

White Paper

# The Role of Composability in the Supply Chain

Sponsored by: PartnerLinQ

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## INTRODUCTION

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The past five years have been a difficult period for the supply chain. While the effects of the COVID-19 pandemic continue to recede, new disruptions have emerged in the form of the military conflict in Ukraine, chronic global inflation, and recurring logistics issues like the Suez Canal blockage or the destruction of the Baltimore bridge. While the persistent disruptions to supply chain organizations are not new, what's more intriguing are the obstacles that hinder their capacity to respond effectively to these disruptions. They are seeking improved tools and application approaches to become more agile and responsive.

In a recent IDC's *Worldwide Supply Chain Survey*, we see significant "drag" from legacy or poorly integrated systems when organizations are asked about what prevents them from responding more effectively to disruption. In Figure 1, we have highlighted three industry segments, but the sentiments depicted there also hold for most other industries surveyed. We will leave supply chain partner constraints for another discussion, instead focusing on the implications of older or poorly integrated systems that either operate without broader context or create data silos that limit an organization's ability to gain necessary end-to-end visibility and take timely decisions/actions to improve its business outcomes. Of particular interest in the discussion of composability is the notion of inflexible or poorly integrated systems tools.

**FIGURE 1**

**Response to Disruption**

Q. *What gets in the way of better response to disruptions in your supply chain?*



n = 1,815

Source: IDC's *Worldwide Supply Chain Survey*, April 2024

For this discussion, and particularly for the non-IT reader, IDC defines composability in the following way:

- Composability enables components/modules to be connected via API on the product level, with the narratives highlighting the customer experience potential of the system. Composability enables the assembly or configuring of an app via prebuilt point solutions loosely coupled via API. The benefits of composable applications are similar to those of entire software stacks composed of such applications. Just as composability is an alternative paradigm to individual software applications, which are custom-built in-house, composing entire systems of these applications is meant to provide an alternative to all-in-one platforms. Organizations can augment individual functions within the stack by integrating best-in-class microservices into the stack. However, composability is tied to assembly and configurations that are not custom built. Instead, they "snap" into place and reduce the burden on in-house developers. The most important aspect of composable applications is that they are decoupled and must be connected to create a whole system.

In the supply chain specifically, composability can help businesses adapt to changing conditions, provide flexibility, and help solve problems. It involves breaking down a system into interchangeable building blocks that can be assembled in different combinations to meet specific needs. This modularity allows for rapid innovation and adaptation, such as updating or swapping out a component instead of replacing the entire system (see Figure 2).

FIGURE 2

## Composability Versus Modularity

### "Composable System" and "Modular System"

Modules are the building blocks that must be composed to make a usable system of applications.

#### Composable System

This is the business-friendly term for prebuilt modules connected via API on the system level. Narratives highlight the CX potential of the system.

***"Assembling a system via prebuilt component applications and APIs"***

*That is, these systems are the result of integrating prebuilt modular components. The point of the exercise is to reduce dependence on in-house developer teams.*

#### Modular System

This is the IT term for composed systems on an architectural level. It implies that the modularity is more important than whether the components are prebuilt.

***"Assembling a system with prebuilt, legacy, and/or custom modules and APIs"***

*That is, these modules are independent and self-contained. Whether these modules are prebuilt is not as critical in a modular system as in the composable paradigm.*

Note: The figure is from *Headless Systems: Understanding Architectural Styles for Composed Systems of Modular Applications — Business User Perspective* (IDC #US51005323, July 2023).

Source: IDC, 2023

Modular applications are helpful for organizations with legacy systems. Modules are the building blocks of configurable applications and must be composed for maximum functionality and accelerated time to value. A product with a modular design is decoupled and componentized, which means that it is broken down into smaller, composable, independent components with singular tasks. At a high level, modular and composable applications may be viewed as similar but there are some fundamental differences. A composable application may include modules, but it is a classic example of "the whole being bigger than the sum of its parts," as composability considers the totality of the application rather than just the pieces.

Returning to the points illustrated in Figure 1, there is a clear opportunity for supply chain organizations to improve their response to disruptions and be more resilient through modern and better-integrated supply chain tools, yet the "answer" and the technical migration path will not be the same for all companies. Some have already moved to the cloud, others plan to do so imminently, and still others have no

immediate plans to move. Despite this, or perhaps because of this, exploring the role of composable applications in the supply chain and the degree to which supply chain organizations view them as appealing is interesting.

## TRENDS

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Several important trends are shaping supply chains now and in the future. While the current inflationary period has reinforced the importance of efficiency and waste reduction, companies have recognized the necessity of a modern, agile supply chain and the degree to which it can enable revenue and profits. Given the different maturity levels in adopting cloud applications, the ability to be agile within a mixture of modern and legacy on-premises tools is crucial. Composability is an important lever for the supply chain as:

- 47% of companies tell IDC a lack of digital competencies limits their ability to transition their supply chain to new business models.
- 57% say that a lack of supply chain agility limits their ability to react to changes effectively.
- 21% say their top priority is modernizing and updating their supply chain IT infrastructure.
- 17% say their top priority is to improve end-to-end supply chain orchestration capabilities.

## BENEFITS

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The journey to more resilient supply chains may have encountered a hiccup with the chronic inflation issues of the past two years, which reinforced the need to be more efficient, but it remains an important goal for many organizations. As we have noted frequently in IDC's supply chain research, many disruptions are not predictable, so the resilient supply chain allows companies to respond quickly and decisively when those disruptions do occur.

Recently, we published an update to the IDC MaturityScope on supply chain resiliency, which details the maturity of resiliency across 22 different dimensions. Composable/adaptable applications are just one of those dimensions, but given the implications of older, inflexible systems for disruption response, they are critical.

When we asked supply chain organizations about the drivers for composability, it came as no surprise that resiliency tops the list (see Figure 3). If IT applications are not resilient, it is hard for supply chain operations to be resilient. More interesting is the view that composability can help make the business more efficient. In a world where

inflation has put pressure on prices and costs, efficiency may be more important than ever, or at least understanding the trade-offs between efficiency and resiliency.

**FIGURE 3**

### Composability Drivers

Q. When thinking about your supply chain, what are the key business drivers for composability?



n = 1,815

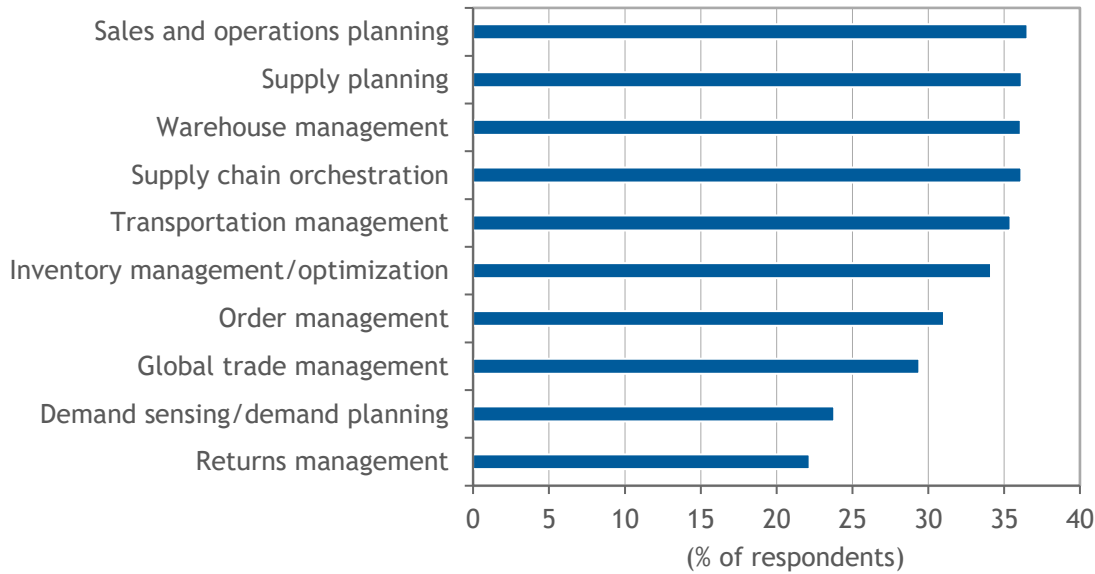
Source: IDC's *Worldwide Supply Chain Survey*, April 2024

From a supply chain process perspective, when considering composability and the areas that can benefit the most (see Figure 4), the answer is a variation of "all of them" — or at least the broad perspective from which many key areas can benefit. Certainly, areas like sales and operations planning (S&OP), supply planning, and overall orchestration can be quite volatile. Given both black swan events and operational disruptions, the ability to adjust quickly can be the difference between meeting business goals and missing them.

## FIGURE 4

### Priority Areas for Composability

Q. Which supply chain areas or processes do you think can most benefit from a composable approach?



n = 1,815

Source: IDC's *Worldwide Supply Chain Survey*, April 2024

We also see composability as most useful in areas with multiple systems or processes. S&OP, for example, is not one process but a collection of many processes that arrive at a consensus plan. Likewise, supply planning can include elements of both production planning and supplier sourcing.

The other important element to remember is that as companies continue to outsource additional areas of the supply chain or operations, the ability to digitally connect across a broader ecosystem becomes critical. In a recent IDC conversation with a chief supply chain officer, she noted that "90% of the disruptions to their supply chain occur outside of their own four walls." If the supply chain is not connected to key suppliers or customers, the benefits of extended visibility and connectivity are marginalized.

## ROLE FOR AI

Although efficiency and costs are of chief concern in the short run, the bigger, longer-term opportunity lies in scaling AI use consistently and seamlessly with a business outcome focus. Instead of the conventional push model, where external providers or IT push AI solutions or use cases to the business, IT should help the business adopt tools that enable specialized users to create, experiment, and adopt AI-infused apps. In other

words, applications where AI use cases are embedded rather than "bolted on." This approach will deliver smarter proactive visibility, purpose-built orchestration tools (think next-generation control towers), and other applications that seamlessly integrate into both planning and operational processes tailored to the unique needs of the business. This means the business should lead in embracing AI through the right digital tools that facilitate data-driven intelligent app composition.

Both the current reality and future potential for AI lies in addressing those top concerns, and it remains an avenue for exploration. Automating workflows, enabling exception management, and improving response times will continue to put focus on AI. Generative AI (GenAI) largely remains in its early phase, so its benefits, for now, are muted (see Figure 5).

**FIGURE 5**

**Use of Artificial Intelligence**

Q. *What benefits have you seen from using AI in your supply chain?*



n = 1,815

Source: IDC's *Worldwide Supply Chain Survey*, April 2024

**The Future Is Now**

Organizations must explore how AI tools can help with productivity and performance across their supply chains without delay. Tools are available to help across a broad range of supply chain activities, even if data quality and process integration require some additional effort. Although GenAI tools will certainly evolve, work "wasted" in training older tools will be outweighed by the immediate insights gained and the lessons learned for future implementations.



Organizations should:

- **Create trusted content repositories:** Establish easily accessible data repositories where similar/common source content can be hosted, managed, and maintained (synchronized with real-time systems of record). This cache of long-lived, validated, and unstructured content forms the basis of retrieval-augmented generation, allowing LLMs to deliver trusted, contextual, and relevant results.
- **Grow AI expertise:** Identify internal roles for AI innovation and transformation. Establish partnerships with technology providers and system integrators that understand the company, supply chain, and industry. Facilitate sharing goals, capabilities, and values across the product development ecosystem.
- **GenAI risks and security:** Implement AI data governance standards to reduce potential biases (e.g., training data diversity) and improve data privacy. Enforce robust security measures to protect against breaches by continuously monitoring the model and output and ensuring compliance with legal and ethical norms. Have multidisciplinary teams regularly audit LLM decisions and outcomes to identify and correct biases that arise over time.

## CONSIDERING PARTNERLINQ

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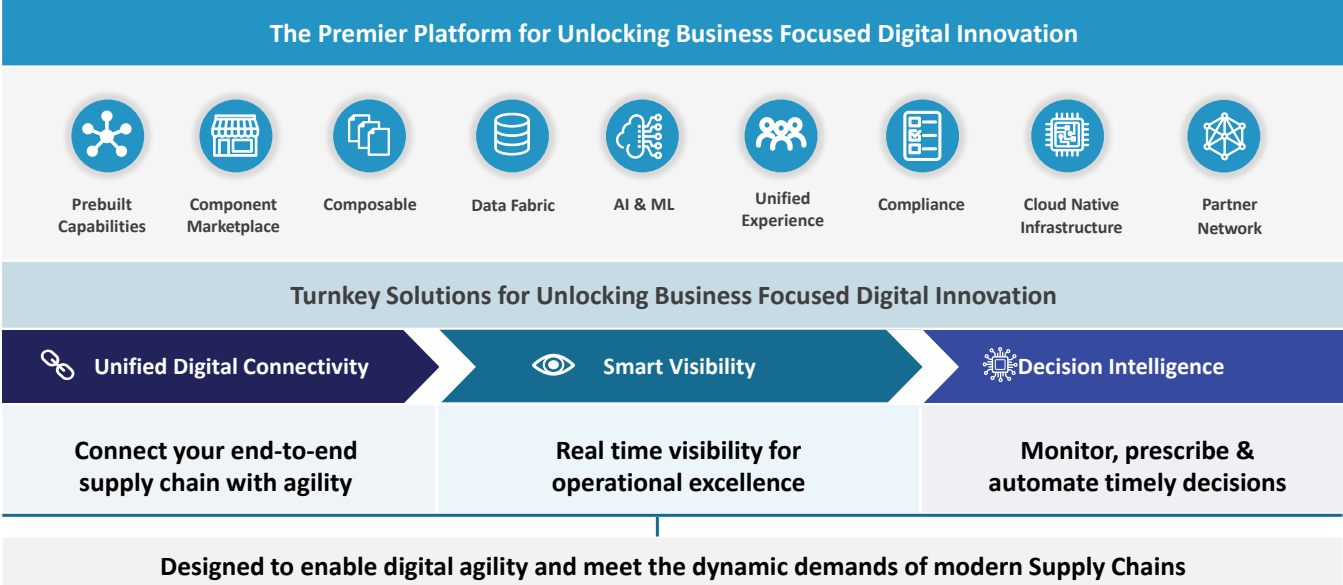
PartnerLinQ is a composable supply chain platform that aims to redefine digital connectivity, end-to-end visibility, and decision intelligence. It is purpose built to help transform supply chain organizations, empowering them to become more dynamic, agile, and resilient while ensuring high levels of process and data integrity and stringent compliance standards.

PartnerLinQ helps supply chain companies enhance their responsiveness and flexibility, transforming them into entities capable of adapting to highly volatile market conditions and managing complex supply networks. PartnerLinQ unlocks digital supply chain agility, enabling quicker response to rapidly changing customer demands by reducing lead times and optimizing shorter product cycles. The company offers a versatile suite of turnkey solutions for industries including retail, distribution, transportation, logistics, food and beverages, apparel and footwear, consumer goods, and manufacturing. With composability at its core, PartnerLinQ is configurable and extensible for delivering value to any supply chain enterprise with its enterprise systems landscape and external partner ecosystem. Built on a cloud-native architecture with APIs and scalable microservices, the platform supports the deployment of individual or multiple connected solutions, allowing organizations to address their specific needs. As more solutions are added, the platform helps enable a seamless transformation of the

organization's core technology landscape, enabling modernization without disruption (see Figure 6).

**FIGURE 6**

**PartnerLinQ Platform Overview**



Source: PartnerLinQ, 2024

The platform enables businesses to quickly connect with their upstream, downstream, and midstream partner ecosystems via a cloud-native platform, driving visibility and decision intelligence through business-focused composition tools. PartnerLinQ's personalized UI/UX allows business operations and technology teams to access all capabilities.

PartnerLinQ's consulting and professional services helps customers harness the power of the composable platform and the company's turnkey solutions to deliver value across diverse business landscapes (see Figure 7). This integrated approach enables efficient, customized solutions designed to drive innovation and growth.

**FIGURE 7**

**PartnerLinQ Composable Turnkey Solutions**



Source: PartnerLinQ, 2024

By adopting PartnerLinQ's innovative approach, businesses can future proof their supply chain enterprises, ensuring resilience and adaptability in an ever-evolving market landscape.

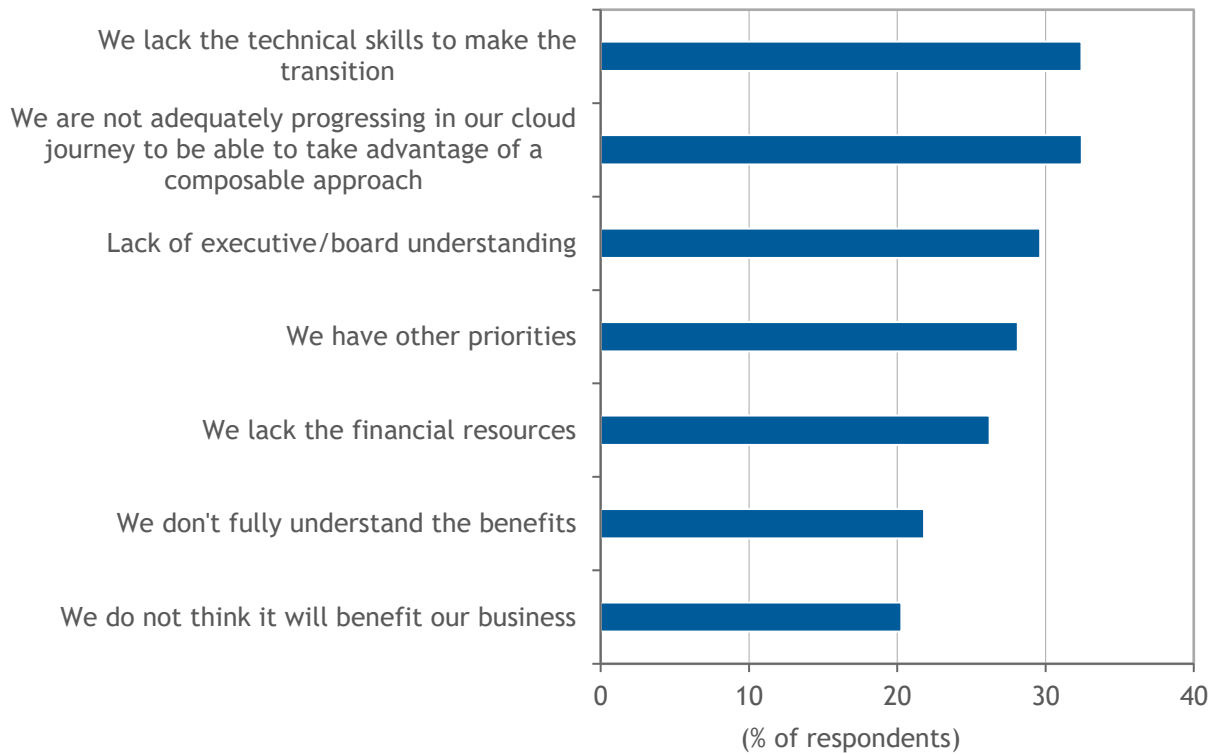
**CHALLENGES**

While composability is promising, a rush to niche/expert solution providers should not be commenced hastily. Some pros and cons to consider on the path to composability versus larger end-to-end partners are discussed in the sections that follow. IDC also cautions that this is not a binary decision. Many companies have implemented the largest tech vendors' solutions and niche solutions. This is the point of composability — the ability to mix and match. In IDC's 2024 *Supply Chain Survey*, when asked about the barriers to a composable approach (see Figure 8), supply chain organizations cited the need to accelerate cloud progress first (32%) and a lack of technical skills (32%) as the primary impediments.

**FIGURE 8**

**Composability Barriers**

Q. *What are the barriers to a composable approach for your supply chain?*



n = 1,815

Source: IDC's *Worldwide Supply Chain Survey*, April 2024

Both composable and one-stop-shop approaches offer their own sets of pros and cons. Examples to consider include the following:

- **Composability**

- **Pros:** Composability (and, by extension, seeking so-called expert solutions/partners) enables a far more flexible approach and opens the door to finding best-fit solutions. There may be a global trade solution perfect for an organization's industry. Or perhaps there is a demand planning vendor with the specific, advanced capabilities the business needs.
- **Cons:** With flexibility can come complexity and cost. Many CIOs/CTOs have lost sleep over the total cost of ownership, cumbersome layers of integration, and mixed road maps for upgrades across disparate solutions.

- **One-Stop Shop**
  - **Pros:** Larger players have made great strides in ensuring they offer scalable, end-to-end solutions. This means they are offering scaled solutions and perhaps can compete on bundled pricing versus a menu approach. What's more, the larger players have made efforts to be "the best of both worlds" by enabling integration to focused solutions.
  - **Cons:** It's valuable to ask whether larger players offer focused customer support and defined solutions for the company's industry and/or business specifics. Chances are that most do, and asking whether there are functional players that offer a better fit may yield interesting results, depending on the business and industry. In addition, having fewer larger partners may create a dependency.

## CONCLUSION

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In IDC's recent *Supply Chain Surveys*, when organizations are asked about what prevents them from responding more effectively to disruption, we see significant "drag" from legacy or poorly integrated systems as a significant issue, specifically that IT systems continue to be dominated by legacy tools that are neither flexible nor salable. Migrating to the cloud and cloud platforms eliminates some of this legacy drag, but it is also important that the applications themselves have inherent flexibility and resilience. Within applications, or across groups of applications, composability enables components/modules to be connected via API on the product level, with the narratives highlighting the customer experience potential of the system. In other words, compatibility confers flexibility at the application level by enabling the assembly or configuring of an app via prebuilt point solutions loosely coupled via API. Composability allows organizations to better match IT tools with changing business requirements, including the ability to more quickly and effectively adopt AI use cases.

## ABOUT IDC

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International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications, and consumer technology markets. With more than 1,300 analysts worldwide, IDC offers global, regional, and local expertise on technology, IT benchmarking and sourcing, and industry opportunities and trends in over 110 countries. IDC's analysis and insight helps IT professionals, business executives, and the investment community to make fact-based technology decisions and to achieve their key business objectives. Founded in 1964, IDC is a wholly owned subsidiary of International Data Group (IDG, Inc.).

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