



Proceedings of 7th Transport Research Arena TRA 2018, April 16-19, 2018, Vienna, Austria

Business Insights of Innovative Logistics Services – discussing Models, Strategy and Markets

Iraklis Stamos a, Lina Konstantinopoulou b,

^aIRU Projects, Avenue de Cortenbergh 71, 1000, Brussels

^bERTICO, 1050, Brussels

1.1.1. Abstract

Within this paper, we present and discuss the viability of potential business model for innovative logistics services, as developed within the EC funded AEOLIX project. To overcome the fragmentation and lack of connectivity of ICT-based information systems for logistics decision making, AEOLIX aims to establish a cloud-based collaborative logistics ecosystem for configuring and managing (logistics-related) information pipelines. Its overarching business model, that of a platform, as opposed to the conventional linear flow pipe models, is presented herein, along with the ways it will create value by facilitating exchanges between two or more users and thus allows users to both produce and consume values. The basic structure of the AEOLIX business model is presented, with its users, value unit, filter and core interaction dimensions explicitly described. The paper also positions its efforts in regard to similar endeavours and discusses the pros and cons of an exchange or a platform business model for logistics services before mapping out potential users and innovative approaches to engage them. The paper concludes with insights on the business success factors of logistics platforms and their monetization and economics potential in the short future.

Keywords: business models; ICT platforms; AEOLIX H2020 Project

1. The AEOLIX project

AEOLIX is consolidated from the results achieved in a number of related R&D projects. This designed data and service driven platform enables the flow of information that will feed the pan-EU applications. It is undertaken based on the identified gaps and practical problems, such as the complexity of the integration and the associated high costs, to develop solutions and the engagement of a large community of logistics actors, for whom the simplified connectivity, velocity of integration and reduced costs are the main drivers for the success of the technological approach. To overcome this fragmentation and lack of connectivity between systems and services for logistics decision making, AEOLIX proposes connecting logistics information systems of different characteristics, intra- and cross-company, for immediate (real-time) exchanges of information in support of logistics-related decisions. Almost every process, product or service will become digitally enabled, which will lead to the creation of an information enabled economy.

The AEOLIX Platform represents a critical way forward of supply chain visibility and interoperability through decentralized information sharing. AEOLIX cloud services provide connectivity to multi-actor data and in-house or cloud-based applications, processes and services, thus enhancing collaboration and interoperability, potentially across the entire transport and logistics sector.

AEOLIX provides a comprehensive architecture to enable a digitally secure and regulated logistics services and information sharing platform based on the following specific components (Figure 1):

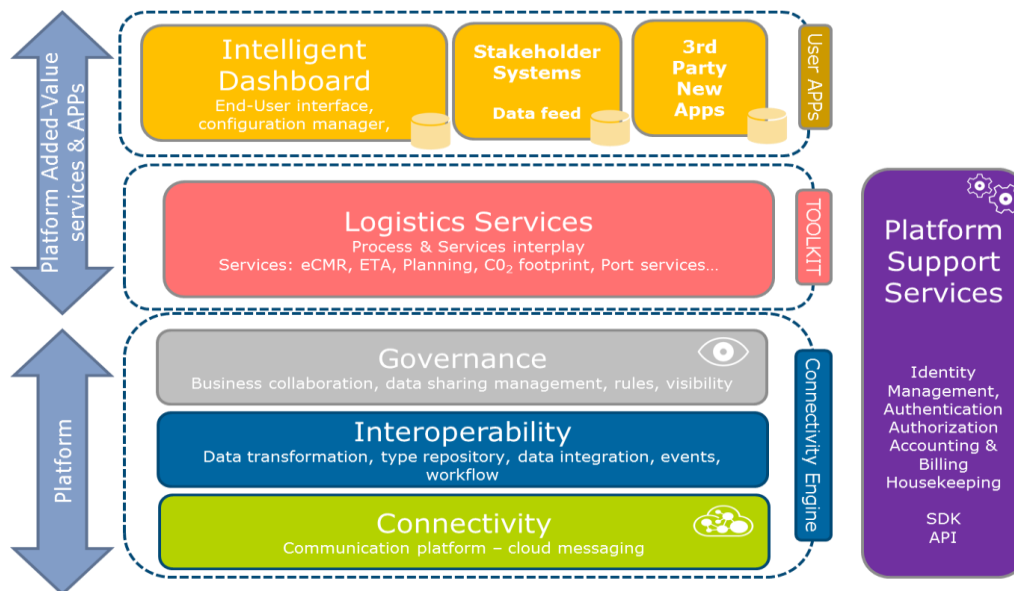


Figure 1: The AEOLIX platform view

- **AEOLIX Connectivity Engine:** responsible for providing the connectivity and interoperability services to support seamless data exchanges between organizations and services. These technical services provide the architectural setup, (1) connecting the end-user with its many business partners and systems in their networks, (2) allows for interoperability and governance services, the information exchange between different systems, setting the stage for partner/system interactions (business collaborations), along with data sharing management rules (to/with who shares which data), events and workflows.
- **AEOLIX Toolkit:** comprise core logistics services to support and implement the business needs of AEOLIX end-users. Examples of services to be offered in the toolkit are: E-CMR, routing, planning services for road and intermodal service, ETA service, CO2 monitoring, dangerous goods transport management... Toolkit services can be used via the AEOLIX connectivity engine by applications, services and sensors or interplay with other toolkit elements. During the project, toolkit services have been selected as use cases to be implemented at different Living Lab locations to validate and demonstrate the benefits of the platform. During the project a services working group will be created to identify toolkit service providers and its operation within the platform.

- **AEOLIX Dashboard:** is an intelligent, user configurable web application that serves as a dedicated portal to the AEOLIX Platform, managing and enabling access to end to end logistics visibility through the data being shared by logistics partners via the CE. It enables intelligence to be added to the data from within the dashboard and by accessing and mobilizing applications from the toolkit.

The AEOLIX Platform will provide not only an additional tool through the dashboard but a set of integration tools such as APIs (Application Programming Interfaces) and SDKs (Service Development Kits) to allow the integration of existing end-user systems or services and the possibility of development of new end-user applications. In this sense, the AEOLIX Platform provides a SDK (Service Development Kit) to develop or integrate software solutions or services for the AEOLIX Toolkit, enriching the AEOLIX Platform services to help logistic stakeholder address their business needs on their processes or requesting specific cloud services. Finally, AEOLIX provides an API to enable the connectivity of services, apps or devices running in different platforms (Java, .NET, JS...) to the AEOLIX Community Ecosystem in simplified technology integration. The AEOLIX platform provides a security framework based on a trust model for cloud-oriented collaborative networks and security mechanisms (identity management, authentication/authorization mechanisms). It is aligned with the EU directives and recommendations such as the e-Identification and trust services described in the Digital Agenda for Europe and aligned with the Digital Single Market. The support services will also include accounting and billing services for an efficient and sustainable collaboration between all relevant stakeholders in the platform. During the project, logistics related business issues have been selected as use cases to be researched at different Living Labs to validate and demonstrate the benefits of the platform.

From the Living Lab analyses it is clear that a multitude of configurations are needed, and AEOLIX is precisely designed to accommodate the following:

- A relatively advanced shipper, forwarder or transport company can develop a specific connection to the Connectivity Engine (CE) using the SDK, to send and receive data to the (CE) and then to the Dashboard for use. For instance, a major shipper in the AEOLIX Consortium seeks to send production volumes and availability to the CE and the Dashboard will make these critical data visible to its transportation partner.
- A relatively less developed user can upload files that are then received by the Dashboard, and the data in the file is then accessible in the Dashboard; the Dashboard can display the data in a manner agreed between the players, and can be securely accessed from a PC, tablet or smartphone (e.g. using credentials).
- An AEOLIX user with its own systems can integrate and connect them directly to the platform using the SDK, allowing them to connect to the CE to share information with AEOLIX participants and interplay with services available in the Toolkit to cover their business needs.
- Application providers can provide their services through the Toolkit; users can access the Toolkit via the Dashboard, send data into the application and receive the enhanced data back to populate the Dashboard with the desired information; in one Living Lab scenario, the shipper wants to send GPS truck location coordinates to an app that sends back a map of the truck location into the Dashboard for viewing.
- Formal documents to port authorities can be accommodated variously: if ports want to offer their services they can use the SDK and the guidelines for services providers to include their services in the toolkit. If they are not interested in offering any service, but they need to interact with the AEOLIX community, they can be part of the platform and share data or use services within the AEOLIX community
- 3rd party applications can be developed on top of the platform thanks to the use of the SDK, allowing new apps and systems connect once to the platform and access to the connectivity and toolkit capabilities to address specific users' needs.

The AEOLIX Platform is developed following various platform releases. Each release will be validated by users and their feedback will be collected to form requirements for the next release and these will be done in the test fests events. The AEOLIX Community will play an important role in the development by giving their requirements on the Platform. Therefore, the Community building has a natural relationship with development of the AEOLIX Platform.

2. AEOLIX business insights

2.1. Platforms vs. Pipes

As we often discuss about AEOLIX being a platform, it must be noted that a platform is a business model, not just a piece of technology. It is often the case that a platform is conflated with a website and/or a mobile app; however, a platform is not just about a piece of software. It is a holistic business model that creates value by bringing together consumers and producers.

Opposed to the dominant business models since the industrial era, that of pipes with a linear flow, where firms create stuff or services, push them and sell them to customers (pipe business model), AEOLIX will be governed by a platform business model (PBM). Rather than owning production and inventory like most traditional businesses, a PBM creates value by facilitating exchanges between two or more users and thus allows users to both produce and consume values.

Therefore, AEOLIX requires us to build and develop with not only having the consumer in mind (as is the case in e.g. skyscanner.com, a pipe that allows users to consume air tickets) but also the producer (similar to e.g. AirBnB, a platform governed product with tools for producers (e.g. pictures hosting) and consumers (e.g. voting)).

2.1.1. Exchange vs. Content platforms

The key difference in PBMs is between platforms providing value by enabling exchanges between consumers and producers and those that provide value by enabling producers to create content and broadcast it out to an audience. Deciding on the core interaction of AEOLIX will define its type of PBM; and this is Step 1 for Business Modeling as it will largely shape the business strategy to be followed.

Examples of exchange platforms are: UBER, AirBnB, eBay, Amazon.com, Skype, Dropbox. Respectively, examples of content platforms are: Facebook, iOS, Amazon, Twitter, YouTube.

2.2. Users in AEOLIX

A user is anyone that will use AEOLIX; either creating supply and responding to demand, thus **producing** data and/or services, or creating demand and **consuming** the supply, or **paying** for either producing or consuming. Users in AEOLIX are not segmented; as in e.g. eBay or LinkedIn, the providers (of either services, data or consumable content of any kind) can simultaneously be consumers of other providers' products. Therefore, the above classifications refer to potential roles and not segments.

Most of the AEOLIX products, as they are explicitly described and defined based on each LL customization of desired solution, have more than one producer or consumer role. For instance, fleet operators might be **consumers of data** produced by forwarders (e.g. Mendelez) for sending the right size of trucks on the right time to pick up cargo, **consumers of services** produced by third-parties (e.g. routing or eCMR) for reaching their destination and simultaneously **producers of data** (GPS locations) that third-parties will use for providing additional services (e.g. ETA) to other interested stakeholders (e.g. terminal operators) where these trucks are eventually heading to*.

Therefore, **customers** of AEOLIX can be one of the following entities:

- a) the producers: e.g. forwarders that will pay for publishing pick-up times and cargo sizes
- b) the consumers: e.g. terminal operators that will pay to access cargo ETA to better arrange ship schedules
- c) third-parties (someone else): e.g. a self-advertising service provider to promote its service

The above classification is critical for AEOLIX: without producers there is no value for consumers, and without consumers there is no value for producers. Both need to be on board for AEOLIX to work. This will indeed determine the overall user acquisition to AEOLIX; AEOLIX cannot work on the basis of getting users and converting them to transact. On the contrary, it will first need to build network effects before any conversions. Building network effects for AEOLIX will mean that before any trial towards connecting users with each other for presumable multiplier effects of the endeavor (e.g. connecting LLx' stakeholders with LLy' stakeholders),

* This use case is subject to data and services disclosure rights to be negotiated among interested parties. It is herein assumed that all of these players have agreed to fully share.

AEOLIX will first provide the tools to create a body of content and enable transactions around it. Then (if any) will come the networking.

Therefore, AEOLIX will first need to provide single-user utility, i.e. utility to the user even when other users are not yet on the network. The single-user utility is all about the creation of content that will ultimately form the core of the network. Agreeing on the core of AEOLIX being ‘visibility’ and breaking down the visibility buzz word in making commercially valuable data and services public[†], discussions and transactions will center on this data and services publicity. Hence, the single-user tool needs to allow data and services publishing and posting. First and foremost, for business internal reasons; although that might not necessarily be the case for the big players in supply chain that might have already figured out how to do this, AEOLIX needs to plan for the small- and medium-enterprises as well, that have often limited resources for doing so. This goes beyond the needs and requirements of the LLs.

This is an extension of the e.g. OpenTable business model. In OpenTable, a restaurant first manages its real-time seating supply based on a single-utility tool, before allowing other consumers to network around it and reserve their tables.

Strategically speaking regarding AEOLIX market initiation, the next steps will be followed:

1. Vision/imagine the network – do not start on network creation though
2. Develop the single-user tool that creates content and is central to business interactions
3. Capture interactions around the content to build network linkages at the backend (through LLs)
4. Open out after reaching critical mass of linkages

2.3. Basic structure of AEOLIX business case

The basic structure of any platform, and thus of AEOLIX as well, is summarized in the following:

$$\text{Users} + \text{Value Unit} + \text{Filter} = \text{Core Interaction}$$

where,

Value Unit is what users on one side of the platform create for others; in the case of AEOLIX that is data publishing and posting, third-party service provision, etc.

Filter is how the users will find the Value Unit; can take the form of a search interface, or use location of users to filter value units. In the case of AEOLIX LLs this is already indirectly addressed; a sort of a preliminary filtering already conducted.

Core Interaction is whatever satisfies the needs and desires of both users in a transaction and earns AEOLIX money.

2.4. Potential business success factors for AEOLIX

It goes without saying that real-world proof of concept of AEOLIX through its LLs will be a powerful tool for creating the success story around it and branding it. In parallel though, and planning for the future and the expansion of AEOLIX after its project life, the following factors will be key for its success:

- Removal of barriers for the creation of content (data, services or both); AEOLIX will need to simplify the content creation process through its SDKs, APIs, etc., and thus enable users to spread the word. One-click buttons usually help in this direction.
- Increasing the producers’ pool, not just the users’ pool; value for the overall network will be eventually scaled by scaling production of content. Therefore, AEOLIX will need to think about incentivizing (or even subsidizing?) the production, towards increasing the percentage of producers.
- Implementing curation process of service providers to ensure a positive experience; i.e. screening and testing the level of services providers will produce and offer through AEOLIX and ensure customers will continue using AEOLIX (e.g. a routing planner that is not taking into account truck sizes may route trucks through tunnels with height restrictions)

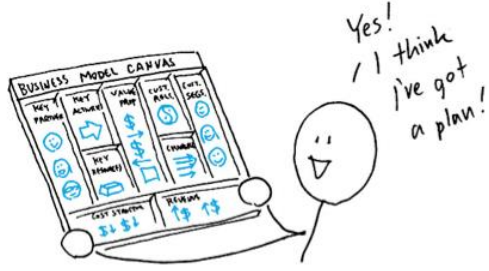
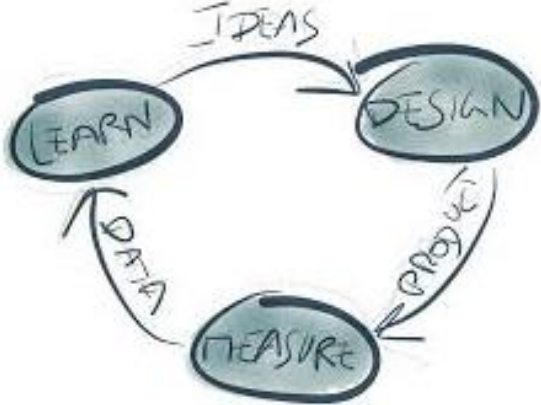
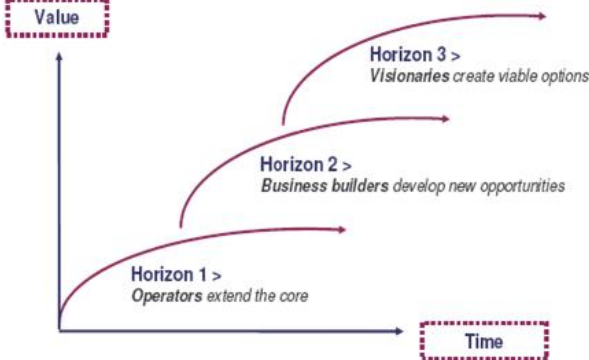
[†] Public herein refers to a group of users handed with visibility rights by the producer of content

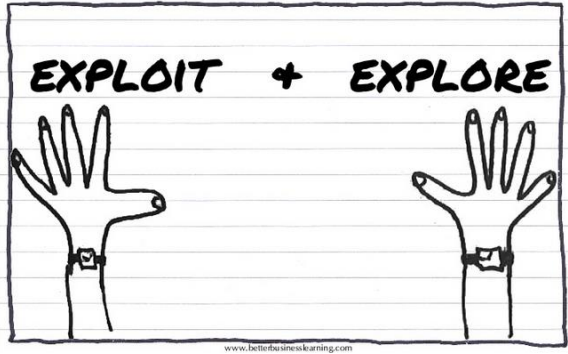
The value proposition of AEOLIX is a combination of technology and the content that the users will create on top of it. Similar to e.g. YouTube, AEOLIX value will lie both in its ability to host and stream user-defined content (be it data, services or both), but also in its ability to store it and visualize it in a customized way via its dashboard.

3. Business modelling techniques

Several business modelling techniques will be tried and tested to conclude on a viable business model. Besides the widely-used business model canvas approach, lean start-up methodologies or ambidextrous organization approaches will be followed. Table 1 summarizes techniques for business modelling in AEOLIX:

Table 1: Business modelling techniques to be followed in AEOLIX

BMT	Brief description	
Canvas	Strategic Management template for developing new or documenting existing BMs Visual chart with elements describing a product's value proposition, infrastructure, customers and finances	
Lean Start-Up	Method for developing businesses and products Can shorten product development cycles by adopting a combination of business-hypothesis-driven experimentation, iterative product releases, and validated learning.	
Three Horizons of Innovation	Beyond the usual focus of fixing innovation just in the present Connects the present with the desired future and identifies the 'seen' disruptions towards a vision H1 - Operational: The here and now H2 - Entrepreneurial: Detecting shifts & adjusting in agile ways H3 - Futuristic: Based on values, visions and beliefs	

<p>Ambidextrous Organization</p>	<p>Balance Exploration and Exploitation Exploration: search, risk taking, experimentation, discovery, innovation, Exploitation: refinement, choice, efficiency, implementation, execution</p>	
----------------------------------	---	--

4. Business models – an overview

The above mentioned processes will be culminated in the development of the business models for the AEOLIX products and services. However, monetization in AEOLIX is not straightforward. Although it might be clearer for some LLs, where business needs are explicitly stated and formulated (“I need this and if I get this, I will pay for this), when moving from LLs level to ecosystem level, things become more difficult to break down. This is the case as AEOLIX will need to figure out who creates value (and this is not necessarily the one that creates content through data and services) and who is to be charged for this.

For instance, it might be the case that when producers and consumers transact through AEOLIX, one or both sides will pay the platform a cut.

Or, AEOLIX might monetize consumer attention and attraction through e.g. advertising.

Or even, AEOLIX may license API usage.

Or, as discussed above, producers could be incentivized to participate.

In any case, business models of other platforms (with similarities or not) that will be thoroughly studied and elements of which will be used are summarized in Table 2

Table 2: Business models of existing platforms – to be used in AEOLIX

BM	Description	Example	AEOLIX applicability
Brokerage	Brokers are market-makers: they bring buyers and sellers together and facilitate transactions. Brokers play a frequent role in business-to-business (B2B), business-to-consumer (B2C), or consumer-to-consumer (C2C) markets. Usually a broker charges a fee or commission for each transaction it enables. The formula for fees can vary.	eBay PayPal Amazon.com	Yes
Advertising	The web advertising model is an extension of the traditional media broadcast model. The broadcaster, in this case, a web site, provides content (usually, but not necessarily, for free) and services (like email, IM, blogs) mixed with advertising messages in the form of banner ads. The broadcaster may be a content creator or a distributor of content created elsewhere. The advertising model works best when the volume of viewer traffic is large or highly specialized.	Yahoo! Google	Yes
Merchant	Wholesalers and retailers of goods and services. Sales may be made based on list prices or through auction.	Amazon.com iTunes	Maybe
Manufacturer	The manufacturer or "direct model" is predicated on the power of the web to allow a manufacturer (i.e., a	Many	Maybe

	company that creates a product or service) to reach buyers directly and thereby compress the distribution channel. The manufacturer model can be based on efficiency, improved customer service, and a better understanding of customer preferences.		
Affiliate	In contrast to the generalized portal, which seeks to drive a high volume of traffic to one site, the affiliate model, provides purchase opportunities wherever people may be surfing. It does this by offering financial incentives (in the form of a percentage of revenue) to affiliated partner sites.	Amazon.com	No
Community	The viability of the community model is based on user loyalty. Users have a high investment in both time and emotion. Revenue can be based on the sale of ancillary products and services or voluntary contributions; or revenue may be tied to contextual advertising and subscriptions for premium services. The Internet is inherently suited to community business models and today this is one of the more fertile areas of development, as seen in rise of social networking.	Wikipedia Flickr	Maybe
Subscription	Users are charged a periodic -- daily, monthly or annual -- fee to subscribe to a service. It is not uncommon for sites to combine free content with "premium" (i.e., subscriber- or member-only) content. Subscription fees are incurred irrespective of actual usage rates. Subscription and advertising models are frequently combined.	Netflix	Yes
Utility - SaaS	The utility or "on-demand" model is based on metering usage, or a "pay as you go" approach. Unlike subscriber services, metered services are based on actual usage rates.	Internet providers	Yes

5. Acknowledgements

This work presented herein is part of the AEOLIX (Architecture for European Logistics Information Exchange). For more information please visit <http://www.aeolix.eu>