

# Governance of Visibility Platform

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**Abstract**— A real-time transportation visibility platform develops its network by adding successive complementors. The governance mechanism benefits the platform owner the most and creates asymmetries among platform members. These asymmetries trigger cooptation, tensions between governance costs and co-created value, autonomy, and control. The intervention of a platform customer was the primary mechanism of managing the tensions. Resolving tensions between complementors and real-time visibility platform providers by sharing responsibilities and aligning incentives is critical for the successful performance of a real-time visibility transportation platform.

**Keywords**— *supply chain visibility, transportation visibility platform, platform governance, platform tensions, supply chain, digitization.*

## 1. Introduction

According to ref. [1] visibility requires integrating data from telematics systems and enterprise resource planning, transport management systems, and warehouse management systems. Because of incompatibilities of vendors, rules, processes, timeliness, and so forth, it is challenging to share helpful information externally, sometimes even internally. Having disparate systems makes it challenging to coordinate with partners, and differences by vendors and a lack of compatibility of the applications that are used prevent access to valuable external data. Ref. [2]. states that leveraging an internet-based platform to facilitate the exchange of information between supply chain partners was a powerful approach to avoid the complexities of integrating IT systems across the partner organizations. However, most research focused on the technological- and business aspect of platforms, taking the platform owner's viewpoint. According to ref. [3] little research has been conducted to understand and analyze heterogeneous complementors and customers in the platform ecosystem. The research questions of this study comprise: What are the governance

mechanism and tensions within the real-time visibility transportation platform? How to manage complementors to reduce tensions and improve governance mechanisms?

## 2. Literature review

Ref. [4] states that digital industrial platforms are platforms as:

- collect and integrate data from a heterogeneous set of industrial assets and devices,
- provide this data and additional technical support to an ecosystem of third-party organizations who develop and enable complementary solutions that affect the operation of industrial assets and devices, and provide a marketplace to facilitate interactions between platform owners, third parties, and business customers.

A technological architecture constituted of a modular core, standardized interfaces such as APIs called boundary resources [5], and complementary extensions and social processes: mechanisms for governing the ecosystem of complementors make up the organizational form that is the platform [6], [7].

Regarding platforms, governance can be interpreted as a mechanism affecting cooperation and coordination of their members and establishing technological standards for connectivity. Through governance, a platform owner exerts influence over other actors in the ecosystem [8], defining the ground rules for orchestrating interactions in the ecosystems [9]. Governance rules mainly include decision-making power and access ownership of the platform system; ecosystem participation and division of labour rules, platform pricing, and value distribution policy [10]. Ref. [11] suggest the platform owner facilitates information sharing between autonomous complementors and consumers in an ecosystem.

According to ref. [8] a platform's governance design encompasses three perspectives: governance by sharing responsibilities and authority, governance by aligning incentives, and governance by sharing stakes. Ref. [12] suggests governance of platform ecosystems is a process of considerable variation and change in practicing ecosystem-wide rules and values. This process has tangible consequences for co-created value and governance costs. Platform owners seek to minimize governance costs early in the partnership by closely

following the rules, limiting co-created value. Over time, some complementors can increasingly attract the platform owners' attention by demonstrating that the partnership has substantial co-creation potential. Ref. [13] studies pricing and revenue sharing as a governance mechanism in platform ecosystems which refers to payment flow within the platform ecosystem and how they are distributed between the different stakeholders. Researchers agree that pricing for platforms should follow a divide-and-conquer strategy, meaning that one side of the market is subsidized (divide). In contrast, the other side is priced at a premium to recover losses from the other side (conquer). Even in the absence of profits, platforms are often willing to set very low prices, i.e., predatory pricing. This pricing strategy results in considerable losses for a platform to scale quickly, undercut competitors, and, hence, build up market dominance by increasing the platform size [14].

The success of digital industrial platforms largely depends on their ability to attract an active ecosystem of actors. However, motivating actors to join a platform ecosystem is one of the key challenges in platform establishment, often labeled as the "chicken-or-egg problem" [15]. Hence, platform governance requires addressing several interdependent tensions, including the need to balance platform openness and control, exerting influence over the quality and range of complements, managing simultaneous collaboration and competition with complementors, and creating ecosystem value while also capturing some of that value [16]. All platform systems exhibit tensions between platform owners and complementors. For multi-sided platforms, the main threat is disintermediation: by replicating or reverse-engineering the platform side of these interfaces, rivals may be able to "clone" the platform itself and compete with it directly [17]. Complementors strive for competitive differentiation, focusing on their own portfolio of domain expertise, market mechanisms, relational capital, and sector knowledge to create locally relevant solutions [7]. Managing complementor engagement is rife with contradictions. To foster generativity (i.e. evolvability), the independence of complementors, who work autonomously to satisfy customer needs, must be promoted and facilitated. To create and maintain a coherent, shared identity for the platform (i.e., stability), however, complementors' pursuit of their own interests must be balanced with the interests of other players in the ecosystem. While there is ample research on the challenge of balancing a platform's stability with its evolvability, it focuses predominantly on governance mechanisms as the primary means for reconciling these competing demands [7]. Platforms need to balance complementarity and competitiveness of their actors [7]. If

complementors join a platform, they can change their role to competitors [6], [14]. Platforms need to balance the complementarity and competitiveness among complementors [11], which implies managing the contradiction between a platform's evolvability to foster generativity and its stability to enable efficiency and complementors' value capture [7]. Tensions in pricing and the provision structure between platform owner and complementor illustrate the asymmetries in the negotiating power between the platform provider and complementor. The imbalances and power asymmetries entail the risk of a loss of trust between a platform provider and complementors. However, trust is a significant factor for the relationship between the platform provider and complementor for the platform's long-term success. A fair and sustainable governance structure has a significant positive impact on the motivation of complementors to engage on the platform [3].

The problems of information sharing and connectivity affect a gap between the theory and practices of real-time solutions deployment in the supply chain [18] [19], and seek to be solved by establishing a platform. Likewise, little research attention has been paid to the application of understanding the governance and tensions of a platform for real-time visibility and industrial digital platforms. Most insights on governance strategies and their effectiveness in driving complementary innovation are based on business-to-consumer (B2C) platforms [20]. Despite the increasing significance of platform-based business models, a clear understanding of the interplay of platform strategies and ecosystem conditions and governance of platforms is the need of the hour. The scholars call for research on how platforms balance seemingly conflicting tensions (e.g., openness vs. control; collaboration vs. competition with complementors) [14]. The next gap in the literature regards understanding the design and governance of a platform for real-time visibility in the network where subcontracting predominates.

### 3. Methodology

Ref. [21] recommends case studies as a valuable approach in the first stages of theory development, primarily when they examine phenomena with a theoretical background. Participant observation activities were used as the primary approach for collecting qualitative data. Observation through participation is a complex research method because it often requires the researcher to play a number of roles and to use some techniques and has been used extensively as a research method in situations where behaviours are complex, difficult, or embarrassing for participants to recall or describe [22].

As the Logistics Research and Development center team member in the European Control Tower of the fast-moving consumer goods company, the role of the researcher was to support the projects that automate and digitize the transportation network and supply chain. Logistics Control Tower acts as a focal company and coordinator from the point of view of material and information flows. Integration of data necessary to achieve real-time visibility is in the hands of a real-time transportation visibility platform. From the perspective of platform partners, a focal company is a customer, whereas transport service providers, GPS providers, IT providers are complementors. The real-time visibility platform deployment should enable elimination and optimization logistics processes, with an ambition of zero-touch logistics.

The study uses various methods for data collection and analysis (Table 1). In the first phase, onboarding calls and follow-up meetings discussed tensions and governance mechanisms. The onboarding call introduced the project, presented requirements to Key Account Manager of Transport Service Provider, IT contact, GPS Provider contact, and deadlines associated with every task. After the onboarding calls, the implementation specialist, either from a focal company or visibility provider, sent minutes. Afterward, it followed communication encompassing emails and calls. The follow-up calls were valuable information as the participants discussed deployment issues that revealed tensions. The other source of qualitative information was weekly meetings during which procurement, transport planning, internal customers service, and external stakeholders, i.e., the real-time visibility platform team, discussed the progress of the deployment (Table 1).

**Table 1.** Information sources

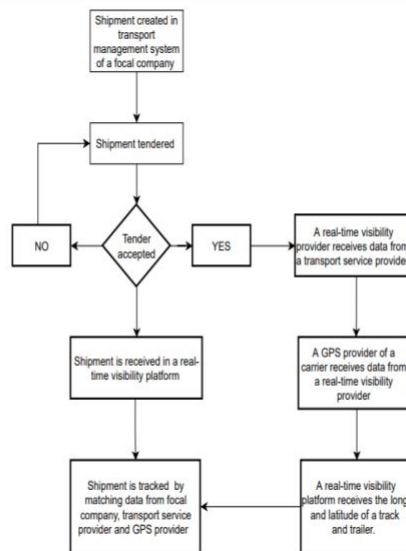
Meetings	Researcher role	Informants
Onboarding calls and follow-up meetings	Observer Facilitator Interviewers	Transport Service Providers (Key Account Manager, IT Specialist, IT providers (Specialists), GPS providers (Specialist), Platform owner (implementation specialist)
Weekly compliance calls	Facilitator Providing and presenting analysis	Platform customer (Procurement Specialists), Platform owner (Implementation Specialists)
Workshops	Facilitator	Platform owner (Vice President, Key Account Manager, Implementation Specialists) Platform customer (Procurement Specialists)

The workshops set up by a focal company to discuss methods to accelerate deployment were the forum to share views and perspectives on managing tensions with complementors.

#### 4. Findings

Complementors of the platform comprise transport service providers, GPS providers, IT providers, a competing transportation visibility platform, freight exchange. Following the alignment between a platform owner and customer, the customer's project identifies a critical mass of high-priority carriers to onboard during the customer's implementation cycle. Onboarding carriers should also be a collaborative effort between both the platform owner and a customer. It is incumbent upon the customer to require its common carriers and brokers to collaborate and comply with a platform owner. Hence, the transportation visibility platform owner triggered requirements, and a platform customer needs from complementors (transport service providers) to comply with platform requirements. The obligation of the

transport service provider was to send data to the owner of a platform. When problems arise, the procurement team of a focal company (platform customer) should intervene with the transportation providers. The governance mechanism benefited the platform owner the most and created asymmetries of costs and benefits among platform members. Data process flow illustrates the mechanisms through which a platform owner exerts influence over other actors in the ecosystem (Figure 1).



**Figure 1.** Data flow

The owner of a visibility platform integrates data from a customer and complementors. However, they used a customer to impact the other complementors to build capabilities needed for integration. The technological boundary resources are API, FTP.

While the real-time transportation visibility platform owner receives a subscription fee and is paid for the carrier's onboarding, transport service providers (complementors) do not directly benefit from being a platform member. The platform owner does not share a fee with complementors, though they must invest in capabilities for connectivity. A real-time visibility transportation platform owner attempts to attract complementors by offering the status "carrier of the month", "trusted carrier". Asymmetry of effort triggers tensions among the platform owner and complementors. The only potential indirect benefit is that transport service providers can use the capability to enable shipments for real-time visibility as the argument in the negotiations of a business contract with a focal company; however, still, costs and service are more important. Asymmetry of risk, rewards, and benefits for transport service providers, particularly freight

forwarders and a real-time visibility platform, hinder information sharing willingness. The value of a real-time transportation visibility platform network grows exponentially in line with an increasing number of members. A real-time transportation visibility platform develops its network by adding successive complementors (carriers, GPS providers). They benefit from a platform customer and complementors data, information, and knowledge.

These asymmetries trigger competition tensions between governance costs and co-created value, autonomy, and control. A platform customer (focal company) forces freight forwarders to collaborate with a platform provider. Freight forwarders (complementors) cooperate with a platform owner because of their willingness to be directly rewarded for developing capabilities necessary for tracking shipments in real-time.

Freight forwarders as complementors can become competitors to a real-time transport visibility platform through integrating subcontractors, resulting in competition and control versus autonomy tensions. This integration prevents the direct connection of subcontractors with the owner of a real-time transportation visibility platform. Willingness to achieve a role of a network integrator triggered tensions between autonomy and control.

Both needs for autonomy and aspiration to be a network integrator are reasons for competition between freight forwarders and the real-time transportation visibility platform owner.

Some freight forwarders (complementors) signed a contract with the competing transportation visibility platform, integrating more carriers than a transportation visibility platform selected by a discussed customer. This transportation visibility platform should send data directly to the transportation visibility platform selected by a focal company. This tension blocked the data sharing as the transportation visibility platform selected by some freight forwarders required the additional sum to be paid. Intervention of a focal company contributed to unlocking the capability of sharing data without further payment.

The transportation visibility platform selected by a focal company made efforts to increase the number of integrated subcontractors (complementors) and started collaborating with a digital freight exchange. The freight exchange should share the data from carriers with the transportation visibility platform. However, freight exchange quickly built its capabilities to track and trace data in real-time. The relations between transportation visibility platform and freight exchange evolved from collaboration, through collaboration and competition to pure competition.

There is also a tension between governance costs and the tangible and intangible benefits resulting from the combination of resources of the partners and platform complexity and development costs. Freight forwarders could not convince drivers to use the application for tracking shipments by offering them an additional bonus.

## 5. Conclusion

This study investigates tensions as the reason behind behaviours of transportation visibility platform members. The governance mechanism benefited the platform owner the most and created asymmetries of costs and benefits among platform members. The tensions between autonomy, control, and cooperation are because of the asymmetry of efforts between platform owners and complementors. The only mechanism of managing the tensions was the intervention of a focal company (a platform customer). The procurement team from the focal company should fix tensions between complementors (subcontractors) and the platform provider. They preferred to fulfill costs and service goals over reaching high compliance on tracked shipments.

Resolving tensions between complementors and real-time visibility platform owner is a key for the successful performance of a real-time visibility transportation platform. A transportation visibility platform owner should share the fee with transport service providers without reliance on a transportation visibility platform customer. Freight forwarders (complementors) should ensure freight-forwarders and sub-contractors provide tracking information to avoid tensions. Adding the contractual obligations to enable shipments for monitoring can not be sufficient as there are more important KPIs regarding on-time delivery, on-time collection. The platform owner and platform customer should align on governance mechanisms to resolve tensions amongst the platform members. The points to align between platform owner and platform customers should be: owning the onboarding process, responsibility for ensuring 100% compliance, sources of tracking i.e. integration with GPS hardware, integration with portable GPS hardware, integration with mobile apps technical bugs resolution, customer enhancement timeline.

The recommendation is a bonus-malus scheme to ease tensions among the platform members. Following the scheme, complementors could be awarded or punished depending on tracking real-time shipments. The scheme should balance the asymmetries of benefits from being part of a real-time visibility transportation platform. Resolving tensions between governance costs and co-created value would require the platform owner to ensure

freight-forwarders and sub-contractors provide tracking information. The focus should be on the critical operational lanes where the waste i.e. demurrages costs, are high and high responsiveness needful. Solutions across all modes (i.e. road, rail, air, ocean), and an accurate expected time arrival for LTL and cross-docked deliveries should be the next step because of high costs.

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