UNIVERSITY OF LJUBLJANA
SCHOOL OF ECONOMICS AND BUSINESS

MASTER'S THESIS

THE DEVELOPMENT OF INTERNET PLATFORMS FOR SUPPLIER RELATIONSHIP MANAGEMENT: THE CASE OF ECRATUM PLATFORM

Ljubljana, December 2019 ENKELA SKIKULI

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LIST OF ABBREVIATIONS

CTO – Chief Technology Officer: executive level position focused on technology
EDI – Electronic Data Interchange: structured way of sharing information electronically
IPD – Integrated Product Development: cross–disciplinary course with focus on product development
IS – Information Systems: incorporated system used to create, store and process information
ISO – International Organisation for Standardisation: set of standards ensuring product quality and compliance
IT – Information Technology: software or hardware used to manipulate and process data
KPIs – Key Performance Indicators: measurable performance values
MVP – Minimum Viable Product: minimum value of a product to be delivered to the customers
PDIF – Product Development Integration Framework: framework facilitating product development

PPI – Producer Price Index: measuring price changes
PSM – Purchasing and Supply Management: management of processes in the purchasing and supply discipline
QA Officer – Quality Assurance: position dealing with quality testing of a particular product or service
SCM – Supply Chain Management: management of supply chain business processes
SRM – Supplier Relationship Management: discipline arming to facilitate supplier relationship strategies and interactions
R&D – Research & Development: set of activities and resources used to create new ideas
SaaS – Software as a Service: subscription models
SLA – Service Level Agreement: product specification agreement

1 INTRODUCTION

1.1 Study background

A supply chain can be defined as a network of people, companies, resources, processes, and technology, involving all the steps in creating and selling a product. It incorporates processes starting with the distribution of raw materials from the supplier to the manufacturer, through to the operation of providing the product to the end-user (Stadtler, 2015). Supplier relationship management (hereinafter: SRM) is a structured, enterprise-wide evaluation of the overall business strategy of suppliers and their capabilities. It determines the activities needed to interact with suppliers, and the arrangements and execution of these activities in an organised manner. SRM develops a beneficial two-way relationship with potential partners and maximises values to deliver innovation and efficiency by aligning strategic objectives (SDI Point of View, 2016).

The supply chain is more complicated than just one-to-one or business-to-business relationships; a supply chain implies a bigger network of businesses and complex business processes (Lambert & Cooper, 2000). Supply chain management (hereinafter: SCM) involves the integration and management of these complex relationships between the supply chain members. It also acts as a way of facilitating and creating value from the supply chain business processes (Lambert & Cooper, 2000).

SCM has a positive impact and helps businesses to optimise business performance and has thus been an essential element in fostering competitiveness (Trkman, McCormack, De Oliveira & Ladeira, 2010). Businesses are now managing their relationships with suppliers using the latest modern technology, which provides opportunities to create value from SRM. SRM and successfully implemented technologies improve the overall supply chain performance therefore help in increasing quality, while at the same time reducing costs. SRM also enables companies to obtain the relevant resources, and collaborate with potential suppliers (Gyampah, Boakye, Adaku & Famiyeh, 2019).

It is essential to understand what makes a relationship between customers and suppliers durable and long-lasting: collaborating with the right suppliers to reduce costs and to produce high-quality volume (Choy, Lee & Lo, 2003). Technology-driven solutions should be studied and applied, however, to respond to the competitive and strategic need of businesses today. Technological solutions are helpful in creating strong relationships with suppliers, ensuring efficient management, and as significant determinants of long-lasting relationships with key suppliers (Subramani, 2004).

One of these new competitive technological opportunities is the SRM platform. SRM strategically aims for collaboration with suppliers, so that a company can develop a new product competitively, produce goods efficiently and manage the business processes smoothly (Park,

Shin, Chang & Park, 2010). Hänninen and Smedlund (2019) emphasise the importance of supplier-customer interaction through digital platforms as a way of delivering a more immediate and continued value, which can result in a more intimate collaboration. They also suggest that suppliers that are product-oriented, and focused only on providing quality and low prices, will not be good players in the market. Digital platforms are now a vital part of supplier relationships. Digital platforms have radically transformed the organisational structure of value chains, and the ways that companies organise their business, over the last twenty years (Ordanini & Pol, 2001).

SRM is a part of broader business processes, such as involvement in product design, the selection of materials, information and document sharing, transformation and technology and partnership building. Deploying the practices above help firms to be increasingly competitive, in a market where businesses are functioning internationally (Whipple, Wiedmer & Boyer, 2015; Tseng, 2014).

Campelo Filho (2017) explains that SRM platforms are implemented using software, making it possible for businesses to perform the different business processes that arise between suppliers and organisations. They also enable companies the possibility of automating these processes entirely.

There are many different platforms and SRM applications available now, offering different packages and features based on the needs of organisations and suppliers. Hoek (2013) names the primary technical/functional competencies of SRM organisations as sourcing, negotiating and contract management, supply market analyses, spending analyses, operational excellence, cost management, risk management and supplier management. According to Deloitte (2015), SRM aims to create relationships between an organisation and its suppliers in a two-way collaborative form, which will be mutually beneficial. It consists of collaborative and relationship-building activities, targeted to strategic and critical supply partners that deliver significant value to the firm (e.g. in terms of sustained competitive advantage or innovation).

It is difficult for companies that chose not to follow the new SRM trends in technology to survive in the competitive market (Shuets & Day, 2016). Many other technology trends also affect SRM platforms in some way, and should be considered when working with SRM. Some of the technological trends that affect SRM are software as a service, the use of analytic tools and big data. Cloud-based applications that could be accessed anywhere online are significantly advantageous for managing SRM activity (Donati, 2016). More companies are moving towards Software as a Service (hereinafter: SaaS) models, using cloud computing as a solution for managing supplier relationships. SaaS models offer to users a subscription to use the software online without the need of maintaining the technical infrastructure or buying a licence (Choudhary, 2007).

The Consultancy State of Flux report explains that new technologies act as a wave that contributes to business efficiency and the innovative supplier relationship, and reduces supplier risk (Shuets & Day, 2016). There are many examples of advanced SRM platforms, which I will examine later in the thesis. According to SAP (2009) research, the leaders in the market are those that make the best of new IT solutions and use the most convenient for their businesses. They suggest that using an SRM platform is beneficial in three ways:

- Processes – providing more efficiency in different business scenarios, greater visibility, reducing cost and increasing productivity.
- People - simple processes, the opportunity to focus on more strategic parts of the businesses, more visibility, improved productivity and improved performance due to time reduction and efficiency.
- Technology – web-based platforms, integration with different tools, better data validation, replacing paper documentation to contribute to smoother processes and more insightful data-driven decision-making.

1.2 Goal of the thesis and research question

As the title implies, this thesis aims to analyse how technological trends help SRM platforms to create automated processes and facilitate the process of creating better supplier insights. The data and information availability provided by SRM platforms create value and trigger better strategical decision making.

The next step will be to present a more detailed view of SRM, including a definition of SRM, and considering how SRM platforms help businesses and the importance of implementing them. I will also examine the process automation that this technology provides and the value that derives from it. Other technological tools that affect the performance of SRM will be analyzed and how these platforms provide more efficient business processes and deeper supplier understanding.

The practical part of the thesis will include a case study involving an SRM platform. A new module launched in the platform that facilitates the communication between customers and their suppliers will be demonstrated. The module and the platform itself provide automated processes and create value by making it possible to build a strong relationship with key suppliers. This case study will support my theoretical findings that supplier relationships are complex, and that the new SRM platforms can boost performance and manage aspects of critical supply. User requirements, goals, technical and non-technical documentation, implementation, testing and user feedback will be presented.

The main research question that will be answered in this paper is the following:

- How can an automated SRM platform be developed to meet the challenges that businesses face in the relationship with their suppliers?

The main objectives of this thesis are the following:

- Determine the main factors that create a stronger and more valuable customer-supplier relationship.
- Examine the critical features of SRM with a focus on the need for open and robust customer-relationships.
- How are the new technological trends affecting SRM.
- Analyse how technological trends affect SRM in terms of managing information efficiently and how these trends simplify the means of communication and collaboration.
- Analyse a SaaS SRM platform called ecratum and demonstrate the new project implemented as part of this platform. The insights from presenting this case study will show the complexity of the customer-supplier relationship.

1.3 Research method and structure of the thesis

The thesis structure includes two parts: theoretical and practical. The first part, the theoretical, comprises descriptive research based on relevant sources and analysis.

I reviewed scholarly papers, books and web sources to obtain data with which to analyse the SRM platforms. A significant part of the study focuses on the importance of supplier relationships and examines the benefits and challenges of SRM platforms in the new technological environment. I used market observation portals, statistical sources and market research, provided by consulting and research companies, to obtain data on the current state of SRM platforms. I also present emerging SRM trends and predictions.

In the second part, I use a case study as a research method. The case study helps to understand the complexity of the SRM processes and to identify 'how' the advanced technology supports those processes. I provide an in-depth and detailed examination of a real-life SRM platform called ecratum.

I investigated and observed the company as part of the ecratum team, for the case study. The platform and the company background is described in detail, including platform functionality, objectives, shortcomings and improvements to be made. The case study mainly investigates the implementation of a new module in the ecratum platform called "Trader & Producer", a module aiming to connect customers, traders and producers in exchanging documentation. I analyse the status of the platform before and after the new module implementation.

As I was personally present in the project as part of the product management team, I observed the entire process of creating and implementing the new module. I held several interviews with

the stakeholders of the project during and after implementation. I obtained feedback from the end-users of the module.

2 Supplier Relationship Management

2.1 The role of Supplier Relationship Management

SRM mainly appeals to buyers to shift their mindsets and understand the possibility of other tendencies within a partnership. According to Web (2017), the transition to actual supplier relationship management can be challenging. SRM is a challenging process, and not many companies can fully deploy it, however, those who achieve it and understand the core of SRM can create considerable value for their businesses.

According to Source One (2017), SRM provides a consistent way of interacting and managing suppliers that promotes collaboration and continuous improvement from the supply base. SRM offers promise, however, a lack of clear business cases and a lack of understanding about SRM are causing resistance in implementing valid SRM programs, especially among today's over-burdened and lean sourcing departments. Not all suppliers require the high level of interaction offered through a comprehensive SRM program. Vendors that directly impact financial performance, who affect the delivery of goods and services, have access to sensitive company information, or are associated with corporate regulatory obligations, are most suitable for SRM. A better understanding of SRM, its components, and its implementation, would allow strategic sourcing departments to successfully use this program to maximise the potential value of these critical supplier relationships (Smith, 2016).

2.2 Importance of SRM and the challenges businesses face

There are many definitions and perceptions of SRM, however, according to SAP, how we define SRM is of little importance. What is important, is focusing on how businesses use SRM to understand the goals, needs and requirements of their customers. It is hard to succeed and to identify the best solution if you do not include your customers in product development. Hearing the customer voice should be one of the top priorities when it comes to implementing an SRM platform. Satisfying customer expectations means improving service levels, quality, and experience, and having a better position in the market, which is beneficial for the company and its suppliers (SAP, 2019).

Once the customer requirements are set and prioritised, and potential customers defined, the internal stakeholders should also be involved across the overall process. The challenge here is creating the right strategy and structure so that the goals align and that SRM efforts meet the expectations of suppliers and stakeholders. Smith (2016) notes that the principles which help to reach the goals of SRM and align it to company strategy are the following:

-cross-functional work internally
- continuous improvements to create supplier value
- working closely with suppliers to meet their requirements
- maintaining suppliers by integrating them into decision-making and intensive engagement.

There are significant barriers when it comes to SRM; State of Flux (2014), defined the following as the most common:

- Lack of budget and resources
- Lack of people and skills
- Business and strategy change – customer-focused strategy critical to delivering value (not being customer-focused could be challenging)
- Measuring benefits
- Lack of supplier support

Implementing an efficient SRM platform can support companies in creating revenue growth. However, this is not a straightforward process in the majority of the cases, and takes time to be achieved. SRM over time, if approached with the right strategy, the right people and technical skills, can help in reducing problems and quality issues, and increasing speed. The adoption of new technologies is the primary driver of the benefits, which also reduces costs (Source One, 2014).

According to Wachira (2013), one of the biggest challenges for SRM, is the lack of advanced technology. There are different approaches to implementing SRM; many organisations use advanced technology trends to apply SRM in different ways. The method used by most businesses is integrating suppliers with organisations by acting as a connection between the two. This approach supports companies in using a different kind of technologies. Technology plays a crucial role in SRM, and using different levels of technology between companies makes it challenging to establish SRM. There are cases when the supply chain network may not work adequately due to incompatibility between the two companies, making it difficult to operate (Wachira, 2013).

Research Triangle Park (2018) studied a company operating with science and technology, using an SRM platform to manage their suppliers. The company explained that the main challenge they had was managing and maintaining a large amount of manual data. The company adopted an SRM platform in order to implement a more structured and transparent way of storing the significant volume of data. Apart from organising the data, Triangle expected an improved relationship with their suppliers and more security in storing their data.

The company implemented a SaaS SRM solution called Jaggaer to manage their suppliers. In two years, using Jaggaer procurement software, the company was able to store data on a central

platform where users could access it. Making the data easily accessible and creating reminders for users every time a task needed to be completed improved the data maintenance and increased work efficiency. The company also managed to acquire new suppliers due to the user-friendly registration interface for supplier application. The company no longer had to update supplier information manually, as the suppliers were now responsible for entering, updating and managing their data and the necessary certificates. Several thousands of suppliers were part of the system. Approximately five hundred users used the platform, and monitored suppliers and processes through it. Jaggaer also integrated a supplier application to manage the performance of contractors and create a more secure database.

The example above clearly demonstrates that SRM platforms can help in managing and overcoming many business challenges, by managing and storing centralised data, facilitating supplier monitoring and communication, and automating business processes (Research Triangle Park, 2018).

2.3 Automation of supplier management processes

Enterprises have to re-engineer or automate their operations to ensure increased performance and efficiency. One economical way of responding to changes is the implementation of information technology (hereinafter: IT) solutions. IT solutions work as performance improvement tools, to cut down costs or eliminate inefficiencies (Xu & Quaddus, 2013). In many cases, the introduction of new IT solutions leads to a need for business processes changes. IT enhances business processes by increasing the efficiency of existing processes, or enabling entirely new methods that transform a business (Medeiros, Perez & Lex, 2014).

Hammer (2001) explains that companies try to streamline cross-company processes to reduce costs, increase quality, and have more efficient operations. To survive in a competitive market, enterprises should be able to take innovative business approaches and collaborate closely with stakeholders. Innovation and supplier collaboration will help them to create and manage processes that overcome the traditional corporate boundaries and bring new value. Being able to act in an innovative environment will create efficiency and competitiveness.

Similarly, Trkman, Indihar Štemberger and Jaklič (2007) emphasise that focusing on process-based management principles plays a vital role, not only in successfully managing the supply chains, but also when coping with challenges, despite the external economic or social environment changes. Streamlining essential business processes across the supply chain and integrating activities into key supply chain processes instead of focusing on individual functions enables value creation for all stakeholders (Trkman, Indihar Štemberger & Jaklič, 2007).

According to research by Oja-Gillam (2013), around 68% of technological projects fail to meet their goals. Similar figures are given in the report created for the Project Management Institute

by the Smith (2014), stating that reduced requirement collection and inadequate analysis is the reason for failure in 47% of cases.

The implementation of new technologies can cause temporary deficits in productivity, which are much greater than expected. The initial phase of implementation often creates misalignments between the technology and the organisation. Leonard (2011) categorises these misalignments as:

1. Technical specifications – not apparently feasible or clear at the start of the project
2. Delivery system – failure to align the technology and the user infrastructure, such as support for the current systems used to deliver the new technology to the users. Programs and training required to educate the users on the new platforms.
3. Value and performance specifications - How does the current organisational structure and strategy align with the incoming technology? How will it be affecting the people and job performance? What impact will it have on the work processes? These are all questions that needs a clear answer and alignment before implementing new technology.

How can businesses avoid these failures? RTG Solution Group (2018) suggests that the first critical step is to create a visual representation, and document the current state of the business processes and workstreams. Mapping the current processes highlights the interconnectivity by which practices work through the business and indicates where compression and barriers exist. Documenting and understanding the ongoing processes works as a framework of how the company operates before identifying potential solutions. Having clear insight works as a baseline for measuring the pain points, changes that the technology should bring and scope the streamlined processes.

Huhns and Stephens (2001) note that apart from the need for a distributed architecture to automate the supply chain processes, there is a significant number of technological attributes that need to be adopted. The properties below are critical in automating the supply chain (Huhns & Stephens, 2001):

- Disintermediation (removing intermediaries in the supply chain—such as manufacturers selling direct to consumers by cutting out distributors and retailers (Boström, 2018)). The process of removing intermediaries implies that a user has a direct interaction/association with their suppliers through the software. Providing users with smooth access and interaction with online data and applications, in a distributed way, requires an active-object architecture.
- Dynamic composability and execution. A system should run as a set of disseminated parts, however, the resources required will mostly be undefined until implementation: this demands an infrastructure to enable their identification and composition as required in an incremental approach.

- Interaction. There will always be expected types of interactions among supply-chain participants. Those interactions must be clearly defined when implementing a new system in order to facilitate the process. Implementing a new system requires that the interaction is clearly expressed and rationally reasoned and presented among the participants.

Bäckstrand (2007) considers interaction/collaboration between suppliers and customers across the supply chain processes as a means of improved competitiveness. There are many studies stressing the importance of interactions within the supply chain and the benefits coming along (Bäckstrand, 2007; Horvath, 2001; Sahay, 2003).

- Interaction not only brings benefits; it affects performance by enabling collaboration between different participants in the supply chain. The most common benefits from supply chain interaction are revenue improvements, cost savings, and the flexibility to deal with possible operational uncertainties (Bäckstrand, 2007; Simatupang & Sridharan, 2005)
- Error tolerance and exploitation. As implemented systems become highly sophisticated, they should anticipate and reduce errors in their components and interaction protocols.

Attempts to automate supply chain processes are complicated, requiring the different companies in a supply chain to maintain the consistency and confidentiality of their information systems (hereinafter: IS) and operations, as well as an IT system that aligns all the involved parties (Huhns & Stephens, 2001). IS are defined as interrelated systems, people and organization aimed to create, store, process and share information that will support decision making in a company. The IT has a similar role to the IS of processing information, the difference is that IT is part of the IS and doesn't incorporate people or processes but rather the technology (Bourgeois, 2016).

3 BUILDING A SUPPLIER-CUSTOMER RELATIONSHIP

3.1 Trust & communication

The art in the execution of strategic supplier relationships is to look for opportunities to innovate, either within product development or in process improvement (Webb, 2017).

Lambert (2001) defines a partnership as "a tailored business relationship based on mutual trust, openness, shared risk and shared rewards. That results in a business performance greater than it would be achieved by two firms working together in the absence of partnership". A healthy relationship with key suppliers in the majority of the cases contributes to enhancing corporate performance. Goffin and Szwejczewski (2006) note that close supplier relationships help firms to reduce costs, create high-quality products, and improve the design of those products.

Lajara and Lillo (2004) report that vital SRM practices include selecting the "best" suppliers, working closely with them and entering into long term relationships based on mutual needs and trust. Choy and Michael (2008) also explained that a lack of confidence among suppliers is one

of the main challenges faced by SRM. Trust is a vital component in supply relationship management, which creates value and improves collaboration.

Many elements come into play when assessing and choosing the suppliers with whom to collaborate. Kannan and Tan (2002), researched supplier assessment, and used various statistical approaches to determine the main elements affecting the process. A survey was used to implement the study and to collect data. Among 4500 responses, the majority of the respondents were product manufacturers, followed by material manufacturers, with the rest being retailers and wholesalers. The highest criteria ranked by the respondents were chosen to meet the deadlines for delivery and quality. Other essential factors were response time and the capability of the service.

Supplier selection and evaluation is a necessary process that profoundly affects business performance. Strategic communication and supplier commitment directly affect the performance of a business. With clear communication in place, the process of addressing issues such as time or quality between buyers and suppliers is smoother, especially if the expected results are clear and realistic (Kannan & Tan, 2002). According to an article published by the Oxford College for Procurement and Supply (2018), having proper communication between various stakeholders and external suppliers, with bright and creative ideas, improves the process of supplier collaboration. Having a good communication base creates improvements in processes, better experiences and better-managed process. If communication is limited, so is the ability of the supplier collaboration to affect the successful end-to-end process.

The consulting company PwC found that SRM derives value for everyone involved in the supply chain, both customers and suppliers (Hoek, 2013). It enables open communication and cooperation between companies and their key suppliers, which stimulates trust.

Trust and communication are two essential elements that have an impact on positive relationship in supply chain performance (Wachira 2013; Hsiao, Purchase & Rahman, 2002). The conceptual framework built by Wachira (2013) uses trust, communication, risk assessment and supplier partnership as independent variables which directly affect the performance of the supply chain, as shown in Figure 1. The elements are defined using statistical analysis based on regression.

Failing to create a good relationship with suppliers can result in unsatisfactory supply chain performance. Many studies see trust in SRM as an element between all the stakeholders and organisations. (Ha, Park & Cho, 2011; Joshi & Stump, 1999). Ha, Park and Cho (2011) see trust in the supply chain as a counterpart to collaboration, directly affecting supply chain performance.

3.2 Sharing risk

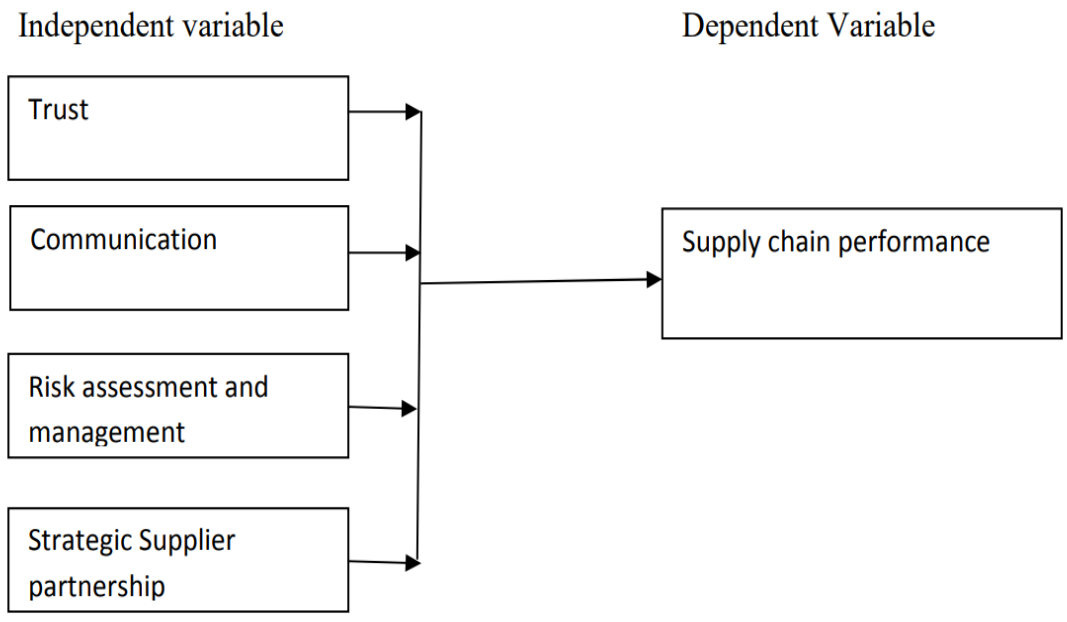
Figure 1, developed by Wachira (2013), names risk assessment as one of the variables in supply chain performance. It is well known that all business, especially business ventures, either

somehow imply or are exposed to an element of risk. Different organisations coming together in SRM processes to execute workstreams with the same goals brings them healthy relationships and excellent performance, however, at the same time, they are all also undertaking new and shared risks. Narasimahn and Talluri (2019) suggested the main reasons for increased risk in supplier relationship management. They identified several trends in the market nowadays, such as:

- Implementing strategy by acquiring expertise from external firms.
- Collaborating on a global level.
- The greatly increasing trend of outsourcing and acquiring knowledge from external partners and suppliers.
- Driving innovation and working with potential suppliers is an essential for competitive advantages.

Last but not least, the advancement and rapid implementation of information technologies also create risks as they manage and assist extended supply chains. It is essential for both suppliers and customers in SRM to take ownership and manage these risks, as well as being continually transparent with each other. In other words, suppliers and customers entering a stable relationship should adopt and manage the element of shared risk through open, transparent and honest engagement. Transparency provides clarity for the parties involved, which helps to address risks and avoid jeopardising the supplier relationship (Große-Wilde, 2004).

Figure 1: Trust and communication are important factors for good supply chain performance.



Source: Adapted from Wachira (2013).

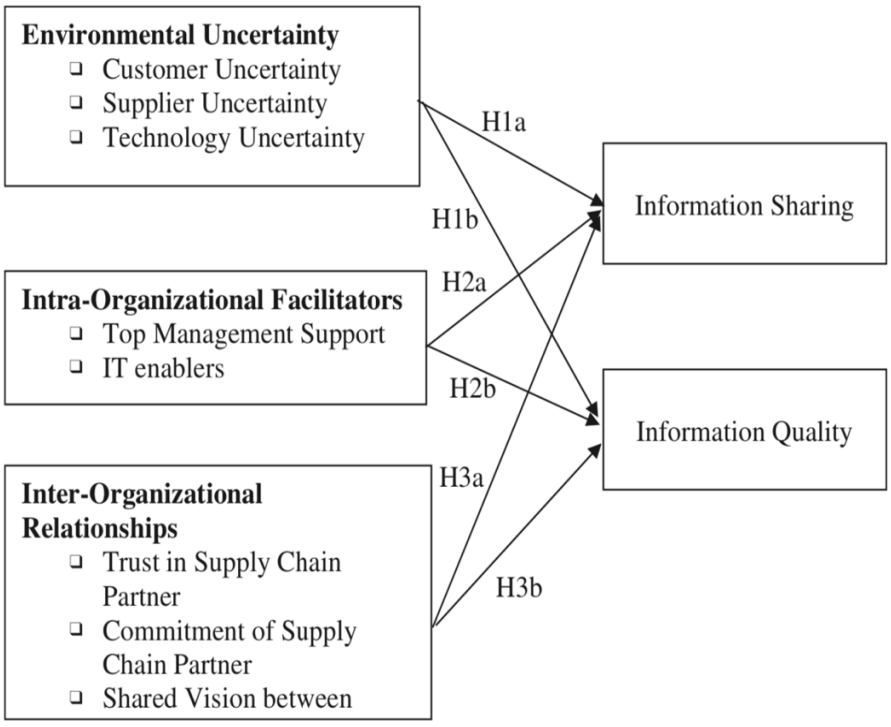
3.3 Shared vision and strategy

Another crucial element in a trustworthy supplier relationship between companies or firms forming a partnership is the vision these companies have for their businesses. Their vision must include the main objective they want to achieve together in their prospective markets. A shared vision and strategy should generally be aligned for the successful execution of processes, to ensure the relationship remains strong.

Even though the vision needs to be aligned between the two parties, individual strategic plans should also be enhanced, with each trying to avoid the cannibalisation of the other.

Figure 2 also shows how a shared vision can be a driver for the other essential elements already mentioned: information quality and quantity. If there is a shared vision and similar values, then the two organisations will most likely be facilitated in building trust and a stronger relationship. A shared vision leads to higher quality and quantity shared information. Li and Lin (2006), note that a shared vision and strategy between different partners of the supply chain, will enable shared values, beliefs, shared goals and trust. If supply chain partners do not have aligned goals and visions across organisations, then they may also lack information sharing, quality and commitment.

Figure 2: Factors impacting information sharing and quality in SRM.



Source: Adapted from Li and Lin (2006).

3.4 Shared values and goals

Companies entering and building a supplier relationship must consider and respect each other's essential elements and values. The values include elements such as vision, goals, ways of working, sustainability and many other factors that are part of a company. A strong supplier relationship is more likely, and likely to be more successful, when agreeing to adopt each other's values and to share those values equally among or between them (Hurtado Jaramillo, Arimany Serrat, Meijide Vidal & Ferràs Hernández, 2018). A robust customer-supplier relationship is vital, and has a massive impact on business performance; thus, I will examine it in more detail below.

Divine Foundjem and others (2012) note that the relationship between traders and producers is significant, since both have many benefits to gain through collaborating. The trader's role is to act as an intermediary between the producers and the companies who are buying their goods. Traders do not produce or own goods (Carter, 1997). Excellent business performance depends on building strong relationships. A good relationship with traders means that producers benefit by selling their goods in the long term rather than selling them randomly and in the short term. A lack of trustworthy and long-term relationships can bring much risk in terms of income, access to input and sales (Bijman, 2008).

Times of profusion (mass or large quantity of production) may mean that producers have to rely strongly on healthy relationships to market their goods. On the other hand, in times of scarcity and healthy competition, traders will have to rely on these relationships to access the goods they want to purchase. Traders can also gain many advantages from an excellent long-term relationship with the producers of goods, in terms of increased operational efficiency, cost reductions, improved quality, improved shipment and many others. There are numerous benefits from collaboration with producers, primarily when producers are organised in groups (Bijman, 2008).

According to the theory of relationship marketing, some factors like shared values, trust and communication act as preconditions in order for potential partners to initiate, grow and keep a relationship. A good relationship will improve and increase customer retention in a supply customer relationship. Trust and commitment are the keys to a successful relationship that will fulfil the needs of both parties; however, it is essential to have the necessary resources to create these long-term relationships with core partners that contribute to the strategy (Mack, 2016).

On the other side, traders also need to build strong relationships with their customers. Customers are the most potent resource of a company. The processes of customer acquisition, retention and customer value extraction are critical aspects of success. In today's competitive market, however, where customers have a variety of choices, substitutions and a lot of information available, these processes are very challenging. As discussed in the article by Reinartz, Krafft

and Hoyer (2004), companies today are moving from a product-centric marketing approach toward being customer-centric. The customer-centric approach helps to better manage their relationships with the customers, to create value, and most importantly, to retain them. The case study presented later in the thesis demonstrates how a customer-oriented approach helps businesses to focus, create, manage and retain long-lasting relationships with their customers.

4 ROLE OF TECHNOLOGY AND THE TRENDS AFFECTING SRM

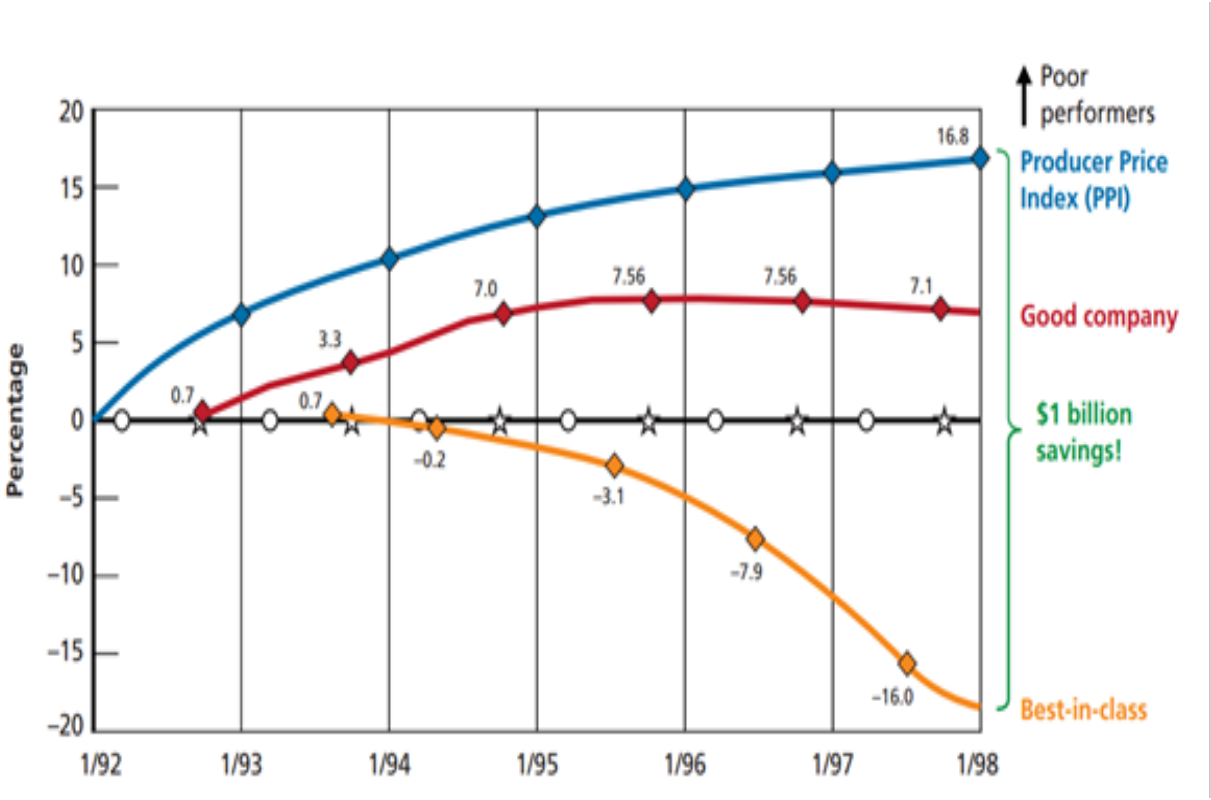
4.1 Role of SRM supplier platforms in relationships

Adopting suitable SRM platforms can help enterprises in building strategic relationships with key suppliers and offers the possibility of vast long-term benefits ("The Importance of Supplier Relationship to Your Business", 2017). One potential benefit of SRM platform efficiencies is cost reduction. SRM helps business save money by minimising the risk of delays or mistakes in production.

Nelson, Moody and Stegner's (2001) analysis shows the possibilities of long-term savings via SRM. Figure 3 shows the potential cost savings, considering different companies operating in the automotive market with different SRM practices. Actual data was used, and the companies were clustered into three groups: the Producer Price Index (hereinafter: PPI), the Good Company and the Best in Class. The PPI (blue line) shows the performance of a group of automotive goods that had no SRM in place, which resulted in poor performance indicated by the cumulative percentage growth in costs. The company in "the good company" cluster implemented some of the purchasing and supply management (hereinafter: PSM) best practices, but did not focus on their direct relationship with the suppliers and their prices.

Even though the "good company" performed better that the PPI company, it was still above average in terms of cost saving. The best-in-class firms, on the other hand, adopted the best SRM practices and mostly focused on fostering their relationships with their suppliers. The study shows that best-in-class companies saved roughly $600 million more than the good company by implementing SRM practices and at the same time, building healthy supplier relationships. Working closely with the suppliers delivers cost-savings, leverages more quality and reduces delays and inefficiencies (Addae, 2015). SRM platforms centralise the supply chain processes by making it possible for good practices to be applied across all the stakeholders, and automates these processes for better information flow.

Figure 3: SRM helps in saving costs.



Source: Adapted from Nelson, Moody, and Stegner (2001); Chenoweth, Moore, Cox, Mele and Sollinger (2012).

Kuipers, Adrians, Dolder & Flauren (2017) also suggests the significant benefits of SRM adoption, especially with the support of different digital tools. Apart from the benefits I have already mentioned in the thesis, such as cost optimisation, spending efficiency and market innovation, an essential element derived from SRM platforms is the potential for better information sharing between suppliers.

Information sharing leverages the supplier relationship by enabling the timely distribution of the information, greater visibility among suppliers and the ability to react quickly (Zhou & Benton, 2007; Hsu, Kannan, Tan & Keong Leong, 2008).

Information sharing and knowledge learning are two components that are reciprocally connected and crucial in SRM. These valuable components help to build trust between suppliers. Information sharing also efficiently facilitates and coordinates the distribution of activities between suppliers, which has a positive impact on the development of supplier relationships (Nobeoka, Dyer & Madhok, 2002). Continuous communication with suppliers, in an efficient manner, and customer sharing knowledge capabilities are essential drivers of a successfully implemented SRM, resulting in strong supplier relationships.

A significant part of information sharing is the documentation exchange that SRM platforms can support. There are several national, and international certifications shared among suppliers, enabling quality checks, requirement specifications, legal compliance, contracts and so on (Infoentrepreneurs, 2019).

The central role of SRM platforms in documentation exchange is to allow electronic information exchange between customers and suppliers, and to avoid paperwork. SRM platforms provide a few advantages when digitally exchanging documents. The benefits are:

- Better structure of the data (provided templates, rules, dates).
- Time-saving (documents are not lost anywhere, and items can be received as soon as they are requested, no matter where the suppliers are).
- Transparency between all the involved parties (ENISA, 2016).

Implementing an SRM platform to get the benefits noted above requires the companies and stakeholders involved in a supply chain to integrate at various levels, however, and to find suitable solutions across processes. Chenoweth, Moor, Cox, Mele & Sollinger (2012) note that SRM programs use six practices that are considered best practices. Implementing best practices will permit supply chain members to integrate at various levels and to leverage the supplier relationship by:

- Collaborating and managing the relationship with every supplier involved in the process. According to Stegner (2002), large enterprises must consolidate contracts with their suppliers. In this way, they can work more closely together and measure progress, while improving overall performance and reducing costs.
- Establishing measures to define supplier performance, using different systems, thresholds, factoring or targets. Every organisation must assess supplier performance. There are different ways of measuring performance; Gordon (2005) suggests that an assessment can simply involve setting up some key performance indicators (hereinafter: KPIs) and measuring against them as a target. Alternatively, this can be taken to a more advanced level, from data gathering and analyses to assessment programs.
- Ensuring that suppliers will reach the goals and requirements and essentially making sure they are legally compliant. Having a measurement will also make it easier to manage and retain relationships with valuable and strategic suppliers as well as avoid possible problems. Gordon (2005) explains that measuring performance is essential because it will increase the ability to rely on and trust suppliers.
- Involving key suppliers early in product or feature design to incorporate their knowledge in current processes, generate ideas and reduce complexity. A real-life example where involving suppliers in product design allowed savings and a reduction of costs by millions of dollars is the development of Alcatel operations. Their success came as a result of supplier involvement in the early design phase (Addae, 2015).

- Having constant communication with the suppliers through meetings or different means. Transparent and continuous communication will drive commitment to the relationship, more precise goals and expectations, up-to-date improvements and a shared vision. The importance of shared technology will be discussed further in the next sections.
- Recruiting personnel with expertise in supply chains or sufficient qualitative and quantitative skills on SRM for higher performance quality. SRM personnel will preferably have a background such as engineering, logistics, planning or purchasing functions. Having skilled personnel will help in better internal processes and better supplier communication (CAPS Research, 2005).
- Training and educating the recruited personnel, so they have sufficient knowledge of the suppliers they work with. The personnel must understand the processes the suppliers go through, capacities and the incorporated costs. It is essential that they all understand visibility and shared goals and expectations.

4.2 Functionality and use of IT as support for SRM

Technological advancements help businesses and organisations to save time and reduce costs of production, and are an advantage to all businesses across different industries. Businesses use the advances derived from technology to be more competitive and operate efficiently (Martin & Leurent, 2017). Technology advances have a positive impact on business performance and have simplified the way we do things. They also save time, increase production, and simplify communication. These advantages are mostly present because of omnipresent internet access, advanced software development tools and the availability of scalable and reliable data centres (Martin & Leurent, 2017).

Advances in technology have also had a significant impact on the way a supply chain is coordinated and operates. Companies are now able to exploit popular technologies such as social media, big data and cloud computing to understand and improve their relationships with suppliers (Bharadwaj, El Sawy, Pavlou & Venkatraman, 2013).

Information technology is often seen as an essential/critical element in solving supplier-related issues. Implementing SRM software will not add value alone if it is not combined with other IT capabilities. SRM software is complex on its own, and it should not operate in isolation (Hoek, 2013). Figure 4 presents the current issues that companies are facing when using technology, and suggests the best practices that should be considered instead. Authors of figure 4 suggest that technology should be considered as an enabler instead of a solution. There should be increased focus on basic functionalities, especially when building partnerships. Data must be shared through an open system with the ability to collaborate (Hoek, 2013).

IT plays an important role and acts as a value enabler by deriving transparency and efficiencies while improving processes and information flow. The information technology (IT) capability of

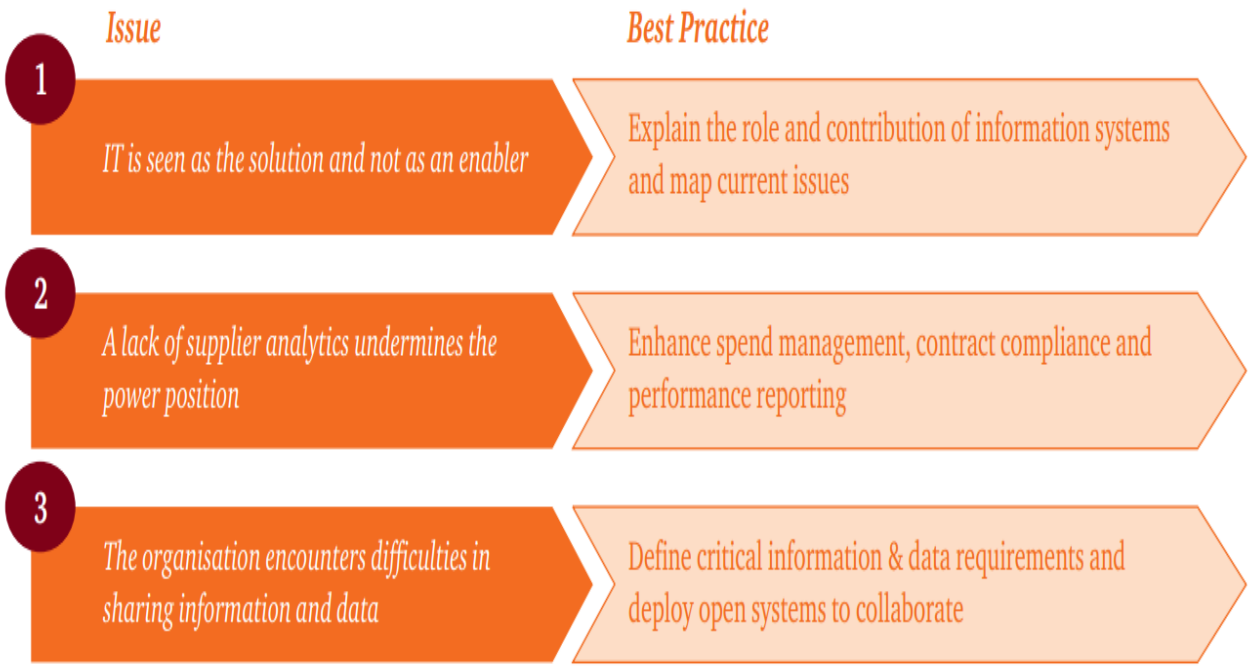
a firm, effective communication with suppliers and customer KMC are the main factors that determine successful interactive performance. Tseng (2014) calls the dyadic quality performance as interactive performance in supply chain. A dyadic quality performance is the quality of the confirmation when the goods or services meet the requirements of the parties that are involved in a buyer-supplier relationship process. The processes involve terms of standards, legislation, and economic factors (Tseng, 2014).

The relationships created between firms and their suppliers through collaboration create and enable better competitive supply relationship capabilities for all parties affected. A collaborative relationship focuses on strengthening joint investments, common goal projects, information and knowledge sharing, improved product development, collective agreement and understanding of plans and milestones (Vanpoucke, Vereecke & Boyer, 2014). It also helps in realising the challenges from both sides.

An example that shows the success and benefits of implementing an inter-organisational IS is described in the study conducted by Amoako-Gyampah, Boakye, Adaku & Famiyeh (2019). The relationship and the interconnected IS between companies like Cisco, and Xiao Tong were evaluated. Cisco is a multinational company that develops and provides network equipment, and Xiao Tong is one of Cisco's distributors, mainly operating in China. Both companies implemented IS across their organisations, aligned with their structures. The IS role was to enforce the efficiency of working together. Implementing the system made it possible for the companies to have greater visibility in the business processes. The advantages mostly affected product specifications and documentation, purchase information and the better communication and sharing of data (Amoako-Gyampah, Boakye, Adaku & Famiyeh, 2019).

Gaining access to new technology and implementing it across the organisation was beneficial for both companies, not only for their mutual corporation but also for future collaboration partnership with other partners. Xiao Tong improved in performance as a result of using the new technology, which made it more competitive in the market. Cisco, on the other hand, benefited by using more efficient technology. This efficiency helped in improving the relationship with Xiao Tong and allowed them to use the new IS with other partners globally (Amoako-Gyampah, Boakye, Adaku & Famiyeh, 2019). The example of Cisco and Xiao Tong in implementing the inter-organisational information system shows that when appropriately used in alignment with strategy and structure, the new advanced technology can improve performance and optimise business processes in the supply chain.

Figure 4: Best practices to enhance SRM through technology



Source: Adopted from Hoek (2013).

Customers and their suppliers want to deploy IT systems that help them collaborate in different ways, from sharing transactional data such as purchase orders to online collaboration on developing complex 'engineer-to-order' systems. According to an article by State of Flux CEO Alan Day, however, companies are not satisfied with the use of IT systems (Heinzman, 2018). Alan conducted a study to find out how technology is supporting supply chain businesses. Only 7% of companies taking part in the study were utterly content with the way their IT systems and technology were supporting the processes in the supplier management stages. 46% said the investment of technology has so far failed to improve or facilitate the supplier management lifecycle (Heinzman, 2018)

Companies encounter many difficulties sharing information and data due to the use of different applications, different coding and different languages. Now, companies are replacing their Electronic Data Interchange (hereinafter: EDI) solutions and starting to use open systems to share information and data via the web (e.g. XML). Software suppliers are offering solutions in the Cloud while business process outsourcing for procurement-related processes is becoming generally accepted (Hoek, 2013).

4.3 Technological tools affecting SRM

SRM is designed to ensure users easy access to an organisation's databases, giving them an overview of actions and interactions with the suppliers. One of the application's main objectives

is to unify the communications while preserving a coherent discourse and instantly sharing the information gathered with the stakeholders (Dumont, 2019).

Information sharing within a supply chain can be seen as the integration of information systems and streamlined business processes that can be used in many business activities. Using technology supports the improvement of, and focus on, building a strategic supplier relationship by making the communication and information exchange between supply chain parties smoother and more efficient. The current advances in technology and information infrastructure mean that companies and their suppliers can implement inter-organisational information systems and as a result, be more competitive, and satisfy the requirements of the customers to improve relationships and performance (Hsu, Kannan, Tan & Keong Leong, 2008).

Whatson (2019) undertook research to understand the importance of information sharing in an organisation. Many companies participated in the survey, and 78% stated that information sharing contributed to the success of the organisation. Information sharing is a vital process that could take a considerable amount of time in collaboration with critical suppliers, however. In the survey, 49% of respondents stated that information sharing was one of the processes on which they spend most of their time when dealing with strategic suppliers.

Building an information system is a complex process, and when collaborating with different suppliers it is essential that the IS are aligned. It is thus vital to building the IS in an integrative approach. Companies should use internal or external expertise of the business processes and understand how the users interact or conduct business. The business process supported by IS should be analysed across the company and affected participants (Park, 2010).

SAP (2018) found that documents on shared drives, emails and standard portal technology power SRM in more than half of the businesses taking part in their study. Sixty-three per cent of businesses reported that activity relating to SRM was carried out manually, mostly in Excel. When businesses use existing software to manage some aspects of information flow to and from suppliers, it is ineffective. Just over half of businesses say its performance is reduced. According to research by Shuets and Day (2016) for State of Flux, 59% of companies lack the required functionality and features to manage the information flow between suppliers. Sixty-three per cent say systems are conflicting, which makes it challenging to integrate.

Kuipers, Adrians, Dolder and Flauren (2017) suggest that firms develop new approaches to collaboration and information sharing with suppliers, including a range of digital tools. High profile development projects can benefit from digital tools that facilitate buyer-supplier collaboration. A variety of technological firms offer collaboration platforms. Examples are the SAP, which has launched software for Integrated Product Development (hereinafter: IPD), and IBM, which has released a Product Development Integration Framework (hereinafter: PDIF). These tools aim to enable idea generation and information exchange. They help in monitoring

development progress, synchronising communications between suppliers, procurement and with different internal customers as they work together on innovations.

Looking at SRM at a deeper level suggests that some aspects rely on technology more than others. Heinzmann (2018) conducted research where different companies using SRM were asked how IT supports SRM in their organisation and where it has the most impact. Seventy-three per cent of the respondents claimed that technology was supporting SRM aspects such as contract management. It improved their first interactions in relationship building with key suppliers and provided them with guidelines. On the other hand, there were other crucial parts of SRM that the companies stated were not as well supported by technology. Transactional and purchase capabilities were seen as lacking technology support. Respondents also found difficulties in defining the sustainability of the suppliers and with technical support. Most of the respondents also stated that they do not use technology to foster supplier innovation (Heinzmann, 2018).

Most businesses are aware of the importance that technology has in SRM. Some fail to be fully supported by technology, because there are difficulties in finding tools or systems that support all the parts of the supplier information management. Even though there many advanced tools and types of technology available to support companies in a more efficient supply relationship management, it is not always used. Heinzmann (2018) stated that companies are still commonly using less advanced tools like Excel or SharePoint when it comes to managing or sharing information.

Open innovation and crowdsourcing are emerging as platforms for engaging with suppliers and fostering innovative potential.

- Open innovation is seen as making use of not only internally developed but also externally sourced ideas to accelerate innovation. It allows firms to acquire external knowledge and align it with internal competences to drive innovation, improve the product, and reduce costs and risk (Chesbrough, 2003). In other words, according to Brant and Lohse (2014), when implementing an open innovation model, a company does not attempt to generate innovative ideas on their own. Instead, they would exploit internal and external ideas that would drive excellence and help to be more effective at lower costs and risk, and to accelerate technology development.

Brant and Lohse (2014) listed several advantages of using an open innovation model in SRM:

- Cost reduction and the lower possibility of risk, making it react faster to a competitive market. The literature suggests that open innovation helps organisations to reduce costs as it gives access to compatible skills, knowledge and technology from outside resources. The external expertise used will reduce the risk in developing a new product and will help in better managing costs and internal resources. Getting external expertise will also support the

adoption of businesses to change or transformation and drive competitiveness in the rapidly changing markets (Huizingh 2011; Brant & Lohse, 2014). It also fosters innovation with long term benefits. Involving suppliers in product development and the innovative processes has been shown to drastically improve performance and innovation across an organisation. Innovative ideas and knowledge from experts and partners typically lead to an improved value that speeds up the development of products with better quality and utilises the development process (Brant & Lohse, 2014).

- Open innovation drives higher product quality and a better understanding of the requirements. Using the feedback gathered from different external or internal stakeholders or experts in the field enables firms to better utilise and enforce their research and development outcomes. Involving users in early product development is a critical success factor for building products that the users need. It helps companies to understand user requirements and satisfy their needs. Addae (2015) also states that involving the users in product development not only brings innovation but also reduces complexity and costs.
- Utilisation of new market advantages – Sharing and connecting to different aspects of Research and Development (hereinafter: R&D) across a firm enables the possibility of new ideas and opportunities. It allows firms to explore potential markets and to collaborate with relevant partners. Furthermore, it creates awareness and innovative distribution channels. The benefits are a result of the possibility of collaborating with companies with expertise in commercialising solutions.

Birkinshaw, Bouquet, Barsoux, and Boudreau (2011) listed the differences between the two different principles of closed and open innovation, as shown in Figure 5. Closed innovation leans more towards focusing on internal knowledge, discovery and private ownership. The companies using closed innovation believe that by not sharing their ideas with external partners and by conducting the R&D on their own, there are more chances to be competitive in the market. Conversely, open innovation companies following open innovation continually seek to acquire knowledge and expertise from outside the company. They believe that combining internal and external knowledge would build a better business model.

Figure 5: Comparison of open innovation principles and the closed innovation approach

Closed Innovation Principles	Open Innovation Principles
The smart people in our field work for us.	Not all of the smart people work for us* so we must find and tap into the knowledge and expertise of bright individuals outside our company.
To profit from R&D, we must discover, develop and ship it ourselves.	External R&D can create significant value; internal R&D is needed to claim some portion of that value.
If we discover it ourselves, we will get it to market first.	We don't have to originate the research in order to profit from it.
If we are the first to commercialize an innovation, we will win.	Building a better business model is better than getting to market first.
If we create the most and best ideas in the industry, we will win.	If we make the best use of internal *and* external ideas, we will win.
We should control our intellectual property (IP) so that our competitors don't profit from our ideas.	We should profit from others' use of our IP, and we should buy others' IP whenever it advances our own business model.

Source: Adopted by Birkinshaw, Bouquet, Barsoux, & Boudreau. (2011).

- Crowdsourcing is seen as a useful mechanism for gathering ideas, innovations, and information from a specific population, typically via the internet. The approach is increasingly used by suppliers to develop and 'push' new products to the market. Wal-Mart is an organisation which successfully used crowdsourcing in a program called Open Innovation. In 2012, this firm launched the "Get on the Shelf" program, enabling participants to suggest new innovative ideas, with the possibility that chosen products would be part of Wal-Mart's website and store shelves (RIS, 2013).

An article published on Forbes by Cancialosi (2015), called "Crowdsourcing: Your Key to a More Effective, Engaged Organization?" describes the process of crowdsourcing as a form of interconnected peer-production, that can also often be performed by individuals alone. One main criterion for the crowdsourcing process is the possibility of contributing in an open format and having a large pool of knowledgeable potential participants. The concept of crowdsourcing and its use has been increasingly adopted, and can be used in many different ways. Crowdsourcing involve simply exchanging and collecting innovative information, knowledge and ideas to source interrelated investment capital for entrepreneurs.

The multidisciplinary field of analytics and analytical tools can also help supplier relationship management to improve performance. Analytics allows strategically enabled tracking and analysis of the progress of the intended benefits. Analytics is not the technology itself, and it can be defined as a field of organisational procedures. Analytics is combined with different tools and techniques to gather information. Having the information makes it possible to analyse the data,

interpreting it and forecasting the outcomes of different problems. Trkman, McCormack, De Oliveira and Ladeira (2010) presented a study where it was found that analytics had an impact on the performance of supply chains, and a more significant impact if the companies have good IS capabilities in place. The study was conducted using a large sample of companies from different industries.

Analytical insights and focusing on number outcomes improve decision making by providing more credibility to results, as well as guaranteeing a focus on the strategical issues (Kohavi, Rothleder & Simoudis, 2002). Khan (2013) suggest that business analytics is a valuable element for various areas of supply chain management. Advanced analytics techniques are now an essential part of almost every business process. Business analytics can help companies in making the right decisions by using external and internal data availability in an optimised way. In other words, the consistency of analytics and its use in SRM improves decision making and performance by providing a strategic coherence. It combines and interprets both external and internal data for the business.

The availability of analytics means that businesses will have data available for meaningful insights. These insights could be used and presented in a way that will enable firms to look at past performance, their current state, and predict future performance or demand for the manufactured products, thus helping strategic and operational management to make the appropriate decisions and plan future activities such as production and supply efficiently (Stenius & Vuori, 2018).

Advanced sourcing analytics that can reveal opportunities for value creation and provide organisations with a renewed competitive advantage. These tools can tell organisations what is happening in their business and how well they are servicing their needs. By using tools such as advanced bid analysis, inventory analysis and vendor managed inventory analysis, companies can identify new vendors, maintain a lower level of inventory, and successfully analyse alternative, potentially more competitive bids. Finally, sourcing analytics can be applied to supply risk assessment. By evaluating performance and risks metrics based on real-time data, firms can assess financial and operational risks within their supply base (Clements, Kukar & Martin, 2019).

5 CASE STUDY – ECRATUM SRM PLATFORM

5.1 Methodology

I present a case study involving ecratum, a company offering an SRM platform with a B2B industry focus. A case study is an empirical research method investigating a real-life contemporary phenomenon, which will help to examine the context of SRM platforms in a systematic way (Zainal, 2007).

The focus of the case study is the process and steps of launching a new module on the ecratum SRM platform, starting from the inception of the module and progressing to the implementation and maintenance, including the challenges and complexities it creates. The case study encompasses a more in-depth analysis underlying the principles of a real-life SRM context. and including the barriers implied with it, and recommendations for what could have been a better way of understanding supplier needs and requirements. The theoretical findings from the literature review will be emphasised. In the case study I will demonstrate how SRM platforms help businesses in streamlining business processes and work best with the support and alignment of other technological tools.

The case study will demonstrate the process from the very beginning of a new feature phase called Trader & Producer. The process of feature development will be described in detail, including the initial idea of developing it and the process of implementation itself. The idea was generated by the users of the ecratum platform after several requests were submitted. The request was first directed to the Customer Support team through direct communication with the suppliers.

The feature requested was not supported on the platform; it was a brand-new functionality that had to be built from scratch. Once the data was gathered from the users, the product team and I had a brainstorming session to evaluate the importance of the requested feature. We analysed the benefits and trade-offs that the feature would have for ecratum and our users, by considering different technical and monetisation factors. The factors will be explained later in Section 5, where I will go into more detail about the process of gathering requirements.

Having evaluated the factors above, we decided to act upon the request. Although the requested feature involves technical complexity, it is feasible, and it came from our high-value users, with a high possible risk of churn in case of non-implementation. The request was added to the roadmap, and I was assigned as the product manager leading the feature development – reporting directly to the senior product owner. Three back-end developers, a front-end developer, a designer and one quality assurance officer (hereinafter: QA officer), were part of the team responsible for delivering the module. The case study is compiled through a combination of different data sources, such as observation, documentation of the processes and interviews. The observation took place during the development of the project in the company. It was supported by the collected documentation and the interviews conducted with the stakeholders of the module. All parts will be described to ensure data quality and consistency.

The different phases of the project in the case study were:

- The initial idea to create a new module – the first phase of the module development started with the idea itself and the problem identification. The idea for a new feature initially came

from the customers of ecratum. We identified the problem, validated the idea and prioritised it in the backlog through a series of structured interviews and research.

- Gathering requirements – after identifying the problem, the next step was requirement gathering, mainly through interviews. The feedback obtained from the potential stakeholders was analysed to determine the requirements to be met in the project. The goal and scope of the project were defined based on the requirements. The requirements were stored in product requirement documentation, and the purpose of the module was structured. The document was later shared and communicated to all the stakeholders of the project.

- Planning –having set the requirements as a product team, we used a roadmap to summarise our goals and to communicate the strategy execution. A roadmap serves as a strategic document and as a plan to execute the different processes included in a project. Sharing the roadmap with the different stakeholders of the project provides a better alignment of goals and facilitates communication.

Davies (2019) explain that a product roadmap serves as the primary source of goals, processes, priorities, and the progress of a product. It also acts as the primary source for aligning the organisation's goals and plans between stakeholders. After all the stakeholders had agreed on the defined roadmap, we created user stories for each step of the module to share with the development team and manage the requirements. A user story can be described as a requirement representation which is easily understandable, valuable and measurable. It is mostly used in an agile project to explain what a feature should do from a business perspective, as well as functionality-wise (Trkman, Mendling & Krisper, 2016).

Finally, yet importantly, the minimum viable product (hereinafter: MVP) was also set for the early adopters of the module. The MVP is the very first version of the product or module, and is of the minimum value required to satisfy the customers who initially adopt it. It is used for iterative feedback to manage future development (Lenarduzzi & Taibi, 2016).

- Development – Once the feature was clearly defined, the requirements and specifications were set, and the team agreed on the MVP. The next step was providing the user stories and the mock-ups to the development team for the development phase. A mock-up is a visualisation of how a feature/product should look before being built. It is mostly a guide for front-end-developers. A few prototypes released to the internal team during the development process for testing and examining early bugs or improper functionalities.
- Implementation - during the implementation phase, the project plan translates into action, as the development and testing are completed. A demonstration was presented to the internal team and the stakeholders of the project once it had been internally implemented.
- User feedback –feedback was collected from the users who tried the new feature and more details of the feedback, the process and results will be presented in the sections below. The

feedback was used to determine whether the feature was meeting customer expectations and whether they were using it conveniently.

- Results and challenges – in the last section of the case study, I present the results of the delivered feature and the implications. The team had to meet several challenges, and act after analysing the gathered feedback.

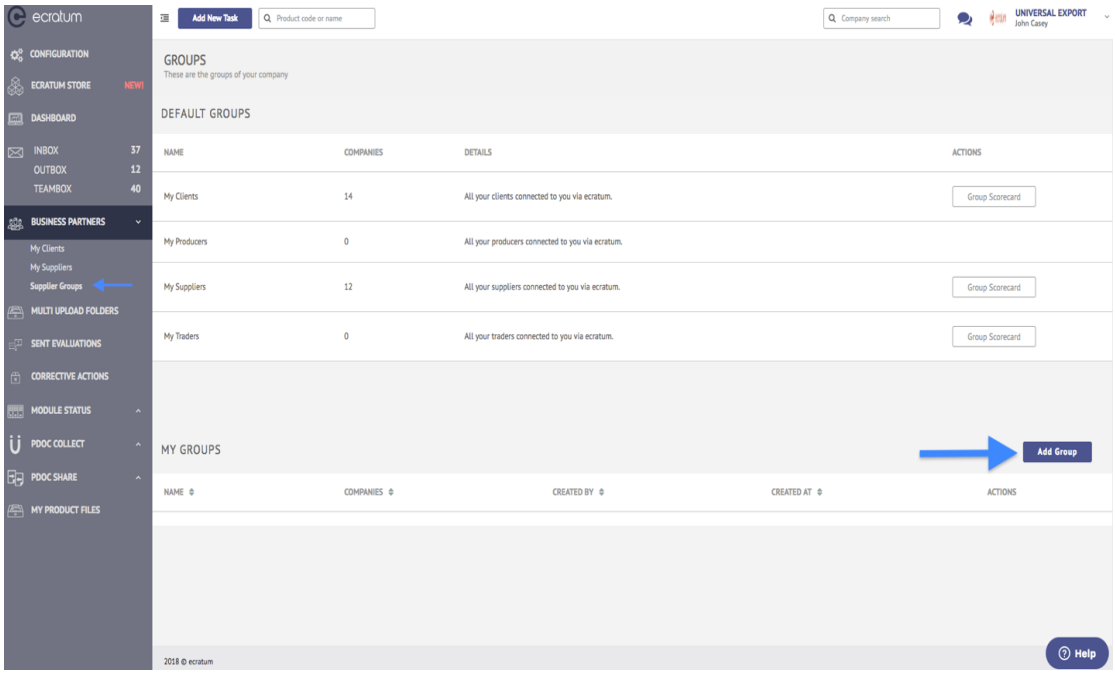
The product development phases mentioned above are described in more detail in the following sections. The results of the project are also presented along with recommendations for improvement and future research.

5.2 Presentation of the company – ecratum

Ecratum - a start-up founded in Berlin in 2000, provides a professional SRM SaaS platform that is effective across all industries. As a web-based Software-as-a-Service solution, ecratum serves small and large businesses, and customers alike, and can be implemented for any industry that deals with supply chain. It operates in many different countries in Europe and in parts of the US.

Ecratum offers several services to support businesses, such as automated requests for suppliers and supplier documentation, audit follow-ups and supplier evaluation tools. It enhances quality, reduces the risk inherent in supplier relationships and aims to save customers up to 50% in process costs as well as grouping suppliers by different relationships (Figure 6).

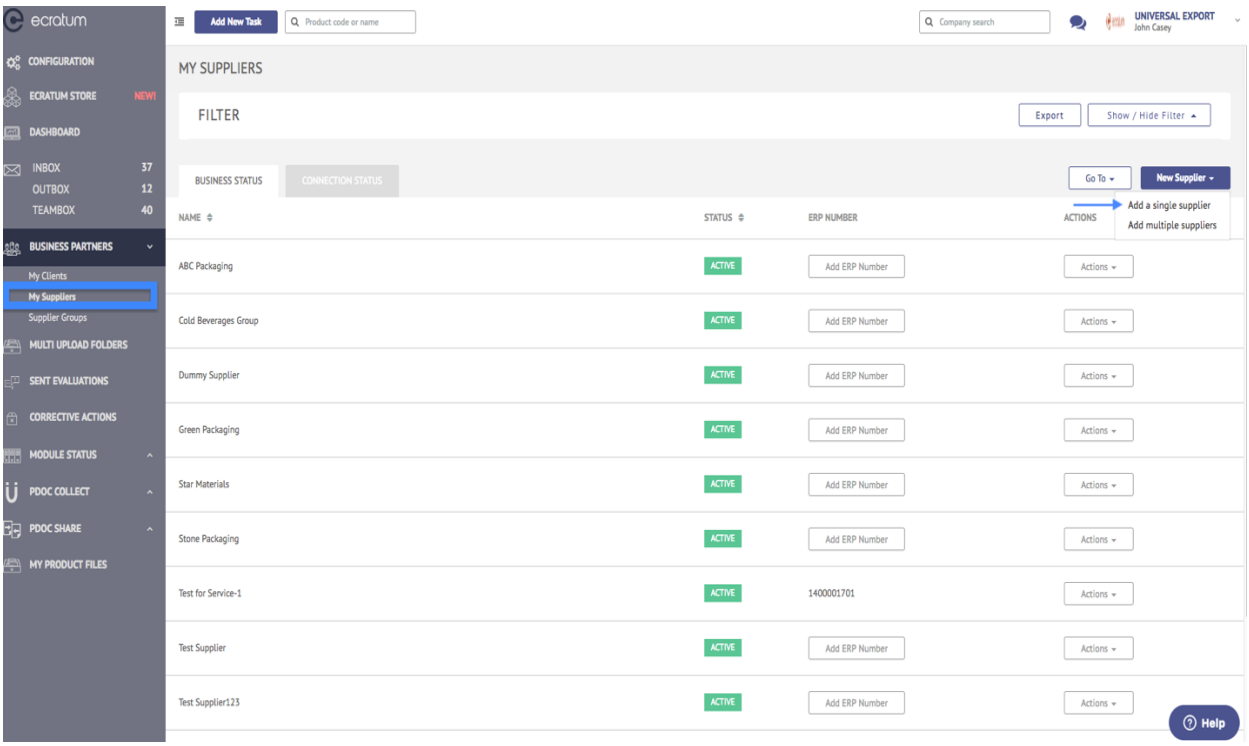
Figure 6:Grouping suppliers in ecratum platform



Source: Adopted from ecratum (2019).

ecratum offers to its customers and their suppliers a place where they can effectively work together. With SRM software at its core, ecratum claims to have the power to create a worldwide B2B network where business happens, and new partnerships start. Today, 20,000 companies from more than 80 countries are working with ecratum (ecratum, 2018). With their efficient and easy-to-use platform, ecratum supports companies in automating suppliers and documents management. Users of the platform can easily create data and document requests for products, upload their own documents and contact their business partners directly. As shown in figure 7 ecratum platform enables the users to connect and have an overview of their suppliers as well as the type of relationship they have established.

Figure 7:Connecting with suppliers on the ecratum interface



Source: Adopted from ecratum (2019).

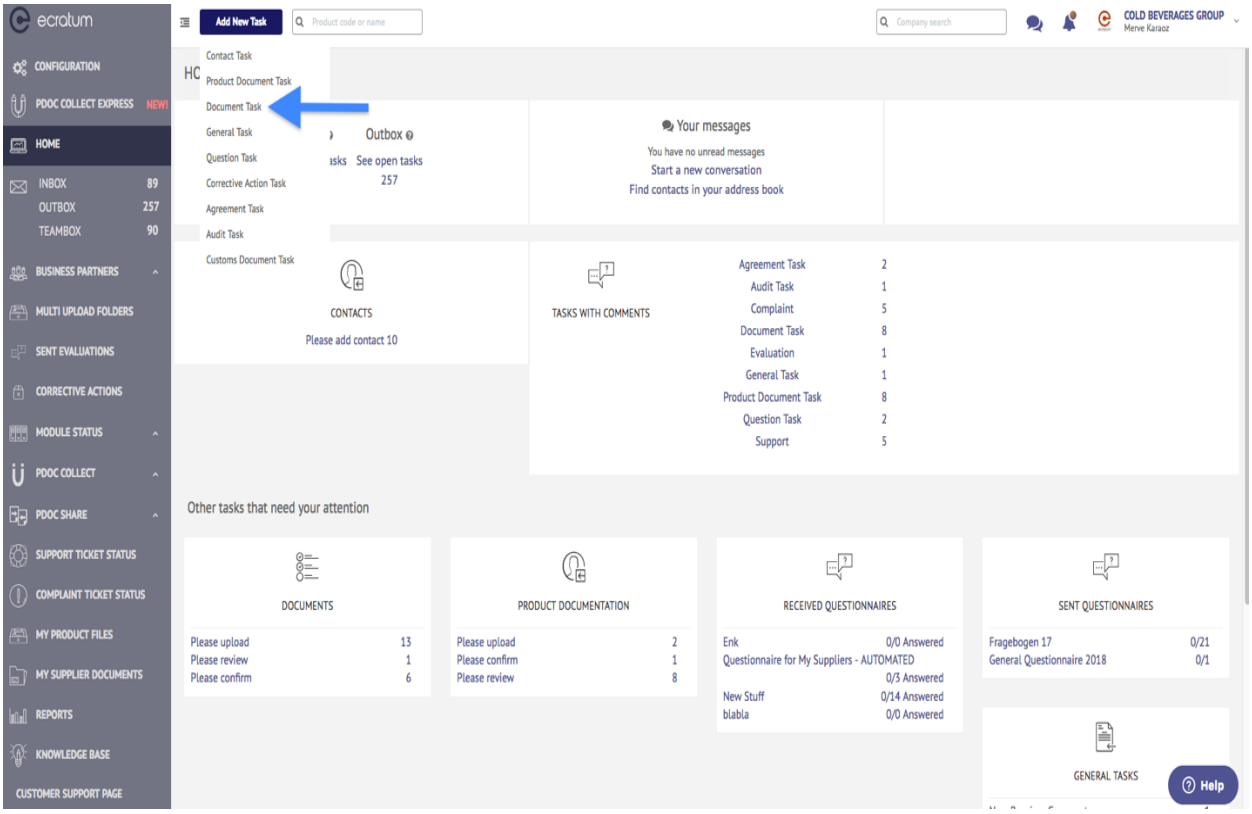
SRM offers its users different modules, so they can collaborate with their suppliers. The main and most commonly used modules on the platform are:

- Corrective actions – the aim is to keep and improve the quality of the product and the overall relationship with suppliers. If suppliers do not meet the expected quality or do not provide the necessary product specifications, the users can send complaints to their suppliers using different templates, and can track and manage the complaints using the 'corrective action'

feature. Users can also choose whether they want to send customised complaints to a single supplier or to a group of suppliers at the same time, which can speed up the process.

- PDoc Collect – this module allows users to collect and share product documentation with their suppliers. Users can easily upload documents or specify the product requirements needed from their suppliers in a shared page. The product specification documents can then easily be managed updated or collected. Figure 8 demonstrates one of the ways ecratum users can exchange documents.
- Supplier evaluation – provides a way to manage and track the suppliers via an individualised process to evaluate them. Users will thus be able to tailor the evaluation process based on different needs and requirements. Users share the requirements as reviews with the suppliers and give them the opportunity to respond to them on a platform, so the users can track the progress of each review.
- Trader and Producer module – exchanges documents and tasks between clients, traders and producers. More detail will be provided in the next sections.

Figure 8: The process of sharing documents in ecratum platform



Source: Adopted from ecratum (2019).

5.3 Trader & Producer module – Overview

Ecratum's platform aims to enable the requesting, collecting and administrating of documentation sent by wholesalers. It provides customers with an overview of their direct and indirect supplier relationships and greater visibility of their interactions. Users can find information about each wholesaler with whom they collaborate on the platform, including a profile overview and the different producers related to them. Each customer would be able to see the profile of the wholesaler and the producers of the goods connected to those wholesalers.

The Trader & Producer module provides an overview of the indirect supplier relationships. The goal of the project was to connect businesses with their suppliers and to provide transparency between all the participants involved supply chain processes. Our aim as a team in ecratum was to build a module that would completely change the way our customers work with their traders and producers by providing transparency. One of the processes we were aiming to facilitate was documentation exchange between the supply chain participants.

Suppliers need to meet the terms and requirements of their customers when negotiating. There are different product certificates and documents that can be requested from suppliers or provided by them to ensure quality, excellent performance and detailed descriptions of the products. Having the right certifications and having certain expectations helps businesses to find reliable suppliers.

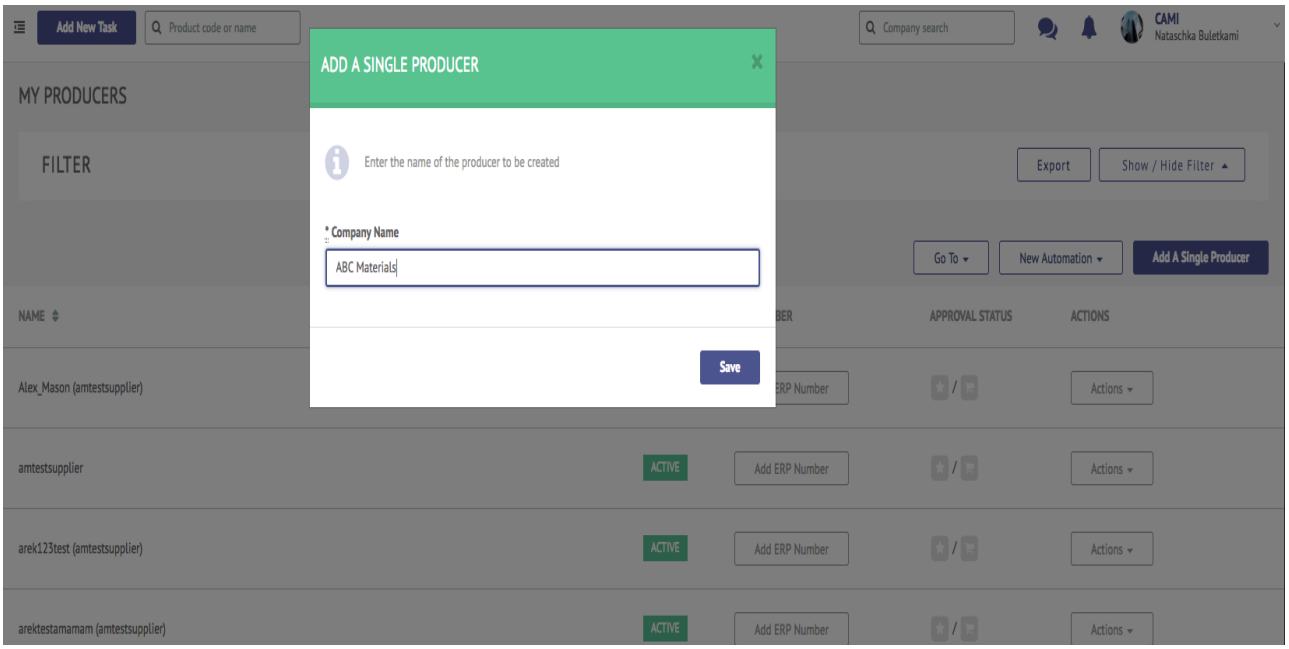
One of the most commonly exchanged quality management certificates, also through ecratum, is the International Organisation for Standardisation 900 (hereinafter: ISO 900). ISO provides certificates with a set of guidelines, requirements and a set of the standards that suppliers need to have in order to ensure quality products that are recognised globally. The standards are very customer-focused and accepted in 170 countries, with over a million companies using it. Apart from ISO 900, different companies operating in different industries have different requirements from their suppliers. There are many ways for businesses to request the required specifications from their suppliers. One way of structuring them is by creating different templates, and another is through setting up service level agreements (hereinafter: SLA). An SLA usually states all the objectives and specifications for the service or product that suppliers provide. The agreement includes details of the service or product deliverables and the expected standards of its performance. It can also contain procedures for measuring expected performance or failure of performance, and the termination of a contract. As the aim of the service level agreement is to meet individual business requirements, however, it is always changing, and can contain different structures and information.

I will explain the idea behind Trader and Producer feature in more detail in the sections below. I will provide a presentation of the development, functionalities and the challenges we encountered during and after the project.

5.3.1 Initial idea to develop Trader & Producer module

In SRM, there is a sequence of events or business processes when users (customers) need product document files for different business reasons. Business reasons can include compliance or any other relevant factor, and users therefore request the document from the traders. Traders do not always have the requested product documents from their customers, however, as they belong to the original producers. There are many business cases when traders present product documents on behalf of the producer to their customers. Alternatively, they do not own the document at all. In this scenario, traders first need to request it from the original producer and then provide it to their customer. The users of ecratum had to go through the steps described when working with traders and customers, and the ecratum platform was not supporting such business cases. Traders and producers are able collaborate using ecratum platform (Figure 9). The aim of Trader & Producer is to enable the collaboration also between the third party – users.

Figure 8: The process of adding a producer



Source: Adopted from ecratum (2019).

ecratum customers reached out through phone calls and emails to our Customer Support (CS) team. They requested a feature that would facilitate the way they work and communicate with traders and producers. The principal customers of ecratum (the most profitable) were some of the users who requested the feature. The CS team shared the gathered feedback from the customer to the product team for further review.

5.3.2 Gathering requirements

After the CS team handed over the gathered feedback to the product management team, the next step was for us as a team to communicate directly with our users. Direct communication would help to understand their needs and the complexity of their request. Interviewing the key customers was the main means of requirement gathering and the first touchpoint for tackling the problem. The input gathered from the customers was documented using a documentation tool and later analysed for an implementation decision based on the following factors:

1. Technical possibility and difficulty of implementation – we first examined whether it was feasible from a technical aspect to implement the proposed feature, as well as the period and resources required to build it in terms of engineering complexity.

2. Monetisation value of the customers – as ecratum offers different subscription plans, , we also looked at the value of the users to prioritise the feature on the roadmap, and evaluated whether they played an essential role in long-term growth.

3. The risk of churning – another important factor considered was the risk of our customers churning without the support of the requested functionality.

We analysed the needs of the customers, and the importance of the functionality requested based on the criteria above. Benchmark research was also conducted so as to understand the market. Through the research, we tried to understand whether our competitors already had a module that incorporates such functionality. Our research revealed that only one competitor was offering a similar feature, but not precisely meeting all the needs of our users. Our observations suggested that there were limited solutions offered, when it came to business processes involving several participants in the supply chain and document exchange.

The conclusion of the requirement gathering analysis was that even though building the feature was complex from a technical point of view, it should still be implemented. The feature was requested by our important high-value customers, who we did not want to leave dissatisfied. The feature would bring competitive value to ecratum. As a result, we decided that the new module would be processed in the pipeline and implemented. During the interviews, one of ecratum customers even claimed that they would churn if the platform did not support the functionality they needed.

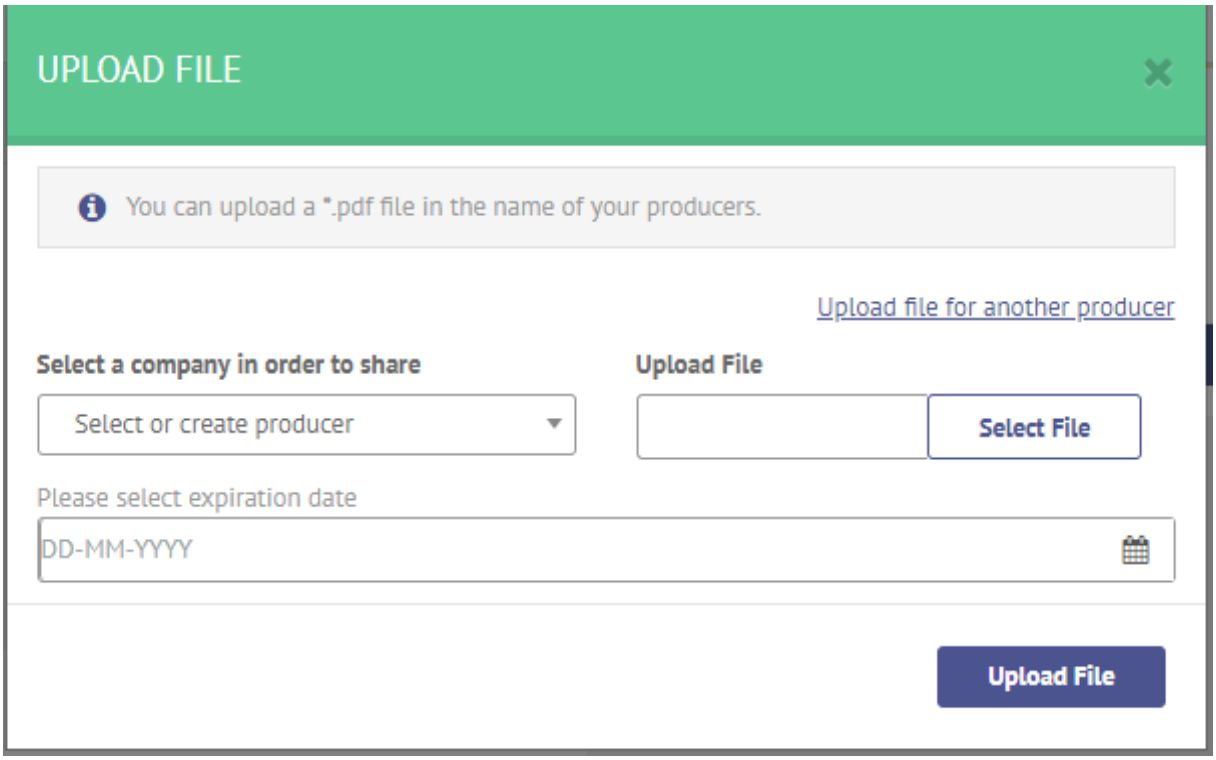
5.3.3 Planning

A decision was made to develop a module that would make it easier for ecratum users to communicate as a three-party involvement information exchange. The next step was to start planning the development and add it to the roadmap.

The goal was to create a module that would allow users to perform the following process: If traders do not own a product document requested by their customers, it would feasibly allow them to request the document from the producers of the goods instead. Once they have the document, traders should be able to forward it directly to the customer.

This procedure will allow traders to receive the required document simply, by clicking a button on the online platform, and to forward it to their customers in a one-step procedure. The idea is that the customer and the producer do not need to communicate, as is always the trader in the middle who enables the process (Figure 10).

Figure 9: Traders are able to directly send documents from producers to their customers using the ecratum platform



Source: Adopted from ecratum (2019).

Before creating a roadmap to support our goals and strategic planning, we first needed to understand the technical feasibility/complexity of the new module. Understanding the complexity would help us forecast the timeframe required to build the feature. After several meetings and discussions during the first two weeks in May 2016, and especially input from our Chief Technology Officer (hereinafter: CTO), we estimated the first module delivery to our end users as within the next quarter. Requirement gathering also took place during May 2016, and we expected the first delivery to be sent out at the end of September 2016. The first beta version would be delivered only to our top five customers.

The senior product owner assigned the team responsible for working on the module. I was assigned as the product manager, leading the feature development. My primary responsibility was to make sure that all the requirements were met, and the stakeholders were completing the required work streams across the company. I reported progress directly to the senior product owner who was helping with strategic decision making. I was the central communication point between all the departments involved. Three back-end developers and a front-end developer were assigned from the IT team to develop the module, entirely dedicated to this project. A designer was responsible for providing the mock-ups and the visuals. The mock-ups were used to develop the look of the module on the site. Finally, we had a quality assurance employee who was responsible for testing and reporting bugs or the incompatible user experience.

Following an agile methodology, the product team created a high-level plan on the roadmap. We defined the roadmap's strategic objectives, and the tasks required in order to achieve those objectives. The roadmap was therefore aligned with the plan. My responsibility as product manager was to make sure that the high-level planning in the roadmap translated into components and tasks that could be assigned and tracked throughout the project.

Part of the planning was also creating user stories based on the gathered user requirements, which would later be used by the technical team during the development process. The user stories were documented and will be presented in the next section.

5.4 Development & implementation

The backlog created during planning includes all the steps/tasks that must be done to complete the whole module. It is used as a guide for the development and implementation phase to plan and prioritise. The backlog was created with the help of the development team, and it also reflected the list of effective steps that they need to undertake to complete the necessary tasks. The duration of the tasks and milestones was used as input for the development team to forecast when to start the task and how long they had until they had to finish it. Even though the development process has been planned and ready to be executed, it could still be slightly changed on given circumstances (i.e. technical complexity). The backlog was not set in stone as there might be difficulties coming along during the development. The tasks are described in detail, in a way that other teams can understand.

The development team created the technical documentation based on the user requirements as a basis for tasks to be completed during the implementation, along with the user stories created by the product team. The front-end developer used the mock-ups created by the designer to build the front end of the site, making sure to provide a user-friendly experience.

I documented all the possible scenarios of how the users might need and interact through the new feature. The scenarios were written in three ways: from a user perspective (the person buying the

goods), as a trader and as a producer. The documentation was used continuously by the development team.

As opposed to a regular customer/supplier relationship, the trader is liable for all documentation and information requests that the customer may have. In some industries, the trader is obliged to disclose the original manufacturer of the goods (i.e. in food industries for traceability reasons), but this is not mandatory in all industries.

As mentioned above, creating user stories was the first step of the documentation process in order for the business and the developers to understand the business scenarios so that the new module would be applicable. There are two possible business scenarios where the module is supposed to help, as follows:

1) The customer is connected to the trader, meaning they have a business relationship with the trader but not with the producer, and is not informed of the actual producer of the product. Producers, on the other side, are also not disclosed to the sender of the tasks (request of documents, etc.), who in this case is the customer.
   a) In this scenario, all tasks requested by the customer go to the trader
   b) The trader replies to all tasks with the option of sending the requested document or informing the customer that is not available.

2) The customer, who can request a task, is connected on the platform with the trader of the goods. The customer can see who the producers of the product are.
   a) In this case, the trader first receives the tasks requested by the customer.
   b) The trader can reply to the request received by the customer. Alternatively, when the trader does not own the document needed, the trader would have the right to forward the task directly to the producer, who would then send the required document to the customer.

The trader should be able to forward the tasks that they receive from a customer to one or more producers for them to work on these tasks. When the producer completes the tasks, the trader should be able to forward them to the original sender of the task without disclosing communication as described above.

Apart from the scenarios above, the users of the module can perform other functionalities. Below are some additional requirements applicable to both scenarios:

- Producers should have an account on the ecratum platform for the trader to possibly work with them.
- The trader should be able to forward the task in both scenarios – whether the customer knows the producer or not.

- Communication between the original sender of the task and the trader should not be visible by the producer unless forwarded by the trader. Similarly, communication between the trader and the producers should not be visible to the original sender of the task, the customer.
- The trader should always be able to see the status of the task exchanged with the customers, and also the historical view of the previous tasks.
- The trader should have the ability to connect and invite different producers to the ecratum network.

The development phase helped the teams to arrange everything required for implementation, where the project needs to take shape. An essential part of the implementation phase was to make sure that the teams were confident and aware of every step they have to build. There must also be clear communication between them. Progress was monitored through our internal ticketing tools, which I was managing, and through testing in a staging environment. Improvements were made continuously and added to the backlog in case there were some changes not incorporated with the plan.

A ticketing system was used to report bugs, as the product was tested daily by our QA. Progress was also reported daily through a stand-up meeting. I used the information shared during the meeting to maintain control over tasks and help with the directions that we are following for the plan agreed on at the beginning of the project. Progress was also measured based on the deadlines set and the delivery of the task.

After many incremental improvements and discussions, the first completed beta version was successfully developed on time in mid-September. We presented a demonstration of the module to the internal stakeholders of the project, before sharing it with the end-users.

Once approved by the senior product manager, we briefed the CS team through the module so they could communicate to the customers that the module would go live. They would support the users with the presentation of the module or any other enquiries, and be responsible for sharing the feedback gathered from the users once they had tried the module with the product team.

5.5 User feedback

The first beta version of the Trader & Producer module was released on time as planned, and was delivered for testing to five users/companies as planned on the roadmap. The customer support team gave the users a demonstration of the new feature and helped with the technical set-up.

A week after using the module, ecratum started receiving the first feedback from the users, with requests for improvement of the features. At first, the pressure came from A major retailer, which was not satisfied with what the module had to offer. They had difficulties working with

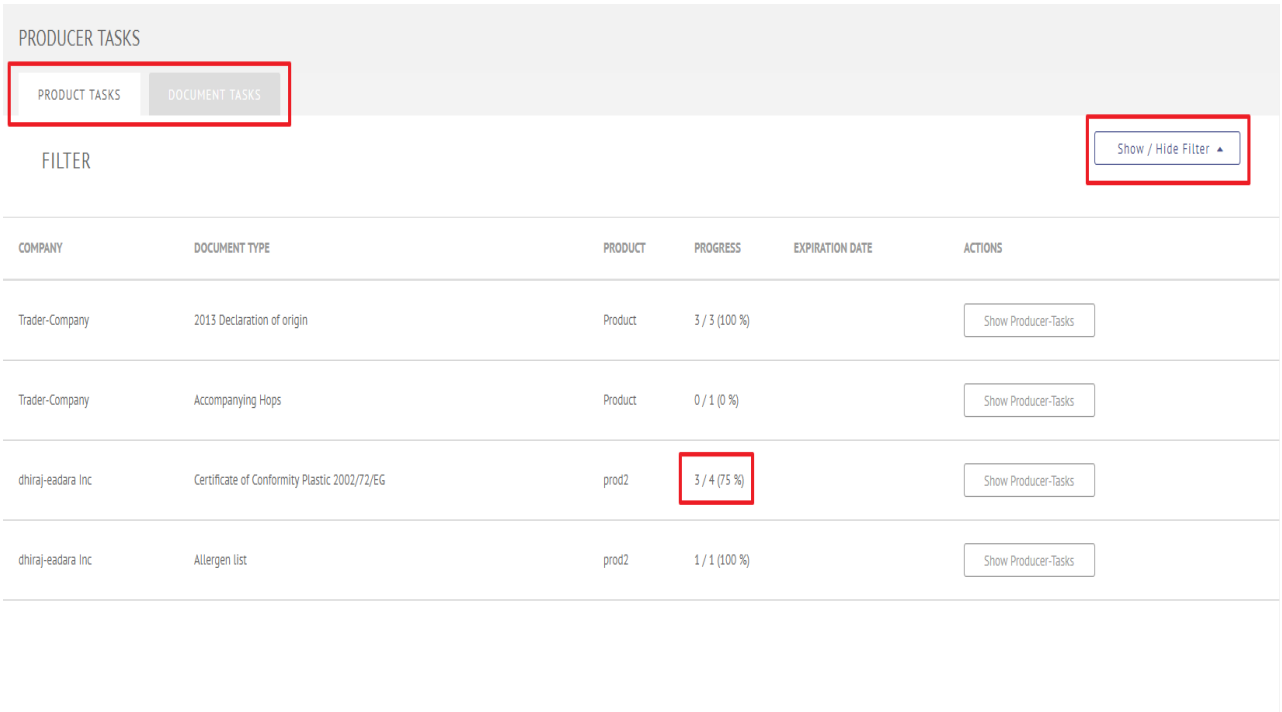
many suppliers at the same time, which was an essential aspect of the way they operate. Small bugs were also encountered in the functionality.

The customer support team gathered feedback from all the users that tested the first version. They shared the feedback with the product team and went through it. The feedback was analysed, and we tried to measure its importance. The analysis helped us in making decisions and understanding the feasibility of adding improvements to the current version.

After an in-depth analysis of the new functionality request and with the help of the development team, we decided to add improvements to the current feature. The following improvements were added to the roadmap to be considered for the module redesign. We promised the users that the new requests would be considered, and that we would try to deliver the improved version within the next 2-3 months:

- Users found that core functionality was missing – forwarding a task or a request to more than one producer at a time. Users explained that in a real-life scenario, they need documentation from different producers (i.e. different brands) for every product that clients buy. As a result, instead of forwarding the requests individually to each producer, users should be able to forward the same request to multiple producers at a time. Sending the same request individually to each producer can be very time consuming,
- Visibility/Tracking – The traders who used the module were also interviewed. According to their feedback, a missing function was the option to have better visibility. Visibility was meant to allow tracking of the tasks sent in the past or shared with a producer. For instance, when traders visit the profile of a producer, they should have the ability to check the history with that producer (tasks/documentations exchanged). This historical overview would help them to keep track and define their business relationships with one another.

Figure 10: Progress track of the accepted tasks by a trader

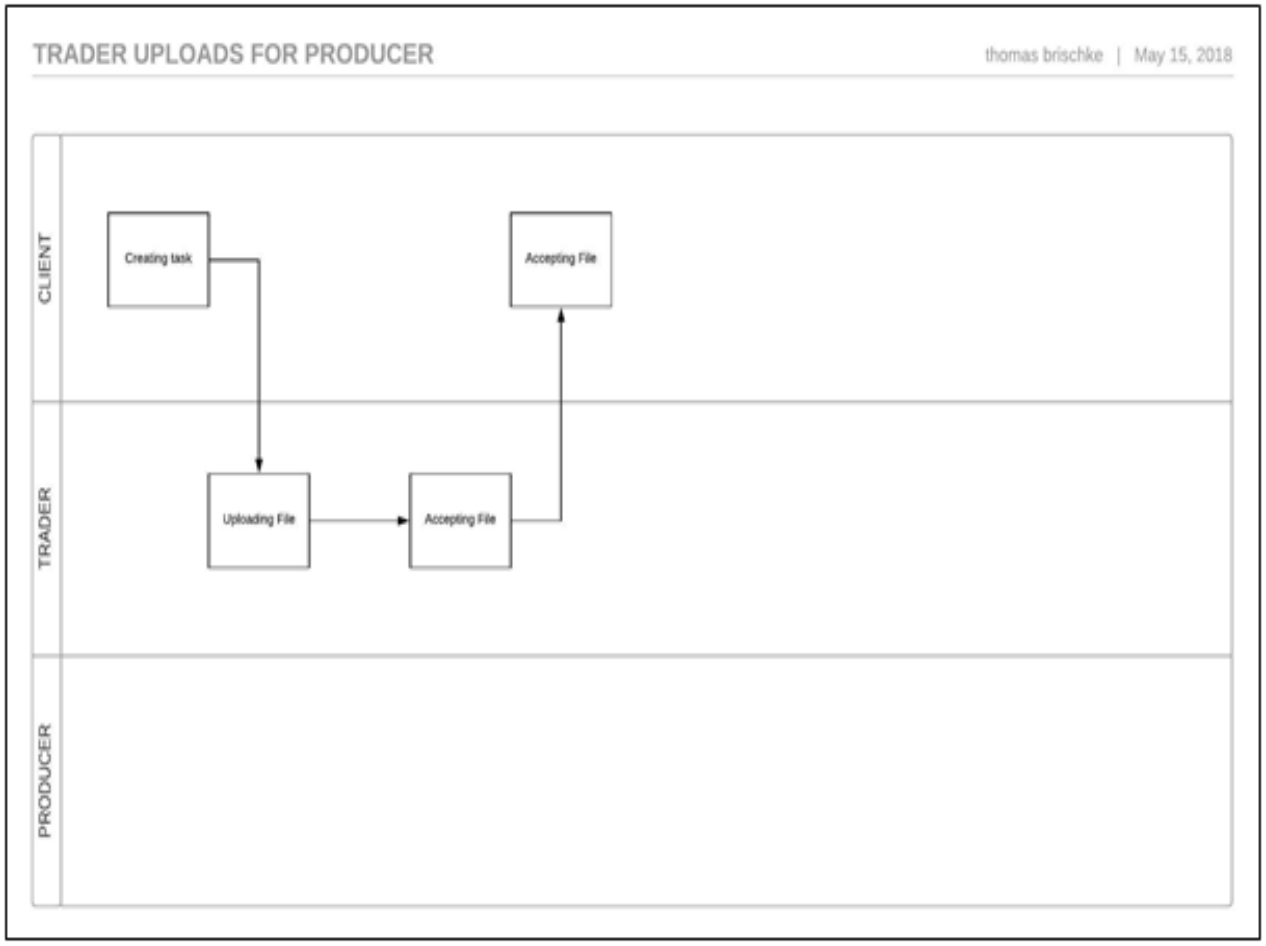


Source: Adapted from ecratum (2019).

The revision targeted three main problems in the first version of the Trader & Producer relationship:

1. As already mentioned, the team also prioritised a core feature that the module should have had in the first version initially - the ability for a trader to forward a task to more than one producer.
2. The current implementation was too error-prone for end-users. It confused the relationship between client, trader and producer, or any tasks sent between the three. The main reason for this was the inability to track the history of the document exchange. Not being able to track the history led to a lack of visibility in the relationships (i.e. the producers with which a trader is connected).
3. The interface was not giving the end-user the required information and steering them along the "happy path". During development, we defined "the happy path" as the process of interacting with the feature without confusion and completing an intended task. Due to the complex nature of the relationships, the user interface needs to steer the end-user to their goal and prevent them from creating errors along the way. This meant that the interface had to be improved in order to be more user-friendly and more comfortable to navigate for our customers, as they had difficulties using it.

Figure 11: Happy path when a customer requests a document directly from a trader



Source: Adopted from ecratum (2017).

Figure 12 represents the case when a Trader already owns the producer document that should be forwarded to the client. In this case the forward functionality is not required, and the users were able to perform it without any issues.

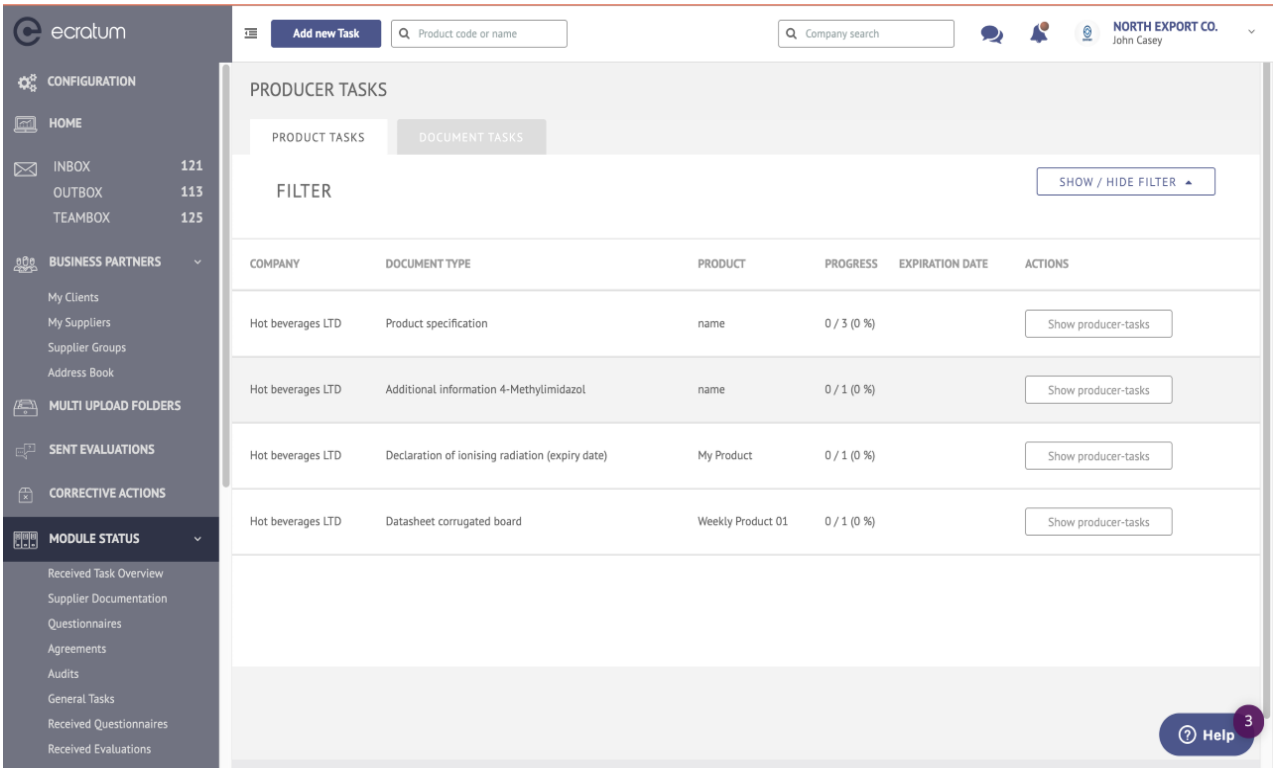
5.6 Product improvement – second iteration

The decision was made for a second version of the module to be created and delivered to our customers. The product team and I communicated internally and aligned all the teams involved. The process was added to the roadmap and the steps and milestones were refined.

In cooperation with the teams we decided on the steps to be undertaken by each team and we worked on defining the MVP and the acceptance criteria for the module, based on the feedback and input gathered from the users.

The development team defined two acceptance criteria for the implementation of the new versions with the improvements. The criteria were written in a user story form as follows:

Figure 12: Second delivery of task overview

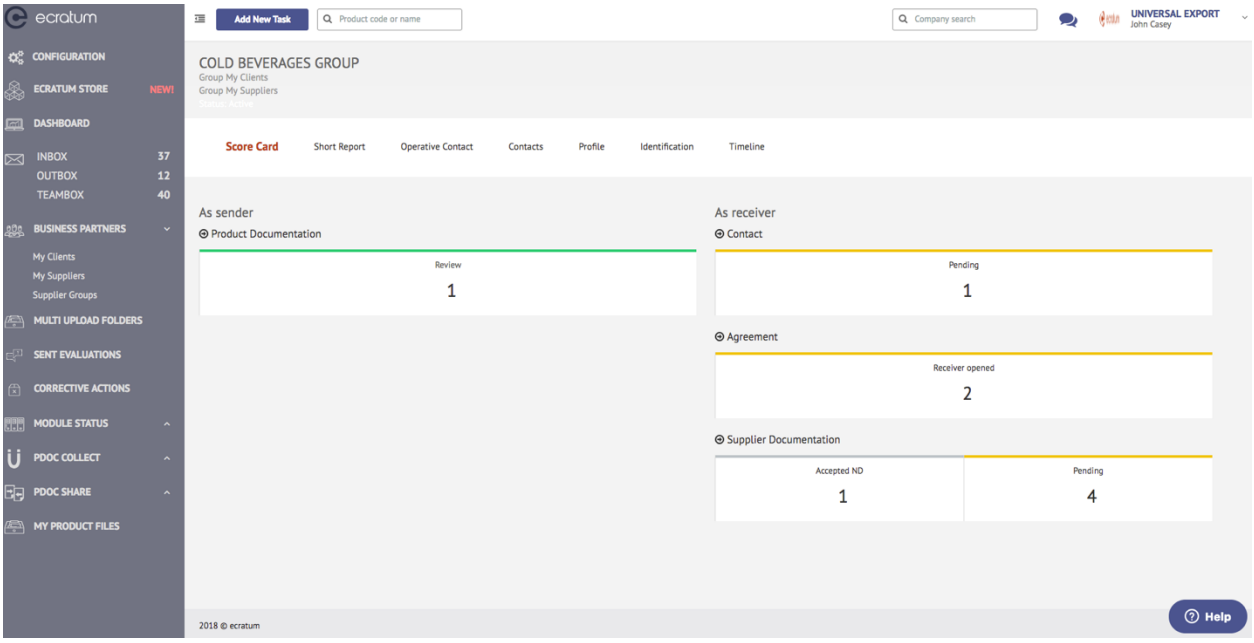


- *Source: Adopted from ecratum (2019).*

1. Acceptance criteria for Client (what behaviour/functionality do clients expect to complete through Trader/ Producer?):
    - I need to be able to send product document tasks to a trader, not necessarily knowing who the producer is and how many producers supplied that material via that trader.
    - I need to be able to define what other information (i.e. profile information that includes question tasks, document tasks, contact tasks) I want from a producer or a trader to fill in, upload or reject.
    - I need to have an overview of all the tasks I sent to a trader or a producer. I need to be able to differentiate between suppliers, producer and traders in company overviews and search results (Figure 17).
    - All task types should behave similarly to regular tasks (expiry, revalidation, reject, accept, commenting, etc.).
    - Optional: I need to be able to see all the producers of a certain product (Client – Trader – Products – Suppliers) via PiBuy
2. Acceptance criteria for the Trader (the tasks/functionalities that a trader wishes to complete through Trader/ Producer feature) - when a client sends a task to me, I need to be able to perform the following:

3. Assign it to one or more of my existing producers. If there are no existing suppliers, I need to have the ability to create the necessary producers and be able to assign them as my producers. Be able to upload files or fill in forms in the producer's name.
4. These producer names will be automatically "shared" and connected to my clients and be visible there once I link a task to a producer.
5. I should have an overview of all the open tasks (Figure 14) per customer and the producers assigned to them or have the opportunity to assign tasks that I have not yet assigned to producers.
6. I can import a list of my producers as "custody" producers. Custody producers are considered to be those a trader has worked with, are validated and where the required certificates are issued.
7. I can create a "custody" producer over the interface.
8. When a client sends a task directly to one of my custody producers, the task will be in my inbox to work on.
9. I need to be able to forward a task to more than one producer.
10. I want to receive reminder e-mails (to-do e-mails) to show me the pending tasks per customer

Figure 13: Historical overview of tasks exchanged



Source: Adopted from ecratum (2019).

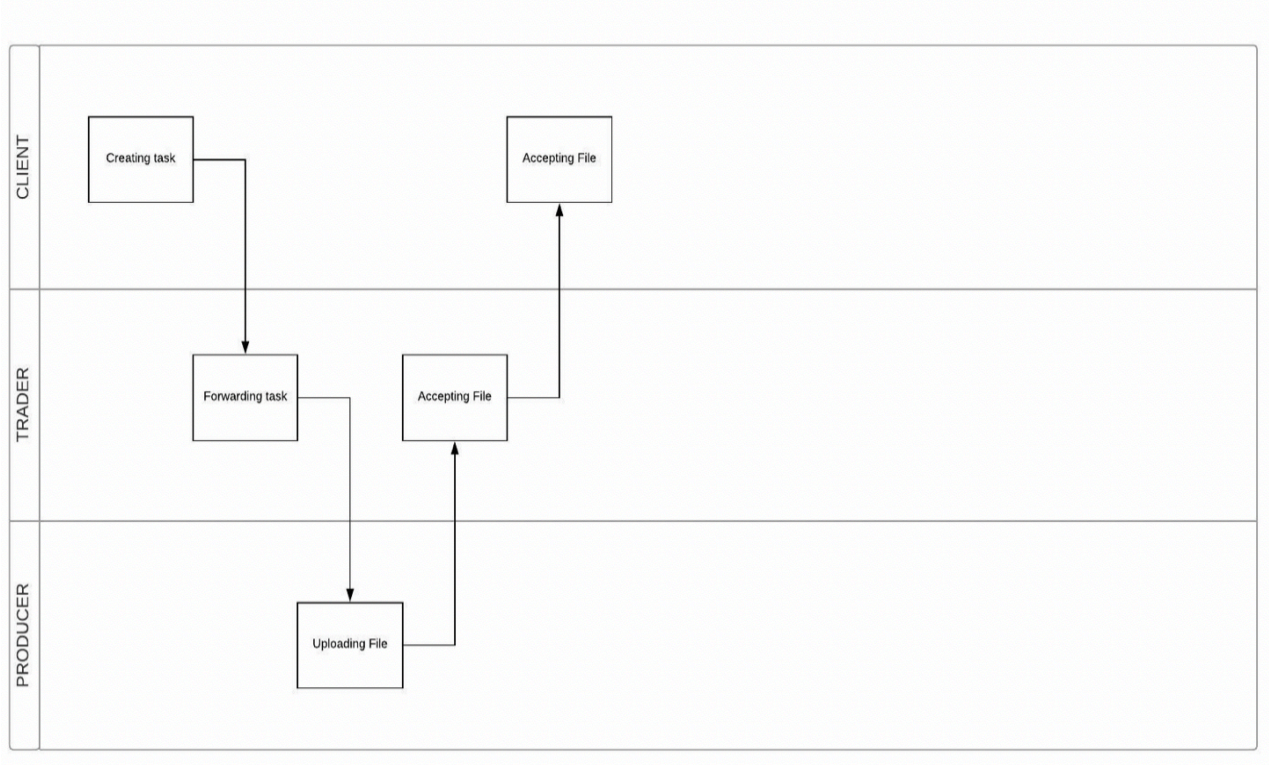
Following the user stories above, the redesign of the module took place with the same team members involved in the second iteration. The product team was in continuous communication with the end users and I tried to clearly communicate the requirements to the developers, designers and all other team members in the team. It was critical that we are all aligned regarding the goals.

Due to the technical complexity of the development, we delivered the module approximately a month later than the estimation time. We had to adjust our roadmap and we kept the customers informed in order to manage their expectations.

Although there was a lot of frustration and pressure from our customers, they were happy with the new results and the functionality. There were a couple of minor requests to further improve the module and the product itself, however, looking at the bigger picture, the second iteration was successful. We had no customer churn and the functionality met the essential needs of our users.

There are several scenarios on how the clients – traders – producers are able to collaborate through the module. Figures below represent some of the collaboration possibilities.

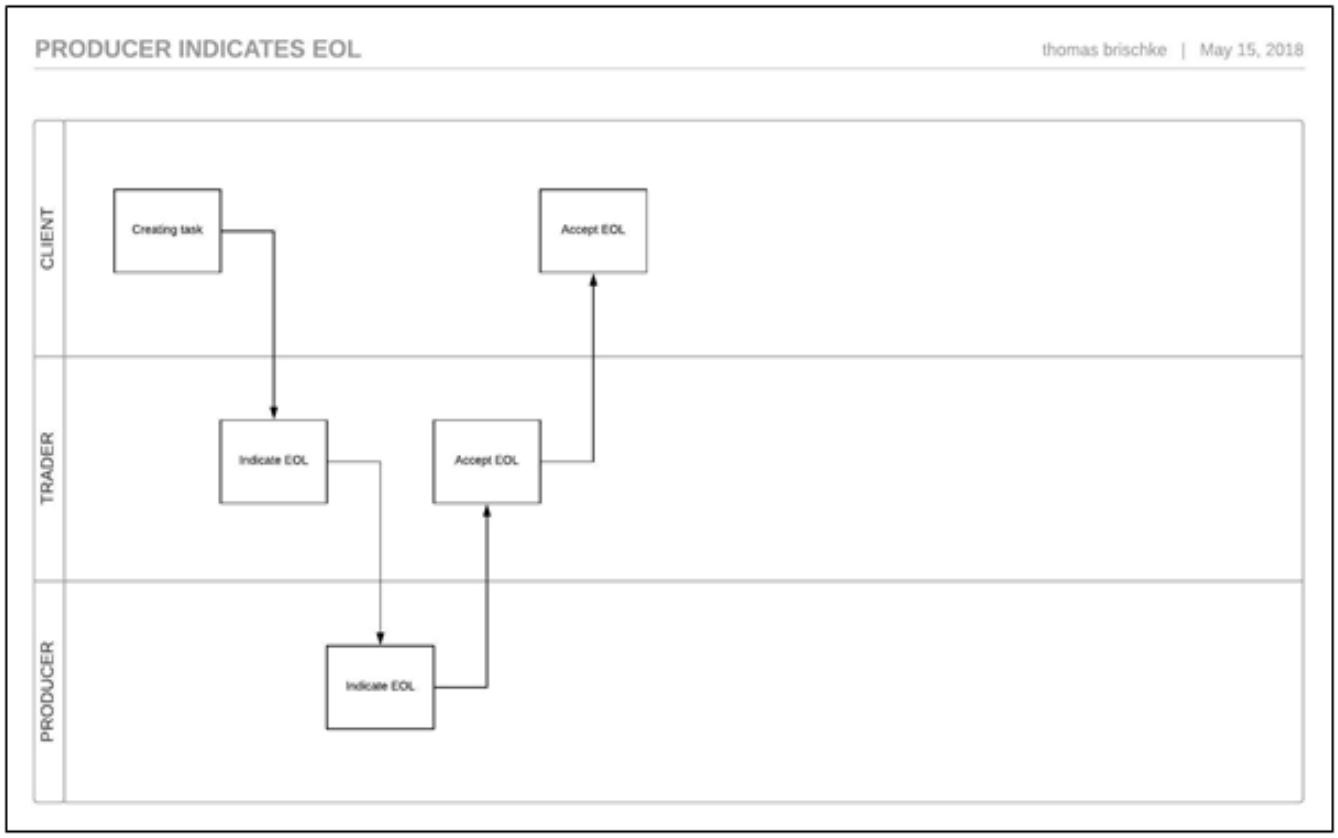
Figure 14: The path when a trader has to forward a task requested by the customer to the producer of the goods.



Source: Adopted from ecratum (2017).

Figure 15 represents the case when the client requested a document from the trader. The trader does not own the document required and sends the request back to the producers of the good. Once the trader receives the document from the producers it forwards that document to the client. The functionality described was implemented in the first iteration. However, our users claimed that in some cases they need to forward the same request to multiple producers at once.

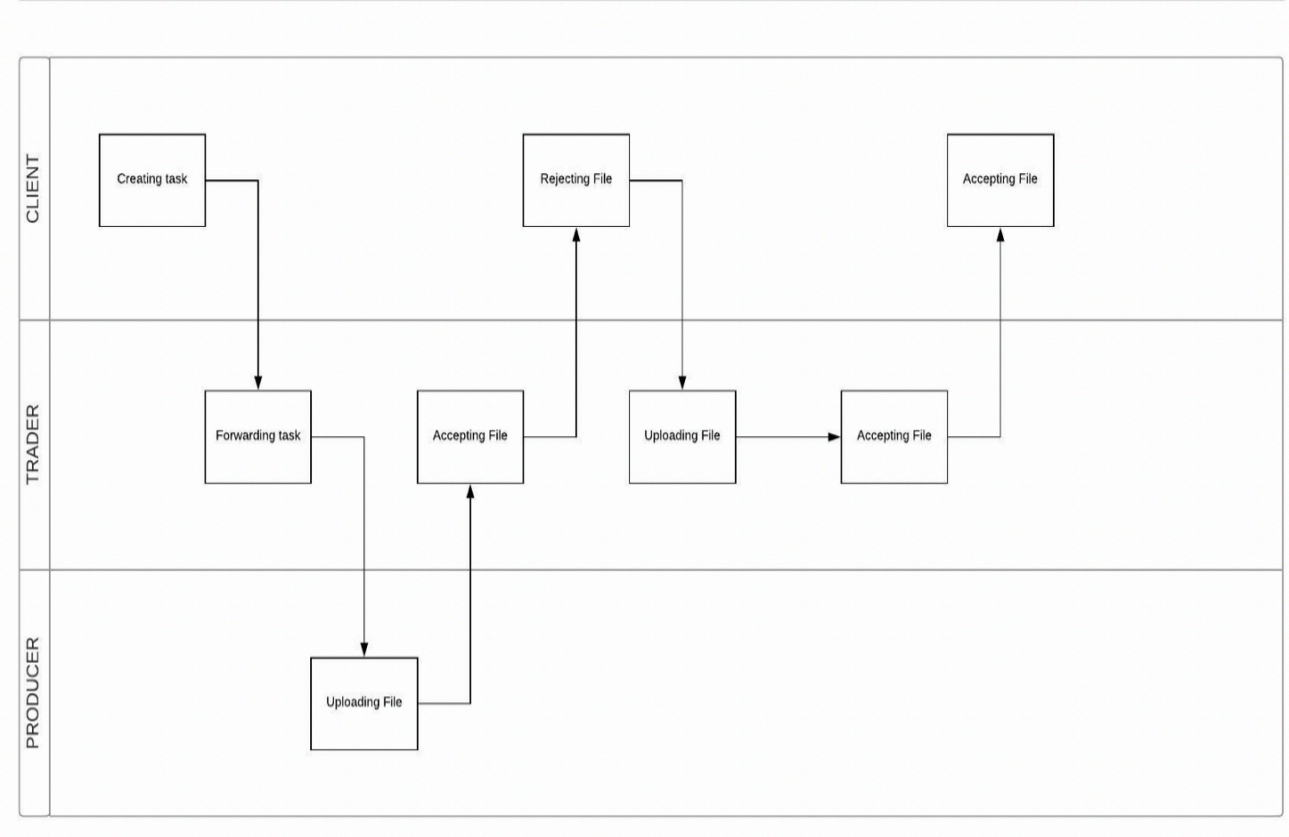
Figure 15. End of Lifecycle



Source: Adopted from ecratum (2017).

The process represented in figure 16 showcases the process when the trader does not own the document requested from their client and it indicates the end of lifecycle (EOL). The producer has to also confirm the request as EOL in order for the task to be closed.

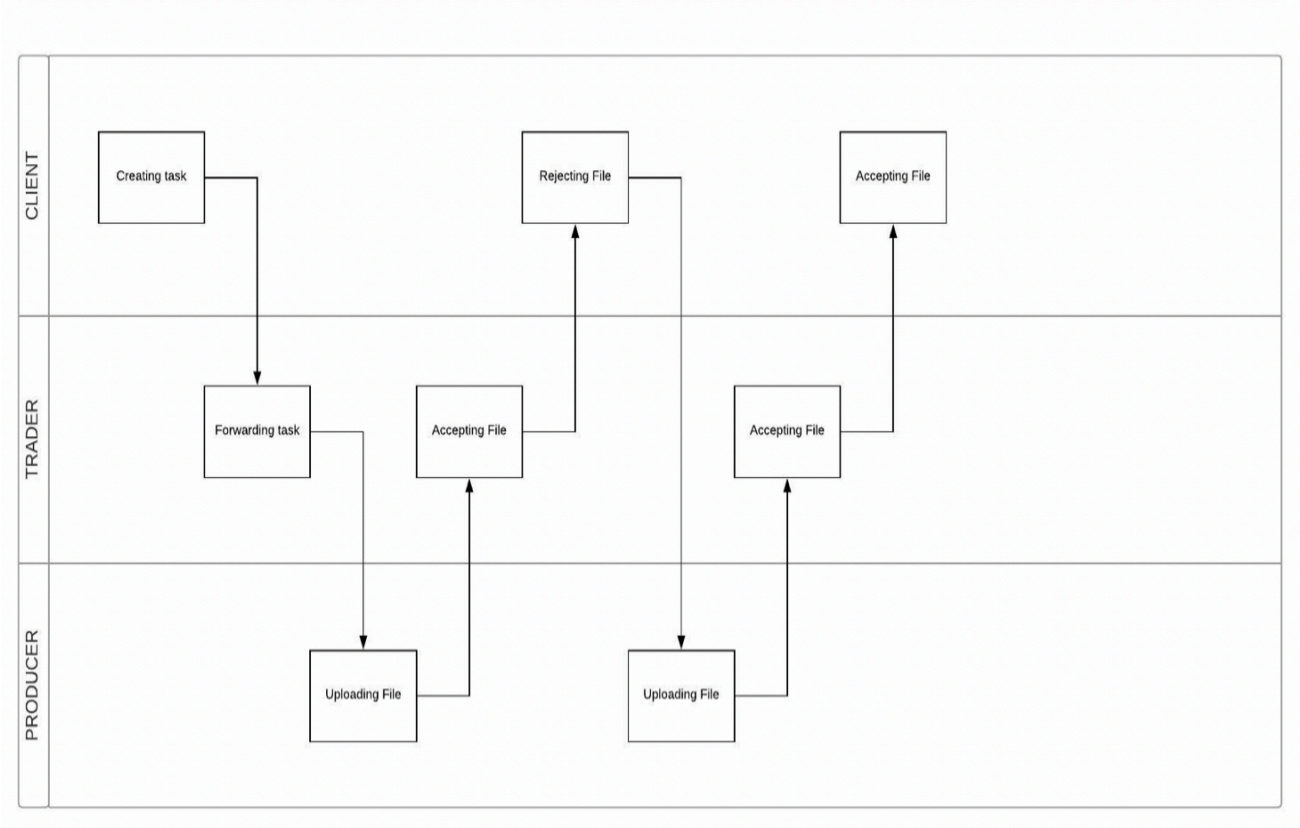
Figure 16: Case where a user is not satisfied with the provided document and trader resends



Source: Adopted from ecratum (2017).

Figure 17 represents the case when a client is not satisfied with the document received from the trader. In this case the trader forwarded the wrong document to the trader. The client has the possibility to disapprove the document and the whole process will start again. In case the producer does not own the required document there is the possibility to indicate it as EOL.

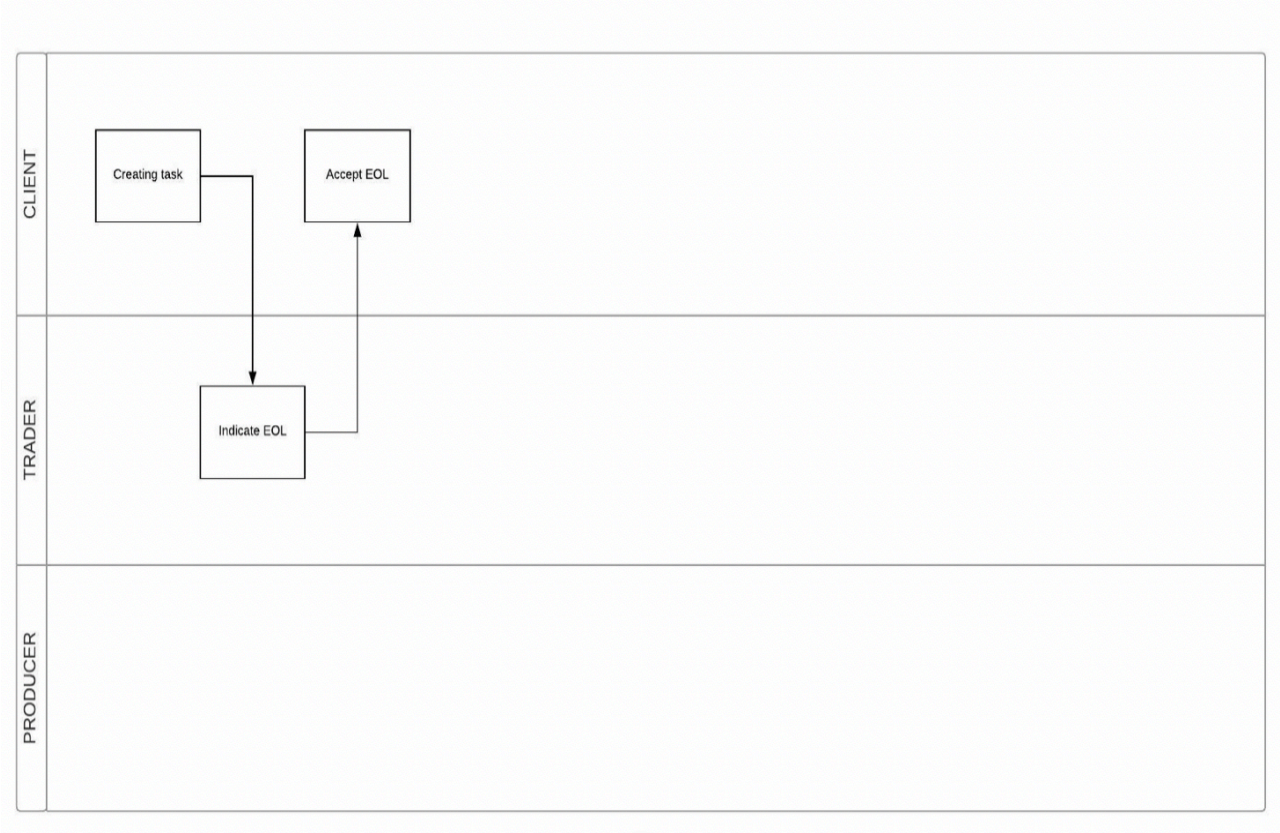
Figure 17: Case where a user is not satisfied with the provided document and producer resends



Source: Adopted from ecratum (2017).

Figure 18 represents the case when a client is not satisfied with the document received from the trader. In this case the client has the possibility to directly reject the file to the producer without involving the trader in the process. In these cases, it is the decision of the producer to be visible the clients.

Figure 18: End of Lifecycle - Trader doesn't have the document



Source: Adopted from ecratum (2017).

6 ANALYSIS

Even though there was a constant A/B testing approach in place and the team built the module in an incremental process, with continuous improvements for minimal risk, there was still a considerable gap between what users required and what we delivered.

Based on the outcome of the first module iteration and the theoretical finding in the thesis, the gap and user dissatisfaction were caused due to limited data availability, not using technological tools, unclear communication with the end-users and because the field was partially unknown. Another possible factor was lack of research into the business process that the feature was supposed to support.

The internal team was well-coordinated, and everyone was aligned with the goals and milestones we had to achieve, however, unfortunately, the same cannot be said when talking about the communication and understanding the requirements of the external stakeholders. A roadmap was built with single workstreams, and the product team continually tracked progress through the ticketing systems to make sure we are being strategic and delivering value to our users. I investigated the reasons why we could not completely understand the requirements, or the

functionality requested, together with the product team. The main points we focused on, were what would help our key customers simplify the documentation exchange between suppliers and solves their pain points.

After discussing how we could streamline the development with the team, the very first instance of the problem we encountered was that we were communication with our users through the CS team. Direct communication with the users would help in more efficiently shaping and understanding their needs. Since we did not spend a considerable amount of time researching user requirements as a product team, the lack of communication was a factor that could have been improved, primarily by communicating directly with them and listening to their needs.

Communication is a potential contribution that could have helped us better gain insights into the problem and act upon them. More clear communication could have been ensured by scheduling weekly or biweekly check-in meetings with the stakeholders of the project, sharing the progress and coordinating our efforts.

Several authors have highlighted the importance of communication and involvement of the end-users in the product development or design, especially at an early stage and this is also supported by the theoretical/academic findings of this thesis. It has been shown to improve performance, save costs by reducing the complexity of understanding the requirements and pushing new ideas for innovations and creativity (Brant & Lohse, 2014; Addae, 2015).

Direct communication also supports processes such as time or quality management and the clarity of the results (Kannan & Tan, 2002). Another element demonstrating that direct communication improves understanding of requirements and defining the specifications arose during the second iteration, when we as a product team started communicating directly with the customers, the next delivery or revision of the feature was much more successful.

Being part of the project, we realised that an essential aspect of working with an SRM platform is to be aware of the complexity of customer-supplier relationships. The tasks or documentation exchanged between them in most cases required several steps to be completed and several parties involved. Proper market research needs to be conducted to achieve transparency and visibility regarding the processes that our users will need to complete. In order for us to meet their needs and to simplify the way they are doing business or communicating with one another, we must understand their needs.

In addition to the lack of communication, many other actions could have been taken to prevent the issue that we encountered. A lack of data availability, current or historical, regarding how the customers were using the ecratum platform made it even more challenging to track their behaviour. We realised in the theoretical part of the thesis that many technology capabilities can help firms identify and validate problems and simplify the challenges of solving those problems.

First of all, ecratum did not have an analytics team which could support the tracking data for user behaviour or by providing insights. Information on the past performance of the customers or their behaviour on-site using the platform would have helped the team to make better decisions. Analytics would have been a source of truth, allowing us to generate actionable insights for understanding our users. It would have helped us to translate those insights into decision making about the functionalities we could implement for our users.

The availability of analytics insights would have allowed us to notice that our users were sending the same task to several producers or traders. This would have saved us the time of building the feature correctly and avoided potentially unsatisfied users. ecratum had implemented a tool for tracking how people navigate on the site, however, as there was no analytics team, no one was using the tool to track the navigation and improve the user experience.

ecratum also lacked in-house resources with the required expertise to work on the complexity of the Trader & Producer module. Acquiring external knowledge and innovative ideas would have been helpful to make the development process smoother. Academic findings regarding the technology supporting SRM show that one of the approaches we mentioned was open innovation. There are two ways we could have used an open innovation approach:

1. Using the possibility to acquire external knowledge from experts in the field or even technical support (through outsourcing).
2. Alternatively, as ecratum has a considerable number of suppliers using the platform, we could have asked them to support us with their expertise and generate ideas. The suppliers could have contributed ideas about the efficiency of processes. Acquiring knowledge from existing customers would not only help the Trader & Producer module but any other module or feature development that the company might undertake in the future.

In summary, as a result of a lack understanding of user requirements on the first delivery of the module, ecratum risked losing their key customers. The main issue was not being able to build and deliver what the end-users initially requested. Even though the feature was performing as requested in the second delivery of the module, and the team went the extra mile to build the functionality, it took a lot of time and resources to complete it. Consequently, the development time exceeded the initial planning.

Conducting more research, direct communication with the customers and having data available for insights, would have made the process of understanding the ecratum users more accessible and more efficient. According to the research I conducted in the theoretical part of this thesis, it is also essential to have an IT system in place that supports analytical decision making. Alternatively, outsourcing some parts of the project to experts for better knowledge and technology would improve efficiency.

Conducting sufficient research and having a proper IT system could have saved us time and costs. Additionally, it would have avoided the risk of ecratum losing potential customers. After several iterations, my team and I managed to deliver the feature and successfully retained our customers. The Trader & Producer project can serve ecratum as a lesson for the future, to communicate closely with the users, and to use analytics tools to understand customer needs better and create meaningful insights.

7 CONCLUSION

The supplier relationship is an essential aspect of supplier chain management, and it plays a vital role as a discipline in many aspects of supply chain interaction. Based on the theoretical findings of this thesis, SRM contributes to better business performance, helps suppliers to build stronger and strategic partnerships, creates strategic planning and optimised business processes.

SRM platforms also help businesses to manage all interactions between suppliers and their customers. Interactions include sharing information, exchanging documents, sharing values and risk, and building a healthy relationship. They also facilitate relationships with the third-party organisations who supply goods or services to an organisation. Supporting processes with more than one party involved simplifies the interaction between suppliers and helps them to maximise the value of those interactions. Companies have also seen improvements not only in performance but also in competitive advantage, and service levels, and finally they can attain better customer satisfaction.

We have examined the most valuable elements in creating long-lasting and robust supplier relationships. The main elements contributing to this are trust, transparency and communication, sharing and alignment with the goals and the vision of the interacting companies. Furthermore, like any other business process, SRM implies risk, which it is essential to share between the companies and manage together.

This thesis suggests that SRM adoption provides significant benefits for companies. Those benefits are more likely with the support of different digital tools. The advantages of SRM adoption described in the thesis are cost optimisation, spending efficiency, market innovation, streamlined business processes and better information sharing among suppliers.

According to the papers considered in the thesis, it can be concluded that information technology is a critical element in solving supplier-related issues. Many companies currently implement stand-alone IT systems, without potential combination with other IT capabilities.

This thesis offers an essential insight into the use of IT in SRM. SRM software is sophisticated, and it should not operate in isolation. Technology should be considered as an enabler, and the focus should be stronger when building partnerships. Data must be shared through an open system with the ability to collaborate. Implementing an inter-organisational information system

in alignment with strategy and structure improves performance and optimises business processes in the complex partnerships of the supply chain.

The case study of ecratum is used in the thesis to present the development of a new SRM feature to analyse the complexity of SRM platforms. The features aim to support the documentation and information exchange between the participants of the supply chain, especially when more than two parties are involved in the process (customers, traders and producers).

The case study helped to identify and demonstrate the importance and complexity of SRM platforms and processes. SRM encompasses a complex business process that requires significant effort and research when trying to develop a feature that aims to support relationships between the participants. SRM platforms must also be supported by technological tools that can be used to understand the users and business processes better. Analytics tools are one way of understanding significant factors modifying the relationship between suppliers. Open innovation could also help in acquiring expert knowledge and the use of technology for better performance.

The features described in the case study represent, and are limited to the optimisation of processes in SRM platforms such as documentation and information exchange between the participants. It does not describe the scenarios of other business processes between suppliers supported in SRM platforms which leaves space for future research. Also, while the thesis describes the importance of implementing and using technological tools, it lacks details on consequences or risks of not implementing those tools.

It would be beneficial to research the potential losses due to not using an IT system aligned with strategy when developing an SRM platform. Furthermore, based on my personal research for the thesis there is lack of literature presenting business cases and technology use when more than two parties are involved in a supply chain.

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APPENDICIES

Appendix A: Summary of the Thesis in Slovenian Language

Povzetek magistrskega dela

Namen pričujočega dela je analizirati, kako tehnološki trendi pripomorejo platformam SRM pri ustvarjanju avtomatiziranih postopkov in omogočajo boljši vpogled v dobavitelje. Podatki in informacije, ki jih platforme SRM dajejo na razpolago, ustvarjajo vrednost in sprožajo kakovostnejše strateško odločanje.

Oskrbovalno verigo lahko določimo kot mrežo ljudi, podjetij, virov, postopkov in tehnologij, ki so vključeni v korake proizvodnje in prodaje izdelka. Vključuje postopke od distribucije dobaviteljevih surovin proizvajalcu do postopkov nudenja proizvoda končnemu uporabniku (Stadtler, 2015). SRM je strukturirano poslovno vrednotenje splošne poslovne strategije glede dobaviteljev in njihovih zmožnosti. Določa dejavnosti, ki so zahtevane za interakcijo z dobavitelji, ter ureditev in izvedbo teh dejavnosti na organiziran način (SDI Point of View, 2016).

Magistrsko delo je razdeljeno na dva dela, teoretičnega in praktičnega. V prvem delu natančneje predstavljam SRM, podam definicijo zanj in obravnavam vprašanje, kako platforme SRM pomagajo podjetjem. Prav tako opisujem pomembnost in posledice implementacije platform SRM. V delu preiskujem avtomatizacijo postopkov, ki jo omogoča tehnologija SRM, in vrednost, ki jo ustvarjajo. Analiziram tudi ostala tehnološka orodja, ki vplivajo na zmogljivost SRM, in kako te platforme omogočajo učinkovitejše poslovne procese in globlje razumevanje dobaviteljev. V praktičnem delu obravnavam študijo primera platforme SRM po imenu *ecratum* in razvoj njenega novega modula.

Odnos z dobaviteljem je bistven vidik managementa dobavne verige in igra ključno vlogo v mnogih vidikih interakcije znotraj dobavne verige. Na podlagi teoretičnih spoznanj v tem delu SRM prispeva k boljši poslovni zmogljivosti, pomaga dobaviteljem pri gradnji močnejših in strateških partnerskih odnosov, ustvarja strateško načrtovanje in optimizirane poslovne procese.

Platforme SRM prav tako pomagajo podjetjem z managementom vseh stikov med dobavitelji in strankami. Ti stiki vključujejo deljenje informacij, izmenjavo dokumentov, deljenje vrednosti in tveganja ter razvoj zdravega odnosa. Prav tako olajšujejo odnose s tretjimi organizacijami, ki dobavljajo dobrine ali storitve dani organizaciji. Podporni procesi z več kot enim vpletenim deležnikom poenostavljajo stike med dobavitelji in pomagajo povečati vrednost teh stikov. Podjetja so poleg izboljšav v zmogljivosti zaznale tudi dvig konkurenčne prednosti in ravni storitev, s čimer lahko dosežejo višjo zadovoljstvo strank.

Raziskala sem najpomembnejše elemente v postopku ustvarjanja dolgotrajnih in robustnih odnosov z dobavitelji. Glavni elementi, ki prispevajo k temu, so zaupanje, transparentnost in

komunikacija, deljenje in usklajenost ciljev in vizij podjetij v stiku. Prav tako kot ostali poslovni procesi tudi SRM pomeni tveganje, za katero je ključno, da ga podjetja vzajemno delijo in upravljajo.

V tem delu predpostavljam, da implementacija SRM za podjetje pomeni znatne prednosti. Te prednosti pa se verjetneje oblikujejo s podporo raznih digitalnih orodij. Prednosti implementacije SRM, ki so opisane v tem delu, so optimizacija stroškov, učinkovita poraba sredstev, tržne inovacije, vitki poslovni procesi in boljše deljenje informacij med dobavitelji.

V skladu s članki, ki jih obravnavam v delu, lahko zaključim, da je informacijska tehnologija kritičen element pri reševanju težav, povezanih z dobavitelji. Številna podjetja trenutno implementirajo samostojne sisteme IT brez možnosti povezave z drugimi zmožnostmi IT.

V tem delu dajem ključen vpogled v rabo IT na področju SRM. Programska oprema SRM je sofisticirana in naj ne bi delovala izolirano. Tehnologijo bi morali smatrati za omogočitelja in se bolj osredotočati na snovanje partnerskih odnosov. Podatke je treba deliti preko odprtega sistema z možnostjo sodelovanja. Implementacija medorganizacijskega informacijskega sistema, ki se ravna po strategiji in strukturi, izboljšuje zmogljivost in optimizira poslovne procese v kompleksnih partnerskih odnosih znotraj oskrbovalne verige.

Študijo primera *ecratum* v delu uporabljam v namen predstavitve razvoja nove funkcije SRM za analizo kompleksnosti platform SRM. Cilj funkcij je podpreti izmenjavo dokumentov in informacij med deležniki v oskrbovalni verigi, še posebej ko sta v proces vključeni več kot dve stranki (stranke, trgovci in proizvajalci).

Študija primera je pomagala odkriti in prikazati pomembnost in kompleksnost platform in procesov SRM. SRM obsega kompleksen poslovni proces, ki zahteva znatno prizadevanje in raziskave, če želimo razviti funkcijo za podporo odnosov med deležniki. Platforme SRM potrebujejo podporo tehnoloških orodij, ki izboljšujejo razumevanje uporabnikov in poslovnih procesov. Analitična orodja so en način za razumevanje znatnih dejavnikov, ki spreminjajo odnose med dobavitelji. Tudi odprte inovacije bi lahko pripomogle k pridobivanju strokovnega znanja in uporabi tehnologije za višjo zmogljivost.

Funkcije, opisane v študiji primera, predstavljajo in so omejene na optimizacijo procesov na platformah SRM, kot na primer izmenjava dokumentov in informacij med deležniki. Ne opisujejo scenarijev drugih poslovnih procesov med dobavitelji, ki jih podpirajo platforme SRM, kar pomeni priložnost za prihodnje raziskave. Čeprav v tem delu opisujem pomembnost implementacije in uporabe tehnoloških orodij, manjkajo predvsem podrobnosti o posledicah ali tveganju v primeru, da teh orodij ne implementiramo.

Nadalje sem skozi raziskovalno dejavnost za to delo ugotovila, da je literatura glede poslovnih primerov in rabe tehnologije z več kot dvema deležnikoma, vpletenima v osrkbovalno verigo, pomanjkljiva.