KINAXIS®

Supply chain transformation and the role of IT

A guide for IT professionals navigating today's changing business landscape

Introduction

As businesses contend with everyday variability as well as extreme volatility and disruption, supply chain agility and resiliency have never been more important.

> "Kinaxis provides an innovative, reliable, and scalable solution that can handle the complexity of a contract manufacturing environment."

GUS SHAHIN
FLEX CIO

Concurrent planning – the process of making and managing synchronized plans across time horizons, business processes and organizational boundaries at the same time – is imperative for surviving in an increasingly unpredictable world. So, too, is the need for the underlying supply chain technology to be agile and resilient, best of breed, scalable, flexible, secure and intelligent.

IT professionals are entrusted with selecting the right technology for today and the future, and tasked with navigating a flood of buzzwords, terminology and PowerPoint slides that are often unproven or fundamentally inadequate in addressing real needs.

In this guide we present some of the latest thinking and perspectives from our team of experts to help guide IT professionals through the supply chain planning journey. On behalf of the entire Kinaxis team, I hope it provides you with the timely and actionable insights you need to prepare your business for the future.

My best,

JOHN SICARD
President and Chief Executive Officer, Kinaxis

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The IT landscape is changing. New technologies. New data streams. New demands. Whether you're the chief information officer (CIO), a VP of IT infrastructure, a systems administrator or anywhere in between, odds are you're feeling the pressure as more and more companies look to transform traditional business models into digital ones and get more out of their enterprise resource planning (ERP) systems like SAP and Oracle. At the forefront of those transformations is the supply chain – heralded as the next great corporate differentiator.

ANDREW MCDONALD
Chief Product Officer,
Kinaxis

CEOs and supply chain leaders are turning to you, the IT professional, to help advise and guide on what supply chain technology to invest in next. That's leading to the resurgence of one of the most divisive debates in IT – stick with a single vendor or invest in best-of-breed solutions. It's an important choice to make, and one that can define the future of your organization's IT landscape.

Deciphering the truth

So how do you know what's best for your business? Let's play a little game of fact or fiction to help you decide.

Single-vendor solutions have lower cost-of-ownership

FICTION

At first blush, it may seem that going with a single vendor is the more cost-effective option. One negotiation, one price list, one number to call if something goes wrong. But the truth is, it's very easy to end up paying for subpar functionality that leaves your company and its supply chain at risk. The key question to ask when comparing cost-of-ownership across single-vendor and best-of-breed solutions is simple. Does it solve your supply chain planning challenges? If it doesn't, the cost of not being able to plan and respond with agility when reality strikes will take a much bigger toll on your business than the initial cost of software

Best-of-breed solutions deliver better functionality

FACT

With a best-of-breed solution, you're getting more robust capabilities that are

better aligned to your specific needs. As an added bonus, with many best-of-breed solutions, you end up with even more functionality than you were originally looking for – providing space for you to continue to grow and mature your supply chain planning processes without needing further technology investment. Implementation for best-of-breed solutions is also faster and easier than the deployment of a behemoth single-vendor solution. That leads to a much faster time to value.

Integration is easier with single-vendor solutions

FICTION

This may have been true in the past, but integration technologies have come a long way – especially if your systems are cloud-based. APIs and the rise of standard connectors to systems like SAP and Oracle mean it's easier than ever to integrate data from multiple solutions, even if they aren't from the same vendor. In addition, while integration across vendor-owned planning and execution solutions may seem straightforward, there are often unadvertised complexities,

> "With a best-of-breed solution, you're getting more robust capabilities that are better aligned to your specific needs."

especially if each module has its own data model or the company has grown its solution through mergers and acquisitions inheriting legacy architectures. This often results in an unsynchronized collection of on-premise and on-cloud aspects, different data models, conflicting algorithms and even multiple user interfaces that cannot be unified without costly and lengthy rewrites.

Best-of-breed solutions are easier to update

FACT

Best-of-breed solutions are typically easier to update than monolithic single-vendor solutions. As a result,

you'll be able to take advantage of new innovations faster and with less risk, so you can help your business keep its supply chain on the cutting-edge. You also won't have to worry about updates impacting other systems or being on a different release cycle than other technology in your IT stack.

> "The ideal best-of-breed solution is one that offers a platform, meaning demand, supply, inventory and capacity are planned concurrently."

There's less risk involved with single-vendor solutions

FICTION

Single vendors are often large companies, with long histories and large support teams, making them seem like a more stable, less risky option. The top best-of-breed solutions have decades of expertise in their given space, and since they're more specialized in a specific area of functionality, they can provide better guidance and support. In addition, having all of your technology from a single vendor means you're locked in with that company – a large risk from a data security and product end-of-life standpoint. Making changes to a monolithic system down the line often becomes a costly, frustrating endeavor. Just look at how many companies are struggling with the end-of-life of SAP Advanced Planning and Optimization offering.

The supply chain planning technology landscape

When it comes to evaluating your company's supply chain planning options, there's a ready mix of single vendor and best-of-breed solutions. Many of the largest enterprise resource planning (ERP) system providers offer supply chain planning in one form or another. The question is, do they actually meet the planning needs of your business? More often than not, the answer is no.

That leaves you with a myriad of best-of-breed solutions to sort through. But be warned – not all supply chain planning best-of-breed vendors are created equal. In fact, many of them only cover a single area of planning functionality, leaving you trying to stitch together multiple systems just to get basic supply and demand balancing. That's when risks grow, total-cost-of-ownership rises and time-to-value increases.

The ideal best-of-breed solution is one that offers a platform, meaning demand, supply, inventory and capacity are planned concurrently. All planners are looking at the same data, with similar views, on the same system. One platform. One data model. One interface. It needs to work harmoniously with your existing ERP and technology stack, and beyond that, it needs to give you the flexibility to deliver exactly the kind of supply chain planning experience your users want through custom app and logic building.

That single platform, data model and user experience approach is harder to achieve than it appears. Take a close

look at any platform-based solutions during the evaluation phase to ensure whatever option you choose has the technology backbone to deliver on the vendor's claims and deliver the speed and scalability your business needs. Any best-of-breed platform you select should have:

- An in-memory database with optimized storage and execution strategies ranging from software design to processor cache lines and that uses automatic indexing and direct memory references
- Versioning capabilities that allow you to create and store multiple supply chain digital twins and model scenarios using only incremental changes (deltas) in input data
- An always-on algorithm engine that runs on the same server as the database so there is direct access to the in-memory data and data relationships, resulting in real-time results
- A data-agnostic integration approach so you can bring in data from multiple sources in a variety of formats and the ability for you to define your own data model/schema extensions
- Strict physical and digital data security policies with continuous assessment of the product and server infrastructure to proactively get ahead of any emerging threats or risks

A practical approach to the use of AI and machine learning, and advanced algorithms, that focuses on solving real problems and caters to both data scientists and business users

As your company's supply chain planning needs continue to evolve, weighing the risks, costs and benefits of turning to a single provider versus best-of-breed solutions will remain a critical IT-led decision. Choosing what's right for your business, its supply chain, and your IT infrastructure vision should be based on your company's unique requirements, and how sustainable that solution is in the long-term from a people, process and data perspective.

Advocates of using best-of-breed vendors

A global community of supply chain leaders across industries such as automotive, industrial, life sciences, aerospace and defense, consumer products, and high-tech and electronics.

Your supply chain is only as agile as its technology

The software you choose today will determine what's possible for years to come. Design speed and agility into the foundation of your supply chain planning platform, so your company can be implementation-ready when innovative solutions are introduced.

GELU TICALA
Vice President of Product Development
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Lots of companies promise forward-thinking applications as part of their supply chain planning suite, but the reality rarely lives up to the potential. Capabilities like digital twins, what-if scenarios and machine learning only work as well as the platforms they operate on, and many companies' platforms lack core features like efficient data management and storage systems, which drive faster planning and analysis.

Before true innovation can be operationalized, IT professionals have to optimize the databases and technology that support the entire supply chain planning suite. Here's what to look out for.

Tech specs for agility

In-memory database

Most supply chain planning platforms use database management systems that employ disk storage – and keep supply chains in the dark ages. These systems slow users' ability to access records and conduct analysis, preventing them from adopting more mature planning processes.

State-of-the-art planning solutions use in-memory databases that outpace and outperform disk storage. In-memory databases take less time to locate records and perform more consistently than disk storage, so planners – or the applications they're using – can retrieve results quickly and reliably.

> "Capabilities like digital twins, what-if scenarios and machine learning are only as good as the platforms they operate on."

Direct memory references in database design

To add even further efficiencies, some software suites are redesigning database management systems. Relational databases have been the go-to supply chain data solution for decades, but any user can tell you the format isn't without its flaws. When a planner needs to review a complex bill of material (BOM) for a product, they may need to access hundreds or thousands of components, each with their own components. These components are typically spread across multiple tables. Even with the use of keys and indices to speed up data retrieval, complex queries and joins increase the time it takes to get results.

Columnar databases simplify some of this complexity by only searching the columns where conditions are met, thereby speeding up the time to results. However, they are less efficient when a query needs to return multiple columns.

Some supply chain solutions, like Kinaxis® RapidResponse®, have unique hybrid hierarchical and graph database structures that simplify storage and access. In the case of RapidResponse, data is stored with direct memory references to all associated records. Instead of duplicating multiple fields or requiring complex joins, any reference to a record in another table is simply a direct pointer to that record. When a user requests all records for a certain part in a BOM, the software finds the part and then uses the set of direct memory references to find related records.

These associations speed up queries and simplify the process for handling

data with complex relationships. Queries that may have once taken hours can be finished in minutes or seconds.

Always-on algorithms

With a high-performance database, supply chain solution providers can also compile code directly into the database engine, where it has direct access to in-memory data and data relationships. This integration enables always-on algorithms that power fast, comprehensive analysis.

Complex operations, such as those used for Material Requirements Planning (MRP), can be built into the platform and automated. Multi-Sourcing is a widely-used algorithm that can allocate different sources of supply for a part based on factors like target, priority or contractual requirements. If existing supply can't satisfy demand, a new supply (planned order) is generated. Platforms like RapidResponse will even determine the source to use based on sourcing factors and consider shared resource constraints, like manufacturing capacity or supplier allocation limits.

Another algorithm, Capable-to-Promise, calculates realistic order completion dates considering component availability, demand priority and capacity throughout the supply chain. Other variables are calculated within the algorithm, such as an Available Date calculation that determines timelines for supply or demand based on material availability and an Incremental Availability calculation that splits orders based on component availability and shows the dates when the splits would be available.

Best-in-class platforms will also use configurators that allow users to extend and modify algorithms with the introduction of additional logic.

Efficient versioning engine with lossless scenarios

Digital representation of the physical supply chain, commonly referred to as a digital twin, is the foundation of modern digital supply chain planning. The more detailed the twin, the more robust its ability to provide plans, early warning signals and prescriptions for corrective actions. Being able to replicate a digital twin into multiples is also foundational to strong scenario planning. But don't just look for platforms that can provide copies of production data. The wrong architecture for digital twins can eliminate memory and processing efficiency gains – especially with in-memory databases – and even create obstacles to scenario planning.

Solutions that create and store entire copies of production data require additional storage space and a lot of it. This can slow down processing times, increase costs and reduce functionality for users. If planners want to create multiple copies for comparisons, they are limited by the speed and memory consumption of their planning suite as it duplicates and accesses these full-scale copies. And if they want to do it faster, they have to settle for a subset of the supply chain model, approximations or aggregations of their data, all of which results in potential disconnects between the baseline plan and the scenario, in turn leading to reduced confidence in the outputs.

Many of these solutions also fail to alert users to changes that may have occurred to the database after a copy was made. Any scenarios that get implemented can overwrite these changes without notifying planners, leading to further issues down the line.

Instead, solutions that offer what-if scenario planning should include standard operations, like create, delete, archive, update, reset and commit, without other drawbacks. Some solutions store versions of data using only incremental changes, or deltas, which take up less storage space, enabling planners to create, save and compare data without adding costs. Less storage space also means faster access and evaluation without loss in granularity, so planners can run multiple, accurate scenarios in record time and with fewer limits on the number of versions they can create. Because these versions are lossless, users are guaranteed apples-to-apples comparisons between any two or more scenarios. This comprehensive evaluation of alternatives results in higher confidence and smarter decision-making for users.

Capabilities for the future

Technology that empowers planners to know sooner and act faster drives agility and performance improvements across the entire company. Planners can monitor and respond to changes in the supply chain in real-time, diminishing the threat of disruption and increasing the resiliency of the supply chain. They spend less time on mundane, low-value tasks like data wrangling and more time on meaningful analysis. IT professionals create faster time-to-value with newly implemented technologies, like artificial intelligence and machine learning, that run effectively and as intended. The entire network becomes faster and more responsive, supported on a pillar of capable technology.

Six essential data security features to look for in a supply chain planning platform

As a responsible business leader, you wouldn't dream of leaving the door to your office building unlocked or letting people wander into your facilities at random. That's because you know that having the right security measures in place is critical for protecting your assets, ensuring that your employees stay safe and making sure your operations continue to run smoothly.

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It's the same with your supply chain data. If you leave the doors unlocked to your digital assets, you expose your business to monumental risks. The impact of a single security or privacy breach can be catastrophic. Cyberattacks are the number one threat many organizations face, with an estimated 80% of all data breaches originating within the supply chain[1]. And, as hackers come up with new, increasingly sophisticated methods for accomplishing their goals – whether it's stealing your data or disrupting your operations on a massive scale – it's a threat that's not going away anytime soon.

The good news is that you can protect your supply chain data. It all starts with proactivity. Don't wait for an attack to happen. Take steps today to ensure your data stays safe. Choosing the right supply chain planning platform, for example – one that employs the most advanced information security technologies available – is essential for ensuring the security of your supply chain data.

Here is a list of six essential security features to look for in a supply chain planning platform so you can avoid the fallout from a major cyberattack.

User access management

One of the fundamental steps to safeguarding your supply chain data is carefully restricting who has access to it. The vast majority of users don't need full visibility into all areas. They only need access to a small subset of the available data. Permission to view the most sensitive supply chain data should only

[1] *Integrating cybersecurity into supply chain risk management.* Presented by Jon Boyens, RCAConference 2016, Moscone Center, San Francisco, CA, 2016. https://www.slideshare.net/cisoplatform7/integrating-cybersecurity-into-supply-chain-risk-management

be granted to the most trusted users, and even then on a need-to-know basis.

Your supply chain planning platform should make it easy for users to securely access the data they have permission to view. For example, any planning platform should enable secure logins using HTTPS/TLS encryption and support customer-defined user permission levels. This will give you the ability to define who can see and interact with specific information and application functionality, extending from suppliers to customers.

> "Permission to view the most sensitive supply chain data should only be granted to the most trusted users, and even then on a need-to-know basis."

SAML/Single Sign-on support is also important as it eliminates the need for multiple logins, and gives you the ability to configure your own password management policies to align with corporate guidelines for password expiry, complexity requirements and user lockouts.

System architecture and availability

An effective supply chain planning platform should also be capable of allowing your authorized users to have global access to your supply chain data, anytime and from anywhere. It should be built on a secure and reliable architecture and the vendor's Internet Service Providers and Content Delivery Network partners must be able to provide the right combination of high operational uptime and low latency connectivity to make sure that your users enjoy the best possible performance when using the platform.

Security and data privacy standards

Security and data privacy standards are another aspect of supply chain data security that needs to be top of mind when you're assessing potential supply chain planning platforms. For example, does the platform in question adhere to strict industry standards for data privacy and security? Is it constantly in line with applicable data privacy laws and regulations, such as the General Data Protection Regulation (GDPR)?

The vendor you're considering should ensure that it conducts annual SOC 1 and SOC 2 audits of its service and should also demonstrate that it routinely conducts internal and external assessments–following documented enterprise-wide processes which include management oversight to ensure the confidentiality, integrity and availability (CIA Triad) of your data.

Data center security

While your supply chain data is a virtual asset, and an extremely valuable one at that, it's easy to forget that it also has a physical component. All of the data

that we think of as being in the cloud ultimately resides on a physical server located in a data center somewhere. And that means you need to be as concerned about any threats to the data center infrastructure as you are about the many threats to your data originating in the cyber domain.

Data centers are subject to a wide variety of security threats, so protocols need to be put in place to handle everything from environmental changes to natural disasters to terrorist attacks. The people who frequent the data center site have the potential to compromise the security of your data, so strict controls and monitoring must be put in place.

Given these risks, it's essential to ask your supply chain platform vendor a couple of key questions. First, does the platform vendor make use of enterprise-grade data center facilities to co-locate its systems? And do its data centers implement best-in-class physical security? Some key best practices you should be looking for include:

- 24x7x365 security personnel
- Keyless, biometric security systems for employees
- Complete N+1 infrastructure with network and firewall redundancies
- Secure visitor access registration process
- Restricted access to authorized personnel only
- Multiple security authentication layer
- Multifactor authentication mechanism
- All ingress and egress point monitored by camera
- Secure logging of activities and CCTV video with integrated alarms
- ISO , SOC and other relevant certifications and audit programs

Security, availability and performance monitoring

To ensure the security of your data, your supply chain planning platform must provide extensive monitoring capabilities, including a comprehensive network security monitoring system that includes fully automated intrusion prevention systems. Your platform should also provide advanced security assurance through regular security scans. Incident management processes should include both automated and manual security monitoring, as well as a path for escalations of verified security risks, as defined in incident handling procedures. You also need to quickly be made aware of any localized or general service outages.

> "The people who frequent the data center site also have the potential to compromise the security of your data, so strict controls and monitoring protocols must be put in place."

Secure administrative access

Finally, your supply chain planning platform has to provide secure administrative access for the provider's Customer Support agents. Agent access must be controlled by a Virtual Private Network (VPN) with multi-factor authentication (MFA) and firewall access control, wherein all data transmissions are encrypted.

Conclusion

Selecting and deploying the right supply chain planning platform with these six essential security features will set you on the path to keeping your supply chain data safe and secure, so you can focus on managing your supply chain and what matters most to your business. At Kinaxis®, we place extreme emphasis on securing our customers' data. To learn more, read our brochure on data security in Kinaxis RapidResponse®.

Machine learning & supply chains

Tips for making the right investment decision

Is your buzzword bingo board lighting up with the latest artificial intelligence and machine learning (AI/ML) terms? Is your IT team getting inundated with requests for new data sources to feed the hungry AI/ML engine? If so, you're not alone. In Adobe's 2019 CIO Perspectives Survey, nearly 80% of CIOs reported plans to increase their investments in AI/ML in the next year.

POLLY MITCHELL-GUTHRIE
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Why all the focus on what was only recently a geek's domain? Ultimately, math is not the point, no matter how much anyone dangles their sophistication in these areas. The point is to solve business problems, which is why the majority of CIOs in the Adobe survey said AI/ML has the greatest potential of all tech investments.

How can machine learning help us understand demand?

What supply chain problems show the most promise for Artificial Intelligence and Machine Learning? One area is better understanding of customer demand. "The forecast is always wrong," so we'll never get it 100% correct, but improving forecast accuracy even a little can translate into a lot – lower inventory, fewer stockouts, more accurate production schedules, and the list goes on.

Traditional statistical forecasting relies only on sales history to predict future demand. Demand sensing applies ML to increase forecast accuracy by incorporating a wider range of signals, such as weather, holidays, social media sentiment, point-of-sale (POS) data, web searches, product ratings, and more.

Consider a company that manufactures a popular food product that went viral in the Twitterspere after a celebrity cooking show centered on it. The manufacturer wants to replenish stores quickly to meet increased demand, but only those stores where demand is likely to increase. Social media and POS data signals likely suggest higher demand in some locations than others, but with demand sensing

that impact can be predicted more accurately and supply better matched to consumer demand for each location.

> "ML can dig through historical data to predict what lead times will actually be, so that stale assumptions are not used."

Maybe your company's long lead times mean replenishment can't be quickly adjusted, so you're more interested in better planning for your air filter production. If winter was wet but temperatures normal, these are ripe conditions for pollen, which will make for a nasty spring for allergy sufferers but increase sales for your filters. Demand sensing can help you incorporate a weather signal to increase the accuracy of your forecast so you can ramp up production accordingly.

Can machine learning help us on the supply side, too?

For companies with long lead times, Machine Learning can also close the gap between signal and execution for supply, although there are far fewer market solutions tackling the supply side. If plans are based on more accurate lead times, customer orders will more likely be delivered on time and lower buffer stocks will be necessary to ensure production. But getting lead times right may mean analyzing what could easily be a 100K+ combination of parts and suppliers.

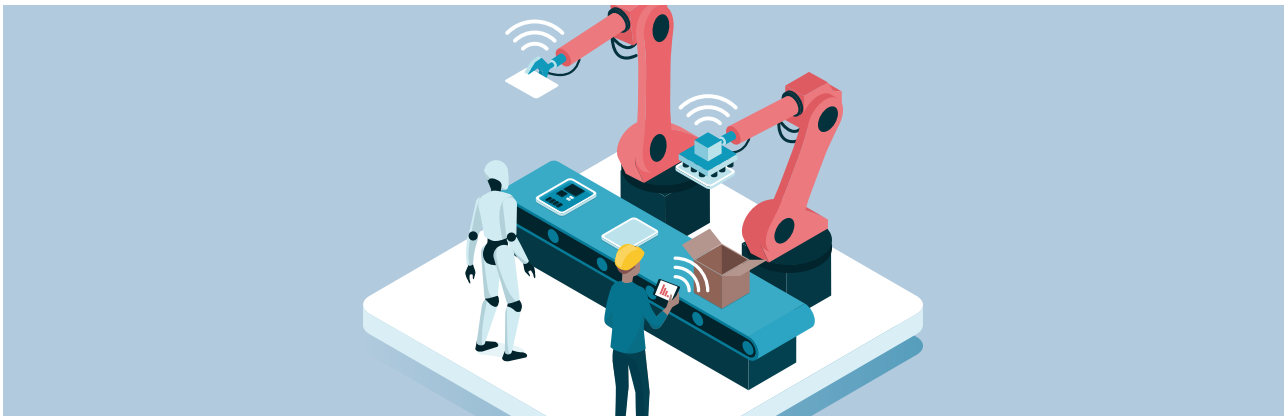
ML can dig through historical data to predict what lead times will actually be, so that stale assumptions are not used. With more accurate inputs, the planner can set processing rules, which then will automatically ignore or accept those lead time deviations unworthy of attention and flag those that merit the time and domain knowledge to decide the best course of action. ML can also identify patterns worthy of root-cause analysis, such as a consistently-late supplier or problematic part. The same approach can be used to more accurately predict yields.

What should IT consider in evaluating machine learning capabilities?

If your business sees value in these applications of Machine Learning to your supply chain, as an IT professional, you'll be asked to help them make the best decisions in purchasing the right solution. With the market flooded with options, what should be key considerations in evaluating ML vendors?

Planner empowerment

The first consideration should be empowering the planner. Unless you have data scientists available for supply chain analysis, matching supply and demand is still the domain of planners, who need tools they can adopt without the fancy math and programming that power Machine Learning systems. And planners rule this domain for good reason – they know the business, whereas data scientists' strength is in the very math and programming skills planners lack.



Data fusion

Tools aimed at empowering the planner need to be able to address the data ingestion, parsing, and learning at the core of Machine Learning. The beating heart of ML is actually not math in the brain but the data it analyzes, because the business value lies in giving the math the data it needs to find insights. Data scientists know that data preparation can consume as much as 80% of their time, so look for a solution that uses innovative data fusion techniques to do this heavy lifting for your planners, who are unlikely to be SQL wranglers. Get them out of using multiple Excel spreadsheets for all their different data sources and into one environment, where that data preparation is both automated and native to their supply chain workflow. One difference between ML models and more traditional analytics is that ML requires much more data in order to be able to learn, so trying to manage these volumes in Excel simply doesn't scale.

> "The beating heart of ML is actually not math in the brain but the data it analyzes..."

Automated machine learning

Getting data ready for analysis is only the first step, but a good Machine Learning solution will not require a planner to know things like how to build an ML workflow or tune hyperparameters either. Instead it will automate these steps, using an approach called AutoML, which enables planners to evaluate results and make the right business decisions. While your company may have experience with automated forecasting tools, the power of ML also carries a greater complexity that means that automation itself entails many more steps.

Engineering

While some vendors aim to impress by name-dropping algorithms, the bones of Machine Learning are the engineering to automate the entire process. Getting insights from data requires a little bit of math and a whole lot of well-executed engineering. In a much-cited paper, Google makes this point, that the ML code composes only a small fraction of a deployed ML system, which requires a vast and complex infrastructure. These bones are much less sexy to talk about but critical to the success of ML, because it is engineering that moves a model from math to deployment.

Not only do most planners lack software engineering skills, most data scientists are experts in math, not engineering. This is why many data science projects fail at deployment, which is all about those engineering bones. Avoid spaghetti code and baling wire by choosing a solution with the bones built for you, so your planners can focus on the insights ML delivers and IT isn't bogged down managing technical debt.

Operationalization

Math in the lab may offer insights but no ability to execute, so ask how the Machine Learning becomes operational. This step has two important components to consider. First, does the solution offer the planner the ability to experiment on a digital twin with the insights ML can deliver before committing to them in production? And once they have decided which experiments are worthy of adopting, is it seamless to take this step? Just like with data preparation, you also want a solution that provides results and the ability to commit to them native to a planner's workflow.

Interpretability

Finally, look for a vendor that offers ways to understand the stories the math is trying to tell and doesn't just expect you to trust it. Machine Learning models are well known for having high predictive accuracy but at the expense of interpretability. Planners won't use what they can't trust, and the powerful solution you helped the business buy will gather dust on the shelf. A good solution ensures the confidence of the planner with visualizations to help interpret the value of the signals ML delivers, so planners can decide whether to adopt them.

To move beyond buzzword bingo and ensure investment in AI/ML pays off, help the business make a good decision by ensuring the planner's success. Planners know the business, so give them an ML solution that can augment their expertise with a healthy heart (automated data ingestion and preparation), a good brain (a library of math models fit to the problem), and strong bones (engineering that ensures insights can be acted upon). The best solution isn't about math or eliminating the planner but making them even more effective, so they can augment their expertise to make even better decisions for your business.

Digital platforms bring change

Opportunities and risks

There is no area as challenging for IT departments than supply chain. With information spread over multiple databases and applications, collecting and reformatting the data to operate your supply chain smoothly, can be a daunting task. Add to that the need to regularly upgrade systems and introduce new technologies, and the challenges increase.

When new solutions are introduced to the technology infrastructure, IT plays a critical role in ensuring existing systems remain operational and their integrity protected – all while meeting the continuous stream of expectations for new capabilities and the resulting system upgrades.

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Software-as-a-service (SaaS)-based systems are increasingly being used in organizations around the world to reduce the costs of maintaining complex IT architectures and the effort to do so.

When it comes to supply chain, SaaS offers many advantages, including easier maintenance and monitoring, and fewer things to worry about than on-premise offerings. This is because the software provider is responsible for ensuring the latest version of firmware, software, security patches or even “built-in” disaster recovery for servers, switches and routers.

With the advantages also come the challenges of managing the technology infrastructure remotely to ensure availability and security policy compliance, and to guarantee that all users have access to vital supply chain planning solutions.

Using SaaS to re-invent 21st century-ready security policies

SaaS-based systems provide the highest standards in security policies. Today, government, aerospace and defense, and education and financial institutions all leverage SaaS infrastructures, which is a testament to the security of the data centers and security protocols on these new technology platforms.

Software providers in the SaaS space offer clearly defined security policies that can be shared across the organization to clarify what is (or is not) an acceptable practice, thereby simplifying enforcement and reducing ”grey areas.”

The main responsibility for IT, along with the governance of the security policy, is to create and manage access, setup and onboarding procedures for existing and new users so they have the proper security credentials and training they need to properly access the network and other IT resources.

Timely system and IT tools setup, training for new employees and removal of employees from the network become key areas of focus with SaaS to prevent improper systems use and security violations. These steps also help protect company information from being shared inappropriately, whether by new or former employees.

> "Digital innovation requires a robust core of digitally-enabled processes on a scalable IT infrastructure."

Leveraging SaaS to accelerate innovation

Sustaining your digital backbone remains important, but so does accelerating innovation in your organization.

For IT to take the lead in this area, the IT team needs to build innovation into business processes and choose comprehensive digital solutions that fit the business, are aligned with industry-specific needs and configured for the unique demands of the organization.

SaaS is not only about ease of use, affordability through subscriptions, flexible access, improved security and backup models. It also frees up talent, taking the burden away from IT operations, data management and infrastructure support to provide other more value-added business support.

Digital innovation requires a robust core of digitally-enabled processes on a scalable IT infrastructure. As companies move their IT to the cloud, it gives them opportunities to automate the standard business operations and provide more differentiated innovation.

Many leading SaaS vendors are evolving into platform solutions that provide IT departments and their service partners with options to configure and tailor existing processes and functionality. This offers the opportunity to:

- Extend the potential of core systems
- Address tomorrow's needs for innovation in core processes using digital SaaS technologies
- Radically improve insights for decision-making
- Deliver exponential value throughout the enterprise

From running operations to leveraging existing user workflows with technology, these platforms can evolve to enable delivery of applications and new functionalities that gives IT full autonomy to drive innovation for users.

Driving master data management innovation

Data is of paramount importance for driving system adoption and delivering the expected ROI of technology investments, especially in the business and supply chain planning area. Poor data quality and incomplete information records also make it tempting for planners and system users of integrated planning solutions to revert to Excel.

A unified data model offered by best-of-breed vendors such as Kinaxis keeps all relevant planning data in a single place, enabling sound data hygiene principles and data quality control processes to be put into place.

The benefits of a unified data model do not stop with the data maintenance of all relevant supply chain network and planning parameters. Powerful visualization capabilities, built-in machine learning, AI-supported data assessment and parameter management procedures designed for cleansing supply chain planning relevant parameters and optimization rules, help planners continuously heal the data or parameters that drive optimization decisions. The historian capability, which archives plans and allows resets to the planning context at any point in time, ensures fast recovery of planning information and relevant data setup and parameters, which are overwritten in more traditional planning solutions.

With data and parameter quality built right into the platform, planners can focus on more value-added tasks, like problem-solving and decision-making, leaving repetitive complex data and parameter update tasks to the system.

Leveraging SaaS to simplify the integration framework

SaaS solutions as described in this article don't restrict technology benefits for the users. The single instance, unified data model, and single data scheme and format mean that IT integration and interface requirements feed a staging area or data hub or directly populate the supply chain software platform. In both cases, the integration design, data mapping and resulting interfaces are significantly simplified. Common knowledge and expertise can then be leveraged to transfer the data from the legacy or enterprise resource planning (ERP) solutions into the single platform.

Overall, the single instance contributes to a significantly simplified integration effort for the customer. The vendor designs the integration once, then develops a single set of interfaces to the customer's systems, where the required core static and dynamic data reside for supply chain planning.

Innovate with planning algorithms

Advanced algorithms are at the core of any modern decision-support solution. Algorithms were developed over the years to include different rules and policies, and represent real-life digital twin models and challenges for different industries and companies.

Some software vendors have selected optimization algorithms based on heuristics, others based on more CPU-intensive and slower linear programs. Whatever the approach, most solutions are rigid, evolving and improving slowly over time because the expertise and testing required to address solution flaws is as precise and complex as brain surgery. If not performed correctly – it could "paralyze" the business.

> "Algorithm innovation promises to completely disrupt the pace of innovation with regards to optimization."

In this space, cloud-based platforms like the one developed by Kinaxis have made breakthrough innovations by providing third-party vendors, experts and subcontractors the opportunity to develop their own algorithms or correct existing versions through certified applications.

Algorithm innovation promises to completely disrupt the pace of innovation with regards to optimization. A multitude of apps will become available to the planners of these platforms to solve their optimization issues. And even better, IT departments will be able to take the decision to build their own certified enhancements and solutions on these platforms and potentially commercialize them!

Selecting the best partners and providers

Carefully selecting strategic SaaS partners and projects is critically important to IT organizations. Choosing the best of the best ensures IT can adopt useful tools and best practices to free up time, accelerate system deployments, improve security policy adoption and introduce and accelerate large-scale innovation in many different dimensions, including:

- Automation of data management
- Simplified integration concepts
- Accelerated solution improvement in complex areas such as optimization
- New tailored digital business processes for the company

Freeing up time and reducing IT operating costs is paramount to accelerate the introduction of technology innovation you offer your business. So is the access to the multidimensional digital innovation power provided by the best platform providers.

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Discover how to transform your supply chain

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Managing complexity doesn't have to be complex. Find out how to simplify your day and make your supply chain more agile and resilient in an increasingly unpredictable world. Learn how to eliminate silos, banish disconnected processes and say goodbye to outdated, static data.

Read more about concurrent planning

Ask an expert

Let one of our experts walk you through the RapidResponse features and capabilities that can help you address your immediate supply chain planning needs and put you on a path to long-term success. We'll show you how to transform your supply chain for exceptional business outcomes.

Contact us

About Kinaxis

Navigating supply chain volatility takes agility. Why? Because plans are never perfect. Kinaxis® is the authority in empowering fast, confident decision-making across the supply chain so people plan better, live better and change the world. Trusted by top brands, we combine human intelligence with AI and concurrent planning to help companies plan for any future, monitor risks and opportunities and respond at the pace of change. Powered by an extensible, cloud-based platform, only Kinaxis delivers industry-proven applications so everyone can know sooner, act faster and remove waste. Don't believe us? Ask us to prove it.

Learn more at kinaxis.com.

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