Visibility in complex supply chains. Platform, governance, tensions.

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1. Introduction

The cause-effect relationship between supply chain visibility and business performance can be ambiguous (Somapa et al., 2018). Transportation shipments can affect supply chain visibility, making it a matter of concern (Holcomb et al., 2011).

Organizational factors rather than technological factors create the most significant barriers to visibility. Organizational silos, unwillingness to share information, lack of time, lack of rewarding systems, and increased levels of work are the primary concerns (Somapa et al., 2018).

Apart from the theory, the paper encompasses evidence from the field on deploying a real-time transportation visibility platform. Each discussed category includes both theoretical and practical insights.

2. Platform and real-time visibility

2.1.Theory

Real-time visibility requires integrating data from telematics systems and enterprise resource planning, transport management systems, and warehouse management systems. As a result of incompatibilities of vendors, rules, processes, timeliness, and so forth, it is challenging to share helpful information externally, sometimes even internally (Lee & Rim, 2016). 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. The leveraging of an internet-based platform to facilitate the exchange of information between supply chain partners has shown itself to be a powerful approach to avoid the complexities of integrating IT systems across the partner organizations (Schrieck et al., 2017).

Digital industrial platforms are platforms as (1) collect and integrate data from a heterogeneous set of industrial assets and devices, (2) provide this data and additional technical support to an ecosystem of third-party organizations who develop and enable complementary solutions that (3) affect the operation of industrial assets and devices, and (4) provide a marketplace to facilitate interactions between platform owner, third-parties and business customers (Pauli et al., 2021). Real-time visibility platforms can be classified as the multi-sided (de Reuver et al., 2018) digital industry (Pauli et al., 2021) supply chain platform with contractual relationships.

2.2. Business practice

Because 65% of all shipments are subcontracted, the global IT procurement team chose a real-time visibility platform supplier also for the focal company European transportation network managed by Logistics Control Tower. The real-time visibility platform deployment scope encompassed the transportation network of 45 own factories and 260 co-packers, 60 warehouses from which Logistics Service Providers managed the vast majority. Yearly the number of full truckloads amounted to 260 thousands. The number of companies provided transport services accounted for 110. Logistics Control Tower acts as a focal company and coordinator from the point of view of material and information flows. The role of an integrator of data necessary to achieve real-time visibility belongs to a real-time transportation visibility platform. From the point of view of platform roles, a focal company is a customer, whereas transport service providers, GPS providers, IT providers are complementors.

3. Platform governance

3.1.Theory

Platform governance concerns decisions about a platform. Governance broadly refers to who decides what a platform's ecosystem is. A digital platform ecosystem comprises a platform owner that implements governance to facilitate value-creating mechanisms on a digital plat-

form between the platform owner and an ecosystem of autonomous complementors and consumers (Hein et al., 2020) .

Governance impacts the evolutionary dynamics in platform ecosystems, and the competitive advantage generated by governance choices can strengthen or diminish with the choice of architecture for the platform (Tiwana, 2014). A governance model, includes rules for participation, interaction, and resolution of conflict. Participation rules govern openness, defining who can affiliate with the platform. Interaction rules govern behavior on the platform, division of surplus, privileges, and responsibilities (Parker & Van Alstyne, 2016). Depending on the ownership status of platforms, the platform owners establish governance mechanisms that define the ground rules for orchestrating interactions in the ecosystems (Hein et al., 2020). Platforms need tools to orchestrate the interactions between the different sides involved, so-called platform governance mechanisms (Schreieck et al., 2017).

Pricing and revenue sharing have been studied as a governance mechanism in platform ecosystems which refers to payment flows within the platform ecosystem and how they are distributed between the different stakeholders. (Schreieck et al., 2016).

3.2. Business practice

Complementors of the platform encompass transport service providers, GPS providers, IT providers. On-boarding was led depending on a case either by a focal company or transport service provider team. A focal company ensured that the transport service provider delivered the required contact details to data suppliers encompassing the GPS provider and IT provider if necessary. The obligation of the transport service provider was to streamline communication with data suppliers and chase them if necessary. Once issues occurred, the procurement business team of a focal company should be involved in a conversation with carriers. The business transport team of a focal company with designated project champions supported the on-boarding team to resolve potential operational issues and monitoring benefits from a deployment.

4. Tensions

4.1.Theory

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 (Rietveld & Schilling, n.d.).

As the first avenue for digital platform ecosystem research is to attract complementors and ensure that they continuously engage with the platform (Hein et al., 2020). Given the nascent and rather fragmented market, the success of digital industrial platforms will largely depend 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” (Tiwana, 2014). Complementor can change its role competitor and vice versa which is particularly relevant for digital platforms (Gawer, 2014).

Competitive strategy describes whether competition, collaboration, or the mélange of both, coopetition, is the most suitable strategy to establish a platform ecosystem among competing ones (Schrieck et al., 2016).

4.2. Business practice

Asymmetry of risk, rewards, and benefits for 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. By adding the successive carriers as well as GPS providers, they develop its network. They benefit from a platform customer and complementors data, information, and knowledge. While the owner of real-time transportation visibility platform is paid per shipment tracked in real-time, transport service providers do not receive any direct benefit of being a member of the platform. The only indirect benefit is that they 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. These asymmetries trigger coopetition tensions between governance costs and co-created value, autonomy and control. From the end of freight forwarders, collaboration is unintended and forced by pressure from a focal company. In contrast, competition results from the willingness to be directly rewarded for developing capabilities necessary for tracking shipments in real-time.

Freight forwarders can be real-time transportation visibility platform owners and gain a position of a network integrator thanks to the integration of subcontractors. The latter is to prevent direct integration of subcontractors with the owner of a real-time transportation visibility platform. Willingness to earn 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 behind competition between freight forwarders and the real-time transportation visibility platform.

Conclusions

Capabilities and willingness of supply chain partners to enable shipments for real-time tracking should be verified before deciding to implement a real-time transportation visibility platform. What is their current coverage of the GPS market of a real-time visibility transportation platform? What hardware can they offer to provide GPS tracking? Can they calculate accurate Expected Time of Arrival for every shipment? Can they provide an accurate expected time of arrival for LTL and cross-docked deliveries and intermodal shipments? Can they offer an e2e solution for a customer across all modes (i.e. road, rail, air, ocean)? are examples of questions that should be addressed before the decision on deployment of a real-time visibility transportation platform.

The owner of a real-time visibility platform should own transport service providers (complementors) onboarding process. After onboarding, the owner of a transportation visibility platform should be responsible for ensuring 100% compliance. They should, for example, share the fee with transport service providers, without reliance on a transportation visibility platform customer in order to manage tensions efficiently

References

- de Reuver, M., Sørensen, C., & Basole, R. C. (2018). The Digital Platform: A Research Agenda. *Journal of Information Technology*, 33(2), 124–135. <https://doi.org/10.1057/s41265-016-0033-3>
- Gawer, A. (2014). Bridging differing perspectives on technological platforms: Toward an integrative framework. *Research Policy*, 43(7), 1239–1249. <https://doi.org/10.1016/j.respol.2014.03.006>
- Hein, A., Schrieck, M., Riasanow, T., Setzke, D. S., Wiesche, M., Böhm, M., & Kremer, H. (2020). Digital platform ecosystems. *Electronic Markets*, 30(1), 87–98. <https://doi.org/10.1007/s12525-019-00377-4>
- Holcomb, M. C., Ponomarov, S. Y., & Manrodt, K. B. (2011). The Relationship of Supply Chain Visibility to Firm Performance. *Supply Chain Forum: An International Journal*, 12(2), 32–45. <https://doi.org/10.1080/16258312.2011.11517258>
- Lee, Y., & Rim, S.-C. (2016). Quantitative Model for Supply Chain Visibility: Process

- Capability Perspective. *Mathematical Problems in Engineering*, 2016, 1–11. <https://doi.org/10.1155/2016/4049174>
- Parker, G., & Van Alstyne, M. (2016). Platform Strategy. In M. Augier & D. J. Teece (Eds.), *The Palgrave Encyclopedia of Strategic Management* (pp. 1–9). Palgrave Macmillan UK. https://doi.org/10.1057/978-1-349-94848-2_435-1
- Pauli, T., Fiel, E., & Matzner, M. (2021). Digital Industrial Platforms. *Business & Information Systems Engineering*, 63(2), 181–190. <https://doi.org/10.1007/s12599-020-00681-w>
- Rietveld, J., & Schilling, M. A. (n.d.). *Platform Competition: A Systematic and Interdisciplinary Review of the Literature*. 36.
- Schreieck, M., Hakes, C., Wiesche, M., & Krcmar, H. (2017). Governing Platforms in the Internet of Things. In A. Ojala, H. Holmström Olsson, & K. Werder (Eds.), *Software Business* (Vol. 304, pp. 32–46). Springer International Publishing. https://doi.org/10.1007/978-3-319-69191-6_3
- Schreieck, M., Wiesche, M., & Krcmar, H. (2016). Design and Governance of Platform Ecosystems—Key Concepts and Issues for Future Research. *ECIS*.
- Somapa, S., Cools, M., & Dullaert, W. (2018). Characterizing supply chain visibility – a literature review. *The International Journal of Logistics Management*, 29(1), 308–339. <https://doi.org/10.1108/IJLM-06-2016-0150>
- Tiwana, A. (2014). *Platform ecosystems: Aligning architecture, governance, and strategy*. MK.