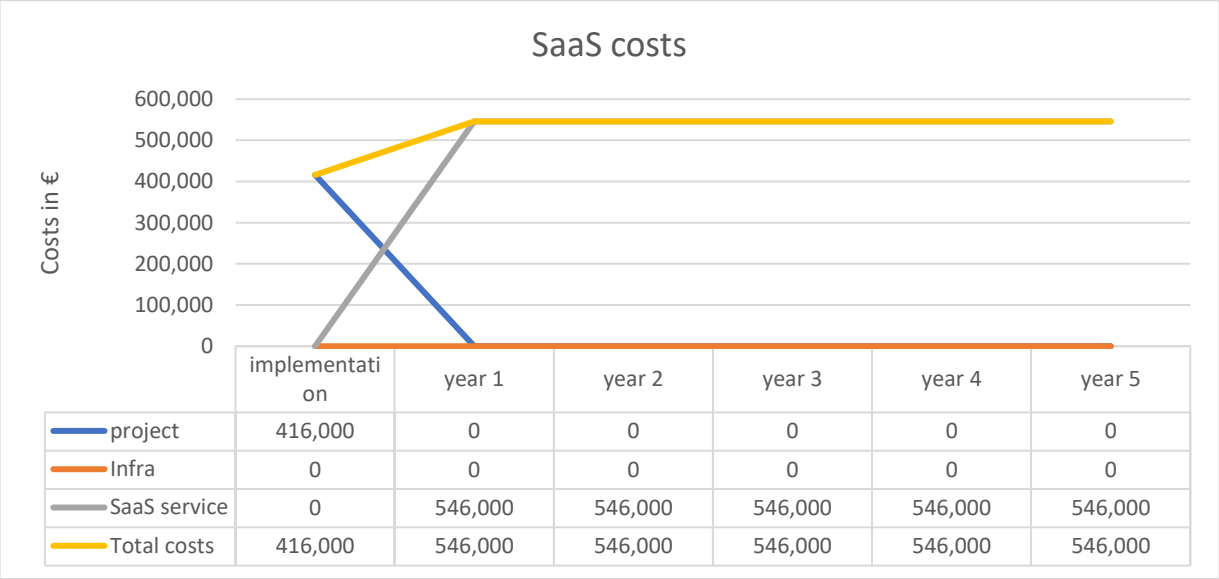
FIGURE 3
WORKLOAD COMPARISON – CHEMICAL SAFETY SYSTEM

In the current market for chemical safety systems, only a few vendors dominate and all of them have transitioned to offering their solutions solely through SaaS licensing model. This trend is mirrored in other sectors as well, with traditional system vendors seeking a larger share of customers spend by exclusively providing full SaaS services. Given the periodic need for upgrades to meet new legal requirements and to ensure ongoing support from vendors, the only viable solution was to adopt SaaS- delivery model for chemical safety systems. This transition aligns with the company's strategy to utilize more SaaS solutions where feasible.

The SaaS licensing model for chemical safety system is not based on users but rather on the number of cases processed through the system. This offers a high flexibility in terms of user numbers. However, contractually, a minimum amount of cases is agreed upon, establishing the minimum contractual cost. This cost is slightly less than the costs outlined in the case study as the case volume is larger and there is a possibility to reduce costs if volume decreases.

The cost structure of SaaS licensed system is opposite to that of perpetually licensed one. In the case of SaaS, most of the costs occurs along the actual usage, rather than being upfront as illustrated by figure 4. In the implementation of chemical safety system under the SaaS model, the project pricing reflects the migration effort from old system. This entails migrating all data from the customized client specific system to a multi-customer platform with a rigid data model.

FIGURE 4
SAAS COSTS – CHEMICAL SAFETY SYSTEM

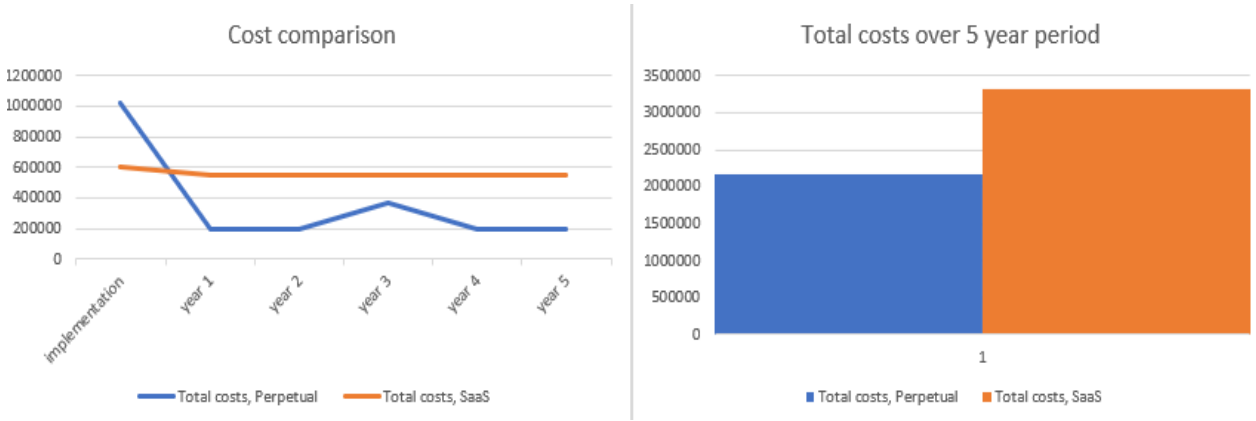


	implementation	year 1	year 2	year 3	year 4	year 5
project	416,000	0	0	0	0	0
Infra	0	0	0	0	0	0
SaaS service	0	546,000	546,000	546,000	546,000	546,000
Total costs	416,000	546,000	546,000	546,000	546,000	546,000

The workload for SaaS licensed system is considerably less than compared to that of perpetually licensed system, as illustrated in figure 3, and the roles and skills required are very different. With the SaaS licensing model, the customer's responsibilities involve managing the vendor and translating various business needs to the vendors service specialists. This does not require supporting the actual use of the system or making changes to configurations.

The total cost of ownership for the five-year period reveals that financially utilizing SaaS licensed system is more expensive than perpetually licensed system, as depicted in figure 5. Furthermore, the difference between perpetual licensing and the SaaS licensing model is projected to increase over time.

FIGURE 5
TOTAL COSTS – CHEMICAL SAFETY SYSTEM



However, despite the considerable workload difference during the five-year period, totaling 12 FTEs, and even more so considering that the needed role for SaaS licensed system is only a service manager with minimal allocation, the overall cost is less than what is depicted in financial figure 5. Additionally, the service manager role is commonly utilized for other services as well, allowing one service manager to

oversee several services. Furthermore, as no deep system knowledge is required, managing backup resourcing is straightforward. Another advantage of utilizing SaaS service is the constant updating of the system without the need for a large scale upgrade every three years, thereby saving resources on the business side. This allows them to focus on using the system rather than maintaining it. The constant updating of the system is itself an advantage of the SaaS delivery model. In the case of chemical safety, authorities frequently update the requirements, resulting in necessary changes to the system. These changes are common to all users of the system, making a multi-customer platform a sensible choice.

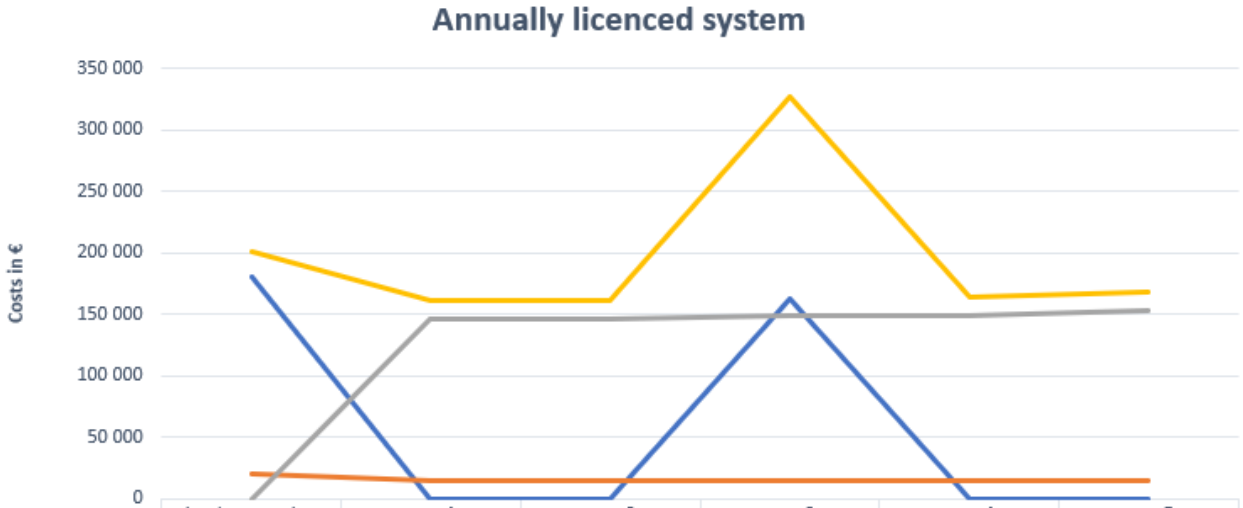
The Electronic Laboratory Notebook, ELN

The Electronic Laboratory Notebook (ELN) is utilized in laboratory work to replace traditional paper notebooks during tests and analysis. ELN systems have been in use for extended periods, like chemical safety systems and have typically been commercially available with client specific implementations and configurations.

However, the use case for ELN system differs, as the licensing model has historically been annual rather than perpetual. Despite this, the delivery of the system still falls under the client's ownership. We could argue that this represents an early movement to SaaS-like licensing model, necessitating resources and expertise to implement, maintain and support the system.

In addition to the implementation of the system, ELN has been a business-critical system, requiring periodic upgrades every three years. As figure 6 portrays, both the implementation project and the periodic upgrade project result in significant financial impacts compared to the annual costs of the system.

FIGURE 6
PERPETUAL LICENSED COSTS – ELN

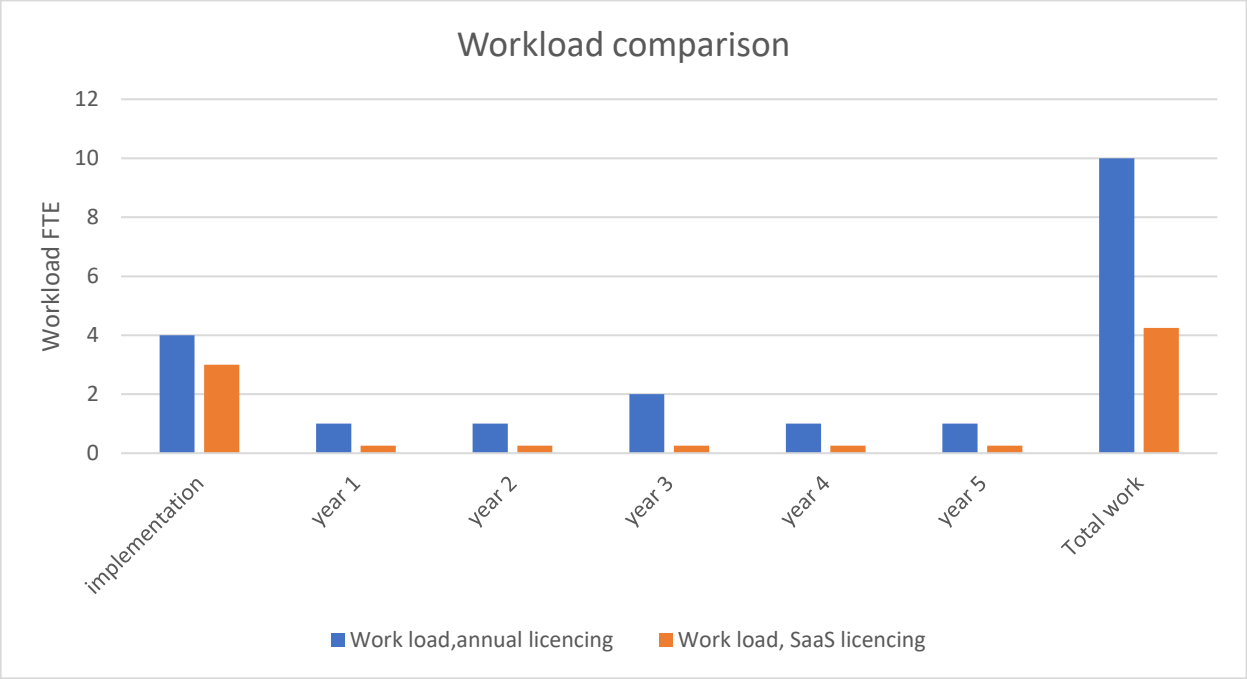


	implementation	year 1	year 2	year 3	year 4	year 5
project	180 900			163 000		
Infra	20 000	15 000	15 000	15 000	15 000	15 000
License	0	146 000	146 000	149 000	149 000	153 000
Total costs	200 900	161 000	161 000	327 000	164 000	168 000

The resourcing for ELN follows the similar pattern to that of the chemical safety system, with the most effort required at the implementation and upgrade projects, as shown in figure 7. However, the projects are less resource intensive as much of the work is outsourced to the vendor of the system. Managing resources for ELN is also simpler in some respects. While ELN is a business-critical system, it is not as time critical as chemical safety, allowing for less intensive resourcing in terms of backup. Additionally, the skills required for backup resourcing are less demanding and deep knowledge of the system is not necessary for

the back-up personnel. Transitioning to a SaaS system changes the resourcing needs to service management from system specialist roles. Since support is provided by the vendor, the workload is minimal.

FIGURE 7
WORKLOAD COMPARISON – ELN

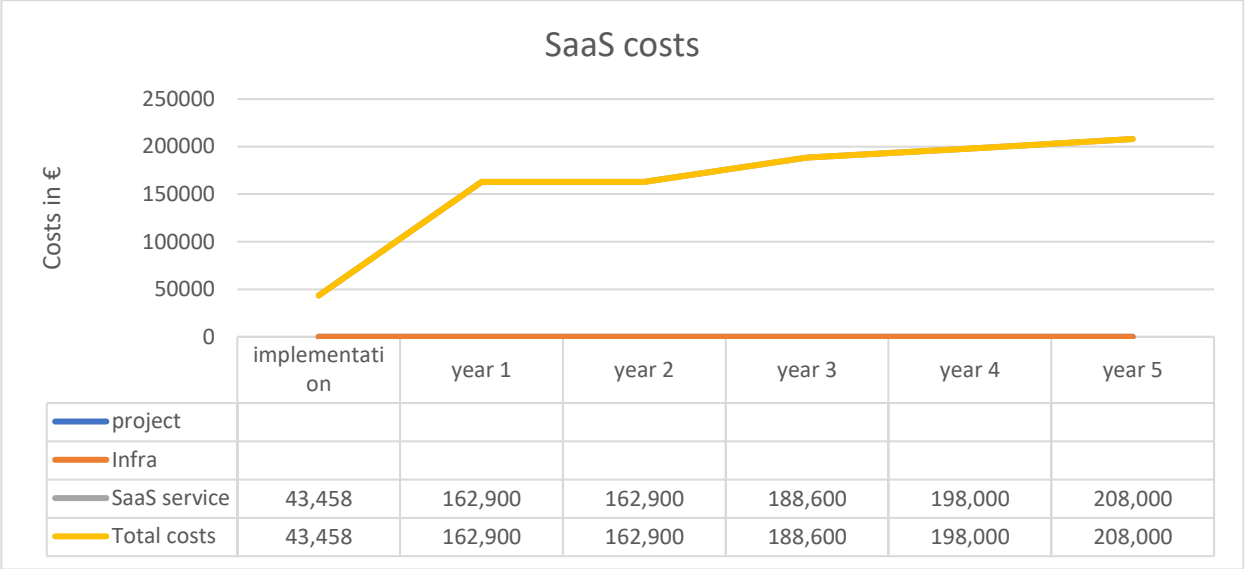


The transition to a SaaS delivery model for the ELN system was facilitated by the existing annual licensing model, where the annual license cost outweighed the hosting expenses. Furthermore, most of the resourcing for the implementation and upgrades was already handled by the vendor. One of the primary drivers for this was the need to grant external parties access to the ELN-system, as some laboratory work is outsourced. With the on-premises delivery model, external users faced access restrictions due to company network and firewall configurations. Another motivation was to eliminate the need for upgrades every three years, which, despite requiring minimal effort, incurred costs as the configurations had to be transferred to the new version by the vendor's experts.

Under the SaaS licensing contract, pricing is based on named users and charged per user per year. However, *there is no flexibility to decrease user numbers, as the contract binds to a certain number of users and only allows addition of more users*.

While SaaS licensing costs align with the annual licensing model, they are slightly higher, primarily due to infrastructure costs. These infrastructure costs would be incurred in any case, as illustrated in figure 8. The implementation project costs do not fully capture the situation, as only a portion of the data was migrated to the new SaaS system, with the bulk of data from the old system archived, resulting in on-going costs associated with archived data.

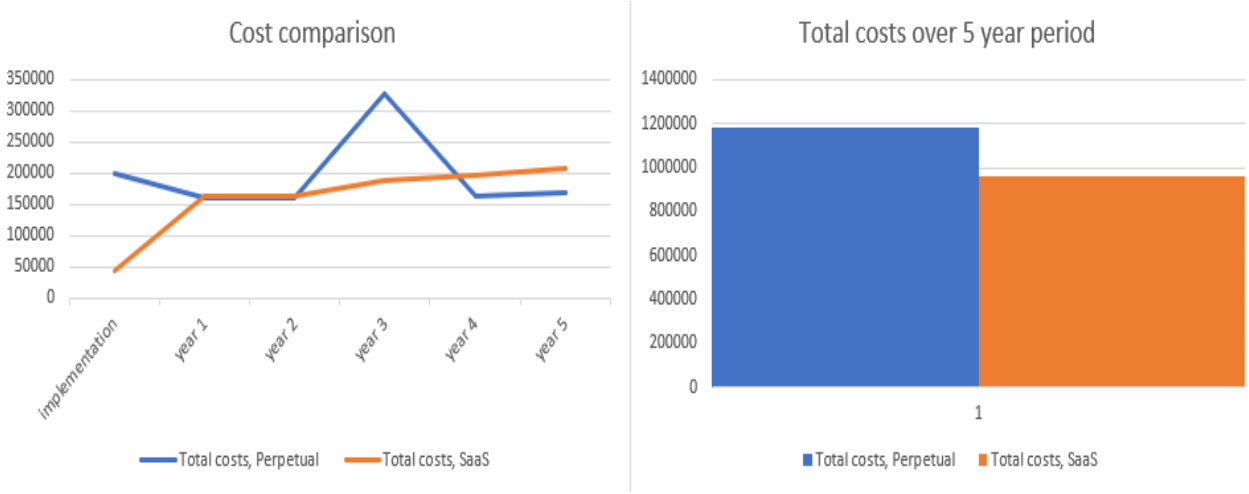
FIGURE 8
SAAS COSTS – ELN



	implementation	year 1	year 2	year 3	year 4	year 5
project						
Infra						
SaaS service	43,458	162,900	162,900	188,600	198,000	208,000
Total costs	43,458	162,900	162,900	188,600	198,000	208,000

The total cost of ownership for the five-year period shows that in the case of ELN system the SaaS licensing and delivery is more cost efficient than the combination of annual licensing and own delivery, as the upgrades are not causing significant costs every three years, figure 9.

FIGURE 9
TOTAL COSTS – ELN



When extending the cost comparison beyond the initial five-year period, the SaaS delivery model proves to be less expensive for the first 11 years. It is only at the 12th year the that the cost SaaS delivery exceeds the cost of annual licensing. This assumes that the pricing in contract renewals for SaaS delivery remains consistent with the initial five-year period and that the annual licensing cost follows a similar trend as observed during the case study period and historical data.

For ELN system, adopting the SaaS delivery model proves to be the optimal choice, offering cost efficiency and resource optimization. However, the primary advantage in its capability to share the access

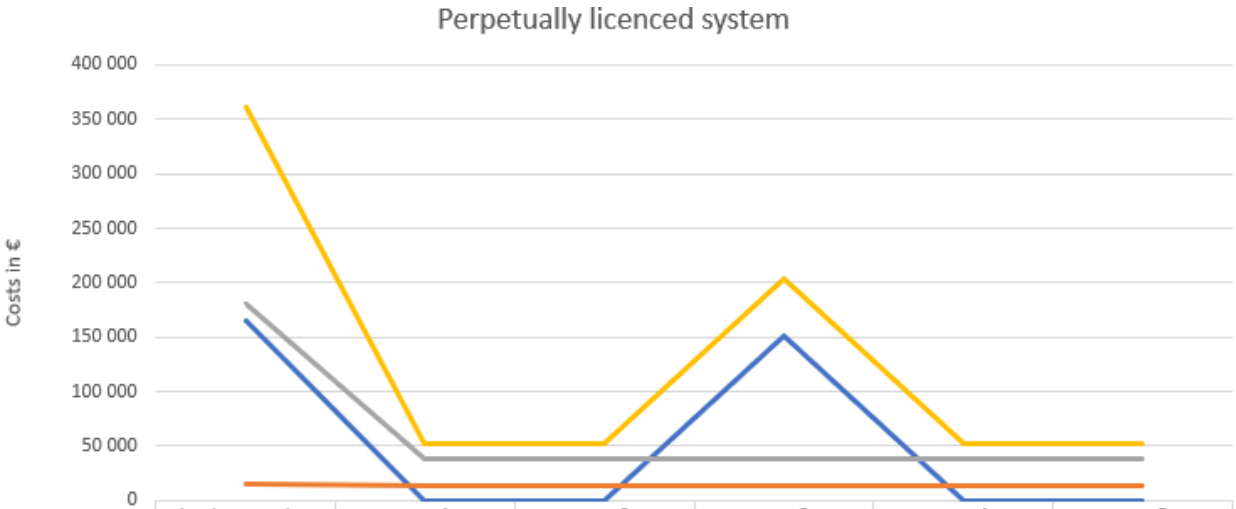
with external users. In this scenario, the financial efficiency is achieved by utilizing the vendor's standard system with no customer specific configurations and implementation required. The comparison in this case differs from others in this study as the licensing model already incorporated SaaS features, despite the system being delivered on the client's premises.

The Packaging Material Management System

The packaging material management system is used to design and manage packaging materials, making it applicable to all industries involved in goods packaging. These systems generally face few industry-specific demands or constraints, as the business processes remain largely consistent across different sectors.

The case study company's experience with the packaging material management system contrasts with the other systems in this study because the previous system, before transitioning to a SaaS licensed system, was not entirely commercially available. While the system was commercially sourced, a coded customized presentation or user interface layer was added on top, tailored to the company's business process. Consequently, implementation and upgrade projects were very lengthy and expensive, particularly as external resources were strategically chosen for coding capabilities. This approach significantly impacted the total cost, as shown in figure 10.

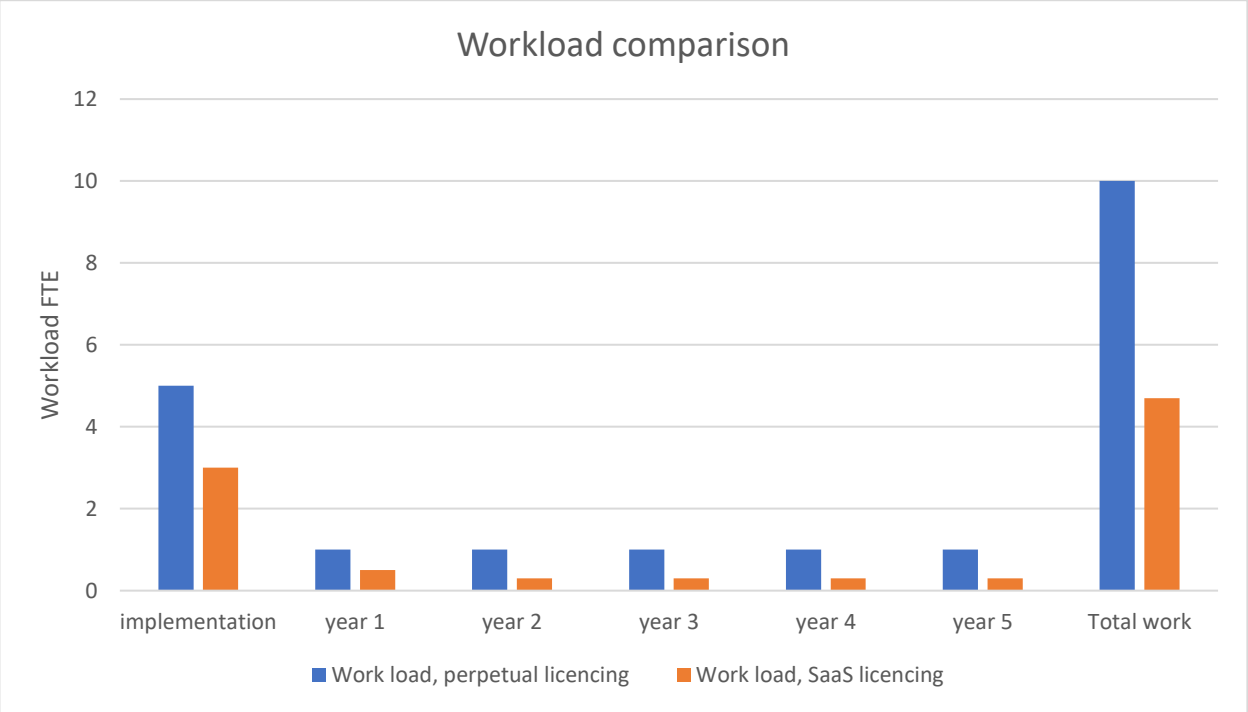
FIGURE 10
PERPETUALLY LICENSED COST – PACKING MATERIAL MANAGEMENT SYSTEM



	implementation	year 1	year 2	year 3	year 4	year 5
project	165 500			151 500		
Infra	15 000	14 400	14 400	14 400	14 400	14 400
License	180 600	38 500	38 500	38 500	38 500	38 500
Total costs	361 100	52 900	52 900	204 400	52 900	52 900

The system users were limited to one department, with a small user base and infrequent support requirements. Despite the necessity for deep and detailed skills needed to support the system effectively, the resource demand was manageable, as illustrated in figure 11. However, a challenge emerged regarding enhancements or changes, as they invariably required external coding resources. Consequently, such modifications were only implemented during upgrades when coding had to be validated against newer core system versions. This rigidity rendered the system slow to accommodate business changes or improvements.

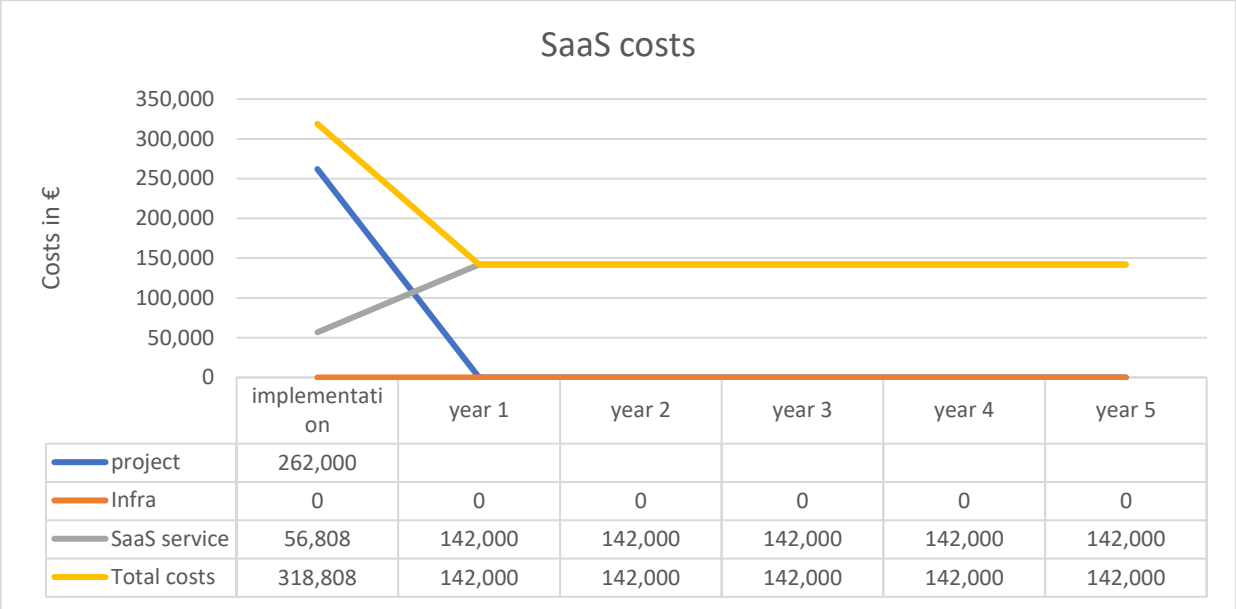
FIGURE 11
WORKLOAD COMPARISON – PACKING MATERIAL MANAGEMENT SYSTEM



The primary motivation for transitioning to a SaaS licensed system stemmed from the bespoke nature of the existing coded system, coupled with the general demand across industries for packaging materials management solutions. However, the costs associated with the SaaS licensed model are notably higher compared to perpetual license combined with the custom-coded user interface, as illustrated in figure 12. The implementation project cost contains some customer-specific configurations to workflows within the system and the migration of data from the old system's data model into the new system's data model.

The cost for SaaS licensing is not determined by named users but rather concurrent users, meaning that the system can be accessed by a larger number of individuals but only a specific number at any one time. This setup has both advantages and disadvantages. On one hand, it allows for greater accessibility, enabling more users to access the system, especially beneficial for users in different time zones. However, the disadvantage being that the nature of business processes often requires users to be logged in throughout the entire workday, potentially limiting the concurrent usage.

FIGURE 12
SAAS COSTS - PACKING MATERIAL MANAGEMENT SYSTEM



	implementation	year 1	year 2	year 3	year 4	year 5
project	262,000					
Infra	0	0	0	0	0	0
SaaS service	56,808	142,000	142,000	142,000	142,000	142,000
Total costs	318,808	142,000	142,000	142,000	142,000	142,000

When comparing the total cost of ownership over the five-year period, the SaaS delivery model proves more expensive with the disparity increasing over time, as seen in figure 13. However, it is important to consider the long-term viability of a solution reliant on proprietary code and external coding resources.

FIGURE 13
TOTAL COSTS – PACKING MATERIAL MANAGEMENT SYSTEM

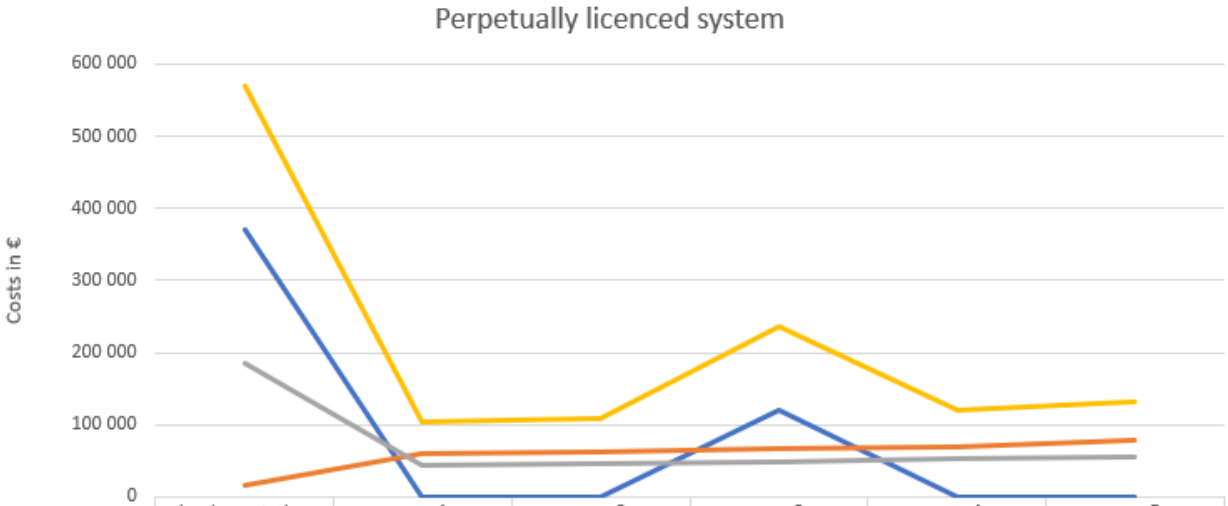
Opting for the SaaS licensing model proves to be costlier compared to the previous system, prompting some reconsideration. There might have been a feasible alternative with perpetual licensing, especially given the substantial costs incurred during the implementation of the SaaS system. Building an on-premises system with similar cost could have been a viable option. However, the decision to use the SaaS delivery model was a strategic decision to shift the roles and skills of IT personnel from system expertise towards service management proficiency. In this scenario, the immediate benefits of SaaS delivery model are not evident, particularly since the system's current usage remains within the company network.

The Electronic Archive

The Electronic archive system in this study has the shortest life cycle and is relatively new compared to the other systems. Traditionally, having been closely associated with the paper archives and data has resided in live systems. However, there has been a need to archive data from live systems for several years now, whether to reduce system storage costs, optimize system performance by archiving some data or archive data instead of migrating everything to a new system. For instance, in this study, the old ELN system was archived to the electronic archive instead of being migrated to the new SaaS implementation.,

The financial aspect of the electronic archive differs from other systems in this case study, as the amount of archived data directly impacts costs. Infrastructure costs constitute a larger portion of the total costs compared to other systems in the case study (see figure 14). For the electronic archive, the implementation project cost is explained by the initial design and implementation of data and metadata models during the initial implementation. This was a one-time effort and was also used in the following SaaS implementation and migration.

FIGURE 14
LICENSED COSTS – ELECTRONIC ARCHIVE

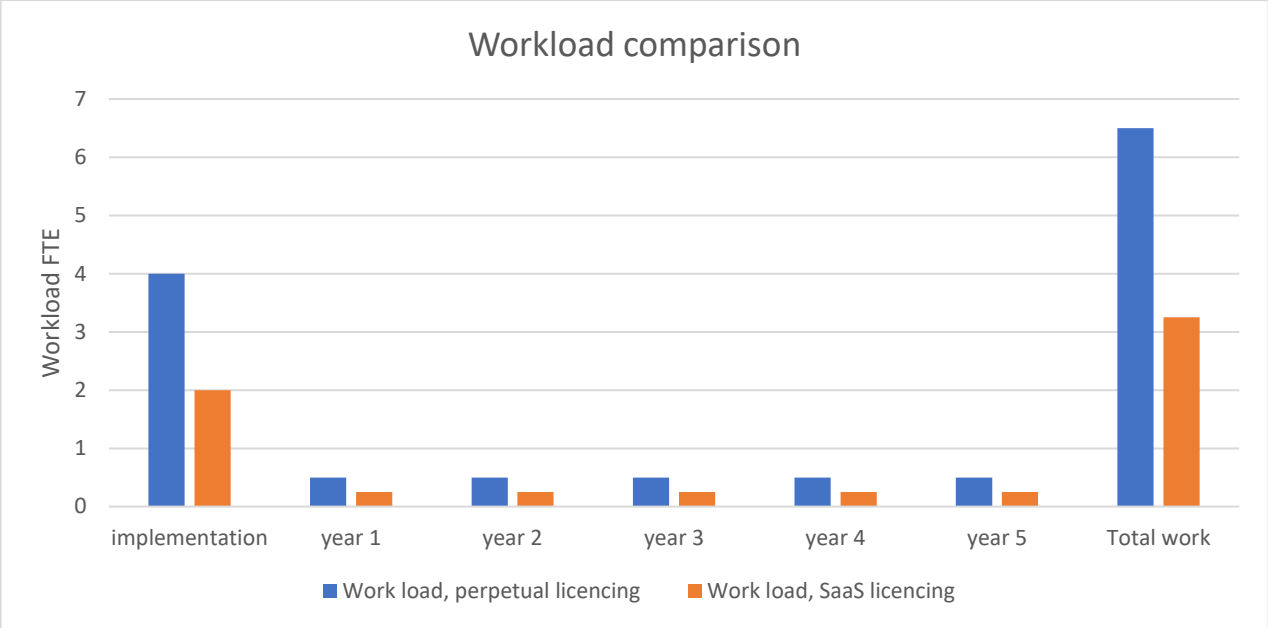


	implementation	year 1	year 2	year 3	year 4	year 5
project	370 000			120 000		
Infra	15 000	59 000	62 000	66 000	68 000	78 000
License	185 000	44 000	46 000	49 000	52 000	54 000
Total costs	570 000	103 000	108 000	235 000	120 000	132 000

Resource allocation for the electronic archive was considerably lower, with roles requiring a dual skill set. Firstly, individuals needed a deep understanding of the system to perform configurations, although larger upgrades were sourced from the vendor. Secondly, they also needed to possess archiving skills, which are essential for both traditional paper archiving and electronic archiving. *This presented a challenge, as finding someone with expertise in IT and archiving was uncommon.* Furthermore, the workload was

insufficient to justify dedicating a full-time person to this role (see figure 15). Despite the shorter life cycle compared to what the company was accustomed to, this dual requirement prompted the search for an alternative solution.

FIGURE 15
WORKLOAD COMPARISON – ELECTRONIC ARCHIVE

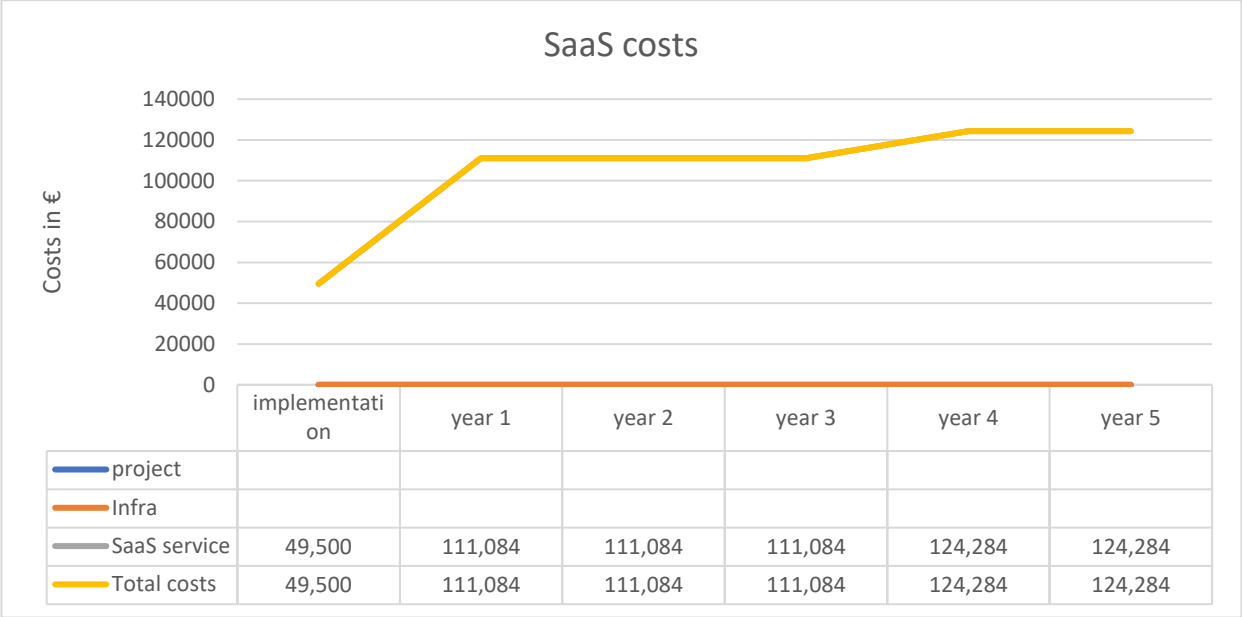


The presence of resourcing challenge was one of the catalysts to investigate the feasibility of SaaS solution. By clarifying the resourcing needs and roles, the archivist could manage both traditional paper archives and the electronic archive, while the service manager could oversee supplier management aligning with practices to other services. Additionally, the company's strategic directive to utilize SaaS solutions wherever possible further propelled the investigation.

The price of SaaS licensing depends only on the archived data volume, like perpetual licensing model where infrastructure costs are significant. *There is no user limit, and the service cost adapts monthly to the data volume. If a large amount of data is purged from the archive, costs decrease accordingly. However, the trend is ever increasing amount of data.*

SaaS licensing costs, as shown in figure 16, are determined by the archiving roadmap and estimated from year 3 onwards, given the system's usage of just over a year. The low implementation cost is explained by the direct use of existing data and meta-models, simplifying the implementation process.

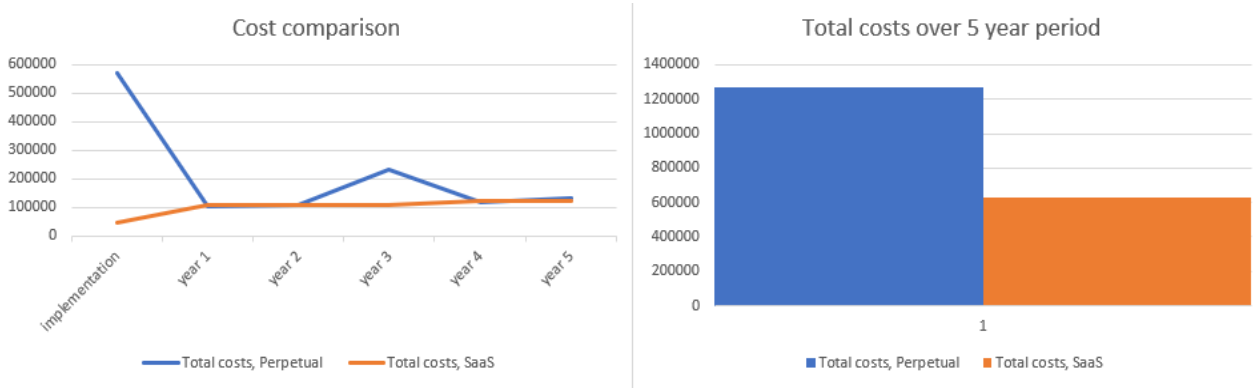
FIGURE 16
SAAS COSTS – ELECTRONIC ARCHIVE



	implementation	year 1	year 2	year 3	year 4	year 5
project						
Infra						
SaaS service	49,500	111,084	111,084	111,084	124,284	124,284
Total costs	49,500	111,084	111,084	111,084	124,284	124,284

The total cost comparison for the five-year case study period indicates that SaaS licensing costs are lower than those of the of perpetual licensing model, as illustrated in figure 17. Additionally, *with reduced and more focused resourcing requirements, the SaaS licensing model proves to be more efficient. Even when extending the calculation to longer period, assuming consistent data volumes, SaaS licensing model remains more cost-effective, mainly due to lower implementation costs and the need for the fewer upgrades to maintain support.*

FIGURE 17
TOTAL COSTS – ELECTRONIC ARCHIVE

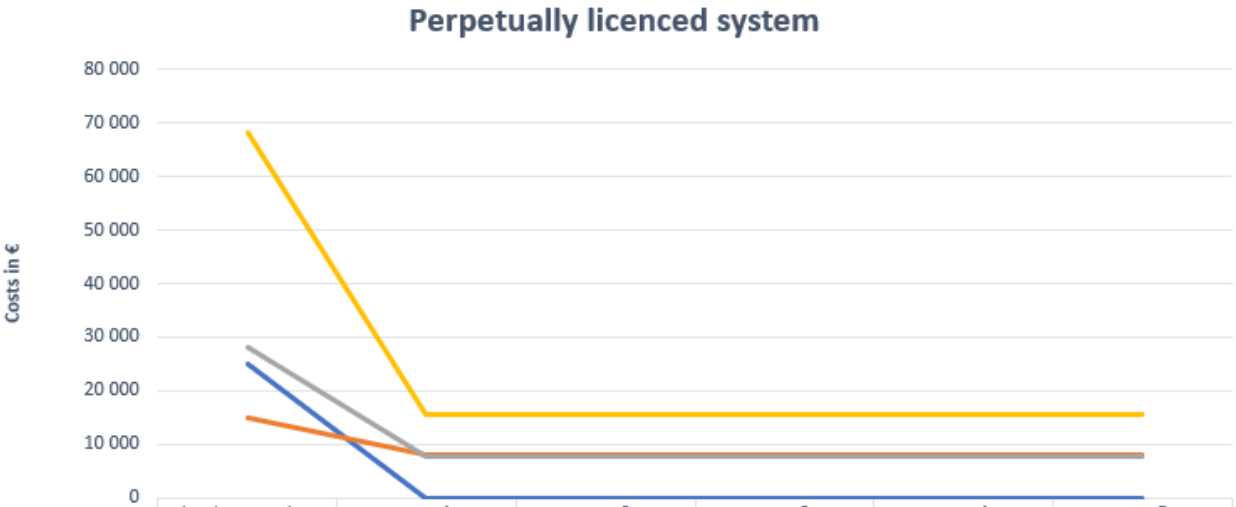


The Intellectual Property Rights (IPR) Management System

The Intellectual Property Rights (IPR) system manages the company's intellectual property and patents. As a company engages in research and development, the IPR system is essential for maintaining and exchanging this information with relevant authorities. Although, the IPR system serves a small number of users, it requires significant maintenance, as demonstrated in this case study.

The perpetual licensing model for IPR system proved to be financially cost efficient, as shown in figure 18. The low cost over time is partly attributed to the infrequent need for upgrades. Over the system's 12-year life, it was only upgraded once. Therefore, this comparison does not include upgrade costs.

FIGURE 18
PERPETUALLY LICENSED SYSTEM – IPR



	implementation	year 1	year 2	year 3	year 4	year 5
project	25 000					
Infra	15 000	8 000	8 000	8 000	8 000	8 000
License	28 250	7 650	7 650	7 650	7 650	7 650
Total costs	68 250	15 650	15 650	15 650	15 650	15 650

Main reason for the lack of upgrades was the extensive resource demands of the system specialist role. *Maintaining the system consumed all available resources*, leaving no capacity to execute upgrades, as illustrated in figure 19. Additionally, the vendor did not enforce a strict version life cycle, meaning support was provided solely on payment of the maintenance fee.

Transitioning to a SaaS licensing model had two primary factors. The necessity to have a modern up-to-date system and the strategic initiative to adopt SaaS solutions where appropriate. Like the previous perpetual licensing model, the SaaS licensing model is user based, with a minimum requirement of five users annually. The current number of annual named users is ten. The pricing structure of the SaaS licensing model is not linear and reflects the number of users in non-proportional manner.

The implementation cost for the SaaS solution was insignificant compared to the system's annual cost, even with the migration of all data from the previous on-premises system, as illustrated in figure 20.

FIGURE 19
WORKLOAD COMPARISON – IPR

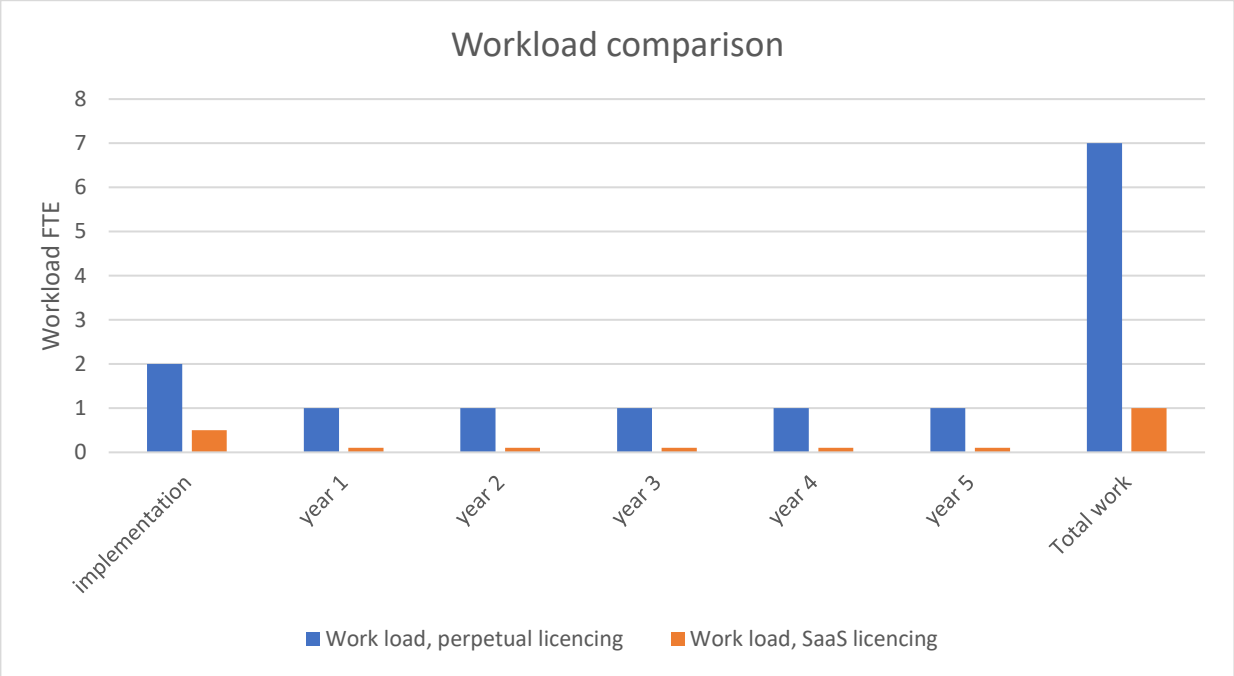
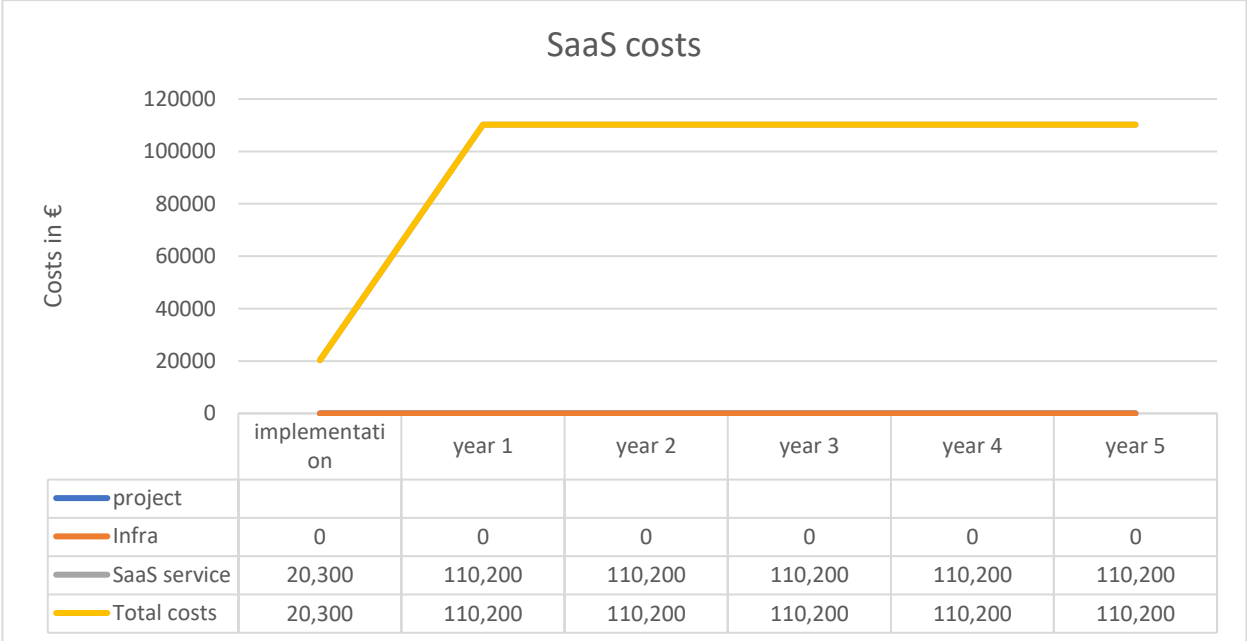


FIGURE 20
SAAS COSTS – IPR

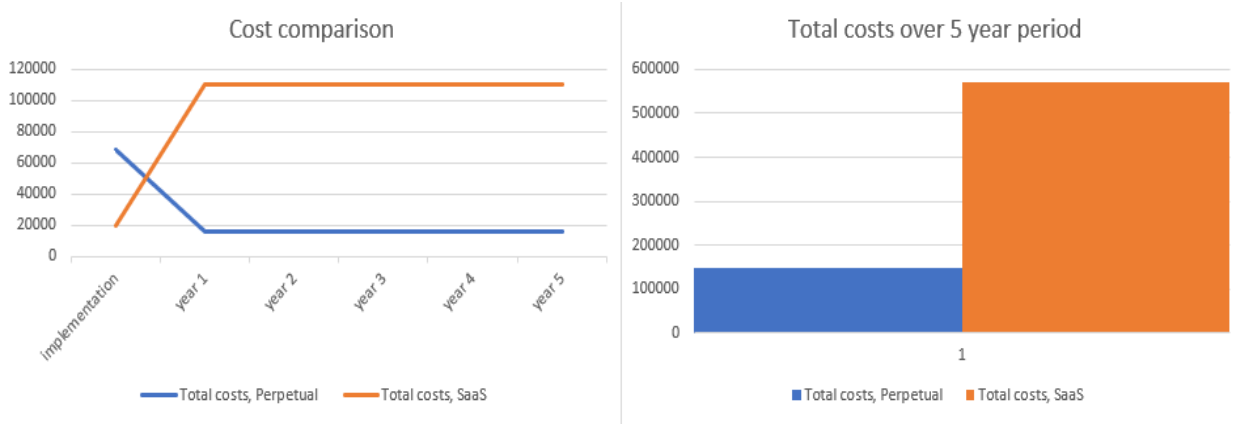


	implementation	year 1	year 2	year 3	year 4	year 5
project						
Infra	0	0	0	0	0	0
SaaS service	20,300	110,200	110,200	110,200	110,200	110,200
Total costs	20,300	110,200	110,200	110,200	110,200	110,200

The annual cost of SaaS licensing is significantly higher compared to the perpetual licensing, as shown in figure 21. Financially justifying the SaaS licensing system is challenging. However, the primary driver for this choice lies in the significant reduction in resource requirements. *Unlike the perpetual model, the*

SaaS licensing model requires only a fraction of the resources, with the necessary role shifting from a system specialist to a service manager focusing on vendor management.

FIGURE 21
TOTAL COSTS – IPR



THE RESULTS

Financial Impacts of Moving from a Perpetual Licensing to a SaaS Licensing Model

The case study demonstrates that transitioning from perpetual licensing model to SaaS licensing model can result in both increased and decreased costs, depending on the specific circumstances of each case.

The cost increase for the chemical safety system is substantial, with costs more than doubling when comparing perpetual to SaaS licensing. Despite the decrease in resource requirements, which are nearly one third compared to the perpetual licensing model, *opting for SaaS licensing is not financially feasible*, especially considering the expensive implementation project. However, it is important to note that the options are limited in this case, as all vendors currently offer only SaaS model systems.

In the case of the electronic laboratory *notebook (ELN), the SaaS licensing model proves to be more financially efficient.* Furthermore, the SaaS delivery model offers additional advantages, such as the ability to access the system from anywhere in the world, not just within the company network. However, *from a financial perspective, although SaaS is more cost effective, the licensing model was not truly perpetual to begin with. It already operated on the same principles as SaaS but lacked the vendor service and SaaS delivery capabilities.* This could be seen as an early phase of SaaS in licensing, where the technology was not mature enough for vendors to deliver. *For the ELN system, transitioning to a SaaS solution brought only positive outcomes, as it eliminated the need for in-house system specialists, as along with the maintenance of both the infrastructure and the application itself, all practically at the same costs. In the case of packaging materials management system, the cost of SaaS licensing far exceeds that of hosting an on-premises one-off solution. This contrast prompts us to ask a question for the rationale behind choosing the SaaS model.* Despite potential reductions in the workload and streamlining of the roles and skills, opting for the SaaS licensing model appears to be financially unsound. While the case study does not explore the possibility of transitioning from a self-hosted one-off solution to a perpetually licensed industry standard solution, where the cost structure might align better with other systems, *the mandatory change from the old system warrants a reconsideration of the SaaS licensing model.*

The electronic archive is the another financially positive example of a SaaS licensing model. Unlike other cases, here the comparison was truly between the perpetual licensing and SaaS licensing models. Whether the implementation projects are factored in or not, *the SaaS licensing model proves to be more economically advantageous to the customer*. This raises a question of how is this possible? Despite almost the identical difference between maintenance and infrastructure costs in perpetual model and the service

fee in SaaS model and still the SaaS model, the latter includes the service element, eliminating the need for in-house systems specialist. The reason must lie in the volumes managed by the vendor in the multi-customer environment, enabling them to negotiate lower license fees and infrastructure costs per terabyte than any single customer company could. Additionally, the vendor can capitalize on professional services offered along the application further boosting their revenue. Another contributing reason to the financial viability of the service is the standardized nature of the electronic archive and that it has no customer specific configurations and is uniformly operated across all customers.

The intellectual property rights (IPR) system presents another example of financially challenging SaaS licensing model. The annual cost of SaaS is significantly higher compared to maintaining a perpetually sourced system with on-premises hosting. Even with the workload differences, the workload saving cannot come close to compensating for the disparity. This is another example where financially, upgrading the on-premises perpetually licensed system would have been more prudent. However, the decision to opt for the SaaS model was driven by the strategic goal of utilizing SaaS services wherever feasible.

The case study highlights that, SaaS licensing model may not always be cost efficient or elastic, but there are instances where it proves to be suitable and financially viable option, outperforming perpetual licensing and in-house system delivery. Given the conflicting results regarding the financial efficiency of SaaS services, it is imperative to examine from multiple perspectives, the strategy of utilizing SaaS services.

Another notable financial aspect illustrated by the case study is the licensing model. With business-*critical IT systems, a licensing model independent of named users appears to offer the key for financial success*. However, this principle may not be applicable to cases where SaaS delivery involves truly commodity software, such as word processing or email tools. *In such scenarios, active license management becomes crucial to ensure that SaaS licensing translates into a financial success. This, again, requires dedicated license management efforts.*

The Elasticity of SaaS-licensing Model

The first hypothesis tested in this case study suggests that Systems as a Service (SaaS) platforms exhibit elasticity both in computing capacity and user allocation, allowing for easy adjustments according to the business requirements.

Regarding computing capacity, all systems in the case study have demonstrated this elasticity. For three of the systems licensing is based on user numbers, whether named or simultaneous users, and the SaaS provider automatically adjusts computing capacity to maintain performance and availability. In the other two systems, capacity is added as necessary, with the costs reflected in monthly service pricing. However, in the case of the chemical safety system, licensing is based on cases rather than computing needs, affecting SaaS service pricing.

On the other hand, elasticity in user allocation does not align with the hypothesis. While number of users forms the basis of licensing cost, adjustments typically only allow adding users, not reducing them. In this case study the pricing structure is justified by the vendor, offering fixed cost per license over a longer term. In this case study, for five years and with the originally sourced license count forming the agreement baseline.

The Ease of Implementing SaaS Model Systems

The second hypothesis in the case study related to the ease of implementation within the user organization. However, the findings were inconclusive. *In two out of five cases, the implementation process proved to be substantial in terms of effort and cost.* It was observed that implementing SaaS licensing model system was more costly to implement but less resource-incentive, compared to the perpetually licensed predecessor. Furthermore, in these two cases, the total expenses over the five-year study period were higher for the SaaS licensed system than for the perpetually licensed one.

In the three cases where the SaaS implementation proved financially viable, the similarity is that the service was adopted from both publicly available SaaS systems and from multi-customer codebases. This means *there were no customer specific coding requirements and minimal configuration needed during*

implementation. Additionally, the process was further simplified by the necessity for only a few standard integrations with other business systems.

The Resourcing Impact of SaaS Licensing Model Systems

As part of its strategic objectives, the organization in the case study aims to transition from specialized *roles dedicated to specific applications towards more generic service management positions.* This shift is prompted by a growing number of business applications and the increasing technical complexity of systems coupled with the demand for increased automation and functionalities like artificial intelligence. Without this shift to service-oriented roles, the organization would face the prospect of expanding IT workforce significantly to adequately staff all the business-critical systems and ensure their uninterrupted operation.

The Roles and Skills

When transitioning to a SaaS licensing model, it affects the IT resources within the company, particularly with regards to roles and skills. With perpetual licensing, systems are typically developed and managed using internal resources, with specific skills tailored to each system. This can pose challenges as deep knowledge of multiple systems is necessary, leading to resources being dedicated to only one or two systems. *This makes it challenging to adapt to workload changes and sudden demands. Additionally, ensuring backup support for business-critical systems requires specific expertise, resulting in staffing complexities and increased IT headcount.*

Transitioning to SaaS licensing brings about a shift in required skills within the client organization, necessitating a move from system specific expertise to service management. In the case study, approximately ten individuals transitioned from IT-system specialist roles to other roles, not all of which were service managers, requiring them to acquire new skills. *Such significant personnel changes demand systematic change management*, on-going support from senior leadership and a long-term strategic resource plan. To address this, the organization established a comprehensive service management learning program for those assuming service manager roles.

Furthermore, this study reveals a significant decrease in required resourcing across all five cases, *highlighting the challenge of reallocating freed up resources effectively*. While some individuals readily adapt to new roles and skill sets, others may resist change. Long term strategic resourcing planning is essential to manage these shifts and determine appropriate management actions.

The Impacts for Sourcing Roles and Skills

Procurement undergoes a significant transformation in the shift to SaaS licensing, requiring revaluation of roles and skill sets. *The complexity of SaaS contracts necessitates a more specialized approach to sourcing and contract negotiations*. This includes the introduction of new contractual terms that demand closer attention during decision making processes, a finding supported the case study.

In procurement, negotiating successful SaaS contracts requires a broader array of roles than traditional contracting. In addition to sourcing specialists, negotiations now involve service management, information security, integration and IT architecture specialists. These individuals must be adept at engaging with vendors to negotiate and refine the terms of agreements proposed by the vendor.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The case study highlights the variability of outcomes across systems studied, making it challenging to claim that the SaaS licensing model is universally optimal for running business-critical IT systems. While the study indicates that SaaS licensing proves financially advantageous in two out of five cases, the determinants of this efficiency are multifaceted. Ultimately, only one of five cases demonstrates long-term cost efficiency with the adoption of SaaS licensing model and service.

The case study highlights several reasons for transitioning to SaaS solutions beyond theoretical considerations. Additionally, achieving elasticity and continuous optimization proves challenging, leading

to unexpected financial impacts from SaaS licensing model. This case study emphasizes the importance of examining factors beyond mere financial figures, emphasizing the significance of the company's strategic decisions and employee strategy.

From a financial perspective, transitioning from perpetual licensing to SaaS model can generate benefits depending on how licenses are calculated, such as simultaneous users or capacity. *For commodity systems, active license management at client organization ensures the optimal license usage. However, for business-critical applications with a stable userbase, the SaaS licensing model may primarily benefit vendors. Elasticity of license management is a critical term in agreements and sourcing decisions*, with pay-as-you-go commitments ideally having minimum levels significantly lower than the actual license needs.

This case study did not account for another crucial financial aspect mentioned in literature, the renewal price cap. This term, though not featured in this study due to client organization's relative newness to SaaS agreements, proved critical in one instance. In late 2022, amidst inflationary pressures, the vendor proposed a substantial increase in renewal fees. However, thanks to the renewal price cap clause, the client organization saved nearly 200 000 euros annually for the subsequent contract period.

For computing capacity, the elasticity differs from traditional hosting, whether managed internally by IT or outsourced to a third-party hosting provider. In the past, capacity increases were project-based requiring hardware procurement and implementation projects resulting in maintenance disruptions for the business. With SaaS, capacity can be increased automatically or by request without impacting business operations.

The key to successful SaaS implementation and service delivery lies in utilizing a standardized system with multiple customers sharing the same code base, minimizing the need for custom configurations. However, the case study indicates that implementing a SaaS solution may not always be straightforward. In fact, it can sometimes be more labor incentive than deploying an in-house system. This presents a challenge as the high implementation costs effectively lock the client into their current SaaS vendor. This makes it impractical to switch to a different provider. In such scenarios, opting for the traditional perpetual licensing model might be more advantageous.

One of the driving forces behind the adoption of SaaS delivery model for IT systems is the organizations personnel strategy. For many companies, IT is not their core business but rather an essential support function. However, in modern business landscape IT plays a crucial role in every aspect of operations. To address this challenge, many organizations turn to SaaS services and strategically allocate resources to manage these services. This approach not only streamlines the required roles, and skill sets but also significantly affect the overall resource requirements. While existing literature often views resourcing as primarily a project phase issue, the insights acquired from this case study highlight its broader and long-tern impacts on continuous IT service provision.

To succeed in transitioning from perpetual licensing models and internally supported IT systems to SaaS services, *one of the most critical phases is the sourcing process. Additionally, understanding contract terms is essential for a successful transition to SaaS, as emphasized in the case study*.

Recommendations

For any company considering a shift towards SaaS services for business-critical applications, the decision should be driven by the specific needs that the SaaS service model can best address. These needs may include requirements such as access from outside the company network, fluctuating user numbers or capacity needs or the necessity for mobility in application usage. In such cases, the benefits offered by SaaS service often outweigh the higher costs associated with implementation or licensing compared to traditional perpetual licensing and in house hosting. Additionally, the SaaS licensing model allows for more transparent allocation of IT service costs, making it possible to attribute expense directly to products or services as they occur.

When transitioning to SaaS services it is important to have a realistic understanding of the implementation process. *Contrary to common beliefs, implementing a SaaS service is not always quicker or simpler than building an in-house system with perpetual licensing*. Furthermore, a significant and costly implementation project can create a vendor lock-in situation, making it impractical to switch to a different

service provider due to the high costs associated with a new implementation. This dynamic often gives SaaS service provider an advantage during contract renewals.

Sourcing SaaS services required skills and understanding that differ from those needed for perpetual licensing. It is the single most crucial phase for a client when acquiring a SaaS licensed services because the initial agreement and the terms agreed upon defines the entire service lifecycle. This is the only time when the vendor is willing to negotiate with the client and it is also the only opportunity to discuss factors like the renewal price cap. Once the implementation is complete, regardless of its ease or speed, the vendor gains leverage over the client as switching to another system would disrupt business operations.

When a company transitions to SaaS services, especially on a large scale, it necessitates a shift in the role and requirements of the IT organization. Consequently, the decision to adopt SaaS services must include a personnel strategy for IT. This transition also involves acquiring new competencies or redefining roles and skills, moving from application specific specialties to broader IT specialties such as information security, architecture or service management. Planning for this shift is essential as these competences are indispensable from day one of the transition to SaaS Services.

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