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# Applying the Concept of Modularity to IT Outsourcing: a Financial Services Case

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**Abstract.** Information systems and information technology (IS/IT) services are often outsourced to external vendors for reasons of cost cutting or specialized expertise. Throughout the years, reports about high failure rates regarding IS/IT outsourcing initiatives have been repeatedly published. Therefore, the large variety of mitigating factors proposed in literature did not seem to be sufficient to significantly improve the success rate of these projects. This paper employs the concept of modularity to study the (un)successful execution of IT outsourcing projects. For this end, we present and analyze a single case study conducted at a financial institution in Belgium. It is shown how several modular structures can be identified and analyzed and might provide insight in the (un)successful outcome of IS/IT outsourcing initiatives.

**Keywords:** IS/IT outsourcing · Modularity · Case study research

## 1 Introduction

Due to globalization and advancements in information and communication technologies (ICT), information systems and/or information technology (IS/IT) outsourcing became a very common practice in developed and emerging economies. The global market of IS/IT outsourcing is predicted to be more than \$260 billion in 2018 [7] and over 94% of the ‘Fortune 500’ companies are outsourcing at least one major business function [17]. Despite IS/IT outsourcing’s importance and its worldwide acceptance, general performance reports on outsourcing initiatives indicate problematic situations. For instance, in some studies, failure rates as high as 50% and above (e.g., [10], [20]) are reported. A large number of IS/IT outsourcing projects is being re-negotiated or prematurely terminated and many IS/IT outsourcing failures are even not publicly reported due to the fear of negative responses from the market and stakeholders [3]. Others suggest that in about 78% of IS/IT long-term outsourcing cases, the relationship between the customer and the vendor reaches the point of failure (e.g., [16]). Therefore, it is no surprise that some authors report satisfaction rates regarding IS/IT outsourcing projects of only 33% (e.g., [8]). Evolution over time tends to suggest some, but insufficient progress in this respect. For instance, one longitudinal study found that the percentage of failed IS/IT outsourcing projects (i.e., cancelled

prior to completion or delivered and never used) had declined over time but still amounted to 44% in 2009 [13].

Many suggestions have been uttered by both scholars and practitioners on how these problems can be mitigated. Some suggest to streamline operations and ‘fix the problem’ before outsourcing IS/IT services (e.g., [18]). Other management-oriented suggestions include the ‘Partnership Model [14]’, the ‘Seven steps to successful outsourcing’ [9], knowledge sharing [15], ‘knowledge transfer’ [19], high quality ‘service level agreements’ (SLA) [11] or the reconfiguration of organizational resources (e.g., [26]). However, as the empirical research (as mentioned above) continues to report high failure rates of IS/IT outsourcing projects, it seems that these remedies turned out to be partially successful at best. The desire to be better equipped to understand potential IS/IT outsourcing issues has fueled the study presented in this paper. We present the use of a well-known and widely applied engineering concept (i.e., modularity) to study an enterprise challenge, i.e., the successful execution of IT outsourcing engagements. This perspective to analyze outsourcing initiatives is new as most existing approaches adopt a purely managerial focused perspective (e.g., focusing on issues such as trust or leadership). We illustrate our approach by presenting and analyzing a case study conducted at a Belgian financial institution. While in the past, we employed our perspective to analyze two theoretically based cases (i.e., based on case material available in literature), this paper presents the first case in which information was gathered via primary sources.

The remainder of this paper is structured as follows. Section 2 will describe the methodology adopted to analyze our case. Afterwards, the case is introduced (Section 3) and our analysis and findings are presented in Section 4. Our discussion and conclusions are offered in Sections 5 and 6, respectively.

## 2 Methodology and Theoretical Background

We propose the lens of modularity to analyze outsourcing engagements. Modularity has been argued to reduce the complexity of systems [2] which makes it an interesting concept to apply to outsourcing engagements as these are typically considered to be highly complex as well. Baldwin and Clark [1, p. 86] state that a modular system is “composed of units (or modules) that are designed independently but still function as an integrated whole”. The concept is recursive, in the sense that a module within a particular system can in itself be considered as a system as well, also being composed of a set of (sub) modules [21]. Good modular design should be characterized by high cohesion (modules consisting out of highly related parts) and low coupling (few dependencies between modules). The interaction between modules is captured by their interface, which should be exhaustive and invariant throughout time. In order to manage the modular architecture of a system, a set of design rules may be put forward, which formulate a set of boundary conditions to which all modules should adhere so they can communicate with one another [2]. While some authors have already suggested possible links between modularity and outsourcing (e.g., [6, 23]), this connection

has always been formulated in rather general or even vague terms. Little explicit knowledge is available regarding which specific aspects within outsourcing engagements can be studied by means of modularity and to which insights this might lead. Therefore, we formulate the following research question: *“How can the concept of modularity be applied to outsourcing engagements: which modularity specific aspects can be used and regarding which organizational issues can it provide additional insights?”*

Based on this research question and following the decision making structure of Wohlin [24], our research is to be seen as basic research (as we want to understand a phenomenon, here: IT outsourcing), inductive (aiming to infer general claims from observed data), having a descriptive goal (investigating the “how”) and asks for an interpretivist approach. Therefore, a qualitative research process was deemed suitable as our goal is to gain an in-depth understanding of the manifestations of modularity within the context of IT outsourcing [25]. More specifically, a case study was chosen as the appropriate research method as this allowed us to investigate the relevance of the modularity concept within IT outsourcing initiatives in their natural setting [4, 25]. Given the lack of preceding in-depth work on modularity in an outsourcing context, a more descriptive case study was considered appealing.

Our unit of analysis is a single company applying outsourcing in order to deal with its required IT functionalities. The selection of the case organization was performed purposefully based on a set of criteria. The case organization had to be engaged in IT outsourcing engagements of a certain amount of complexity. An organization was preferred which operated in a different industry than those in which our previous cases were performed (i.e., media broadcasting and higher education), and which was able to put an informant at our disposal who was willing to meet at least three times. The case organization as described in Section 3 was selected as it satisfied all criteria. It concerned a company within the finance industry which is particularly interesting as this industry is recently experiencing tendencies towards high digitization. Further, the company was involved in a multi-vendor package configuration, which also differed from our earlier cases in which one large outsourcing project was discussed.

Data gathering was mainly performed through interviews and analyzed by means of thematic analysis [24]. In a first stage, in-depth desk research about the Belgian banking sector and their IS/IT outsourcing strategies was performed. Next, publicly available documentation (including news papers and magazines) regarding the IS/IT outsourcing strategy adopted by the case organization was studied. In the second stage, a first exploratory meeting with the CIO of the company was performed. Here, the goal was to get a general overview of the organization. Therefore, the main questions were directed towards the current situation of the (IT) organization, their most important IT systems, the IT architecture and the different IT outsourcing initiatives undertaken in the past and present, etc. In order not to influence the answers provided by our informant, only the general goal of the research project was briefly discussed upfront (i.e., “we investigate the role between modularity and outsourcing”) without men-

tioning specific concepts to be used during the analysis. In the third stage, a preliminary analysis of the first interview was jointly performed by the authors. The main goal of this initial analysis was to scope a set of potentially relevant issues (i.e., related to modularity) to be further investigated in the later stages. These issues were then systematically discussed and further elaborated during the second interview. In this interview, the basic ideas regarding modularity (decomposition, interfaces, coupling, etc.) were summarized for the informant. In the fourth and final stage, a more thorough analysis was performed by all authors. Also, a third interview was held in which the findings were presented and validated for factual correctness and appropriate interpretation. Any remaining questions of the informant were addressed during this interview, as well as a more in-depth discussion of the current state and findings of the research project in which the case is embedded. All interviews were conducted at the Belgian headquarter of the organization by the three authors, lasted each for about two hours, and were completed within a total time frame of about 2 months. The conversations were recorded digitally for future reference.

We acknowledge that the single-case approach presented in this paper limits the generalizability of our findings. It is however important to note that this case is embedded within a broader research project, in which several case studies (both theoretical and real-life) are performed. This should allow us to apply our perspective to various situations within different contexts, and to reflect on the generalizability of our findings in a more informed way.

### 3 Case introduction

Our case organization concerns a Belgian banking organization (further referred to as “AB bank”, a fictitious name in order to guarantee anonymity and confidentiality). AB bank focuses on private banking activities, implying that—compared to traditional retail bankers—their customer base is smaller but wealthier. Further, the bank’s activities include asset management and merchant banking services. Within the Belgian financial services industry, the organization can be considered as medium sized in terms of its number of employees, number of clients, turnover, etc. While being a private bank in its core, the bank also welcomes investment clients with smaller budgets which can be served via an online investment portal. The portfolio management activities for bigger clients are offered through personal advice.

Due to its relatively limited size (about 10 employees), the IT department of AB bank is rather small as well. The bank considers its IT activities as operational and necessary but not as a strategic issue to obtain a competitive advantage. In that context, the bank has chosen over the years for a multi-vendor IT outsourcing strategy. This means that multiple and different external suppliers are used to provide different types of services. First, most of the development and maintenance work of the IT infrastructure is outsourced to external parties. Additionally, the IT department is dealing with many applications from different vendors. Given its relatively small internal team and the focus on outsourcing,

AB bank has only developed three core applications internally: CRM, client on boarding (registering information of newly acquired customers), and an order management system. This aligns with the ambition of AB bank to limit the amount of customized products, while giving preference to the usage of package solutions. Therefore, the main activity of the in-house IT team of AB bank is concerned with the integration of all outsourced activities as well as its general management (package selection, vendor negotiations, etc.). Our informant was the head of the IT department (CIO). While sketching the current situation of his department as well as the outlook for the future, the integration of the different (often externally acquired) applications was already indicated as a major concern. As the previous two cases conducted in this research project [12] did not include multi-vendor configurations and were not situated within the financial services industry, this case allowed for a further exploration of our approach in a different setting. Moreover, the interviews with our informant allowed for a more interactive, iterative and in-depth way of information gathering.

## 4 Findings

We highlighted in Section 2 that modularity is inherently a recursive concept that can be applied at different levels. Our analysis revealed two major levels at which modularity could be clearly applied to the case at hand. Therefore, we subsequently discuss issues at an inter-organizational level (in which we consider the relationship of AB bank and its IT service providers) and at an intra-organizational level (in which we consider the internal organization of AB bank, such as the architecture of its different IT applications and their integration). This is visually illustrated by Figure 1. On the one hand, the figure depicts a general overview of the IT system modules present within the case organization (the grey ovals indicate the internally developed and maintained applications). One can easily observe that a large majority of the IT applications (i.e., the white ovals) are outsourced to an external party. On the other hand, the figure shows that for these outsourced applications, a set of SLAs was agreed upon with a set of external IS service providers.

We adopt the same way of reporting for each of the identified modularity manifestations. First, we provide some relevant context related to the manifestation and identify the modular structure which is considered. Second, we ponder on which design prescriptions can be derived from the existing knowledge base regarding modularity for this situation. We refer to these prescriptions as modularity requirements. Third, we verify whether these requirements were actually adhered to in the specific situation at hand in the considered case. Based on such reasoning we can explore (1) which modularity aspects are relevant in an IT outsourcing context (2) to which organizational artifacts and modular structures can they be applied, and (3) to which extent this could clarify potential issues in the outsourcing engagement.

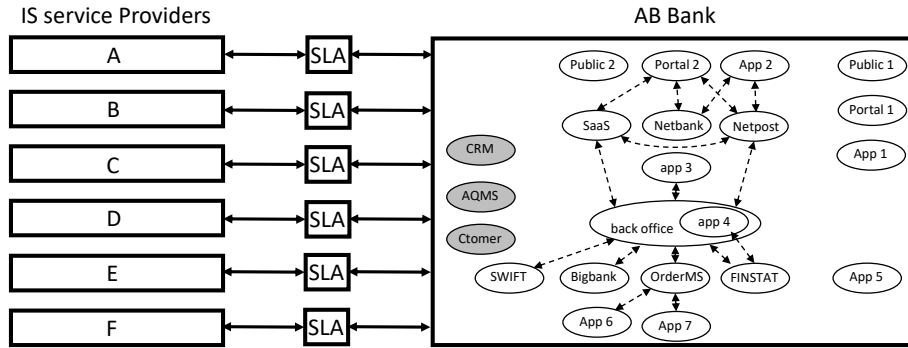


Fig. 1. Modular structures identified in the AB Bank case

#### 4.1 Modularity manifestations at the inter-organizational level

At the most general level, an outsourcing deal concerns an agreement or contract between (mostly two) parties in which one party (the vendor) agrees to deliver certain (in this case IT related) services to another party (the client). As these deals are often highly complex and of crucial importance for both parties, they need to be managed by good arrangements stipulating the roles and responsibilities of each of the involved actors. In the outsourcing industry, such contract is typically labeled as a *Service-Level Agreement (SLA)*. First, it is clear that such SLA is crucial from a legal point of view. Recall from Section 1 that many IT outsourcing projects fail and may result in non-satisfactory relationships between the vendor and the client which may sometimes even end up in a legal dispute. In such cases, obviously, the SLA serves as the starting point to analyze who has (not) fulfilled his or her responsibilities. In more general terms, the SLA can be regarded as the set of rules between the vendor and the client that govern the outsourcing relationship, which makes the SLA a crucial component of each and every outsourcing engagement. Given the importance of an SLA in an outsourcing context, we interviewed our informant in-depth about the SLAs adopted by the case organization during its outsourcing engagements. More specifically, we asked about how these SLAs were established during the initiation of an outsourcing deal. Furthermore, we obtained information regarding the extent to which the respondent believed that these SLAs were effective in providing a sufficient amount of guidance and coordination between the parties involved during the execution of the project. We also asked about the evolution of such SLA in case of long-term engagements: what if one of the parties wants to adapt certain conditions in the contract? (How) can this be done?

**Identifying the modular structure and requirements** At least two types of modular structures can be discerned when focusing on the role of an SLA within an outsourcing project. First, an SLA could be considered as the interface between the two organizations involved. Recall from Section 2 that an interface

is the common boundary between modules, and manages the communication and interaction (input/output) between those modules. As the SLA should govern the rules and arrangements between parties, this clearly matches the definition of an interface. In that case, the outsourcing collaboration is the system in scope and the relevant modules are the vendor organization and the client organization. We refer to this configuration as *modular structure 1.1*. A second option could be to consider the SLA itself as the system and the different clauses, rules or paragraphs as the modules within that system. Indeed, one could consider documents, and legal documents in particular, as modular systems [5, 22]. The paragraphs, items or clauses within such documents are clearly identifiable units—which are often reused within different contracts—aggregated into one specific contract acting as the specific SLA for a specific outsourcing agreement. We refer to this configuration as *modular structure 1.2*.

Regarding modular structure 1.1., and based on Section 2, we know that a good interface between modules should be exhaustive and complete. Applied to the SLA interpreted as the interface between the vendor and the client, this implies that all services required by AB bank from the vendor should be listed in the SLA (and other services than those embedded in the interface should not occur). We refer to this statement as *modularity requirement 1.1*.

Section 2 further mentioned that an interface should be kept constant throughout time (as otherwise changes in one module would cause unnecessary ripple effects within other modules). However, given the long-term duration of many outsourcing contracts, it is conceivable that mutually agreed upon changes in the SLA do need to happen or additional behavior of the involved parties is required (e.g., improved services from the vendor to the client). As this change of interface happens purposefully in order to change the behavior of one or both parties, this does not need to be problematic. However, in order to enable agility and flexibility regarding the SLA contract, it is required that the SLA itself consists out of subparts or modules itself (cf. modular structure 1.2). Each of these individual contract modules can then be updated or removed from the contract, or additional ones can be added. We refer to the existence of a fine-grained SLA contract which can be adapted at the level of individual clauses as *modularity requirement 1.2*.

**Assessing the modularity requirements** It was remarkable to note that the SLA was mainly considered by the case organization as a “necessary obligation” attached to the beginning of each outsourcing initiative. The formulation of an outsourcing contract was primarily regarded as a legal issue to be dealt with by the legal department and not to be consulted except in cases where judicial actions were required:

“For me a contract is something you make, you sign, and put it in a closet. (...) The moment you need that is because you have a problem.”

Instead, our informant explained that AB bank was counting—to a large extent—on the professional behavior of the outsourcing partner and expected them to be



reasonable. Stated otherwise, the “legal” SLA was indeed realized via a formal contract whereas the actual or “operational” SLA was mainly based on confidence and mutual trust: While in several situations such collaboration succeeded (due to personal contact between people at the vendor and the client side), the respondent acknowledged that this way of working had also clearly failed in numerous occasions:

“(For instance,) when we see a problem (...) and ask to ‘S’ (pseudonym of a vendor): ‘why is this problem not noticed by you?’ they answer that they were not monitoring that process. We tell the ‘S’ people that being a professional you should have monitored that problem. The ‘S’ people will reply that they have not been asked (by AB bank’s SLA) to monitor that problem. (...) Both parties have done what is stated in the contract. Yes, but was that enough? No, probably not. It is not stated in the contract that we should make the design how the architecture (of the application) should look like and define it. But we expect them to operate the platform that runs the application.”

From the above, it becomes clear that the description embedded within the SLA was by no means exhaustive. Ambiguous formulations were (often consciously) allowed within the contract as trust was considered to be the main driving force behind the collaboration. As a consequence, we conclude that modularity requirement 1.1 was not met.

While we do not underestimate or want to ignore the importance of human aspects (such as trust) in organizational collaborations, we find it interesting to note that this identified violation of requirement 1.1 (i.e., an insufficient specification of the way of interaction between the parties) was precisely considered by our informant as one of the most important reasons why outsourcing contracts were not always executed as expected. Discussions arose with vendors on who should do which tasks and it was highlighted that AB bank was unable to insist on getting the expected services performed properly due to their limited leverage over the respective vendors.

When asked for the possibility to adapt the SLAs with its vendors during the execution of an agreement, our informant indicated that such things simply did not happen at AB bank. Also here, our informant indicated that this is mostly assumed to be covered by mutual trust: an outsourcing contract is often negotiated and drafted as a whole, and there is not really a procedure in order to accommodate changes. Contracts are typically signed for a fixed duration (e.g., five years) and should therefore be renegotiated within the borders of this cycle. The only type of change which was explicitly taken into account was the (premature) termination of the contract initiated by the client (i.e., AB bank). This was again mainly included based on financial and legal motivations, such as stipulations regarding the maximum amount of costs for AB bank in order to leave the deal and be able to switch to another vendor. From these findings, it is clear that the SLA itself was considered as one monolithic block which was to be dealt with (and negotiated) as one whole. Parts (or modules) could not be

changed during the stipulated duration of the contract. Therefore, we conclude that modularity requirement 1.2 was not met.

#### 4.2 Modularity manifestations at the intra-organizational level

At a more fine-grained level, an IT outsourcing project concerns the transferal of certain responsibilities regarding a (set of) IT application(s) from the client to the vendor. Clearly, at the client organization, these externally developed IT applications should be integrated (both with internal systems and with systems from other vendors) so that they can collaborate with one another if required. As described in Section 3 and illustrated in Figure 1, AB bank adopted a multi-vendor outsourcing strategy encompassing numerous medium sized applications and only a limited amount of applications developed and maintained by themselves. The arrows within the figure depict the most important interactions between the systems.

Given the importance for AB bank of managing this set of applications, we interviewed our informant in-depth about how the organization dealt with this particular configuration. More specifically, we asked about how the integration between these applications was established. Was this easy or problematic? Whose responsibility was this? And how was this taken into account during the different phases of the outsourcing project (e.g., initiation, startup, execution, etc.)?

**Identifying the modular structure and requirements** The modular structure to study the communication between and integration of AB's IT systems can be easily identified. That is, each individual IT application is a module on its own. Our informant discussed the elaborate IT application landscape within AB bank (e.g., the different applications for the back office, front office, customer on board, etc.), some of them being internally managed and some of them externally. As the organization did not distinguish subparts within each application, the application level is the lowest granularity level available when studying the integration issue in this case. Therefore, we consider AB bank's IT application portfolio as the system, with every individual application being a module. In case an internal system has to communicate with an external IT system, this latter system should also be considered as a module. We refer to this configuration as *modular structure 2.1*.

We mentioned in Section 2 that a well-designed modular system should have a clear and well-established modular architecture. This means that the set of modules (here: IT applications) in the system should be identified and the dependencies between the IT applications (i.e., the interfaces) should be exhaustively documented. A set of design rules should be created, formulating conditions to which the IT applications have to comply (i.e., required inputs and outputs). Within these limitations, each IT application can freely choose its specific implementation. We refer to the existence of exhaustively documented inter-application interfaces and the adherence to centrally defined design rules as *modularity requirement 2.1*. Further, Section 2 explained that a good modular

structure should exhibit high cohesion, meaning that every individual module should have a clearly focused responsibility. Applied to modular structure 2.1, this means that every IT application should be concerned with a clearly delineated functionality and, for instance, no overlap in functionalities among multiple IT applications should exist. We refer to this latter statement as *modularity requirement 2.2*.

**Assessing the modularity requirements** At the start of the discussion of the IT application integration during the interview, we expressed our feeling that the architecture looked rather complicated and that we were wondering if and how integration occurred. It was immediately noted by the informant that integration was an important IT challenge within AB bank as it was straightforward for him to enumerate a set of pertinent issues in this area. For example, it was stated that if a new customer is coming to open an account, the administrative employee needs to enter data manually in 7 different systems and that in some cases this number of systems can go up to 15. Or, if a customer likes to order a particular equity, the portfolio manager first has to look up the equity offers within a system *A* and then needs to go to system *B* to execute the order as no direct links between these two systems is established. Similarly, if a customer calls to AB bank and asks to buy a certain amount of a particular stock, the portfolio manager will enter this request into system *B*. System *B* sends this request automatically to the broker's system (typically another Belgian bank). The request comes back to system *B* confirming that the operation is executed at a particular price per share. The additional charges for this operation (e.g., commission, taxes, etc.) do not get incorporated in the invoice at that moment as it is not included within the interface between system *B* and the external broker. In fact, the information about the additional charges is only known to AB bank (and therefore its client) one day later. Stated otherwise, not all systems which can or should automatically interact were properly connected in the case of AB bank. Furthermore, this even did not seem to be a real priority when asking about the process of vendor and application selection:

“When we select an application, the 1<sup>st</sup> thing we look at are the functional requirements. Do they match with our business requirements? Then we look at the non-functional requirements. We look at (...) are we able to manage the operating systems, the database systems, things like that. But indeed we don't take, let's say, some requirements there in terms of what kind of interfaces do we want.”

Finally, it was interesting to note that the integration problem was not only technical or on a syntactical level, but equally semantic: the respondent acknowledged that different systems often used different (but similar) concepts which further hampers the integration. From this exemplary evidence, it becomes clear that the interfaces between the different applications of AB's IT portfolio were often not exhaustive, if they existed at all. Therefore, we can conclude that modularity requirement 2.1 was not met.

In order to investigate the degree of cohesion in the IT applications of AB bank, we asked our informant about how vendor and package selection was performed when a certain (new) functionality was required to be fulfilled. It became clear that the case organization performed its search in a purely supply based fashion. Stated otherwise, no explicit upfront delineation of IT application modules and their required functionalities was performed by AB bank when initiating the search for an outsourcing partner and packages. One can expect that such approach results in IT applications with rather broad responsibilities, which are quite likely to be frequently partially overlapping. This was largely confirmed by our informant:

“Of course, if you go back to the packages, they come out-of-the box with a number of functionalities that you possibly already have in other systems. (...) At the end (...) you will end up with some double functionality in modules that provide the same function.”

Based on this evidence, we can conclude that also modularity requirement 2.2 was not met.

## 5 Discussion

Table 1 summarizes the findings presented in the previous section. It is interesting to see that our analysis pointed out that modularity aspects could be applied to a variety of situations such as the collaboration as a whole, its SLA, as well as aspects within the IT application portfolio. While the manifestations found in this case did cover both organizational and technical (IT) related matters, they were exclusively situated within the outsourcing configuration and not the process (steps) for executing a project. It is important to realize that the observation of all modularity requirements not being met in this case does not mean that the application of the modularity concept was unsuccessful or irrelevant. In contrast, one can note that each of the violated modularity requirements could be associated with suboptimal situations within the outsourcing engagement and provided additional insights in potentially underlying reasons of the related issues.

As discussed in Section 2, we validated our analysis in phase four of the case study with our respondent. Here, we also wanted to know from our informant whether our approach offered a useful way for him to look at some of the IT challenges within AB bank and if so, in what way. It was interesting to note that the informant explicitly acknowledged that he indeed found our perspective to be relevant and it was triggering him to think about certain things in a new and fresh way. In order to prevent possible bias and “researcher pleasing” behavior, we asked for a more specific argumentation. Then, the informant for instance mentioned that he was not aware that their integration was a problematic issue in such large extent and that he was thinking about how he could incorporate ideas regarding design rules (which were currently absent) into his organization.

Modular Structure	Modularity Requirement	Conformance
Outsourcing collaboration	Fully specified SLA	not met
SLA	Fine-grained clauses	not met
IT application portfolio	Exhaustive interapplication interfaces	not met
IT application portfolio	Cohesion and lack of duplication	not met

**Table 1.** Summary of findings

Nevertheless, our informant also indicated several practical issues which might arise when trying to avoid the above mentioned violations of modularity requirements. Consider for instance the identified need for complete and exhaustive SLAs (i.e., inter-organizational interfaces). Our informant acknowledged that a necessary amount of trust combined with a more complete and operationally defined interface was likely to improve their outsourcing collaborations:

“We didn’t provide (this service) in the SLA and perhaps we should have thought about it in advance that the system should function as designed and that the response times are within appropriate limits. Perhaps we also put the SLA at a too high level. We should have gone more into some detail points. (...) It is indeed more on operational levels that we didn’t describe what we expected them to do. (...) Ok, (now) I understand, if we would have this kind of description, we could easily take it and discuss it with the party to see where the differences are.”

However, the actual realization of such contracts in practice did not seem straightforward in all cases. For example, listing all activities that should ever be done in an outsourcing collaboration seems rather difficult as it is challenging to look ahead in this way:

“In an outsourcing contract it is difficult to foresee what I need in six months or in one year. It is difficult to make it specific, therefore it is also difficult to foresee it already in a contract.”

In contrast, what might be realistic is to have an independent industry standard, in which the generally accepted best-practices for such outsourcing deals are listed. Contracts based on these standards could probably already partially mitigate this problem.

A similar remark was made with respect to the modularization of the SLA contracts themselves. While the informant indicated that modular contracts would be highly appealing from a client organization viewpoint, it was also uttered that the realization of modular SLA contracts is not trivial either. First, the different parts (clauses) in a contract are typically not fully independent: changes or stipulations in one clause can influence other ones, hampering simple aggregation in a plug-and-play fashion. Second, easily changeable contracts might reduce the negotiation power of vendor organizations and therefore be

in contradiction with their implicit business model: in typical outsourcing contracts, deals are made for a period of 3 to 5 years guaranteeing the supplier a revenue for the upcoming years.

The informant also agreed with the observation that the modular architecture resulting from the supply-based selection of packages (causing duplicate functionalities to arise) could be improved. It was indicated that it was likely that a more fine-grained modular approach was required to do this:

“We start in fact from an application which is in itself perhaps designed quite modular but we don’t use it (in that way) because we use it as a complete functional box and now we are trying to cut pieces out of this complete box.”

Finally, our informant acknowledged that the modular integration of the different IT applications within AB bank was far from optimal. AB bank had the ambition to improve this situation in the future. However, also this was considered to be non-evident due to multiple reasons. For instance, being a small to medium sized financial institution with a limited amount of customers, integration projects such as those related to the new customer registration process are very unlikely to obtain a sufficiently high priority. The informant additionally indicated that they also had some fundamental questions on how a good modular structure, in order to allow such integration, should be developed in the first place. While some basic and intuitive knowledge regarding modularity was present in the company, our informant indicated that in such case it would be required for him and his organization to acquire more in-depth knowledge regarding modular systems and sound integration practices.

## 6 Conclusions

IS/IT outsourcing is an important business strategy for many organizations. Unfortunately, failure rates remain high. This paper presented a new perspective on IT outsourcing initiatives, based on the concept of modularity. 4 modularity manifestations were identified, after which a set of modularity requirements was derived and tested for its (non) adherence in the context of a single case within the financial services industry. The ability to identify modularity manifestations and testing modularity requirements in a case study fulfills the main goal of our paper, i.e., demonstrating the relevance of modularity for interpreting and understanding IT outsourcing issues, and exploring the set of issues for which the approach can offer additional insights. Nevertheless, the observation of all 4 modularity requirements not being met in this case clearly reveals the need for future research: the actual feasibility of more modular-compliant outsourcing engagements in practice should be investigated (i.e., to which extent can modularity requirements be met in a realistic environment?). This necessity is also supported by the fact that our respondent indicated some practical issues in this respect. Additionally, our findings were exclusively situated within the

outsourcing configuration and not the process (steps) of executing such project, so the latter aspect should be subject to future research efforts as well.

We believe this paper has theoretical and practical contributions. Regarding the first, several authors have already suggested the potential importance of the concept of modularity in the context of IT outsourcing. However, how our understanding of IT outsourcing projects can precisely be improved by using the concept is hardly ever discussed. Our paper clarifies some aspects of the relationship between modularity and IT outsourcing by listing a specific set of relevant issues to which modularity could be applied. A structured way of analyzing these manifestations (modular structure–modularity requirement–conformance) was offered in the context of an actual case. Regarding the second, practitioners could benefit from the examples provided in the paper. They describe how a well-designed modular structure within IT outsourcing projects can lead to (partial) improvements of their real-life outsourcing challenges and vice versa.

A limitation of this paper is the fact that it concerns a single case study, limiting its generalizability. However, as this case is part of an overarching research project (investigating the relevance of the concept of modularity in the context of IT outsourcing), this will be mitigated by the future integration of this case within the overall research project. Such overview could reveal which aspects from the theoretical knowledge base on modularity are, in general, most relevant for studying IT outsourcing. It could also offer interesting insights by highlighting those outsourcing risk factors (mentioned in management literature) of which our understanding could, in general, be improved by using a modularity perspective. As another limitation, it is important to remark that this paper does not propose an encompassing formalized model of IT outsourcing initiatives in terms of modularity (rather, our focus was put on demonstrating the mere relevance of modularity in this respect). Again, such efforts could be initiated once all case material in the mentioned research project has been integrated.

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