Creating Competitive Advantage for Air Freight Communities Using a Cargo Community System: A Case Study in Amsterdam Schiphol Airport

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Abstract

Airports have become the center hubs of supply chain collaborations. To support the air freight collaborations in airports, Cargo Community Systems (CCSs) was developed. A CCS is not only an enabler but also a challenge for establishing and maintaining collaborations. A proper understanding of how to govern the relationships between companies in the community is needed to achieve a sustainable collaboration. This study presents the development of Amsterdam Schiphol Airport's CCS – Cargonaut. The air freight community in Schiphol Airport has been through two lifecycles of governance. The main differences between the first lifecycle (1981-1995) and the second lifecycle (1996-now) are: (1) Cargonaut's ownership, (2) the cost-sharing structure, and (3) the member's power in the decision making. From Cargonaut's development, we can conclude that the governance of inter-organizational collaboration over time is dynamic. Schiphol community has been successful in creating business value and competitive advantage through the use of Cargonaut system across its supply chain actors.

Keywords

Cargo community system, CCS, governance, collaboration, air freight.

Introduction

Players in air freight collaborations – e.g. freight agents/forwarders, airlines, ground transport companies, customs, integrators, etc – need to coordinate their SC activities to achieve their best performance. Air freight is preferable for goods that have a high value-to-weight ratio and cannot survive a long ocean trip (Christiaanse et al., 1995), as well as are needed in a short time-frame. Airports' position in the air freight – or sometimes referred as air cargo – collaborations goes beyond their basic roles in the physical flow of goods. They have become the center hub of the Supply Chain (SC) collaboration. To support air freight collaborations in airports, Cargo Community Systems (CCSs) have been developed. A CCS is an information system that connects the SC actors in air freight communities; thus integrates the actors' administrative systems and supports the inter-organizational SC activities. IATA in Alt (1997) declared that generally, a CCS has three basic characteristics: (1) an open and neutral system to support (2) automatic forwarding and conversion of standardized airfreight-related information (3) between a large number of participants.

In the studies on inter-organizational collaboration, technology is identified as not only an enabler (Oguz et al. 2018) but also a challenge for establishing and maintaining collaborations. A proper understanding of how to govern the relationships between companies in inter-organizational context is needed to achieve a sustainable collaboration. Pilbeam et al. (2012) showed that there is a strong conceptual and empirical support for links between governance instruments and supply network outcomes. The more effective collaboration structures succeeded because they fitted their environments and were appropriate for their

missions, or they adopted themselves to their contexts (Alexander 1995). Despite advancements in inter-organizational governance model literature (Baudry and Chassagnon 2012; Lowndes and Skelcher 1998; Provan and Kenis 2008), there is a limited number of studies on information-system-enabled inter-organizational collaborations (Markus and Bui 2012).

An air freight collaboration's governance is an urgent factor for every CCS implementation. Thus, this study aims to answer a question: "How does the governance of air freight communities affect the success of the CCSs implementation?". In order to explore the air freight communities, this study will focus on a specific community that is built around an airport. This study aims to present the history and evolution of the governance of Amsterdam Schiphol Airport community's and its CSS – Cargonaut. In this study, we will present that the privatization of Cargonaut to its constituent participants and the other aspects of its governance have led the collaboration to achieve their competitive advantage as one of the largest airports in Europe.

Governance of Inter-organizational Collaboration

Inter-organizational governance is the act of coordinating a collaboration of multiple companies (Markus and Bui 2012; Provan and Kenis 2008). Studies used the term "governance" loosely to address technical governance, organizational structures, coordination mechanism, decision making processes, and other elements in governance, e.g. the lifecycle (Alvarez et al. 2010), the mechanism (Aulakh and Gençtürk 2008), the aspects (Markus and Bui 2012), and the models (Provan and Kenis 2008).

In this study, we are discussing governance as a dynamic concept that is context dependent. A similar study by Chandra and van Hillegersberg (2018) has been done in a port collaboration supported by a Port Community System. In a collaboration context, governance is the coordination strategy to ensure that the companies work together to reach the collaboration's goal. Supported by a CCS as its fundamental technology asset, an air freight collaboration will more likely to adopt hierarchical and formal governance models to coordinate the complexity of information system (Gulati and Singh 1998; Markus and Bui 2012). Moreover, the interdependence between companies in the community and their goal consensus are high. Both factors have been identified as key predictors of a hierarchical governance model (Gulati and Singh 1998; Provan and Kenis 2008).

Since the collaboration and its environment are changing over time, the governance needs to be adapted to the changes. There are 4 phases in the lifecycles of inter-organizational collaborations, adapted from Lowndes and Skelcher (1998): (1) Pre-partnership collaboration, (2) Partnership creation and consolidation, (3) Partnership program delivery, and (4) Partnership termination or succession.

The pre-partnership collaboration phase begins when one or more initiators decides to dedicate its resources – e.g. finance, human resources, and network – to develop a collaboration of organizations. The initiators will invite other organizations to collaborate and join the collaboration eventually. In order to gain the interest and trust of these companies, the initiators should be able to communicate the benefits and costs of joining the collaborations. Both kinds of informal and formal mechanisms can be used to reinforce the collaboration (Alvarez et al. 2010). Later, the trust and power distribution between the companies affects the type of collaborations that will be created.

After the collaborations are established in the partnership creation and consolidation phase, a flat or hierarchical structure is implemented. The structure is highly affected by trust, power distribution, and formal agreements that are built up during the prior phase. Depending on the structure, the collaborations can choose to intensify the formal or informal, or both, mechanisms in coordinating its members. In this phase, the collaborations are preparing the services and systems that will be delivered in the next phase. The success of collaborations in this phase depends on the members' willingness to financially contribute to the set up as well as the willingness to exchange their information with other partners (Srour et al. 2008).

At the beginning of the partnership program delivery phase, the members in collaborations start to use the systems. The system providers, such as a CCS operator, can request members to pay fees that are mainly meant to cover the development and maintenance expenses (Carlan et al. 2016). During this phase, companies may join and exit the collaborations. The systems and services may also be developed to accommodate the technology opportunity and the collaborations' requirements. Thus, collaborations are changing over time. To support this development, minor changes in the governance may be implemented.

Partnership termination or succession is the last phase in a lifecycle. In this phase, the collaborations are assessed. The result of this evaluation could be to terminate or continue the collaboration with a different governance arrangement – which leads the collaborations into the next lifecycle.

Research Methodology

This study adopted a single longitudinal case study method. Other empirical studies on inter-organizational systems, such as Rodon et al. (2007), have emphasized the importance of in-depth longitudinal study in this area. The case study method is selected because the implementation of a CCS in a collaboration is a unique case that is dependent on the collaboration's characteristics and environment. Moreover, air freight collaborations that are based on CCS are still limited in number. The collaborations are dynamic and complex systems in which a longitudinal case study could provide in-deep understanding. Data used in this study is a combination of an interview with the Chief Executive Officer (CEO) at Cargonaut and secondary data collected by reviewing reports, studies, as well as industry magazines and journals.

Cargonaut

Cargonaut's history and evolution is divided into two periods. In the first period of Cargonaut, Cargonaut Holding B.V. was fully owned by the Schiphol Airport Authority. Later, this ownership became shared with other companies in Schiphol's community.

Full Ownership of Schiphol Group

In 1920 Schiphol was transformed into a civil airport (Royal Schiphol Group 2019). Schiphol Airport is located in the Netherlands and is owned and operated by Royal Schiphol Group (N.V. Luchthaven Schiphol) that was established in 1958 (Bloomberg 2019). The majority stakeholder of Schiphol Group is the Dutch government, while the rest of the ownership is shared by the municipality of Amsterdam and the municipality of Rotterdam; In 2008 the Groupe ADP (Aéroports de Paris) - Air France's hub operator – invested and joined the ownership (Royal Schiphol Group 2018a).

The pre-partnership collaboration phase – A collaboration was prepared between Schiphol Group (the Schiphol Airport Authority), the Dutch national airline – KLM, the freight forwarders, and the professional association of freight forwarders (Dac 1996). The preparation studies dated back to 1981 and feasibility studies were executed between 1983 and 1985 (Dac 1996).

The partnership creation and consolidation phase – Cargonaut Holding B.V. was established on the 31st of December 1985 in the Netherlands (LexisNexis 2019) as an independent CCS operator. Despite Schiphol Group's intention to maintain its neutrality, the authority was the most important initiator, and later on, it's the sole owner of the company (Dac 1996; Nieuwsblad Transport 1995c). The main purpose of Cargonaut was providing an EDI infrastructure and an automation of some of their activities and information exchange (Dac 1996) in order to speed up the ground handling process, lower the number of documents in the international transport, and improve the communication and the quality of information between all parties involved (Christiaanse et al. 1995).

The partnership program delivery phase – In the 1980s, Cargonaut 1.0 was released. When Cargonaut's first software, Piconaut, came into operation in 1988, 15 companies participated as members (Dac 1996). In the beginning, Piconaut only supported the airlines' reservations and status information (Rouss 2016). Due to this limited service, the adoption of Cargonaut 1.0 was relatively slow. The adoption improved when Piconaut connected to Sagitta– the automated dutch customs system – for import declaration in 1989 (Dac 1996). Later in 1990s Cargonaut accounted for several successful developments, for examples are extended services for the air freight community in Schiphol Airport, as well as the connections to other CCSs, Traxon, and Sagitta-Export.

The introduction of Sagitta-Export in 1994 (Nieuwsblad Transport 1993; Nieuwsblad Transport 1994) increased the importance of the customs process in Cargonaut. In June 1995 Piconaut was replaced by an integrated package for import and export – CargoMate, developed by Westlake Systems (Cargonaut 2016c; Nieuwsblad Transport 1994).

Cargonaut's operational funding was generated from the members, including: (1) one time payment: communication module and adapter, air transport messages, customs messages, (optional) module for printing the Single Administrative Document; (2) pay-per-use payment: renting an electronic mailbox per month, transmission cost per message (Dac 1996). Besides, Cargonaut was also commissioned to provide tailor-made solutions for the members of Schiphol air freight community (Nieuwsblad Transport 1996).

In 1995, the number of members increased to 120 companies; They produced more than 1.3 million electronic transactions – increased by 21% from 1994 (Nieuwsblad Transport 1995a). However, Cargonaut had not been as successful as it was expected to be (Christiaanse et al. 1995). Cargonaut's finance was in the red for the first time in 1995 (Nieuwsblad Transport 1996).

The partnership succession phase – In 1995, Cargonaut entered the partnership succession phase of the first lifecycle initiated by Schiphol Group. During this phase, Cargonaut had been developing and delivering its services as per usual. In 1995, the first air freight trucker – Jan de Rijk – connected to Cargonaut through an e-mail services (Nieuwsblad Transport 1995b).

Shared Ownership

The pre-partnership collaboration phase – This phase was indicated by the negotiation on the transfer of shares. The negotiation had taken less than a year and by the end of 1995, a transfer agreement of 58% of the shares was reached (Nieuwsblad Transport 1995a).

The partnership creation and consolidation phase – 60% of Cargonaut's shares were in the hands of nineteen companies by the 1st January 1996; Those companies are KLM and Martinair (12.5%), three handlers (19%), thirteen air freight forwarders (28.5%) and Westlake (Nieuwsblad Transport 1996). After the transfer agreement, Cargonaut recorded a modest profit (Nieuwsblad Transport 1996).

"The decisions for participation, however, are not based on the dividends, but the fact that everyone agrees that Cargonaut supports the Schiphol airfreight sector", Cargonaut's Director (Nieuwsblad Transport 1996). This commitment based on the value that Cargonaut delivers was emphasized by the CEO during our interview, "We have never paid dividends to our shareholders in our history. It has always been re-invest to the market." Thus, Cargonaut is a non-profit organization. Later, the shareholders' composition slightly changed over time. Some benefits for the community to be involved as the shareholders are: the Cargonaut system's value in supporting their SC activities, the opportunity to be the first to make use of a certain innovation, and the influence in the decision-making processes.

The partnership program delivery phase – In 1996 the system was updated to Cargonaut 2.0. In the same year, the Cargonaut system was linked to the Internet (Nieuwsblad Transport 1996). During the second governance lifecycle, the challenge was shifted from technology to commerce in order to capture clients and prospects (Rouss 2016). The opinions regarding Cargonaut's success were mixed, between players who were pleased and unsatisfied (Nieuwsblad Transport 1997). In the beginning, the international connection of the CCSs and the attempts to get more shippers on Cargonaut were not a great success (Nieuwsblad Transport 1996). The main problem of Cargonaut and almost all CCSs was the structure of and trends in the air freight sector (Nieuwsblad Transport 1997); e.g. complex information flows, benefits from a lack of information (for example was benefit for freight forwarders), and the adoption of the Internet that could distrub Cargonaut's main service as an intermediary between incompatible systems (Nieuwsblad Transport 1997).

To support its activities, Cargonaut established several legal entities. In September 1996, Cargonaut B.V. was established as a subsidiary of Cargonaut Holding B.V. (LexisNexis 2019). In addition, there are other companies of which Cargonaut Holding B.V. is the owner: Cargonaut Nederland B.V., Cargonaut IP B.V., Cargonaut International B.V. (LexisNexis, 2019). "Although we have three legal entities, we operate as one organization", Cargonaut's CEO. In 2011, a European community trademark registration was filed for Cargonaut by Cargonaut Holding B.V. (Trademarkia 2019).

According to Cargonaut's CEO, by the end of 1990s Cargonaut evolved from processing EDI transactions to providing the critical integrated system, "We went from EDI messaging from A to B to more and more integrated message brokering, and we have been more and more a logistic solution provider for the industry chain". In 2014, Cargonaut 4.0 was introduced based on input from its users and stakeholders (CargoHub Magazine 2014). Cargonaut had been greatly expanded to manage and speed up all the processes involved

in the import and export of goods through Schiphol (Air Cargo World 2016). This development was the result of Cargonaut's innovations and influenced by the trend in the Schiphol air freight community.

In 2016, approximately US$2.17 (€2) million was invested in the Cargonaut platform; Half of the funding came from the TopSector Logistics – an government and industry funded organization that seeks to promote advanced logistics practices in the Netherlands –, while the remainder was provided by Dutch customs, Logius, ACN (Air cargo industry association), Schiphol Group and Cargonaut (Air Cargo News 2016a; Air Cargo World 2016; Buxbaum 2016). Nowadays, Cargonaut's services for the air freight community are categorized into 6 groups: Customs Compliance, eFreight, Ready for Carriage, Security Compliance, Connectivity, and Track and Trace (Cargonaut 2016b).

Other significant developments of Cargonaut – European Green Fast Lane – were also initiated in 2016 (Dijkhuizen 2018). The project aims to improve KLM Cargo's truck supply lanes and is part of the Smart Cargo Mainport Program, which aims to find innovative schemes to improve cargo flow through Amsterdam, underpinned by transparent data exchange (Air Cargo News 2017a). The project succeeded. Philip Roodenburg at Swissport says "The key to success lies in a different way of working together: instead of telling each other 'you have to do this, and you have to do that' we have looked with a helicopter view of how we can jointly organize the process efficiently and predictably" (Royal Schiphol Group 2018b).

Until now, Cargonaut has been serving Schiphol air freight community with the integrated system and its innovation. In 2016, the Maritime Single Window had already been started and is the first step in the Single Window Trade and Transport (SWHT); The SWHT aims to be the digital government window for exchange of data in the commerce and transport sector in 2020 (Cargonaut 2016a). In 2016, Cargonaut introduced a new timetable as the first step in setting up a cloud platform that makes the re-use of data between the cooperating parties possible (Cargonaut 2016d). In 2017, Cargonaut developed an early warning system for pharma shippers; The fund came from the Netherlands Organization for Scientific Research and TKI Dinalog – the Dutch Institute for Advanced Logistics (Air Cargo News 2017b). In 2018, Cargonaut supported Schiphol Airport in linking the airport's CCS with Mumbai Airport's CCS (Air Cargo News 2018).

During Cargonaut's time of service, its shareholders and members have always been involved in the decision making to decide on the direction of Cargonaut's development. "Ideas may come from individual customers or the airport operators. Then we have the rules and regulation changing. We come with suggested solutions. Depending on the subjects, forwarder chambers, airlines chambers, are involved" Cargonaut's CEO. "Because we didn't just want to implement changes to the system, we chose to consult a cross-section of our client list in combination with internal deliberation. Furthermore, we have met with external parties like ACN, FENEX, and EVO", Cargonaut's General Manager (Cargonaut 2014). The role of ACN was also emphasized by Cargonaut's CEO, "ACN played an important role because they are in which players negotiate of what the local rules should be. So, once they signed it off then we know what solution to make. They are decision making role playing. We make the solution. Together we come up with industry solution." ACN members represent Cargonaut's customers. For every solution, Cargonaut always focuses on developing an industry-wide solution. "For solutions we can think of, we always look if they feasible, scalable, and if they can be of general use to the community", Cargonaut's CEO.

Since Cargonaut's early development, the system has implemented detailed data governance, using contracts and NDAs (Non-Disclosure Agreement). "Data ownership is a big thing. We have your information, but we will never abuse it and you are in full control of your information.", (Cargonaut's CEO). The Cargonaut system makes sure that the access to members' data is under the control of each member. "We register each participant and agree on what can and cannot be requested. That is also checked.", Cargonaut's Director (Nieuwsblad Transport 1996). Every member is clearly informed that the Dutch customs has access to all information in the Schiphol's CCS (Meijer 2007). The data governance is also implemented in the Cargonaut's connection with other CCSs. For example, in the shared interface between Cargonaut's and Kale Logistics Solutions' CCSs to support Schiphol Airport's link to Mumbai Airport, India, participants of the network will be in full control of their data at any time (Air Cargo News 2018).

Cargonaut supports the operational cargo processes, and provide knowledge and intelligence and analytics capability to management and decision makers based on the industry benchmark. For the operational services, Cargonaut charged a certain amount of fees to its members. In 2013, a research into the use of eLink at Schiphol concluded that the costs and requisites to implement the system need to be communicated more clearly by Cargonaut to potential users (Douven 2013). In 2014, based on 'fair use

policy', Cargonaut offered different bundles for its various customer groups (Cargonaut 2014). "We are going to do bundles that consist of subscriptions and based on the number of messages. The subscription becomes much easier.", Cargonaut's CEO.

The new cost structure consisted of (Cargonaut 2014; Cargonaut 2016b):

> (1) basic infrastructure, i.e. connection and use of the CCS platform
> (2) community applications, i.e. ECS, eCargo Receipt, eAWB, eLink Basic
> (3) specific players' applications, e.g. forwarders will get Declarations Import, Export, Transit, NVWA, and Submission House Airwaybill information
> (4) data transfer (per month), and
> (5) customized applications – the 'add-ons'

The billing is done per month, but each member signs a contract with Cargonaut for a longer period. In addition, Cargonaut also charges the customers fees for advising/consultancy, training, and implementation services. Other possible revenues stream is from the information, e.g. big data, processing in supporting the companies' management to get an insight into the air freight community.

Besides funding the operational activities, the revenue also pays for Cargonaut's development. According to Cargonat's CEO, Cargonaut's expenditure is focused on investment and research cost, "Three types of investments: IT quality investment, market investment, organizational development investment. And there is research cost." "It has been a very informal organization. And we do not need to be formal all of the sudden, but we need to be able to work according to certain procedures to be able to deal with the growth"

Nowadays, Cargonaut offers solutions for all SC-player categories. Concurrently, Cargonaut is also orchestrating the information standard in the Schiphol air freight community. "Our core processes are twofold. First is solution development, more of an innovation and initiator role. We (also) have our role in orchestrating the information components. We don't own the processes and infrastructure", (Cargonaut's CEO). Aiming to support the competitive advantages of Schiphol air freight community, the Cargonaut system has been intertwined with various SC activities and becomes a critical system for its members. "If Cargonaut stops, the cargo handling here stops. We have become a critical part of other companies", (Cargonaut's CEO).

The success of Cargonaut has been proven since its shift from focusing on EDI messages to developing an integrated system. Cargonaut takes care of handling of 98% of logistics information flows at Schiphol Airport and is the largest provider of messages to Customs in the Netherlands (Arendsen et al. 2004). In 2016, Amsterdam Airport Schiphol received awards from IATA - Air Cargo Excellence Award: 'Best Major European Airport' (Royal Schiphol Group 2019). In 2017, Amsterdam Airport Schiphol served 1.75 million tonnes of cargo (Royal Schiphol Group 2018a). These achievements proved that Cargonaut has delivered Schiphol to be a major port in the air freight industry. "It is not our role to improve someone's company. It is our role to improve Schiphol as the main port.", Cargonaut's CEO

Discussion

The air freight community in Schiphol Airport has been through two lifecycles of governance (Figure 1). During these periods the CCS has been developed and evolved from Cargonaut 1.0 to Cargonaut 4.0.

The first lifecycle is started as early as 1981 when the preparation study to implement CCS was executed in Schiphol. In the first lifecycle, Schiphol Group was the only owner of Cargonaut. It means that Schiphol Group maintained Cargonaut's neutrality. This neutrality was mainly supported by the ownership of Schiphol Group itself, which was basically publicly owned (Dutch government and two other municipalities). However, this governance arrangement was terminated in 1995 when Cargonaut was in red. The community decided that the reason for the loss was the lack of member-participation. Thus, the last partnership succession phase in this lifecycle led Cargonaut to the next lifecycle.

In the second lifecycle, the governance arrangement was changed. Cargonaut's ownership is shared between Schiphol Group and other companies in Schiphol community. In addition, all customers of Cargonaut are sharing the cost to develop and maintain the CCS platform. The customers also have the power to decide on Cargonaut's development through ACN as their representative.
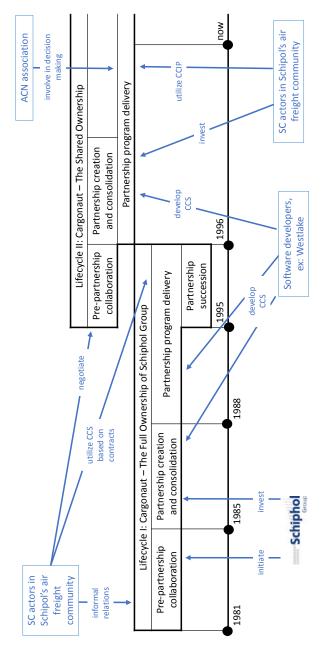
Figure 1. Governance lifecycle of Schiphol Airport Air Cargo Community

The ownership structure and the established governance mechanisms of Cargonaut on both lifecycles show that Schiphol air freight community adopts a formalized governance model. This finding supports the previous studies (Gulati and Singh 1998; Markus and Bui 2012) which argue that the complexity of information system, the high interdependence between companies, and the high goal consensus are key predictors for a formalized governance.

However, it is apparent that the formalized ownership structure in the first lifecycle was not suitable for the Schiphol community later on. In the first lifecycle, the collaboration established a top-down governance approach. The collaboration hub, Schiphol Group, invested in Cargonaut because the collaboration did not have any experience with a CCS beforehand. In this lifecycle, Schiphol Group took the risk to introduce the concept of CCS and its benefits to the community. After the community gets used to the Cargonaut system and the collaboration built on top of the CCS in the second lifecycle, a bottom-up governance approach was established. The privatization of Cargonaut gave more power in decision making to the members in exchange for financial investment and participation.

The change of governance in the second lifecycle was established without affecting the CCS service. Since Cargonaut was delivering its services continuously, in the first lifecycle the partnership succession phase occurred in the same time with the first partnership program delivery phase, and in the second lifecycle, the second partnership program delivery phase occurred in the same time with the partnership creation and consolidation phase.

Nowadays, Schiphol air freight community has turned into a successful collaboration. Using Cargonaut's CCS to support its SC activities, Schiphol has become one of the best air cargo airports in Europe. An important advantage of Cargonaut compared to other CCSs is the Cargonaut's focus on both B2B and B2G communication, instead of on only one of these two types of communication (Meijer 2007). According to many forwarders, the biggest advantage is the insight into the SC processes based on transparent, fast, secure, and quality guaranteed information; This benefit is more valuable than the 20-25% reduction in lead-time and the paperless approach (Douven 2013). One of Schiphol's competitive advantages, is the transparent and fast information flow between the air freight players in the Cargonaut system. It is represented in the three pillars of Cargonaut's values, which are 'doorzien' (transparent), 'doordacht' (throughout) and 'door data' (by data) (Reggs 2018). This success was greatly affected by the governance of the collaboration.

Cargonaut development is still ongoing. Air freight industry is affected by the changes in the global supply chain. For example, there is a shift from bigger imports to smaller imports, which is a part of a wider trend – e-commerce is growing at the expense of traditional commerce, small shops and businesses growing while large ones struggle. "There are more small packages, but also smaller players," Cargo Director of Amsterdam Airport Schiphol (Air Cargo News 2016b). Thus, we are also expecting a continuous improvement on the Schiphol collaboration's governance.

Conclusion

The case of Amsterdam Schiphol air freight community shows that the established inter-organizational governance is dynamic. The community has been through two lifecycles of governance. The main differences between the first lifecycle (1981-1995) and the second lifecycle (1996-now) are: (1) Cargonaut's ownership, (2) the cost-sharing structure, and (3) the member's power in the decision making. The changes in the governance arrangement indicate that implementing Cargonaut's CCS was only the first step in creating competitive advantage for the community. Later on, the implementation needs to be supported by a set of governance mechanisms and structure that is suitable for the relevant situation.

This study presents a CCS implementation case, which is popular in the air freight industry but still few in numbers. Our main contribution will be in supporting the supply chain management field – especially the air freight management – which has been acknowledged in practice and academic world (Ellram and Cooper 2014). The lesson learned from this case will enrich the-state-of-the-art knowledge on the governance of inter-organizational collaborations.

The managerial implication of this study is eloquently summarized by the Cargonaut's CEO during our interview "You can buy the technology, but it will be of no use. Because first you have to have a good collaboration model and then you can apply the technology. If you don't have the collaboration model and you don't have the ability to act and decide as a community, technology is worthless." Moreover, this study will not only benefit large companies in the air freight industry but also SMEs and startups in joining or establishing supply chain collaborations by giving access to inter-organizational governance state-of-the-art knowledge.

This study is limited to one case study. In the future, a cross-case analysis with a similar study, such as Chandra and van Hillegersberg (2018), will be conducted. Using different points of view in defining inter-organizational governance in different collaboration contexts, we expect that there will be similarities and differences between the cases. The enriched analysis will lead to a more robust understanding of inter-organizational governance dynamic.

Acknowledgements

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