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Unleashing the IT potential in the complex digital business ecosystem of international trade: The case of fresh fruit import to European Union

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Abstract

The digital ecosystem for import of goods in international trade is analyzed, in-efficiencies are identified and their possible causes are revealed. The business ecosystem is rather complex and interlocked with many actors and various rules and regulations. It is supported by a digital business infrastructure, which however is very disjointed. The communication of information among the actors involves many disconnected information systems and manual processes, which introduce delays and lower data quality. This has severe consequences in the shape and form of increased lead-time, which our case analysis of import of fresh fruit reveals is critical for the quality of the fruit. However, the coordination is difficult since information is stored in isolated information systems and only shared among few actors. The IT potential in the digital business ecosystem could be unleashed by using a state of the art integrated information infrastructure to exchange information between the actors and their information systems in real time. This potentially could ameliorate the complexity of business ecosystem and thereby be a foundation for improvements of the business processes for all import to EU including of course fruit.

Keywords: Digital business ecosystem, International trade, Information infrastructure

1 Introduction

The business ecosystem for import of goods into the EU should be quite simple with importer, exporter, authorities and service providers but in reality, the ecosystem is extremely complex. The more one explore about it, the more surprised one gets that it works, or at least works to some extent. This research contributes to identifying and understanding the complex business ecosystem especially through focusing on IT systems and digital infrastructures. The paper proposes digital strategies for potential improvements.

The case selected for this research is import of fresh fruit in containers by sea to European Union via the port of Rotterdam. A majority of the containerized international trade to the EU is via the port of Rotterdam, which is the largest port in Europe measured in volume. The case study focuses on the crossing of the border to the importing country. More specifically it focuses on that part of the supply chain from the time, when the refrigerated container with fresh fruit is unloaded from the container ship into customs territory ship and until it's allowed to leave the customs territory and be transported e.g. to the warehouse of the importer. Importers in general see the border as a huge barrier for the trade and their challenge is to lower the barriers for their goods.

As a consequence of the complexity, the lead time from the container is at the quay and until it arrives in the warehouse of the importer is often very long. Additional there is a large unpredictable variation in the lead-time. For importers of fresh goods the lead-time and its unpredictable variation add to the importers risk, and it can easily result in a reduced profit or even end in loss. This uncertainty and the related risk make it difficult especially for small and medium sized importers to maintain a stable and profitable business (WEF 2013).

It is estimated that 40% of the delays in the lead-time of supply chains for international trade in the large ports is caused by administrative burden imposed by authorities. The cost of crossing borders is relatively high adding 0.53% on the importers purchase price of the goods (Anderson and Van Wincoop 2004). In total the annual world-wide extra costs due to administrative burdens of crossing borders are estimated in the range 100-500 Billion US$.

The question addressed in this research is twofold:
1. What is the situation of the current digital business ecosystem for import to EU of fresh fruit and what are the critical issues?
2. Which digital strategies might be pursued to increase the efficiency and effectiveness of the business ecosystem?

The rest of the paper is structured with a theoretical framing, a description of the methodology applied, an analysis of the business ecosystem for fruit, and finally suggestions for possible digital strategies for unleashing the potential and thereby improving the efficiency and effectiveness of the ecosystem importing fresh fruit into the EU.

2 Theoretical Framing

The business ecosystem of international trade, where companies have to send approx. 10 documents per container to various border inspection agencies for import, has been transformed in the last two decades from being almost exclusively paper based to becoming more and more a digital business ecosystem.

Since the early 90's the collaboration in the digital business ecosystem among organizations using electronic communication has primarily been and is still based on electronic data interchange (EDI). This was originally researched and referred to as Inter-Organizational Systems (IOS) e.g. (Krcmar, Barent et al. 1995) and more recently as Information Infrastructure (II) e.g. (Hanseth and Lyytinen 2010). In most cases, IOS have a positive effect on organizational performance, since IOS is shifting transactions from condition of organizational hierarchies to condition of markets by lowering external coordination or transaction costs (Robey, Im et al. 2008). Many early IOS were characterized by high asset specificity; more recently IOS are starting to use open standards lowering the asset investment. Some IOS research shifts the focus away from proprietary investments in technology and toward dimensions like social and procedural interdependence (Wareham 2003). In any case, the power balance and the trust between the partners involved in IOS seem to be critical factors in the adaption and use of EDI (Hart and Saunders 1997). There seems to be a duality between evolution of infrastructures and the standards by which they influence each other providing a potential to evolve both (Hanseth and Braa 1999). Relationships characterized by thrust and joint problem solving result in high degree of EDI use (Robey, Im et al. 2008). Accordingly, the traditional view based on the simple assumption that firms choose between hierarchical governance and market governance, has been criticized based on the arguments that they rather employ coordination strategies encompassing multi-layer relationships with multiple partners (Klein 1995). The traditional view on design of IS and IOS is not well suited for the II area, e.g. architectural design is not applicable since II is never built from scratch but always evolve based on existing infrastructure (Henningsson and Hanseth 2011).

Improving collaboration for international trade and the implementation of eCustoms solutions have been analyzed e.g. regarding (1) the e-customs solution TradeNet, which was successfully introduced in Singapore in the late 1980s (King and Konsynski 1990), (2) the less successful TradeLink in Hong Kong (King and Konsynski 1990), (3) the benefits of increased use of EDI for collaboration (Damsgaard and Lyytinen 1998), (4) the streamlining of the Danish eExport for the cross-border taxation (Bjørn-Andersen et al., 2007), (5) the ITAIDE research program recommending an implementation framework for e-Customs addressing trade facilitation (Henningsson, Budel et al. 2011), and (6) the costly and mixed experience of the ever evolving European e-Customs (Henningsson and Henriksen 2011).

The research regarding information systems traditionally focuses on IT in well-bounded organizational contexts in a single organization (Sidorova, Evangelopoulos et al. 2008). As companies evolve and become more digitalized, new generative dynamics emerge, affecting the ecosystem (Brynjolfsson and Saunders 2009). Most organizations have optimized their own dataflow, a few have integrated and attempted optimization with their immediate network

partners / actors, but there have only been very rudimentary attempts at optimizing the full dataflow in the total value network through digitalization. A review of state-of-the-art research revealed that there is limited research regarding how to manage and govern the information in infrastructures outside the well-bounded organizational contexts (Robey, Im et al. 2008) & (Tilson, Lyytinen et al. 2010).

This case study builds on the above contributions and adds knowledge to these in two ways. Firstly, it reveals and extends current insights into how digital business ecosystem consisting of non-integrated information systems and the use of multiple communication channels cause costly delays and increased security risks in the containerized supply chain for international trade import to the European Union. Secondly, the paper provides a number of suggestions for improvements in the digital business ecosystem of international trade.

3 Research Methods

The main reason for choosing case study as the method is that the supply chain for international trade is extremely complex and largely unexplored. There are simply very few detailed studies of what really happens. With a case study method it is possible to investigate a contemporary phenomenon in depth and within its real-life context (Yin 2009). An in-depth understanding of the details is needed in order to understand the complexity and the issues causing the costly long lead times and the variations in lead times. The case study it here defined as an empirical inquiry that potentially can help to explain presumed causal links in real-life interventions that are too complex for the survey or experimental research methods (Flyvbjerg 2006).

Even just the limited part of the eco-system investigated here from quay to warehouse is rather complex and have many more important variables than the possible data points. Nevertheless, it provides insight into the complexity, which must be addressed in order to bring down the costs of international trade. The part of the eco-system with the highest variation in lead time (and accordingly the part that causes the highest risks/costs) is from the moment where the container arrives in the port of Rotterdam and until it is stored at the warehouse of the importer inside the EU.

Data collection was predicated on the principle of relying on multiple sources of evidence with an additional data converge (Yin 2009). It was done in Rotterdam collecting data from five different types of stakeholders as described in detail in Appendix. One focus group was conducted with three government representatives and three representatives of the shipping line. Furthermore, separate interviews with two importers and three representatives of the harbor terminal were conducted. Even though there are several hundred importers of fruit and vegetables in the Netherlands, we believe that the ten importers selected for focus group sessions, interviews and visits are representative for the fruit importers. The triangulation was deemed successful, since about half way through the data collection, we found that the same issues kept coming up from the respondents. This strongly suggests that the selection was representative as regards the situation for small medium sized enterprises (SME) importing fresh fruit in refrigerated containers from other continents to the European Union (EU) via the port of Rotterdam.

In the sections following, we have added in parentheses the name of the informants who have supported the analysis in interviews and/or focus groups.

We suggest that the overall results of the case study are rather robust meeting the guidelines suggested in literature (Herriott and Firestone 1983). Accordingly, we believe that the research results will be rather generally applicable, but this will need to be verified in a later follow up of the research in other ports

Previous research focuses primarily on the perspective of one actor (e.g. one authority like customs agency, exporters, or freight forwarders,) and its communication with the other actors. However, there is almost no research, which explicit incorporates the point of view of importers. This is surprising since the importers are the ones who drive the import, run the risks, and cover the trade cost including cost of getting acceptance from the authorities like custom and evoking the efforts of the service providers involved in moving the containers. Importers are the ultimate customers of the process we are looking at. This case study complements the existing research by focusing on (1) the importers of fruit to EU via the port of Rotterdam rather than any of the other actors and (2) by applying a multi-actor perspective.

4 Analysis of business ecosystem

The importers of fruit report three set of problems hampering effective supply chains, long lead times, substantial variation in lead times, and unpredictability lead times. Interviews with the importers of fruit indicate that lead times may vary from 1 day to 3 days and even increasing up to 5 days over weekends.

In order to understand the possible causes for long, unpredictable and variable lead times, we will in the following first explore the business ecosystem with the roles of the actors and the flow in the supply chain. Secondly the digital business ecosystem will be explored using the data collected as well as the available documents, information, systems and the related communication. Finally the issues and possible causes will be listed.

4.1 Actors in the business ecosystem

The business ecosystem for international trade involves up to 30 different actors, which might be classified as importer, exporter, authorities and service providers. The main activities are: buy, transport and pay for the goods. We will only focus on the transport and only the part from quay at destination to the warehouse of the importer.

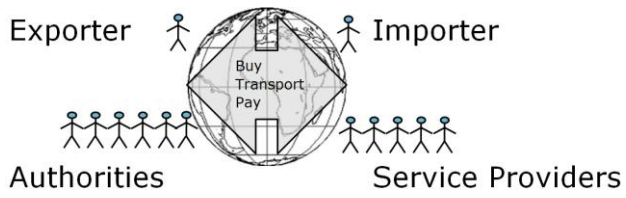

Figure 1: The main roles of the actors in the ecosystem for international trade[1]

[1] Adapted from UN/CEFACT, 2001

The importers are typical international traders that buy goods from vendors in other countries and enter into agreements with different service providers on how the goods are transported safe and secure between the countries from the exporter' to the importer' warehouse. The number of service providers varies but typically includes freight forwarders, shipping line, terminal operators, inland transporters (road, barge or rail), banks, and specialized agents for declaration and inspections.

Countries protect their territory at the border through different types of regulations, inspections (e.g. food and product safety) and control of the imported goods. Seen from the point of view of importers, these represent a number of barriers (focus group of importers). Additional barriers are related to currency, communication, language, etc. Passing the barriers takes time and even worse, the time it takes vary substantially (Frugiventa).

In the case of fresh fruit import to EU via the port of Rotterdam at least the following authorities are typically involved: the customs (collection of tariffs, etc. and security), the phytosanitary authorities (plant inspection), the health authorities (human health),the veterinary authorities (disease prevention), and the scanning inspection (detect smuggling). Of course the authorities are more suspicious on some imports than other e.g. when import is fruit from countries known for growing narcotics, e.g. Colombia. The authorities demand certain documentation e.g. certificates and specific information in predefined forms, demand certain inspections including physical inspection of container and / or goods and in some cases taking samples of the goods.

To handle the requests by authorities, the importer use specialized service providers to move the container with special equipment like straddle carrier and truck, to coordinate and arrange the logistics, to assist with fulfilling the requirements from the authorities in an efficient manner, and to authorize inspection on behalf of the authorities. The service providers charge a fee to the importer for the service. In total the number of actors can easily exceed 15, and in some instances, there are up to 30 actors (Frugiventa) . Obviously, the ecosystem for international trade gets more complex.

4.2 The digital business ecosystem

For the importer there is certain information that is crucial in order to have the goods pass the border and to coordinate the logistic activities. There are about ten key chunks of information per container (interviews with fruit importers) that the importer typically keeps track of e.g. filled declaration, certificates, expected arrival time, promised deliveries to customers, etc. The importer often keeps this information in a spread sheet or in various information systems. The following analysis is primarily based on the interviews with two importers and the focus group in FrugiVenta.

Among the actors involved in the eco-system, different types of information are communicated to coordinate and plan the activities. There are some formal documents e.g. Bill of Lading (B/L), declarations, certificates, movement forms. The B/L is issued by the sea carrier, and formally handed over to the shipper (often it is in practice received by the shipper' logistic service provider or freight forwarder on behalf of the shipper). The B/L primarily specifies the

receiver of the goods and / or the goods in the container(s). Subsequently the B/L is then send to the receiver of the goods, who will present the B/L to the sea carrier in the port of destination to receive the goods (often this is done by the receiver' logistic service provider). There are various alternative ways for the operation e.g. where the shipper allow the goods to be received or picked up by an appointed person (often the logistic service provider on behalf of the receiver) without presenting the B/L, but instead identifying themselves as representative for the receiver. The declarations and certificates are specialized documents stating for the authorities the goods intended to cross the border.

Important information for the logistic planning is the estimated time of arrival (ETA) which is communicated publicly by the shipping line along with estimated time of departure (ETD) when the container ship is leaving port again. Once this is known, the terminal operator will typically set the ETA of the individual container as the estimated time of departure for the vessel since then all containers are unloaded, and therefore neither the shipping line or the terminal operator do know when the individual container will be unloaded. When the container is stacked for storage within the terminal area this is used as the actual time of arrival (ATA) for the container by the terminal operator and communicated to the authorities and the logistic service provider via the port Information system for the community of operators in the port of Rotterdam. The importers want to get the fresh fruit to their warehouse, and they do not use the given ETA per container since they know the container will be unloaded long before the given ETA. The importers report that they, when the vessel is reported to be at the quay in the port, will constantly check if the ATA has been updated and immediately after they register the arrival of the container, they will order the trucking company to pick up the container.

Prior to arrival the ship will file an advance manifest about intended unloads, based on this information matched with declarations from importers and potential other information. The authorities in the port of destination will decide which containers are selected for certain types of inspection and for scanning. This is also communicated via the port Information system. Some importers have access to the port Information system, but for other importers the logistic service provider will inform them via e-mail. This is done by copy from the port Information system in a spread sheet, which is e-mailed to a service provider in India that will generate the relevant e-mails to the shippers. If that is an importer, this process typically takes one day. If the container is not selected for inspection or scan, then the importers can order a trucking company to pick up the specific container. The actor that filled the declaration to the authorities are the declarant and it can be the importer or on his behalf a logistic service provider or a specialized service provider who perform the handling of declarations. The declarant will receive "permission to remove" the declared goods from the authorities with an associated IMA number. This message needs to be forwarded / communicated to the terminal operator prior to picking up the container, if the logistic service provider can be perform this task on behalf of the declarant / importer[2]. Frequently the declarant / the importer for is not

[2] The port information system offers the service to forward this message to the terminal on behalf of the declarant

informed directly about some inspections and the scanning, and therefore the importer relies on the logistic service provider or access to the port Information system of the port community for getting this information. Following this, typically within an hour, the scan or inspection is arranged by phone by the logistic service provider. The truck can then either wait for the container or might be redirected in order to handle another container. Typically the agreements with the trucking company include up to 3 hours of waiting time, while additional waiting time is charged separately. Having such agreements is a clear indication that waiting time is quite normal, and reducing the number of round trips that a driver can perform within a normal working day.

The number of individual communications of documents or information from one actor to another ripples because e.g. besides the logistic coordination information then the service provider additional has to receive an order and return an invoice etc. Therefore the total number of communication operations counts up and is more than hundred per container

The Dutch are and have for long been very efficient in handling import of goods. The port of Rotterdam is constantly being expanded to cope with the growing demand. There is a close collaboration among the companies and authorities in the port community. The community continuously collaborates with new initiatives meant for improvements. One of the major initiatives resulted in an advanced information system named Portbase.[3] The port information system "enables all the participants to optimize their logistics processes when they import goods via the port of Rotterdam" [4].According to Portbase website[5], nearly all members in the port community are using Portbase to exchange information among each other, but independent sources reports that only 50-60% of the actors are using the port information system[6].

The coordination of the activities is done by communication in various ways among the actors. The communication is typically between two actors (peer to peer). The communication channels are typically a mix of phone, e-mail, ordinary mail, courier, electronic messages as EDI messages, etc. Each actor will often keep the relevant information in a spread sheet, or in one or more information systems. Some information is shared via specific information systems. Some service providers will manually extract information from the information system and then communicate this to another actor. The different actors have various working hours and might even be located in different time zones. This cause some delay and fluctuation in the communication especially over weekends. Additionally the actors might be busy and therefore it takes time before a manual action can be performed and the action might need to be coordinated among several actors e.g. importer, authorities and terminal operator for inspection of goods.

If we look at the different mix of communications channels, the most important way of keeping track of activities is a structured spreadsheet. The importer primarily communicates

[3] www.Portbase.com
[4] According to the Managing Director of Portbase Iwan van der Wolf
[5] About us at www.portbase.com
[6] Professor Yao-Hua Tan

with other actors via e-mail and phone to coordinate the activities and the logistics. On the other hand the authorities and some of the service providers exchange information primarily via the port community' port information system. Only few importers have purchased access to the port community' port information system. Instead they are typically kept updated on the logistic information by the service providers. However, this extra step of transferring the logistic information causes delays and frequent miscommunications.

The reasons for the different communication channels are that they have been available for a long time, and that they are easy and quick to use, and they are relatively inexpensive. When an actor is under time pressure it's very easy to call another actor by mobile phone. Therefore the communication is not captured in any Information system, which makes it difficult to coordinate and to plan activities.

4.3 Findings

The analysis of the import of fresh fruit case shows that the ecosystem in addition to the importer and the exporter includes a huge number of different actors - service providers and of course various authorities. In total, we have learned that up to 30 actors could be involved. The complexity seriously affect the lead time.

The individual physical activity of moving the container from the quay to the importers warehouse including possible 'detours' for scanning and inspections, is in total maximum a few hours. Accordingly, the rest of the lead-time is waiting time before the different types of scans and inspections. The number of controls per see cannot be changed, but in order to improve on the overall effectiveness and reduce the staggering high administrative costs associated with international trade, our attention has to turn to the many instances of waiting time (Focus group with shipping line and the representatives of Dutch customs). These can only be reduced by (1) a possible reduction in the number of physical activities (which is unlikely) (2) a better planning of the physical activities, and (3) by increasing the transparency and currency of the information in a joint repository. By this, we do not mean a central physical repository, but a virtually integrated II following pretty much the principles of the Internet with a large number of independent systems/servers, but based on a jointly shared communication standard and governance.

Currently, the actors in the ecosystem use different means of communication (interviews and observations at fruit importers). Furthermore, the actors generally only communicate with one or maybe two other close actor before or after the in the supply chain. In this way actors are very limited in their possibilities for optimizing processes. Other barriers include that the actors have limited working / opening hours to process manual tasks and that the individual actor keeps information in each their information system. The uncertainty about the inspections, the complexity of the communications among actors, the lack of visibility among actors of the important coordination information (since it resides in the various information systems), the lack of access to precise and updated information all makes it very difficult to plan the activities and thereby reduce lead-time and variation in lead-time.

Typically, at any time, only one actor has the knowledge about the exact location of the container e.g. the terminal operator when the container is within the terminal area and the driver when the container is on the truck. The importer, who owns the goods in the container, has no insight into the actual location or actual time of its activities. They only have a blurred view and are left to guess the activities and location. The importer and other actors specifically lack visibility about the individual container's actual location and updated status regarding clearing by authorities. Finally, the importers lack transparency when their containers are in the customs area. This might be why they blame the authorities for the long lead times, which is correct regarding the number of controls. However, in our analysis, the inspections/controls are not the culprit. They do not take many minutes. The culprit is the high complexity of the ecosystem surrounding the controls, the unpredictability of if and when containers are marked for inspection/control, and the in-efficient logistic coordination primarily due to lack of updated logistic information.

5 Possible strategies for improvement

The analysis has identified some of the main causes for the prolonged lead time and its variation. In this section we shall propose some possibilities for improvements of the effectiveness in the digital business ecosystem. More specifically, we will illustrate how import of fresh fruit via Rotterdam to the EU potentially can obtain a reduction in lead-time and cope with variations in lead-time, which will reduce the trade cost significantly.

Many of the trade documents that are still in paper format could become electronic documents. One example is the required certificates and the B/L, where we believe that an electronic version (possibly with electronic signatures) could fulfill the authorities' requirements. A simple solution could be attaching a link to the filed declaration for a stored electronic version of the original certificates, which could be enhanced with search (based on Optical Character Recognition) and other features. This could potentially reduce the cost associated with preparation of those documents in paper and in original form.

The importers has proposed a set of key information that could improve the coordination and planning:

1. actual time of departure of vessel with containers from port of origin
2. ETA and later ATA at port of destination of the vessel,
3. ETA (in a time interval of ½ day) and ATA of unload of specific container
4. information about selection for inspection(s) and scan
5. possible to reserved time for inspection(s) and scan including opening hours
6. the actual time of exit from terminal area.

The accuracy of the ETA information for the container could be improved if the terminal operator and the shipping line collaborated to estimate which containers are expected to be unloaded within an interval of e.g. three hours. That would on average reduce the lead time with approximately 8 hours if the time in the port is 16 hours for a vessel and therefore the importer can better plan the pickup of the container instead of constantly checking if the container has been unloaded.

Today some key information is only communicated between two actors in a peer to peer communication e.g. authorities' "Permission to remove" and associated IMA number communicated to the declaring actor. Similarly, it is often the importer, and not the logistic service provider or trucking company who has the task to transport the container from the terminal to the warehouse upon its release. Alternative methods to delegate authorization, automatically get a notification via e-mail or sms, and automatically forward (also outside working hours) key updated status information for containers could improve this and reduce the lead-time over weekends.

Another possibility is that the importer could purchase access to the port community' port information system (or another similar software provider) that publishes the most updated data about the containers status. However, the SME importers are reluctant to purchase access to the port community's port information system because they can't see the cost benefit in purchasing access. Alternatively some of the other actors e.g. the logistic service provider could provide the key information in a real time version. Some service providers already offer this but only for a minor part of the key information and other key information e.g. if the container is selected for inspection or scan is processed manually by an outsource partner in India.

The above suggestion would increase the visibility of the container status in near real time, which potentially can improve the possibilities for the importer or his service provider (the logistic coordinator) to plan in a proactively way the activities and the associated logistics. The visibility will also help to the transparency and that the actors including the importers get the same, shared view of the status of a particular container in the supply chain.

The un-integrated information system and communication channels cause delays and security risk in the containerized supply chain for international trade import to the European Union. The lack of visibility of the actual situation for the individual container is a major issue and makes it difficult to coordinate activities in the supply chain. A range of technical suggestions have been proposed e.g. having webcams in the terminal area, use drones to follow the activities, equip the containers with GPS-tracking devices, and enable the actors to share their activities via an application on a mobile device.

Over and above reducing costs and lead-time, visibility can also potentially increase the security for the containers and for the terminal area at port of Rotterdam.

6 Conclusion

This research reveals that importers of fruit experience in-efficiency and long lead time passing the barriers of the customs territory on its route from the quay to the warehouse and with high variation in lead time due to a complex ecosystem with many actors and unknown number of controls; and that they potentially can reduce the costly lead time and its variation by better logistic coordination utilizing a set of few key information from other actors in the digital business ecosystem. The typical importer is struggling with heterogenic information infrastructure to get the key information. A part of the key information is available from the

port community's port information system, and the typical importer is reluctant to purchase them

Can the port information systems be characterized as Information Infrastructure (II)? The emergent properties for the port information system are that it's shared locally, heterogeneous, evolving, and the structured properties are direct composition within one platform and centralized control. To be characterized as an information infrastructure it also need to be open, have a recursive composition as organizational principle, be distributed, and have dynamic control as structured properties. (Hanseth and Lyytinen 2010). Accordingly, the current port information systems cannot be characterized an information infrastructure for international trade as proposed by the ITAIDE research project. This is confirmed by the fact that only approximately 60% of the actors utilize the port information system. Consequently, the recommendations from the ITAIDE project to implement the so-called I3 framework (an II) is clearly not implemented yet.

It's our recommendation to implement a II that conforms with the design guidance for IIs which is accessible, provides open and shared data, enable real time tracking of container movements, and make efficient planning possible. The governance of above shall provide thrust among the actors in a degree that they share their data for the individual container.

Clearly to detail our recommendation is a next task for our research.

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Appendix for data collection and sources for main quotes in the analysis of the business ecosystem

Data collection is primary the below listed interviews, observations and focus groups which took place in late January 2014 in Holland.

Organization	**Person(s)**	**Period**	**Method**	**Documentation**
Shipping Line and Dutch customs authorities	3 representatives from authorities and 3 from private service provider	20140128 14:00-17:00	Focus group	Records, audio taping (partly transcribed) and note
Fruit importer	Logistic Manager (importer)	20140128 08:00-10:00	Interview and observation / site visit	Records, audio-taping, notes, documents and pictures
Fruit importer	Logistic Manager (importer)	20140129 08:00-10:00	Interview and observation / site visit	Records, audio taping, notes, documents and pictures
FrugiVenta, Den Haag	Director and 8 logistic experts from 8 importers	20140129 15:00-18:00	Focus group	Records, audio taping, presentations and notes
Terminal operator, Rotterdam	3 representatives from private service providers company and 3 advisors from special service providers	20140130 08:00-13:00	Interview and observation / site visit	Records, audio taping, notes and pictures