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 Theme 3:
 Information And Communication Technologies

Challenge 6:
 ICT for Safety and Energy Efficiency in Mobility
 Logistics for Life
 ICT-2009.6.1

Logistics for Life

Logistics Industry Coalition **for**
 Long-term, **ICT-based** Freight Transport **Efficiency.**



Deliverable 2.2a

D2.2a Knowledge Base and Logistics for LIFE Framework

Workpackage WP2

Leading Partner: SINTEF

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1.0	Working document for internal discussions	Tor K. Moseng	2010-11-01	Sections more defined with initial text and illustrations
2.0	Final document for internal review	Tor K. Moseng	2010-11-25	
3.0	Final version	Tor K. Moseng	2011-01-13	Final reviews have been processed

Contribution

Partner BIBA

Contribution

The Knowledge Base has been developed in close cooperation with BIBA. Many valuable discussions have been held, and feedback on both layout and structure has been given. BIBA is also responsible for the content in the Knowledge Base, which has given BIBA also a management role of the Knowledge Base.

Partner BLG Logistics Group AG & Co. KG

Contribution

BLG gave valuable input to the document through the internal review process. The comments are processed and included in the final version of this document.

Partner Chalmers

Contribution

The Knowledge Base has been developed in close cooperation with Chalmers. Many valuable discussions have been held, and feedback on both layout and structure has been given.

Partner Insiel Spa

Contribution

Insiel gave valuable input to the document through the internal review process. The comments are processed and included in the final version of this document.

Partner SINTEF

Contribution

Leader of the task and responsible for the delivery. SINTEF has developed the Knowledge Base in cooperation with eBOS Technologies Inc., provided the initial document, and reformulated the content based on inputs. The finalisation has also been done by SINTEF.

Deliverable process schedule

No	Process step	Responsible	Date	Involved persons	Notes
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2	Establishing the Knowledge Base and planning of deliverable	WP2 Leader	2010-10-20	<ul style="list-style-type: none"> • Tor K. Moseng 	Knowledge base developed
3	Presentation of the Knowledge Base to the consortium	WP2 Leader,	2010-11-02	<ul style="list-style-type: none"> • Tor K. Moseng • Hans Westerheim • Jannicke Baalsrud Hauge 	Initial version of the Knowledge Base established
4	Deliverable ready and leader to approve the document for review	WP2 Leader	2010-11-25	<ul style="list-style-type: none"> • Tor K. Moseng 	Final version of the deliverable.
5	Reviewing Quality check	Peers Coordinator	2010-12-10	<ul style="list-style-type: none"> • Paolo Paganelli • Moritz Quandt • Wolf Lampe 	Review by internal peers.
6	Processing the reviews for the final version	WP2 Leader	2011-01-13	<ul style="list-style-type: none"> • Tor K. Moseng 	Final version
7	Publish on the IC Forum	WP2 Leader	2011-01-14	<ul style="list-style-type: none"> • Tor K. Moseng 	Final stage of process.

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1 Executive Summary

This first version of the Logistics for LIFE (L4LIFE) Deliverable 2.2 (D2.2a), is the first of three incremental versions belonging to D2.2. The L4LIFE D2.1 presented a Knowledge Base report describing the taxonomy to use and other requirements to a L4LIFE Knowledge Base and Framework. The taxonomy, which structures the information content, is used in the L4LIFE Knowledge Base described here in D2.2a.

The L4LIFE Knowledge Base is based on the existing platform SKEMA, which has been developed and used in other European projects in the 7th Framework Program. Its design and structure are however adapted to the L4LIFE taxonomy and needs. This first version of D2.2 presents the initial L4LIFE Knowledge Base where the taxonomy, in terms of ARKTRANS function indexes, and some content from WP1 is used. The Knowledge Base is online and available on www.ebostechnologies.com/logistics4life. The Knowledge Base is in this deliverable described with illustrations and descriptive text.

Based on input and feedback from the project, and especially WP1 and WP4 (including the Intelligent Cargo Forum), the Knowledge Base will continue to evolve.

2 Introduction

One of the main objectives of the Logistics for LIFE project (L4LIFE) is to collect and describe knowledge of ICT solutions making the freight transport more efficient and sustainable, including more environmental friendly. This knowledge is further used as input to the L4LIFE Framework that will consist of a structured knowledge repository, i.e. the L4LIFE Knowledge Base¹, and supporting tools for linking and analysing the content together with end user guidance.

The deliverable D2.2, describing the L4LIFE Knowledge Base and Framework, consists of three incremental versions. This is done to include progressive input and feedback coming from Workpackages (WPs) 1 and 4. This first version (D2.2a) describes the initial layout of the L4LIFE Knowledge Base. The Knowledge Base is based on work done in the European project SKEMA [1], which has developed a knowledge platform for use in maritime transport and logistics.

The L4LIFE taxonomy is based on the ARKTRANS framework [2], and ARKTRANS has been used in WP1 for collecting content to the Knowledge Base. But projects evolve, and this must also be reflected in ARKTRANS. Also, there is a process in aligning ARKTRANS with the Common European Framework on Information and Communication in Transport and Logistics² [3]. Therefore, the L4LIFE Knowledge Base and Framework will from initial states be further enhanced with refinements reflecting the developments made in other European projects. The online version of the initial L4LIFE Knowledge Base can be accessed on www.ebostechnologies.com/logistics4life.

This deliverable first describes its relation to the other L4LIFE WPs in Section 3, before presenting the initial L4LIFE Knowledge Base in Section 4. WP1 has done an extensive information collection, and its relation to the Knowledge Base is described in Section 5, before further work and conclusions are given in Sections 6 and 7, respectively.

¹ The Knowledge Base is the knowledge repository with content structured according to the taxonomy in D2.1, while the L4LIFE Framework is the overall platform consisting of the Knowledge Base, tools and administrative facilities.

² Several EU projects have taken a joint initiative aimed at one Common Framework for interoperability between ICT systems in transport logistics. The baseline and initial roadmap have been published on the IC Forum [3] and presented in Bremen during the ECITL 2010.

3 Relation to other work packages

The L4LIFE Knowledge Base is a part of WP2 in L4LIFE. It receives inputs from other WPs, as well as alignment with technical facilities provided in the project. Below, the relation to WP1 and WP3 is described.

WP1: Survey, Observatory and Synergy

WP1 analyses state-of-the-art technology which is applicable for increasing the efficiency in the freight transport sector. Also, research and development initiatives regarding ICT for freight transport efficiency will be analysed. Here, gaps and synergies will be identified. Among the information collected is a questionnaire answered by all projects chosen as best practices. Since the information coming from the questionnaires is structured based on the L4LIFE taxonomy, it is the input to the L4LIFE Knowledge Base – both in content and structure.

WP4: Forum and Supportive Actions

The L4LIFE Knowledge Base will interface the IC Forum managed by WP4. The contribution coming from the Intelligent Cargo Forum (IC Forum) [4] will be summarized by WP4 and provided as an input to the content database. The contributions will come from the WP4 members, as well as from the many discussions in the IC Forum. In addition, the Knowledge Base must be aligned with the IC Forum in order to avoid overlapping elements – especially dynamic elements that need frequent updates like news and events.

4 The L4LIFE Knowledge Base

This section consists of a brief presentation of the L4LIFE taxonomy in Section 4.1, before the initial layout of the Knowledge Base is explored in Section 4.2. The exploration describes each module with both illustrations and text. Section 4.2.9 describes required L4LIFE Knowledge Base tools, before the technology provider behind the underlying platform is presented in Section 4.4. The Knowledge Base is currently online and available on www.ebostechnologies.com/logistics4life.

4.1 The L4LIFE Taxonomy

The main objective of the L4LIFE Knowledge Base is to provide information to transport and logistics operators to enable more efficient operations through the use of ICT. In order to make such information available, it is important to structure the content in the L4LIFE Knowledge Base on a well defined taxonomy. The L4LIFE taxonomy was described in D2.1 [5], but is briefly mentioned here to give a full introduction to the L4LIFE Knowledge Base and to inform on the changes in the taxonomy since the D2.1. These changes are mostly due to the activities in projects like e-Freight [6], SMARTFREIGHT [7], and the now finished Freightwise [8].

4.1.1 ARKTRANS

ARKTRANS is a multimodal framework for ITS. The whole transport sector is addressed, and the specifications are valid for all transport modes (road, sea, rail, and air). ARKTRANS is based on comprehensive studies of the transport sector, where stakeholders, projects and activities representing all transport modes in freight transport have contributed to the development. ARKTRANS is used in national and European projects, which address co-modal as well as modal solutions. The current version available is ARKTRANS v6.0. However, due to recent developments in projects like Freightwise, e-Freight and SMARTFREIGHT, and the activities concerning the Common Framework (see Section 4.1.3), ARKTRANS is also updated to reflect the changes. Figure 1 shows the Reference Model as it now appears in ARKTRANS.

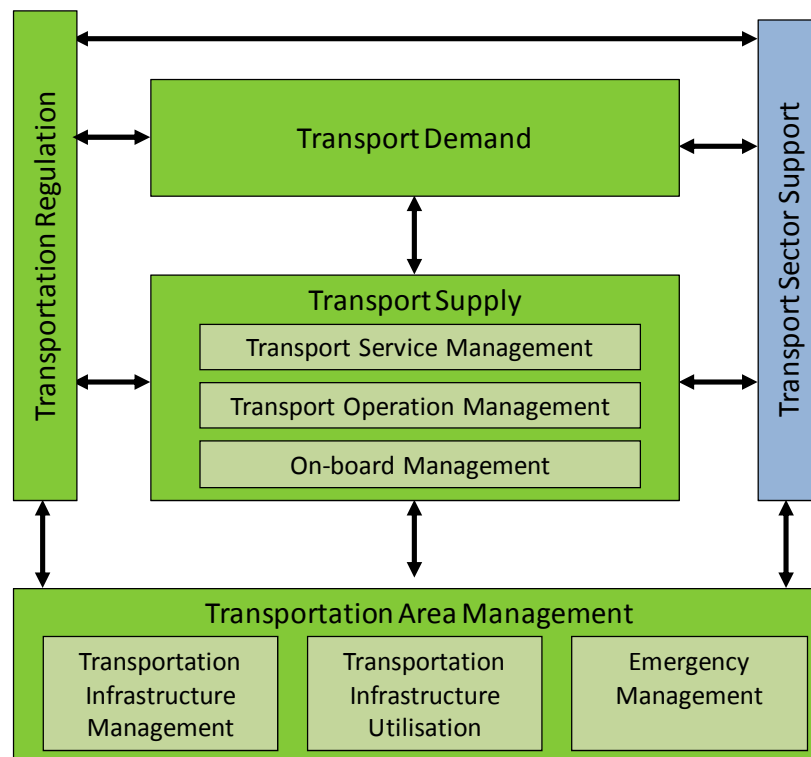


Figure 1: The ARKTRANS Reference Model

The changes made in Figure 1 compared to the Reference Model pictured in D2.1 (Figure 2 on page 10) are mainly the splitting of the Transportation Network Management domain into Transportation Area Management and Transportation Regulation. This is motivated by the increased importance of regulation (including customs) in projects like e-Freight, which is also shown in the Common Framework. The domains have further been organised slightly different. A short description of each domain follows:

- The Transport Demand domain represents the transport user, which defines the transport demands, does transport planning, requests the required transport services, and follows up the transport.
- The Transport Supply domain is responsible for providing transport services to the transport user in the Transport Demand domain. This also includes the management and execution of the transport operations (e.g. the actual transport, goods handling, document handling, etc.), as well as responsibilities related to safe and efficient operation of the transport means (e.g. navigation and adaption to traffic situation).
- The Transportation Area Management domain arranges for safe, efficient and environmental friendly transport. It includes the management of the physical transportation network infrastructure (e.g. road, railways, fairways and terminal areas), traffic management (of traffic flows and individual transport means), and emergency management.
- The Transportation Regulation domain handles all regulations, including customs operations involved in the transport chain.
- The Transport Sector Support domain provides generic services to the other domains, (e.g. different types of information services)

As indicated in D2.1, not all domains are equally important in the context of L4LIFE. The Transport Sector Support domain provides necessary services for the transport and logistics operations, but is not the focus in L4LIFE. However, due to feedback received within L4LIFE, a discussion around its presence is needed. It is therefore kept in the initial L4LIFE Knowledge Base.

4.1.2 Functions as Indexes

To each of the domains illustrated in Section 4.1.1, there is a set of functions defined through compound functions in a hierarchical structure. These functions represent what the stakeholders, or *roles*, within each domain are responsible for and do as part of their transport operations. Due to their importance and close coupling with the sector stakeholders, they are used in L4LIFE as indexes in the taxonomy for structuring the content in the knowledge repository.

By taking the functional viewpoint from ARKTRANS as a starting point, there are many functions which are not relevant in the context of L4LIFE. The relevant functions were identified in D2.1, and used further for the Knowledge Base. It must however be remarked that the complete taxonomy is dynamic regarding the functions. The work in other L4LIFE WPs, especially the analysis and result collection in WP1, might identify gaps in the taxonomy leading to new function definitions, or to changes/deletions of existing functions towards the final L4LIFE Knowledge Base.

4.1.3 Relation to the Common Framework

The Common Framework is an initiative taken by a range of projects within the DGs INFSO, MOVE and ENTERPRISE³. It was first presented at the 4th European Conference on ICT for Transport Logistics (ECITL) in Bremen in November, 2010. The main objective of the Common Framework is to develop a common framework for exchange of information between ICT systems in transport and logistics to improve the interoperability between these systems. This initiative has emerged by seeing that cooperation will benefit all actors involved – both from a research and an industrial point of view.

The relation between the Common Framework and ARKTRANS is quite close in that ARKTRANS is the basis for e.g. both SMARTFREIGHT and Freightwise, which again leads to e-Freight. This puts

³ The projects are Freightwise, RISING [9], Integrity [10], Smart-CM [11], Euridice [12], SMARTFREIGHT, e-Freight, and DiSCwise [13].

the L4LIFE taxonomy in the center of the activities, but also puts requirements on its definition since it must be in coordinance with both ARKTRANS and the Common Framework. This also makes L4LIFE to an important contributor to the Common Framework as it is represented by actors involved in all these projects.

The first version of the Common Framework report covers the definition of actors, domains and to a certain degree the interaction between the domains. Figure 2 shows the domains defined by the Common Framework. The figure also illustrates some information messages that define the interaction between the domains. The following domains are illustrated:

- **Transport Demand:** This domain deals with all activities defining the need for transport and identifying the appropriate services. It corresponds to the *Transport Demand* domain defined by ARKTRANS.
- **Transport Supply:** This domain deals with handling interactions with Transport Users, managing the transport and logistics operations, and executing the transport and logistics operations (including the driving). It corresponds to the *Transport Supply* domain defined by ARKTRANS.
- **Supply Chain Security and Compliance:** This domain deals with regulation and monitoring of transport operations. It corresponds to the *Transport Regulation* domain defined by ARKTRANS.
- **Cooperative Systems:** This domain deals with the interaction between vehicles and the infrastructure. It more or less corresponds to the *Transportation Area Management* domain defined by ARKTRANS. The argument to differ from this is that only the logistics and transport is targeted, and not traffic management. However, ICT in traffic management is in L4LIFE one important aspects that will make the logistics and transport sector more efficient.

Except from the Transport Sector Support domain, part of the ARKTRANS Reference Model, which also is mostly outside of the scope in L4LIFE, all domains in ARKTRANS are to a high degree represented in the Common Framework. The differences are the terminology of the Transportation Area Management and the Transport Regulation domains. However, the domains' content are, at least in the current version of the Common Framework, closely aligned to the ARKTRANS content, and consequently the L4LIFE taxonomy.

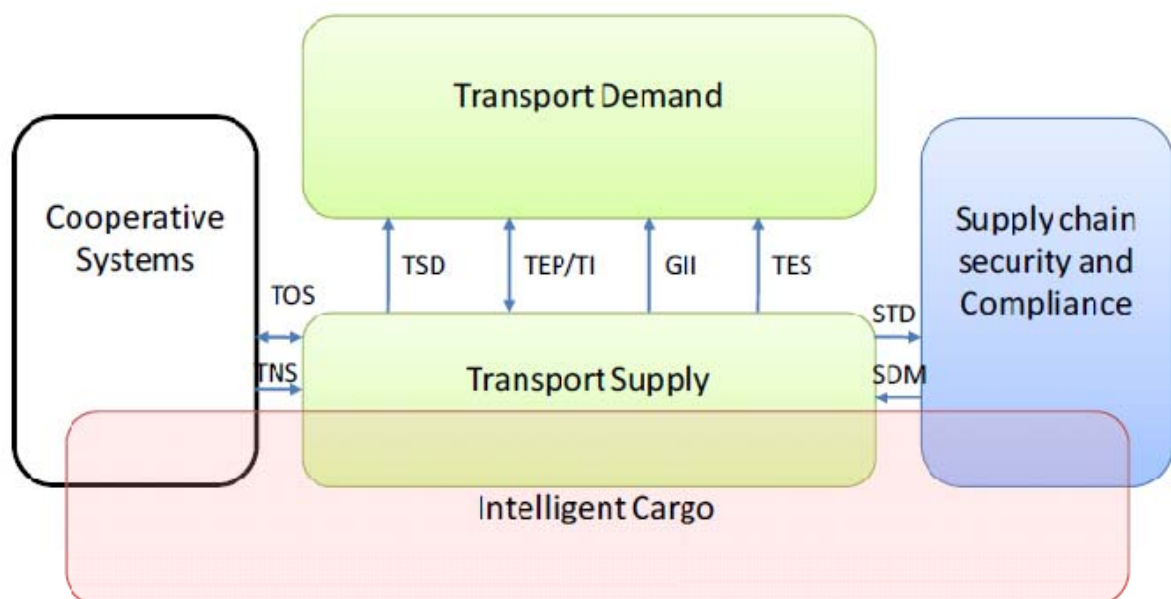


Figure 2: The Common Framework domains [3]

Also shown in Figure 2 is Intelligent Cargo. It is not an own domain, but rather a concept to enable information exchange where it targets three of the defined domains. One could also argue that the concept should cover the Transport Demand domain by defining a link between the cargo and the cargo owner. Speaking of concepts, the term Cooperative Systems could also be defined as a concept on the same level as Intelligent Cargo. However, at this stage in the processes with the L4LIFE taxonomy and the Common Framework it is more important to define the content than the domain naming. In this sense, they are aligned to the degree that the Common Framework has defined.

There is, and will continue to be a dialogue between the L4LIFE project and the creation and definition of the Common Framework. The L4LIFE taxonomy (i.e. ARKTRANS) specifies the content of the domains to a completely different degree than the Common Framework. But it is expected that they will be aligned also at lower details in future versions – in this process L4LIFE will play an important role.

4.2 Initial L4LIFE Knowledge Base Layout

The layout of the L4LIFE Knowledge Base is made up of several modules where each module represents either some important information and a link, list of content, or a domain with associated functions from the taxonomy. Figure 3 shows the overview of the L4LIFE Knowledge Base with all modules. L4LIFE has in the setup of the Knowledge Base used the knowledge platform from SKEMA in its work. SKEMA provides not only a structured layout, but also an administrative tool for editing both content and structure. For more on the technological solution and its provider see Section 4.4.

In the following, each module is presented and described separately. In addition, the indexes and their structure are also described.

Logistics for LIFE Logistics Industry Coalition for Long-term, ICT-based Freight Transport Efficiency.

+ CUSTOMISED HOMEPAGE LOGIN WEBSITE SEARCH

Navigation

- Policy Index: Sunway
- Subject Index: Oceanway
- Projects: Stakeholders

Intelligent Cargo Forum

The goal of the **Intelligent Cargo Forum** is to improve the logistics industry competitiveness and sustainability by means of innovative technologies focusing on the cargo and its interaction with vehicles, users and the environment.

Transport Policies

- E-Porting
- Third Maritime Safety Package
- E-Quotation
- E-ROSLR
- No-Term of the 2001 Transport Whitepaper

The ARKTRANS Framework

- The L4LIFE knowledge base uses the ARKTRANS framework as taxonomy to structure the content
- [Click here](#) for more information on ARKTRANS

L4LIFE Survey

- To better know what the stakeholders want, Logistics for LIFE has made a survey to collect information
- [Click here](#) to take the survey

Projects Directory

- Much of the content are from European and national transport and logistic projects
- See the [project index](#) for a list of L4LIFE related projects

Transport Demand

- Represents the transport user
- Defines the transport demands, does transport planning, requests the required transport services, and follows up the transport
- Plan and Prepare Transport**
 - Manage Long Term Demand
 - Define General Transport Preferences (GTP)
 - Obtain Information
- Manage Booking**
 - Define Transport Selection Plan
 - Manage Contract
 - Manage Service Definition
- Manage Transport**
 - Receive Contract-Related Information
 - Manage Transport Status
 - Monitor Transport Items
- Manage Transport Realisation**
 - Manage Financial Transactions
 - Manage Statistics

Transport Regulation

- Represents the transport regulator, including authorities for e.g. customs and environmental aspects
- Handles all cargo and transport related regulations, including customs operations
- Perform Law Enforcement Operative Control and Supervision**
 - Manage Hazardous Goods Transport Information
 - Manage Import and Immigration
 - Manage Customs
- Manage and Provide Regulation Information**
 - Manage Hazardous Goods Characteristics
 - Perform Multimodal Hazardous Goods Mapping
 - Manage Transport Related Decisions
- Issue Licenses and Certificates**
- Manage Transport Related Directories**
 - Manage License and Certificate Information

Transport Supply - Transport Service Management

- Represents the transport service provider related to customers and services
- Responsible for providing transport services to the transport user in the Transport Demand domain
- Publish Transport Service Information**
 - Manage Customer Relations
 - Manage Contract
 - Manage Transport Service Request
 - Manage Bookings
 - Perform Valid Management
 - Manage Strategic and Tactically Transport Services
 - Identify Transport Service Needs
 - Define Operation Strategies
 - Plan Transport Service

Transport Supply - Transport Op. Management

- Represents the transport service provider related to transport operations and execution
- Management and execution of the transport operations (e.g. transport, goods and document handling, etc.)
- Plan and Prepare Transport Operation**
 - Adapt to Traffic Management Policy
 - Acquire Transportation Network and Traffic Situation Information
 - Allocate Space and Resources
 - Manage Transport Resources
 - Manage Certificates and Licenses
 - Manage Personnel Information
 - Manage Transport Means Information
 - Control Transport Operation
 - Receive Traffic Management Messages
 - Perform Quality Assurance Control
 - Provide Route Guidance
 - Execute Transport Operation
 - Manage Transport Operation Information and Progress
 - Support Transport Task Execution
 - Report on Transport Operation
 - Monitor Transport Operation
 - Track Transport Means
 - Track Load Item
 - Monitor Load Item
 - Manage Transport Operation Information

Transport Supply - On-board Management

- Represents the transport service provider related to transport means operation (e.g. a driver)
- Responsible for safe and efficient operation of the transport means (e.g. navigation and adaptation to traffic situation)
- Manage Transport on Network Usage**
 - Monitor and Control Driver Behaviour
 - Monitor Transport Means
 - Support and Control Mobility and Transport Means Operation
- Manage Transport Means Information**
 - Manage Crew Information
 - Manage Transport Means Characteristics
 - Manage Transport Means Properties
- Manage On-Route Reporting**
 - Report Transport Means Trading Information
 - Report Transport Means Access Information
 - Support Traffic Situation Reporting

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Figure 3: The L4LIFE Knowledge Base

4.2.1 Navigation Module

The navigation module indicates for the user where to go for different content and indexes. Figure 4 shows the choices the users have:

- Policy index: This index structures the policies identified in a hierarchical order.
- Subject index: This index structures the subjects, or the domains with their functions, identified in a hierarchical order.
- Projects: A list of the projects contributing to the content.
- Survey: Link to the L4LIFE survey.
- Glossary: Definitions of words used.
- Stakeholders: Identified stakeholders for L4LIFE.

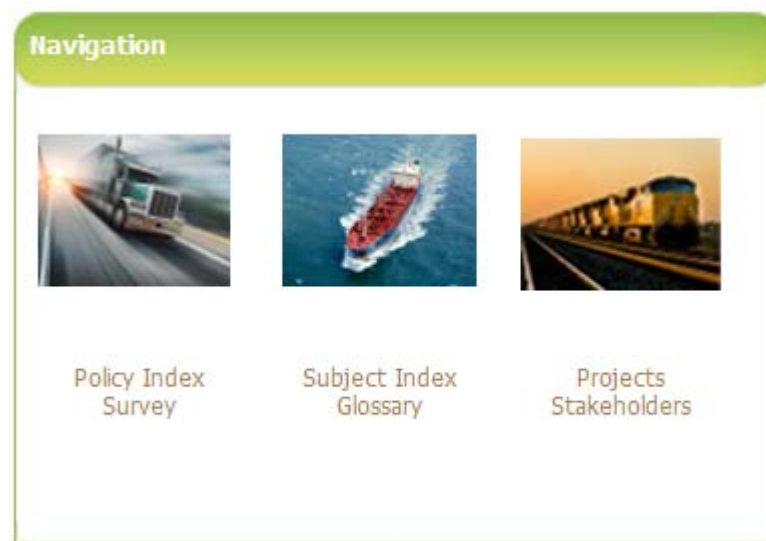


Figure 4: The navigation module

In the current version, the actual content in the items glossary and stakeholdera are somewhat missing or only adopted from the SKEMA content. These items will be updated with L4LIFE relevant content for the next releases of this Knowledge Base. The projects contributions at this stage are the projects chosen as best practises in WP1. Currently, the included projects are divided into European and National projects, but can also be extended to e.g. industry projects. The included projects from the best practices are:

- CVIS (EU)
- Freightvision (EU)
- Freightwise (EU)
- NS FRITS (EU)
- Smart CM (EU)
- SMARTFREIGHT (EU)
- Integrity (EU)
- Be Logic (EU)
- EUROFOT (EU)
- EURIDICE (EU)
- DiscWise (EU)
- RISING (EU)
- Cassandra (SWE)
- TransEco (FIN)

The policy index is currently a hierarchical structure of the policies identified in D1.2 [14], while the subject index is a hierarchical index tree with the domains from the taxonomy on the first level, and where the next levels shows the functional decomposition from each domain. Figure 5 shows the subject index where the *Transport Demand* domain is expanded to the lower layer function *Book Transport Service*. The hierarchical indexing is on the left side, different links on the right side, additional information at the bottom, and the content describing the function in the middle. It must be noticed that it has at this moment not been decided which of the links actually will be used. The links

shown in the figure are adopted from SKEMA, and a discussion both internally and externally to the project will hopefully clarify which links are of use. It is a trade-off between giving necessary information and avoiding too much information for the users. The Intelligent Cargo Forum will also be important in this process as information do not need to be repeated and updated in both databases. This is especially true for information like news and events. Most likely to be kept are the links:

- Related document: giving the user reference reading
- Related projects: informing the user about projects that target the function chosen
- Related policies: advising about which policies to consider when using the information

In addition, related products or technologies could be given – something many users would be interested in. This could either be a specific product or a standardised, de-facto or stated, technology.

The screenshot displays the 'Logistics for LIFE' website interface. The header includes the logo and the tagline 'Logistics Industry Coalition for Long-term, ICT-based Freight Transport Efficiency.' A search bar is located in the top right. The main content area is divided into several sections:

- Index:** A tree view showing a hierarchy of topics. 'Monitor Transport Items' is highlighted in blue.
- Monitor Transport Items:** A section with a sub-header 'Monitor Transport Items' and links for 'info' and 'View / Add Comments'.
- Glossary Terms:** A section stating 'No glossary terms available'.
- Subject News:** A section stating 'No related news available'.
- Linked Topics:** A section stating 'No linked topics available'.
- Related Documents:** A section stating 'No documents available'.
- Lessons Learned:** A section stating 'No data available'.
- Information Sources:** A section stating 'No Information Sources available'.
- Related Projects:** A section stating 'No related projects'.
- Related Policies:** A section stating 'No related policies'.
- Related Products:** A section stating 'No Product Services available'.

At the bottom, there is an 'Additional Information for Monitor Transport Items' section with three sub-sections: 'Journals' (No related journals), 'Events' (No related events), and 'Experts' (No related experts). The footer contains 'Copyright 2009, logistics4life' and 'Developed by eBOS Technologies Ltd'.

Figure 5: The subject index

4.2.2 Intelligent Cargo Forum Module

This module gives a link to the Intelligent Cargo (IC) Forum, and thereby states the close association between the L4LIFE Knowledge Base and the IC Forum. Figure 6 shows the module.



Figure 6: The Intelligent Cargo Forum module

4.2.3 EU Transport Policies Module

This module lists the policies identified as most important for L4LIFE in D1.2. This list is certainly dynamic, meaning that as other policies are identified – new or updated – the list will also be updated. The module gives further a link to the policy index where more detailed information about the policies is given. Figure 7 shows the module where six policies are listed currently.



Figure 7: The EU Transport Policies module

4.2.4 The ARKTRANS, Survey and Projects Modules

The ARKTRANS module gives the L4LIFE relation and dependency to the ARKTRANS framework, through the taxonomy. Figure 8 shows the module, where also a link to the ARKTRANS web pages is given.



Figure 8: The ARKTRANS module

The L4LIFE survey module gives the users a link to a survey which will give valuable feedback to L4LIFE. The survey is formulated in WP1. Figure 9 shows the module.

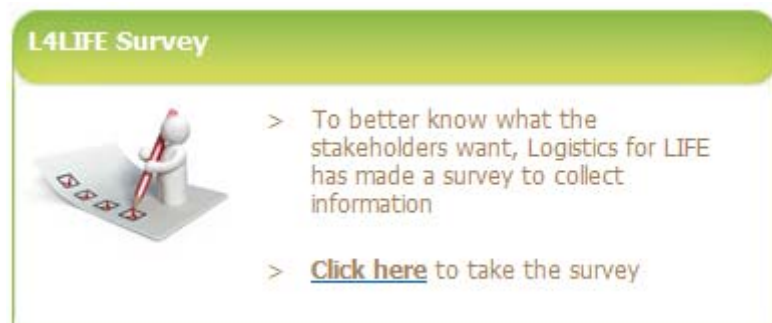


Figure 9: The survey module

The projects directory module is really only a link to the list of projects that were mentioned in Section 4.2.1 and part of the best practices in WP1. Figure 10 shows the module.

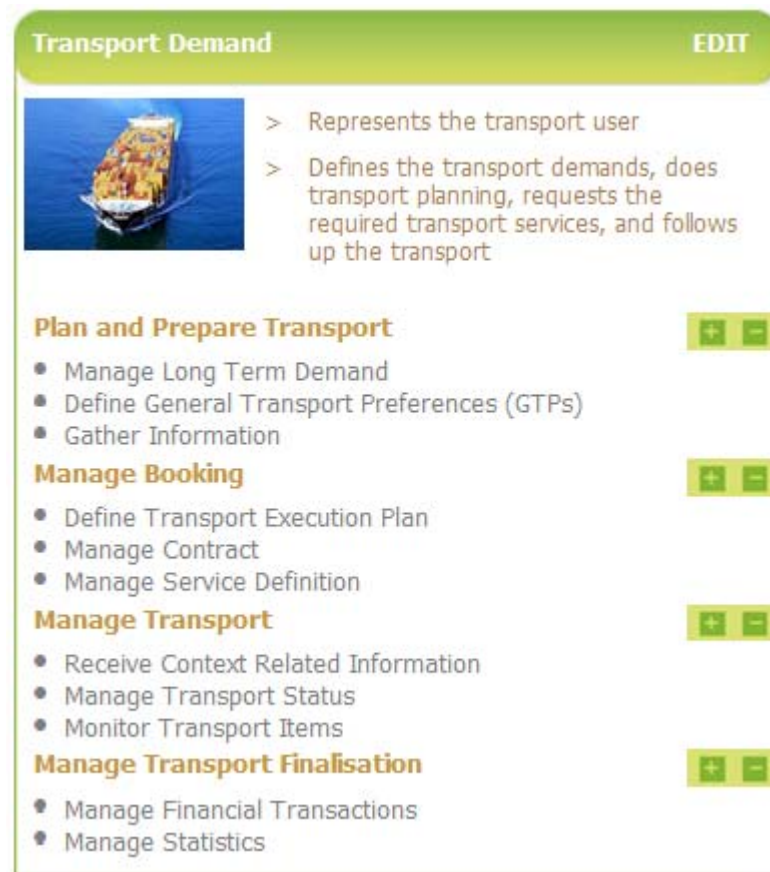


Figure 10: The projects module


4.2.5 The Transport Demand Module

This module represents information contained in the functions associated to the *Transport Demand* domain in the L4LIFE taxonomy. This domain consists of a hierarchy of functions, as also described in D2.1. Figure 11 shows the module, where the first level functions are shown together with their first three next level functions, or child functions, which is default from the SKEMA platform's side. This deliverable will not go into detail with the functions, but keep with descriptions of the Knowledge Base's structure.

By following the links attached to the listed functions, the subject index (as shown in Figure 5) appears with the chosen function highlighted. The example in Figure 5 shows that it is the function *Monitor Transport Items* that has been chosen from the Transport Demand module.



Transport Demand EDIT



- > Represents the transport user
- > Defines the transport demands, does transport planning, requests the required transport services, and follows up the transport

Plan and Prepare Transport + -

- Manage Long Term Demand
- Define General Transport Preferences (GTPs)
- Gather Information

Manage Booking + -

- Define Transport Execution Plan
- Manage Contract
- Manage Service Definition

Manage Transport + -

- Receive Context Related Information
- Manage Transport Status
- Monitor Transport Items

Manage Transport Finalisation + -

- Manage Financial Transactions
- Manage Statistics

Figure 11: The Transport Demand module

4.2.6 The Transport Regulation Module

This module represents information contained in the functions associated to the *Transport Regulation* domain in the L4LIFE taxonomy. This domain consists also of a hierarchy of functions, where the first level functions are shown together with their first three next level functions (where three next level functions are defined). This is shown in Figure 12.

By following the links attached to the listed functions, the subject index (as shown in Figure 5) appears with the chosen function highlighted. The subject index can then be further explored without going back to one of the modules, as the subject index contains all the modules described in the sections 4.2.5 to 4.2.8.

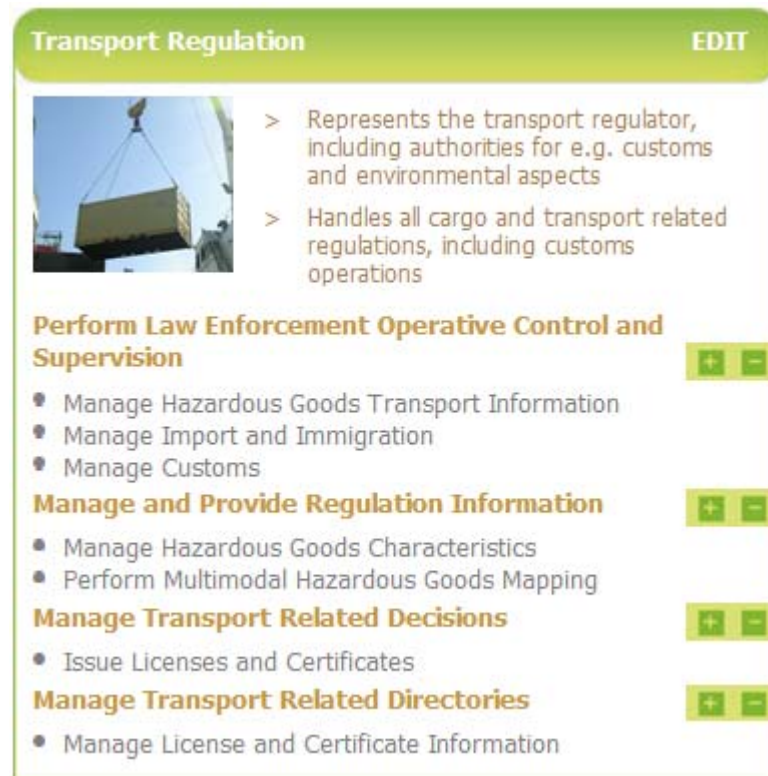


Figure 12: The Transport Regulation module

4.2.7 The Transport Supply Modules

The information contained in the functions associated to the *Transport Supply* domain in the L4LIFE taxonomy is divided into three modules in the Knowledge Base; *Transport Service Management*, *Transport Operation Management*, and *On-Board Management*. This division is both done for practical purposes with the restricted number of function levels supported in the SKEMA platform, but also due to the domain's importance in the transport and logistics sector. The division into the three modules follows the division also done in ARKTRANS and the taxonomy.

The Transport Supply – Transport Service Management module is shown in Figure 13, while Figure 14 shows the Transport Supply – Transport Service Operation, and Figure 15 the Transport Supply – On-Board Management module. By following the links attached to the listed functions, the subject index (as shown in Figure 5) appears with the chosen function highlighted. The subject index can then be further explored without going back to one of the modules, as the subject index contains all the modules described in the sections 4.2.5 to 4.2.8.

Transport Supply - Transport Service Management EDIT

> Represents the transport service provider related to customers and services

> Responsible for providing transport services to the transport use in the Transport Demand domain

Publish Transport Service Information

Manage Customer Relations

- Manage Contract
- Manage Transport Service Request
- Manage Bookings

Perform Yield Management

Manage Strategic and Tactically Transport Service Planning

- Identify Transport Service Needs
- Decide Operation Strategies
- Plan Transport Service

Figure 13: The Transport Supply – Transport Service Management module

Transport Supply - Transport Op. Management EDIT

> Represents the transport service provider related to transport operations and execution

> Management and execution of the transport operations (e.g. transport, goods and document handling, etc.)

Plan and Prepare Transport Operation

- Adapt to Traffic Management Policy
- Acquire Transportation Network and Traffic Situation Information
- Allocate Space and Resource

Manage Transport Resources

- Manage Certificates and Licences
- Manage Personnel Information
- Manage Transport Means Information

Control Transport Operation

- Request Traffic Management Measures
- Perform Quality Assurance Control
- Provide Route Guidance

Execute Transport Operation

- Manage Transport Operation Information and Progress
- Support Transport Task Execution
- Report on Transport Operation

Monitor Transport Operation

- Track Transport Means
- Track Load Item
- Monitor Load Item

Manage Transport Operation Information

Figure 14: The Transport Supply – Transport Operation Management module

Transport Supply - On-Board Management EDIT

> Represents the transport service provider related to transport means operation (e.g. a driver)

> Responsible for safe and efficient operation of the transport means (e.g. navigation and adaption to traffic situation)

Manage Transportation Network Usage

- Monitor and Control Driver Behaviour
- Monitor Transport Means
- Support and Control Mobility and Transport Means Operation

Manage Transport Means Information

- Manage Crew Information
- Manage Transport Means Characteristics
- Manage Transport Means Properties

Manage En-Route Reporting

- Report Transport Means Tracking Information
- Report Transport Means Access Information
- Support Traffic Situation Reporting

Figure 15: The Transport Supply – On-Board Management module

4.2.8 The Transport Area Management Modules

The information contained in the functions associated to the *Transport Area Management* domain in the L4LIFE taxonomy is divided into two modules in the Knowledge Base; *Infrastructure Utilisation* and *Perform Operation Traffic Management*. This division is mostly done for practical and informational purposes with the restricted number of function levels supported in the SKEMA platform. The division into the two modules follows the division also done in ARKTRANS and the taxonomy.

The Transport Area Management – Infrastructure Utilisation module is shown in Figure 16, while Figure 17 shows the Transport Area Management – Perform Operational Traffic Management. By following the links attached to the listed functions, the subject index (as shown in Figure 5) appears with the chosen function highlighted. The subject index can then be further explored without going

back to one of the modules, as the subject index contains all the modules described in the sections 4.2.5 to 4.2.8

Figure 16: The Transport Area Management – Infrastructure Utilisation module

Figure 17: The Transport Area Management – Perform Operation Traffic Management module

4.2.9 Submit Information Module

Also included in the Knowledge Base is a module called Submit Information. This module, shown in , is available by going through the *Customised Homepage* option in the top. Here, users may register to get access to include information to be added in the Knowledge Base. The reason for not including it in the default view is that there is currently no organization behind the function to handle such registrations. Also, to allow different users access to include information at the moment could disturb the actions taken in WPI when it comes to the on-going inclusion of collected information.

Click here to register'."/>

Figure 18: The Submit Information module

4.3 L4LIFE Knowledge Base Tools

Deliverable 2.1 listed four tools for the Knowledge Base in order to enhance the user experience and information gathering process. These tools were:

- On-line manual
- Glossary

- Search function
- Frequently asked questions (FAQ)

Both the glossary and search function are provided in the first release of the Knowledge Base. But the glossary needs an updated content from the initial SKEMA glossary. The search function needs to be tuned in what to look for in the database. What to look for will be a further task together with WP1.

The on-line manual is currently not available, but will be included in later releases. The FAQ will appear as one of the results from WP1's survey and questionnaire. Such feedback will give the initial FAQ, while it will surely be updated based on the users' feedback at later stages as well.

4.4 Technology Provider

The L4LIFE Knowledge Base is build upon the knowledge platform developed in the European project SKEMA – Interactive Knowledge Platform for Maritime Transport and Logistics. The technology provider behind this platform is eBOS Technologies Inc., which is centred in Nicosia, Cyprus. eBOS provides technologically advanced e-business software applications to customers worldwide. Core business is software design, development, application integration and web services. eBOS also offers a wide range of packaged web-based solutions for e.g. content management, project monitoring, and customer management.

They are also involved in research and development including national and European collaborative projects focused on the integration of traditional IT systems with active Knowledge Bases and e-business services.

In relation to L4LIFE, the most relevant work has been on the SKEMA knowledge platform, from which the L4LIFE Knowledge Base is build. The SKEMA knowledge platform has also been used in European projects like e-Freight, where eBos also is a consortium partner, and PROPS. The SKEMA knowledge platform is shown in Figure 19, where the similarity with the L4LIFE Knowledge Base is obvious. The *Navigation* and *EU Transport Policies* modules are preserved more or less as they are, while the other modules are replaced with L4LIFE modules. Currently, eBOS hosts the L4LIFE Knowledge Base on their services and provides server availability and support. The L4LIFE Knowledge Base is available from www.ebostechnologies.com/logistics4life.



Figure 19: The SKEMA knowledge platform [1]

5 Knowledge Base Content

In addition to the EU transport policies and information about different projects, the most content will be about the functions and how ICT can give more sustainable transport and logistics through these functions. In order to get structured information from the information collection, the questionnaires from WP1 to the best practise projects included a section for the Knowledge Base functions. This section invited the projects to give information about the functions targeted within the projects. This process gives much more structured information that can be placed directly in the Knowledge Base. The results from these questionnaires are given in D1.2.

But the questionnaires gave much more information than what the section with the functions gave as well. One challenge will be how to include more information in the Knowledge Base. Are there other ways to present the information – other modules that can represent this information?

In addition to the questionnaires, WP1 has developed a survey which will give even more information that should be placed in the Knowledge Base. This process is, however, not finished. The survey can be accessed online on.

6 Further Work

As the L4LIFE Knowledge Base presented in this deliverable D2.2a is only the first of three incremental versions, the main focus in the coming time is to further improve the Knowledge Base from feedback given in other WPs and from external actors.

The first open issue to mention is to identify which related information should be included to the information in the subject index related to each function. Here, a close cooperation with the IC Forum is necessary.

A second issue is to develop and integrate the Knowledge Base tools identified. None of these are finished at the moment, so more work is needed here.

Then, a third issue is to include all the information gathered in WP1. Currently, the Knowledge Base is rather empty when it comes to content. The main reason for this is that the focus up till now has been on establishing the structure for the content.

Fourth, it must be pointed out that the Knowledge Base must be tested on different actors and stakeholders holding roles from the entire transport and logistics sector in order to ensure that the content is available and is what the users require.

Finally, the Knowledge Base must reflect and be aligned with the activity concerning the Common Framework. Basically, it is the L4LIFE taxonomy and the functions to be defined in the Common Framework that must be in accordance.

7 Conclusions

This deliverable has presented the initial version of the L4LIFE Knowledge Base. The taxonomy described in D2.1 is used and updated with results coming from projects like e-Freight, SMARTFREIGHT and Freightwise. The taxonomy will also most probably evolve based on inputs from the functions to be defined in the Common Framework. Since the L4LIFE taxonomy already has defined lower levels functions, L4LIFE will play an important role in the further definition of the Common Framework.

The L4LIFE Knowledge Base uses the knowledge platform developed by eBOS Technologies Inc. in the European project SKEMA. This platform has also been used in other projects like e-Freight and PROPS, showing the platforms great usability. Based on the initial layout from SKEMA, L4LIFE has developed its own modules with content suitable for L4LIFE.

The taxonomy identifies different domains, each with an associated hierarchical level of functions. Each domain is in the L4LIFE Knowledge Base represented by an own module – some are actually divided into several domains. By looking at a function, the subject index appears where all functions from all domains are shown. Information related to a function will also have related information like relevant projects and documents. The L4LIFE Knowledge Base is available online on www.ebostechnologies.com/logistics4life.

The next steps are to further improve the Knowledge Base by integrating Knowledge Base tools, including content mostly from WP1, and test the Knowledge Base's usability on different stakeholders.

8 References

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