How to Successfully Implement a Transportation Management System — Part 2: Execute

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Initiatives: Supply Chain Technology Strategy and Selection

Focusing on key tasks such as interfaces, training and testing during the implementation of a TMS can help reduce implementation time and cost and avoid roadblocks. Supply chain technology leaders can use this research to learn how to overcome pitfalls in TMS implementation.

Overview

Key Findings

- Underestimating effort and time to accomplish tasks, such as preparing master data or building the necessary integrations to other systems, can cause the transportation management system (TMS) implementation to disrupt important operational processes and produce unexpected and unusable results.

- Data migration and data validation and verification can be cumbersome tasks; however, they are very important contributing factors to the success of the project.

- Overlooking the readiness of the business organization for TMS deployment can put the successful implementation at risk, as the organization (end users) or the system itself might not be ready to replace current systems and processes.

Recommendations

Supply chain technology leaders responsible for ensuring the success of a TMS implementation should:

- Avoid operational, process and optimization misalignment issues in configuration and integration by identifying internal customizations and ensuring teams can support integration and data preparation tasks.
Introduction

TMS vendors continue to reduce the complexity and lead times during the implementation process by introducing different project methodologies (agile versus waterfall), prebuilt integrations with other systems, templatized configuration and a more structured approach. And it appears those efforts are working. A recent Gartner survey indicates that about 48% of the customer references that implemented a TMS answered that the process took six months or less (see Figure 1).

Figure 1: TMS Implementation Times

- Get the organization’s super users ready by involving them in the creation and execution of user acceptance testing (UAT) and the validation and verification of data and configuration of the TMS.
- Increase your chances for a successful TMS rollout by designing an effective end-user training program and ensuring stakeholders impacted by the change are informed.
This is in line with the current estimated TMS implementation times promoted in the market for one site with average complexity operations. As indicated in the first part of this series, every TMS vendor has its own implementation process (see How to Successfully Implement a Transportation Management System — Part 1: Design). But despite certain differences, TMS implementations typically follow an identifiable process consisting of the six different phases, as illustrated in Figure 2.

Figure 2: TMS Implementation Process Phases

This research covers Phases 4 through 6, which mainly focus on the execution of the implementation tasks that were identified in Part 1. In these execution phases, the organizations’ teams are required to do the groundwork of the implementation — building interfaces, configuring the solution, preparing and reviewing the master data, testing the solution, and ultimately preparing and training the end users for the go-live of the TMS. Organizations that are starting to explore, or that have recently selected, a TMS application can use this research to help them avoid some of the more common challenges that can negatively impact the second part of their implementation phase.

Note: This research is the second part in a series of two and focuses on providing an overview of TMS implementation best practices during the phases of system configuration, verify and validate, and deployment and go live. The first part focuses on the design of the TMS implementation, where the preparation, project initiation, and discovery and design phases are described (see How to Successfully Implement a Transportation Management System — Part 1: Design).

Analysis
System Configuration — Avoid Operational, Process and Optimization Misalignment in the TMS Configuration and Integration

Once the requirements are elicited and the processes (“as-is” and “to-be”) are reviewed and confirmed by the TMS buyer and vendor, the project moves to the system configuration phase. In this stage, the vendor will start configuring the TMS system as specified in the previous phase, considering the different requirements, modes of transportation, capabilities and interfaces to other applications. A good part of the work in this phase is carried out by the TMS vendor or vendor integrator (interface data mapping, initial configuration and solution development if customizations are required).

However, the organization implementing the TMS usually is still responsible for some tasks such as interface preparations, including the creation of interface test scenarios, and the collection and preparation of master data. The time and effort to accomplish those tasks are often underestimated as organizations fail to understand the full scope of their transportation and technology needs and requirements. In this stage of the project, organizations’ key priorities should be to identify internal customizations and have their teams ready to support integration and data preparation tasks (see Figure 3).

**Figure 3: TMS Implementation Process Phase 4: System Configuration — Key Considerations**

<table>
<thead>
<tr>
<th>Preparation</th>
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**Identify Internal Customizations**
- Identify customized software that can impact the integration of the TMS
- Confirm timelines and allocation of IT resources
- Document integration mapping changes

**Be Ready for Action**
- Be proactive
- Remain communicative with external stakeholders
- Establish integration success outcomes

*Source: Gartner 754658_C*
Interface Preparation

This includes the development, configuration and/or customization of interface(s) of those systems that connect to the TMS owned by the organization, such as ERP, the warehouse management system (WMS) or order management solutions. Typically, the introduction or replacement of a TMS disrupts the workflow with the interfaced systems. It is essential that personnel from the organization's IT department are involved in identifying the interfaces and developing the changes. Business stakeholders involved in the design of the TMS operational processes should support the IT staff in this task by providing details on the process handover points and the data exchange expected between different applications.

Although many TMS vendors position themselves as ERP-ready (for example, Infor, Oracle, QAD or SAP, among others) or able to integrate via APIs, the reality is that this works well with the standard configuration of these ERPs. However, we find, most organizations implementing a TMS indicated that their ERPs and other systems are customized or highly customized.

Customizations in applications interfacing to the TMS increase the time and effort required to fulfill this task during the implementation project, as the differences between the interface versions need to be analyzed, confirmed, developed and tested. Organizations should consider this when allocating time and effort for this task in the project plan.

Not only the development work on the interface needs to be carried out. In addition, the corresponding documentation of this work as well as the design of the tests should confirm the success of the developed changes.

Master Data Preparation

This task relates to the collection, preparation and validation of master data for the TMS. At Gartner, we have seen from past client interactions that the time and effort required to do this task are often underestimated. Organizations need to consider that prior to uploading a dataset to a new TMS, this data needs to be reviewed, then cleansed and finally validated.

Although at a glance, collecting and preparing the data looks like a simple task, the reality is that this is quite time-consuming. The data typically required for TMS implementation includes, but is not limited to:
Another complexity element for master data preparation is whether data needs to be migrated from existing legacy transport applications to the newly implemented TMS. In such cases, it’s extremely important to ensure that the migrated data has been thoroughly reviewed and validated.

Failing to adequately prepare the data will result in further problems with the utilization of the TMS. In this task, the common computer science and mathematics proverb, “garbage in, garbage out” (GIGO), certainly applies. Optimization rules, configuration of routes or automation of processes, such as rate tendering or calculation of ETAs for delivery, might not work as expected, impacting operational performance to the point of questioning the need for the TMS.
Verify and Validate — Ensure a High-Quality Implementation

“The bitterness of poor quality remains long after the sweetness of low price is forgotten.”

— Benjamin Franklin

This quotation from Benjamin Franklin in the 19th century is especially true for TMS implementations in the 21st century. Failure to verify requirements and validate TMS capabilities to ensure a high-quality implementation was a key constraint identified by many customer references.

Once the system is configured based on the provided requirements and a cleansed set of data is uploaded, the verify and validation phase starts. This phase will determine if the TMS is configured correctly and confirm the integration to other applications (ERP, WMS, among others) or carriers work as specified (verify). Additionally, in this stage the uploaded data prepared before, and the configured processes, optimization rules and TMS capabilities, are reviewed and fine-tuned to confirm that the TMS can fulfill the requirements it is supposed to support (validate). Organizations must focus on the key considerations shown in Figure 4 and commit to allocating sufficient time during these tasks to ensure the right outcome.
During the verify and validate phase, organizations need to allocate a good amount of training for their super users, or key users, as this affects the longer-term success of projects. Business super users and technical IT resources will be responsible for the creation and execution of user acceptance testing (UAT) test cases, because neither business nor IT can design UAT independently. Business users know the scenarios they want to test, and technical IT resources will know how the TMS should actually meet those scenario requirements; therefore, the creation of UAT tests should be a collaborative exercise. Additionally, the super users will be responsible for supporting the design of the test cases. And although most organizations seem to allocate a significant amount of time for testing and training at this phase (around two to three weeks), some have reported that more time spent on this task would have helped them with the go-live phase.
Together with the previous Phase 4 (system configuration, see Figure 2), this verify and validate phase is one of the most time-consuming phases during the implementation of a TMS. Planning the time and resources required to accomplish the tasks involved in this phase is the key to success. And a common mistake is rushing to confirm the UAT without a solid base of real-life case scenarios, and focusing only on basic scenarios and functionality just to meet the previously agreed go-live date. Those basic scenarios could be preparing and executing tenders to carriers, maintaining and searching rates, point-to-point delivery, pickup shipments or the allocation of costs and accruals to shipments. All those are siloed scenarios that rarely are executed separately from each other. Organizations should keep their focus on testing how the data flows through the different modules and capabilities of the TMS and ensure that this configuration supports the end-to-end shipment processes as defined by the organization.

Organizations should verify and validate that the provided TMS configuration is correct and the provided dataset was migrated correctly by testing the TMS using detailed test case scenarios that mirror real-life processes and expected outcomes. It’s very important to test both the normal successful process flow as well as the exceptions or anomalies that might happen such as late order changes, carrier declines or integration errors.

**Be Flexible on Go-Live Dates**

As recommended by one organization participating in the TMS research: “Do not jeopardize testing and training and be flexible on go-live dates.” While it’s unrealistic to know all the capabilities and functionalities of the TMS in a few weeks of training, super users should have a good level of knowledge on capabilities so they can provide first-line support to end users during the deployment and go-live phase, providing first line support. Organizations should prepare a compelling UAT by including data that would be used in a production environment, and real-life case scenarios and expected outcomes instead of using the standard TMS vendor-provided UAT version.

At this point, it is important not to fall into changes that address the needs of the few instead of the many. During testing, and depending on who was involved, organizations often find some part of the processes that might not have been considered in the early design phase and might not be part of the new operational process strategy of the company. This might lead to requests for changes to the TMS, including new configurations or even customizations. Organizations need to carefully evaluate if a change would truly make an impact or if it can be solved with a supporting workaround (for example, entering a remark in a specific field or outside the TMS). Organizations need to consider that, typically, the later the change is addressed in the implementation of the TMS, the higher the cost.
Deployment and Go-Live — Ready, “Study,” Go!

The deployment and go-live phase is the final step in TMS implementation. Here is where the preparation efforts of having a clear and compelling set of master data, super users properly trained and the TMS configuration tested is finally put to the test. As indicated in Gartner research, Maximize Business Success in the Deployment Phase of a Transportation Management System Implementation, preparation is key to success in this phase (see Figure 5).

**Figure 5: TMS Implementation Process Phase 6: Deployment and Go-Live — Key Considerations**

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<tbody>
<tr>
<td><strong>Test Last-Minute Configuration Changes</strong></td>
<td><strong>Reinforce Training</strong></td>
<td><strong>Perform a Gap Analysis and Adjust as Needed</strong></td>
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Organizations must ensure that the deployment option (pilot project, MVP and others) selected during the TMS project initiation is still valid and that the stakeholders (end users, carriers, among others) and the technology are ready for it. This includes confirming that:

- All master data and required operational data for the TMS rollout is loaded in the TMS system.
- The initial training for TMS end users was successfully finalized.
- Configurations and customizations suggestions collected from end-user training have been evaluated and considered for the TMS rollout (approved or rejected).
The super users trained in previous phases are often responsible for providing training to the final end users, as many vendors use the “train the trainer approach” to reduce the cost of the TMS implementation. Although modern TMS solutions are typically user-friendly, and usability is an area where more vendors are investing nowadays, it is recommended that organizations implementing a TMS emphasize the importance of training the end users. Creating specific training material aligned with the organization’s operations and processes should help end users to better understand the functionalities offered in the TMS. Using real-life examples and real-life data in training scenarios help end users assimilate the new TMS concepts and capabilities. Either with end-to-end scenarios (from tendering to POD receipt) or just specific processes, the end user should be trained on, for example, tender, planning and outbound execution. Customizing the training helps assimilate the new TMS concepts, and provides the end users with the opportunity to identify potential areas of improvements in real-life processes prior to the TMS go-live.

**A Need for Continuous Training**

Some organizations have recognized the importance of having a continuous training program to ensure that end users are up to date with new functionality released by TMS vendors. This continuous training program can be done through a simple yearly evaluation test — sort of a certification test — or in a more sophisticated manner through an online e-learning module. As TMS solutions deployed in the cloud typically get updates every half or quarter of the year, it is important to identify how the changes to functionalities and capabilities could impact the organization’s TMS configuration and use. Some of the new capabilities might provide new and more optimal ways to operate; for example, the introduction of new optimization rules to the routing capabilities.
Evidence

1 Magic Quadrant for Transportation Management Systems. A survey based on TMS references was conducted as part of data gathering efforts to help Gartner build existing knowledge of the selected vendors in this market. As part of the process, all 18 selected vendors were asked to submit a minimum of six references that had not been provided previously and represented TMS implementations. The vendors provided reference contact information, which we used to invite the references to complete a 30-minute survey. A total of 117 customer references completed the survey from November 2019 through December 2019. Vendor reference data is different from primary research and is not a representative knowledge base of the TMS market. The 117 references do not represent customers in the overall TMS market in an exhaustive manner. Rather, they represent select customers that the participating vendors chose to share with Gartner and that elected to participate as reference checks.

Document Revision History

How to Successfully Implement a Transportation Management System — Part 2 - 27 January 2020

Recommended by the Author

Some documents may not be available as part of your current Gartner subscription.

How to Successfully Implement a Transportation Management System — Part 1: Design

Magic Quadrant for Transportation Management Systems

Supply Chain Brief: Customer Experience Becoming a Priority in Transportation Technology

How to Select the TMS, Provider and Solution Best Suited for Your Strategic Capabilities

Tool: RACI Matrix for TMS Implementation

Tool: TMS Integrator Finder

Increase the Success Rate of TMS Implementation by Creating Change Awareness Upfront

How to Calculate the Return on Investment for a Transportation Management System

Gartner’s Model for Holistic Multimodal Transportation Management Systems — Part 1: Core Capabilities