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Accelerating the Innovation Uptake in Logistics

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Accelerating the Innovation Uptake in Logistics

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Abstract

During the last decades several research projects and related initiatives have investigated innovative approaches and solutions aiming at improving transport logistics. However the level of adoption has still not reached a satisfactory level. In fact, compared with other industry sectors it is very low.

The European Union (EU)-funded project Loginn - Logistic Innovation Uptake – aims at investigating the reasons behind this and to develop methodologies for overcoming the slow innovation uptake in the field of logistics. As an example, for research and development projects in the logistics area the idea is to improve their capabilities to bridge the gap between pilot implementation and marketable solutions. For this purpose, the project will examine existing approaches of innovation achievement. Combined with the identified barriers and gaps currently hindering innovation in the logistics sector, this will serve as an input that culminates in a Logistics Innovation Action Plan for Europe integrating existing initiatives for accelerating logistics innovation market uptake into a comprehensive, straightforward form with a precise initiatives-to-do list.

In addition, the project aims at disseminating innovative logistics practices, technologies and business models to the logistics community and fostering the information exchange on innovation in logistics. For this purpose, an information hub for logistics innovation, the “LogisticsArena” (www.logisticsarena.eu), was established, which is supported by additional activities on social media like Facebook, LinkedIn and Twitter. This paper presents first results of the project.

Keywords: maritime piracy, anti-piracy measures, effectiveness, commercial shipping

1. Introduction

The transport logistics network in Europe represents the aorta of the European economy. Only through the provision of a fast and reliable logistics structure, pan-European and international cooperation between enterprises in Europe can be realised and support the European competitiveness. However due to the recent developments e.g. high fuel prices, the need for green co-modal and intermodal logistic concepts, smaller consignment sizes, etc., new challenges arose. These are often of complex nature, like the expected increase in freight transport volume and the respective impact on the environment and on the life of citizens, especially taking into consideration that Greenhouse gases (GHG) emissions, noise and dust caused by freight transport are already a problem today, contributing with one third of all transport emissions in the EU (European Commission, 2010a). Innovation is a key factor for addressing these challenges and thus it is of utmost importance that the innovation potential can be fully accessed in order to nurture intermodality and co-modality (Behrends, 2009) as well as to improve the productivity, since the efficiency within this sector improves less than average. One main factor is the lack of interest in innovation in freight transport, compared to other sectors. Research shows that other industry sectors spend from 4.8 to 17.8% of their turnover on research and innovation, compared to only 1.1 % for the transport industry (Wagner, 2008), leading to a lower adoption level than in other sectors. (Nilsson, 2006) and (Sternberg et al., 2011) see the main reasons in missing clarity about promising innovation potentials. With its Europe 2020 strategy (European Commission, 2010b) has formulated a set of ambitious goals in the areas of smart, sustainable and inclusive growth, and further decomposed them into seven flagship initiatives and in the frame of this also funded several activities, often with good results, but low visibility. Among the goals to be achieved, one should mention the 3% target of

investments in Research and Development (R&D) and innovation and the 20/20/20 goal (i.e. to reduce greenhouse gas emissions by at least 20% compared to 1990 levels, to increase renewable energy consumption to 20%, and achieve a 20% increase in energy efficiency).

The main objective of the Loginn project is coordinating and supporting Research and technology development (RTD) projects in the logistics area to improve their capabilities to bridge the gap between pilot implementation and marketable solutions. To achieve this goal, Loginn set up a collaborative platform (LogisticsArena, www.logisticsarena.eu) to allow the main stakeholders of the logistics domain (industry, Small and medium sized enterprises (SMEs), public authorities, investors and research organizations) to work together on promoting innovative transport logistics solutions aiming at increasing efficiency with a particular focus on intermodal transport. The Loginn approach for supporting logistics innovation achievement involves three interlinked and mutually reinforcing dimensions: innovative business models within the supply chain, innovative logistics practices, and innovative technologies. A detailed analysis in these fields can be found in (Baalsrud Hauge, 2014).

This paper presents the analysis of the relationships existing between different barriers and drivers throughout the three dimensions of Loginn. It concludes with a list of proposed actions aiming at triggering the adoption of logistic innovation through the use of the identified solutions. These initial actions will serve as input and will be further investigated and discussed in the Loginn action plan.

2. The Loginn project and its instruments

The Loginn project is supporting the development and up-take of innovations by providing a discussion and consensus building platform, the LogisticsArena (LogisticsArena, 2013) aiming at bringing the potential stakeholders and providers together, fostering information exchange and user involvement in the development phase according to principles of co-creation and participatory design. (Schumacher, 2013; Sanders & Stappers, 2008; Bødker, 2005). These

principles are not only applicable for product but also service design, and thus also relevant for transport and logistics service development.

Loginn will support innovation adoption in transport logistics by taking a holistic approach that considers several mutually reinforcing aspects of innovation: business models, logistics practices and technologies.

- Business models are the representation of the way the members of a supply chain use their skills and resources to increase customer and shareholder value.
- Logistics Practices of interest for Loginn are the ones that have enabled the transport industry to efficiently evolve in the recent years.
- The technologies considered by Loginn are the one that can support the transport industry, whether they concern infrastructure, hardware, software, or complete eco-systems.

Due to the interrelation between the three pillars, a holistic approach is essential for deriving an action plan aiming at innovation-uptake. Besides, this approach will favour the customization of RTD results towards industrial demand solutions, supporting the development of sustainable business plans for European RTD projects, exploiting synergies between European RTD projects to enable a seamless exchange between RTD projects and logistics stakeholders and finally enabling and supporting the access to Investors (Loginn 2013a-c; L4L, 2010a, 2011a,b, 2012a,b)

The basis of our research is an extensive analysis of more than 300 regional, national, and international research projects and initiatives. Based upon the outcome of these results, we looked at the maturity of the different solutions and the relevance for transport and logistics at one hand side, and its innovation potential on the other hand side. In a second step, barriers for successful introduction were identified (L4L 2011c, 2012c; Loginn 2013a-c, 2014). In a third step the identified barriers from the three areas business models, solutions and practices were compared and commonalities were identified. This methodology provides the consolidated and final list of unique barriers identified during the project, then establishes the matrix of correlation between the different barriers

and the innovative solutions surveyed. This first matrix is completed by the correlation between barriers and Loginn innovation enablers of the LogisticsArena. Finally, taking into consideration both unique barriers and innovative solutions as well as the Loginn innovation enablers, this methodology produces the final correlation between all these concepts, identifying guidelines for the use of the Loginn solution according to the real and concrete needs for innovation uptake in the logistics sector.

3. Barriers for Innovation Uptake

This chapter presents the complete list of barriers that were identified in the project. As evoked in the introduction, these barriers will later be aligned into a set of unique barriers.

3.1 Business models

By examining several projects and initiatives (Loginn, 2013a) as described in the approach above, a number of barriers have been identified hindering the market uptake of innovative business models. These are briefly described in the remainder of this section.

- Financial issues

Financial issues, as expected, present one of the most frequently cited barriers. These have to do especially with cases when the initial investment cost (hard or soft infrastructure) either is too high to be covered by one company, or the actual use of the specific asset has to be shared by various organizations due to its nature (e.g. use of public infrastructure also for commercial purposes).

- Missing/limited hard facts

The majority of real-life pilots refer to the introduction of well-defined technological solutions or even practices. Business models behind them remain a "black box" area and their impact is usually treated as "other qualitative impacts" with limited hard data to assess it.

- Misaligned performance metrics

Business models, although centered on a focal organization, have boundaries much wider than those of the specific organization. Thus, by their very nature have inter-firm (and firm-customer) cooperation as a prerequisite. One of the most important barriers hindering this is the lack of alignment between the performance metrics of the involved supply chain actors leading to suboptimal or contradictory results.

- Short contract durations

Bringing an innovative business model in the marketplace requires a significant investment (in terms of preparation time and trust building) between the supply chain actors. Short contract durations and arms-length business relationships between providers and users of logistics services act as a barrier for its market uptake.

- Lack of appropriate legal/institutional framework

Innovative business models usually put pressure on existing legal/institutional frameworks extending their boundaries and challenging their content. This has become evident especially in cases of business models that involve the horizontal cooperation of supply chain actors (thus raising healthy competition concerns) or the involvement of consumers (e.g. crowd sourcing) in the delivery of logistics services (thus raising compensation & cargo insurance issues).

- Customer security issues

Besides data security, customer security issues can serve as a barrier. This is the case especially of business models that incorporate the consumer or city-dweller for the last mile. The perception of the goods recipient on whether it is safe to accept deliveries by a “stranger” or a “neighbour” can serve as a significant barrier.

- Lack of gain-sharing models

Most innovative business models are based on the perception that collaboration can lead to better results for everyone involved. For introducing them though, clear models of how these results are to be split will have to be put in place from an early stage. Such models should lead to quantifiable results and be very clear in its use and allow synergy gain calculation and redistribution.

- Lack of Trust

A fundamental requirement for realizing the full effect of innovative business innovations is to create trust between the involved organizations. This trust can only be achieved through long-term relationships between the actors and contracts that decreases the distance between the companies. Short term, arms-length relationships have to be avoided.

- Need for commonly accepted methodologies & mechanisms

Lack of commonly accepted methodologies can be a significant barrier especially in relatively unexplored areas. Methodologies for allocating the cost of urban-shared distribution systems, for estimating the environmental impact of logistics operations, for assessing the level of risk in supply chain networks, and also commonly accepted mechanisms for obtaining the required data, are cases in point.

- Need for common/compatible operational practices

Business models that involve the collaboration of various actors during the physical delivery process require common or compatible operational practices among the actors involved. This is a typical barrier found in most cases of horizontal or vertical cooperation in the supply chain.

- Need for establishing infrastructure sharing practices

Sharing infrastructure among various partners requires clearly defined practices. Such a requirement becomes evident especially in cases of horizontal cooperation between logistics services providers within a city logistics setting.

- Need for critical mass of on-line private users

Innovative business models incorporating the social media require a minimum critical mass of "enrolled" online private users. This is especially important when social media is not used only as a marketing channel but as a necessary operational tool for supply chain actors interaction. The case of crowd sourcing is the first that falls within this category.

- Need for processing huge amounts of data

Business models involving extended collaboration between different supply chain actors by their very nature place a need for processing effectively and

efficiently huge amounts of data. This becomes more critical in the cases when the consumers (end users) are involved as data providers and when the logistics infrastructure is shared.

- Need for information sharing through interoperable systems

The need for processing huge amounts of data is inevitably translated to a need for systems interoperability between the actors involved. This becomes more important when the new business model requires data provision also from a variety of systems (public and private ones) and when the number of smaller-size organizations involved (e.g. such as smallholders, consumers purchasing groups, etc.) is high.

3.2 Innovative practices

Innovation is not only about audacious business models or cutting-edge technologies. Hence, one of the principle threats and most complex dimension of innovation is the one of practices. Even with an optimal business models and the access to the most efficient tools, if parties involved in the logistic chain do not apply efficient practices, their efforts will probably be vain. In this section we briefly explain the different barriers that are faced by the innovation in term of practices.

- Lack of standards

Three different types of standardization problems are identified: data quality, data reliability and Information technology (IT) interoperability.

- Data quality

Many different documents/types of data are necessary for functional supply chain and their synchronization is crucial for that functionality. The quality of data used by stakeholders will determine the quality of the decisions that are taken therefore data quality must be regarded as a crucial requirement towards functionality of the supply chain.

- Data reliability

The human dimension of any project or process has a risk factor associated to the fact that humans make mistakes and an error caused by the misuse of

information might have destructive effect on the development of a project. Therefore, it is recommended to set objectives, clear forms that are easy to use by stakeholders, secure storing and confidentiality registers and clear paths of information distribution across the hierarchy of the project in order to eliminate possible reliability issues.

- IT interoperability

Interoperability is the ability of a company to collaborate with others, or among internal organisational units, using information technologies. It is understood that a sustainable supply chain needs to be interoperable both externally and internally in order to optimise the use of resources or acquire necessary relations with the entire supply chain with smooth performance based on the modern IT solutions available in the market.

- Lack of cooperation among actors

Cooperation is critical in addressing a wide range of common highlighted challenges faced by surveyed logistics companies, whose success depends very much on cooperation among relevant actors, however the actors involved could be many: government and other public bodies, private stakeholders of all sizes and, customers, society, technology developers, etc.

- Financial barriers

From initial investments to pay-back time, different economic aspects of financing a project can act as a barrier towards the implementation or the expansion. Budget restrictions limit the overall expenditure on the strategy and are often subject to change given the past profit figures or expected market reduction due to economic changes and as a result, the projects can get delayed and the costs overrun.

- Infrastructure issues

Buildings, terminals, roads, communication networks and energy supply facilities are some examples of infrastructure requiring long-term investment, with expanded life cycle, which involves significant amounts of lead-time to develop, plan and implement, not to mention maintenance investments for its continuity in time.

- Lack of information

Information could be the key to the implementation of ILP and must be properly addressed.

- Effectiveness

As important as an efficient use of information is an effective application of the content of it to the socio-economic aspects of a project. In this sense, for the future benefit of ILP projects, more effective and accurate information systems and evaluations are necessary in order to cope with socio-environmental systems and their future development.

- Complexity in administration

Administrative complexity is usually result of either unrealistic decisions or information overloads. There is still lot of paperwork e.g. for customs clearance requiring filling different forms that are often not compatible among each other and disable communication flows in detriment of the logistics activities. The efforts put in designing an ILP will not be productive if the administrative steps to be followed are not simplified, clarified and easy to access.

- Public opinion

Public opinion as collective behavior can play an important role in decisions and act as propaganda for the accepted/declined projects. An informed public opinion could result positive in reinforcing a socio-economic or socio-environmental initiative towards getting the relevant governmental attention or support. An informed society is more capable of assimilating the pros and cons of each alternative and will tend to present positive approaches to suitable options.

These barriers are identified based upon a thorough analysis of good practices (i.e. the maturity of the solutions is high and the solutions are implemented at least in pilots) (L4L 2011b, 2012b; Loginn 2013b; Amazon 2013; Google 2013; collectplus 2013; iGoeasy 2013; Locative 2013; Batco 2013)

3.3 Innovative solutions

The innovative solutions' barriers can be divided in three categories:

1. technological barriers such as Immaturity of innovative technologies, lack of reliability and accuracy, security concerns and lack of standardization
2. barriers related to solutions' business model such as the cost, privacy concerns, limited target group, organizational issues, lack of transferability and lack of awareness
3. barriers related to business processes such as deployment considerations, labour considerations and increased fuel emissions

In detail, the following barriers were identified:

- Immaturity of innovative solutions

While technologies such as mobile communications and Social media are considered mature there are technologies that are still only subjects of research and funded projects or others that are used in commercial level but their use is not widespread and they are still facing inherent problems.

- Lack of reliability and accuracy – security concerns

Often the information channels through which information is gathered are not owned by the organization using the information. In most solutions, there are multiple stakeholders and there are different parties for collecting, transmitting, storing and managing the data. This fact raises questions about the data consistency, integrity and liability. Specific mechanisms have to be set for securing the data and evaluating their source.

- Lack of standardization

One of the main constraints for most technology solutions is the unsolved issue of the standardization of communication technology and protocols. Before solutions are adopted by the industry on a large scale, issues of technology incompatibility and lack of standardization have to be resolved.

- Costs

There are many cost aspects as far as the adoption of an innovative solution is concerned; these are in detail software costs that are usually license costs, hardware costs referring to purchasing, installing and maintaining equipment, training costs, and operational costs.

- Privacy concerns

Privacy concerns are raised in most of the solutions where data are transmitted, stored and used by many different stakeholders.

- Limited target group

Some of the solutions analyzed refer only to specific parts of the logistics industry. There are solutions dealing only with one part of the logistics operations (e.g. solutions that are used only for quotes and contracts). Others refer only to a part of the logistics sector (e.g. solutions that apply only to SME), and a third group is limited to the partners of the specific company who developed the solution.

- Organizational issues

There are solutions that involve players from many different sectors: the automotive industry, road operators and telecommunications operators, as well as road-based service and equipment providers. In some of them the participation of local or central authorities is essential. Additionally, mechanisms also have yet to be defined for the payment and billing for the services that are offered by different providers. Therefore there is a need for sufficient regulations and decisions on the governance of such systems.

- Lack of transferability

This barrier appears in solutions that they were built at first place customized for a specific organization or a specific part of the logistics sector.

- Lack of awareness

Companies that introduce innovative solutions and governments that want to set these solutions as standards have to run awareness campaigns in order to overcome the market's and people's skepticism towards these solutions or their ignorance.

- Deployment considerations

In many innovative solutions the transition from the previous legacy systems to new technologies and systems is not a smooth procedure. Highly qualified personnel is required, new business processes have to be created, other have to be abandoned and good practices have to be revised.

- Labour considerations

The adoption of innovative technologies implies changes in the workforce of an organization. New expertise is required while skills acquired before years may become obsolete. In emerging technologies there are few people with the necessary competences. Additionally, the adoption of innovative technologies may result in frustration to the employees that have to change the way they normally used to do their job.

- Increased fuel emissions

The use of vehicles by following strictly alert signals and safety warnings may result in more unstable driving speed which in turn results in more fuel consumption (cost) and more fuel emissions.

There are certain barriers that are met to almost all the innovative technologies such as lack of standardization, security concerns, involved costs and deployment considerations. As a consequence of these barriers the logistics sector is reluctant to adopt them. However, it cannot be foreseen that the adoption of innovative solutions provides strategic and operational advantages to companies that understand their needs and have a clear view of how to use new tools for fulfil them. As the technologies become mature, logistics companies should follow their evolution and find the right time to use them to their advantage (L4L 2010, 2011b,c, 2012b,c; Loginn 2013c; ActivePivots 2013), Deal 2013; Jumprack 2013; TQL 2013; Tweetload 2013)

4. Identifying unique barriers

The identification of unique barriers could seem redundant with the previous chapter; however, beyond the natural need to remove duplicated barriers, it also serves a second need: the consideration of barriers against the complete logistic innovation space (relying on the three Loginn dimensions). Hence what is also extremely important in this process is to identify the accurate “level” of the barrier, identifying a barrier too generic or too specific will prevent the accurate

identification of enablers and actions. In the following we provide a list of unique barriers which was used for our analysis:

- Complexity in administration
- Costs - Financial Issues
- Deployment considerations - system governance and ownership
- Fuel emissions
- Immature technology
- Infrastructure issues
- IT interoperability
- Labor considerations - workforce expertise
- Lack of awareness
- Lack of cooperation between stakeholders
- Lack of legal/institutional framework
- Lack of operational interoperability
- Lack of Standardization
- Lack of Trust
- Limited/Misaligned evaluation data (e.g. from pilot implementation)
- Privacy - Security issues
- Reliability – Quality - Accuracy of data
- Users' & market size considerations

5. Loginn Innovation enablers

Based upon the early identification of barriers within the three pillars, the next step is to consider how to overcome those barriers. For this purpose, Loginn Innovation enablers were identified. Some of the proposed enablers are directly related to the operation of the Logistics Arena, while others are initial proposals to be further elaborated in the Loginn Logistics Action Plan.

5.1 LogisticsArena as consultation platform for content

The first enabler is the LogisticsArena itself, which per definition should be the virtual place where interested parties could meet, discuss, share success or failure stories. Six individual factors related with the LogisticsArena were grouped under this enabler. The LogisticsArena should be a guide for logistics companies where they can see output from innovation and how to implement it themselves. Therefore the LogisticsArena should provide best cases and describe them in a way that they could be easily understood and be of help also for SMEs. To this end it would be necessary to create templates to describe best logistics practices with also a focus on SMEs. In order to stimulate the discussion, the LogisticsArena should invite relevant stakeholders to share good examples for innovative solutions for logistics problems. For a better usability of the LogisticsArena it would be appropriate to restructure and refocus arena content considering, as target group, the persons responsible of innovation in companies and providing topic groups for specific innovation issues (e.g. humanitarian logistics networks, cloud company closed services).

5.2 Arena as community

The LogisticsArena is not just another website, the most valuable result for Loginn will be the community that will grow around it. The second enabler is therefore the LogisticsArenaCommunity (LAC). The community in itself is not a real enabler, in this case the term facilitator would be more appropriate, but a live community is the real vehicle to innovation. The LAC should target/attract experienced professionals to create a fostering environment. This professional community could then become a trusted source of inspiration for professionals in logistics. The LAC will possibly introduce/request new feature in the LogisticsArena like experience database, contact list, and innovative logistics companies' catalogue to define/ accelerate the Innovative SME's Communities building. The focus on SMEs is not a limitation, but SME do need innovation and could benefit from a collaborative environment.

5.3 Education

Loginn's main objective is to make available the knowledge that is spread among different stakeholders, to this end one important aspect is education. In this context it could mean to establish educational initiatives, e.g. establishment of Master Programs at academic institutes. To support the above initiatives it will be necessary to define training and educational system dedicated to technology and innovation managers in the field of logistics and provide tools to share knowledge via practical and scientific discussion that will allow the creation of a professional network. The expected result would be a methodology to develop innovative concepts to solve real problems.

5.4 Coaching

Education would be pointless if not supported by adequate follow-ups on the field, for this reason Coaching is the fourth identified enabler as it will support logistics companies to dare to take on new alternative technologies. It should provide concrete and easy-to-use examples for logistics companies to follow in their business development, through a set of prioritized R&D action that could support the innovation uptake, examples and results from previous R&D projects. Partners of R&D Community should provide the necessary support channeling the European Commission directives and initiatives. The major result will be the possibility to link single company innovation success with the community targets for sustainability.

5.5 Innovation services intermediary

While Education coaching and technology transfer are enablers supposed to transfer the knowledge towards the logistics companies and operators, the Innovation services intermediary will operate to increase the understanding of Information and communication technologies (ICT) influence on collaborative logistics processes with the aim of supporting, developing and defining an Innovation services ecosystem for logistics.

5.6 Innovation monitoring

Promoting innovation requires also a process for monitoring its progress. The LogisticsArena will incorporate a limited but rather comprehensive set of indicators, following the logic and structure of the already established Innovation Union Scoreboard. The so called “Logistics Innovation Scoreboard” can provide the basis for harmonizing future efforts on monitoring the evolution of logistics innovation in Europe.

5.7 Consensus building platform

As this enabler involves the sharing of experiences on logistics innovation initiatives and the building of consensus on possible solutions or future focus areas, it is expected to have a positive impact on all barriers identified. In specific, the mechanism of consensus building platform where different stakeholders can bring their specific needs and perspective into discussion and also provide necessary information will make it possible to analyse the barriers from different perspectives and commonly search for common solutions. By looking at the identified barriers, it becomes clear that the complexity of these barriers requires a multi-perspective and consensus building approach. In addition, this platform will also provide access relevant information on frameworks, legal rights and obligations, new solutions etc. That will help in the consensus building process.

5.8 Innovation ecosystem

Bringing together logistics innovation experts into a community is among the main prerequisites of building an innovation fostering environment. Community members contact details and expertise will be made available to potential innovation adopters (especially SMEs due to their increased need for innovation) providing awareness on innovation services availability. Moreover, creating an innovation ecosystem, due to the improved interaction among innovation providers and users, is expected to increase trust and improve cooperation prospects. The access to the expertise will also provide a faster information of latest developments in the three areas. This will foster the ideation process and

encourage people to innovate since it also reduces the risks of developing solutions already existing. The effect of best practice access presented in a trustworthy environment will also lead to a faster uptake. At the same time, as the ecosystem develops the size of the innovation market is expected to increase.

5.9 Interface for developing synergies with other initiatives

Developing synergies with other initiatives like the ALICE platform (Alice, 2014) can address in a more effective way common barriers such as the ones related to interoperability issues (operational & IT), missing legal/institutional components, technology immaturity and data quality/reliability.

6. Derivation of Actions

6.1 Overall approach

The analysis presented in the previous chapters forms an integral part of the overall approach employed by Loginn for accelerating logistics innovation market uptake, which bases on the three dimensions of logistics innovation, as identified by the Loginn project: Business Models, Logistics Practices & Enabling Technologies. For each of the innovative solutions identified within the project, the respective barriers in bringing them to the market place were identified. These dimension-specific barriers were further aligned into a set of unique innovation barriers, removing any double references. Based on this analysis, the Loginn approach for accelerating logistics innovation market uptake was applied. The first group of actions is based on the employment of the Logistics Arena. The Arena was initially envisioned as a technological platform to facilitate opinion sharing and ultimately consensus building on the major problems and solutions regarding logistics innovation market uptake. As the project was progressing, it became evident that the Arena could play a wider role. This enhanced role of the Logistics Arena is reported in the present paper and includes a number of

innovation enabling functions, i.e. the Arena as an innovation ecosystem, a consensus building platform, an interface for developing synergies with other initiatives, an innovation monitoring tool, an intermediary for innovation services, and a sustainable innovation facilitator.

Finally, Loginn believes that a number of additional innovation enablers can be employed. These are of a more general nature and relate to policies, regulatory measures, financial mechanisms, innovation management actions and future research directions. These are to be addressed in the forthcoming Logistics Innovation Action Plan.

6.2 Proposed Actions

In order to advance the work on the Logistics Innovation Action Plan and to ensure the user involvement, the action plan will be developed by using an agile development approach, we here describe some of the types of actions to be envisaged to complete the channeling of logistic innovation uptake. A key for the long term logistic innovation is the exploration and organization of future research directions. It will be critical for the logistics domain to fully accompany its future research directions with clear objectives, ensuring that research outcomes are indeed taken into account and fully exploited. The uptake of logistics innovation is prevented or limited by the lack of research or proper management. In the end, finance plays a core role within logistics. Hence, the very nature of goods transport is not only about an unavailable good, but rather about obtaining it at the lowest price, even if it is already available at the desired location. As an example some countries are exporting high quality fruits while importing lower quality ones at the same time, requiring very competitive shipping costs. In this perspective, the proposition and emergence of more adapted financial mechanisms would become both a driver for innovation accomplishment and a key element fostering new innovation. Even if innovation has to be fostered and protected, it cannot be done at all costs. As illustrated in the previous sections, some of the barriers faced by the further uptake of logistics innovation are linked to the lack of proper regulatory measures that would channel their application. In

this perspective, logistics innovation and policies have to be considered together with proposals of regulatory measures on a transnational level.

7. Conclusion and next steps toward an holistic action plan

Innovation is a key factor for the competitiveness of the European industry and has historically played a vital role in increasing efficiency. The transport logistics industry has seen relatively small improvement in terms of innovation with only 1.1% of the turnover for the transport industry.

In this paper we describe the Loginn approach and presented the first analysis results of innovative business models, good practices as well as technological solutions. There are several solutions available at a prototype level, i.e. technological solutions are available, but either not robust enough yet, or the potential market is not ready for the innovation. In addition, it can be stated that several of these prototypical solutions do not deliver a business model suitable for potential customers, and that there is a lack in large scale deployment of many of the solutions.

This paper provides a critical element for the uptake of logistics innovation by identifying the links existing between the current barriers faced by the domain and the drivers that could help overcome them. In addition we identified how the enablers offered by Loginn's LogisticsArena supports, channels and fosters innovation, further allowing the overcoming of existing barriers. This paper provides valuable information about the most useful and promising solutions and enablers. A clear identification of unique barriers is provided requiring attention due to the necessity of specific solutions. Finally, we propose actions leading to an improved innovation uptake in logistics by considering logistics innovation and policies together with proposals of regulatory measures on a transnational level.

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