

The NEXUS Story and its Stakeholder Analysis: Digitalising Multimodal Logistics and the Associated Value Chain Worldwide

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Abstract: The NEXUS project involves innovation and entrepreneurship. The first task of the project team, which is eclectic and includes several different profiles (research assistants, researchers, managers, engineers, designers and marketing specialists) was to do a stakeholder analysis, which involved doing some field work – six unstructured interviews – as well as some secondary data analysis (scientific articles on the Scopus database; Google searches; among others). The main concerns were to: unlock value through stakeholder engagement; move from concept to collaboration – for sustainable port development; and to connect ports worldwide which will involve international stakeholder collaboration and synergies for sustainable innovation. A Stakeholder analysis is a process consisting of identifying the individuals or groups that have a specific interest in a project, which can affect them, or be affected by them, including large groups such as customers and suppliers; employees; shareholders and investors. It is necessary to sort them according to their impact and consequences regarding the project. It is essential to manage stakeholder expectations when making decisions, especially in a project with thirty-five partners and with a global reach. The initial funding is around 92 million euros (approved by the Recovery and Resilience Plan (RRP)), to ensure the ambitious implementation of the new NEXUS platform and other related products. To minimize backlash, early as well as ongoing stakeholder involvement is a prerequisite. Strategy formulation should not occur in an “ivory tower” and involvement is key. For effective and efficient decision-making, to minimize risks, which need to be identified as well as all the connections and relationships to be created and nurtured. The research question at the outset was: How may we successfully implement a multi-partner project which involves considerable investment, and which aims to digitalize maritime ports worldwide? The theme is, currently, without precedent as the impact intended is for there to be a positive impact on all stakeholders involved – a win-win situation all around. The project will finish in 31-12-2025 and will produce 28 innovative solutions for commercialization. NEXUS is a green and digital project which is up to date as regards the latest sustainability norms and regarding overall operational efficiency in multimodal logistics. Work Package 10 is a specific exploitation, internationalization, promotion, and dissemination package.

Keywords: Maritime ports, Global strategy, Financed Project, Interviews, Decision making, Innovation

1. Introduction

The Recovery and Resilience Plan (RRP or PRR in Portuguese notation) is part of the European Council's economic and social impact mitigation instrument, Next Generation EU. This instrument aims to support the dual climate and digital transition. The RRP, as a national action programme, covers an extended period until 2026, with the aim of supporting and implementing reforms and investments for sustainable economic growth after the pandemic. The RRP benefits from a total funding of 16.643 billion euros, a total of 13.944 billion euros in grants and 2.699 billion euros in loans, targeting investment in three fundamental areas: resilience, climate transition and digital transition.

The present article focuses on NEXUS Agenda, one of the selected Mobilising Agendas for Business Innovation of the Recovery and Resilience Plan (PRR). NEXUS Agenda is a consortium headed by the Port of Sines and comprises 35 partners sharing the main objective to digitalise and decarbonise the logistics chain associated with the Port of Sines corridor. The consortium represents the whole value chain, covering port authorities, maritime, terminal and railway operators, carriers, dry ports, logistic operators, technology suppliers, importers, and exporters, and is supported by universities and research institutes. The initial funding is around 92 million euros (approved by PRR), to ensure the ambitious implementation of the innovative project. NEXUS Agenda aims to create an ecosystem comprising 28 products and services for the Sustainable and Digital Transition of Sines Corridor. This includes three main categories: open data collaboration platform, federated applications and services, and hardware assets, distributed across ten work packages.

The research question at the outset was: How may we successfully implement a multi-partner project which involves considerable investment, and which aims to digitalize maritime ports worldwide?

Agenda NEXUS is the first project of this kind in Portugal. Like other international projects such as MAGPIE and PIONEERS, this entrepreneurial project has ambitious innovative goals, in line with current sustainability and

digitalisation needs (the need to minimize the carbon footprint while minimizing costs at the same time - simplifying and streamlining processes).

2. Bibliometric Analysis

A bibliometric analysis was performed, to show trends in the research (large dataset, broad scope) pertaining to our “stakeholder analysis” AND strategy topic. A search in the Scopus database on 09-03-2024 with the terms “stakeholder analysis” AND strategy revealed 633 documents. Exporting the CSV files to VOS viewer (co-occurrence of author keywords; minimum number of occurrence of keywords = 2) revealed figure 1.

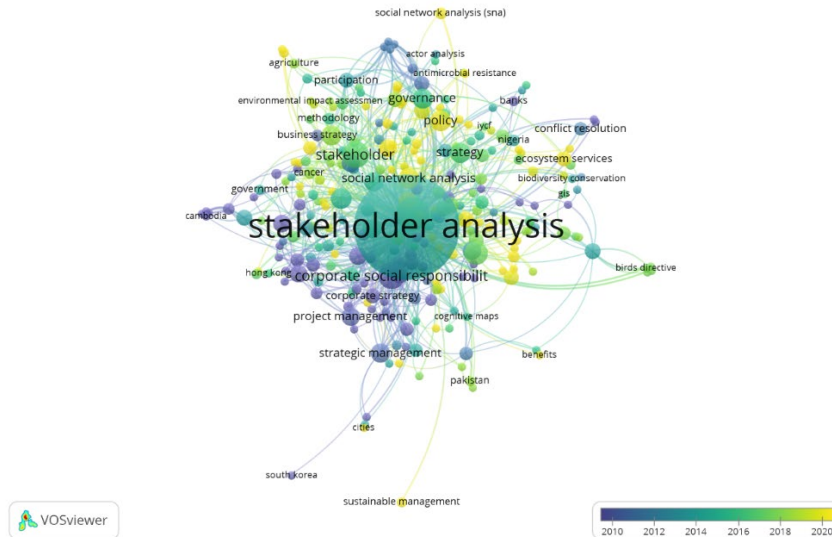


Figure 1: VOS viewer (co-occurrence of author keywords)

Table 1 shows the 22 main keywords in the VOSviewer analysis. Note that China appears above the United States of America in the analysis (with 12 versus 5 occurrences on Scopus for this topic) as China is apparently being more discussed in the literature for this topic. Stakeholder Analysis appears most linked to the term Corporate Social Responsibility (CSR); as well as to the term governance (table 1). Indeed, within the NEXUS project the Stakeholder Analysis was decided to be done by the governance stakeholder and the rationale behind the Stakeholder Analysis is that all stakeholder impacts and consequences (and needs and expectations) of the NEXUS project must be predicted and planned for in advance. NEXUS is about CSR, innovation, community development, corporate strategy, participation, sustainable development, decision making, project management, among others, so the VOSviewer depictions (figure 1 and table 1) show we are on the right track and aligned with the literature.

Other author keywords visible in figure 1 though not in the top 22, in table 1, are: benefits, conflict resolution, stakeholder engagement, public participation, participatory approach, and participatory planning, which are all essential concepts, at this earlier as well as at later stages, of the NEXUS project.

Table 1: The 22 main keywords in the VOSviewer analysis

Selected	Keyword	Occurrences	Total link strength
<input checked="" type="checkbox"/>	stakeholder analysis	286	485
<input checked="" type="checkbox"/>	corporate social responsibility	19	52
<input checked="" type="checkbox"/>	stakeholders	29	50
<input checked="" type="checkbox"/>	stakeholder	19	48
<input checked="" type="checkbox"/>	governance	11	38
<input checked="" type="checkbox"/>	china	12	28
<input checked="" type="checkbox"/>	participation	6	27
<input checked="" type="checkbox"/>	strategy	11	27
<input checked="" type="checkbox"/>	decision making	10	26
<input checked="" type="checkbox"/>	community	6	25
<input checked="" type="checkbox"/>	environmental management	8	24
<input checked="" type="checkbox"/>	stakeholders analysis	14	24
<input checked="" type="checkbox"/>	corporate communications	8	23
<input checked="" type="checkbox"/>	policy	12	23
<input checked="" type="checkbox"/>	social network analysis	12	23
<input checked="" type="checkbox"/>	community development	3	22
<input checked="" type="checkbox"/>	corporate strategy	6	22
<input checked="" type="checkbox"/>	innovation	8	21
<input checked="" type="checkbox"/>	public participation	7	21
<input checked="" type="checkbox"/>	sustainable development	9	20
<input checked="" type="checkbox"/>	united states of america	5	20
<input checked="" type="checkbox"/>	project management	9	19

3. Methodology

The approach adopted in this article is a case study (the analysis of a contemporary phenomenon using various methodological approaches) outlining, in particular, the stakeholder analysis which was performed. The case study herein involves a qualitative analysis of the NEXUS Agenda innovation project (literature reviews plus six unstructured interviews). The case study research method was selected as it allows for a specific analysis of the project's scope in a real context. Of note is that in the literature review, which was performed, a comparison was made with similar projects (Eisenhardt, 1989; Ghauri, 2004). The case study allows for a more profound analysis (Piekkari et al., 2009), provides a detailed analysis, combining information from various sources, ensuring the validity of data (Ghauri, 2004). The research question is linked to the management of an innovation project - enabling the study of the processes conducted in the stakeholder analysis conducted as part of the NEXUS Agenda.

The literature review was conducted through a search in the Scopus database (a main database in the social sciences area). Search terms were established according to the research topic and organised into a search sequence, allowing for greater interaction and reorganisation in the process (Pittaway et al., 2004). The search terms, applied to the title, abstract and keywords, resulted in the following search string: search 1 - "stakeholder analysis"; search 2 - "ports" AND "stakeholder*" AND "innovation"; search 3 - "sustainability strategies"; search 4 - "port management"; search 5 - "port" AND "entrepreneur". The searches were conducted on March 28th, 2024.

A qualitative methodology was used to collect data through interviews (Duncan & Holtslander, 2012; Easwaramoorthy & Zarinpoush, 2006). Six unstructured and exploratory interviews (Saunders et al., 2019), regarding the stakeholder analysis, were conducted during the months of January, February, and April 2024 (as the need arose): with a freight forwarder, a cargo owner, a specialist in Ports, two technology firms / suppliers and a Portuguese taxpayer. The interviewees were chosen because they had the necessary knowledge to help answer the research question (a purposive sample). The interviews lasted approximately 10 minutes each and were conducted by telephone. Handwritten notes were taken of the interviews. Previous knowledge of the company was used (following a desk research effort to that end) to tailor the interview script used to the specific context of the company.

With the data from the interviews and other sources, it was possible to develop a study of the stakeholder analysis process that was close to reality.

4. Literature Review

4.1 The Port's Role in Supply Chain Management and its Sustainable and Digital Transition

Ports serve as pivotal elements within the supply chain, enabling local production and consumption sectors to engage on a global scale. In recent years, the advent of globalization has significantly modified the paradigm of supply chain management, leading to increasingly demand-driven markets. Factors external to ports, including technological advancements, governmental policies, competitive forces, and a growing emphasis on sustainability in its comprehensive context, have earned increased focus (Notteboom, 2022).

Ports are facing a tremendous challenge, due to the sustainable and digital transition under the label 'Industry 4.0' and 'Logistics 4.0'. The challenge is to ensure that port clusters remain economically profitable by developing and introducing sustainable innovations in the process, providing value to society (Mendes Constante et al., 2023a).

An increasing need to introduce sustainable practices has been emphasised in the industry, fostering a holistic implementation of sustainability in port management (Notteboom, 2022). The benefits include, among others, increased security and resilience of the infrastructure, reduced emissions, creation of job opportunities and convergence with the local community (Mendes Constante et al., 2023a).

Business management over different time horizons is highly strategic. Considering that the environment in which the business operates is constantly changing means understanding that the management strategy must focus on the present and the future (Aalders, 2023).

A sustainable approach to supply chain management comprises three pillars of sustainable business models, mentioned in the literature: environmental, economic, and social (Daly & Cobb, 1999). Accordingly, ports address different reliance on stakeholders for economic, environmental, and social issues thus engaging stakeholders, whose progress is regularly disclosed through reports (Herremans et al., 2016). Ports operate as

an economic engine, contributing significantly to a country's economic growth (Vinod & Prakash, 2023). As powerful economic business networks, ports can support multi-layered sustainability (Lavissière et al., 2020).

4.2 Innovation and Entrepreneurship

In the port and intermodal context, considering the current paradigm shift, the implementation of innovative technologies is imminent (Musso et al., 2022). Consequently, ports face exceptional challenges arising from emerging trends: the energy transition, the digital transition, the focus on the circular economy, urbanisation, etc. (Mendes Constante et al., 2023). Developing a business model is a complex activity that implies close collaboration between those involved, by concentrating diversity as much as possible (Osterwalder & Pigneur, 2011).

Musso (2022) argues that 5G networks are the backbone of data collection and sharing infrastructures to be combined with technologies such as cloud computing and storage, Blockchain and Artificial Intelligence, among others (Musso et al., 2022).

Innovation in ports is remarkably complex because of two main factors, both arising from the interconnected nature of port activities, which require coordination and collaboration between several companies. Innovation does not occur in environments with isolated efforts, but through a joint effort of interconnected actors, as the concept itself implies this interconnection (Gilbert & Rasche, 2008). The result of innovation, however, is constrained by institutional nuances, such as a risk-taking culture, regulation, and an attitude in favour of cooperation (Mendes Constante et al., 2023). Port clusters involve a variety of activities along the supply chain, involving challenges for building an effective innovation ecosystem. International activities in ports are controlled by subsidiaries of multinational corporations, representing most companies present in port clusters (de Langen & Haezendonck, 2012).

The innovation system approach aims to describe, understand, and clarify the structure, processes, and dynamics of innovation. Systems of innovation may be supranational, national and/or regional (Mendes Constante et al., 2023). The literature suggests that there are advantages to the spatial concentration of initiatives and the promotion of innovation, even if they are restricted to a particular region. It is in this environment that innovation ecosystems are born - although the concept is subject to various interpretations in academia - based on the complex relationships established between the parties involved in technological and innovative development (Mendes Constante et al., 2023).

Mendes Constante (2023) proposes a framework with port-specific characteristics, identifying the components of a port innovation ecosystem, mentioning that the great distinctive characteristic of this ecosystem is its absorptive capacity (Mendes Constante et al., 2023). Nicotra (2014) says that this capacity "determines its ability to recognize and assess the potential value of external knowledge and then to assimilate and integrate it into innovation activities" (Nicotra et al., 2014, pp. 90). The framework comprises 'Human capital (formation), Demand for innovative products and services, support structures for cooperative innovation projects, research cooperation, incubation services (including venture capital)', with the base of an 'innovation-oriented culture, and pro-innovation government (regulation)' (Mendes Constante et al., 2023).

4.3 Stakeholder Analysis

In the literature there is no unanimity regarding stakeholder theory, and it is possible to analyse a set of different narratives that outline the various perspectives, considering the subject matter, such as strategic management (Miles, 2017; Gilbert & Rasche, 2008).

The term "stakeholder" does not find a consensual definition in the literature, considering the various interpretations of the authors, which are invariably different based on the scope of use of the term. This inevitably leads to challenges and constraints in the development of theory and empirical tests (Harrison et al., 2015; Miles, 2017).

Thus, Miles (2017) suggests a system for classifying this construct, which makes it possible to list, filter and order the definitions presented, drawn from both stakeholder and managerial perspectives. This multi-dimensional model comprises four sections, aiming to provide clarity in identifying and analysing stakeholders (Miles, 2017). Each section focuses on distinct aspects of stakeholder identification, featuring: Managerial Perceived Determinants; Managerial Perceived Relationship Attributes; Stakeholder Perceived Determinants; and Stakeholder Perceived Relationship Attributes. This framework leads to the configuration of 4 quadrants, relating to 4 classes of stakeholder, class 1 influencer, class 2 claimant, class 3 recipient, and class 4 collaborator (Miles, 2017).

Kennon et al. (2009) proposed a stakeholder analysis tool. It is presented as a 16-square matrix with two axes centred on the stakeholders, which are *influential* - stakeholders who have power and influence on the organisation or project management (x-axis), and *important* - stakeholders who have power over the execution of the project or the outcomes (y-axis) (Kennon et al., 2009). This helps to have a holistic view of the stakeholders.

4.4 Stakeholder Governance

Governance is intricately linked to stakeholder theory and has acquired particular importance due to the emerging challenges and complexities that new businesses present. The literature emphasises that globalization, technological innovation, and a broader impact of corporate actions require a reassessment of traditional governance models, highlighting the importance of considering a wide range of stakeholders in governance processes. The fundamental role of executive governance in orchestrating interactions between stakeholders to optimise the creation and dissemination of value is also highlighted, advocating a governance framework that comprehensively integrates the perspectives of a diverse set of stakeholders. Businesses should identify and prioritise stakeholders based on their ability to affect or be affected by the actions of the business. This involves effective governance, which implies strategic engagement with various stakeholders (Parmar, et al., 2010; Yuan & Wang, 2024).

4.5 Stakeholder Management and Engagement in Port Operations

To achieve a competitive advantage and remain important players in the market, interaction with the port's stakeholders is a strategic move (Ascencio et al., 2014).

Proper contact with stakeholders must be ensured via proper interactions that allow valuable feedback regarding future improvements. A first step is to identify and analyse these groups, conducting a Stakeholder Analysis, enabling mutual needs and expectations to be identified in the short, medium, and long term (Aalders, 2023).

Port stakeholders can be identified as all those involved directly or indirectly in the international trade processes, such as the importers and exporters, the Port Authority, the terminal operators, customs, customs agents, transport companies (ground and maritime), freight forwarders, empty container parks, surrounding society, etc. (Ascencio et al., 2014). Stakeholders have been categorized into three groups: business-related stakeholders; societal groups and local communities and institutional stakeholders (Notteboom, 2022).

The literature has distinguished three stakeholder engagement strategies, also based on different relationships, the transactional, which aims to inform, the transitional, that responds, and the transformational, whose purpose is to involve (Herremans et al., 2016).

5. Case Study Presentation

5.1 NEXUS Agenda

The Recovery and Resilience Plan (RRP) is a key component of the European Council's Next Generation EU initiative, aimed at mitigating economic and social impacts. This instrument is designed to support the dual transitions of climate and digitalization.

This article specifically highlights NEXUS Agenda, one of the selected Mobilising Agendas for Business Innovation under the RRP. Led by the Port of Sines, the Nexus Agenda consortium includes 35 partners who share the common goal of digitizing and decarbonizing the logistics chain associated with the Port of Sines corridor. Many of these members are companies currently exploring products in innovative areas, such as Physical Internet Supply Chain Orchestration and Collaboration, Last Generation Port and Logistics Community Systems, Innovative Gate Operational Systems and Access Control Solutions, Highly Specialised Terminal Operating Systems and Gate Control Solutions, Cloud and Data Solutions for Transport Operations, Transport Management Systems and eCMR solutions, Carrier Operations optimisation), among many others.

The primary objective of NEXUS Agenda is to establish an ecosystem comprising 28 products and services for the Sustainable and Digital Transition of the Sines Corridor.

The work within the NEXUS Agenda is divided into a distinguished structure, through 11 work packages. The agenda is divided into four primary areas of work packages:

1. Work packages 1 to 8 are core to the project, relating to R&D&I activities that will lead to the NEXUS ecosystem of products and services for the digital and ecological transition.

2. Work package 9 addresses advanced training and HR qualification needs for the port, multimodal and logistics sector.
3. Work package 10 has to do with all matters relating to the exploitation, dissemination, and internationalisation of the agenda (including the Stakeholder Analysis).
4. Work package 11 is responsible for project management.

5.1.1 Similar projects

At the European level, there are other similar projects.

The Horizon 2020 project, "Pioneers," represents a strategic initiative aimed at transforming European ports into models of sustainability, aligning with the European Green Deal's vision for a climate-neutral continent by 2050. This project, involving a consortium of 46 partners from 11 countries, seeks to create a replicable green port master plan by 2026.

The Magpie project, led by Project Manager Reyer Will, embodies a transformative approach towards creating smart, green ports across Europe. This ambitious initiative involves a consortium of 45 diverse partners, including four major European ports, knowledge institutions, industry associations, and private enterprises, all focused on enhancing logistical efficiencies from the port to the hinterland through innovative, sustainable technologies.

These projects, as well as NEXUS Agenda, are united by the Green Deal initiative and European ideas of creating green and digital corridors, aligning with the Global Gateway Strategy to create sustainable and trustworthy connections for the benefit of people and the planet.

The main difference concerns the leadership of the project, as NEXUS Agenda is led by the Port of Sines Authority, while in the other projects the ports participate as partners. The funding itself also differs, both PIONEERS and MAGPIE being funded by the European Union's Horizon 2020.

5.2 Mission, Vision, and Values

NEXUS Agenda's mission is "to create an innovation ecosystem that promotes the green and digital transition of the transport and logistics sector, with a special focus on the multimodal corridors of Sines". This aligns with the NEXUS Agenda's vision of positioning the Port of Sines as a catalyst for an international reference ecosystem in the field of the green and digital transition.

5.3 Products and Services Ecosystem

NEXUS Agenda aims to develop an ecosystem of 28 products and services for the Digital and Sustainable Transition in the transport and multi-modality sector.

The 28 innovative products and services across three key categories:

- Nexus Open Data Collaboration Platform.
- Nexus Federated Applications and Services.
- Nexus Hardware Assets.

The NEXUS Open Data Collaboration Platform aims to gather, organize, standardize, and analyse a vast quantity of quality multimodal network data, which will then be accessible through an open data collaboration marketplace. Establishing a comprehensive environment for sharing data and collaborating which will encourage innovation and the application of artificial intelligence.

NEXUS Federated Applications and Services covers 25 applications and services to be included in the Open Data Collaboration Platform's Apps and API portfolio. These will significantly leverage the wealth of accessible high-quality logistic data and synergies with other products in the ecosystem. Each of these digital products and services will have its own Unique Selling Proposition (USP) and *Go to Market Strategy*. They will be prepared for commercialisation both through NEXUS and as stand-alone solutions.

NEXUS Hardware Assets include innovative hardware-based products that offer significant synergies with the open data collaboration platform and all its applications and services.

6. Stakeholder Analysis Process

The NEXUS Agenda has emerged on the national scene as an entrepreneurial and innovative project. The unprecedented scope of the agenda gives the project the potential to strategically position the activities associated with the Sines corridor at an international level.

As clarified in the literature, the Stakeholder Analysis process consists of identifying individuals or groups that show some specific interest in the organization, either impacting it or being impacted by it, for example in the decision-making processes. The success of a project, especially an innovation project, can be determined by those who are involved (Kennon et al., 2009). In this sense, a stakeholder analysis was conducted as a way of trying to deeply understand the impact of stakeholder clusters.

In NEXUS Agenda's case, the target segments were identified. The process involved allocating stakeholders from the NEXUS ecosystem to quadrants in the matrix. The interviews with a freight forwarder, a cargo owner, a specialist in Ports, two technology firms / suppliers and a Portuguese taxpayer were a valuable contribution to identifying the stakeholders' needs regarding the NEXUS Agenda. This first process resulted in the definition of six main clusters: project partners, potential customers, professional experts, academic public, governmental institutions, and Portuguese and international population.

An adaptation of the 16-square matrix proposed by Kennon et al. (2009) was used, distributing the clusters into four quadrants. The matrix crosses the levels of influence, on the X axis, and the level of importance, on the Y axis (Kennon et al., 2009).

Figure 2 shows the Stakeholder matrix for the NEXUS project.

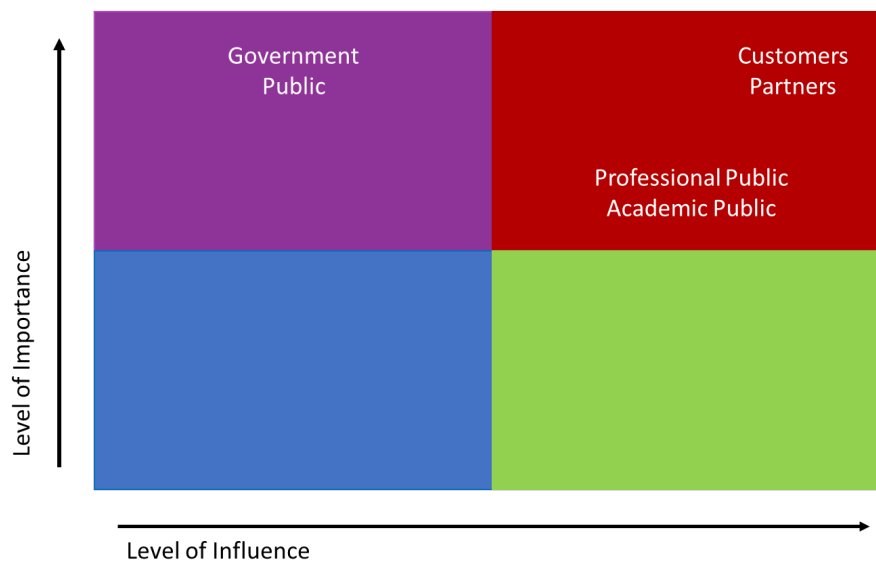


Figure 2: Stakeholder matrix – NEXUS Project

In figure 2 we can see that both the government and the [general] public are important but have a low level of influence in the outcome of the NEXUS project. The professional (specialists) and academic publics (higher education institutions) have a greater influence on the outcomes but are less important. Finally, customers (including potential customers) and [project] partners are both important and influential.

7. Discussion and Conclusion

Love change and hence implement the right strategy for all - and not just a strategy to maintain the status quo

(The Authors)

Transformation efforts “have gone under many banners: total quality management, reengineering, right sizing, restructuring, cultural change, and turnaround. But, in almost every case, the basic goal has been the same: to

make fundamental changes in how business is conducted to help cope with a new, more challenging market environment.” (Kotter, 1995).

The NEXUS project falls under Portuguese cultural norms, which mean high uncertainty avoidance (99/100) and low motivation towards achievement and success (31/100) (rather favouring quality of life) (Hofstede Insights, 2024). This may mean a subconscious attempt at maintaining essential processes and systems in place - rather than changing the fundamentals which need to be changed – as “innovation may be resisted” (Hofstede Insights, 2024). Change requires hard work. Change requires an embracing of the unknown. Will the senior leadership of NEXUS be up to the task – beyond incremental innovation and more in the direction of radical [technological] innovation?

Future NEXUS project difficulties may involve the following, as enumerated by Kotter (1995):

Error #1: Not Establishing a Great Enough Sense of Urgency

Error #2: Not Creating a Powerful Enough Guiding Coalition

Error #3: Lacking a Vision

Error #4: Undercommunicating the Vision by a Factor of Ten

Error #5: Not Removing Obstacles to the New Vision

Error #6: Not Systematically Planning For and Creating Short-Term Wins

Error #7: Declaring Victory Too Soon

Error #8: Not Anchoring Changes in the Corporation’s Culture

The above-mentioned errors correspond to phases which need to be traversed over a long period of time. These phases cannot be disregarded or jumped over as this will lead to failure. Haste is the enemy of a solid implementation - that sticks in the long term. All of the above eight errors may have tragic consequences for a project. Having said this, it is normal that even the best managers and leaders commit at least one big error during transformation efforts (Kotter, 1995).

The Kotter (1995) change model has gained a good reputation for addressing the main issues involved – including communication (or a lack of it). As regards error 4 - communication between partners is a constant, and frequent visits to the Sines Port have occurred during the NEXUS project.

As the project has not yet finished certain business implementation errors may still appear – to date, the project is on track. Project team members have been chosen on a voluntary rather than mandatory basis – all the better for the necessary intrinsic motivation (Amabile, 1998) to be present. Job satisfaction, passion, curiosity, and a personal challenge are all present at key points of the project – making for creativity to be nurtured and not killed (Amabile, 1998) – a prerequisite for success.

To sum up we would like to include a quote from an interview with a member of the Portuguese population – a Portuguese taxpayer. The interview was done on 17-04-2024 - by telephone and for around 10 minutes:

"From my point of view the NEXUS project makes sense, to the taxpayer, as if the general objective is to make ports more efficient, in Portugal, including Sines, then the money is well spent. To lower costs is essential, as is to contribute to a better functioning of ports, and to make them more profitable. Being a project aiming at mainly public entities it should be noted that private entities that use the ports will also benefit, from the better and improved services. Obviously, an online platform should not just be glossy and nice but provide real time information which is of use. Do not just provide the weather forecast, which we can get anywhere nowadays, from many other sources and sites... A better interaction with ports, which leads to added business, for a public good, is a good objective to have. As a taxpayer I am interested in that. More efficient public services. If the project does contribute to more traffic to our ports, stating when cargo will arrive and leave... without having to make telephone calls... that is advantageous. Anything that optimizes work is good and if that brings business to a Portuguese port instead of to Vigo, in Spain, or others, then all the better. Invest to gain something... to stimulate real time information, to make things more fluid, help logistics, that is good. Ports are a point of entry for wealth in the country and so as a taxpayer I am happy that money is being well spent. It is important to be efficient, have less people involved in the process, to make management processes quicker, this is all desirable." (a Portuguese taxpayer).

This research has some limitations. Considering that the project is still ongoing, there might be a lack of comprehensive data available for analysis, which could limit the depth of the findings. Stakeholder dynamics can change over time, and an ongoing project may encounter new stakeholders or shifts in existing stakeholders' interests, which may not be fully captured in the analysis.

Future research should include interviews with stakeholders after the project has finished. Have the objectives been achieved and the expectations fulfilled? Only then will we really be able to answer the research question: How may we successfully implement a multi-partner project which involves considerable investment, and which aims to digitalize maritime ports worldwide?

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References

- Aalders, A. F. (2023). The Basics. In A. F. Aalders (Ed.), *Cultivating Organizational Excellence: A Practitioner's View* (pp. 15–38). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-26289-0_2
- Ascencio, L. M., González-Ramírez, R. G., Bearzotti, L. A., Smith, N. R., & Camacho-Vallejo, J. F. (2014). *A Collaborative Supply Chain Management System for a Maritime Port Logistics Chain* (Vol. 12).
- Daly, H. E., & Cobb, J. B. (1999). For the common good. *Journal of Business Administration and Policy Analysis*, 27/29, 65–86.
- de Langen, P. W., & Haezendonck, E. (2012). *Ports as Clusters of Economic Activity*. <https://api.semanticscholar.org/CorpusID:167166232>
- Duncan, V., & Holtslander, L. (2012). Utilizing grounded theory to explore the information-seeking behavior of senior nursing students. *Journal of the Medical Library Association*, 100(1), 20–27. <https://doi.org/10.3163/1536-5050.100.1.005>
- Gilbert, D. U., & Rasche, A. (2008). Opportunities and problems of standardized ethics initiatives - A stakeholder theory perspective. *Journal of Business Ethics*, 82(3), 755–773. <https://doi.org/10.1007/s10551-007-9591-1>
- Harrison, J. S., Freeman, R. E., & de Abreu, M. C. S. (2015). Stakeholder theory as an ethical approach to effective management: Applying the theory to multiple contexts. *Revista Brasileira de Gestao de Negocios*, 17(55), 858–869. <https://doi.org/10.7819/rbgn.v17i55.2647>
- Herremans, I. M., Nazari, J. A., & Mahmoudian, F. (2016). Stakeholder Relationships, Engagement, and Sustainability Reporting. *Journal of Business Ethics*, 138(3), 417–435. <https://doi.org/10.1007/s10551-015-2634-0>
- Easwaramoorthy M., & Zarinpoush F. (2006). *INTERVIEWING FOR RESEARCH What is an Interview?* www.fao.org/docrep/W3241E/
- Hofstede Insights (2024). Country comparison tool: Portugal. Available at: <https://www.hofstede-insights.com/country-comparison-tool?countries=portugal>
- Kennon, N., Howden, P., & Hartley, M. (2009). Who really matters? A stakeholder analysis tool. In *Extension Farming Systems Journal* (Vol. 5). <http://www.csu.edu.au/faculty/science/saws/afbmnetwork/efsjournal/index.htm>
- Lavissière, A., Mandják, T., Hofmann, J., & Fedi, L. (2020). Port marketing as manifestation of sustainable marketing in a B2B context. *Journal of Business and Industrial Marketing*, 35(3), 524–536. <https://doi.org/10.1108/JBIM-12-2018-0409>
- Mendes Constante, J., de Langen, P. W., & Furió Pruñonosa, S. (2023a). Innovation ecosystems in ports: a comparative analysis of Rotterdam and Valencia. *Journal of Shipping and Trade*, 8(1), 18. <https://doi.org/10.1186/s41072-023-00145-w>
- Mendes Constante, J., de Langen, P. W., & Furió Pruñonosa, S. (2023b). Innovation ecosystems in ports: a comparative analysis of Rotterdam and Valencia. *Journal of Shipping and Trade*, 8(1). <https://doi.org/10.1186/s41072-023-00145-w>
- Miles, S. (2017). Stakeholder Theory Classification: A Theoretical and Empirical Evaluation of Definitions. *Journal of Business Ethics*, 142(3), 437–459. <https://doi.org/10.1007/s10551-015-2741-y>
- Musso, S., Perboli, G., Apruzzese, M., Renzi, G., & Selini, N. (2022). Innovative Business Models in Ports' Logistics. *Proceedings - 2022 IEEE 46th Annual Computers, Software, and Applications Conference, COMPSAC 2022*, 1702–1707. <https://doi.org/10.1109/COMPSAC54236.2022.00271>
- Nicotra, M., Romano, M., & Giudice, M. (2014). The Evolution Dynamic of a Cluster Knowledge Network: the Role of Firms' Absorptive Capacity. *Journal of the Knowledge Economy*, 5 (1), 70–93.
- Notteboom, T., P. A., & R. J.-P. (2022). *Port Economics, Management and Policy* (1st ed.). Routledge. Notteboom, T., Pallis, A., & Rodrigue, J.-P.
- Osterwalder, Alexander., & Pigneur, Yves. (2011). *Business model generation : inovação em modelos de negócios : um manual para visionários, inovadores e revolucionários*. Alta Books.

- Parmar, B. L., Freeman, R. E., & Harrison, J. S. (2010). *Stakeholder Theory: The State of the Art*. <https://scholarship.richmond.edu/management-faculty-publications>
- Pittaway, L., Robertson, M., Munir, K., Denyer, D. and Neely, A. (2004), "Networking and innovation: a systematic review of the evidence", *International Journal of Management Reviews*, Vols 5-6 Nos 3-4, pp. 137-168.
- Saunders, M.N.K., Lewis, P., Thornhill, A. (2019). *Research methods for business students*. 8th edition. Pearson.
- Vinod, G. K. , & Prakash, G. (2023). Evaluation of the potential for maritime cluster development in South Asia. *Australian Journal of Maritime & Ocean Affairs*, 1–25.
- Yuan, K., & Wang, X. (2024). Promoting Cleaner Production in Ports: Analysis of Joint Governance by Central and Local Governments. *Transportation Research Record*, 2678(2), 693–722. <https://doi.org/10.1177/03611981231175909>