Hype Cycle for Multienterprise Solutions, 2019

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Application leaders and supply chain leaders can use this research to identify options for platforms to support their B2B ecosystem as well as their digital business transformation.

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What You Need to Know

The rise of digital business and the need for greater visibility have fueled renewed interest in multienterprise solutions. Digitizing multienterprise processes delivers improvements in agility, visibility, scalability, and profitability across a wide array of application and supply chain domains. However, not all new offerings will become mainstream instantly. While billions of dollars of investment have been pumped into blockchain startups, most implementations are in pilot or proof-of-concept stage. Interest around blockchain grew as a potential alternative or complementary solution to existing multienteprise solutions to meet companies' needs for visibility and transparency. For example, many governments are examining blockchain as a possible technology to digitize customs and finance processes.

Many companies are reevaluating or replacing their legacy-based systems, many of which are based on older technologies such as electronic data interchange (EDI) and managed file transfer (MFT) and examining API-based options. Additionally, multienterprise solution buyers want broad

offerings. Therefore, we're seeing the rise of the network of networks (multiple multienterprise solutions connecting to each other to create an ecosystem that brings extended value by linking together formerly siloed sources of data). Broad offerings remain challenging, however, as vendors struggle to architect sufficient flexibility in data and process models, build competency across multiple process domains and create practical pricing plans. Many vendors create these broader platforms by developing lightweight, placeholder modules or through acquisition.

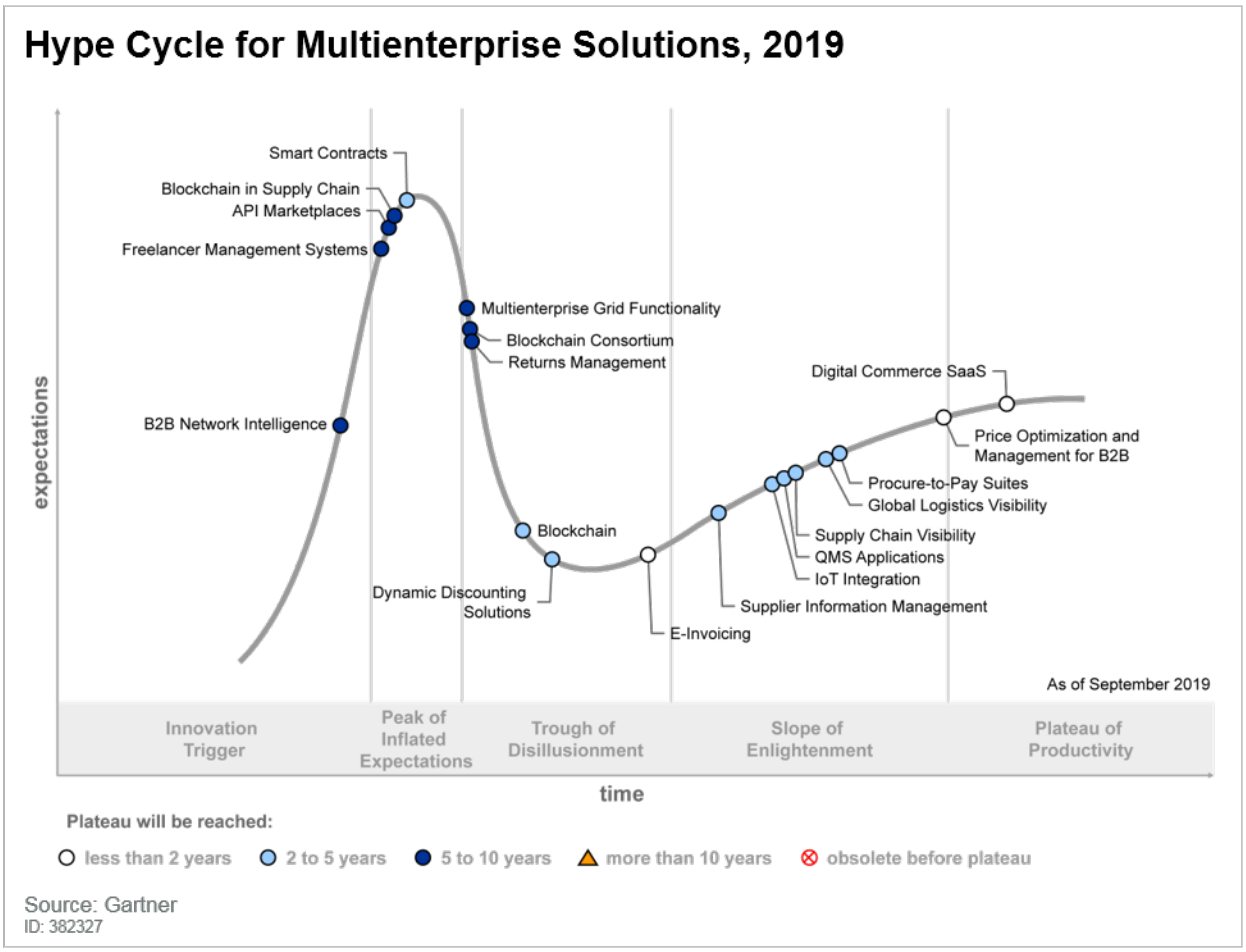
Take a cautious approach to new technologies, and use a flexible strategy when investing in and deploying multienterprise solutions. Favor vendors that offer multiple connectivity options, as this will accommodate a greater portion of your customers and suppliers.

The Hype Cycle

Multienterprise solutions combine applications, technologies and networks that enable organizations to digitize and automate processes, exchange documents and data, as well as share information (visibility) with customers, suppliers and partners. Multienterprise enablement signals a shift from traditional, internally focused process automation tools to solutions that support communities of organizations. Some multienterprise platforms create a shared community intelligence not possible without the mulitenterprise aspect. Supplier risk modeling, for example, pools data from many different sources and generates a community consensus that can be refined based on your company's own parameters. Many of the innovation profiles depicted in this Hype Cycle appear in other Gartner Hype Cycles, for domains such as supply chain execution, procurement, digital commerce and information governance. The common denominator for solutions selected for this research is a significant functional focus on connecting organizations.

Don't forget that innovation profiles in all stages of the Hype Cycle may offer value. Resist the temptation to ignore an innovation just because it sits in the Trough of Disillusionment. Innovations at this stage may suffer from hype fatigue, but that doesn't mean they can't deliver value. Use Gartner research to help you prioritize your investments. As these technologies mature and progress out of the trough, the risk-to-value ratio decreases, making them safer choices.

Figure 1. Hype Cycle for Multienterprise Solutions, 2019



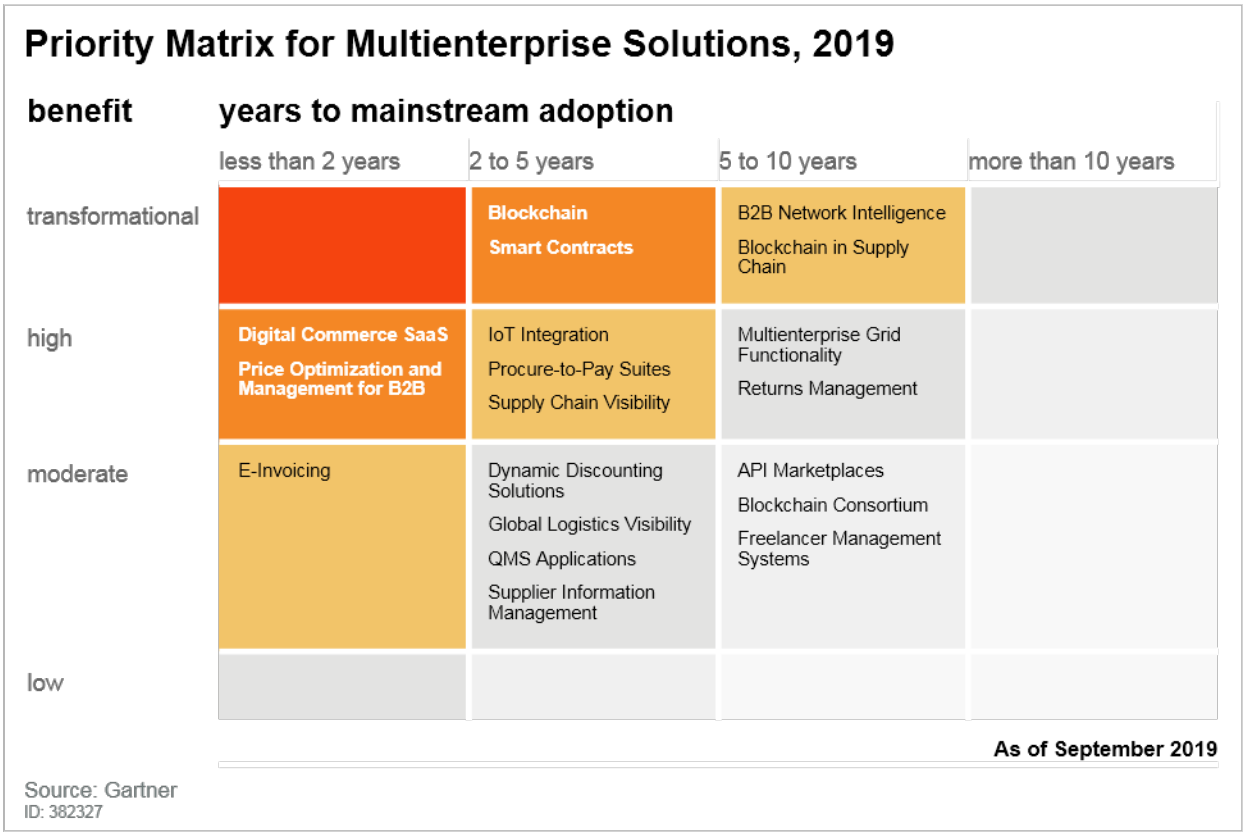
The Priority Matrix

Organizations seeking to build, grow or upgrade their digital ecosystem have many types of solutions to choose from. Use Gartner's pace-layering principles — a framework that matches a solution sourcing strategy to expected service life and benefit type — to select the right type of offering for your particular needs. For example, organizations with a high risk tolerance looking for a multienterprise solution that delivers competitive advantage (a system of innovation in pace layer terminology) should evaluate emerging, transformational capabilities such as blockchain and B2B network intelligence. By contrast, prospective purchasers that want digital systems of record and/or moderate competitive differentiation should focus on solutions that are expected to go mainstream in the next few years, such as digital commerce SaaS and e-invoicing. Prioritize innovations that create communities of trading partners (networks, hubs) because, with these, you can "plug into" an operational site that someone else supports and maintains.

Organizations seeking ecosystem-based competitive advantage and that have sufficient IT resources along with channel mastery can consider investing in solutions that create a private community with a proprietary data model — for example, a custom dealer portal. This is also

referred to as a dominant partner model. The high costs of building and operating such a solution are what make the offerings in this Hype Cycle of interest.

Figure 2. Priority Matrix for Multienterprise Solutions, 2019



Off the Hype Cycle

To provide readers with clearer, more focused research that supports their analysis and planning, we have asked authors to include only those innovation profiles most strongly linked to the Hype Cycle and its theme. In many cases, selecting only the most salient profiles has reduced the number of innovation profiles on the Hype Cycle.

As such, the following innovation profiles were removed:

- Freight capacity platforms (road)
- Multienterprise MDM
- Digital experience platforms
- Supplier risk monitoring
- API-based digital commerce

- Hybrid integration platforms
- Web-based logistics portals
- All-in-one supply collaboration platforms
- Managed application services communities
- Demand signal repository
- Distributed ledgers
- API management PaaS
- End-to-end risk management
- Supplier quality management applications
- Supply base management
- Track-and-trace and serialization
- Information hubs for SCM

On the Rise

B2B Network Intelligence

Analysis By: Kaitlynn Sommers

Definition: B2B network intelligence is a class of analytics obtained from multienterprise networks that process tens of millions of digital transactions between trading partners. These analytics offer macrolevel insights such as identification of suppliers with increasing or declining sales, and of buying organizations that award contracts only to incumbent suppliers. B2B network intelligence can extend to pricing trends for specific spending categories.

Position and Adoption Speed Justification: B2B network intelligence is slowly climbing toward the Peak of Inflated Expectations. It gleans analytic insights from procurement networks, information hubs for supply chain management, sourcing events and e-invoicing networks. Some networks have gained enough traction for vendors to "farm" their data in order to provide powerful insights to buyers and sellers. Increased success in gleaning insights from this data also creates potential for it to inform investors, regulators and governments.

However, to date, we see mostly experimentation in the field of B2B network intelligence. Most vendors are in the early stages of building their communities. They do not want to inhibit growth by exposing data that could hurt a particular company. Furthermore, B2B networks must reach a critical mass for data to deliver reliable insights. Nonetheless, we see some networks experimenting with price benchmarks because the value of the data to buyers and sellers is high. Similar benchmarks, such as cycle time, are also the subject of early exploration.

B2B network intelligence will open up a significant new stream of income for vendors. Networks and hubs are maturing and the volume of traffic is increasingly sufficient to provide useful insights. Monetizing the value of this data will become irresistible.

User Advice: Application leaders responsible for multienterprise solutions should:

- Protect their organization's data and reputation by requiring contract language that allows only aggregated, anonymous use of their data by any hub or network vendor.
- Evaluate sharing their organization's data when value — such as reduced or eliminated fees — may be given in exchange, as in the consumer/social market.
- Work with business leaders to identify B2B network intelligence that may be of interest to their organization, and ask their hub/network vendors to supply it.

Business Impact: The digital consumer experience is a strong indicator of what is likely to become an accepted practice in the B2B market. Today, consumers broadly share personal information with social sites, mobile device companies and digital commerce websites in exchange for convenience and access to discounted shopping. The impact of this sharing has been transformational for consumer technology, and has led to the creation of large companies that make money selling consumer data and advertisements. The impact will likewise be transformational in the B2B arena. B2B network intelligence will provide visibility into information that is currently unavailable, such as detailed insights into pricing, behavior and trends in relation to buyers and sellers.

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Basware; Beroe; Coupa; LevaData; PowerAdvocate; PRO Unlimited; SAP Ariba; SAP Fieldglass; Upwork

Recommended Reading: "Macro Trends Affecting the Multienterprise Supply Chain Business Network Market: Provider and Solution Evolutions"

"Hype Cycle for Multienterprise Solutions, 2018"

"Supply Chain Brief: Getting Ready for Multienterprise Business Networks"

At the Peak

Freelancer Management Systems

Analysis By: Kaitlynn Sommers

Definition: A freelancer management system (FMS) is a platform that enables direct communication between hiring managers and freelance workers. An FMS generally provides algorithmic job

matching, worker classification, workflow automation, payment processing and performance feedback.

Position and Adoption Speed Justification: The market for FMSs is emerging and has high growth potential.

FMSs enable organizations to locate, negotiate with, and collaborate directly with nonemployee professionals to fulfill short- and long-term resource requirements. FMSs often focus on specific skills or types of workers, ranging from unskilled labor to highly specialized professionals. Organizations select workers either from public talent pools or from private talent pools that they have assembled themselves.

Vendor management systems (VMSs) have long supported contingent workers employed by temporary staffing agencies and managed service providers. Organizations are still working out how to use FMSs in conjunction with VMSs. In many cases, there is not yet a formal strategy for engaging with an FMS vendor.

Human capital management, VMS and procure-to-pay vendors are introducing self-sourcing capabilities, which could accelerate adoption of FMSs. On the other hand, the potential for changes in legislation and for worker misclassification presents a challenge to swift adoption. As a result, FMSs will progress at a moderate pace along the Hype Cycle as awareness of them broadens, their benefits are proven and desire for them grows.

User Advice: Organizations that spend significant sums annually on nonemployee labor should evaluate FMSs as a means of streamlining and improving collaboration with freelancers. Small and midsize companies may also want to review them as means of consolidating processes for the use of freelancers and other independent workers.

Application leaders responsible for service procurement initiatives should work with HR, procurement and legal teams to develop a contingent-workforce strategy. This strategy should include examining the benefits and risks of using freelancers and an FMS.

The early success of “generalist” FMS solutions has led to the emergence of specialist FMS marketplaces focused on a particular skill or type of work. We recommend reviewing FMSs for the quality and skills of their freelancers, based on an organization’s needs as outlined in the contingent-workforce strategy. A key differentiator of each FMS is the quality of the freelancers attracted to it.

Note that microwork and crowdsourcing platforms are different from FMSs. Microwork splits jobs into components and distributes work over the internet, while crowdsourcing divides work among participants.

Business Impact: **Access to talent:** Organizations can develop private talent pools filled with alumni, retirees, “silver medalists” (second-place job candidates) and known freelancers. Alternatively, they can utilize public talent pools/clouds for broad searches.

·**Improved operational efficiency:** Algorithmic job matching identifies qualified candidates. Hiring managers can view freelancers’ profiles, credentials and work history. Onboarding is quick, and

managers and freelancers can communicate and collaborate in real time. Once a manager accepts a work product or deliverable, the system executes payment using various options, including escrow funds.

·**Compliance:** Built-in compliance tools ensure that workers are properly classified and the completion of any required background checks and drug tests. FMSs also track the receipt of all required tax and employment documentation.

Despite the positive impact of FMSs, we give them an overall benefit rating of only moderate. These solutions address only a segment of the overall nonemployee labor market and tend to support significantly less spending than VMSs. However, we expect FMSs to continue to grow in popularity and spending throughput over time as organizations increase their use of nonemployee labor.

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Catalant; Comet; Expert360; Field Nation; Fiverr; Kalo; Nétive VMS; Upwork; WorkMarket

Recommended Reading: "Market Guide for Services Procurement Solutions"

"Learn How the Future of Work Is Transforming Employee Experience Globally"

"Predicts 2019: Sourcing and Procurement Application Vendors Embrace APIs and the Ecosystem Approach"

API Marketplaces

Analysis By: Mark O'Neill

Definition: An API marketplace is a platform for API providers to publish and market APIs. Consumers, mainly developers, use API marketplaces to discover APIs and (in some cases) purchase access to APIs. API marketplaces differ from API portals since they are more likely to include APIs from multiple providers, may showcase applications (e.g., mobile apps) using the APIs, and may involve API monetization. Although public API marketplaces are more well-known, a growing number of organizations, including banks, now have deployed internal API marketplaces.

Position and Adoption Speed Justification: API marketplaces have not yet gained significant industry traction due to factors including a lack of industry-vertical API standards, the lack of clearly articulated business models from API marketplace providers, and a lack of marketing which impacts on developer awareness. Because of this, API providers have reported more success in marketing their APIs directly, compared to registering their APIs in third-party API marketplaces. However, a number of API marketplaces have been developed by API providers themselves, and these demonstrate initial success. For example, Twilio provides a marketplace for partners to sell API

access in the form of complementary add-ons to Twilio's core telephony offering, such as AI-based sentiment analysis APIs. Governments, including those of Singapore and Canada, have also begun to deliver API marketplaces which combine APIs from across their governments. Internal API marketplaces have found usage in larger organizations, mainly as enterprisewide API catalogs. All in all, however, API marketplaces are still early in their maturity.

User Advice: For CIOs, CTOs and application leaders seeking to be:

- **API providers:** Recognize that your choice of API marketplace(s) in which to offer APIs will depend on the industry focus and profiles of its users: Be relevant to them. Gartner clients report that general API marketplaces, which list APIs that can also be found through other channels (like web search), have brought them few new users. API marketplaces that include an integration capability, or target a particular vertical or multiparty community, have brought more success. But when considering commercial API marketplaces in which to register your APIs, examine billing terms carefully to understand what proportion goes to the API marketplace provider. Find out if a revenue-sharing model is available. Because your APIs may be side-by-side with competing ones, think carefully about differentiation.

  If you plan to build your own API marketplace, ensure that you establish a commercial model upfront (e.g., through registration fees charged to API and app providers and/or revenue share provided to API and app providers) as well as a clear governance process for onboarding third-party APIs or apps. Understand that although it is developers who will leverage APIs through your marketplace, you must also consider incentives to ensure that businesses engage. In addition, consider delivering an internal API marketplace first. Full life cycle API management vendors provide API marketplace capability, based on API portals, that can be deployed inside the organization.

- **API consumers:** As API marketplaces gradually develop, ensure that you use APIs from trusted marketplaces, and that you examine usage agreements, licensing and billing terms carefully. If an API is available in an API marketplace, also investigate if the API is available through a direct business relationship with the API provider itself.

- ***Business Impact:*** For API providers, the presence of their APIs in API marketplaces can increase consumer mind share, which may lead to more API usage, and business scale benefits. For public API marketplaces, these consumers may include not only individual developers, but also new business partners. The API marketplace provider may take a share of the revenue for API access purchased through the marketplace, but this can be considered a cost of sale by the API provider.

  For prospective API marketplace providers, there is an opportunity to create marketplaces for particular industries, like BBVA's API marketplace for the financial services sector. The marketplace itself can be monetized, through a registration fee or revenue sharing model.

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Amazon Web Services; BBVA; Lucybot (AnyAPI); Microsoft Azure; ProgrammableWeb; RapidAPI; Temenos; WSO2

Recommended Reading: "Align Your API Marketplace Strategy With Your Ecosystem Goals and Revenue Expectations"

"A Strategic Marketing Mindset Is Essential to Externally Facing API Initiatives"

"To Create a Successful API-Based Ecosystem, Look Before You Leap"

"Choose the Right API Monetization and Pricing Model"

"Magic Quadrant for Full Life Cycle API Management"

Blockchain in Supply Chain

Analysis By: C. Klappich; Alex Pradhan; Andrew Stevens

Definition: A blockchain is an expanding list of cryptographically signed, irrevocable transactional records shared by all participants in a network. Each record contains a time stamp and reference links to previous transactions. With this information, anyone with access rights can trace back a transactional event, at any point in its history, belonging to any participant. A blockchain is one architectural design of the broader concept of distributed ledgers.

Position and Adoption Speed Justification: Supply chain-related blockchain initiatives continue to be nascent with mostly proofs of concepts and solutions in early stages of development. There are few, if any, supply chain blockchain projects being deployed at scale. Interest in potential applications across supply chains has accelerated and supply chain organizations have shown continued interest in blockchain concepts. Initiatives are a mix of vendor-led, industry and consortium driven discussions. Solution adoption and cadence could be dependent on the how supply chains often demand interdependent process steps and verifications across digital and physical transactions. Technology solutions supporting blockchain must adapt to bridge physical levels of authentication and the need for interoperable data exchange across responsible trading partners.

Current capabilities offered by blockchain solutions for supply chain can include a loose portfolio of technologies and processes that spans middleware, database, verification, security, analytics, contractual and identity management concepts. Blockchain is also increasingly being offered as a service or development option across supply chain solutions that target closely aligned objectives such as automation, traceability and security. A critical aspect of blockchain technology is the unregulated, ungoverned verification of successful transactions as well as immutability. These capabilities fund much of blockchain development for supply chain. Other concerns include lack of scalability and full transparency, privacy over consumption of resources, and a perceived operational risk with decentralized protocols.

Blockchain technology adoption challenges for supply chain also include lack of standards for governance across transactions, scalable distributed consensus systems and foundational electronic interoperability across trading partners.

User Advice: The position on the Hype Cycle reflects use cases across supply chains and technology solutions still in early PoC and development phases. Recognize that terminology surrounding blockchain is in flux and often needs more granular and broader interpretation when applied to a supply chain use case. Uncertainty and applicability across supply chains (especially in physical transactions) often masks the potential suitability of technology solutions to meet business use cases.

- Clearly identify how the term is being used and applied internally and by providers to better understand the return on capital employed, and the incremental value that could be realized beyond proven technology options.
- Assess the solution's ability to map and execute across specific supply chain use case criteria and risks — such as location, status and ownership — and its planned timing and positioning across your strategy technology roadmaps.
- Identify specific high-risk areas of supply chains that exhibit transactional complexity across multiple stakeholders. These are prime candidates for blockchain: for example, trade contracts, asset management, transportation and traceability.
- Closely monitor the evolution of blockchain technology solutions for supply chain that might materialize through working groups, consortia or peer-to peer industry initiatives.

Business Impact: Multiple business use cases for blockchain across supply chains are yet to be proven. Although hype has been focused on the financial services industry, supply chain management is likely to see increasingly higher volumes of adoption, but at slower rates. The potential of this technology to radically transform economic-related interactions should raise critical questions for society, governments and enterprises. Although there are no clear answers to these questions today, it is important to find the answers during the rise of the programmable economy.

Consider the following impact areas:

- **Risk: High —** Tools are nascent and unproven, and expertise to set up, maintain and govern these systems is very immature.
- **Strategic policy change: High —** Certain supply chain blockchain use cases deployed as part of a strategic technology roadmap in areas such as global trade finance, product pedigree or security could realize significant business improvements.
- **Organization change: High —** Across diverse supply chain business partners, companies need to address new collaborative and interoperable working practices.
- **Culture change: High —** Blockchain execution will require cultural shifts across all levels of the business focused on shared value creation, trust and consensus, particularly for solutions that span multiple enterprises where ecosystem enablement is difficult.

- **Process change: High —** Protocols for secure transactions and governance mechanisms for the blockchain ecosystems.
- **Competitive value: Moderate —** Early adopters will gain a competitive head start, but because of the multienterprise nature of SCM blockchain use cases, industries will benefit most if multiple parties participate in the technology.

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: arc-net; Blockverify; Chronicled; Circulor; Guardtime; IBM; Omnichain; Skuchain; SupplyBloc; VeChain

Recommended Reading: "Follow Four Evaluation Steps to Decide If Blockchain Is Right for Your Supply Chain"

"Seven Things That Supply Chain Leaders Need to Know About Blockchain"

"Blockchain Fundamentals for Supply Chain: A Guide to the New Boardroom Buzzword"

"Explore Blockchain's Potential in Life Science Companies' Track-and-Trace and Serialization Development Strategies"

"The 2018 Top 8 Supply Chain Technology Trends You Can't Ignore"

Smart Contracts

Analysis By: Adrian Leow; Avivah Litan; Lydia Clougherty Jones

Definition: A smart contract is a computer program or protocol, typically running on a blockchain-based technology platform, which facilitates, verifies or executes business processes that could be triggered by events, on-chain and off-chain transactions or interactions with other smart contracts. A smart contract can also be a digital and autonomous representation of the traditional contract process, including contract formation, creation of enforceable and immutable rights and obligations, and execution of performance.

Position and Adoption Speed Justification: As they emerge, smart contracts will be used to automate a value exchange through contract or contract clause execution, offering fine-grained terms and conditions or other contract specifications with context-specific built-in enforcement (mediated by the underlying technology foundation or platform). Smart contracts can function at varying levels of scope: From a single transaction (e.g., unbundled smart contract) to an organizational unit, to an ecosystem. Smart contracts are designed to facilitate a value exchange and record evidence that the requirements of particular conditions, such as certain specific payment terms or delivery of a good, have been met. This potentially reduces claims or lowers the cost of fraud or dispute resolution.

Smart contracts are the least mature subsystem of blockchain technology, which is itself still very immature. The word “smart” is something of a misnomer. The computer code is prescriptive and, unless informed by AI, has no inherent artificial intelligence (AI) or self-learning capabilities. Still, it is expected that AI will be used (outside the blockchain) to process and model large volumes of data and provide selective data feeds to the prescriptive smart contract code. Similarly, AI models will likely ingest relevant data from the blockchain to inform smart contract or off-chain programmed processes.

As used today, the term “smart contracts” refers to code often written in blockchain-based languages (such as the Ethereum Solidity language) that manage how transactions are processed and written to a blockchain. The future vision of smart contracts includes a potential replacement for simple or complex legal documents and transactions., but there are many obstacles to be overcome such as organizational readiness, unanticipated “follow on” smart contracts, perceived lack of enforceability, potential evidentiary gaps, regulatory compliance, which may take many years.

Smart contract scripting languages, tools, frameworks and methodologies are all currently at an early stage of development. The need for a secure scripting language, that is “Turing complete,” as well as enabling easy smart contract creation is still an unsolved problem in the industry. The capability to automate complex agreements and, for a trustless runtime environment, to provide a deterministic programming language, are key technical challenges that are five to 10 years away. In the future, possibly five to 10 years from now, smart contracts are likely to offer regulators and lawyers an opportunity for enforcement via evidentiary audit trails of actions being performed, thereby contributing to existing traditional contractual law. In the meantime, utilities must be developed to enable all entities who participate in smart-contract-driven processes to be able to validate the flow of the code, and ensure its performing as intended.

User Advice: Application leaders looking at developing a strategy to deploy smart contracts should:

- Research the emerging platforms, technology, tools and frameworks to determine the level of resources needed for smart contract development.
- Develop a clear understanding of the different smart contract platforms, programming models, tools, frameworks and ecosystems, and their limitations and challenges.
- Identify use cases that can derive significant benefit from the core value exchange promised by smart contracts. This includes being aware that the term “smart contract” is already being misused and its imminent “safe” use exaggerated.
- Identify integration points with existing processes to determine their impact on core industry and ecosystem value propositions. Assess the implications for your information management architecture, legal compliance policies, payment systems, customer service and other core business processes.
- Determine policies with respect to contractual enforcement and smart contract use. Familiarity with the technology will also be required by all participants for transactions to succeed.
- Ensure you understand smart contract code that impacts your organization and that you have the tools to monitor its correct execution.

Business Impact: As stated, smart contracts will develop in different forms and with differing levels of impact. Many will simply replace existing transactional tracking mechanisms and execution systems such as used in blockchain-based supply chain management use cases. As such, smart contracts will be impactful. However, only when truly secure and proven smart contracts develop will smart contracts have the potential to transform commercial relationships through granular obligation recognition and secure value transference.

Benefit Rating: Transformational

Market Penetration: Less than 1% of target audience

Maturity: Embryonic

Sample Vendors: Augur; Ethereum Foundation; Gnosis; Hyperledger; MONAX; Provable; R3

Recommended Reading: "Preparing for Smart Contract Adoption"

"Use Smart Contracts and AI to Drive Value From Data Investments"

"Data and Analytics Leaders Need to Focus on Blockchain Smart Contracts Now"

"Market Guide for Blockchain Platforms"

Sliding Into the Trough

Multienterprise Grid Functionality

Analysis By: Micky Keck

Definition: Multienterprise grid functionality is a feature of third-party-owned business process networks (BPNs). Specifically, it is the unique set of capabilities that emerge when all BPN customers agree to share specific common content in a many-to-many fashion. Buyers, suppliers and partners collaborate on content such as logistics, transportation and procurement data. The BPN owner adopts a single data model or provides data-mapping services (multienterprise MDM) to create a grid.

Position and Adoption Speed Justification: Multienterprise grid functionality continues to gain traction as vendors invest in the infrastructure needed to deliver B2B networks and hubs that members can "plug into." The openness of the network allows buyers to connect with partners to collaborate without siloing partners into a limited-value private portal.

These platforms enable business partners to work collaboratively by using common information or indicators to synchronize the supply chain. Suppliers can upload master data, certifications, and product and other information, which is then available on a permission basis to applicable buyers.

Multienterprise supply chain business networks (MESCBNs) show the value that network participants can extract. Logistics grids provide their community benchmark services through the

use of big data shared by members. This data would be much more difficult to access without the participation of multiple parties that form the entire supply chain.

Multienterprise grid technology is moving forward more quickly than previous years as providers address privacy and security concerns. Multienterprise-grid-enabled business process networks are proving to be more secure than private hubs and portals. Higher security is the result of the community sharing costs required to set up and maintain robust security. Additionally, data security must be a critical core competency of the third-party solution owner.

User Advice: **Buying Organizations:** When choosing and implementing a procurement or supply chain solution that requires suppliers to interact online with you, consider the advantages of multienterprise grid functionality. Application leaders responsible for procurement or supply chain applications should evaluate each option to determine:

- Whether it allows your suppliers and service providers to upload common content once.
- Whether it provides access to an existing community.
- Whether the solution provider will provide ongoing business and technical support for your suppliers and service providers, and at what cost.

Suppliers: Educate your buyer customers about the high costs of private portals and dominant partner networks that lack multienterprise grid functionality. Buyers need to understand the cost impact of building and maintaining a private hub or portal.

Buyers and Suppliers: When evaluating the ROI on an investment in a multienterprise solution, consider the availability and value of the community data. Additionally, place a special emphasis on advanced analytical and benchmarking capabilities.

Business Impact: Gartner rates the benefit of multienterprise grids as high when they reach full maturity. The improvement in data quality and cross-enterprise visibility will drive efficiency gains and improve business analytics and predictions. Multienterprise grid functionality supports the ability for participants to upload information once for sharing on a permission basis with other members. Data management professionals looking to improve data validation is a common use case. Examples include:

- Firmographic information (such as tax identifiers, plant locations, executive names, financial data, certifications and contact information) for use in supplier registration, evaluation and risk assessment.
- Catalog content and product specifications for use in procure-to-pay (P2P) solutions.
- Logistics and transportation insights along multiple modes and providers as the basis for benchmarking and optimization.

Procurement and supply chain groups looking for pricing and benchmarking data can benefit from networks that publish community transaction data. Information such as cycle times, pricing/rate cards, and lead times are commonly available datasets.

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Adolescent

Sample Vendors: Basware; Coupa; Dun & Bradstreet; E2open; GT Nexus; LexisNexis Risk Solutions; SAP Ariba; SupplyOn; Tradeshift; Transporeon

Recommended Reading: "Magic Quadrant for Multienterprise Supply Chain Business Networks"

"Macro Trends Affecting the Multienterprise Supply Chain Business Network Market: Provider and Solution Evolutions"

"Supply Chain Brief: The CSCO Perspective on Supply Chain Business Networks"

Blockchain Consortium

Analysis By: David Furlonger; Fabio Chesini; Rajesh Kandaswamy

Definition: A blockchain consortium is a group of companies joining forces to foster cooperation by sharing a ledger and by defining standards and a governance model with the objective of creating a digital ecosystem to reduce operational risk, minimize costs or enhance customer service.

Position and Adoption Speed Justification: The scope of a blockchain consortium can include some or all of the following:

- Developing agreements about sharing a common ledger
- Educating members
- Defining technical and data standards for use
- Building common use cases
- Establishing a governance model
- Fostering a digital ecosystem

Consortia are playing a critical role in blockchain development. Like the blockchain-inspired solutions they utilize, they have been instrumental in bringing to market different industry solutions to shared problems. Consortia take many forms. Some align organizations in a genuine collective model to pursue common goals. Others represent the vision of a single, powerful entity exerting influence over industry subordinates. By our count, there are more than 100 blockchain-focused consortia, with more forming each month. The links between consortia members vary widely and include industry, geography, technology and business affiliations. Many enterprises belong to more than one. Blockchain consortia have particular credibility as developers of solutions to address an industry or geographic problem.

There are four types of blockchain consortia:

- Industry-centric: For example, Energy Web Foundation, Blockchain Insurance Industry Initiative (B3i) and Blockchain in Transport Alliance (BiTA)
- Geography-centric: For example, Financial Blockchain Shenzhen Consortium and Global Blockchain Business Council
- Technology-centric: For example, Hyperledger, Enterprise Ethereum Alliance and R3
- Business-process-centric: For example, for maritime shipping an initiative funded by Lloyd's Register and, in the milk industry, an initiative led by Ant Financial.

Unless and until more clarity can be ascertained as to the role and value proposition of consortia, the business benefits from consortia participation will be hard to attain. Clarity needs to be established around purpose, IP ownership, funding, governance, accountability, payouts, communication, technology sourcing and exit strategies. This clarity will take time to appear and will not be consistent at an industry or geography level.

User Advice: Scores of consortia have formed in just a few years to promote the interests of certain industries, countries and technology platforms. Market powers with vested interests in protecting centralized operations and value chains will establish consortia to achieve market dominance and to promote Trojan horse solutions that lock-in value chain participants. You should:

- Align your organizational strategy in relation to blockchain with the intentions and engagement model of the consortia in your industry or geography.
- Analyze your prospective consortia in terms of the core blockchain-inspired archetypes of Fear of Missing Out (FOMO), Trojan Horse, Opportunistic, Evolutionary and Native, as well as those that you are likely to explore.
- Maximize your consortium opportunities by gaining clarity about the purpose, IP ownership, funding, governance, accountability, payout structure, external communications, technology sourcing and exit strategy of relevant consortia.

Business Impact: Some of the benefits members gain include active engagement and communication with others in their industry, whom they normally view as competitors. For some, this establishes a spirit of collaboration and creates the potential for a broader level of trust. Expect consortia and the solutions they develop to evolve along the decentralization continuum. As they mature, consortia will consider how tokens and tokenization could improve their solutions.

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: Alastria; BiTA; Blockchain Insurance Industry Initiative (B3i); Hyperledger; R3

Recommended Reading: "Toolkit Blockchain Consortia Initiatives"

Returns Management

Analysis By: Simon Tunstall; C. Klappich

Definition: Returns management are software solutions that help manage the end-to-end returns process from connecting with consumers to processing and managing the return and ultimately executing the refund.

Position and Adoption Speed Justification: Returns management software solutions help automate and manage the end-to-end returns process. This starts by providing consumers self-service connectivity to the returns platform to request a return. The platform then manages authorization, dispositioning, shipping, consolidating returns where possible, providing returns visibility while keeping customers informed, tracking updates and finally processing the refund. Leveraging business applications to support the returns management process is not new. In fact, over 15 years ago there were numerous first-generation vendors that built robust solutions to support the end-to-end returns process. However, it was too early then, and e-commerce needed to grow dramatically before the market for specialized returns management became sustainable. Virtually all of the first-generation vendors ceased operations. It is only recently that a new wave of specialist vendors is beginning to emerge.

Demand for robust returns management solutions is growing because returns are a significant and costly problem for companies, making returns a growing area of importance for retailers of all sizes. However, market penetration is still modest because, until recently, returns was a secondary consideration for most organizations, and little IT spending has focused on automating the returns process.

User Advice: Most organizations continue to live with labor-intensive, manual, often undisciplined and inefficient returns management (RM) processes because they prioritized supply-chain-related IT investments on outbound projects (e.g., order management and fulfillment), but this is changing rapidly. RM will become increasingly important. By redefining the return supply chain, companies can create significant opportunities to improve value and strengthen brand presence. To best integrate their returns management capabilities within the supply chain and related business functions, supply chain leaders should:

- Determine which activities to prioritize for improvement by directing their team to conduct a detailed review of returns management operations from the ground up.
- Gauge the current state of the company's returns strategy, capabilities and technology needs.
- Improve the maturity of the reverse supply chain by identifying areas of disconnect between reverse logistics operations, returns strategy and adjacent initiatives within the business.

Business Impact: By redefining the returns supply chain and implementing advanced returns management solutions, companies can create significant opportunities to improve value and strengthen brand presence while reducing costs and improving efficiency.

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Sample Vendors: Inmar; Optoro; ReBOUND; Tech Mahindra (ReLoad solution)

Recommended Reading: "Gartner's Framework for Developing Your Reverse Logistics and Returns Management Program"

"Optimize Your Operational Resources and Activities by Using Gartner's Framework for Developing Your Reverse Logistics and Returns Management Program"

"Strengthen the Strategic Activities of Your Reverse Logistics and Returns Management Program by Using Gartner's Framework"

"Manage the Impact of Adjacent Activities on Your Reverse Logistics and Returns Management Program by Using Gartner's Framework"

"Cool Vendors in Intelligent Supply Chain Execution Technologies"

"Cool Vendors in Supply Chain Execution Technologies"

Blockchain

Analysis By: David Furlonger; Rajesh Kandaswamy

Definition: A blockchain is an expanding list of cryptographically signed, irrevocable blocks of records shared by all participants in a P2P network. Each block of records is time stamped and references link to previous data blocks. Anyone with access rights can trace historically a state change in data or an event, belonging to any participant. A public blockchain uses all five core components: immutability, encryption, broad scale distribution, decentralization and tokenization. Gartner refers to them as blockchain complete or enhanced solutions.

Position and Adoption Speed Justification: Gartner believes that blockchain as a concept has five core elements: immutability, encryption, broad scale distribution, decentralization and tokenization (see "Understanding the Gartner Blockchain Spectrum and the Evolution of Technology Solutions"). Enterprise executives exploring this concept continue to experience two core challenges.

First, the immaturity of the technologies underlying blockchain, which prevent adequate levels of scale, security, usability, etc., with enterprise levels of performance and security.

Second, the transformative nature of blockchain at a process, operating and business model level (in terms of decentralization and tokenization) implies the need to break and remold decades-old business processes, relationships and systems and industry structures very hard to accept and implement.

The crash in cryptocurrency prices, the implosion in the ICO market and the challenges enterprises are experiencing progressing from POC to production systems suggest the market has much further

to evolve technically, and in terms of radicalization of business models before the blockchain concept can move onto the Plateau of Productivity, and blockchain complete and enhanced solutions become a reality. That said, significant research and development persists, including work on Ethereum 3.0 and proof of stake consensus as well as various forms of interoperability. Gartner believes that blockchain solutions using all five core elements of the concept will be enterprise-ready within five years.

User Advice: Educate senior leaders about the opportunities and threats that blockchain capabilities introduce. Continue to develop proof of concepts (POC) — especially in the context of market ecosystems. Identify integration points with existing infrastructures (for example, digital wallets, core systems of record, customer service applications, security systems, etc.). Analyze the role, maturity and interdependence of synergistic technologies such as AI and IoT as key levers in the evolution of blockchain complete and enhanced solutions.

Business Impact: Blockchain complete and enhanced blockchains (see "Understanding the Gartner Blockchain Spectrum and the Evolution of Technology Solutions") provide an opportunity for enterprise leaders to imagine new kinds of business models. In particular, decentralizing commercial exchange, thereby reducing friction and cost and by monetizing multiple forms of assets. Enterprise leaders also face a threat from startups and businesses that can use the five core elements of the blockchain concept to disrupt and disintermediate markets and industries by offering capabilities like identity portability, trustless interactions, smart contracts and new forms of value exchange. These opportunities and threats will evolve over the next 10 years in varying degrees affording strategic planners an opportunity to proactively address opportunities and threats. Regulation will play a significant role is the speed of evolution — recent developments around the framing of compliance for token use and ICOs are to be watched, as well as general consumer behavior toward and acceptance of multiple forms of assets. Progression with identity management will change the power structure in many industries and should be viewed through a business as well as technology lens.

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Adolescent

Sample Vendors: Algorand; Block.one; Cardano; Ethereum; NEO; Zilliqa

Recommended Reading: "Understanding the Gartner Blockchain Spectrum and the Evolution of Technology Solutions"

"Guidance for Assessing Blockchain Platforms"

Dynamic Discounting Solutions

Analysis By: Micky Keck

Definition: Dynamic discounting solutions enable buyers and suppliers to negotiate early payment discounts on an invoice-by-invoice basis centered on the buyer's available working capital and the supplier's cash-flow needs. Generally, the earlier the payment is made, the greater the discount (the "dynamic" factor). The on-demand discount offer differs from early payment discounts fixed in a contract through its flexible application. Some solutions use a sliding-scale discount calculation while others provide a form of marketplace to negotiate the discount.

Position and Adoption Speed Justification: Dynamic discounting continues to move downward on the Trough of Disillusionment due to challenges on multiple fronts. First, enterprises struggle to process invoices quickly enough to take advantage of discounted terms. Second, reluctant suppliers are slow to sign up for the discounting program. Until both of these issues can be resolved, and at scale, dynamic discounting will see sporadic uptake.

An increasing number of procure-to-pay (P2P) suite vendors offer dynamic discounting. P2P solutions bring efficiency and automation to the invoice payment process, allowing companies to process and pay invoices in days rather than weeks. These shorter invoice approval and payment cycles enable buying organizations to take advantage of dynamic discounting. Additionally, buyers that increase their regular payment terms to 60 days and beyond provide incentive for suppliers to join dynamic discount programs.

User Advice: Application leaders in charge of procurement should work with the business to define the business case and blockers to success. The greatest opportunity for a successful implementation of a dynamic discounting solution occurs when:

- Procurement, finance and treasury align on the process and means to secure ongoing program working capital before purchasing the solution
- The buyer only takes discounts when paying the supplier before the original due date
- The discount rate is greater than the cost of buyer capital
- Supplier expectations align with the buying organization's payment process and cycle time
- Utilizing dynamic discounting as part of a broader supply chain finance (SCF) program to help suppliers that don't qualify for traditional SCF programs
- Dynamic discounting is used on a routine basis to bring the most value to an organization
- Invoice automation tools and processes are in place to execute on early payment discounts

It's important to note that dynamic discounting solution providers are not banks. Buying organizations will continue to use their same accounts payable (AP) process and applications for invoice payment. However, the buyer should pay invoices accepted for early payments within 48 hours.

Generally, buying organizations will upload or transfer approved invoice files daily into the dynamic discounting solution and receive a notification or an award file back. Dynamic discounting tools work with various ERP, AP automation, e-procurement and supplier portal solutions.

Business Impact: The use of dynamic discounting solutions presents a win-win scenario for buyer and seller. Buying organizations earn incremental savings, while suppliers of all sizes receive a lifeline of cash to cover operational costs and support growth. Buying organizations commonly identify strong ROI and reduced supplier financial risk as key benefits of implementing their dynamic discounting solution.

Despite the positive impact of dynamic discounting solutions, we give them an overall benefit rating of "moderate." Multiple factors account for this rating.

- First, there is the trend for larger companies to stretch out payment terms rather than paying early.
- Second, dynamic discounting appeals primarily to smaller suppliers with limited access to capital.
- Third, buyers use procurement cards, and their cash rebates, to settle orders that dynamic discounting traditionally addresses.

Benefit Rating: Moderate

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Sample Vendors: Basware; C2FO; Coupa Software; Esker; GEP; Ivalua; SAP Ariba; Taulia; Tradeshift; Tungsten Network

Recommended Reading: "Magic Quadrant for Procure-to-Pay Suites"

"2019 Strategic Roadmap for P2P: Catching the Next Wave of Technology Innovation"

"Procurement and Strategic Sourcing Applications Primer for 2019"

E-Invoicing

Analysis By: Balaji Abbabatulla

Definition: Gartner's definition of e-invoicing is "the interchange and storage of legally valid invoices *in electronic format only* among trading partners." E-invoicing requires cross-functional knowledge spanning business, accounting, regulations and IT, and it involves a lot of complexity, especially when this spans multiple countries.

Position and Adoption Speed Justification: Adoption of e-invoicing continues to increase as more organizations start using e-invoicing, and user adoption increases within organizations that started using e-invoicing a few years ago. Some of the key factors driving such increased adoption include:

- Maturing digital transformation programs
- The increasing number of governments that are mandating e-invoicing

- Global enterprises seeking single software vendor to comply with regulations of multiple countries

While these factors encourage the growth of e-invoicing, traditional challenges continue to slow down the pace of such adoption. These include the complexity of complying with varying sets of government regulations, the continuous investment required to train and onboard new suppliers, and difficulty in standardizing e-invoice templates across multiple geographies. Despite these challenges, maturing software applications and improving user experience will drive growth in user adoption of e-invoicing over the next 12 to 24 months. These growth drivers will lead e-invoicing to the Plateau of Productivity in less than two years. However, this position on the Hype Cycle and the speed at which it travels through the Hype Cycle represent a worldwide average, which might vary considerably from country to country. For example, in some countries, e-invoicing might still sit before the Peak of Inflated Expectations because of an incoming government mandate. In other countries, e-invoicing might be compulsory for certain industry sectors and extended to other verticals throughout the years, making the technology travel very slowly across the curve. This also means that e-invoicing might be slightly more mature (early mainstream) than the global market penetration suggests.

User Advice: Start evaluating e-invoicing project opportunities now, regardless of your company's vertical industry, size or financial shape. Never underestimate the consequences of regulations' diversity across countries. Potential problems are in the details. Don't sell the benefits of e-invoicing internally in your company too quickly. Multicountry e-invoicing projects can take years. Proceed with a succession of projects, and go down the path of least resistance first (e.g., the countries where regulations are simpler). Turn as many transactions as you can, as quickly as you can, into an electronic form, and measure the perceived value carefully (typically by unit cost of processing of an invoice).

It's only a matter of time before e-invoicing becomes a mandatory requirement, either by regulation or as an accepted practice of your trading partners. This is true wherever you are, whether you are a buyer or a seller, or whether you simply take part in a more complex B2B process. Chances are that, at least for a portion of your business partners, e-invoicing is common practice already, making it more and more mandatory for you, if you want to stay in that trading community.

If you need international e-invoicing, select your solution based on the countries in which the solution is legal and certified. Some countries (e.g., in South America) might require a particularly complex solution. Some countries (e.g., Russia) might need a local operator to achieve compliance. The diversity is very high. Because regulations change often, solutions deployed over the cloud are generally preferable. You should favorably consider providers that actively monitor the legislation in the countries you do business in — so being compliant (and staying compliant, as regulations change) becomes their problem, not yours.

Business Impact: E-invoicing has traditionally delivered cost savings due to the automation of invoice matching, validation and authorization processes. A volume of about 50,000 e-invoices exchanged each year typically leads to the break-even point within a year. However, e-invoicing vendors have started embedding e-invoicing at the core of a procurement application suite that delivers a much improved user experience and better ROI. Better user experience leads to higher user adoption, which in turn leads to e-invoicing becoming an accepted and expected technology

across all business transactions. E-invoicing is already a global trend among governments, mandatory in some countries like Turkey and Brazil, while more are beginning to mandate e-invoicing. Governments are keen to mandate e-invoicing to assure stricter compliance to tax regulations and improve spend management. Higher adoption of e-invoicing across business and governments due to better user experience and government mandates will expedite adoption over the next 12 to 24 months.

Benefit Rating: Moderate

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Sample Vendors: Basware; Coupa; EDICOM; Nipendo Supplier Cloud; OpenText; Pagero; SAP Ariba; Sovos; Tradeshift; Tungsten Network

Recommended Reading: "Competitive Landscape: E-invoicing, Worldwide"

"Make APIA Part of Procure-to-Pay to Maximize Procurement Efficiencies"

"2018 Strategic Roadmap for Automating the Procure-to-Pay Process"

"E-Invoicing Gains Traction Worldwide"

Climbing the Slope

Supplier Information Management

Analysis By: Magnus Bergfors

Definition: Supplier information management (SIM) solutions support the collection, organization and maintenance of supplier information. This is achieved using supplier profiles, supplier self-service data entry and approval workflows.

Position and Adoption Speed Justification: This year we have rescoped supply base management (SBM) solutions as supplier information management solutions. This change resulted from the fact that SBM vendors have failed to deliver solutions that adequately cover supplier information management, performance management and risk management. The more focused SIM applications are, however, maturing and continuing toward the Plateau of Productivity.

In the long term, we expect SIM solutions to be absorbed into broader procure-to-pay or source-to-settle suites. Niche vendors with extended service offerings will act as content providers for the broader platforms. Examples of these niches include; supplier onboarding, regulatory compliance, prequalifications, and vetting of vendors that specialize in specific verticals.

User Advice: Leverage SIM solutions to allow suppliers to submit and manage their own information or leverage a niche provider to do this on your behalf. Use this information to manage incumbent suppliers but also to build up a register of potential suppliers.

Profile your different types of suppliers by strategic importance and spend category, and classify suppliers by these types. This will determine what information you need to collect and manage for each supplier. The more strategic a supplier is, the more information you are likely to want to have.

Coordinate SIM and supplier master data management activities. Buying organizations can use a SIM solution to collect supplier master data from suppliers, even though SIM is not necessarily suitable for master data management.

Engage suppliers in data maintenance activities by making them contractually accountable for data quality terms in new and renewed supplier contracts, with penalties for nonperformance.

SIM has become one of the foundational pieces of source-to-settle (S2S) suites offerings from almost all suite vendors. Most S2S SIM offerings however are very basic. Increasingly the suite vendors are partnering with more specialized niche vendors when end users need specific capabilities. Examples include CSR ratings, risk scores, or onboarding services. This means that buying organizations should consider SIM applications that are offered as elements of broader procurement suites.

Make e-sourcing events more efficient by leveraging SIM data and creating cross-functional dashboards and workspaces related to specific vendors.

Use SIM data in procure-to-pay suites, for payment information.

Business Impact: Having correct information about your suppliers is critical to many business processes and applications. A SIM solution that collects, organizes and maintains this information by delegating this responsibility to the suppliers themselves significantly reduces the workload of procurement.

Organizations that holistically track their suppliers and leverage internal and external data sources to achieve a best-in-class supply base will significantly outperform organizations that don’t.

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: APEX Analytix; Aravo; Elementum; HICX; Ivalua; JAGGAER; PRGX Global; SAP (Ariba)

Recommended Reading: “Procurement Can Provide More Than People in the Effort to Get Control Over Supplier Master Data”

“How to Navigate the Fragmented Supplier Management Solutions Market”

“Magic Quadrant for Strategic Sourcing Application Suites”

“Critical Capabilities for Strategic Sourcing Application Suites”

IoT Integration

Analysis By: Benoit Lheureux

Definition: IoT integration refers to integration requirements and technologies needed to assemble end-to-end IoT-enabled business solutions that include IoT-specific integration challenges, such as integrating IoT devices, IoT data, digital twins and multiple IoT platforms. Other more traditional integration challenges include enterprise application and data integration, business process integration, SaaS integration, and B2B/ecosystem integration, as well as mobile app and legacy system integration.

Position and Adoption Speed Justification: IT projects incorporating IoT which typically involve back-end application, data and process integration — competencies that are relatively mature in many companies. But, IoT projects have introduced new integration requirements, such as device and mobile app (back-end) integration, digital twin integration, scalable API interoperability, highly distributed infrastructure, large data volumes, and IoT time-series event streaming and analytics. Many companies can address some but not all of these needs, but companies are expanding their skills to compensate. It is helpful to IoT project implementers that most IoT platforms offer some basic integration capabilities, including device communications (for example, MQTT) and simple API management (for example, for security), and a limited number of adapters (or simply APIs) to integrate with core business applications. But, many IoT platforms still do not yet support all the most commonly used protocols, best-of-breed translation engines, general-purpose workflow development, and a complete portfolio of adapters for all applications, mobile apps and cloud services to be integrated. And only some IoT platform providers offer a hybrid integration platform (see “Innovation Insight for Hybrid Integration Platforms”). However, providers with such gaps are beginning to close them, as evidenced by Software AG’s acquisition of Cumulocity and Salesforce’s acquisition of MuleSoft.

User Advice: Investing in essential integration skills and technologies will help IT leaders more successfully implement IoT projects. Nearly every IoT platform provider has adopted an “API-first” approach for addressing integration, offering APIs for IoT device connectivity, data synchronization and process integration. These capabilities are essential for integrating IoT technologies such as digital twins that run on IoT platforms with existing applications and systems. Typically, they provide event-stream processing, RESTful APIs and, sometimes, message-oriented middleware (MOM), such as MQTT. However, these approaches do not address crucial integration needs such as semantic integration (to translate data from one format to another) or workflow (to choreograph the linking of data, events and processes across many systems) IoT implementers must also at times integrate multiple IoT platforms, e.g., to get data from IoT-connected products from an OEM’s IoT platform (see “Five Approaches for Integrating IoT Digital Twins”). Thus, these implementers often discover that they must leverage stand-alone integration technology, such as iPaaS, API management, ESB suites and ETL tools. IoT project implementers often supplement IoT integration capabilities by adding API management and best-of-breed forms of integration and intermediation

via commercial integration tools, such as iPaaS. Sometimes IoT implementers will also benefit from data exchanges, to help propagate IoT data to external business partners (see "Cool Vendors in IoT Data Exchanges and Brokers"). For IoT project implementers, the goal is to more broadly adopt a pervasive integration approach using a holistic set of integration skills and technologies to address all forms of integration required in their projects.

Business Impact: All end-to-end IoT business solutions require device, data and process integration (see "Use the IoT Platform Solution Reference Model to Help Design Your End-to-End IoT Business Solutions"). The challenges are nontrivial, often involving extraordinary:

- Heterogeneity (that is, multiple types of IoT devices, products and equipment, data, vendors, and systems to integrate)
- Distribution (that is, IoT devices, products and equipment are often remotely located across long distances and multiple geographies)
- Performance (that is, large numbers of IoT devices, products and equipment with high API throughputs and large volumes of time-series data)

The cost of such integration includes:

- Integration skills development and integration development time
- Integration middleware or services (ESB software, iPaaS, data integration tools and API management, data exchanges or brokers)
- Integration products focused on operational technology (OT) integration (such as from OSIsoft and Skkynet) may be needed and must be licensed separately.
- IT services fees when outsourcing integration to a system integrator.

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Sample Vendors: Dell Boomi; Google (Apigee); Informatica; Microsoft; Reekoh; Salesforce (MuleSoft); Skkynet; SnapLogic; Software AG; TIBCO Software

Recommended Reading: "Use the IoT Platform Solution Reference Model to Help Design Your End-to-End IoT Business Solutions"

"Cool Vendors in IoT Data Exchanges and Brokers"

"Innovation Insight for Hybrid Integration Platforms"

"Five Approaches for Integrating IoT Digital Twins"

QMS Applications

Analysis By: Sam New

Definition: A quality management system (QMS) is an aggregation of business processes that supports conformity to requirements. QMS software is a commercial or custom system that supports these objectives. There are two subsets of QMS applications. Quality process management applications are a subset of QMS software with standard operating procedures that enforces conformity to quality standards. Supplier quality management applications are a subset of QMS functionality that helps companies ensure compliance and enforce standards from all supplier tiers.

Position and Adoption Speed Justification: QMS applications are an essential component of a robust approach to quality management. They provide predefined workflows to manage a wide range of cross-functional and cross-application processes that are designed for waste reduction, cost optimization, employee training and documentation. These processes ensure compliance with company policies and government regulations, measure and track quality performance, house quality documents, protect version control, and promote process improvements.

The QMS market is active with new product launches and enhanced functionality. Manufacturers, as part of a pursuit of “enterprise” quality management strategies, are formulating plans to upgrade, replace and consolidate outdated and homegrown systems to a single platform. Key drivers for this replacement and upgrade activity include a desire to harmonize and add common structure to the various methods and procedures that have traditionally been enforced on a functional or localized basis. In some industries, this has driven a replacement market.

In parallel, software providers continue to morph their offerings toward full-scale, reconfigurable platforms with common process and data definitions. The cloud has established itself as a core requirement by a substantial number of buyers, and QMS providers have addressed this with offerings from Amazon, Microsoft Azure and Salesforce. In some instances, private cloud or corporate data centers are used for hosting. Also, capital infusion, expansion into the QMS space by some vendors and the emergence of boutique providers have helped to reshape the product landscape.

This is an active market that includes new product offerings, enhanced functionality, and additional flexibility on hosting and software licensing. The time to plateau is still belabored by targeted deployments for specific processes (e.g., auditing and corrective actions) versus wider support of an ecosystem of parallel processes. Also, general absence of a disciplined approach to “enterprise” quality architecture that balances standard processes and regulatory requirements has delayed the time to plateau. Provider-centric challenges continue. These include an inability to offer pricing that matches cloud offerings in other software markets, and an absence of resources dedicated for ongoing technical and customer support. The nature of the buyer is not changing, and we anticipate many of these risks will be addressed. For the reasons mentioned above, this technology is positioned in the Slope of Enlightenment. We estimate it will reach the Plateau of Productivity in approximately five years.

User Advice: Architect a multiphase deployment that starts with a single process, like nonconformance management, change control or audits, and use the ROI to then expand into multiple processes:

- Analyze the current state of quality management process, and thoroughly define requirements by including compliance, system functionality, licensing options and hosting preferences.
- Structure RFI/RFP documents to include comprehensive questions covering both the technical and nontechnical components of the total solution. Consider the needs of specific system users, especially infrequent or casual users, including UI/UX.
- Assess proposed system integration within the software architecture by considering integration capabilities with systems such as ERP, PLM, MES, LIMS and LMS.
- Ask next-level questions after reviewing RFP responses to assess providers' and service partners' core competencies, business philosophy, product roadmap and strategic direction.
- Scrutinize candidate vendor pricing models, especially for cloud-based solutions, to ensure there's benefit in the agreement.
- Urge candidate vendors to provide a multiphase roadmap that will enable your organization to deploy core QMS functionality and then scale to more advanced capabilities.

Business Impact: Corporate operations and supply chains continue to be exposed by gaps in their quality processes and supporting data, with the financial performance implications coupled with regulatory and compliance risks. Businesses that have multinational and offshore manufacturing centers are particularly vulnerable to negative brand impact from quality issues (such as lead paint in children's toys or poor quality in automobile tires). A stringent quality-compliance program supported by robust tools can prevent unsafe, dangerous or shoddy products from reaching the market, and can ensure ongoing compliance with regulatory requirements and adherence to corporate policies for quality.

Benefit Rating: Moderate

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Sample Vendors: ETQ; Intelex; MasterControl; Oracle; Pilgrim Quality Solutions; QAD CEBOS; SAP; Siemens; Sparta; Veeva Systems

Recommended Reading: "Market Guide for Quality Management System Software"

"Ensure Success in Quality Management System Software Selection"

"Toolkit: RFP for Quality Management System Software"

"Toolkit: Quality Management System Software Vendor Evaluation Model"

Supply Chain Visibility

Analysis By: Christian Titze

Definition: Supply chain visibility (SCV) is about generating accurate, timely and complete views of plans, events and data (transactions, content and related information) within and across organizations' operating supply chains to support collaborative supply chain planning and/or execution. SCV for the purpose of this Hype Cycle is considered a high-level umbrella capability with several more specific, existing visibility capabilities, such as real-time visibility into domestic transportation or global trade management insights.

Position and Adoption Speed Justification: SCV is a foundational capability that enables data-driven, end-to-end (E2E) supply chain insights along companies' extended value chain, laying the foundation for E2E decision making of various levels of granularity and time horizons combined with intelligence and automation.

SCV into planning and execution activities can help companies improve supply chain performance and mitigate risk. Yet, organizations often lack an E2E approach that would enhance and expand from an enterprise to an outside-in, multienterprise value-network/business ecosystem view along multiple use cases for SCV.

SCV targets three supply chain domains — planning, execution and cross-domain — where execution (covering the domains of source, make, deliver and service) is certainly more advanced than the others. Visibility into different risk categories and adding data from the business ecosystem (such as from public domain/social media) is the domain with highest emergence. From a delivery model aspect, cloud is dominant, with a mix of private, public or hybrid setups, depending on the domain.

Supply chain organizations listed visibility as their top-funded initiative year over year — next to business intelligence and advanced analytics, perceiving supply chain management as more and more strategic, according to the 2019 Gartner Supply Chain Technology User Wants and Needs Survey. Consequently, initiatives and investments have further gained momentum. This, together with more mature and capable solutions, is why SCV is quickly moving toward mass adoption.

User Advice: As the visibility journey consists of multiple evolving steps, organizations should start their journey by streamlining internally first by establishing functional and enterprise supply chain visibility. Then, expand into multienterprise SCV and add cross-domain use cases (such as risk and sustainability) in support of effective planning and/or execution.

Organizations should understand that it takes time to take advantage of all visibility capabilities/use cases, with many organizations not yet mature enough to take advantage of the technology available. The biggest obstacles organizations are facing are partner onboarding and data management.

Business Impact: It is essential to get a high-resolution, real-time, enterprise and multienterprise view on a core set of business objects in planning and execution across the supply chain — the "capture" aspect. The added value comes from related capabilities: analyzing data so it could not

only be used to react to disruptions, but also to avoid future disruptions by utilizing the next level of capabilities — the "analyze" and "response" aspects. With the provisioning of enhanced capabilities, impacts and scenarios can be simulated and analyzed in the context of trends, anomalies, threats and opportunities, after which a best business decision can be made. Visibility alone provides incremental value only; it clearly increases when value-added capabilities are utilized, allowing for supply chain capture, analysis and response in an integrated environment.

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Sample Vendors: E2open; Elementum; Infor; JDA Software; Kinaxis; OM Partners; One Network; riskmethods; Resilinc; SupplyOn

Recommended Reading: "Comprehensive Guide to Supply Chain Visibility: 2018 Update"

"Magic Quadrant for Multienterprise Supply Chain Business Networks"

"Macro Trends Affecting the Multienterprise Supply Chain Business Network Market: Provider and Solution Evolutions"

"Macro Trends Affecting the Multienterprise Supply Chain Business Network Market: Elementary Progressions"

"Don't Believe the Control Tower Hype — Buyer Beware"

"Supply Chain Brief: The CSCO Perspective on Supply Chain Business Networks"

Global Logistics Visibility

Analysis By: William McNeill; C. Klappich

Definition: Global logistics visibility improves the connectivity, interoperability and visibility of events across facilities, multiple transportation modes, suppliers, customers and logistics service providers. This technology enables companies to monitor international logistics events throughout an entire multileg shipment itinerary to detect event-driven problems early enough to notify recipients and address possible threats.

Position and Adoption Speed Justification: Applications with visibility capabilities are maturing, despite challenges caused by recurring issues with data quality. Also, connecting to carriers and other constituencies — such as suppliers, forwarders, brokers and third-party logistics (3PL) companies — while still difficult, is getting easier as visibility platforms offer better multichannel integration. Capturing movement information beyond large constituencies that are typically enabled via electronic data interchange (EDI) remains problematic because of the lack of a single unified logistics grid. EDI continues to be the dominant way for companies to connect with trading partners, but has limited worldwide adoption beyond large, sophisticated trading partners, such as

ocean carriers and 3PL companies, as well as some large freight forwarders. Aside from EDI, the utilization of API integration is emerging, as is the use of IoT. Vendors also offer trading-partner portals where trading partners can use the web to receive and update movement information, such as ready-to-ship notifications or en route status reports. Simplified trading-partner portals make it easier to capture data from less sophisticated or automated trading partners. Lately, such applications also offer mobile device integration that allows the capture of geographical and/or conditional information in real time for increased end-to-end visibility. As these platforms and applications mature, they're being used in conjunction with other visibility systems covering other modes of transportation or geographies to form the "Network of Networks."

User Advice: Midsize and large international shippers (those with 1,000 or more containers per year) in dynamic international logistics environments will benefit from improved visibility. Early adopters of stand-alone solutions should consider on-demand global logistics visibility solutions, where upfront costs are minimized. Transportation management system (TMS) users should first consider the visibility solutions offered by their providers, only considering stand-alone solutions when their TMS vendors lack a visibility offering or when their offerings are inadequate. Users looking for true end-to-end visibility across locations, processes and data types should look for generic tools that can support this breadth of use. However, they should plan multiphase roll outs to ensure they address the numerous potential hurdles that will crop up for engagements of this size and scope.

Business Impact: Given the increased risk of managing a global supply chain, the visibility of potential problems is critical to managing global logistics operations effectively. Sensing and responding to events are critical aspects of supply chain visibility, but visibility alone provides only incremental value. Although visibility can identify and diagnose problems, it cannot resolve them. The value of visibility increases when it is integrated with other applications, such as TMS, warehouse management system (WMS), order management, supply chain planning and ERP, where problems can be identified, diagnosed and resolved in a single environment. However, true end-to-end visibility that spans transportation, inventory, orders, multiple modes of transport (such as land and ocean) or multiple functions (such as transportation and trade compliance) is less mature. End-to-end visibility also often requires multiple applications to be "stitched together" or, at the very least, disparate data sources are pulled into one visibility application.

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Early mainstream

Sample Vendors: Amber Road; Descartes; E2open; Elementum; FarEye; Infor; JDA Software; LOG-NET; TransVoyant

Recommended Reading: "Magic Quadrant for Transportation Management Systems"

"Plan for and Use Supply Chain Visibility Capabilities in Close Alignment With Maturity Stages"

"Comprehensive Guide to Supply Chain Visibility: 2018 Update"

“Supply Chain Brief: Getting Ready for Multienterprise Business Network”

“How to Choose the Right Supply Chain Operational Visibility Software for Your Organization”

“Multienterprise Collaboration: Tips for Collaboration in Transportation”

Procure-to-Pay Suites

Analysis By: Micky Keck

Definition: Procure-to-pay (P2P) suites are integrated solutions that automate workflows to request, procure, receive, and pay for goods and services across an enterprise. P2P suites optimize the purchasing process, resulting in improved financial controls, cost savings and process compliance. Core P2P suite functionality includes e-purchasing, catalog management, e-invoicing and APIA. Extended P2P functionality includes dynamic discounting, supplier registration, employee expense management, services procurement and contingent labor procurement.

Position and Adoption Speed Justification: P2P solutions are in the early mainstream stage and moving up the Slope of Enlightenment as vendors increase the capabilities of their full-suite solutions. The P2P suite market is strong, with projected growth rates in double digits over the next several years, and broad appeal across industries and geographies.

Demand drivers include:

- Rationalizing a portfolio of point solutions handling e-invoicing, catalog management and AP invoice automation
- Placing a priority on digitizing manual, paper-based processes
- Improving working capital management
- Expanding coverage of spend under management

P2P solution providers continue to expand spend category coverage through acquisition and investment in core technology. Direct material spend, and sophisticated savings and process analytics, are increasing use cases outside of traditional indirect procurement.

User Advice: Application leaders driving procurement initiatives for their organizations should form multifunctional teams with procurement, finance and IT to evaluate supplier solutions. Organizations with limited existing end-to-end process automation, multiple disparate systems and low spend under management are ideal candidates for P2P suites.

Other recommendations include the following:

- Consider the full capabilities of P2P as the functionality continues to evolve, with some solutions supporting both “direct” and “indirect” procurement needs. Some P2P providers offer inventory management, services procurement, and travel and expense management modules.
- Supplier adoption rates are a key point to P2P solution success. Evaluate supplier-facing costs, functionality and user experience with the same rigor as buyer-side features.

- Carefully review a potential P2P provider's ability to comply with local tax and electronic invoice regulations when considering e-invoicing.
- Investigate how mobile capabilities can improve stakeholders' use of the P2P solution, as tablet and smartphone usage continues to grow in business operations.
- Plan to implement a cloud service delivery model. On-premises solution implementations are rare, and many vendors no longer offer this option. Cloud benefits include shorter implementation times, improved supplier collaboration and faster access to system improvements.
- Review any potential P2P providers' integration capabilities with your core financial management application vendors.
- Don't assume that a single general-purpose P2P suite solution will deliver adequate ease of use and controls for all spend categories. Evaluate spend by logical workstream (for example, direct materials, indirect goods, services, contingent workforce, telecom, and travel and expense). Delivering the best user experience and efficiency may require a mix of solutions.
- Best-in-class suites provide a unified user interface and experience. Look for solutions that provide help to users throughout the purchasing process, to increase usage rate as well as reduce training and support costs.
- Include industry-specific P2P solutions in the evaluation process if your organization is in the healthcare, hospitality, or oil and gas sectors. Sample vendors include GHX (healthcare), BirchStreet Systems (hospitality) and Oildex (oil and gas).

Business Impact: Gartner rates P2P suites as being of high benefit for an organization. P2P solutions can increase the effectiveness of procurement and payables process across an enterprise. These solutions deliver strong ROI by enforcing compliance with sourcing agreements, approval workflows and financial policies. Automating the procurement, approval and payables processes brings many operational efficiencies. These efficiencies include superior working capital management as well as reduced rogue spending, human error and fraud.

P2P suites are continuing to evolve through the use of AI and automation technologies such as RPA. Built-in benchmarking and proactive visibility to key P2P process metrics allow for real-time workflow improvements. Organizations with workforces that don't have access to traditional computers will benefit from mobile and voice-controlled UI advances.

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Sample Vendors: Basware; Coupa; GEP; Ivalua; JAGGAER; Oracle (Procurement Cloud); SAP (Ariba); Synertrade; Tradeshift; Wax Digital

Recommended Reading: "Magic Quadrant for Procure-to-Pay Suites"

“Procure-to-Pay Suites: How to Choose Your Best-Fit Solution”

“Innovation Insight for Conversational Platforms in Sourcing and Procurement”

Price Optimization and Management for B2B

Analysis By: Mark Lewis

Definition: Price optimization and management (PO&M) software enables an organization to efficiently manage and optimize the prices of its goods and services. More recently, these offerings have begun to support a wider range of sales intelligence advice, such as best-next-action recommendations and customer churn warnings. Some vendors focus on the back-office price management and product management roles; others focus on providing sales intelligence in real time to the sales representative. The most successful companies offer both.

Position and Adoption Speed Justification: Price optimization and management is close to the Plateau of Productivity because it is able to demonstrate quantifiable and tangible improvements in margin and revenue in successful implementations. The major vendors in this segment continue to make progress in making their products easier to implement. Ongoing improvements in machine learning and a growing focus on, and recognition of, the value of algorithmic business by senior executives, are all helping to raise awareness of the sector. New fixed-price- or zero-price-implementation packages, along with subscription pricing, make this technology accessible to a wider audience.

User Advice: PO&M is used primarily by large and global B2B or B2B2C organizations. PO&M tools are most valuable when they are extended to the point of contact with the customer. This can include extending PO&M to a direct sales team accessing pricing tools on a mobile device or tablet, indirect sales channels that can access pricing through a partner portal or an inside sales support team, or a customer who can access dynamic, real-time pricing via a digital commerce site. Pricing “guardrails” can be created to let salespeople know if they are within recommended margin objectives for a particular price proposal.

Business Impact: Algorithms are driving digital business and strategies to maximize margins and profitability. The improvements in margin and revenue provided by successful PO&M implementations are achievable and quantifiable. Pricing is increasingly becoming dynamic and digital, requiring real-time microsegment pricing capability that includes the product, current demand, inventory availability, seasonality and multiple other criteria. PO&M will become more widespread as cost of deployment decreases and the demands for digital-enabled and algorithm-based pricing increase.

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Early mainstream

Sample Vendors: Perfect Price; Periscope By McKinsey; Price Edge; Price f(x); PROS; SPOSEA; Vendavo; Vistaar Technologies; Vistex; Zilliant

Recommended Reading: "Market Guide for B2B Price Optimization and Management Software"

"Toolkit: RFP for B2B Price Optimization and Management Solutions"

Entering the Plateau

Digital Commerce SaaS

Analysis By: Mike Lowndes

Definition: Digital commerce SaaS is the deployment of digital commerce platform services via a managed service model, delivered to clients in two primary variations: single-tenant or multitenant, plus hybrids between them. All deployment styles share the application stack whereby clients share common architecture, code and data definitions. These applications are owned, delivered and managed remotely by vendors or their partners, and are most commonly sold as subscriptions to customers instead of the capital expense of software licenses.

Position and Adoption Speed Justification: Digital commerce platform SaaS vendors have continued to grow, by extending regionally, increasing penetration and expanding their offerings. Acquisitions deal size has increased as larger enterprises consider SaaS due to its time-to-market speed and lower startup cost. Almost all conventional on-premises digital commerce platform vendors are actively moving their platforms to the cloud to provide SaaS or at least subscription-based options for clients. The SaaS commerce platform is very near to mainstream use.

While revenue-share-based pricing (that is, percentage of gross merchandise value [GMV] sold on the platform) and limited customization options still arise as issues among clients, Gartner is starting to see alternative pricing such as transaction-based or a flat fee based on GMV/average order value tiers. Moreover, SaaS vendors are allowing for more platform customization via extensibility models, integration frameworks and APIs.

User Advice: Alongside multitenant SaaS platforms, hybrid architectures are emerging. There are two main types:

- Commoditized capabilities are multitenant, but core and more-customizable capabilities remain single-tenant. In this case the overall platform may not be sold as SaaS but will have SaaS capabilities within it, such as search, personalization and analytics (e.g., Episerver).
- Core commerce engines and data tiers remain single tenant, often for perceived data security issues, and middleware and admin UIs become multitenant. These are likely to be sold as SaaS solutions (e.g., Oracle Commerce Cloud).

Key drivers for SaaS:

- Hands-off IT infrastructure enables redirection of in-house resources. The SaaS provider is responsible for environments, ongoing support and for nonfunctional requirements.
- Time to market is typically quicker than with conventional licensed software.

- Feature and functionality enhancements delivered more rapidly as SaaS vendors can regularly update their platforms at no extra cost to clients.
- Upfront costs are typically lower with a pay-as-you-go pricing model, but overall costs may not be less expensive than on-premises alternatives in the long run.

Consider a SaaS platform, if you require:

- Mainstream, catalog-based B2C or B2B commerce.
- The need to test a new geographic region or launch in multiple regions at the same time.
- The need to complement a software solution with a lower-cost alternative for a subset of products with limited customers.
- Few process-related customizations and speed to market.

Understand potential tiered revenue models, negotiate volume discounts or seek alternative pricing discounts prior to initial contract signing.

Carefully assess minimum functional requirements to ensure that all can be met by newer vendors — particularly such items as localization needs for global expansion, B2B functionality for selling to larger enterprises, and API coverage and quality for extensibility and flexibility.

Some vendors sell a suite of SaaS applications (e.g., ERP, CRM, OMS, WMS, sales enablement, service desk) as a bundled solution. Customers could benefit from using multiple applications from the same vendor. However, be warned that these applications are often brought together by acquisition and comprehensive integrations may not be in place.

Exercise appropriate due diligence if your organization has complexity when it comes to sales, ordering, fulfillment and payment processes, because these needs are more likely to require customization. Investigate the extensibility of shortlisted platforms.

Business Impact: SaaS offerings enable organizations challenged by the costs of entry to digital commerce, to get online. As the number of SaaS offerings increases, more organizations are expected to move online and to embrace SaaS. The appeal of SaaS is widening due to alternative pricing models that extend beyond revenue share, private cloud and hybrid alternatives that enable a greater breadth of customization, and the speed of innovation of SaaS platforms.

Some SaaS vendors lack strong B2B functionality (e.g., purchase order or contract ordering/pricing, flexible payment terms, punch-out and catalog segmentation). However, others are becoming more robust in this area, and some are specifically designed for B2B commerce.

SaaS is most frequently adopted by sellers with online GMV sales of $150 million or less, but larger organizations are now choosing this model. SaaS vendors are beginning to support extensibility models for their platforms, which should help gain them enterprise customers. There is little hype remaining as SaaS is seen as a viable, mainstream option for commerce deployments, and the constraints of SaaS are better understood.

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

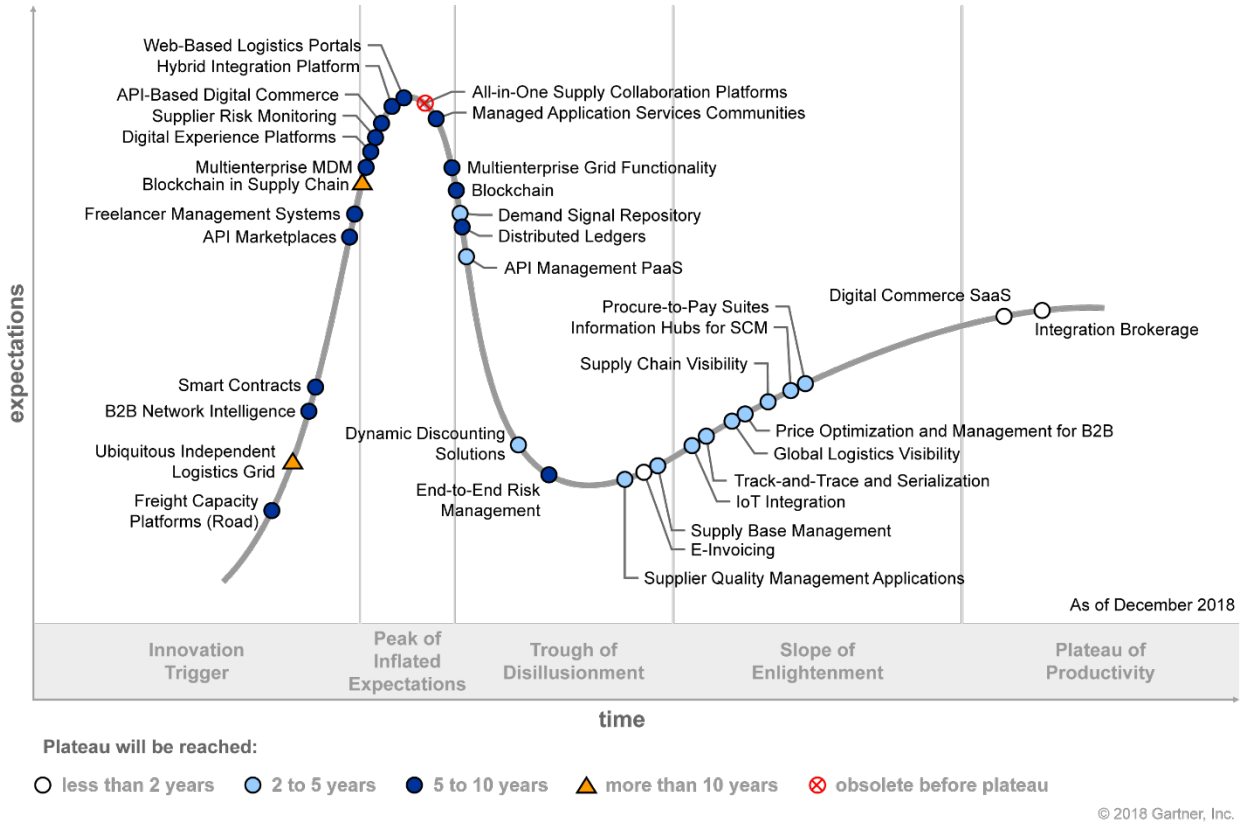
Maturity: Early mainstream

Sample Vendors: BigCommerce; Digital River; Episerver; Insite Software; Kibo; Kooomo; Oracle; Salesforce; Unilog; VTEX

Recommended Reading: "Use Three Criteria to Evaluate Digital Commerce Cloud Strategies"

Appendixes

Figure 3. Hype Cycle for Multienterprise Solutions, 2018



Hype Cycle Phases, Benefit Ratings and Maturity Levels

Table 1. Hype Cycle Phases

Phase	Definition
Innovation Trigger	A breakthrough, public demonstration, product launch or other event generates significant press and industry interest.
Peak of Inflated Expectations	During this phase of overenthusiasm and unrealistic projections, a flurry of well-publicized activity by technology leaders results in some successes, but more failures, as the technology is pushed to its limits. The only enterprises making money are conference organizers and magazine publishers.
Trough of Disillusionment	Because the technology does not live up to its overinflated expectations, it rapidly becomes unfashionable. Media interest wanes, except for a few cautionary tales.
Slope of Enlightenment	Focused experimentation and solid hard work by an increasingly diverse range of organizations lead to a true understanding of the technology's applicability, risks and benefits. Commercial off-the-shelf methodologies and tools ease the development process.
Plateau of Productivity	The real-world benefits of the technology are demonstrated and accepted. Tools and methodologies are increasingly stable as they enter their second and third generations. Growing numbers of organizations feel comfortable with the reduced level of risk; the rapid growth phase of adoption begins. Approximately 20% of the technology's target audience has adopted or is adopting the technology as it enters this phase.
Years to Mainstream Adoption	The time required for the technology to reach the Plateau of Productivity.

Source: Gartner (September 2019)

Table 2. Benefit Ratings

Benefit Rating	Definition
Transformational	Enables new ways of doing business across industries that will result in major shifts in industry dynamics
High	Enables new ways of performing horizontal or vertical processes that will result in significantly increased revenue or cost savings for an enterprise
Moderate	Provides incremental improvements to established processes that will result in increased revenue or cost savings for an enterprise
Low	Slightly improves processes (for example, improved user experience) that will be difficult to translate into increased revenue or cost savings

Source: Gartner (September 2019)

Table 3. Maturity Levels

Maturity Level	Status	Products/Vendors
Embryonic	■ In labs	■ None
Emerging	■ Commercialization by vendors ■ Pilots and deployments by industry leaders	■ First generation ■ High price ■ Much customization
Adolescent	■ Maturing technology capabilities and process understanding ■ Uptake beyond early adopters	■ Second generation ■ Less customization
Early mainstream	■ Proven technology ■ Vendors, technology and adoption rapidly evolving	■ Third generation ■ More out-of-box methodologies
Mature mainstream	■ Robust technology ■ Not much evolution in vendors or technology	■ Several dominant vendors
Legacy	■ Not appropriate for new developments ■ Cost of migration constrains replacement	■ Maintenance revenue focus
Obsolete	■ Rarely used	■ Used/resale market only

Source: Gartner (September 2019)

Gartner Recommended Reading

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

Understanding Gartner's Hype Cycles

Toolkit: Workshop to Identify Key Strategic Technologies for Your Organization's Supply Chain, 2018

Toolkit: Create Your Own Hype Cycle With Gartner's Innovation Database

Hype Cycle for Procurement and Sourcing Solutions, 2019

Magic Quadrant for Multienterprise Supply Chain Business Networks

Macro Trends Affecting the Multienterprise Supply Chain Business Network Market: Provider and Solution Evolutions

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