Enhancing sourcing's value through integrated contract data management

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Abstract

Contracts play a critical role in the value chain, representing the objectives, rights, and obligations of parties involved. In nutshell contracts determine the business value for the contracting parties. They also help manage the increasing compliance requirements set by regulators worldwide.
Contract management has been gaining importance within the past ten fifteen year as a new discipline within enterprise process regimes among financial and accounting, project management and service management. Organizations often struggle to fully utilize the value of their contracts. While advanced contract management systems with artificial intelligence exist, success rate on implementing such systems varies greatly. Studies show that there is often a lack of a dedicated sponsor for contract management within enterprises. Additionally, contract data is typically handled in multiple systems and processes, leading to inefficiencies and errors.

The objective of the case study was to improve the sourcing' efficiency within the case company by developing integrated contract management and contract data management. Sustainability and privacy management were selected as pilot process areas. Utilizing agile methodologies an integrated process description was described for the sourcing domain. Then based on the process model and existing policies, rules and standards conceptual data model was defined for source to contract and purchase to pay areas. Once the process and conceptual data model were ready a detailed logical data model for supplier contract was developed in addition with attribute and their value definitions.

The results of the case study abled immediate improvement in connecting contract data to purchase to pay process and with that gain improvement in cashflow. The new data model also facilitated creation of comprehensive supplier dashboard, which provides wide view for supplier and sourcing managers to supplier contracts, performance, compliance, and risks. The results also provide basis for defining a new system landscape, which will enable implementation of more extensive automation into source to contract and purchase to pay areas.

The agile method proved to be very effective for parallel development of processes and data modeling. While sustainability and privacy management were used as pilot processes, this approach can be applied to any enterprise process area. The method and new data model also opens up new opportunities to explore relationships of sourcing contracts to for example product data management or to customer contracting.

Keywords/tags (subjects)

Contract management, contract data management, source to contract, purchase to pay, sustainability management, data privacy

Liitteet 1 ja 2 ovat salassa pidettäviä, ja ne on poistettu julkisesta työstä. Salassapidon peruste on yksityisen, valtion, kunnan tai muun julkisyhteisön, yhteisön, laitoksen tai säätiön liike- tai ammattisalaisuudet (JulkL 24§, 17 ja 20), ja teknologista taikka muuta kehittämistyötä ja niiden arviointia koskevat tiedot (JulkL 24§, 21).

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1 Introduction

“Modern economies are held together by innumerable contracts” (Quote from the Nobel Prize Award Committee 2016). Contracts are in critical role when it comes to organization’s financial performance, customer satisfactions, supply chain performance and resilience, and regulatory compliance, and still there seems to be limited interest on investing in to the contracting and contract management process improvements. According to estimate made by World Commerce and Contracting (World CC) organization the average value erosion related to poor contract management is around 8.6% of contract value. For the companies that are good at commercial and contract management the value loss is at 3% level. For companies where commercial and contract management is not at such high quality the value loss is more than 20% (Cummins et al., 2023).

Although based on number of studies made by World CC we can nowadays identify many of the sources for value erosion (Figure 10.), the root causes for these sources are much harder to identify. One of the leading thoughts currently is that contract lifecycle spreads out to so many operational areas and from process, tools, or skills perspective there is no single owner for it within organization.

In typical organization contracts are touched by sales or sourcing, delivery organization, legal, finance, compliance teams and many other functions. Each function has their own interest in either crafting a contract or participating to the delivery of contracted services or products. However, typically no single function claims ownership of the contracts as a whole during the entire lifecycle. Contracts maybe stored in multiple systems with no integrated version control, and contract related data gets stored to equally many systems to be used only for a single purpose by each system. This leads into lack of control over the contracts and data that is needed to run operational processes (Cummins & Agrawal, 2021). For example, payment term may be stored as meta data in contract management system, keyed in as input data in the purchasing system and third time in the account payable systems, in each the value might be different. Due to this type of data and process fragmentation organizations are not able to realize the actual value built to the contracts when they were created. The lack of control and fragmentation also increase the inefficiency of managing the contracts and related processes. Multiple functions are handling and collecting contract data at the same time but not sharing it with each other. There are also interdependencies

between sales and supplier contracts that in many organizations cannot be automatically identified. Risks of using wrong data to run operations like customer delivery or invoicing increases. In worst case it may lead into customer claims, compliance violations or even gross negligence and lawsuits. World Commerce and Contracting has identified more than forty friction points in the contract lifecycle management process, which can either create or reduce value of the contracts (Cummins & Agrawal, 2021). Similar results are reflected in the global CEO survey by PwC where CEOs say that 41% of the organizations time spent in procurement or contracting is insufficient (Boswell et al., 2024).

The objective of the case study is to improve the sourcing' efficiency within the case company by developing integrated contract data management. The objective will be reached by developing an integrated process map, and data model, and by improving the data governance for the case company. All these areas will be need when enabling automation of supplier and supplier contract management in the future. The scope of the case study is limited to identifying integration points between privacy management and sustainability management processes, and contract lifecycle management. These integration points will define what data related to suppliers and supplier contracts must be shared across these processes. Results of the case study can be widely applied to cover almost any other process within case company, like security management, product development and customer delivery. Results are not limited to the case company, the same approach as in this case study can be repeated in any industry area. With the integrated process map and data model companies can focus on collecting the data once, at the optimal point within the processes and utilize is multiple times and in different other processes.

2 Research Plan

This section introduces the case company, objectives of the research and overview of the research methods used when executing the case study.

2.1 case company

Case company is a leading technology company specialized in cloud, data, and software services. case company operates globally having customers in over 90 countries. case company employes

24 000 people across the world and has total revenue at 3 billion euros. case company is very committed to delivering sustainable services and has high targets on reduction of GHG emissions, increasing usage of green electricity and increasing the share of female employees.

Case company has been going through major changes over the past few years. First major merger in 2020 to form the current case company and now there are strategic reviews on-going to investigate the viability of separating two businesses into their own company or to sell them.

Mergers and Acquisitions (M&A) as well as demerger processes require always vast amounts of information as part of the due diligence phase related to the companies' basic operations. Sourcing has been supporting the strategic reviews by investigating suppliers, supplier contracts and spend related to businesses under the review. This has proven to be much more difficult than anticipated. It has become evident the sourcing's operational processes and systems do not at current state collect the data needed to make needed conclusions of allocating supplier contracts and spend to each business under review and to the remaining businesses. This finding matches well with the conclusion by Paris (2014), contract creation and negotiations are seen as key processes, but these processes are still document based and use of modern ICT systems and digitalization is limited.

The current contract coverage (spend from suppliers who have a contract in the contract management system), measured when starting the development project, was only at 65%. This is not enough and while at the same time supplier spend reporting cannot be connected to the individual contract the transparency to supplier contract utilization and spend is virtually impossible. Due to regulatory pressure, there is a growing need to support sustainability and data privacy reporting with information related to suppliers and supplier contracts. For the above reasons there is a need to develop more comprehensive data model and governance structure to ensure supplier and supplier contract related data is collected and maintained through the integrated processes at all times during the supplier and supplier contract lifecycle.

2.2 Scope

The case company leadership has already started to think about the future of the retained business after the current demerger activities has been concluded. In the future state sourcing will

have a key role on enabling growth of the retained businesses. In practice it means that sourcing must be able to increase its own efficiency, be able to provide better transparency to the supplier base and supplier contracts, and also improve the end user experience for different users. Sustainability, data privacy and other regulatory compliance related activities are also demanding actions from sourcing organization and impacts to the handling of supplier and supplier contract related data. Sourcing leadership has initiated a development activity focused on defining contract lifecycle management (processes, tools, and related skills). Contract management integration to other sourcing processes and tools and further to other related operational and corporate management processes is defined in Figure 9. Development and implementation of such a system is an enormous undertaking, which takes several years. Therefore, from thesis point of view the scope is focused on the Supplier contract lifecycle management, sustainability reporting and data privacy management (Figure 9). Automation of processes and using Artificial Intelligence (AI) as key enabler will be a recurring theme across the development project.

The objective of the case study is to improve the sourcing' efficiency within the case company by developing integrated contract data management. The objective will be reached by developing an integrated process map, and data model, and by improving the data governance. The scope includes the source to pay process area, include the supplier and supplier contract management processes, and integration to sustainability and privacy management processes. This case study is seeking to find answers to following questions:

- what data related to suppliers and supplier contracts is needed by the different operational and corporate management processes?
- how to extract, share and manage such data within the corporate management system efficiently and accurately?
- what role automation and artificial intelligence play in contract lifecycle management and data governance?

2.3 Research Method

Due to very empirical nature of the research a qualitative research method was selected as a framework and the research was carried out as a case study in form of a project. Contract lifecycle management and its impact to the efficiency and value of sourcing was the leading hypothesis and

set the substantive theory around the research (Kallinen & Kinnunen, 2021.). In this research contact lifecycle management represents itself in both macro and micro levels. In macro level the theory related to contract lifecycle management shows up as clear frameworks and structures that should be in place for well-functioning organization. On the other hand, in micro level theory also brings up topics related to human behaviors like roles and responsibilities that in their own way impact to the efficiency and value of a sourcing organization (Kallinen & Kinnunen, 2021.).

The case study combined interviews, document, and process analysis with iterative development methods for process development and data modeling to produces highly fact based results. From the case company point of view the processes, which were used as the sample set for the data collected and analysis, represented few of the main focus areas.

2.4 Theoretical Background

Project was started with studying theoretical backgrounds for the case study. Due to number of active improvement initiatives and strategic review projects the supplier contract related data was demanded from multiple perspectives. Given the focus on improving sourcing efficiency it was only natural to investigate in more detail the role of data and automation in supplier and supplier contract management. Contract management is an area from which it is rather difficult to find scientific literature. Specifically, when using search words or phrases like “contract data management” or “role of contracting in organization” there were no material found from google scholar or Janet libraries. There are some organizations which are focusing on contract management and how the modern tools are impacting to the implementation of the processes. Publications from these organizations were in key role when building the theoretical framework.

For sustainability and data privacy topics there are plenty of scientific studies made over many years. Here the focus was more related to timelines. Studies that are more than five years old may not reflect the pace of development in these areas.

All and all finding material for the research has been time consuming both from trying to just find some information and on the other hand sorting through wealth of documents.

2.4.1 Project Management method

In information and communication technology (ICT) development there are few major development methodologies used.

Waterfall Project Management

So called waterfall method has been predominantly used for decades in large and complex system and product development projects. In the waterfall methodology the different development activities, requirements definition, design, implementation, testing and deployment, are divided into linear phases that are following each other (Figure 1). The subsequent phase cannot be started until the preceding phase has been completed in acceptable manner.

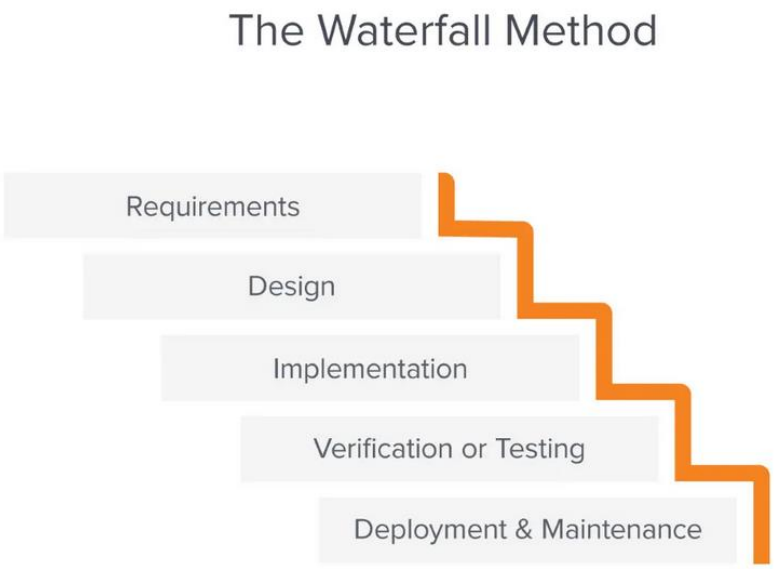

Figure 1. Waterfall method (Adobe Communications team)

The benefits of using a waterfall method are predictability, easier to measure the progress, and ease of introducing new people to the project. On the downside waterfall method is very rigid, managing changes in scope is hard and time consuming, and delays in one phase will delay all the following phases as well (Adobe Communications Team, 2022).

Agile Project Management

The other mainstream development method is called Agile. Agile method supports iterative and incremental development approach. Agile method aims to deliver value after each iteration and by promoting rapid implementation of the user requirements and reacting to the changing requirements in the next iterations. Each iteration, also called sprint, contains same activities as can be seen in waterfall method, requirements management, design, development, testing and deployment. However, the scope of each sprint is reduced to include only the prioritized requirements from the backlog and limited with the available resources (Figure 2).

Figure 2: Managing Agile project in case company (Chaudhari, 2022)

Method Selection

The project included multiple different stakeholder groups, which all had a bit different maturity level and timeline requirements, therefore the agile method was selected with some modifications as the project management method. This allowed the development of the final data model and processes in incremental manner and modifications to the target state as new things were learned from the stakeholder requirements and about the topics under study. For the same reasons it was decided not execute deployment with the development results after each sprint as one does in pure agile development. Only in some exceptional cases the results were adopted to actual use once the sprint is completed. One reason impacting to the selected approach was also that in the case company there were multiple major changes ongoing simultaneously, which impacted to the same stakeholder groups and ability to adopt to changes is typically limited. Therefore, only such changes that resulted in immediate improvement and impacted to smaller groups were deployed as soon as possible.

Use Cases and Participants

Before starting the project execution, five use cases were identified to keep the scope in control. Use case is a description of how system or a process is expected to behave. Use case are used to define and understand functionalities and requirements of a process or a system. Stakeholders who participate to the development of each use case were also identified. Stakeholders represent their function areas expertise and like in sustainability and privacy area are the owner of related processes in the case company. It was important to engage with large group of stakeholders to form a comprehensive view on each of the use case and requirements different stakeholder groups would have.

Use case	Stakeholders
1. Overall process map development for sourcing	Sourcing development lead (Source to contract) Procurement development lead (Purchase to delivery) Senior process manager Head of sourcing excellence and operations Supplier due diligence team
2. Enable sustainability reporting for sourcing.	Sustainability manager Head of Sustainability Sourcing managers Supplier due diligence team
3. Integrate Data Privacy to supplier and supplier contract management.	Data protection officer Group privacy manager Head of sourcing excellence and operations Sourcing development lead Procurement development lead Deputy General Counsel
4. Supplier contract metadata definition.	Sourcing Development lead (Source to contract) Procurement Development lead (Purchase to delivery) Lead Enterprise information architect Head of sourcing excellence and operations Business analyst Supplier due diligence team

5. Connecting contract to Purchase Order	Sourcing Development lead (Source to contract) Procurement Development lead (Purchase to delivery) Head of sourcing excellence and operations Business analysts Service Owner, finance

Table 1: Use case definitions.

Detailed descriptions of the use cases are defined in appendix 1.

2.5 Releases

The overall project was split into two releases (Figure 3). In ICT industry release is usually considered as distribution a version of a software to users. In other industries similar release concepts are used for example for product releases. In this project release was considered to include a set of components like data model or process description, which could then be used for further development, or deployed as such if so chosen. First release included the data and process models for all the use cases. Second release focused on developing the detailed logical data model for the supplier contract with attribute and value definitions.

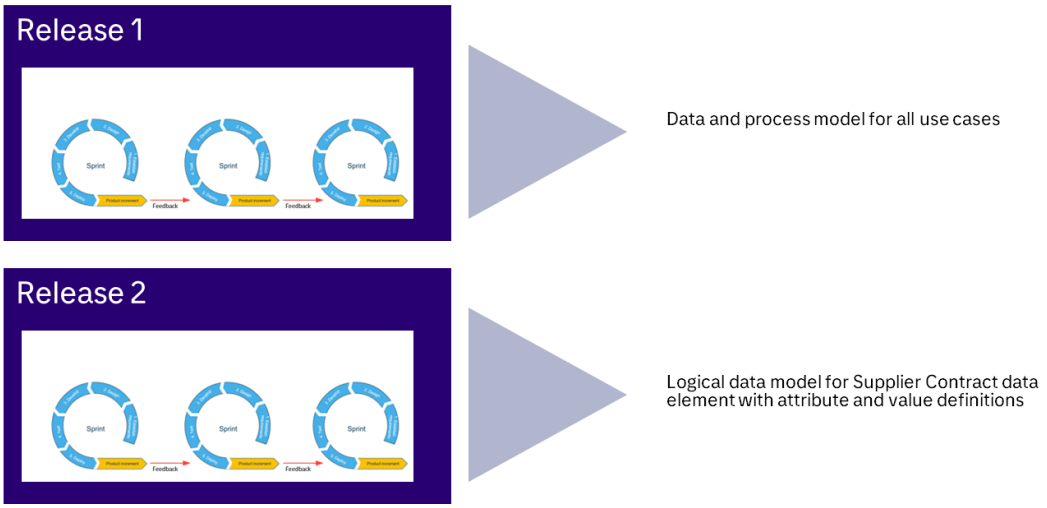

Figure 3: Release split

2.5.1 First Release

In the first release the basic idea was to collect the data requirements and develop overall conceptual data model and overall process development almost simultaneously. At this stage the tools were not in focus more than just understanding the current tools and their features, specifically identifying place where actions are done manually, and limited integrations exists. This set-up gives more time to create a comprehensive gap analysis from the current system landscape in future phases.

Requirements Analysis Stage

First stage of a sprint (requirements analysis) data requirements was collected from the in-scope processes contract lifecycle management, sustainability, and data privacy. During the frequent meetings the requirements were collected into a simple excel tool, which was organized by process and sub-process levels, example shown in Figure 4 below. This allowed from the beginning to understand at which stage each data item should be created and where used. Starting point for the data items were the existing data model related to supplier master data management and data model from the current contract database tool. Some elements were also already defined in some level of detail in enterprise information model.

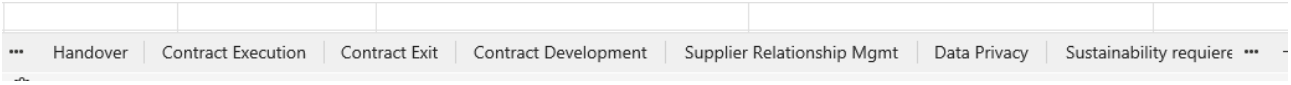

Figure 4: Example of process and sub-process split for requirements collection

Design Stage

In the next stage (design) these requirements were added to the data model and relationships to other data element are defined. Starting point was the case companies' existing data model. Data modeling happens so that first data elements were described in the data modeling tool (Vision or Lucidchard), then high level relationships between the data elements were added and only later

the detailed attribute information for each data element was defined. Example of a simple conceptual data model in Figure 5, due to the confidentiality of the case study more detailed model cannot be shared.

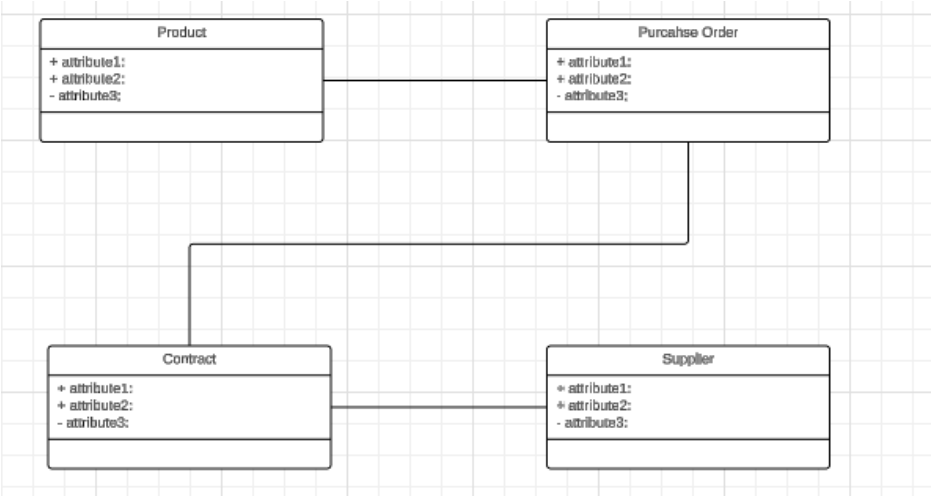

Figure 5: Example of simple data model

Development Stage

Then in the third stage data requirements and data model were integrated to the process development to understand in which process each data item is created and where it needs to be used. Part of the process development was also to map the roles responsible for the data management and current systems where the data is handled. The end result of a sprint was an improved data model, which incorporates the identified data requirements. The evolution of process description recognizes where data is created and used and by whom. In the process description side, there were a lot less existing material. The current descriptions were on rather high level and to be able to map the data items into the processes and roles new more detailed descriptions were developed.

Iterations were fairly short and repeated as many times as the stakeholders felt that the new data model and process maps covers their requirements and project could move to the next phase. For each of the use cases either weekly, bi-weekly, or monthly meetings were organized depending on the maturity of the specific areas. The overall approach is illustrated in Figure 6.

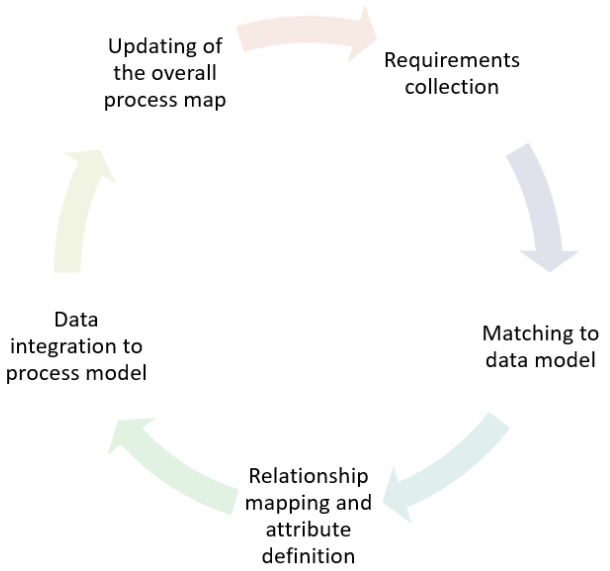

Figure 6. Data and process model iterations

2.5.2 Second Release

Second release focused on developing the logical data model for supplier contract data element and defining the metadata attributes with default value definitions. Starting point for the attributes and their values came from the conceptual data model and process descriptions defined in release 1. In addition, case company policies and rules, like source to contract policy, and contract standards acted as input. Logical data model and attributes will act as the basis when considering the future system landscape and any development related to automation, artificial intelligence, and use of solutions like data lakes and modern business intelligence systems.

2.6 Document Analysis

During past few years there has been a lot of effort on developing processes and policies in the case company. Materials from the existing processes and policies were used as source material when developing the new data model and modifying the process map. All the policy, processes and data models were part of case company quality system and have therefore been through a thorough review processes before being accepted into use. Below is a list of relevant source materials:

- case company policies and rules, including:
    - source to pay policy
    - Source to pay rule
    - know your 3rd party rule
    - environmental policy
    - privacy policy
    - anti-money laundering rule
- case company process documentation, including:
    - IT asset management
    - source to contract
    - purchase to delivery
    - invoice to pay
    - corporate governance, risk and compliance management
    - supplier master data management
- data from various systems like finance systems, ERP, contract management database.
- use cases and requirements documentation
- data models
- external reference process frameworks

At the end there was hundreds of pages of source material, which was analyzed. The main action was to identify integration points between the processes and systems, and to align the terminology used in different policy and process documentation and in the data models.

3 Contract Lifecycle Management

Legal literature gives many different meanings for a contract. However, from contract management perspective contract can be synthesized as complex system that captures parties needs and interests, promises, rights and responsibilities and provides rules on what happens if the promises are not kept (Figure 7). Contract is formed based on the parties' requirements, business demand and supply capabilities as well as external boundaries and drivers that are valid at the point in time. When viewing contracts from this perspective it should be obvious that managing contracts requires specialized skills and well-defined processes to keep these complex systems delivering the value they were designed for.

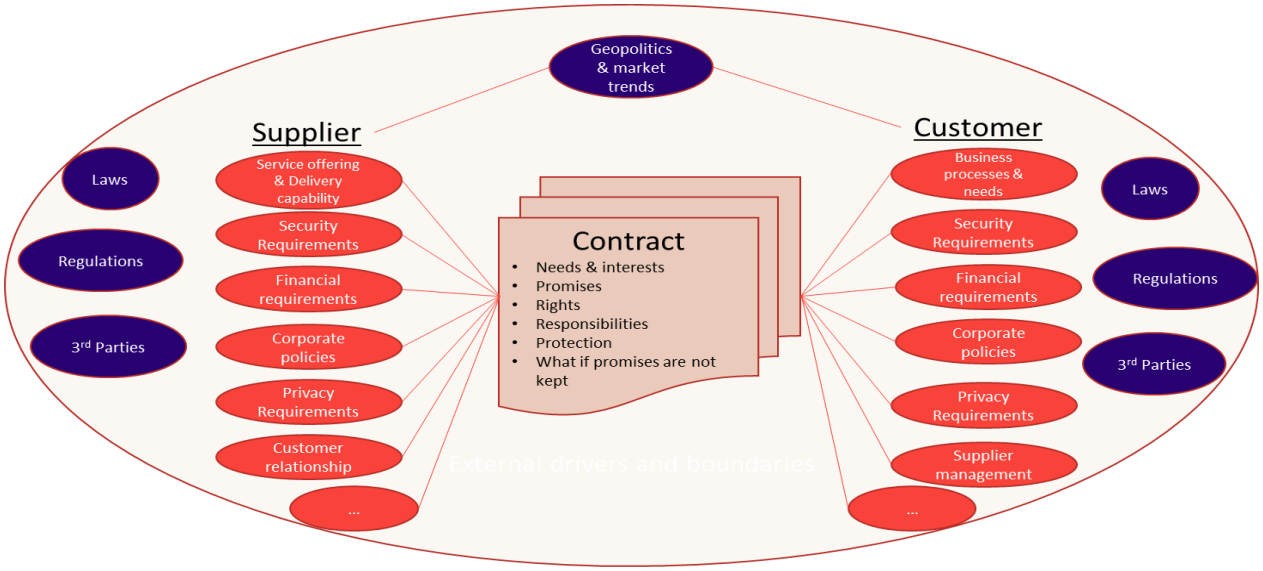

Figure 7: Contract as complex system

3.1 Contract Lifecycle

The contracting lifecycle has different meanings depending on whom you ask. When asking from hard core salespersons, they will say the contracting starts when a request is received and ends once the negotiations are over, and papers signed. For business unit leads quite often tend to think in similar ways. For a contract manager contracting lifecycle is much more comprehensive process as illustrated in Figure 8.

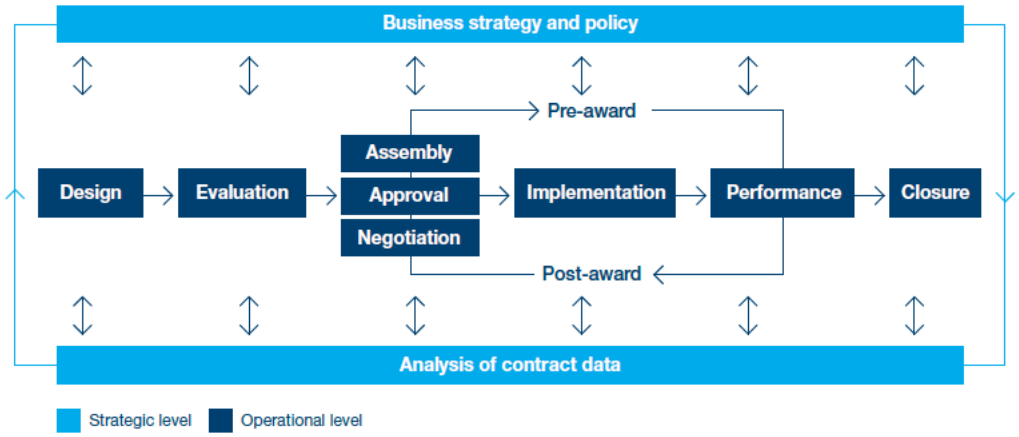

Figure 8. The contracting lifecycle (Cummins & Bulucan, 2023)

At high level contract lifecycle has five distinct phases. Table 2 describes the purpose and how the purpose is achieved for each phase. Each phase builds on top of the previous and there needs to be a continuous feedback loop to improve the contracting practices as visualized in Figure 8. The feedback loop enables companies to learn from their past performance, good or bad, and adjust their contracting to match better with their own strategy as well as to the market behavior.

Phase	Purpose	How
Contract development	Help make sales/ sourcing more efficient and competitive while building the foundation for the delivery.	Create and improve standard clauses, contract templates, other contract collateral and commercial models including pricing unit definitions.
Contract creation	Reduce risks and help to close contracts quickly while enabling successful future delivery and business case realization.	Elaborate contract structure and documents; contract review before committing with customer/ suppliers; managing the deviations from standards.
Contract implementation	Ensure the implementation of what was contracted and protect the profitability.	Hand contract over and transfer responsibility from sales/ sourcing to delivery, ensuring effective implementation of delivery and commercial processes and tools.
Contract execution	Deliver on our promises, communicate, and manage the contract in tight collaboration with customers/ suppliers.	Ensure fulfilment and performance according to contract, support contract changes and accurate invoicing.
Contract closure	Close all loose ends profitably and keep a good reputation.	Plan and execute activities related to contract expiry or termination in tight collaboration with the customer/ supplier.

Table 2: Contract Management Phases

3.2 Contract Data

It has been said that every euro coming in and going out from a company is governed by a contract. The reality is not quite that, but not far from it. Sales contracts, supplier agreements, work contracts, insurances and so on, as said it is very difficult to find an area which in a company would not be governed by a contract. Contract might not always be in written format as in most jurisdictions verbal agreements are as binding, but naturally harder to proof. Contracts contain a lot of valuable information not only for contract management processes, but also for many other corporate processes. Figure 9 very well describes that basically every operational process is somehow connected to the contracts. The corporates' management systems and operational processes rely on different sets of data related to suppliers and supplier contracts to operate efficiently and with high quality. Contract lifecycle management, supplier management, asset management, sales, Service delivery management, customer invoicing, source to contract, procure to delivery, invoice to pay, supply chain management, and many other processes need some data from suppliers and supplier contracts (Figure 9).

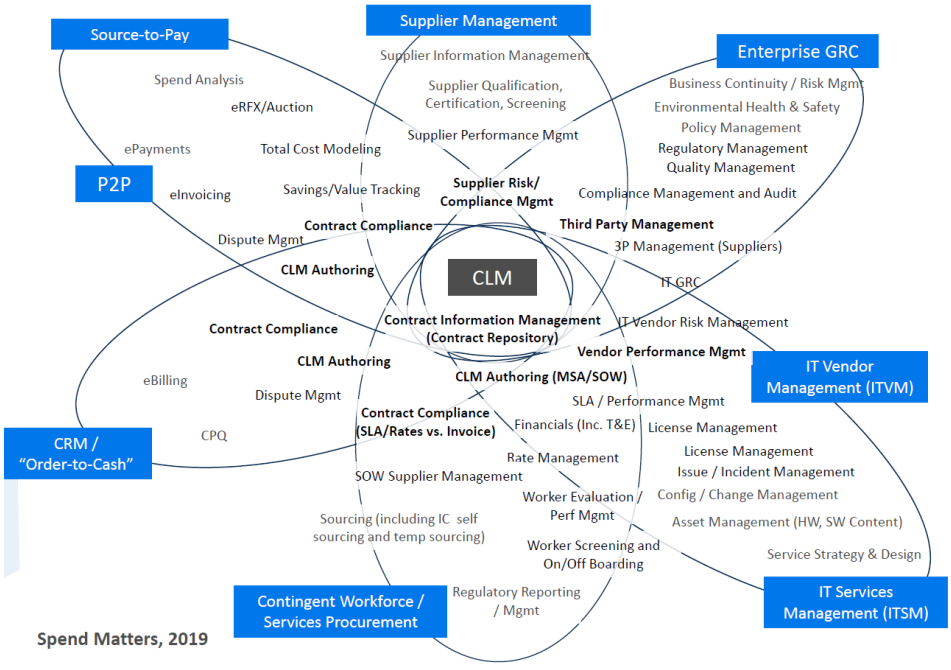

Figure 9. Contract management relation within corporate processes (Bendtsen et al., 2020)

Although within case company sourcing there are some good practices and tools in place to manage suppliers, store supplier contracts and extracted metadata from them, these processes and

systems are still very limited and do not support the operational and corporate management processes in sufficient level, as indicated in article ROI of contracting excellence (Cummins et al., 2023). Processes and tools are operated in silos and manually and are therefore also error prone and inefficient. Additionally, there are gaps in the source to contract process, which has led to situation where not all contracts are stored into the central system. There are cases where business is directly working with suppliers and not involving sourcing. In these situations, the contracts are many times stored to business user's own laptop, shared drives, SharePoint sites or in worst cases not stored at all. Sourcing has just recently updated new source to pay policy and rule, which, once implemented, will fix many of these issues. It will take time to get the whole organization to work according to the policy while at the same time work on improving the processes and systems to support the policy implementation. Case company is not alone with these types of issues. Similar problems exist in companies across the world and in all industries (Cummins et al., 2023).

3.3 Contracts as a Source of Value

Contracts can be seen from multiple perspectives within an organization and depending on what view is taken the role and value of contracts may change significantly.

3.3.1 Contract as Control Mechanism

Contracts are usually seen as controlling mechanism and in case contracts are not followed there are negative consequences. This thinking creates a feeling that contracts are difficult to change on purpose, otherwise one may lose the control. Result of such thinking is contracts are not modified to changing conditions. Specifically contracts with long term should be amended to better fit the volatile business and market conditions. (Cummins & Bulucan, 2023).

With this type of a view, it is difficult to see what is the value that has been built into contracts in general. Contract Management methodology CATS CM offers a different perspective to contracts and their value for organizations. Organization derives their goals and targets from its mission and vision. These goals are then used as building blocks for the organization's strategy, which needs to consider the impact of laws and regulations. No organization can survive alone and get their strat-

egy executed so they will form relationships with other parties, which will be done in form of contracts. As a net effect this means that to get their strategy executed and goals realized organization will cascade certain objectives for each contract (Tonkes & Vlasveld, 2014).

Contracting parties are looking for some benefits for themselves when entering a contractual relation. In large corporations there are multiple different levels of agreements and value varies a lot from contract to contract. Sometimes the value is built into completing a single transaction which fulfills the needs of both parties. At the other end of the spectrum are complex contracts where value generation is no longer tight to just a single transaction but to longer term relationship, joined demand and supply planning, quality control and to continuous development of both parties' products and services. The value of each contract comes from realizing the organizations objectives set for the contract. Contract management, as defined by CATS CM, evolves around the contract objectives. "Contract Management is the realization of intended contract objectives by proactively monitoring fulfillment of all contractually established responsibilities, obligations, procedures, agreements, conditions, and rates, resolving all ambiguities, contradictions, and white spaces, managing all contact related risk, and implementing all desired changes to the contract during the execution phase" (Tonkes & Vlasveld, 2014).

3.3.2 Contract Value Erosion

Many experts and contract management organization are talking about value erosion related to contracts. The basic idea is that due to multiple reasons the contracting parties are not able to achieve the business case they had in mind when entering to the contract. Van Berkum (2023). mapped the sources of value erosion over the lifecycle of contracts in one of his training materials (Figure 10), also identified by World Commerce and Contracting in their study report Ten pitfalls to avoid in contracting (World Commerce & Contracting, 2015). One can quite clearly see that the

value erosion starts already during the pre-award phase when contracts are created and continues throughout the post-awards phase (Figure 10.).

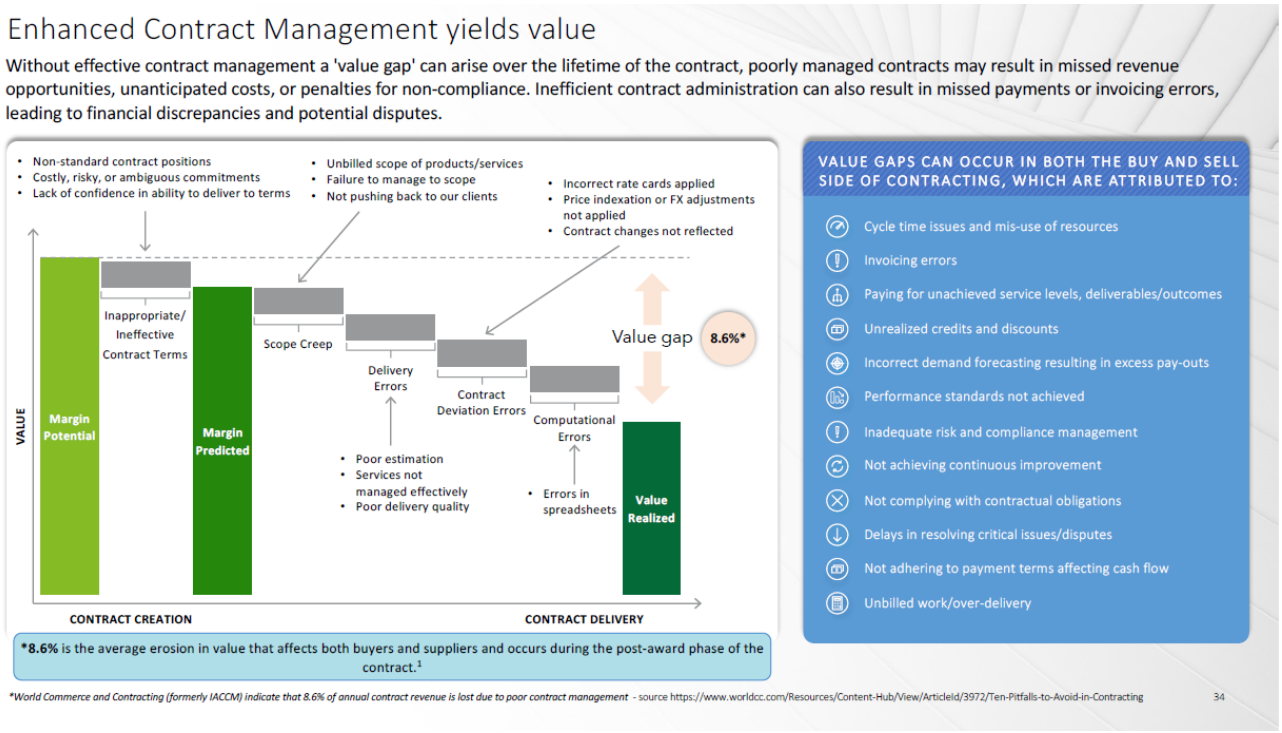

Figure 10. Sources of value erosion Van Berkum (2023)

3.3.3 Ways to Reduce Value Erosion

In the context of reducing the contract value erosion, we need to review the definition of the contract more from operational and lifecycle point of view rather than just a document, which exists in the point of time once being created between the contracting parties.

Broader definition for contract covers the whole lifecycle of the contract. In addition to the signed paper also operational documents and transactions like purchase orders, invoices, statement works, and many other documents need to be considered as part of the contract. Many external factors have also significant impact to how contracts are read and interpreted such as different permits, litigation proceedings and other legal frameworks that sit out outside contract law. “To model the relevant relationships, we must consider contracts as boundary objects to include all relationships, transactions and steps in transactions that are documented in records, electronic or paper” (Directorate-General for Justice and Consumers, 2020).

When viewing contract through the above definition it gives a clearer view why contract data is in such an essential role for the corporate governance system and operational processes.

3.4 Overview of CATS CM Contract Management Methodology

This section gives a high level overview of the contract management methodology developed by Tonkes and Vlasveld (2014). When going through the CATS CM methodology it is important to understand that in addition to the models, activities and roles defined in the methodology, there is also vast amount of data that is needed for the successful implementation and execution of the contract management.

3.4.1 Introduction

CATS CM (Contract Administration & Tracking Scenario Contract Management) is a methodology designed to manage contracts throughout their entire lifecycle. It provides a structured approach to help organizations on executing contracts as agreed in the contract documents, and that they deliver the value parties were looking for. CATS CM methodology provides the necessary tools and structure for contract management. The key theme of the methodology is proactive contract management. Actions needs to be planned and executed in structured manner, taken before the issues arise and not just reacting to them when the occur, then it's too late.

3.4.2 The Four Pillars of CATS CM

The methodology is built on **four key pillars**. These pillars are the true foundation of the whole methodology, and they need to be well understood before one can start the implementation of the methodology.

First pillar defines the key concepts Work To Be Done (WTBD) and All Other Contract Matter (AOCM). When starting to implement any contract one must differentiate between what are the actual deliverables defined in the contract that provide the value for the parties (WTBD), and what are obligations and rights used to govern the contract and relationship (AOCM). This split also builds foundation for defining the different roles and responsibilities related to contract management.

Second pillar defines the different roles involved throughout the contract lifecycle that are involved in the creation and execution of the contract. To secure a good start for the contract execution, these roles must be defined already before the contract is signed. This gives the key roles the opportunity to get to know the contract early and potentially still influence to the finalization. There are few roles are specifically important when thinking of delivering the intended value of the contract. Contract Owner, who has the ultimate accountability for the success of the contract, contract manager, who is responsible for the day to day management of the contract more specifically for the AOCM, and realization and verification manager, who is responsible for delivery of WTBD. Close collaboration between these roles is key for making the contract execution a success.

Third pillar defines the Contract Management Essentials (CM Essentials), which are the key areas in contract managers day to day activities. They include aspects like contract objectives, governance, and reporting (Figure 11). The methodology describes what and how contract manager should be working with in each essential.

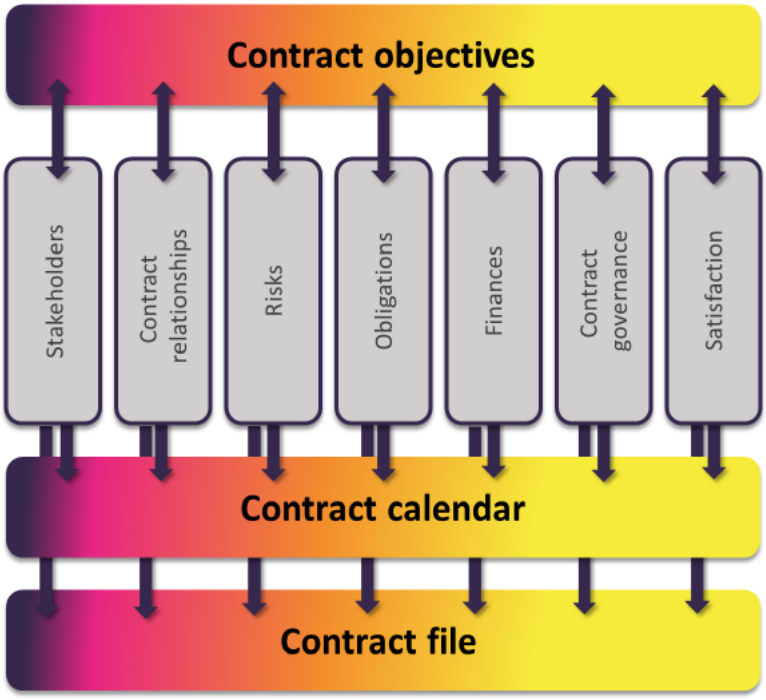

Figure 11: CM essential from CATS CM (Tonkes & Vlasveld, 2014)

Fourth pillar defines the Contract management as a six-step process for managing contracts, from initiation to conclusion (Figure 12). Each step defines a set actions and deliverables that is needed to complete the step. Not all contracts require same level of attention within the organization. Therefore, the methodology defines a set of scenarios, which define the CM Essentials that should be included to the scope of the contract management process for each contract. The scenarios are not carved in stone but can be modified for each organization's needs.

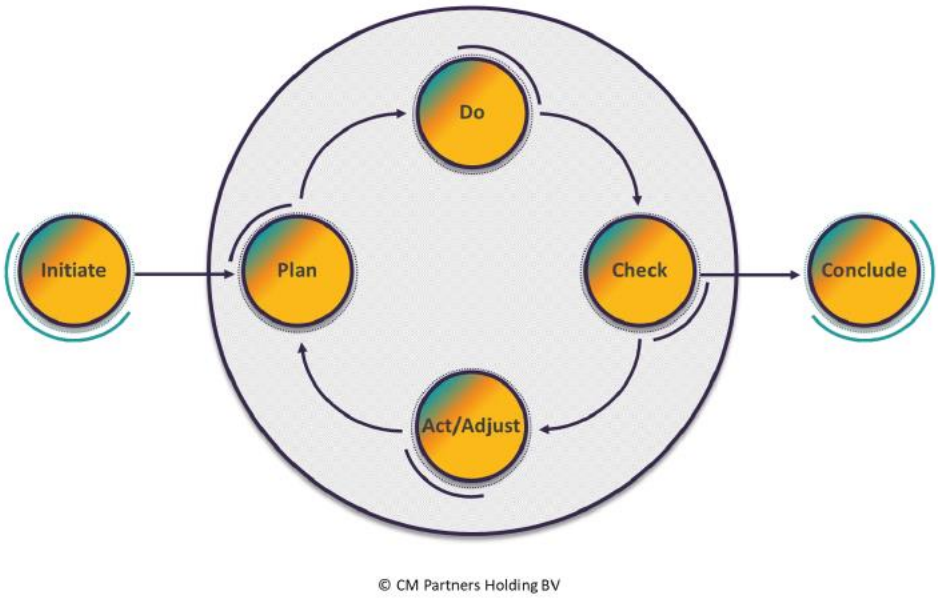

Figure 12: Contract Management process from CATS CM (Tonkes & Vlasveld, 2014)

3.4.3 The Contract Life Cycle in CATS CM

CATS CM uses the CATS Contract Life Cycle (CATS CLC) as a process model to describe the different stages a contract goes through, from creation to execution (Figure 13). These stages align with the lifecycle defined by World CC in Figure 8. Even if the CATS CM methodology does not have detailed process definition for the pre-award activities, the methodology still emphasizes the importance of contract management knowledge at all stages, ensuring that the right agreements are in place for effective management. The conclusion phase is a critical part of CATS CM. It involves a final evaluation of the contract and the performance of the contract manager. In this phase contract manager must check that all objectives set for the contract have been met and that lessons learned are documented for future reference. Conclusion phase is also important for the overall

development of contract management practices within the organization. Lessons learned can also be used to improve contract and other policies as well as the templates used for contracting in the pre-award phase.

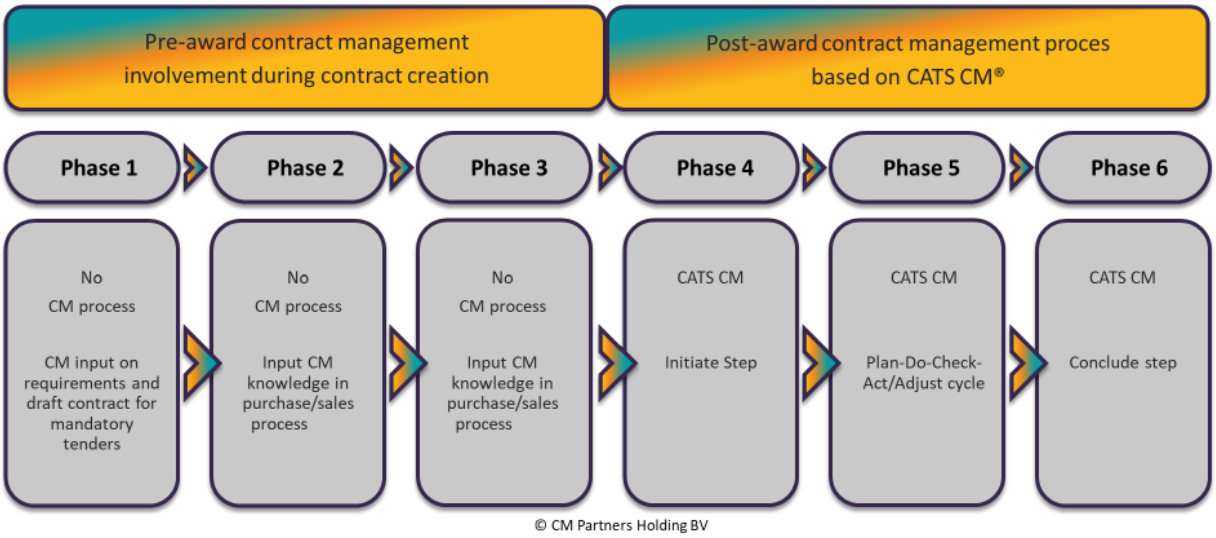

Figure 13: CATS CM contract lifecycle model (Tonkes & Vlasveld, 2014)

To implement CATS CM, an organization must adjust the methodology to its specific needs, especially if it wants to integrate CATS CM with other operational processes and systems. The implementation should consider the organization's structure, processes, and the nature of the contracts it manages.

3.5 Contract Portfolio Management

Both World CC report of ROI for contracting excellence (Cummins et al., 2023) and CATS CM emphasize the importance of building a solid portfolio for contracts, which considers the value and complexity of different contracts. This way one can define the needed actions for managing contracts and safeguarding their value. Variation between very complex and simple contracts depends on the industry. In some industries there are lot of highly standardized contracts like in real estate business where rental and sales agreements are very standardized, and responsibilities and obligations of the parties defined by law. In other industries like ICT, aerospace, construction and defense the contracts tend to be much more complex and highly negotiated and where the legal

frameworks for contracts are not that definitive. For the more complex contracts the contract itself is not enough to manage the value. One also needs to invest into building relationships between the parties and aligning the operational processes to ensure the delivery of the goods or services defined in the contract. The additional effort adds to the complexity of contract management and the costs tight to maintaining the value of the contracts. Contract portfolio approach coupled with the contract management scenarios help companies on estimating the resource needs for contract management across the entire organization.

4 Compliancy in Contract Management

Although contracts should be seen as tools to deliver value for the parties and to the entire value chain, still contracts do have an important role on conveying requirements related to different laws and regulations. In this case study we investigate closer two highly regulated areas, sustainability, and data privacy, which impact nowadays almost all businesses and non-commercial organizations.

4.1 Corporate ESG Relation to Suppliers and Supplier Contracts

Contract objectives defined by CATS CM are not only based on the company vision and strategy, but the goals also include items from laws and regulations. The latter has been increasing on importance when the regulations related to global trade has been tightening over past decades. Things like data privacy, security, sustainability, and many other regulations are bringing more and more requirements to contracting and trading relationships. According to PwC 27th annual global CEO survey (Boswell et al., 2024) government regulations and climate change are in top five reasons influencing business model change and increasing in terms of pressure for the business model changes (Figure 14).

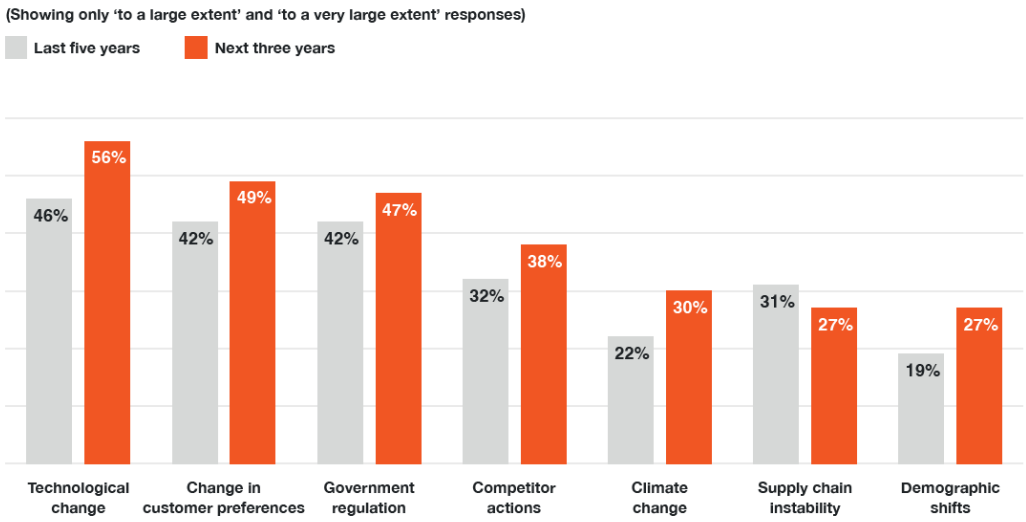

Figure 14: Top five reasons impacting business mode change (Boswell et al., 2024)

Some of the requirements are not limited to the actual products and services but dives much deeper to the working conditions of the suppliers' personnel and to their supply chain. Regulatory frameworks vary based on the industry and products in scope although regulations related to sustainability and data privacy are common for all industries. These requirements are not just defined for the customer and tier one suppliers they must be follow by all parts within the supply chain. This is why the same requirements are repeated back to back in the next tier contracts, and why each part of the supply chain has to think about collecting and reporting data to show proof of compliance. Following the compliance and reporting towards the regulatory requirements are becoming more and more complex and difficult. This effort is also starting to increase the cost of contract management and other compliance functions. This phenomenon can be witnesses in the World CC annual benchmark report, where measuring compliance is on second place on most measured areas just behind cost reduction achieved. According to the same report, focus on ESG adoption and implementation in the companies will increase in near future among commercial and contract management roles (Cummins & Bulucan, 2023).

One hypothesis for this thesis is that by identifying necessary compliance data early on in the contract lifecycle and establishing processes for collecting and managing that data, the effort to manage the data in long term will reduce.

4.2 CSR, ESG or Corporate Citizenship

There are three concepts that have received a lot of focus in literature and in corporate setting. Corporate social responsibility (CSR) is a concept that has been evolving for several decades. It wasn't until 1950's and 1960's that CSR started to take early forms of what we can see now (Agudelo et al., 2019). CSR is characterized more as corporate voluntary actions related to obligations for economical, legal, ethical and philanthropical activities to improve the brand image and to have positive impact to society. Environmental, social and governance (ESG) focuses more on how companies are incorporating social, environmental, and legal activities into their operations. These actions are measurable and can be used to measure the stability of the organization and financial risks. The ESG investments are increasing due to shareholder and investor expectation, and the need of transparency towards regulators and other stakeholders. The third concept is corporate citizenship. However, definition of corporate citizenship is somewhat vague and does not as such bring additional perspective to the these and will not therefore be discussed more on this thesis (Park et al., 2023). ESG will be used as the main concept in this case study when talking about sustainability.

4.3 Importance of ESG

Focus on sustainability and sustainable development has gained more and more attention over the last 30 or 40 years. First sings of increased focus in the global context were seen in 1987, after the Chernobyl nuclear disaster in 1986, when United Natation adopted so called Montreal Protocol and formed the Intergovernmental Panel of Climate Change (IPCC). In 90's the pace on setting higher standards related to environmental activities started to increase with Rio Declaration on Environment and Development, and adoption of Kyoto Protocol in 1997, to name few of the major events. In the beginning of 2000's the focus on sustainability started to shift more on calling corporate world to action and make them to take responsibility as well. With corporate coming into the sustainability discussion also new topics was included. Human rights, anti-corruption, and labor started to get attention under the social responsibility agenda. European Union presented a Green Paper in 2001 named Promoting a European framework for Corporate Social Responsibility. That could be seen as a kick-off for EU to start building a strategy for ESG activities. Since then, EU has played a major role even on global scale on driving more actions around sustainability (Agudelo et al., 2019).

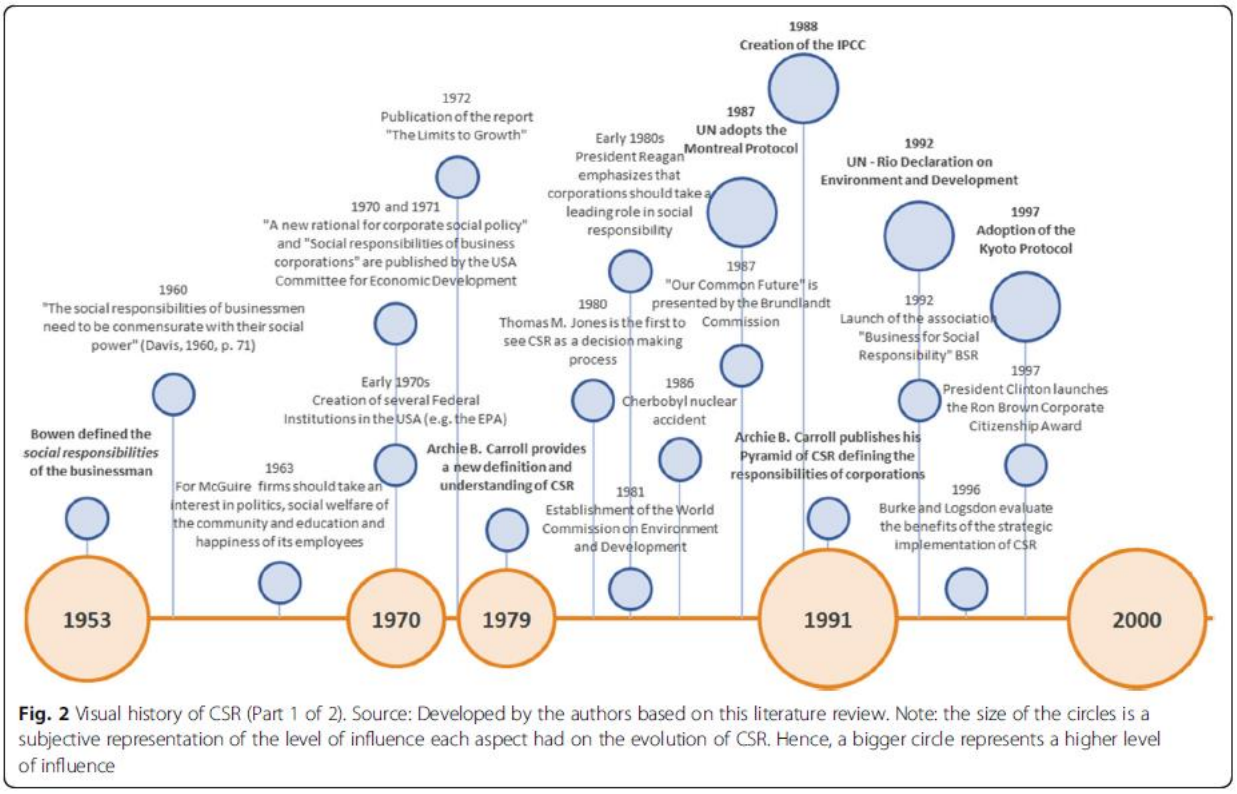

Fig. 2 Visual history of CSR (Part 1 of 2). Source: Developed by the authors based on this literature review. Note: the size of the circles is a subjective representation of the level of influence each aspect had on the evolution of CSR. Hence, a bigger circle represents a higher level of influence

Figure 15: Main event in ESG evelution 50's to 2000 (Agudelo et al., 2019)

Even if sustainability related actions and ESG reporting were seen to impacting positively to the brand image without proper standards comparing companies is very difficult. In 2014 EU parliament approved the European Non-financial Reporting Directive (2014/95/EU) (NFR Directive). NFR Directive set the requirements for the sustainability reporting practices and applied to ca. 11700 largest enterprises and public interest entities, and it came into effect for the financial year 2017 (Agudelo et al., 2019).

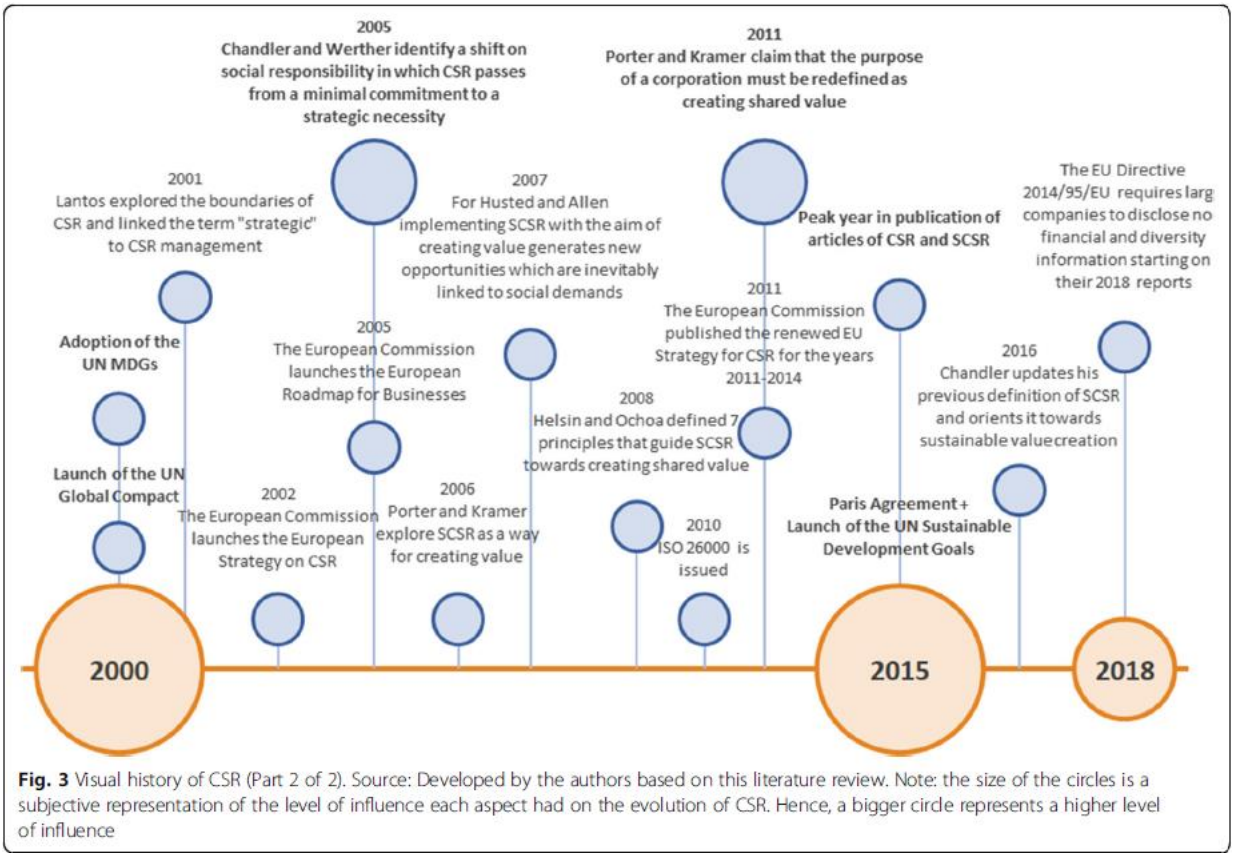

Fig. 3 Visual history of CSR (Part 2 of 2). Source: Developed by the authors based on this literature review. Note: the size of the circles is a subjective representation of the level of influence each aspect had on the evolution of CSR. Hence, a bigger circle represents a higher level of influence

Figure 16: Main events in ESG evolution 2000 to 2018 (Agudelo et al., 2019)

There is still a lot of debate between scholars on how important the ESG reporting really is and whether the reporting in reality reflects the sustainability performance of the companies. A study conducted from Swedish companies seems to indicate that a least the quantity and quality of the ESG reporting has improved since the NFR Directive came into effect. However, it might not still be on the level expected to get investors interested on companies that score high on sustainability, and to meet the EU's targets set in the Green Deal description. We will see over time if the new improved reporting standard, European Sustainability Reporting Standards (ESRS), introduced with the adoption of the Corporate Sustainability Reporting Directive (CSRD) will impact to the ESG reporting quality and satisfy investors needs for better transparency (Arvidson & Dumay, 2021).

4.4 ESG Reporting under CSRD

The new directive, CSRD, will increase the reporting requirements and coverage for companies significantly. New reporting requirements are in effect from the beginning of financial year 2024 and

first new reports will be seen in 2025. CSRD requirements apply to increased number of companies and public interest entities from ca. 11700 to over 49000. All companies will not to start the reporting based on the new ESRS standard with the same schedule. First wave, reporting starting on fiscal year beginning of January 2024, will include to those companies that have already done the reporting based on NFR Directive and so called “large undertakings” that have more than 500 employees. Next wave will start reporting for fiscal year starting on January 2025, this wave will include all the other “large undertakings” and so called “large groups”. The third wave includes small and medium size companies and their reporting obligation start in fiscal year 2026. There are few other groups like non-EU headquartered companies, which will start the reporting still later in 2028 (PwC US National Office, 2024).

In the ESRS there are 12 standards that apply to all areas of sustainability reporting; general standards, standards on environment, social standards, and governance standards as identified table 3 below.

Area	Standards
General standards	1-General requirements 2-General disclosure
Standards on environment	E1- Climate change E2-Pollution E3-Water and marine resources E4- Biodiversity and ecosystem E5- Resource use and circular economy
Social standards	S1-Own workforce S2-Workers in the value chain S3-Affected communities S4-Consumers and end-users
Governance standards	G1-Business conduct

Table 3: ESRS reporting standards

In addition to ESRS there are two other standards. Non-EU dedicated standards, which are applied to non-EU headquartered companies, and Simplified standards that are applied to small and medium sized companies. The Simplified standards have not yet been officially published.

The standards have been aligned with International Sustainability Standards Board (ISSB) and Global Reporting Standards (GRI) to make sure that they are comparable with other global standards on sustainability. This should reduce the need from global companies to do reporting based different standards.

All and all the new reporting requirements are complex and specifically for the small and medium size businesses it will difficult and costly to establish the needed data collection and reporting practices. At the same time there are some concerns on how the reporting standards align with international and local laws in all areas (Waas, 2023).

4.5 Data Privacy Relation to Contract Management

Data privacy is one the activities within organizations, that has very close relationships with contracts in both sourcing and sales domain. Actually, in most case data privacy is a topic, which is present across the value chain starting from customer to any party within the value chain that is handling personal information.

Personal data mean any data of an identified natural person like address, name, phone number, e-mail. There are also some categories of sensitive personal data like religion, health, political opinion. Data privacy is a right that for example in Finland is protected by the constitution. It is in short, a right of an individual to decide who can process data about them. Data privacy legislation is aiming to ensure the organization handling personal data will do so according to the laws and regulations and only when they have lawful grounds for doing so. Few years ago, an updated data privacy regulation was introduced by European Union after the decision called Schrems II. The updated General Data Privacy Regulation (GDPR) is demanding companies to track the transfers of personal data when it crosses EU or EEA borders. Schrems II has created major pressure for organizations to be able to track and report on the processing of personal data not only in the internal operations but also by their suppliers and further in the supply chain (case company Privacy and GDPR instructions).

4.6 How to Secure Data Privacy

There are number of actions that needs to be taken in order for an organization to be able to transfer privacy related information across EU and EEA borders. There are effectively two types of entities involved in data processing data controller and data processor. Data controllers are organization who has the legitimate need to collect and store personal information. Data processors are organizations that can only handle or transfer the personal data according to the data processors instructions. They themselves do not have any rights to the personal data as such (Neuman et al., 2021).

It is important for any organization is to nominate a data privacy officer (DPO). DPO has a key role on ensuring that all needed controls are in place to ensure compliancy with GDPR requirements (Tsohou et al., 2020).

One key aspect for any organization is to understand their data flows and transfers. Data transfer may happen in multiple different ways and before exporting the data organization needs to recognize where possible transfer may happen. Remote access or storing data into cloud which is located outside EU/EEA means data transfer as defined in GDPR. This could easily happen for example in situations where support personnel are located outside EU/EEA and they access support tickets, which include users or customers email, address, phone number and potentially other personal information (Neuman et al., 2021).

Based on the data flow analysis one can start to identify next actions. When knowing the countries where the personal data would be potentially transferred then an assessment of the country's privacy legislation needs to be made. There are numbers of countries where officials have the right to access the personal information for so called strictly necessary use, for examples some foreign surveillance laws in US. Based on the impact assessment data exporter needs to select from set of tools, which once it needs to use to ensure same level of safeguard to the personal data as within EU. The tools include 1) Contractual measures, 2) Technical measures, and 3) Organizational measures (Neuman et al., 2021).

Contractual measures mean in practice either executing Standard Contractual Clauses as part of the supplier or customer contract, or in case the data transfer happens between entities within

same company then creating so called binding corporate rules. Contractual measures can only be relied upon when the country assessment shows that the receiving country has adequate data privacy regulations in place. If the country assessment show that the data privacy regulations are not adequate, then technical measures can be implemented. Technical measures means that the transferred data will be encrypted or pseudonymized so that public authorities access the data. In both cases the keys to open data must be kept within EU/EAA. Technical and contractual measures can also be supplemented with the organizational measures, like implementing clear policies and rules, training the people within the organization on data privacy practices and implementing stringent security policies and practices (Neuman et al., 2021).

4.7 Privacy in Sourcing

In sourcing process privacy has a key role. Each sourcing case needs to be assessed against the privacy requirements weather it is a new case, related to a renewal or change in an existing supplier contract as defined in Figure 17 (Kilpala, 2022). Sometimes also a change in privacy regulations may trigger a reassessment of one or multiple supplier contracts.

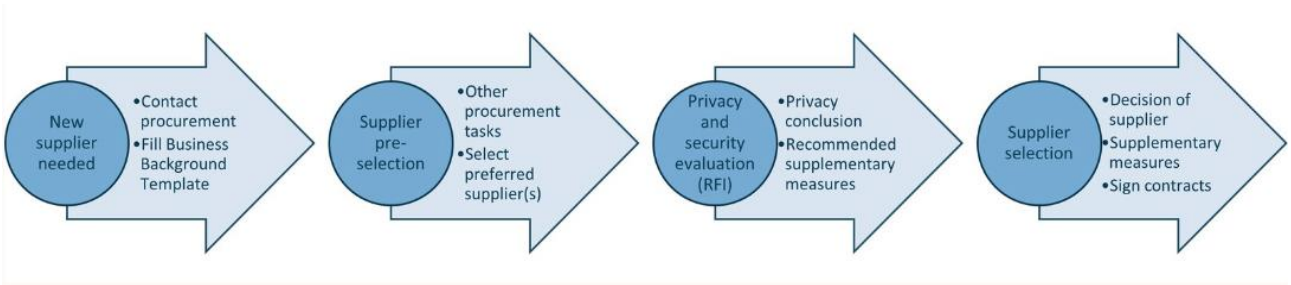

Figure 17: Privacy in sourcing flow (Kilpala, 2022)

When deciding the to award a contract to any supplier It is important to understand what the privacy assessment tells and what are the potential recommendation for supplemental measures. Sometime these measures may be costly and might not guarantee the compliance with GDPR.

Privacy also sets clear requirements for contract management. It is vital the companies are able to track the contractual and also other measures put in place for each supplier contract. Only this way changes in for example supplier delivery locations, new service or products added or changes

in data privacy regulations can be tracked to each contract and supplier, and additional activities to maintain the compliancy can be planned and executed.

5 Role of Automation in Contract Management

During the past decade the role of artificial intelligence and other automation capabilities has increased significantly also in contract management area. The amount of data being processed related to contracts has grown too big for any manual process to be able to keep up in efficient manner.

5.1 Past Research Related to Contract Management Systems

In her report Paris (2014) says that Contract Management Systems (CMS) failed to deliver the automation and transparency to the contract related data that they promised to deliver. This may be true if one is looking for a single system to solve all the different use cases contract lifecycle keeps inside, and specifically if trying to solve both buy and sell side challenges at the same time. One must also remember that since 2014 technology for automating contracting and contract management has taken quantum leaps forwards in particular in last few years. Artificial intelligence (AI) capabilities like machine learning, Natural-language-processing (NLP) are already available in common cloud platforms like Microsoft Azure. Large language models (LLM) and generative AI are improving for mining data from contracts and be used also as part of contract creation and even negotiations.

Digitizing and automating contract lifecycle management may bring additional financial benefits for the company, which are in addition to removing the value erosion defined in section 3.6. McKinsey & Company has studied that for example automation of source to pay process could reduce spend by up to 3.5% (Jain & Woodcock, 2017).

5.2 Prerequisites for Automation

There are number of things that organizations need to consider and have in place before starting the automation journey, or at least consider these things as first steps into automation.

5.2.1 Processes

Before starting to consider automation of contract lifecycle management there needs to be a clear definition of the processes and identification of the actors in each process. Trying to jump directly into implementation of an automated system will not work. If you do not understand how the processes work and integrate to other corporate operational processes, the automation might not deliver to your expectations and the adoption of the systems by the organization will stall. Besides there are multiple different ways to automate activities, not all requiring even highly sophisticated tools. Without clear process definitions it will be difficult to identify where the issues are and what business problem you are trying to solve (Hill, 2021).

5.2.2 Contracts and Digitalization

Where are your contracts stored, are they even in digital or machine readable formats? In many organizations the contracts are not stored in central repositories or are still filed as hard copies. On the other hand, you should also consider if a contract is actually always needed. In sourcing there are many times very simple transactions that do not actually require a written contract as such. This also leads to the first topic, which is the process. When designing your contract lifecycle process you need to consider different use cases and also balance risk and reward (Hill, 2021). As stated in section 3.6 broader definition of contract also includes transaction like purchase orders. If you have the transactions well defined and stored in your systems, then they should suffice as contracts.

Contracts and transactions must be in digital format before automation is even possible. If the current processes are operating on hard copy basis, then the transformation into automated contract lifecycle management will require additional steps like digitizing the hard copies after contracts are signed or moving to use machine readable formats and digital signatures.

5.2.3 Data as Basis for Automation

As said before the base for any automation is laid by focusing into creating a solid data model where contract related data is integrated to the entire enterprise information model and to the processes. This is a key on making sure that contract related data is not treated in isolation, can be utilized by other functions, and may also create new business opportunities for the company.

5.2.4 Governance

When considering automation of contract lifecycle, you need to define certain basic standards and rules based upon which the processes, systems and people should work. Contract templates and playbooks create the basis for automating contract management process, data extraction and analytics. Reviews and decision making are one of the most important aspects that must be clearly defined. The automated workflows cannot really operate without knowing who can approve and what. There may be some automated approvals in place, but the rule for these approvals has to be created by humans (Ross, 2018).

Common language is also important when considering automation. Therefore, time and effort need to be placed for creating a taxonomy that aligns across processes and systems within organization. There are multiple data items that need to move from contract to Enterprise Resource Management (ERP) system to be used e.g. in finance accounting, planning, and order management. Standards like Electronic Data Interchange (EDI) have been in use for a long time. It is important the information contracts like delivery terms, product items and payment terms could easily be shared and matched to these standards.

5.2.5 People

Introduction of any automated system will impact to the people within the organization currently doing the work. It is vital to consider how people operate and use the current tools when designing an automated system. If people fear that the change will make their lives more complicated or add new activities, they will start to resist the change. There may also be just general fear of e.g. losing jobs that will impact to the adoption of new technologies. People need to be included to the change journey from the beginning and phase the change so that the people are able to contribute and adapt along the way (Gould, 2022).

5.3 Automation in Different Lifecycle Stages

Currently in the market there are several vendors that are providing very comprehensive systems that can bring automation to the full contract lifecycle (Figure 18). Some systems are only focusing on either pre-award or post-award phases. This places organizations into difficult position when they are considering on how to do the automation (Phelan et al., 2023).

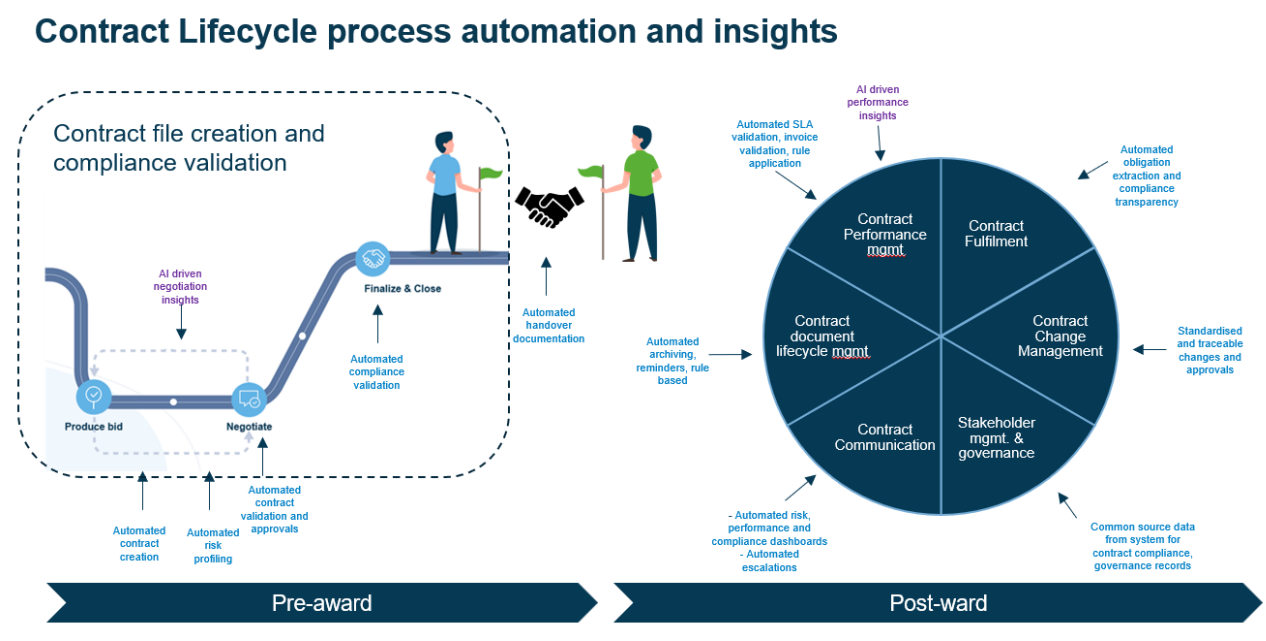

Figure 18: Contract lifecycle process automation and insights (Betdsen et al., 2020)

5.3.1 Pre-award Phase

In the pre-award phase based on the well-defined playbooks, templates, and contract rule contract creation, redlining and approvals can be automated by utilizing Machine Learning, Natural Language processing and smart workflows (AI systems). Organization can train their AI systems based up on the existing contracts, templates, and clause libraries. If contract documents or for example requests for proposal are still received on hard copy the Optical Character Recognition (OCR) can be used to digitize the content into machine readable formant like plain text Microsoft work or searchable PDF's, which in return can be further processed by the other AI systems. Depending on the industry the AI systems have multiple different use cases but, in all areas, they are reducing errors and cycle times, and making it easier for the users to do the right thing therefore making the pre-award phase more efficient (Cummins & Agrawal, 2021).

5.3.2 Post-award Phase

In the post-award phase AI systems can be used to extract data from contracts and using for example Robotic Process Automation (RPA) transfer data into other systems like ERP, financial and production management systems, which in ICT industry can be asset management systems, software license management and performance management systems. By combining data from the

contract management and all other systems into business intelligence tools powerful reporting and analytics can be produced to follow up the fulfilment of the contract objectives and create insights that can help on the contract development, improving playbooks and generally improving the contracting and contract management processes.

5.3.3 Right Automation Technology for Right Tasks

Many of the AI technologies can be used across different tasks within contract lifecycle, important is to understand the level of automation that currently exists and what is the true potential of the automation in different tasks. In the report Jain and Woodcock (2017) stated that across all tasks in Source to Pay 56% of them can be in some level be automated, some are more difficult to automate than others and one needs to assess which technology works best for which task.

6 Summary of Theoretical Background

Contracts have been known and used in human life for hundreds if not thousands of years. It has been debated that written language was developed originally for contracting purposes. Given the history and importance of contracts in current economy it is surprising that contract lifecycle management is rather new discipline compared to for example financial management or project management.

Contract Management Methodology

The first methodology CATS CM was published in 2014 and only in Dutch at the time. As with anything new also contract management has had difficulties on proofing its worth in the corporate process maps. Recently more and more executives are starting to realize the value of contract lifecycle management. This is largely due to increased regulatory pressure from governments across the world but also it has been recognized that companies are leaving a lot of value on the table due to poor management of contracts.

Data from Contracts

Value of contracts is the data contained in them. There are number of processes within the enterprise that need high quality data from contracts as input (Figure 9.). These processes could not produce what is expected from them without the data from the contracts. In some situations, like in relation to data privacy, consequences failing might have significant monetary implications. When implementing contract management processes and tools it is therefore critical to make larger scale study of what data will need to be collected and stored as part of contract lifecycle management processes.

Contract Management Processes

Processes are in key role when collecting and processing the right data. All too often different corporate function operates in silos and spend unnecessary amount of time on reproducing same data over and over again. With clear process definitions, which are built in collaboration between the teams, data ownership and handover points can relatively quickly identified. Time and money spend on defining the cross organization process maps is quickly paid back when data flows can be streamlined, and unnecessary work reduced.

Way to automation

One aspect that is also increasing the interest towards contract management is development related to automation and artificial intelligence. The modern AI tools are enabling many things that in the past would have been too costly or virtually impossible to carry out manually. It is very easy to think that with these modern tools' organization could short cut to full implementation of contract lifecycle management. The brutal reality still shows that if the processes, data, and skills related to contract lifecycle management are not in good shape then the automation is not even doable Figure 19 (Ross, 2018).

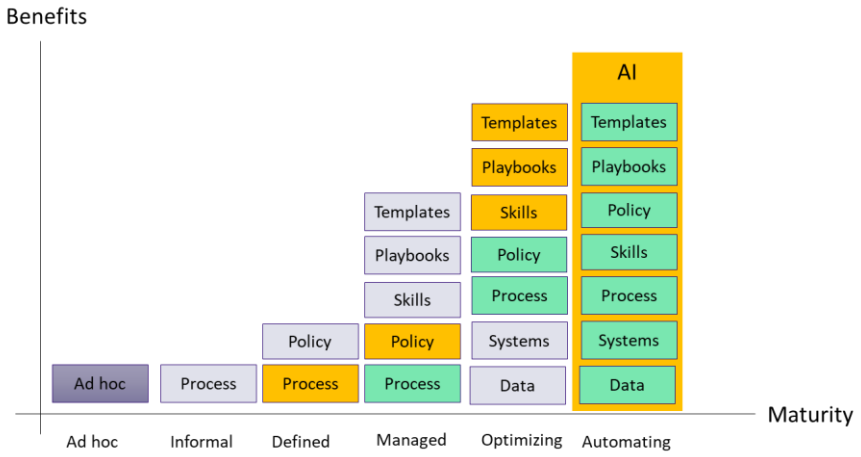

Figure 19: Increasing the maturity of contract management

Ownership of Contract Management

In addition to all mentioned topics there are two critical success factors that one should always anchor before starting to implement contract lifecycle management. First, a clear owner and sponsor for the development, implementation, and continuous improvement of contract management must be in place. Contract management impacts to so many functions, teams, and people within an organization that strong anchoring and push in needed on the highest levels of the organization.

Second thing is timing. Developing all aspects of contract management simultaneously and trying to implement them with a big bang is not successful. Starting with limited scope for development and also for implementation is wise. This will give the organization the opportunity to first of all reap early benefits from the first improvements and also learn about them. In the case company the implementation was started just with few processes and few use cases which were prioritized based on business needed. Similar process can be then repeated for the next items in the list and over time complete all related process listed in Figure 9.

7 Results

This chapter will describe the results from each use case. Since the results are partially confidential, the results described in this chapter are generalizations, which can be applied in other companies as well.

7.1 Use Case 1: Overall Process Map Development for Sourcing

The end result from process development perspective was that there are five processes (Figure 20) in sourcing:

- Supplier Management,
- source to contract,
- Purchase to Delivery,
- Invoice to Pay, and
- Supplier Contract Management.

In the overview there are also other processes areas described, which have a strong linkage to sourcing however not all corporate processes have been added to the figure. These processes are greyed out in Figure 20 and were not part of the scope. Particular focus was placed on how Privacy Management and Sustainability Management connect to sourcing, marked with green in Figure 20. Invoice to Pay process was investigated in detail, however it is not considered to be in scope of sourcing and belongs under financial processes, marked with yellow in Figure 20. Supplier Contract Management was also one process, which was not defined in the current state, but was now added to be part of sourcing processes.

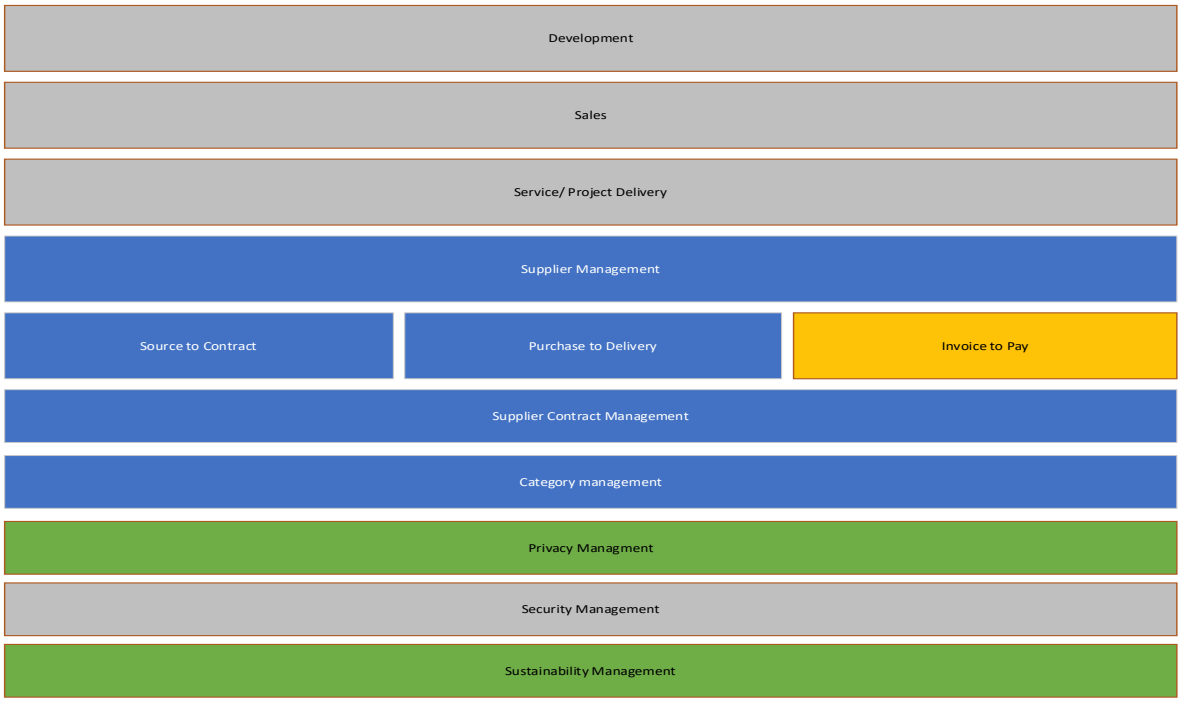

Figure 20: Oveview to integrated process map

7.1.1 Contract Management Processes Within Sourcing

In high level the handling of supplier contract happens during the Source to Contract, when supplier contracts are negotiated and signed, and Purchase to Delivery processes, when supplier contracts are used as basis for purchasing. There was some discussion among the stakeholders that should the Supplier Contract Management be named as own sub-process or should be integrated into Source to Contract and Purchase to Pay sub-processes. Like described in the theoretical framework in section 3.1 there are five process areas within Contract Lifecycle Management: Contract Development, Contract Creation, Contract Implementation, Contract Execution and Contract Closure.

At the end the **Contract Development**, which focuses on developing contracting standards, templates and playbook was not included into the sourcing processes but was determined to be belong under the legal processes. Link to sourcing happens via the Contract Database, which contains the approved templates for the different sourcing contracts as well as a clause library, which can be used when for example using suppliers contract templates as basis for contracting. Even when roles from sourcing organization are participating to the Contract Development it is still not

included into the sourcing processes. The rest four of the processes was included into the overall sourcing process area as own sub-processes.

Contract Creation was aligned with **Execute Plan** phase as part of the source to contract process (Figure 21) where it very naturally belongs. Alignment was done by adding few new tasks for sourcing manager in the Execute Plan phase. Tasks include creation and finalization of the contract documentation, adding and maintaining contract documents and relevant data in the contract database.

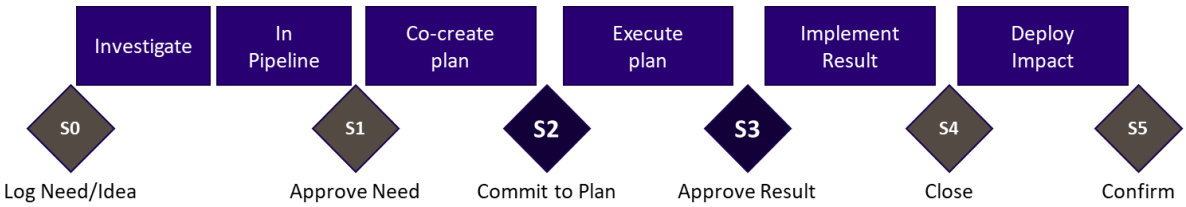

Figure 21: source to contract high level process and approval gates

Contract Implementation is aligned with **Implement Results** phase. In this phase the focus is on moving from pre-signature phase to post-signature phase. This was identified as a critical phase for ensuring successful delivery of the contracts and ensuring that the negotiated results are implemented into the operational processes like purchasing, invoicing and service delivery management. During this phase:

- sourcing manager makes sure that all the contractual documents, decision making material are stored into the contract database along with the relevant metadata, and risks are stored into the risk management system.
- sourcing manager prepares and runs handover sessions where responsibility of the contract is formally handed over to Contract Manager, relevant stakeholders, and buyers.
- sourcing manager and buyers will set up the purchasing and invoicing capabilities in ERP by collecting needed metadata, like payment term, supplier bank accounts, from the contracts and supplier master data.

Contract Execution is aligned with the **Deploy Impact** phase, which in most cases is the longest phase as it covers the lifecycle of the contract until renewed, expired or terminated. Contract Execution is the process area where many of the CM Essentials defined in section 3.4.2 are covered.

For practical reasons the implementation of the CM Essential for sourcing was not done one-to-one with new processes but some essentials where combined still achieving the same results as described in the CATS CM methodology. Contract Execution has particularly strong connection to other operational processes and other processes within sourcing domain. The detailed linking between Contract Execution and other processes is defined in the table 4 below.

Contract Execution processes	Description	Linked Operational Processes	Linked sourcing Processes
Contract File Management	Maintain complete and accurate understanding and record of the contract documentation throughout the contract lifecycle.	Finance accounting and invoicing Product management Service and Project Delivery operations Legal and contract management Privacy Management Sustainability management	Purchase to delivery Supplier management Category management
Contract Fulfilment	Ensuring the achievement of contract objectives by completing the deliverables and obligations defined in the contract.	Finance accounting and invoicing Product management Service and Project Delivery operations Legal and contract management Privacy management Sustainability management	Purchase to delivery Supplier management Category management
Contract Change Management	Documentation, assessment, and authorization of changes that impact to the contract.	Finance accounting and invoicing Product management Service and project delivery operations Legal and contract management Privacy management Sustainability management	Purchase to delivery Supplier management Category management

Contract Risk Management	Identification and management of risk related to the contracts.	Product management Service and project delivery operations Legal and contract management Privacy management	Supplier management Category management
Contract Performance Management	Follow up and reporting of financial and quality indicators.	Finance accounting and invoicing Product management Service and project delivery operations	Supplier management Category management
Contract Governance	Regular follow up and reporting of the stakeholder satisfaction on the contract. Regular meetings with suppliers to manage the contract objectives. Follow up and reporting on the relationships between contracts at portfolio level.	Finance accounting and invoicing Product management Service and project delivery operations Legal and contract management Privacy management Sustainability management	Supplier management Category management

Table 4: Link between Contract Execution and other processes

Contract Exit is the final phase on the contract lifecycle and that is aligned with sourcing gate S5 Confirm. Contract Exit process focuses on closing the contract in systematic manner and ensuring that all material from the parties is either returned or destroyed as agreed, financial accounting is closed, purchase orders are closed, final invoices are settled, agreeing any open issues between the parties, and archiving the contract. Important is also to reallocate the resources connected to the contract management and delivery operations. Some activities within Contract Exit must done also in cases where contract is renewed for a different term. The basic thinking is that the renewed contract has new objectives, period, and financials so it should not be mixed to the old contract.

7.2 Use cases 2 and 3: Privacy and Sustainability Process Integration to Sourcing

During the development several integration points between sourcing, Privacy management and Sustainability management were identified.

First point where both Privacy and Sustainability related items are covered is during the source to contract processes. Both privacy and sustainability are key criteria to investigate in each sourcing case. If there are any privacy or sustainability related topics included in the items to be sourced, then additional due diligence activities will need to be added to the source to contract process phases. Additionally, if privacy related topics are covered in the sourcing case, then it means that a contract must always be created for such situation. Without privacy also other alternative sourcing methods can be used. Due diligence activities include normally sanction check of the suppliers, credit check and science based targets (SBT) verification. These actions are done for all suppliers who are added to the ERP and with whom it is allowed to do business with. If sourcing case includes privacy related items, then privacy and security assessments are added to the due diligence activities. For larger sourcing cases also additional sustainability assessments may be added covering more detailed environmental, social and governance related items. The assessment results have direct impact on what contractual documentation may be needed. Based on the privacy assessment some mitigation actions may be needed as detailed in section 4.6. Such mitigation actions will also need to be added to the contracts and agreed with suppliers, meaning more work also during the source to contract phase. Therefore, it is necessary to conduct these assessments already during the Co-Crate Plan phase (Figure 21.) and include additional time and effort into the sourcing plan.

Second place where Privacy Management and Sustainability Management are linked is during Contract Execution. Table 5 shows that there are several points where Privacy Management and Sustainability Management are linked to contract management. Detailed linkage depends on the individual contract, but the main principles are summarized in table 5.

Contract Execution process	**Link to privacy or sustainability**
Contract File Management	All contractual documents including the data privacy agreement, standard contractual clauses and process specifications must be stored and managed.
Contract Fulfilment	Mitigation actions and other contractually agreed deliverables and obligations related to privacy and sustainability must be tracked and reported.
Contract Change Management	Changes to the supplier deliveries or customer requirements may have significant impact to privacy or sustainability related items requiring updated assessment, analysis and changes to the contract.

Contract Risk Management	Risks identified during the creation of the contract and during Contract Execution may have implications from privacy and sustainability perspective. These risks need to be managed in frequent interval and mitigated according to agreed risk management practices.
Contract Governance	Continuous review of the contract objectives and satisfaction with the contract from stakeholders' perspective, including privacy and sustainability managers.

Table 5: Link between contract management, privacy and sustainability management

Integration between Source to Pay, Privacy management and Sustainability management processes is critical, only this way it was possible to identify what data, when and by whom was created to support the correction decision making, risk identification, action planning and reporting related to execution of sourcing cases.

7.3 Use case 4: Supplier Contract Metadata Model.

7.3.1 Conceptual data models

In the beginning conceptual data models related to Source to Contract and Purchase to Delivery processes phases was created to identify all the different data elements and their relationships.

From the case company specific conceptual data models defined in appendix 1, 37 different data elements were mapped, if the scope would be widened then the amount of data elements would increase. Below are simplified data models to illustrate the idea of conceptual data models Figure 22 and Figure 23. The conceptual data models assisted the stakeholder on identifying what data would be needed from the supplier contract, who is responsible for creation and maintenance of the data elements, and which IT-system or other source is used to manage and store the data elements. Data elements, short description, connections to other data elements, responsible roles and source systems were separately documented to improve achieving a real common understanding between stakeholders. This level of detail will also help when communicating with the responsible roles and defining requirements for any future system development.

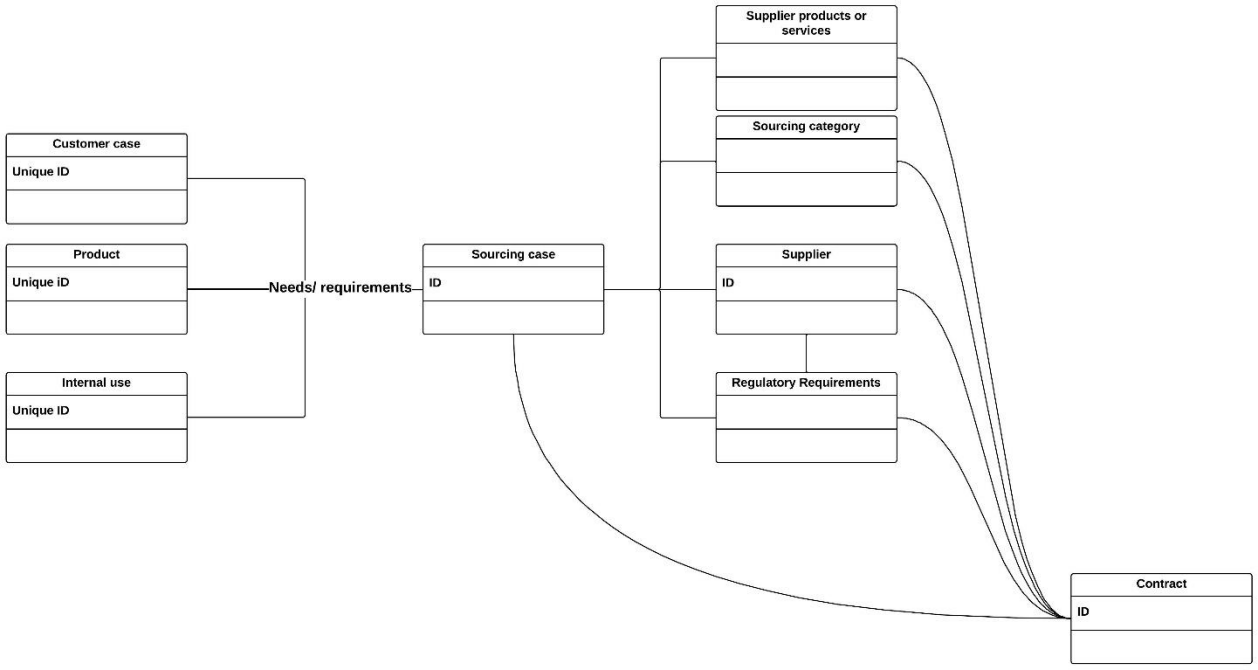

Figure 22: Simplified conceptual data model Source to Contract

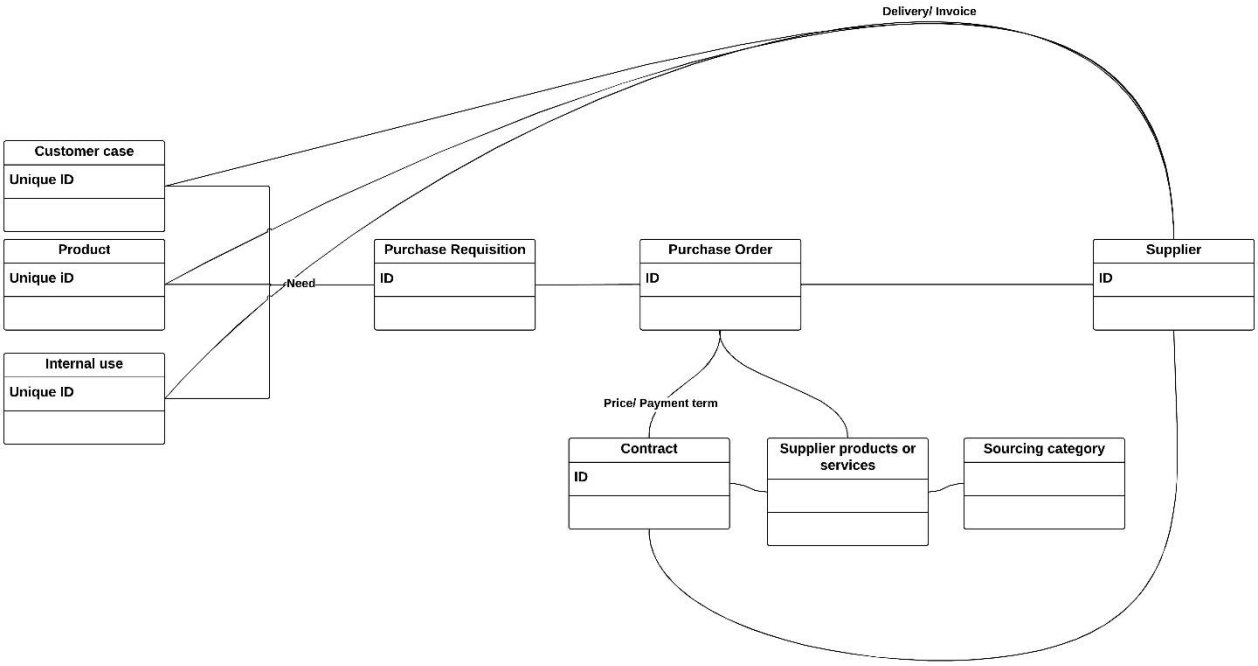

Figure 23: Simplified conceptual data model Purchase to Delivery

7.3.2 Logical Data Model for Supplier Contract

Logical data model defines the various data elements in detail level listing the mandatory and optional metadata attributes and their values. Depending on the attribute the values may come from a fixed predetermined list of values or then they can be keyed in, but the type of attribute is fixed to be for example text or numbers. In some rear cases attribute value may be free text. If there are already ICT-systems in use, then some values for attributes may be automatically generated by these systems.

The attributes and their values were determined based on the needs from the processes in scope of the case study, different related policies and contracting standards defined for the case company. For the Supplier Contract and related data elements 64 different attributes and values for them were created (Figure 24.). Figure 25 provides an example of the details defined for each 64 attributes identified. Once populated for each contract this data enables quick search capabilities and building of different business intelligence without a need to go and open each contract separately. This number of attributes is starting to be at a maximum level, which can still be collected and maintained manually over the contract lifecycle.

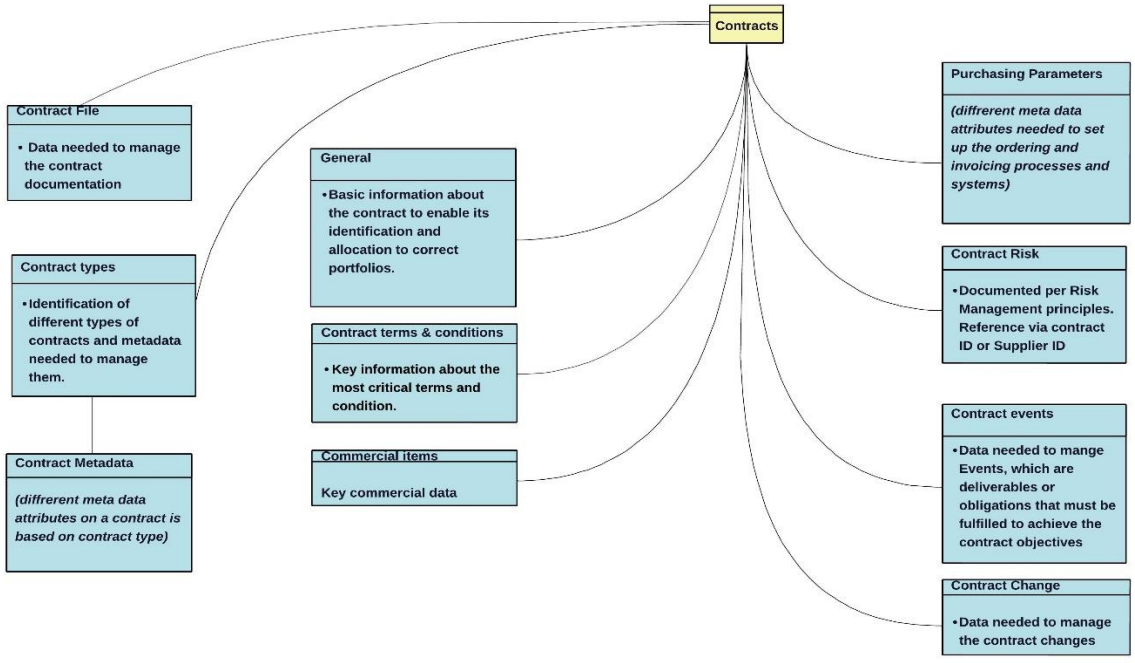

Figure 24: Simplified Contract Logical Data Model

	Metadata for Supplier Contract	In use today	Fix field or metada	Comment	Type	Automation needed	Default content/value
1	Contract Name	Yes	Fix field	Name of the contract from the contract document	Text field		Free text
2	Contract Type	Yes	Metadata	At this point considered as metadata. However we need to be able to define, which other metadata is relevant for each Contract Type	Value list		Frame Agreement, Service Agreement, Project Agreement, License Agreement, NDA, DPA/VDPA, Lease Agreement, Financing Agreement, Partner Agreement, Reseller Agreement
3	Description	No	Fix field	Short description of the purpose of the contract	Text field		Free text
4	Contract Identifier	Yes	Metadata	System generated unique identifier for the contract		Yes	Auto generated
5	Can contract be used to PO creation?	No	Metadata	Defines if the contract is designed to be used for Purchasing purposes	Value list		Yes/ No

Figure 25: Example of attributes and value definitions

7.4 Use Case 5: Connecting Contract to Purchase Order

In the case company there are two types of purchase orders in use, **catalogue** based and **non-catalogue**. It takes a lot of time to set up catalogues for the supplier items and that is why they are mainly used for standardized high volume items like end user devices, mobile devices, peripherals, and end user licenses. When setting up the catalogue buyers are collecting key terms from the contracts like items available from supplier, payment term and prices. This information is then entered to ERP, so that when a purchase order is created that information is automatically included to the purchase order. There may be hundreds of purchase orders based on catalogues in each month, so the time invested in setting up the catalogues pays quickly back when buyers do not need to manually touch each order.

The **non-catalogue** purchase orders are used for more complex cases where items are not or cannot be standardized. There is usually a frame level agreement with the supplier, which defines the commercial terms and conditions and even the type or category on items, which can be purchased but not the details of the items. Since the effort related to building a catalogue is relatively high it does not make sense to set up catalogues for low volume, non-standard or one off items. For the non-catalogue purchases the root of the issue was that the key data from contracts were not made available for the purchase order in the same way as for the catalogue purchases. One of the main issues was IT-system deficiencies, but there were also some unclarities in the process side. In practice this led into situation where buyers needed to key in data manually when creating the purchase orders and without always having contract available Figure 26. This way of processing purchase orders is error prone and needs more effort also from buyers to get the right data. Other issue was buyers limited access to the contracts.

7.4.1 Data Elements

During the data model development Purchasing Parameters was identified as one new data element. Due to the flexibility of the data model the attributes and their values for this data element can be added or modified without major impact to other data elements Figure 27. The first attributes under the Purchasing Parameters included payment terms, which is critical information to flow down to purchasing and accounts payable processes from the contracts.

7.4.2 Datbase Configuration Change

There were limitations on what and how data can be recorded into the ERP system supporting non-catalogue purchase orders. There were already a lot of suppliers and purchasing business unit related data available in the ERP system, Supplier Site table in Figure 26. The solution to the problem was to create an additional data table to the ERP system called Purchasing Parameters, which can be populates without changing the base configuration of ERP system. This allowed the addition of new data from the contract to support the purchasing process.

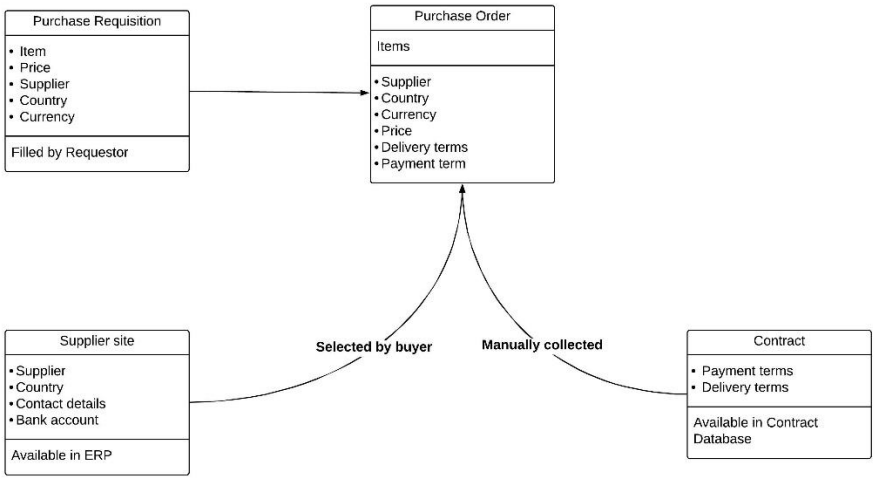

Figure 26: System configuration before adding the new table

7.4.3 Update in Process

Contract database and purchasing are two separate systems and there are limitations on the integration between these systems. On the other hand, changes to the contract that have direct impact to the purchasing parameters are relatively rare so automating the integration was not the first priority. Focus was placed on getting the initial set up of the purchasing and invoice handling in accounts payable to work according to the data from the contracts. For this purpose, handover process from source to contract to purchase to delivery phase was introduced. During this phase sourcing manager has the accountability to collect the agreed data in agreed format and provide that to buyers. Buyers will then use the data to set up the Purchasing Parameters in ERP system so that each purchase order is automatically connected to the correct contract Figure 27.

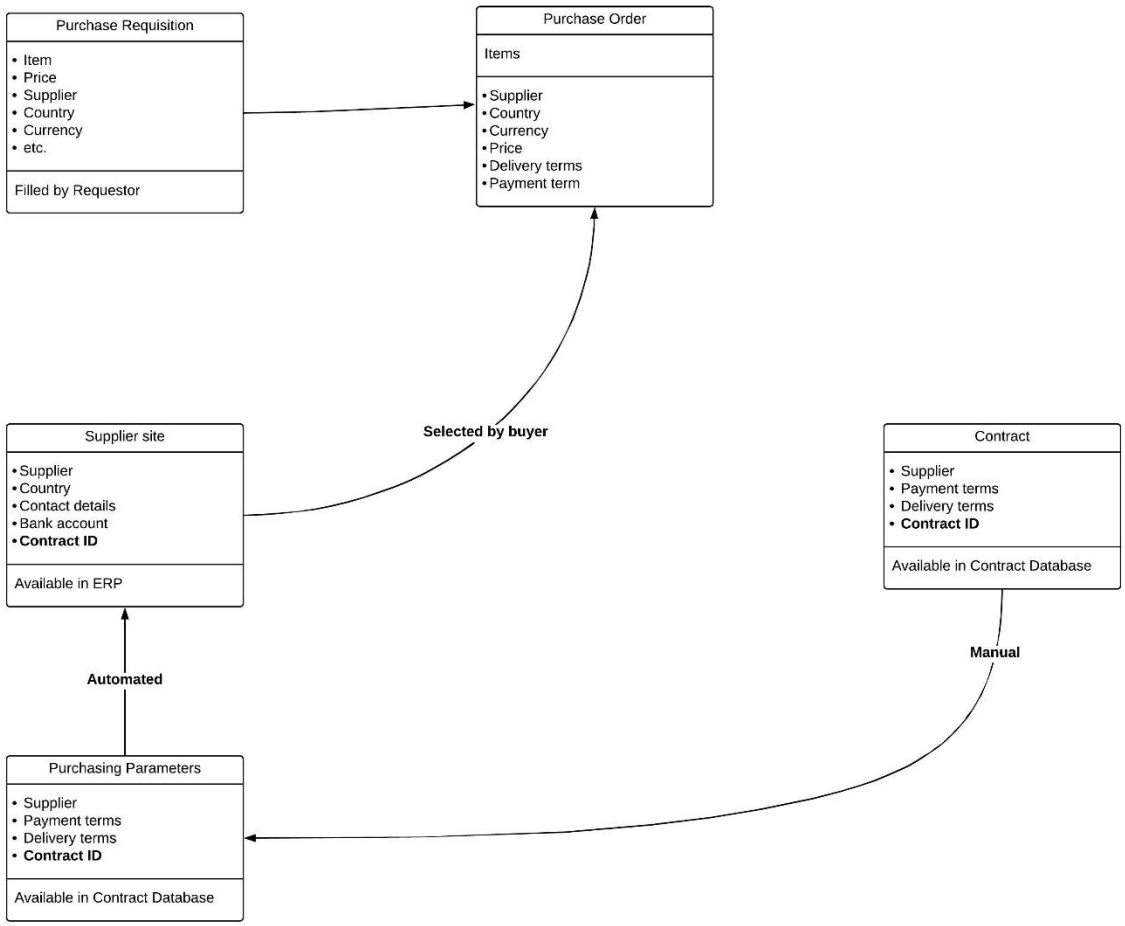

Figure 27: System configuration after adding the new table

With the implementation of the new approach the purchase order to contract ration has increased from 0 to 57%.

7.5 Use Case 3: Sustainability Data in Sourcing

Based on the current state processes and key performance indication for sustainability within the case company there are three areas where sourcing is supporting the fulfillment of sustainability requirements in the case company:

- Supplier base sustainability
- CO2 calculations for supply chain
- Supplier product level sustainability

7.5.1 Supplier Base Sustainability

One of the sourcing's' role is to ensure that supplier base is adhering to same sustainability principles as the case company and its employees. These principles are set in the supplier code of conduct and comprises from minimum requirements on following areas:

- Human rights and labor conditions
- Environment
- Business ethics and anti-corruption
- Legal compliance

In practice supplier compliance with the code of conduct is tracked and recorded starting from supplier onboarding and followed up regularly during the period when supplier is actively used. In the case study number of data elements were identified where the sustainability related data gets recorded and connected to the supplier. Figure 28 shows the different data elements and high level description what kind of data is recorded in each data element. One finding during the case study was that automatic relationship between these data elements does not exist and therefore full reporting capability utilizing data lake is not available yet. However, the supplier dashboard, which has been developed during the case study is providing an overview to suppliers' sustainability status like their compliance with supplier code of conduct and science based targets. Audit and self-assessment data will be added to the supplier dashboard in the next development cycle. Some

of the data needs to be maintained manually and automation of the data collection from the data element is added to the system development roadmap.

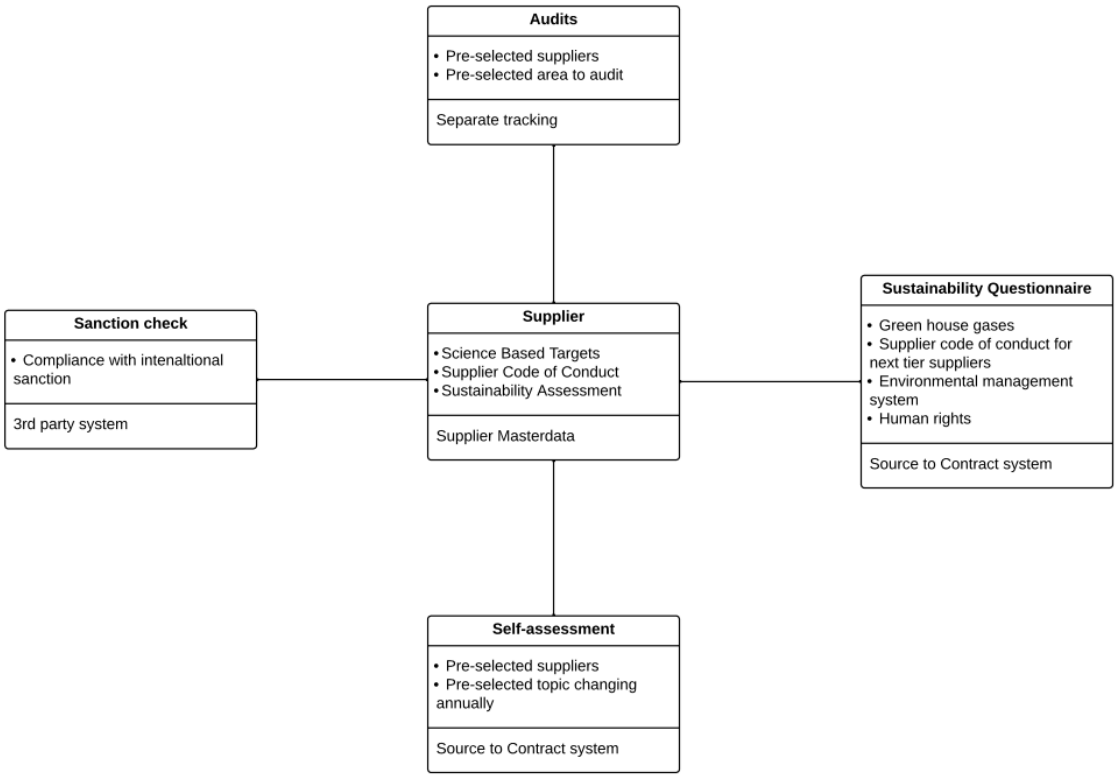

Figure 28: Sustainability data related to Supplier

7.5.2 CO2 Calculation for Supply Chain

Sourcing is working in close collaboration with case company sustainability team on calculating the CO2 emissions from the supply chain. Calculation is made on supplier level and is based on sourcing categories, invoicing amounts and emission factors for each sourcing category provided by 3rd party organizations. CO2 report utilizes the Supplier data element and in addition to the CO2 level per supplier also supplier commitment to science based targets is added to the report.

Evaluation of the new ESRS reporting requirements is ongoing and impact to the emission and other reporting is not fully known. During the case study team discussed about new data element called sourcing Item, which in practice would collect data related to supplier products or services. This data element could in theory contain some sustainability related information, however at this

stage use of the data element was not considered technically feasible. In a case company operating environment with hundreds of suppliers and thousands of supplier products collecting the needed information from the supply chain would require higher maturity from suppliers and much advanced technical capabilities.

7.5.3 Supplier Product Level Sustainability

Sourcing has put focus on including sustainability related requirements and criteria towards supplier product and services during the source to contract phase. In addition to the supplier level sustainability requirements supplier managers are working in collaboration with stakeholders on defining product level requirements and criteria as basis for the supplier and supplier product selection. These requirements and criteria are verified in the sourcing approval gates.

There are multiple different categories, which means that standard sustainability requirements that cut across all of the categories are difficult to define. This means that typically the requirements are defined on case by case basis. During the case study team started to work to define some standards for the devices that are used to provide computing services in hardware category. The basis for the requirements were derived from ESRS and relevant ISO standards. Examples of requirements for the hardware category include:

- Devices must meet ASHREA level 2 as minimum operational temperature ranges and humidity levels.
- Devices must have energy efficiency certificate – decision criteria for HW sourcing.
- Devices must contain energy saving functionality in many levels.
- Device should be easy to repair, support long useful life and EOL should be recyclable and parts reusable. Material circularity should be supported by supplier.
- Supplier must inform the amount of reused materials in the products and commit for continual improvement.

Full set of requirements is still under development; however, these requirements have already been used in active sourcing cases.

It is not enough that requirements are verified during the sourcing case when the supplier and standard products are defined. It is important to control that during the purchasing phase requestors are adhering to the standard products. Team also defined governance model for making sure

that control mechanisms are in place for purchasing to review the use of standards. In the hardware category in most cases the control is relatively easy as larger purchases must go through investment approval process where the standards are also verified. Controls for smaller purchases, which are below the investment approval limit is still under investigation.

8 Conclusions

This chapter dives into the findings from the case study and how they can be used to meet the objective of finding ways to improve sourcing organizations overall efficiency.

8.1 Supplier and Supplier Contract Related Data Needs

First key findings form the case study was a positive discovery of how much data related to supplier and supplier contracts already existed within the organization. Different teams, like privacy and sustainability management, have been developing reports and systems for their own use but those have not been shared more widely. While there is a lot of data seemingly available the issues are the format and sharing of the data. In some cases, clear identifiers were missing so connecting data sets together is difficult and requires manual effort, which in this scale of operations is not really feasible. Multiple data sources also have led into a situation where same data is entered into different systems by different teams or roles. This finding is well supported also by the theoretical framework (Cummins & Agrawal, 2021).

Second key finding was that data quality related to contract data needs improvement. In the current processes and systems there is very limited set of mandatory metadata related to supplier contracts. Even if basic contract metadata exists most of the detailed analytics from supplier contracts cannot be made due to missing or low quality data. On the other hand, for the larger and most critical suppliers the data was in better shape in particular when related to data privacy and sustainability areas, which were investigated in the case study. This would indicate that there are no significant compliancy risks in these areas.

Third key finding, which is supported by discoveries from the theoretical framework, is that data is handled in silos and requires a lot of manual processing. There is a risk that it leads into issues with data quality (Cummins et al., 2023). Supplier dashboard was the first time when all different

data sources related to suppliers, their performance and supplier contracts was made visible in one simple format. Introduction of the supplier dashboard is a major improvement to the transparency for the organization, even if many of the data sources for the supplier dashboard are maintained manually. Supplier and sourcing managers can now access variable data sources through the supplier dashboard saving them time from searching and entering into multiple different systems.

Fourth more significant **finding** relates to the detailed data of supplier products and services, and the need to have this data available for sustainability and privacy purposes. During the source to contract phase there is a lot of emphasis on making sure that suppliers and their products and services meet the requirements stakeholders have for them. Functional and non-functional as well as suppliers' compliance requirements are carefully assessed and recorded to the contract. The issue is that the detailed data of the supplier products and services are not recoded to the case company systems except when catalogues are created. In such cases detailed product descriptions are available in the purchasing tool. Case company is assessing the impact of the new ESRS reporting requirements to sourcing. Many of the requirements can already be covered by the systems and practices in place. However, there are new requirements that in the future may require more detailed data to be available from the products and services to calculate for example some circular economy related metrics. Similarly, in privacy and even in security area where new regulations and requirements are introduced needing more data from the products and services.

8.2 Process Maturity

Findings around the data correlates well with the maturity level on the supplier contract management. There has been relatively mature process in place within the source to contract phase for creating and storing of the contracts into the contract management database. However, the post-signature contract management processes have not been defined in detail until now. Without clear roles and responsibilities related to post-signature contract management contract data has eroded over time and become unreliable. Again, the situation with the larger and critical suppliers is better, which is most likely dependent on named persons looking after these suppliers. One aspect is also that sourcing function has not historically been having a centralized supplier manage-

ment role. Business units have led the supplier relationship activities focusing on suppliers' delivery quality and pricing, leaving the contract management into secondary role (Cummins & Bulucan, 2023).

The redefined process descriptions will assist the organization to implement clear roles and responsibilities across the contracting lifecycle. Together with improved contract portfolio management, discussed in chapter 3.5, will allow the case company to prioritize the contract management activities and resources to the most important suppliers and contracts without overly increasing the amount of people. Clear roles and responsibilities together with the data model definition will also improve the data governance having a positive impact to the data quality.

8.3 Role of Automation in Data Governance

Considering the need for improving sourcing organization efficiency automation can be considered as of the biggest leavers as stated by both Hill (2021) and Cummins & Bulucan (2023). The case study revealed that there is very limited automation on extracting and transferring contract related data both in the pre- and post-signature phases. Data is handled in multiple systems varying from excel files to ICT-tools designed for specific purpose like contract management database. Each system has its bespoke design and data structure, which provides little grounds for developing automation in large scale.

Now the data model and process framework provide basis for the sourcing organization to consider development actions also in the automation area. Combined with the actions related to data quality and digitalization that would allow sourcing organization to drive both efficiency and performance to higher level. Path to fully automated source to pay process is still long and trying to take too big steps at one time is not advisable. In that respect continuing to utilize current business intelligence system and prioritized development to leverage the most important data elements in more automated manner is the first step to right direction.

8.4 Impacts

During the case study few key indicators took steps to better direction. Contract coverage increased from 65% to 86% in some units reaching 96%. Purchase orders connected to contracts increased from 0% to 57%, which as a knock on effect has had also positive impact to cashflow.

8.5 Supplier Dashboard

One of the main results from the case study was the creation of a supplier dashboard (Figure 29). When going through the overall contract and supplier data model it was recognized that there is a lot of data already available in different corporate systems. By utilizing business intelligence tools this information was connected into a comprehensive supplier dashboard figure 29. This is the first time in case company when supplier and supplier contract related data has been made available on this level within one snapshot.

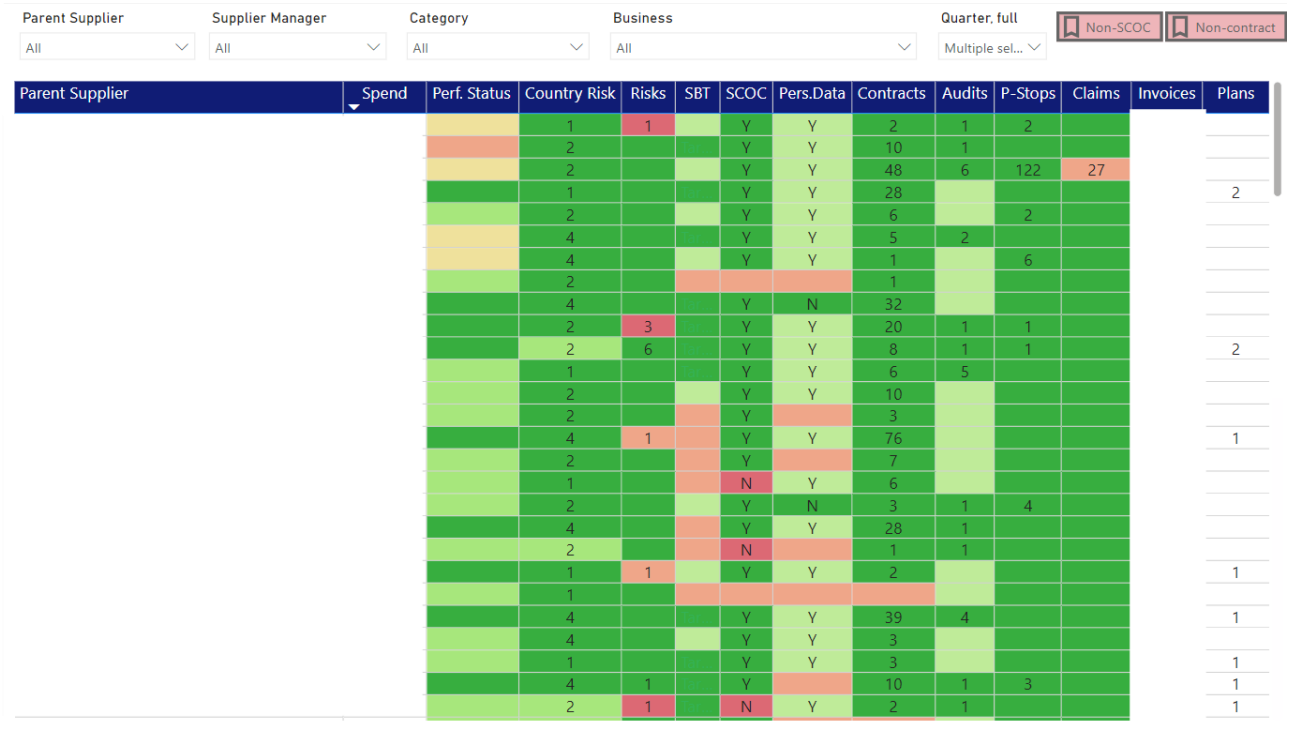

Figure 29: Supplier Dashboard

Supplier dashboard is a practical reflection of the contract and supplier data model, which assists supplier and sourcing managers in the activities and provides an overview of to the supplier and

supplier contract data quality. Supplier dashboard provides supplier managers a comprehensive overview to their suppliers with the ability to drill down to detail. Based on the supplier dashboard supplier managers can initiate corrective actions on either fixing data quality issues or approaching suppliers to ensure that compliance with the minimum requirements is met. At this stage Supplier dashboard is relying in many places to manual data updates.

8.6 Improving Sourcing Organization Efficiency with Contract Data Management

8.6.1 Digitalization

The new data model provides the organization now a starting point on prioritization of data quality improvement actions. Further development is required on digitalizing different data elements identified in the data model. In practice digitalization means that data is enriched with the needed identifiers, made machine readable and transferrable between systems, and in some cases data processing is automated.

8.6.2 Data Governance

There is also a need to improve sourcing organizations data governance and to ensure each role will enter the mandatory data into the systems as part of their day-to-day activities. Before automation is implemented disciplined actions, data quality metrics and continuous follow is needed to increase the overall quality of data. Increase in data quality will also reduce repetitive tasks and errors, which in effect will increase the efficiency and value of sourcing organization.

8.6.3 Automation

Automation will be an action that sourcing organizations must do. However, the automation in this context does not mean that the entire system landscape should be overhauled with one big bang. By identifying key problem areas where different roles need to spend a lot of time in relatively low level data or document processing are perfect opportunities for modern AI tools like Microsoft Copilot to automate. The actual coding does not need major effort, but the result will save sometimes from minutes to tens of minutes processing time and will also increase and standardize

the quality of the outputs. Putting effort on finding such improvement areas will also make the organization much more prepared for the change when more robust fully automated systems will be introduced.

9 Discussion

The objective of the case study was to find ways to improve the sourcing' efficiency within the case company by developing integrated contract data management.

The case study was successful on showing that by investing time on defining detailed processes and related data model will help sourcing organizations to identify where its value exists. The relationship between other enterprise processes and systems is not always easy to recognize. Even with relatively small process samples used the case study proved that by diving into the data, these relationships become much clearer and easier to understand by different stakeholders. Already now the Supplier Dashboard has proven to very effectively way to provide transparency online and near real-time information related to data privacy and sustainability within sourcing and supplier management. For example, in external auditing situations the information can be share right away where in the past collecting such information and setting it up in presentations for auditors would have required days of preparation.

The selected approach for defining processes and data model worked well. Particular the engagement with stakeholders was proven effective both from research and stakeholders' perspective. Since the way of working was mainly in team mode the individual comments and requirements were not recorded by individual name people felt mode free to express their views.

The processes in scope were selected due to their relevance and importance in the current compliance framework within the case company. Sustainability proved to be quite complicated area to study since the new EU regulation is just becoming into force and all implications to processes and data are not clear yet. In retrospect for example service delivery management processes could have been more mature area to include into the scope.

9.1 Future research

The case study still leaves many other corporate processes untouched. As next steps other process areas should be studied using same method to identify relationships to supplier and supplier contract data. In particular product data management and customer contract management could be interesting areas to investigate with the value of sourcing in mind. In addition, security management should be included into scope due to the new regulations like NIS directive in EU and Digital Operational Resilience Act (DORA) becoming into force and impacting to the case company.

9.1.1 Removing Silos and Harnessing Unattained Information

The case study focused on identifying data, which is actually recoded into the contract and build a data model to support the sharing of that data across different corporate processes. At the same time, we should recognize that not all information we handle during the contract lifecycle (Figure 8.) end up in structured format as part of the contract. There is a lot of information that is shared between the parties in different formats during the pre-signature phase, which as part of negotiation and prioritization are left out from contract. This information could appear in emails, formal meeting minutes and other documentation shared during the process. Due to inefficient manual methods this data is never properly recoded and also due to the different friction point defined by Cummins & Agraval (2021) are not shared to the post-signature teams. In many organizations the disconnect exists also in second dimensions between sales and sourcing. Friction points on these both dimensions make the information collection and flow difficult between the phases and teams (Figure 30). As an example, a product sold to a customer contains several elements that are coming from 3rd party and belongs to sourcing organization responsibility. If sales and sourcing are working in silos there is a risk that some meaningful connection between own product and 3rd party items is missed causing issues to customers.

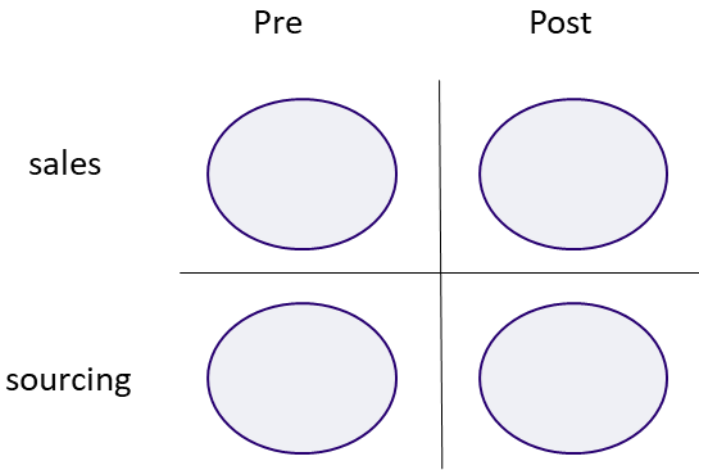

Figure 30: Siloed organization and unattained information

Disconnect between pre and post award leaves a lot of information and tacit knowledge, which do not have a real place in the different processes, totally unattained. Finding and collecting this information could be very valuable for everyone. For example, during negotiations both parties are talking about their interest or goal, which are not always written into the contract, but which are very important during the contract execution to build better relationship. Trying to collect this level of information with conventional and manual tools for contract and relationship management is extremely difficult and requires a lot of effort. In many organizations this is not seen as good investment, or even understood that it would need to be collected. Modern AI systems could be made to collect and analyze this type of structured or unstructured data from different sources and they could also identify connections between data set even if the underlying data models are not fully aligned or terminology use varies (Figure 31).

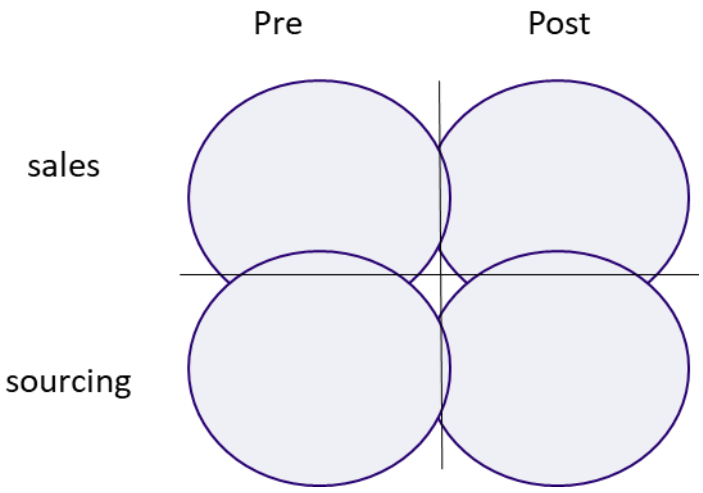

Figure 31: AI systems can help to attain unused information

In the attempt to make the sourcing organization even more valuable player within a corporate this is one area where future research and development should also be aimed at. While making teams more efficient and improving alignment of contracts across the value chain harnessing this invisible information may give organizations the ability to pursue completely new opportunities with the existing customers and within the marketplace (Jain & Woodcock, 2017).

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