Future of the Supply Chain: Mapping the Innovation Pipeline with Unstructured Data

Datasets: Scientific Papers, Patents, Companies, Global News & Blogs

May 2018

POWERED BY Quid®

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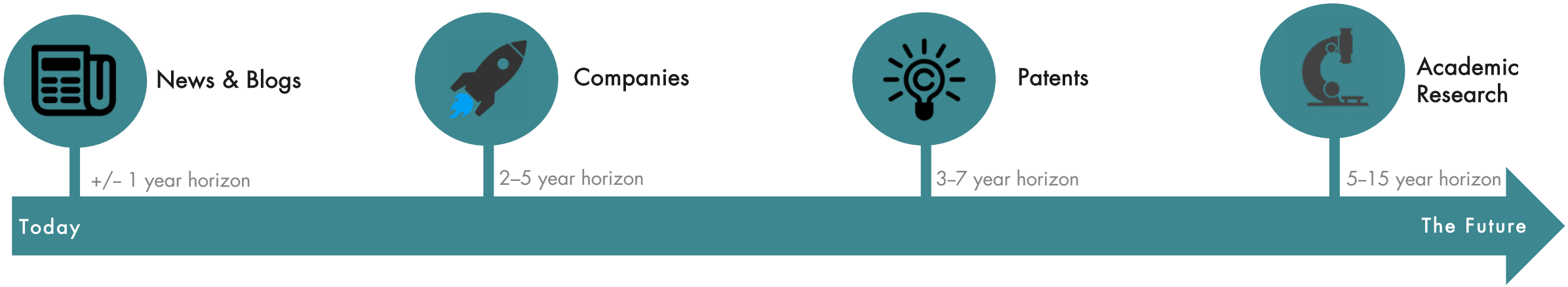
Monitor the Entire Innovation Pipeline

Quid understands that innovation doesn't occur in isolation. Our platform reveals trends across disparate datasets, helping you map the flow of new technologies from inception to product launch & beyond.



- Understand evolution of narratives about technologies, consumers, companies & more
- Data-driven understanding of consumer sentiment
- Find most resonant themes for media & consumers

- Find investment and M&A signals in startups or legacy industries
- Analyze competitor investments and M&A
- Comprehensively map the applications & market components of emerging technologies

- Deep dive on a competitor or set of competitors' IP strategy
- Understand value chains for emerging technologies
- Evaluate your own IP positioning

- Understand research in spaces that will impact your business
- Reveal competitor-sponsored research
- Find partnership opportunities with pertinent researchers

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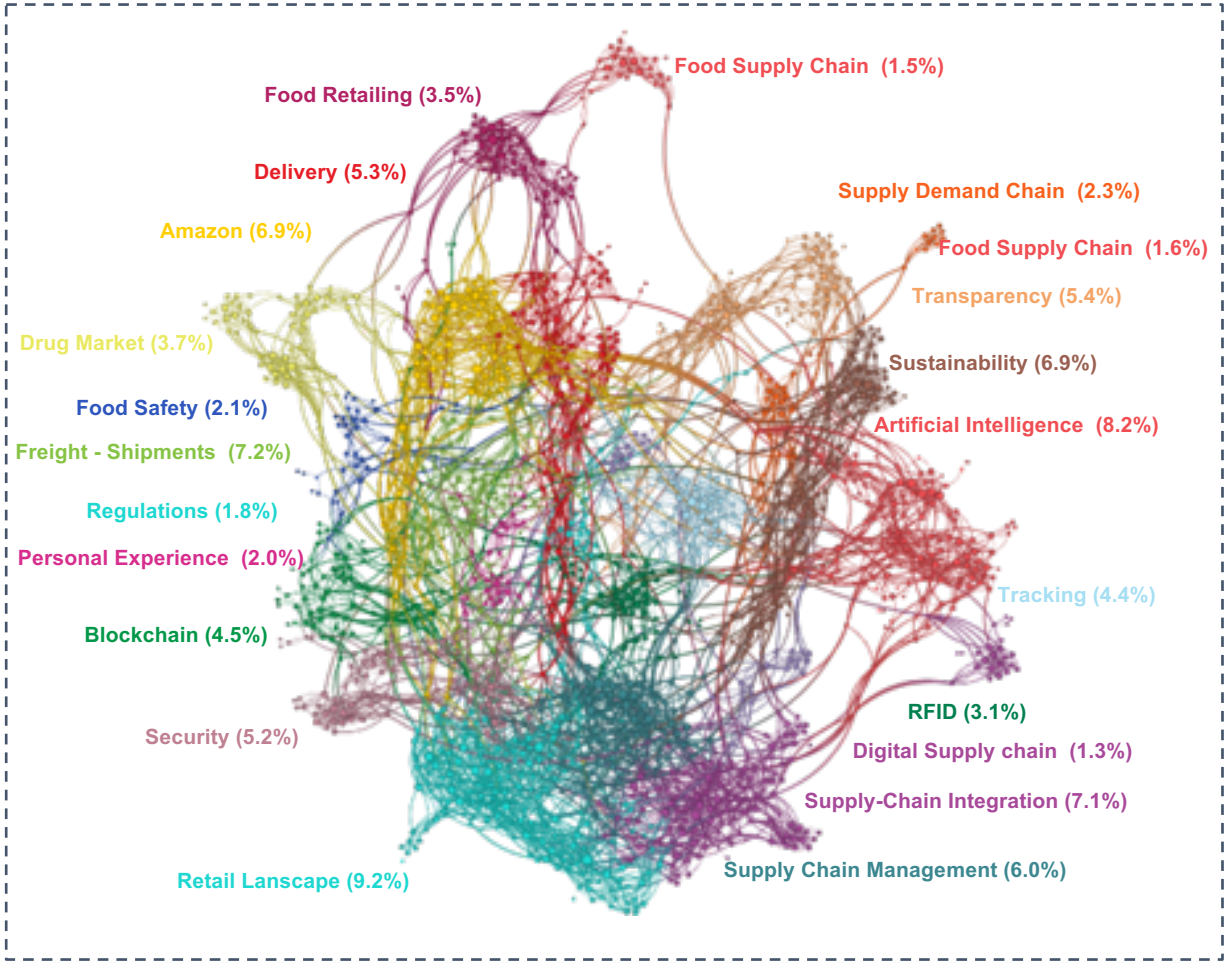
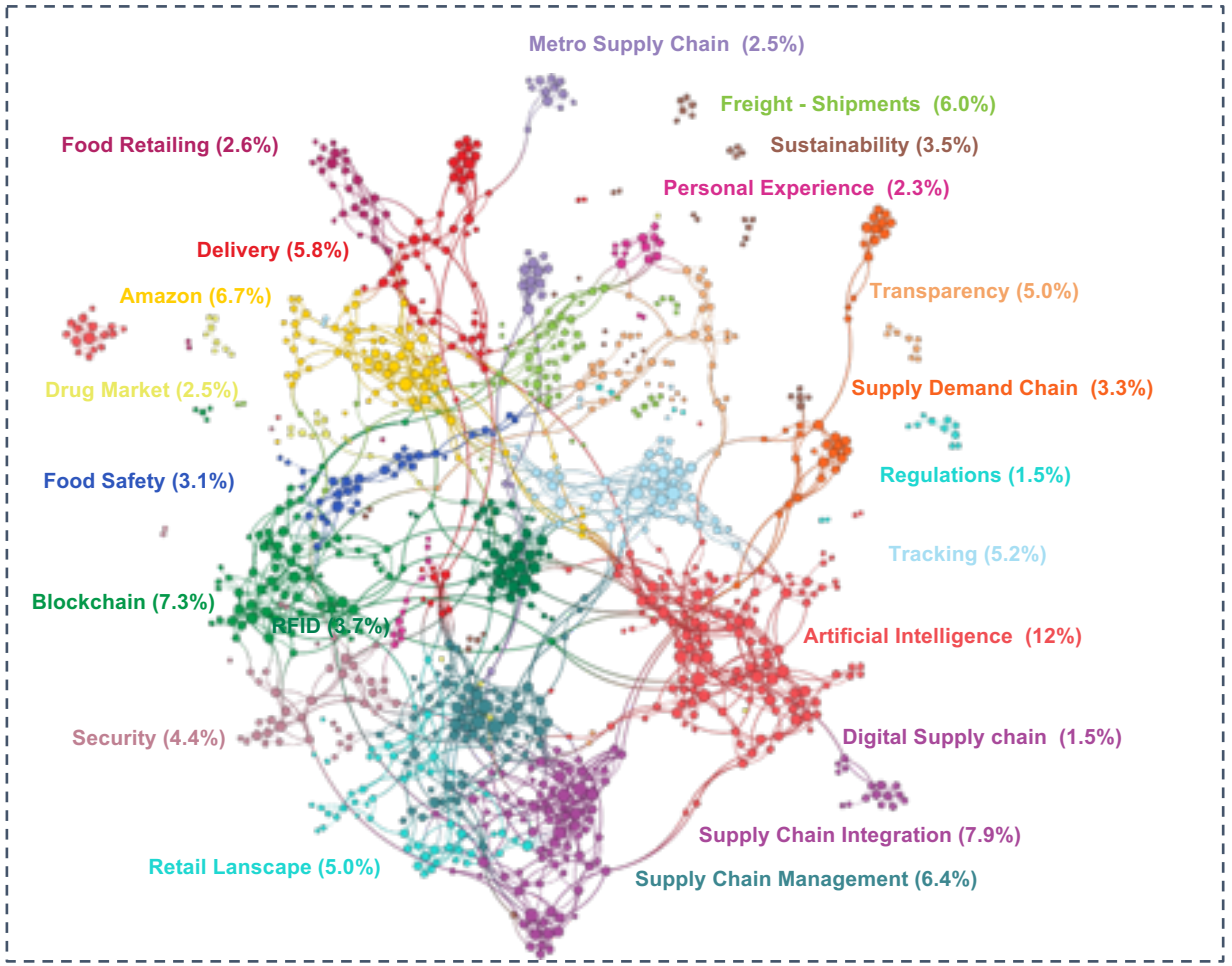
We begin by exploring global news & blogs, where Quid can unveil major themes within the Supply Chain narrative & identify emerging technology and products.

Quid network for all Supply-Chain News



Quid network filtered for the term "technology"



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- Search Query Used = ("Supply chain" and "retailer"). Querying from Lexus Nexus, a global news source with over 550,000 integrated news sources. Clustering around similar topics and keywords.

Emerging Technology in Supply Chain and Logistics - Horizon 1: Using News and Companies to Reveal New Incremental Enhancements, Core Business Operations, Products and Services

Incremental Technology Enhancement	Impact	Example Innovative Company
Supply Chain Integration: Transform digital commerce infrastructure and focus on seamlessly integrating online channels, brick-and-mortar stores and backend supply chains (Visionet Systems Partnership)	More accurate electronic data Interchange. More consistent experience across supply chain	Company A
Artificial Intelligence: Platform that delivers automated instructions to execution layers such as the retailer's ERP, supply chain system, marketing automation tools, and in-store experiences	Trend detection, price management, personalization, allocation	Rubikloud, Intel
Last-Mile: Connect local business or consumers with nearby car drivers and enable on-demand and same day delivery through apps or other software services.	Seamless and personalized delivery. Close the last mile gap between merchants and customers.	Company B
Blockchain: Smart contracts to make and verify transactions across the supply chain	Maintain transparency, secure record keeping, track the transport of goods, and provide a method to engage in secure transactions	Company C
3d Printing (Additive Manufacturing): Create on-demand and customizable material from large manufacturing products, auto components, or consumer goods.	Cut costs, allows for more agile supply chain, greater productivity and more creative solutions	Company D
Delivery: Software integration that enhances visibility across procurement, logistics, manufacturing and inventory management	Shrink lead times, ensure product availability, compete with Amazon and Walmart delivery	Elementum, Home Depot
Personal Experience: Mobile Point-of-Sale payments, employee inventory search, delivery from sales floor.	Enhanced Customer Experience	Company E
Blockchain: Blockchain based electronic shipment systems	Transparency, digitization, track cargo in real time all over the world	Company F
Artificial Intelligence: Stereoscopic camera's that roam aisles and take inventory. Image Recognition.	On-Shelf Inventory Management	Company G
Tracking: Complement logistics controls and create an integrated vision to process in all vehicle transit and product handling phases, traceability of materials, reverse logistics, accounting control and automation of data. RFID (Radio Frequency Identification)	Enhance automation, data integration, machine learning, traceability and tracking functions.	Company H

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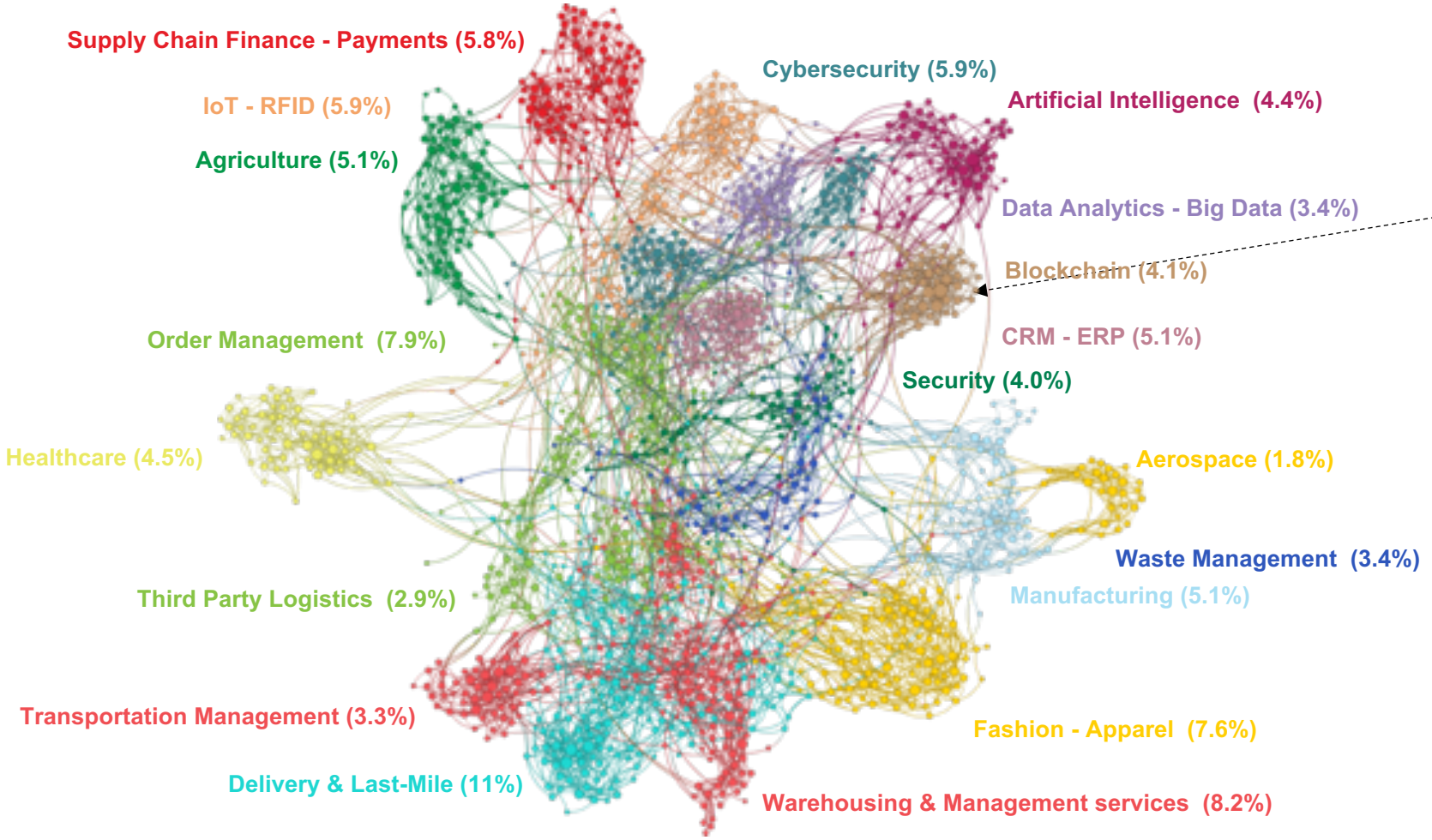
- Analysis determined based on research on both the News dataset and the companies dataset to determine technologies that are either currently in development or are on the horizon

Quid then analyzes thousands of startups developing innovative supply chain solutions and identifies those with the greatest potential to create lasting disruption



Companies

Example Company

Company A

Most Recent Funding: 2017

Headquarters: Sydney, Australia

Description: Blockchain start-up that combines the latest blockchain and 5G technologies to solve critical issues regarding authentication, security, device validation, and interoperability across supply chain flows and IoT networks.

Founding Year: 2017

Investors: Sapien Ventures, CollinStar

Nodes represent individual companies.

Links between nodes represent shared language in company business descriptions.

Clusters are market groupings of companies that use similar technologies or provide value in similar ways.

Network of 1651 startups, representing $15.3B in investment. Nodes sized by degree.

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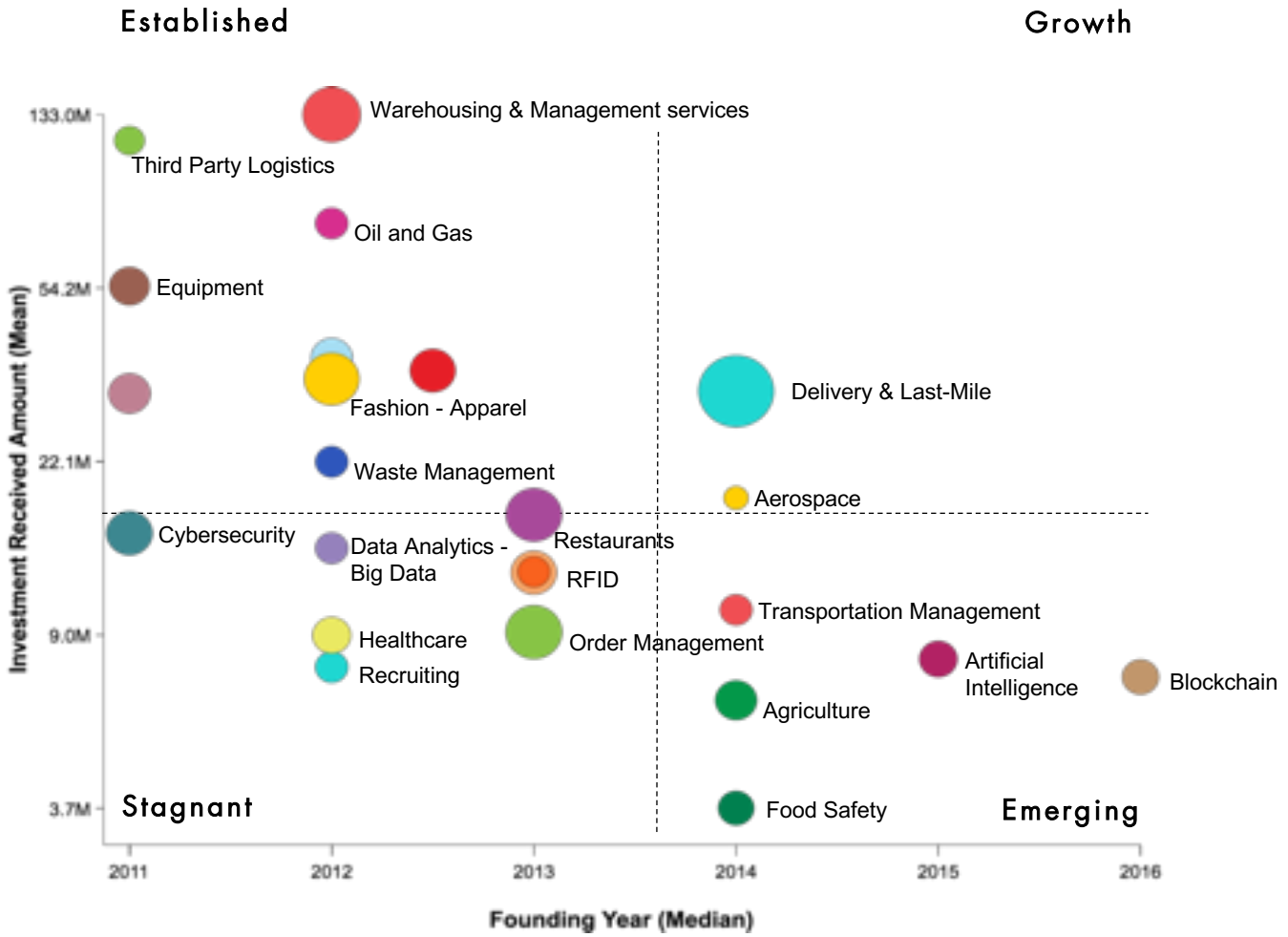
Empowered by actionable metadata, Quid categorizes market segments by maturity & saturation

Companies

Nodes represent companies, sized by count, colored by company.

In the following scatterplot it is evident that the supply chain and logistics space is quite established in a lot of industries but is experiencing disruption from the growth of delivery and last-mile services as well as the emergence of artificial intelligence, blockchain technology, and consumer demand for more transparency in the food supply chain.



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Start-up Recommendations: Supply Chain and Logistics

Company Name	Cluster	Retail Improvement	Total Raised (last 5 years)	Avg Days Btw Rounds	Days Since Last Round	# of Rounds (last 5 years)	Uniqueness score (percentile)	Bridging score (percentile)	Overall Rank
Company A	Delivery & Last-Mile	Inventory Management	$ 42,381,939.00	272.5	172	3	84%	83%	1
Company B	Food Safety	Productivity and Cost Savings	$ 3,900,000.00	375	74	2	98%	91%	2
o9 Solutions, Inc.	Data Analytics -Big Data	Trend Detection	$ 22,000,000.00	252.2	422	6	54%	81%	3
Company C	Delivery & Last-Mile	Internet Retailing Solutions	$ 41,613,033.00	104.5	928	3	73%	75%	4
Company D	Warehousing & Management services	Cost Savings, Price Competition	$ 301,900,000.00	270.5	14	5	49%	0%	5
Project44, Inc.	Warehousing & Management services	Shipping Experience	$ 45,500,000.00	582	24	2	56%	90%	6
Company E	Artificial Intelligence	Manufacturing Cost Savings	$ 506,749.00	122.5	434	3	51%	67%	7
Company F	Fashion - Apparel	Environmental Concerns	$ 17,280,220.00	701.5	98	3	67%	71%	8
Company G	Order Management	Omnichannel Solutions	$ 1,785,000.00	282	148	5	10%	60%	9

Methodology: Taking the exported metadata from the companies dataset we are able to create a weighted calculation using the 6 investment factors in the heat map above to identify start-ups within the supply chain and logistics space that could be good potential partnership opportunities.

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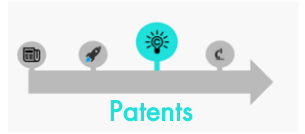
When analyzing patents, Quid reveals industry-wide R&D trends & highlights which players are developing unique IP

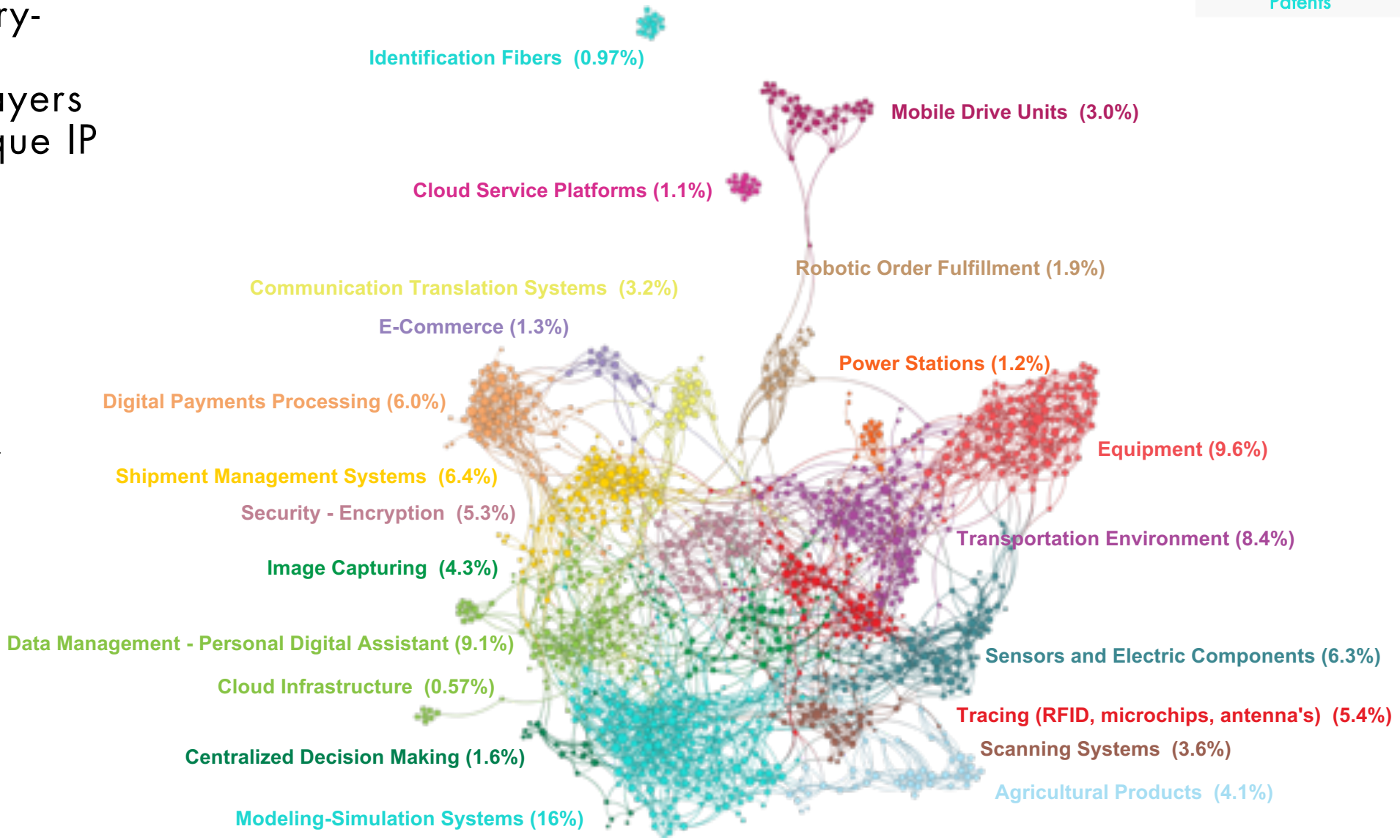


Nodes represent individual patents.

Links between nodes represent shared language in patent abstracts.

Clusters are groupings of IP that address similar problems or employ similar technologies.

Network of 1232 most cited patents filed after 2008 relating to supply chain retail. Nodes sized by degree.



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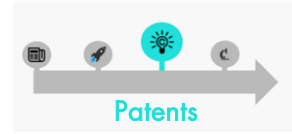
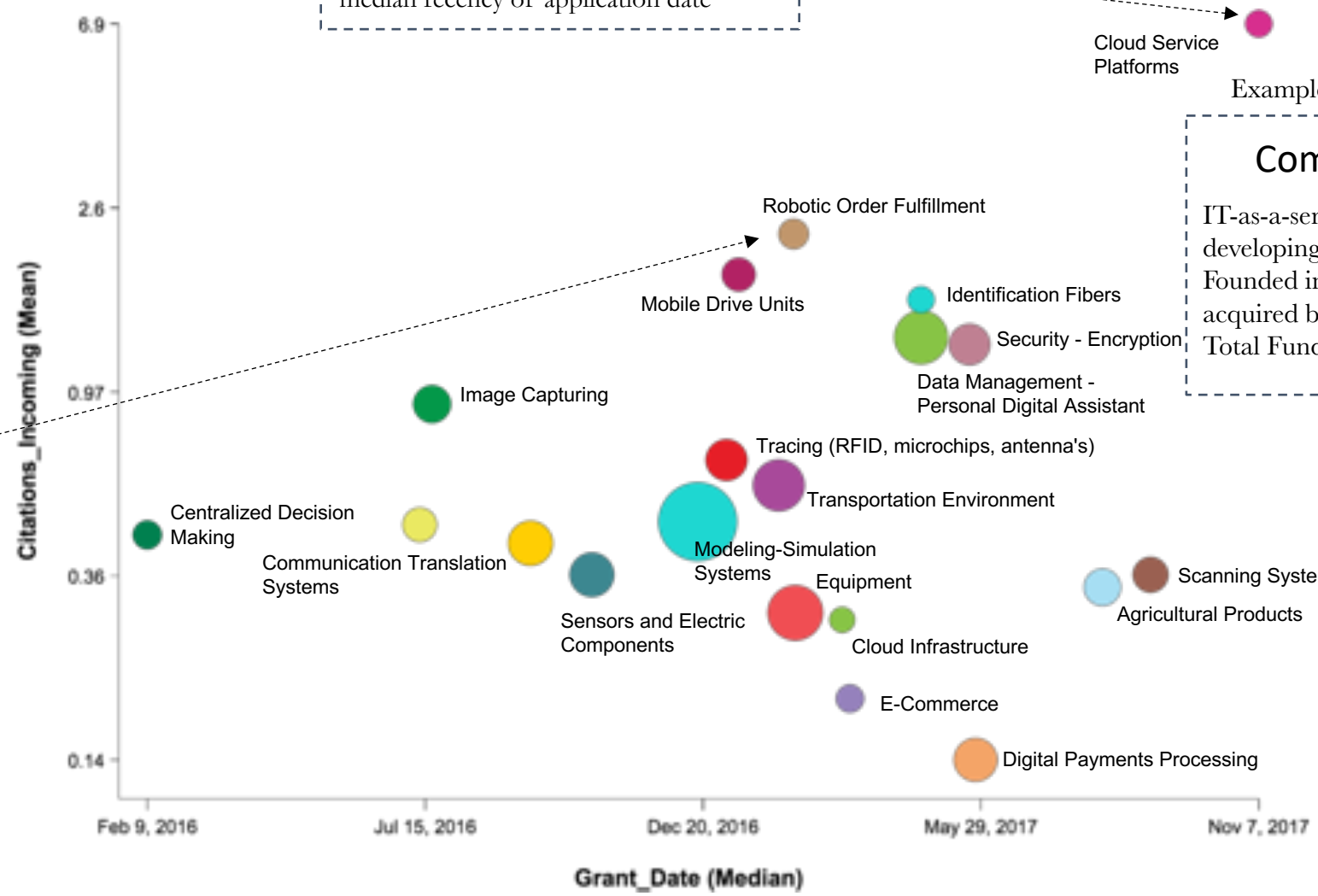
Employing citation metadata and temporal signals can reveal where technologies lie in their innovation lifecycle

Nodes represent clusters, colored by cluster



Cloud Service Platforms represent the most innovative IP cluster based on median recency of application date

Robotic Order Fulfillment had high impact as measured by incoming citations, demonstrating its broad importance to other supply chain technologies



Example Company

Company A

IT-as-a-service company developing cloudMatrix
Founded in 2004 and acquired by IBM
Total Funding: $40.3 M

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Emerging Technology in Supply Chain and Logistics - Horizon 2: Using Companies and Patents Datasets to Discover New Products, Markets, Customer Classes, Business Models

Innovations, New Products, New Markets, New Business Models	Impact	Example Company
Cloud Service Platforms: Non-transitory computer-readable storage medium for creating, provisioning and managing virtual data center. Cloud Service Brokerages	Ability for data sources to talk with each other and make decisions. In the Cloud.	Company A
Robotic Order Fulfillment: Method for generating robotic grasping instructions for items in e.g. mail order warehouse, involves instructing robotic manipulator to perform grasping strategy, and storing strategy in association with characteristics of item in database	Automated Warehouses, speed, machines learning product variations.	RightHand Robotics, Inc.
Modeling-Simulation Systems: Computer-implemented method for facilitating booking based demand forecast problem for e.g. lorry, involves training multivariate time series model using converted multivariate time series, and forecasting results using model	Integrated AI within automated warehouses	Company B
Personal Digital Assistant: Method for real-time presenting, listing, updating, searching, matching, filtering on-demand services, service providers and consumers or users and facilitating for consuming on-demand services, involves performing searching, and matching	Personalization in shopping and buying experience based on data	Telepathy Labs, Inc.
Image Capturing: Method for e.g. identifying prescription for narcotic analgesics on laptop computer in digitally secure environment, involves receiving image that includes product authentication identifier, and identifying authentication identifier	Enhanced security and verification methods	Company C
Scanning Systems: Method for creating and managing commercial insights in waste management, involves utilizing scanner to scan codes of discarded products which enter receptacle bin, and providing data relating to discarding of products to external entity	Product Traceability, Sustainability measurement and tracking capability	Company D
Mobile Drive Units: Order fulfillment system has used in e.g. mail order warehouse, has fiducial mat that comprises fiducial marks which facilitate sensor-based navigation by unmanned drive units that move item into, within, and out of freight transporter	Automated driving units in warehouse that can carry large pallets	Company E
Encryption: Method for discouraging counterfeiting of pharmaceutical products, involves verifying authenticity of pharmaceutical by directing laser beam through packaging to reveal hidden security feature on surface behind packaging	Security and counterfeit detection	Company F
Sensors and Electric Components: Customer alert system for product temperature compliance, has control circuit which obtains verification from customer receiving retail product that thermochromic indicator being affixed to product exhibits first color	Improved transparency, quality control, and customer service	Company G
Blockchain: Method for generating blockchain-based letter of credit relating to contract for trade transaction, involves transferring payment for contract for trade transaction to seller in response to detecting occurrence of both of flow event	International Trade Enablement, Blockchain letter of credit (BLC)	Company H

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- Analysis determined based on research on both the Patents dataset and the companies dataset to determine technologies that are either currently in development or are on the horizon

By analyzing academic literature, Quid identifies early-stage applications & technologies that will shape the long-term future of the supply chain

Academic Research

Nodes represent individual academic papers.

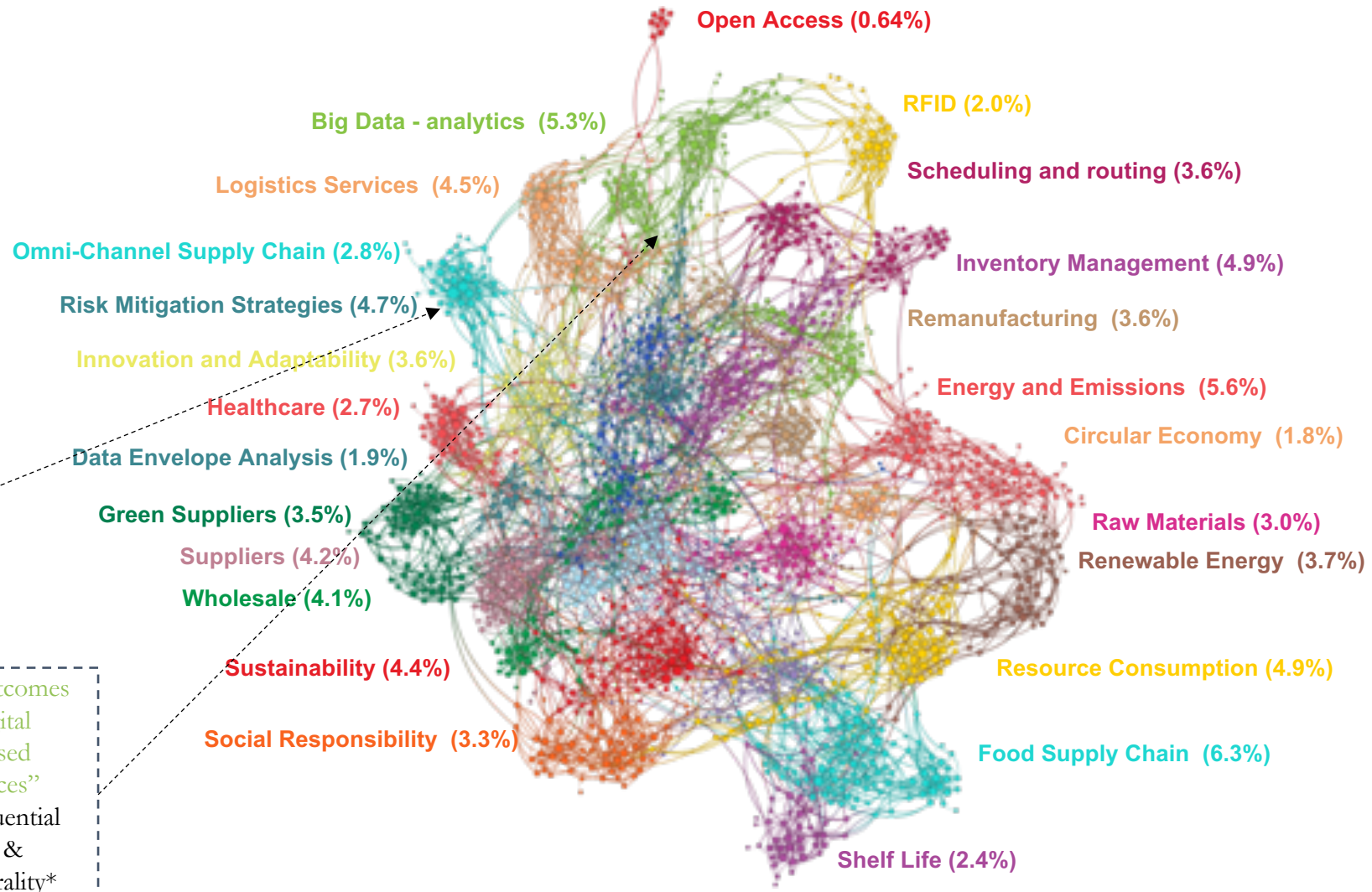
Links between nodes represent shared language in paper abstracts.

Clusters are groupings of papers that address similar problems or employ similar technologies.

Network of 2000 most cited papers relating to supply chain. Nodes sized by citation count.

"Pricing Policies for a Dual Channel retailer with cross channel returns" was the most influential paper by Degree

"Sustainability outcomes through direct digital manufacturing-based operational practices" was the most influential paper by citations & betweenness centrality*



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• *Nodes with high Betweenness Centrality have many connections that extend to disparate parts of the network. These nodes contain language that is shared across multiple clusters.

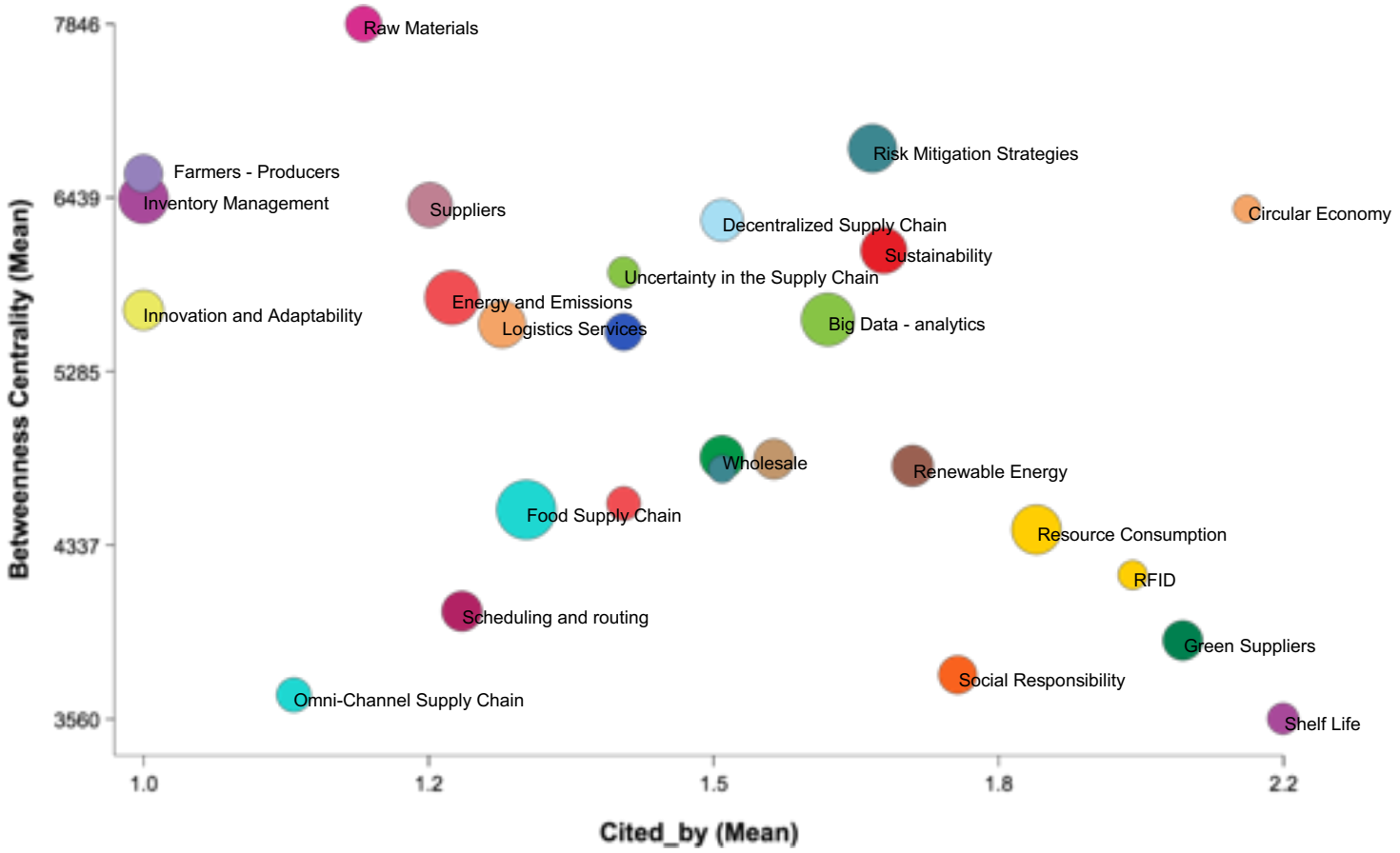
Using Citations and Betweenness Centrality of clusters Quid is able to identify the most resonant and central ideas as they pertain to the future of the supply chain

Nodes represent individual academic papers.

Links between nodes represent shared language in paper abstracts.

Clusters are groupings of papers that address similar problems or employ similar technologies.

Network of 2000 most cited papers relating to supply chain. Nodes sized by citation count.



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Emerging Technology in Supply Chain and Logistics - Horizon 3: Using Academic Research to predict exponential technologies, novel business ideas, and industry changing innovation

Innovations, New Products, New Markets, New Business Models	Impact
Dynamic Supply Chain (Smart Factories): Connected smart factories that share interchangeable processes through a cloud-based system for personalized production. In the system, customers are able to upload a product design file, an optimal supply chain design and operations plan are then determined based on the available resources in the network of smart factories.	Enhanced speed, less inventory, workflow optimization, automated supply chain, machine dependence
Circular Economy: Need credit rating prior to global collaboration. Use blockchain technology to establish each economic entity's transaction details and then employ confidence level algorithms to calculate credit ratings.	Provides effective credit rating of public economic entities. Accountability and transparency.
Drones: Collaborative parcel delivery by truck and drone. Heuristic solution to optimize parcel delivery using drones by increasing speed, efficiency, and scale.	Delivery speed, efficiency, optimization. Cut Costs
Energy and Emissions: Cost-Sharing contracts for energy saving and emissions reduction of a supply chain under the conditions of government subsidies and a carbon tax.	Sustainability becoming engrained in business practices
Logistics Services: Local stations with additive manufacturing equipment and direct digital manufacturing for personalized manufacturing of tools and customized or personal products with crowdsourced development and delivery methods.	Less dependence on traditional manufacturing, enhanced speed and personalization
Risk Mitigation Strategies: Mobile Supply Chain Management in the Industry 4.0 Era.	Personalization, tracking, customer experience
Reverse Logistics: Remanufacturing, repairing, and/or recycling of electrical and electronic waste. Trace the product structure back to individual parts and perform analysis to determine the amount of high quality material needed to make a facility economically viable.	E-waste management. Sustainability improvement

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HOW TO READ A NETWORK

Connections represent similar language used across nodes

A **bridging node** between two clusters indicates the document is at an intersection between two concepts.

Greater distance between clusters indicates **a low number of inter-related documents**

Centrally located nodes are core concepts in the network and share language with many other nodes

The density of a cluster indicates how **similar or diverse the nodes are within it**

Peripheral clusters could represent niche takes on the topic

Similar nodes **cluster together**, and clusters are grouped by color. Each node represents a document.

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IF YOU ARE INTERESTED IN HEARING MORE ABOUT HOW YOU CAN PARTNER WITH QUID TO ANSWER YOUR MOST COMPLEX QUESTIONS PLEASE CONTACT:

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