

DYNAMIC LOGISTICS FINANCIAL MANAGEMENT AND COST-TO-SERVE

An overview of how aThingz' Cubera™ product enables superior logistics financial management through dynamic cost-to-serve performance reporting and analysis.

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1 Introduction

aThingz is a supply chain software company that focuses on logistics optimization and logistics performance management. aThingz refers to their solution set as Sales, Logistics, Operations Planning with Execution (SLOPE). Think of SLOPE as S&OP for global transportation and logistics. (See [“What the Heck is aThingz?”](#) for a description of how aThingz has used first principles thinking to build a software solution unlike any other in the logistics space).

A critical part of the aThingz solution set is its logistics financial management product, which is called Cubera™. Cubera™ provides the ability to perform multi-dimensional cost-to-serve analysis, drill down on variances, identify root causes, prioritize and stack rank improvement areas and monitor improvement projects.

Cost-to-serve is an analytical capability that allows companies to understand the costs of producing, storing, and fulfilling orders, often for a specific product to a specific customer, geography, and for a particular timeframe. The concepts behind cost-to-serve have been around for decades. However, state-of-the-art is still one of a project-orientation – cost-to-serve analysis is performed to drive improvement projects or other projects such as supply chain segmentation, and then it is set aside and not kept up to date. In other words, it is not dynamic, and it’s not continuous.

In the context of the logistics space, this is the gap that aThingz has solved with its Cubera™ product. From a terminology perspective, Cubera™ distinguishes between the following two terms:

- **Logistics Financial Management – is the overall process of dynamically managing logistics costs and improving performance to budget and plans.**
- **Cost-to-Serve – is the cost to deliver parts and assemblies to support production of end-products. It is dynamically calculated as part of the logistics financial management process.**

In this discussion, we provide an overview of the general problem in supply chain management, the specific problem in logistics, along with how aThingz is solving it to uncover and realize tens of millions of dollars of value for its clients.

We discuss this in the context of complex product industries; these industries make complex products with complex bills of materials (material-intensive) and have a tendency to focus a lot of attention on material availability, efficiency, and flexibility. This includes industries such as aerospace and defense, automotive, high-tech electronics, medical and scientific equipment, and industrials. The problem context

THE CHALLENGE

Logistics financial information – the costs incurred – are tallied after the fact. Variance root causes are difficult to identify. It is difficult to bridge the gap between logistics operations and finance.

THE IMPACT

This results in frequent surprises in which costs exceed the logistics budget. Course correction is after the fact and difficult.

THE SOLUTION

Continuous cost-to-serve – vertical and horizontal – along with variance root causes is built into logistics optimization and logistics performance management.

THE VALUE

Millions of dollars of variance can be addressed in a timely manner. Early visibility to variances creates alignment across functions and with management from executives to operations.

of focus in this paper is the logistics associated with inbound material supply of the sort depicted below in **Error! Reference source not found.**

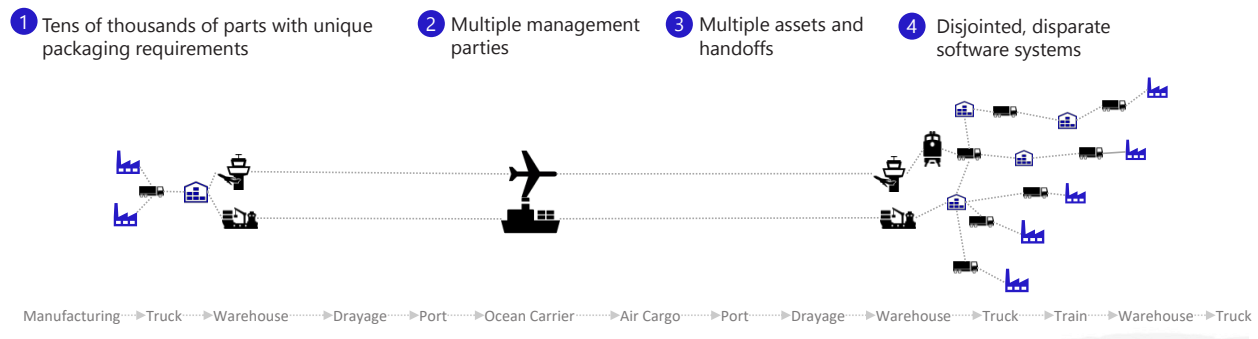


Figure 1 - inbound material supply process

Representative Complex Product Supply Chain

It should be noted that while the problem context here is complex product industries, the solution applies equally well to other industries such as consumer goods, food and beverage, and retail.

Before we discuss the specifics of the inbound logistics problem, let's first review the big picture problems that has plagued supply chain management for decades.

2 Big Picture Problem

Bridging the Gap Between Finance and Operations

One of the chronic challenges in supply chain management is fusing together operational and financial objectives into a single unified systematized process to simultaneously assess how the supply chain is truly performing. Historically, we have had supply chain systems, and processes, and financial systems and processes, and never the two shall meet. Integration between these systems has been characterized by latency, manual manipulations, and offline spreadsheet calculations, making it virtually impossible to dynamically synchronize the performance of supply chains with financials. This reality does not allow for timely, constructive management of logistics budgets.

A key challenge in fusing together supply chain, with financial objectives, into a single software system is data. Supply chain and finance operations typically deal with different data hierarchies that have been built up over years. It is a complex process to map these data hierarchies and to keep the mappings synchronized. This is frequently done with considerable manual human effort, spreadsheets and other interventions.

For example, while financial reporting is governed by rules and regulations, financial software typically allows companies to build many different hierarchies and relationships to allow different views within the

envelope of the rules and regulations. While companies all report financials against the same rules and regulations, how they view data internally may be completely different. Therefore, coming up with a general and flexible mapping process between supply chain cost data and finance department data has proven elusively challenging.

aThingz bridges this gap in the logistics space by building a financial model directly into its operational model for logistics optimization and logistics performance management. This allows logistics and financial teams alike to see on-demand, up-to-date logistics cost performance at multiple levels and across different dimensions. This is discussed further in subsequent sections.

3 Big Picture Problem

Embedding Financial Management in Logistics Planning

As discussed earlier, aThingz provides a new solution approach called Sales, Logistics, Operations Planning with Execution (SLOPE). (See “[What the Heck is aThingz?](#)” for a description of aThingz’ planning, optimization, and performance management capabilities).

Embedded across all aThingz planning and optimization capabilities is dynamic financial management, enabled by Cubera™. This is shown as the vertical bar in Figure 1.



Figure 1 - aThingz Logistics Planning Solutions

It is important to note that while Cubera™ is embedded in aThingz planning solutions, Cubera™ can also be seamlessly deployed with any existing logistics planning tools.

4 Big Picture Problem

Synchronizing Logistics with Sales

It is common in supply chains that sales and marketing regularly modify forecasts based on changing market conditions, as well as offer new capabilities to customers and customer prospects to secure business.

In many cases today logistics is still the tail of the dog – getting wagged around by shifting demand from sales and marketing on the front end and supply disturbances on the back end. At the center of these forces is a dynamic cost picture that is reported, after the fact, as a static cost picture through end-of-the month ERP reporting. At that point, much of the important context is lost, preventing timely and accurate pinpointing of cost variances.

Logistics managers may feel that they are at the mercy of these front-end and back-end forces, particularly when end-of-the month reporting shows that they have once again exceeded their budget. Operations reviews with leadership require lots of explaining, which can only be surfaced through countless hours of spreadsheet data mining and phone calls with logistics partners.

aThingz solves this problem through the following key capabilities:

- 7x24, “always-on” autonomous master data management
- Dynamic logistics financial management
- Intelligent root cause analysis and reporting

These capabilities are discussed in detail in the sections that follow.

5 Always-On, Dynamic Master Data Management

Solving this problem starts with a master data foundation that standardizes, harmonizes, fortifies, and synchronizes data from multiple systems and partners (companies). This data is often embedded with different field names, databases, and documents. And trading partners may change these names and their meanings without notifying downstream receiving systems.

aThingz loads data into a digital twin of the network; this includes suppliers, plants, warehouses, routes, equipment, modes, rates, policies, invoices, demand, forecasts, and plans.

aThingz utilizes machine learning (ML) and heuristics algorithms to standardize, harmonize, fortify, and synchronize required master data. These algorithms detect patterns, outliers, anomalies in data fields and initiates workflows for remediation, so all parties are looking at the same field definitions and associated data. These algorithms are likewise used to process PDF and other documents to ingest and commonize fields.

Background machine learning algorithms also run to review execution of the supply chain network and make improvement recommendations on structure, policy, and parameters.

6 Logistics Financial Management

Logistics financial management has historically followed a monthly cadence driven by a pre-established budget. The budget is developed based on demand volume, and mix, forecasts which drive rough-cut plans for how much transportation is required to deliver parts and components to serve end-product demand.

Once the monthly process is completed, variance-to-budget reporting is performed and reviewed as part of operational review meetings. In today's world of increasing demand and supply volatility, this after-the-fact monthly review process is no longer competitive. Demand and supply changes that occur within the month can have a significant impact on logistics costs. Therefore, it is critical to understand where we stand against the budget at a given point in time, not a month from now.

Furthermore, understanding the cost impact of decisions is important. For example:

- There is a supply delay on part A, which is associated with option package A. If we shift it to Part B, how much additional transportation cost will we incur?
- Orders are coming in different from forecast. Penetration rates for option package A are lower than expected. We need less of Part A and more of Part B. What is the impact on transportation costs?
- Supplier A is behind schedule for production of Part A. Can we move more of Part B and what is the additional cost?
- Part A is on a ship that is delayed at the port. Can we move more of Part B and what is the additional cost?

These, and many other similar, scenarios occur on a daily basis. (And this does not include significant volatility events such as plant shutdowns, plant fires, worker strikes, unusual weather patterns, climate disasters, tariffs, geopolitical tensions, wars, ships stuck at ports or in canals, demand spikes or troughs caused by social media posts, or drop in customer orders inside of lead time).

What is needed is a dynamic, living, up-to-date view of where we stand on cost, as those costs are incurred, along with what-if scenarios and variance-to-budget root cause analysis. This is what aThingz delivers with its Cubera™ product.

End-of-the month budget variances are difficult to trace back to their root causes. Logistics personnel may have a general idea of why the budget was exceeded but not a direct line to trace its origins. The complex interplay between different entities within a supply chain makes it even more difficult. Operations reviews often require endless hours of preparation through offline spreadsheet analysis

6.1 Cubera™ Dynamic Financial Management Process for Logistics

Figure 3 represents a general, simplified process flow from demand generation for finished goods to delivery and processing of invoices for parts and components to finished goods manufacturing and assembly plants. This general flow is typical of complex product companies in industries like aerospace and defense, automotive, high-tech electronics, and industrial manufacturing.

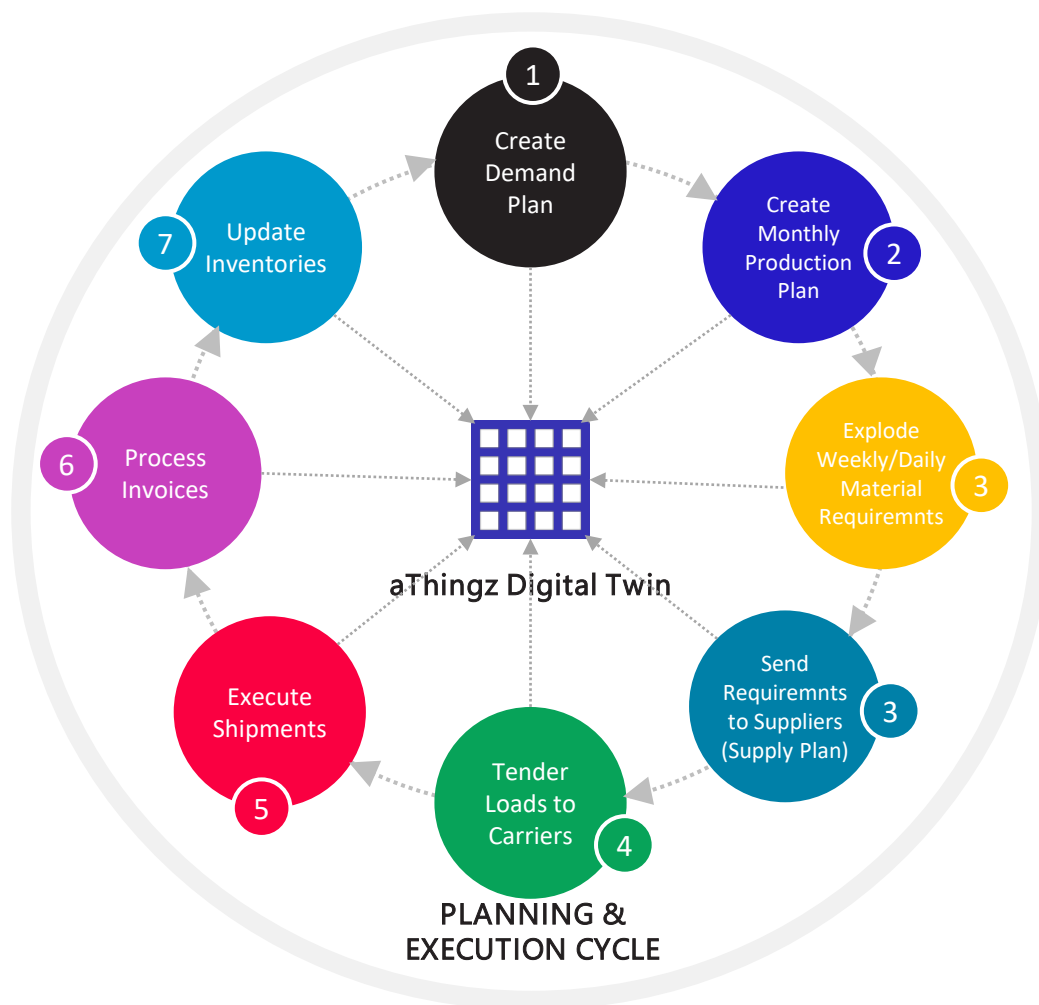


Figure 2 - High Level Planning and Execution Flow for Parts Requirements and Delivery

As this process is executed, it generates data in the form of plans, requirements, loads, shipments, and invoices. Embedded in these processes is a lot of financial data: budgets, forecasts, and transportation. Also embedded in these processes is a lot of data on how transportation was executed: LLPs, carriers, routes, fuel, cubing, and modes. As these processes are executed, this data is dynamically loaded into the aThingz digital twin. This is a dynamic database that represents the supply chain and its budgets, plans, forecasts, and status at any given time. This data forms the basis against which Cubera™ performs its cost-to-serve calculations and enables its logistics financial management process.

Figure 4 provides an overview of the Cubera™ financial management process, along with representative cost-to-serve analyses that are typically performed across different dimensions – end-product, plant, part, LLP/carrier, mode, and route, along with different variance analyses and different operational measures such as utilization and cubing.

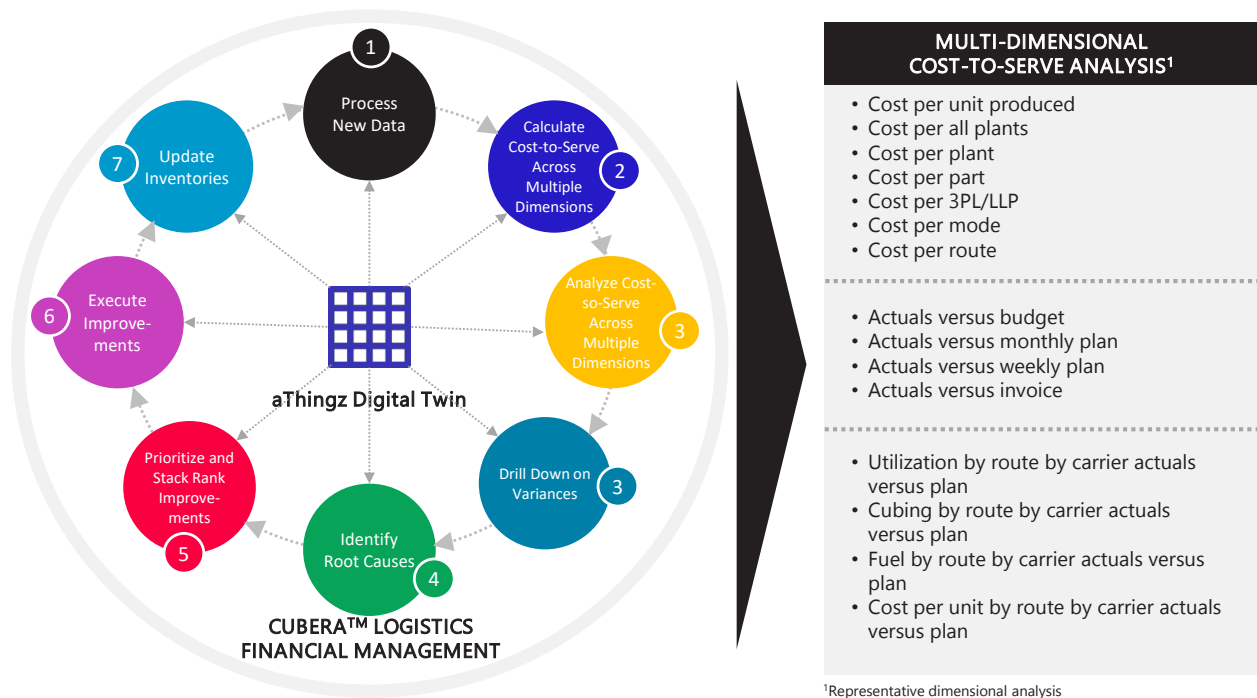


Figure 3 - Cubera™ Logistics Financial Management Process

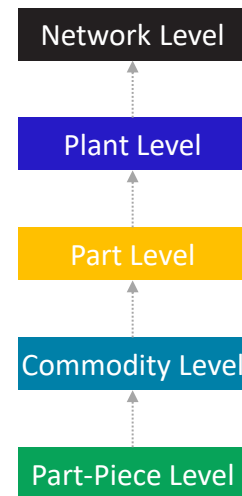
Let's consider some capabilities that are valuable in managing logistics costs. Let's say you make cars (the same is true if you make computers, medical equipment, forklifts, airplanes or any reasonably complex product that requires parts assembly).

In the car example, it is important to know the transportation costs per unit produced (CPU). In fact, you will likely have a budget for CPU. You may also want to know what the costs are at the part level, at the plant level, at the carrier level, at the mode level, and at the route level. And, importantly, you want to know these costs dynamically, as they are incurred. Why?

Consider the following common example. A transportation budget is established for the year and then updated monthly based on updated market demand. The monthly plan turns into weekly and ultimately daily material requirements for each plant. As the month progresses, the demand picture changes and the supply picture changes. The degree of change depends on many factors, but it is clear – setting aside any factors related to the pandemic – that supply chains in general are evolving towards greater levels of volatility. (Consider that the best performing airlines in the United States deliver about 80-85% on-time delivery of their passengers and this is with considerable lead-time padding. This gives a sense of the difficulty of precisely moving things and people in a volatile world).

At the end of the month, ERP reports are run that show that the logistics department exceeded its budget by 20%. At the monthly operations review, management ultimately asks the question, “why, when, and how?” Logistics managers anticipate this question and have analysts jumping through hoops performing spreadsheet analyses to answer the questions of why, when, and how. The next question is, “how are we going to prevent this in the future?”

MULTI-LEVEL COST VISIBILITY



Comments About Volume and Mix

In complex product industries (e.g. A&D, automotive, high-tech electronics, and industrials), the build plan depends on the “option content” in the product. Whereas volume may be relatively easy to forecast, the exact option content of the product is much more difficult to predict with high levels of precision. This “option take rate,” is highly susceptible to change and its swings can have significant impacts on revenue and profitability, and transportation costs. A product mix that is rich in high priced options will be significantly more profitable than one that is skewed towards fewer

Wouldn't it be better to keep a dynamic running tally of transportation costs, and when, why, and how they diverge from the budget? Furthermore, wouldn't it be useful to understand the root causes, how to address the root causes, and create and monitor improvement plans? This is the essence of what the aThingz Cubera™ product provides.

Furthermore, sales and operations planning (S&OP) processes in companies are increasingly dynamic, meaning they are now executed on an almost continuous basis (versus historically monthly). In fact, it is the continuous S&OP process that is making the intra-month demand and supply changes described above. The transportation financial management process feeds this corporate S&OP process. When a

monthly process feeds a continuous process, it creates synchronization problems. When transportation costs are a significant percentage of cost-of-goods sold (COGS), this can lead to S&OP decisions without an understanding of all the costs. How much does it cost to make this demand change or that supply change? Using rules-of-thumb for transportation costs as part of this decision can lead to misinformed decisions.

6.2 aThingz Logistics Financial Management Maturity Model

Figure 4 below shows the aThingz logistics financial management maturity model, enabled by Cubera™. Companies that activate Cubera™ achieve higher and higher levels of precision in the management of their logistics costs as they move from level 1 to level 5. This means that they more tightly control logistics costs and variance to budget not just at the aggregate level but at the LLP, carrier, route and mode levels.

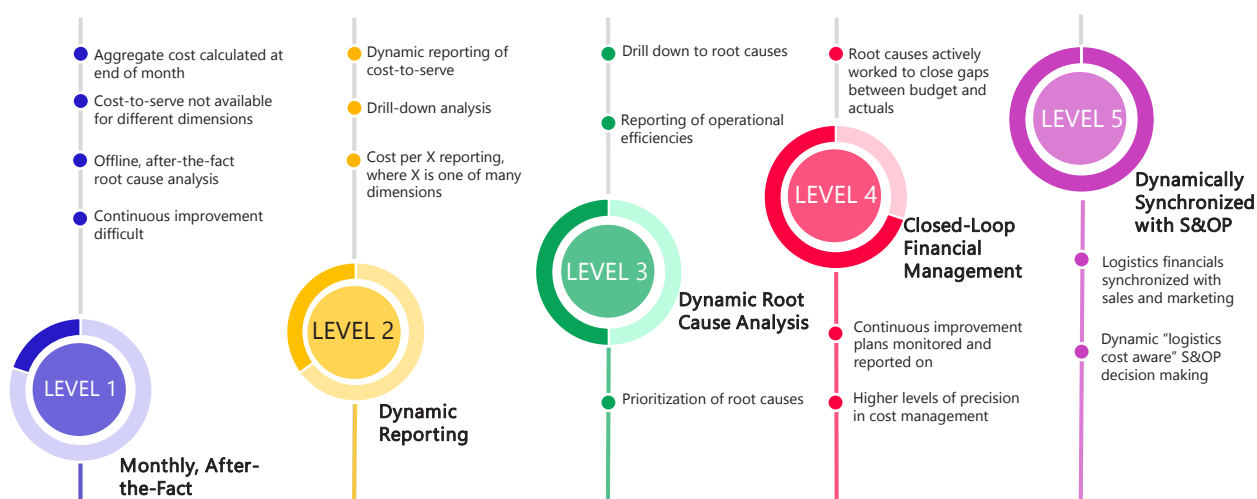


Figure 4 - aThingz Logistics Financial Management Maturity Model

6.3 Comprehensive Cost Management Program

The aThingz financial management maturity model shown above can be used as a roadmap for a comprehensive cost management program. Logistics financial management – enabled by Cubera™ acts as the technology cornerstone of this program, enabling increasing visibility and successively tighter cost control as a company moves to higher levels of maturity.

7 Metrics Alignment

Finally, the Cubera™ solution helps drive metrics alignment across different organizations. Figure 5 shows the aThingz metrics hierarchy for logistics. The metrics highlighted in red are captured within the aThingz digital twin and monitored and managed through various Cubera™ analytics and workflows. This allows alignment across the logistics and finance organizations and with transportation partners such as carriers and LLPs.

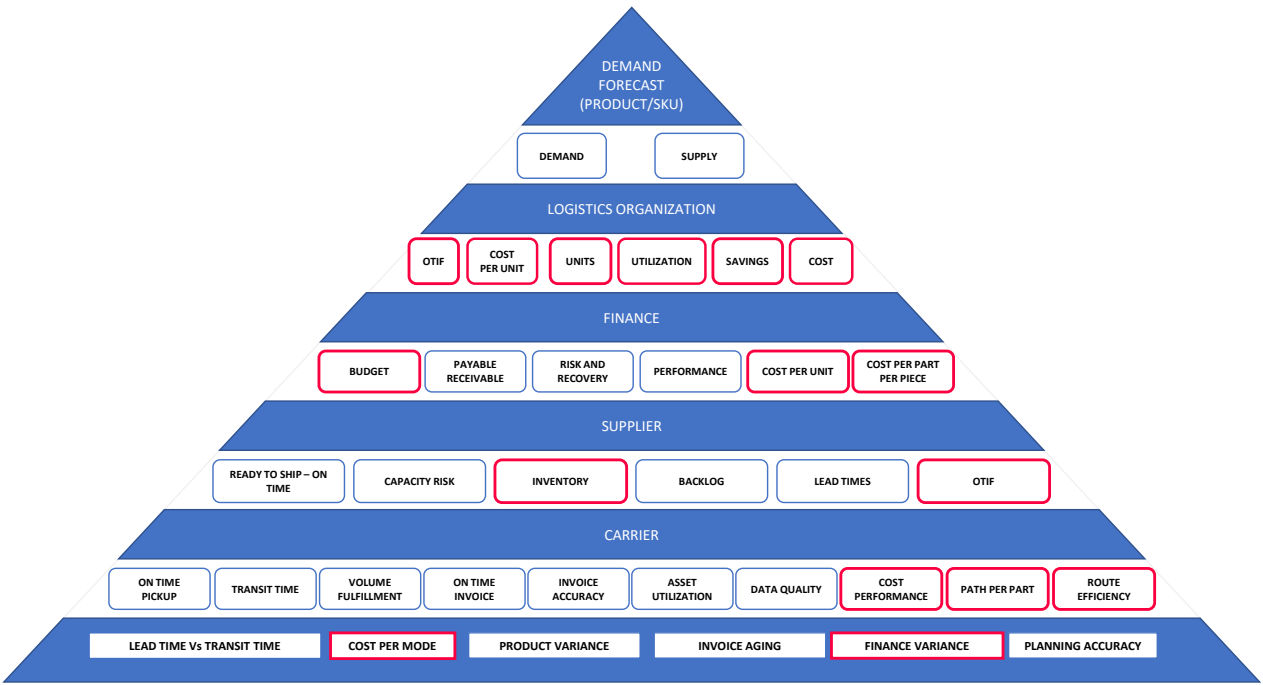


Figure 5 - aThingz Logistics Metrics Hierarchy

8 Getting Started

aThingz’ Rapid Value Activation (RVA) methodology allows for the deployment of Cubera™ in weeks, enabling companies to quickly achieve Level 2 maturity in their logistics financial management (see the aThingz logistics financial management maturity model in an earlier section). A high-level Gantt chart for the fast start program is shown below.

WEEK 1	WEEK 2	WEEK 3	WEEK 4
ANALYZE DATA SOURCES			
	CONNECT DATA SOURCES		
		CONFIGURE REPORTING	
			TRAIN USERS
			GO LIVE

Figure 6 – Representative aThingz Cubera™ Rapid Value Implementation Plan