

Integration of Inter-Company Business Processes by Emerging BPO Approaches

Benefits and Risks in System Supplier's Network

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Abstract

Due to the fast-increasing trend of inter-firm networking and the intensification and deepening of organizational partnerships, the integration of companies' business processes has become an increasingly important topic during the last decade. The extent of the use of information technology (IT) in the integration of inter-company business processes (B2B processes) has also grown rapidly during the last few years. As the electronization of inter-company business processes often includes web solutions of diverse standards and applications, companies are looking for alternatives to outsource integration and partly management of B2B processes. 3rd party integrators are providing services to enable and facilitate the integration of inter-company business processes. Success factors of business process outsourcing (BPO) have been studied at least over a decade, but as electronization of B2B processes is a fairly new integration effort in companies, benefits and especially risks are not well enough identified or managed. In this study, we have explored the emerging BPO approach in B2B integration by the help of related literature as well as by conducting a case study *to create an analyzed picture* of benefits and risks from the perspective of a globally operating Finnish system supplier in building industry.

Keywords

B2B process integration, electronization of business, e-business, e-business adoption, BPO, business process outsourcing, third-party integrator

Introduction

The extent of the use of information technology in inter-organizational business processes has had remarkable growth in last decades. Motives for using IT are very much related to the crucial role of communication in order to improve the efficiency and effectiveness of business processes throughout the supply networks. Still, few companies seem to be able to develop their inter-organizational communication systems alone, and are thus not able to leverage the power of communication progressively. For example, lack of resources and capabilities of the company, quickly changing business and technology environment, and diversity of standards and communication systems have forced firms to search for various solutions to assure the effectiveness of the communication between actors in the supply network.

There are important technological, market-related and business environmental trends that affect the field of business process integration, as well as potential contingency factors the probability and effect of which cannot be accurately determined. These factors have also a significant impact on choices that e.g. a system supplier has in the business process integration. In this study, we try to assess the effect of different such factors on the B2B integration decisions. These factors are an important spur and a starting point for this study.

In this study, we aim to explore the alternative of business process outsourcing (BPO) to third-party integrators which are providing services in electronic integration and partly management of B2B processes. Success in inter-company integration is dependent on the success in adopting BPO. We focus to *create an organized picture of benefits and risks* related to electronic B2B integration adopting BPO approach. In addition, we investigate which kinds of means can be used to manage identified risks and how benefits of new operating models can be viewed as increasing strategic capabilities and operative performance. A case company is studied to gain more in-depth insights to the above issues.

Trends in B2B integration

Information technology (IT) has the capability of making radical differences to the organizational structure and practice (March 1999). In fact, the managerial challenges of e-business seem to be diverse and often related to the management of change. According to Timmers (2000) internet technology has a significant effect on business organization. For internal organization process re-designs and human resource management should be considered as an important change functions. He presents case examples where the use of electronic commerce has flattened the organizational structure and changed decision-making policies. Because the decision-making information can be shared better through organization, responsibilities are clearer and decision-making power can be transformed closest to the decision. Deise et al. (2000) offer same kind of observations arguing that increased transparency of information flattens the organizational structure. They also proclaim for visibility embedded on the business model that enables and sustains accelerated actions. This will help organization to overcome cultural roadblocks and resistance.

It is also necessary to reconcile e-business to the external business organization which means the cooperation with suppliers, channel partners and customers. As Timmers (2000) points out, information and communication technology can lead to radical changes within the company and between companies. Information technology allows companies to cooperate with business partners at lower transaction costs. This will make it interesting to outsource certain activities or functions to other companies, allowing companies to choose not just between markets or hierarchies but also 'hybrid' form of collaboration, which can be called network or partnership relationship. This trend towards outsourcing brings new opportunities to small and medium sized enterprises operating at a lower level in value network.

Switching costs have important role in terms of transaction cost framework. According to Porter (2001) "switching costs encompass all the costs incurred by a customer in changing to a new supplier". It is evident that IT increases the risk of lock-in to the certain partner. Particularly, very scarce services may cause high interdependence on a partner. Shapiro and Varian (1999) warn that the users of information technologies are vulnerable to lock-in in a

particular information system and this may cause expensive switching costs. The risks of digital business model have also been identified by Harland et al. (2003) who argue that electronic business and Internet increase the speed and complexity in supply network, and consequently increase the risk. Companies are more dependent on each other and also dependent on the ICT.

The risks of IT security should also take into account when addressing to the effectiveness of information technology. This is for example pointed out in the Information Security Framework by Palmer et al. (2001). When considering the organizations operating in the network, it is obvious that information assets and their vulnerability are just not a concern of a single organization, but rather also the property of the collaborative partners. The core of their model is on risk analysis, which identifies the importance of information assets, their vulnerabilities, and recovery plans for business continuity. These issues should be considered carefully when outsourcing the supply network integration services.

Increasingly turbulent business environment requires constant change management from business processes and thus affects the need for efficient change control tools for inter-firm operations. These tools, supporting deviation control of business processes, could be outsourced to a 3rd party BP-integrator. In this way the role of BP integrator is changing toward business partner in a network.

Due to the trends affecting the business globalization networking of companies and their business processes is no longer limited within national borders. Due to the internationalization of organizational networks concerning both the operation of large and smaller firms, also the business process integrators need to be able to operate internationally, and they have to develop their expertise to be better able to operate as a link between companies operating in different countries. The integrators for instance have to consider the differences in the maturity of the e-business infrastructure in different countries, as well as the potential differences in e.g. business applications, technological and business integration standards, interoperability and IT security –related issues. Since business process integration is not only concerned with technical issues, but essentially also with the ways that companies collaborate, also various aspects dealing with cultural and business cultural issues should be understood and taken in consideration when designing operation models for international business process integration.

Table 1 summarizes some of the main trends affecting the business processes and their integration, as well as their implications to business process integration, and the potential effect on the systems supplier (network). The basic assumption is that the need for flexible and need for inter-firm process integration is increasing. This comprises of both technological and business integration services. The changing role for third party integrators' is challenging, however, providing many opportunities to take responsibilities of wider range of activities in entire value networks.

Table 1. Important trends and their implications for business processes of systems supplier

Important trends concerning Business Process integration	Implications to Business Processes and their integration	Potential effect on the systems supplier network
1. Increasing use of IT in business	Demand for integration applications and services Interoperability of applications	Need for access to wider scope of expertise in integration and services (standards, protocols, applications,...)
2. Increasing inter-company collaboration and networking	Integration of increasingly more complex business processes More resources and expertise needed in business process integration Interdependence; increasing communication needs	Need for external expertise in the integration
3. Focus on core competencies	Outsourcing of non-core processes and operations	In-depth understanding of the business of system supplier's customer (and the end user)
4. Significance of IT security issues	Importance of risk management in process integration	Need to make sure that the integration solutions provide sufficient security level
5. Increasing dynamism and unpredictability of customer needs and business environment	Flexibility of business models and structure Increasing customer focus Need for constant change management	Need to consider various available options to carry out efficient BP integration that provide enough flexibility. Fast detection and control of process deviations internally and also in system supplier's network. Need to understand customer's business more and more carefully
6. Globalization of business	Global inter-company networking	Monitoring and controlling of globally operating, distributed inter-company networks

Integration levels supporting inter-company co-operation

e-Business today is increasingly widening the concept of business from a simple transactional approach (goods or services that should be selected, bought and delivered, paid,..) to a more complex and wide concept of inter-firm co-operation that include process monitoring, inter-company co-operation and collaborative design (the definition of the features of the product) as well. This new approach stresses the concepts of interoperability and seamless supply and design chain management that have a strong impact in standardization addressed to industrial sectors (CEN/ISSS 2003).

Standardization has been a general strategy across all levels of the enterprise integration framework. Giachetti (2004) has introduced a four-level framework of inter-firm integration including process level, application level, data level and technical network/platform level. Table 2 decomposes a modified enterprise integration framework to reveal and define the integration types and basic functionalities to be supported by standards. Besides, some focal examples of standards are introduced to better understand the complexity of inter-firm BP integration and the need for multi-level expertise.

Table 2. Enterprise integration framework

LEVEL OF INTEGRATION	BASIC FUNCTIONALITIES	INTEGRATIVE STANDARDS, STANDARDIZED TOOLS, MODELS AND METHODS e.g	INTEGRATION TYPE
BUSINESS PROCESS INTEGRATION	Supply Chain / eBusiness Management	SCOR reference model ebXML standards	COORDINATION
DESIGN PROCESS INTEGRATION	Industry-wide Business Process Management	RosettaNet (industry specific)	
BUSINESS PROCESS MODELLING	Design Chain Management	DCOR reference model	
APPLICATION INTEGRATION - In-house or ASP-based	Process design	ARIS, Process Guide, etc.	
APPLICATION INTEGRATION - In-house or ASP-based	Integrative enterprise Information systems ERP, CRM, SCM PDM, PLM	EAI middleware XML interfaces	INTEROPERABILITY
DATA INTEGRATION	Data exchange	EDIFACT	DATA SHARING
	Product data exchange	XML conversions STEP (exchange of product model data)	
TECHNICAL NETWORK INTEGRATION	Platform functions Operating systems	Internet / Intranet technologies	CONNECTIVITY

Each of the levels of integration has in some degree vertical inter-dependence of each other and thus consolidation and concurrent design is required. The relationship between *data integration* and *process integration* is complex (Markus et al 2003). Process integration requires data integration, but data integration does not always support process integration, because the former requires source system standardization or modification, while the latter does not. Anyway the benefits of integration can only be achieved through streamlining or reengineering the business processes of partner companies. Two approaches to easing the

demands of process integration are *industry-wide process standardization efforts* and the “*adapter*” or *interface technologies of enterprise software vendors*.

Best known of the industry-wide process standards efforts is RosettaNet consortium in the computer and electronics industry including seven clusters such as order management, inventory management and manufacturing. For example the order management cluster contains the processes of quote and order entry, transportation and distribution, returns and finance, and product configuration. The standards include both data definitions and a prescribed process flow, allowing for process streamlining. Thus pairs of companies must decide whether and how to implement these standards, one process at a time (RosettaNet 2001).

Standardization is most appropriate for the slow-changing infrastructure elements such as the network and application levels. It is not appropriate for fast-changing applications (Giachetti 2004). The extent of integration between two processes is related to the speed with which one responds to events in the other. This speed depends on both the immediacy of communication and the degree to which the processes respond to the information communicated. Enterprise information systems can play roles in both aspects of integration, first by supporting the communication and second by making it easier for each business process to use the information to respond effectively. As an example, we can consider the way integration between the sales effort and the production effort has become a major competitive issue in many industries. The more integrated these processes are, the faster the production process responds to new orders from sales.

Business process outsourcing as option of B2B integration

Whether to make in-house or buy from outside supplier has traditionally been one of the most important decisions the management of the company encounters. Framework for the analysis has for example developed in the transaction cost economics (Williamson 1985) which has addressed the factors affecting to the optimal governance mechanism of an activity. Transaction costs; costs that arise from coordinating the activity have been used as a basis for whether to choose a hierarchy (make) or outside resources (buy). Theory of TCE assumes that transaction costs are higher in use of external resources for example due to specialized assets, search costs, information costs and enforcement costs (see e.g. Dyer 1997). Other factors like economies of scale, core competency ideology, availability of complementary capabilities and risk sharing have, on the other hand recognized to be drivers of outsourcing.

Business process outsourcing (BPO) is defined as the movement of business processes from inside the organization to an external service provider (Duening, T.N., Click R.L., 2005). Furthermore, BPO consists of the management of one or more specific business processes or functions (e.g. procurement, accounting) by a third party, together with an information technology (IT) that supports the process or function (Halvey et al. 1999). It can be concluded that BPO represents both practically and theoretically a fascinating area of exploration since the research in the field is still novel and decision makers in the organizations request for concepts and models to facilitate decision making. Companies are confronted by huge challenges and changes in the ways of organizing the communication and information transfer in the increasingly global economy.

Motives of business process outsourcing are diverse. According to Feeny (2005) most companies seek alternative and improved ways of leveraging their assets. Furthermore, upgraded processes may boost the overall business performance of companies and their partners. In order to exploit the benefits of outsourcing, companies should firstly decide about the goals they are seeking and which supplier capabilities they need.

The increasing outsourcing of activities has remarkably increased the significance of firm external resources. It follows that the increasing trend towards concentration of core competencies and outsourcing other activities has had a remarkable effect on the business risk management of companies. As stated by Lonsdale (1999), many companies are disappointed with the results they have achieved from outsourcing because of lack of decision making and risk management methodologies. The selected risk classes of outsourcing are briefly illustrated in the following.

Loss of capabilities and resources

The loss of the resources and capabilities that ensure the competitiveness of the company has been identified an important source of risk in outsourcing (Quinn and Hilmer 1994, Lonsdale 1999). The critical step in the outsourcing process is also to analyze the capabilities of the service provider. Feeny et al. (2005) have defined capabilities that are most important in screening suppliers. According to Bhattacharya et al. (2003), the evaluation of the outsourcing decision could be based on the comparison the risk exposures of internal and external capabilities to perform an activity. The scarcer the capability is the more appealing is the decision regarding to develop capabilities internally and vice versa.

Information security

Information security has an important role in the analysis of outsourcing decisions. This is especially important in the cases where the information transfer and communication has a critical role. It is obvious that risk exposure of different processes may vary significantly according to the characteristics of the system or process. Here, the assessment should address the vulnerability of a process and time and cost of recovery of the process. The information security policy framework (Palmer et al., 2001) addresses the role of information assets and the information security in the development process. The core of the model is on the risk analysis which identifies the importance of information assets, their vulnerabilities, and recovery plans.

Loss of strategic flexibility

The outsourcing decision affects to the strategic flexibility of an activity or process implying that it may be difficult to change the standardized processes if necessary (Earl, 1996). The implication of the loss of strategic flexibility is that the supplier provides same services also to the other customers and also to the competitors which prominently reduces the benefit of the outsourced activity or process with regard to the competitive advantage.

Dependency on supplier

The obvious implication of the outsourcing decision is the danger of dependency on suppliers (Lonsdale, 1999). According to Bensaou (1999) the dependency in supplier relationship can be assessed with the levels of the buyer's and the supplier's specific investments in the relationship. In the cases of asymmetry in the relationship specific investments, the other

party is captive in the situation. The trap of “lock-in” situation might have a significant effect on the relative power position in the supplier relationship and consequently to the opportunistic behaviour in the relationship (Williamson 1985).

The risk of dependency may arise from the complexity and maturity of an activity or process. In the cases of supplier/customer –specific processes it might be difficult to replace a supplier. This will be the case for example in the early market stage of an activity reducing the amount suppliers in the markets. The implications of the asymmetric dependency risk are the increased costs due to lack of competition and prioritization of other customer in the resource and capacity overload situations.

Case study of benefits and risks of BPO in system supplier environment

Description of the chosen case company

The case company is a relatively large Finnish systems supplier with a network of suppliers. It provides system solutions for an industry, which can be considered a rather traditional and stable one – the building industry, where relatively few major changes have happened in the business manner and logic lately. However, the manner and rules seem to be in a state of flux, partly due to the novel electronic inter-firm integration concepts and technologies. The solutions area the company operates in is also a traditional and fiercely-competed one, the competition being both local and global. The company is a market leader in selected market segments, and close to being the global market leader in other segments. It operates in dozens of countries all over the world. The company has a few years ago adopted a BPO concept, provided and co-developed together with a 3rd party business process integrator. We considered the case interesting, in addition to the case company and case industry-features, also due to the relatively novel and unique manner the business process integration was achieved through the 3rd party. Also the speed and the manner of the change appeared impressive, and the integration has been achieved globally in a large number of companies.

BPO service concept provided by the 3rd party

The main operations of the BPO provider company are related to the integration services and management of deviations in customer value networks. The objective is to identify fundamental inter-firm information flows and to assure that necessary information is available for all important parties in the network. The significance of deviation identification is increasing and deviations often activate different processes. Minimization of ad-hoc costs of the customer companies is one of the main arguments for using the services.

The business concept of the BPO provider is unique in worldwide. The company is a sole service provider that offers operations beyond the boundaries of standards (e.g. EDI, RosettaNet) and applications (e.g. ERP, CRM, PDM). This allows integration solutions that are required by the customers. These solutions are designed to facilitate information sharing in all levels of the value network, see figure 1.

ANI process integration

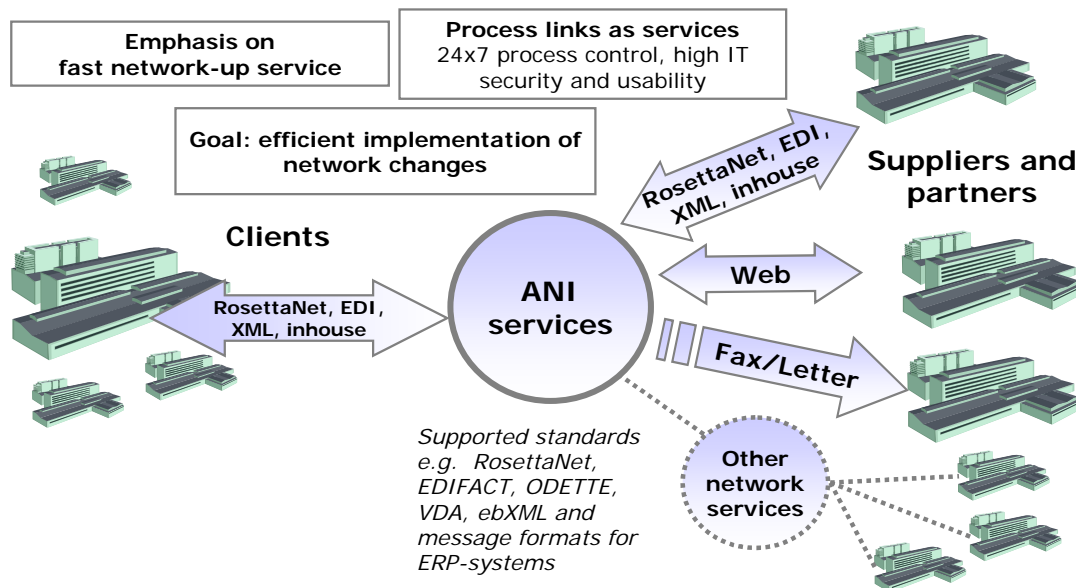


Figure 1. Operating model of the case BP-integrator (Anilinker 2005)

The benefits and risks of BPO have been investigated in this study by in-depth interviews in systems supplier case company and 3rd party BP integrator. Since adopting of BPO can involve major changes in the operating model both in supply network and customer network significant benefits and risks may occur in the systems supplier environment.

Benefits and risks of BPO in case company

The benefits and risks identified in the case company interviews, as well as risk management activities have been categorized and studied in this chapter. We summarize the essential recognized benefits of electronic B2B integration adopting BPO approach in the case company (table 3). The three benefit classes of e-business process integration utilized in the paper have been introduced by Kalakota & Robinson (2001). The recognized benefits in the case company and its business environment have been classified according to whether the effects are more short-term operative or long-term strategic in nature, the first category being generally more short-term and operative, and the second and third categories being more long-term and strategic.

Some views and comments arose during the case interviews:

- System supplier aims to achieve a dynamic partner network - standardized processes enable the formation of a dynamic inter-firm network (easier to connect / disconnect partners in the system provider's network).
- Opportunity for integrating and committing the customers (or other partners) in the electronic, automated process, taking into consideration the customer's present investments and maturity for electronic BPO, and as a part of a more in-depth partnership (a network) (3rd party approach enables)
- Strategic options: e.g. possibility to select most committed and potential partners as a part of more in-depth business network

- The system supplier could not foresee the whole magnitude and velocity of changes when (3 years ago) started the project.
- Some of the results have been even rather surprising.

Table 3. Benefits of business process outsourcing in the case study

Benefit category (adapted from Kalakota & Robinson 2001)	Benefits in BPO of the case company
Improvement of processes and streamlining of workflows	<ul style="list-style-type: none"> ➤ cost reduction, e.g. due to the significant reduction of manual routines, as well as defects resulting from manual routines ➤ almost defectless processes due to automation of routines ➤ increased transparency of processes <ul style="list-style-type: none"> ○ increased transparency enables the company e.g. to develop suitable (operational and strategic) measures, as well as to better manage and further develop the processes ○ => also strategic benefit!
Strategic progress	<ul style="list-style-type: none"> ➤ shortened lead times ➤ shortened time to react to customers' orders (by the whole network) <ul style="list-style-type: none"> ○ shortened reaction times of suppliers (e.g. component orders, other?) ➤ increased service level for customers (and clearly increased customer satisfaction) <ul style="list-style-type: none"> ○ in addition to the above, e.g. the role of sales persons has changed significantly ○ increased time for co-development and consulting with the customers individually, instead of focusing on selling and routine activities ➤ 24/7 service level ➤ learning effect - co-learning together with the 3rd party experienced as an important benefit
Business transformation	<ul style="list-style-type: none"> ➤ the transformation of the building industry from project-based to process-like business ➤ enables the whole network to better compete against other networks (instead of the former dominance of firm-level competition) ➤ more agile and flexible network that can react faster to changes affecting the building industry ➤ deepening of the partnership relations <ul style="list-style-type: none"> ○ e.g. co-development of products and processes ➤ the achieved cost-reductions can be shared to benefit the whole network and to increase thus the competitiveness of the network

Success in electronic B2B integration and management of inter-firm processes by adopting BPO is not only dependent on increasing operative performance in short term but also increasing strategic capability and especially risk management in the change process.

Table 4 summarizes the essential risk factors of business process outsourcing in the case study. The four risk classes of outsourcing are based on the general literature review on the topic. Risk management activities in the table have been collected from the case study to illustrate examples of means to control and reduce risks in the business process outsourcing. By comparing the risks and management activities it is possible to identify and test the robustness of the selected strategy in outsourcing. This also facilitates to develop new risk management activities if necessary.

Table 4. Risks and risk management of business process outsourcing in the case study

Risks	Risk management activities
Lack of resources and capabilities <ul style="list-style-type: none"> ➤ Lack of internal resources ➤ Lack of 3rd party resources 	Prioritization and phased transformation in the development R&D processes are not outsourced Development of internal competencies Developing global relationships with local partners 3 rd party competencies development to support change management
Information security <ul style="list-style-type: none"> ➤ Vulnerability of the process ➤ Detection of the failure ➤ Recovery time of the process ➤ Recovery cost of the process 	Increased redundancy of the 3 rd party integrator Company has partially outsourced security risk management to 3 rd party integrator Other providers that can run the messaging transfer Internal systems development Developing internal capabilities Developing back-up systems
Loss of strategic flexibility <ul style="list-style-type: none"> ➤ Ability to customize processes ➤ Lack of process innovation ➤ Adjustment of the organization to the new way of action 	Company's representative has a leading position in the integrators' community of practice 3 rd party operates only with inter-organizational processes Standardized interfaces provide flexibility to restructure the supply network structure Changes of internal organizational structure
Dependency on BP integration supplier <ul style="list-style-type: none"> ➤ Scarce availability of resource ➤ Increasing costs ➤ Lack of prioritization ➤ Low commitment of 3rd party ➤ Bankruptcy of an 3rd party 	Development of internal capabilities Company has chosen partnership strategy with the integrator Change to other providers that can run the messaging transfer Use of standardized reference models and processes Visibility of activities

Conclusions

With traditional BP integration approaches, it would not have been possible to achieve the same velocity of BP integration than with the 3rd party supported approach providing business process integration services. First, the participation in this type of network did not require heavy IT investments from the focal company and its other partners, like the other traditional approaches do. The partners could be integrated almost regardless of the phase in e-business adoption. The velocity is also due to the fact that the focal company managed to deal with only few investments in IT infrastructure, and could mainly use the current systems, e.g. SAP R/3, in the integration phase.

Another challenge of using BPO approach in business process integration is that the focal company has to adopt a new operating model possibly in an increasingly growing business environment. This requires new standardized working procedures not only from the personal of the focal company but also from co-operating network partners and the 3rd party process integrator itself. When considering the risk management of BPO, the resource and capability dependency arises to the key question. It follows that the resources and capabilities of the focal company and the service provider should be identified. Firstly, the service providers' resources could become a bottleneck in the development process if the amount and complexity of integration develops too rapidly. Secondly, own resources should also be developed to ensure the understanding of the outsourced process. This will facilitate the effective development and coordination of the process in the long run. Finally, the

asymmetric dependency from the service provider should be avoided to ensure the equality in the relationship. Possibility to change to other service providers that can run the processes should be assessed.

The very crucial change in companies applying BPO services of 3rd party appeared as the rules of the game could change in a very short time in an industry. This means that competition could divide business actors in two sectors, those of B2B processes electronized and those of not electronized. The case proved that also in a traditional, relatively slowly changing industry, even major development steps are possible due to novel types of BPO approaches like the 3rd party approach of this study.

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