

Deloitte.



**Location Enabled
Risk Sensing**

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Organizations face increasing uncertainty and risk

An evolving landscape of factors related to regulation, reputation and technology requires that organizations adopt new approaches to understanding and managing risk

- 94% of organizations (155 companies, representing every industry and every geographic region, revenue with at least \$1B) report that their approach to managing strategic risks has changed within the last 3 years
- 9 out of 10 companies believe value creation should be an important goal of risk management. However, fewer than 1 in 5 companies indicated that they are taking commensurate action to broaden the role of risk management
- 30% of board members who had experience in past crises said their reputations recovered in less than a year. Sixteen percent said it took four years or more. Financial and operational crises had similar long recovery times



Brand / Reputation
Consumer sentiment that can influence company perception and value



Macro / External
Factors outside the organization that can impact business operations



Third Party
Vendors in the supply chain who can present unanticipated risks



Fraud / Counterfeit
Manipulation of product or business integrity, such as vendor collusion, adulteration, or copying



Operational Execution
Areas to improve efficiency or effectiveness of controls in operational processes



Safety & Quality
Vulnerabilities influencing operations, merchandising, withdrawals and recalls



Regulatory
New or emerging global and local regulations that can influence the product life cycle

Risk sensing incorporates multiple sources of data and analytics to accelerate speed to insight and action

Detecting patterns across an extensive dataset of interconnected domains to provide actionable insights – and to help organizations mitigate risks before they become crises

Location Intelligence

Delivers a full array of spatial data and analytics specific to organization, with global information alerts from 75,000 sources

Cyber Intelligence

Acquires knowledge about 3rd party and domino risks to organizations, as well as insider threats within the organization to expose culture risks

Predictive Social Intelligence

Uses statistical analysis to monitor and evaluate over 100 million social media posts per day in any language, to predict upcoming trends in the next 72 hours



Near-term Horizon Scanning

Provides speed to insight by scanning over 340,000 data sources globally in 190 countries and 80 languages to deliver early warning signals of potential disruption

Communications

Analyzes social and traditional media trends to detect privacy and public relations risk trends, monitor for reputation and brand sentiment, and assemble industry and competitive intelligence

Financial Monitoring

Aggregates content from public sources to identify patterns and trends which predicate financial risks and other special situations

Components of Our Risk Sensing Approach

Depending on the organization, and the types of risk that are of highest concern to executives, we utilize a combination of tools and techniques to derive insight

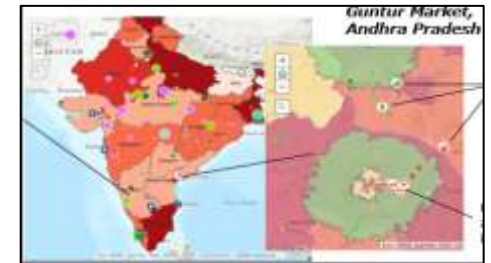
Social Intelligence

- Identify topics of interest that the organization should be monitoring for signs of emerging risk
- A combination of medium term, short term, real time and predictive analytics are built
- Thousands of sources are analyzed to proactively sense external risk signals



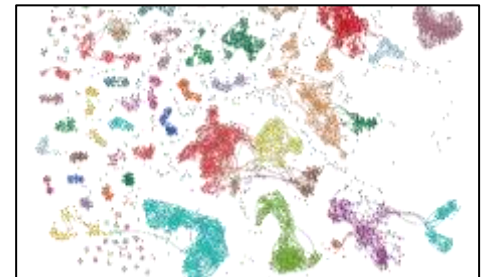
Location Intelligence

- Location Intelligence to identify location specific risk signals
- Understand and model the spatial and temporal relationships of risk factors
- Locational intelligence applied to build higher order products that can help inform decision making



Network Mapping

- Illuminate relevant networks (e.g., supply chain providers, vendors, business partners, etc.) and associated risks, supply chain vulnerabilities and threat mitigation
- Identify entity-specific risks and map the physical location of entities with the identified risks



Technology Backbone – Social Intelligence

Real Time Social Intelligence

A patented, proprietary process that focuses on **statistical analysis** to evaluate over **100 million posts** per day, across **any language or media type**



Provides continuous **real-time** data content classification



Predicts social signals through **next 72 hours**



Augments organizational intelligence via **unsupervised machine learning** and cognitive analytics



Near Term Horizon Scanning

Provides speed to insight by scanning **over 340,000 data sources** globally in **190 countries** and **80 languages** to provide early warning signals of potential disruption.



Provides **near term** 3-6 months of risks and insights



Proactively identifies emerging risks



Automates industry insights with data interpretation and domain knowledge of **experienced subject-matter experts**



Real-Time and Predictive Social Intelligence

Our capability – known as Blab – is focused on what is happening now and where the conversation is going, where most other similar tools are focused on where the conversation has been



Patented, proprietary engine evaluates +100m posts per day across blogs, news and social media



Classifies posts into conversations and predicts how conversations will evolve in the near term



Can predict volume and velocity of conversation up to 72 hours in advance (76% accuracy at 72 hrs)



Also provides insights into top influencers, share of voice, primary media type driving conversation, etc.



Cognitive analytics improve accuracy of predictions over time via unsupervised machine learning



Can process and translate any language because analysis is done through statistical relevance vs. NLP



Analysts and subject matter advisers apply human intelligence to augment data analytics and provide insights



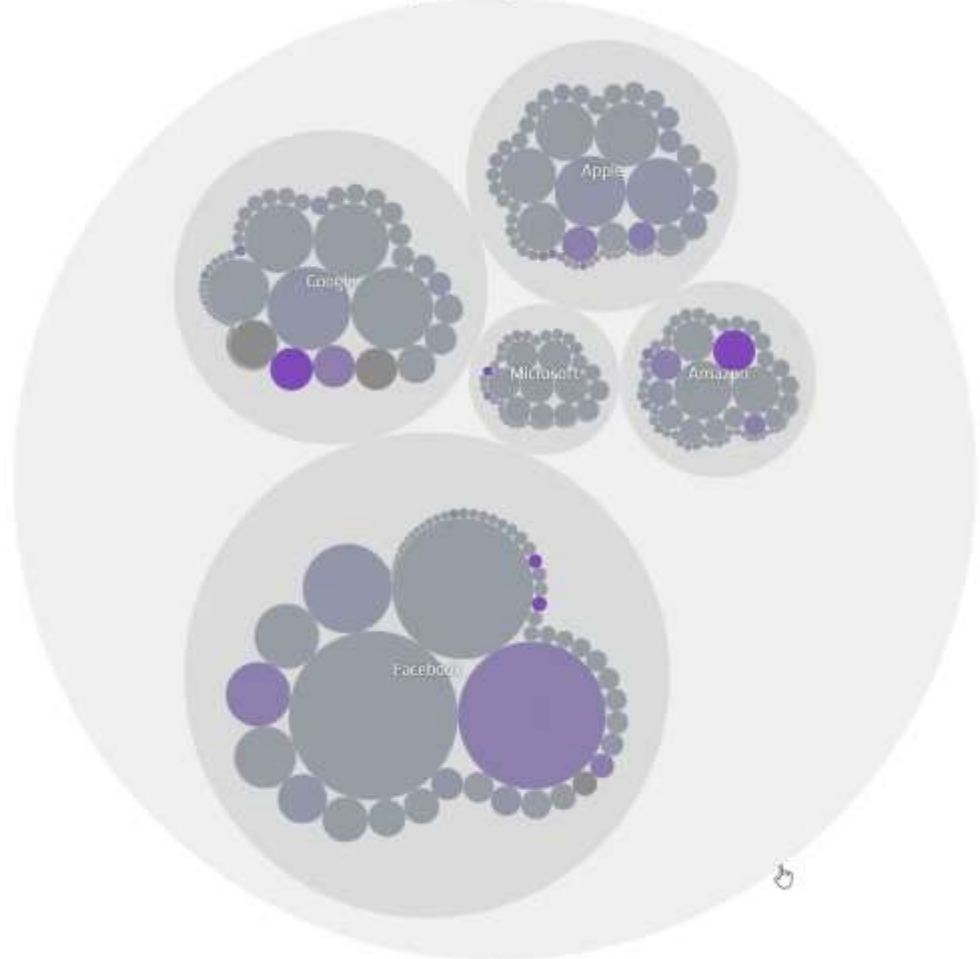
Can provide real-time alerts, as well as daily, weekly, or monthly reporting

Technology Backbone – Social Intelligence

Deloitte.

- Topics
- Themes
- Mashups
- Snapshots
- Alerts
- blab

Major Tech Organizations



Major Tech Organizations

Topics Major Tech Organizations

- +
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Technology Backbone – Location Intelligence

Supply Chain Illumination and Risk Sensing Demonstration

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International Supply Chain Mapping and Risk Profiling

Welcome to the Supply Chain Illumination Risk Sensing Dashboard! To explore different use cases and analyses, simply click through each of the tabs above for new map-based perspectives.

Most mapped features are interactive, so feel free to click a location for extra information. Refer to the legend panel below for feature guidance while examining each map visualization.

This tab represents a global view of a manufacturing supply chain, displaying raw materials originating in India, being processed, tested, assembled in India, shipped from India to Singapore and finally being transported to the Point of Sale outlets.

Please zoom to Singapore to view local points of sale.
Note: Singapore features are only available in tab 1

High Risk Supply Chain Node



Disaster News



Kochi Port



Supports in-depth supplier drill down

Reveals multiple tiers of supplier entities

Depicts product flows

Child Labor

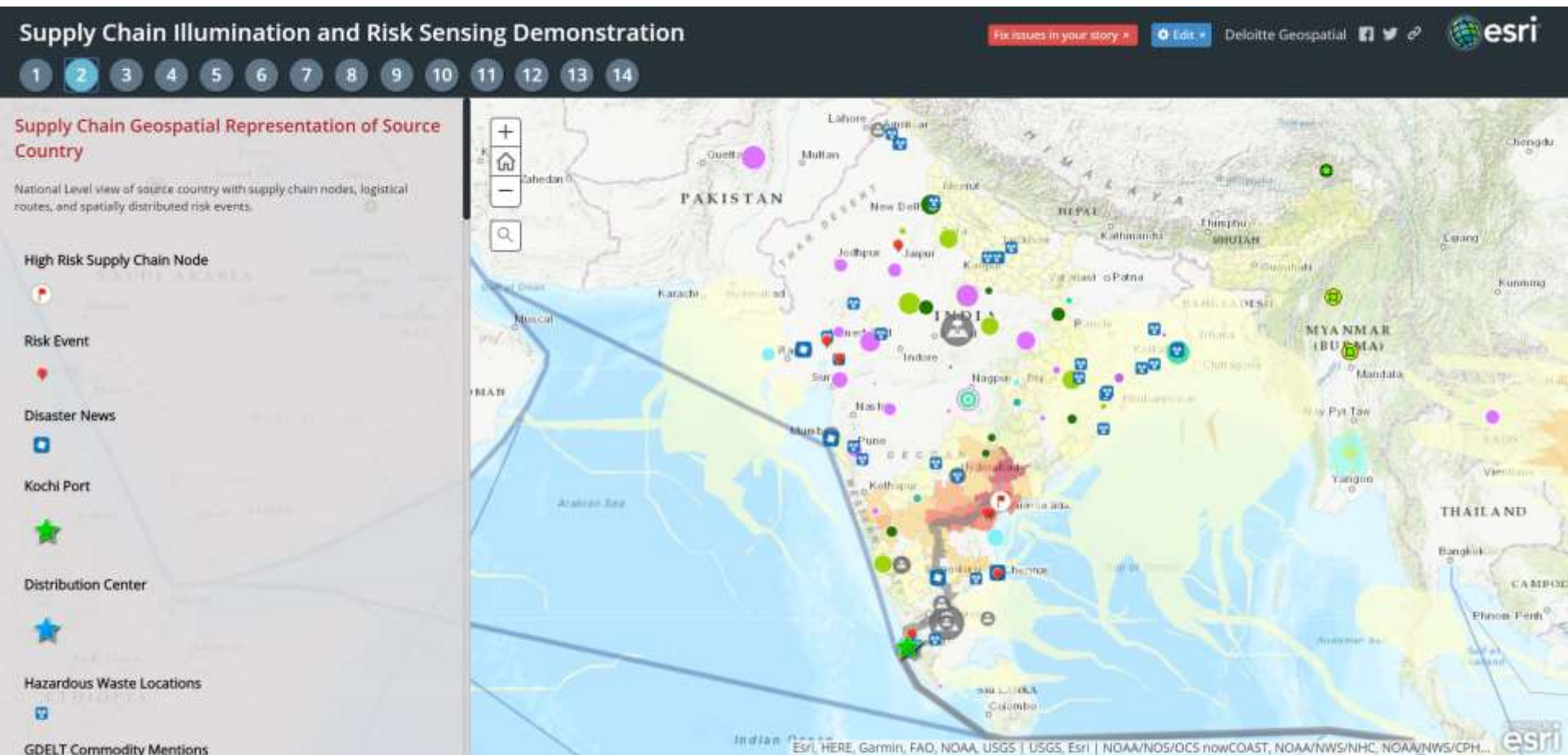
May be used to reveal links to risky entities due to events

Product Pilferage

Informs supplier risk assessments and in-depth analysis prioritization

ILLUSTRATIVE NETWORK

Technology Backbone – Location Intelligence



Technology Backbone – Location Intelligence

Supply Chain Illumination and Risk Sensing Demonstration

Fix issues in your story >

Edit >

Deloitte Geospatial



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State-wise Distribution of Risk Events

Statewide statistics of risk events collected through open source intelligence. Explore specific safety, quality, macro-economic, fraud, and various other types of risk events occurring within each state.

High Risk Supply Chain Node

SAUDI ARABIA

Risk Event

Disaster News

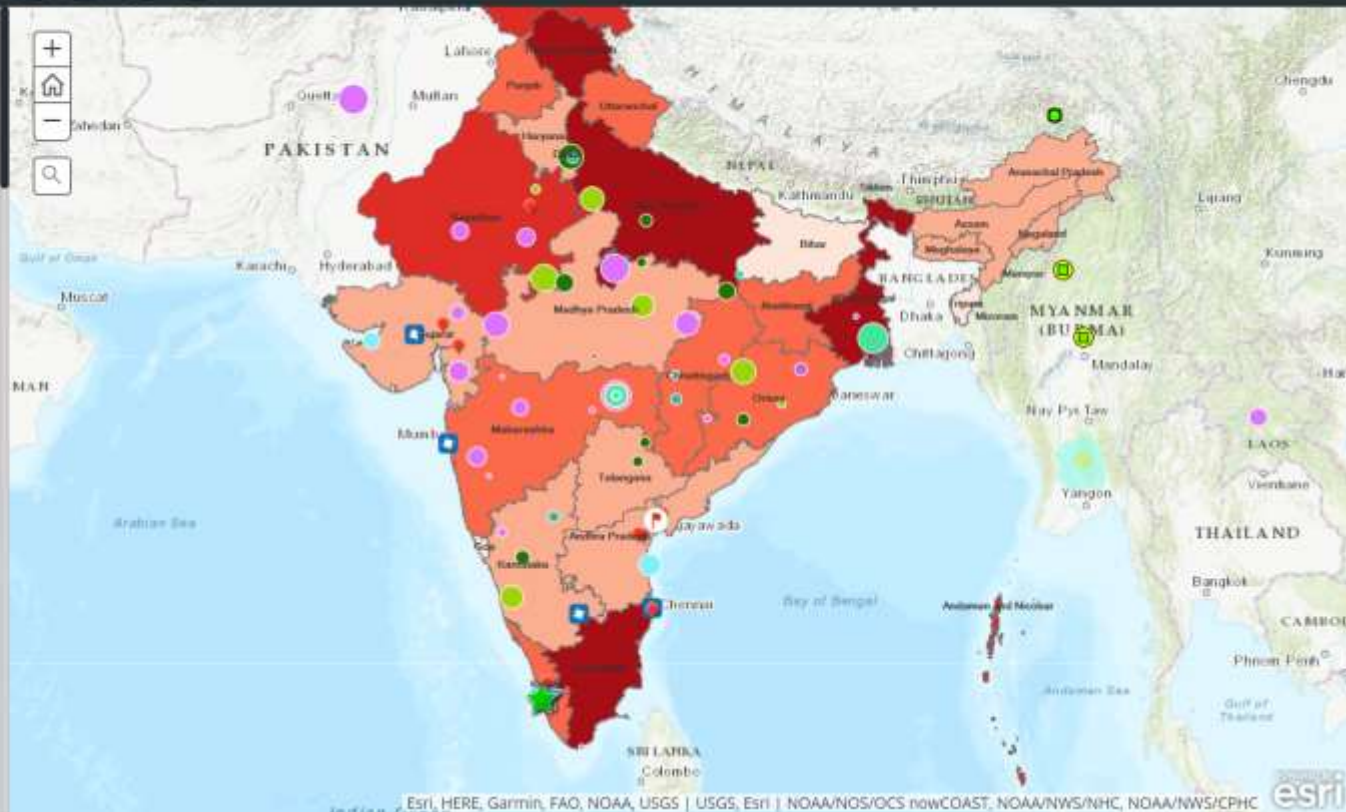
Kochi Port

Distribution Center

Risk Sensing Alert

Topic

Stock Market Updates



Esri, HERE, Garmin, FAO, NOAA, USGS | USGS, Esri | NOAA/NOS/OCS nowCOAST, NOAA/NWS/NHC, NOAA/NWS/CPHC

Technology Backbone – Location Intelligence

Supply Chain Illumination and Risk Sensing Demonstration

Deloitte Geospatial    

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Low Risk Supply Routes

With the presence of predictive geospatial modeling, automatically divert operations away from risk, and optimize routing based on distance, market cost, storage capacity, and more.

This scenario displays distance optimized supply trucking routes, originating at mining locations, passing through production, intermediate storage facilities and quality control warehouse, and ending at the sea port. Any locations that are considered "At Risk" did not participate in route.

When viewing the calculated route time for each leg, trucks were assumed to run at an average speed of 20 km/hr.

High Risk Supply Chain Node



Risk Event



Foundry



Not at Risk



At Risk

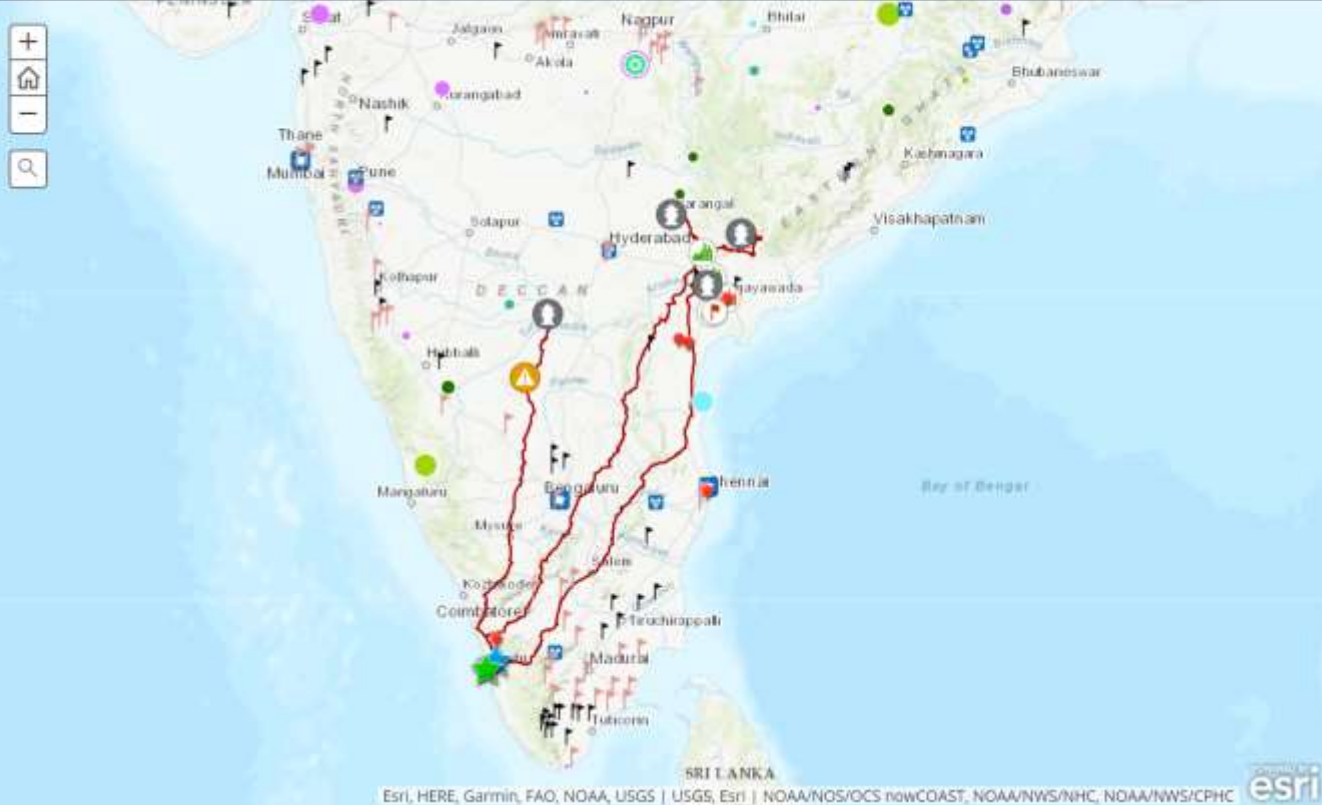
Component Manufacturing Facilities



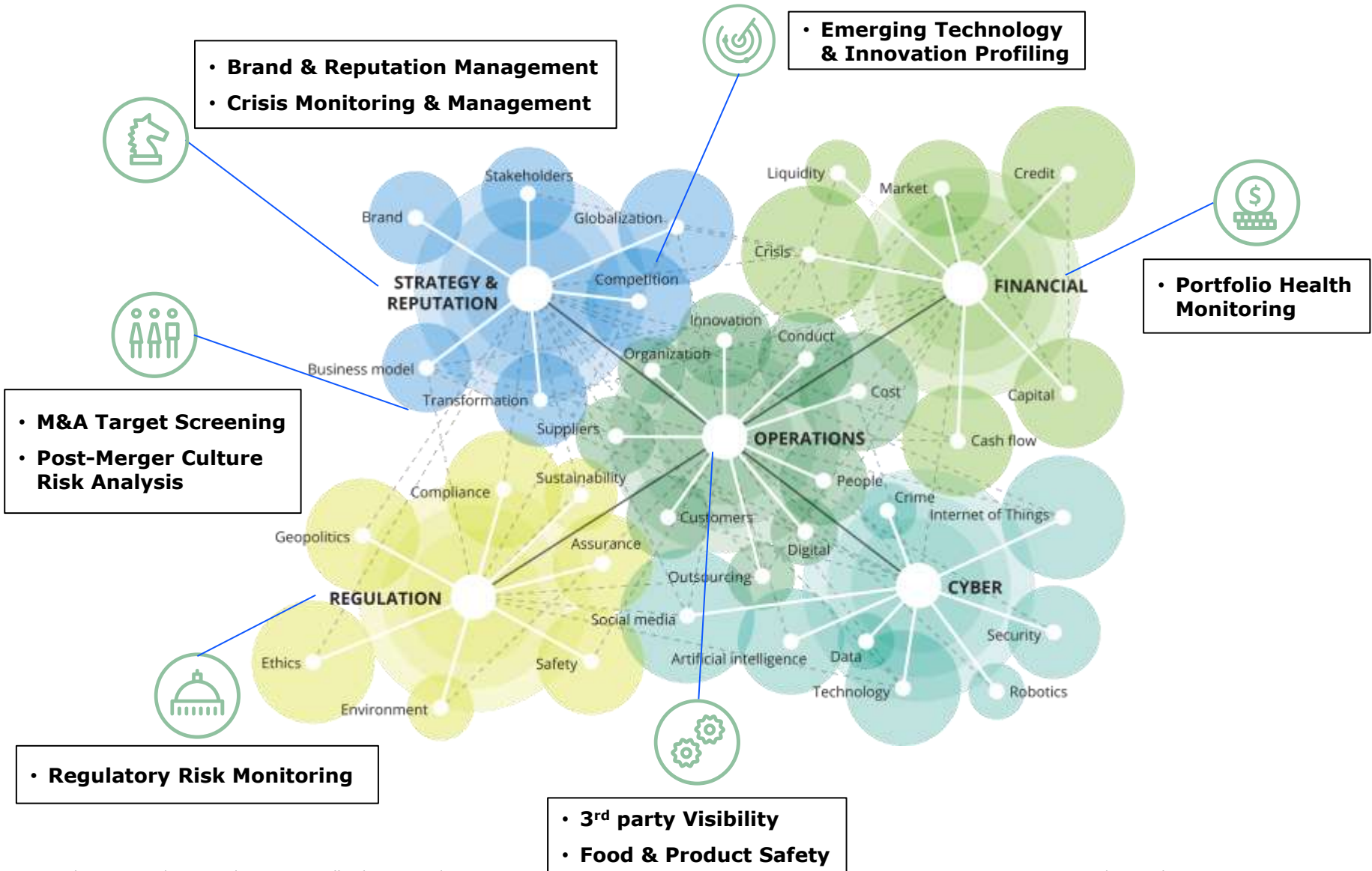
Not at Risk



At Risk



Our risk-sensing capabilities have been leveraged across a wide variety of use cases



Case Study 1: Monitoring Portfolio Health

Industry: Public Sector (Government Financial Regulator)

Business Problem/Issues

A wholly-owned government corporation had **concerns** to evaluate risk to firms **Portfolio health**

Approach / Solution

Deloitte developed a health dashboard to monitor innovation and sustainability indices on an on-going basis

- Created alignment on the need to respond more quickly, proactively, and intelligently to risks and issues within the supply chain ecosystem
- Scanned websites, blogs, social media, news, government data sources, relevant forums as well as analyzed in the on-site findings to identify potential issues
- Collaborated with subject matter specialists to create an industry ontology and lexicons tailored to the business need and priority area
- Developed a risk algorithm to focus insights by leveraging analytical methods such as: natural language processing, concept extraction, topic detection
- Created a dashboard which prioritizes emerging risks and topics of concern
- Established on-going monitoring and alerting capabilities

Business Benefits

The analysis provided the client different "risk lens" to look into and helped them to understand:



Identifying the major policies, regulations and risks related to issuers and servicers



Identifying Macro/External factors which might effect timely payment of principle and interest payments on mortgage based securities

Key Visuals and/or Deliverables

Portfolio Health Dashboard



Legal & Geopolitical Dashboard



Case Study 2: Geospatial Risk Analytics to evaluate Project/Program Risk

Industry: Public Sector (Municipal Government)

Business Problem/Issues

A US city was presented with **extraordinary redevelopment** needs in response to **damage** from a 2011 tornado **disaster**. It was therefore pertinent to have a proactive solution to manage implementation risk of 25 large municipal projects that were being developed



Approach / Solution

Deloitte developed a project monitoring solution in order to capture all the key aspects of every ongoing project. The dashboard sought to have the following features:

- Developed a web geospatial dashboard to view construction projects across the city in a map and view information about the project status
- Dashboard allows City to select an individual project on the map or in a list, showing cost and schedule completion and variance to effectively manage project risk

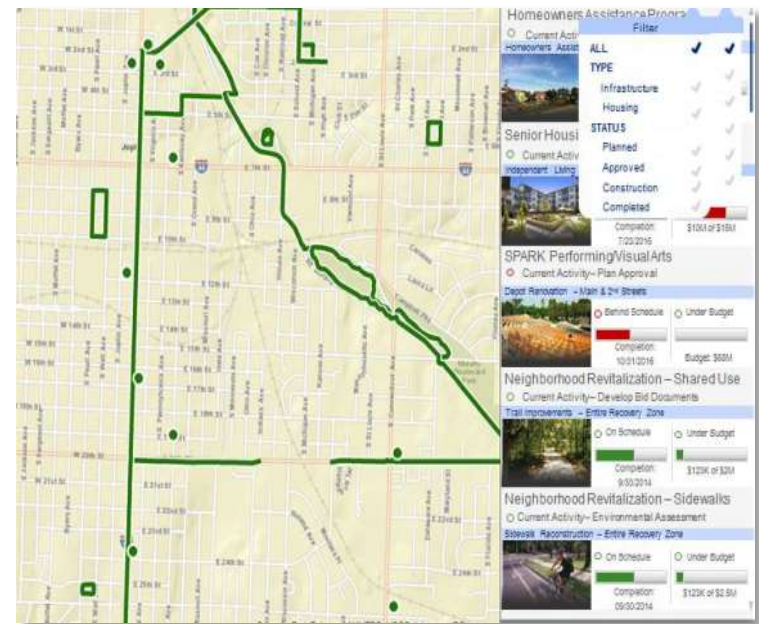
Business Benefits

Availability of a comprehensive dashboard that:

-  Provided the City a single portal to quickly determine the status of all redevelopment efforts and identify risks as they arise
-  Efficiently monitor and control risk on projects worth almost \$1 billion dollars

Key Visuals and/or Deliverables

A geospatial dashboard that proactively identifies and controls risk across 25 large municipal projects



Case Study 3: Risk Sensing to Evaluate Customer Experience

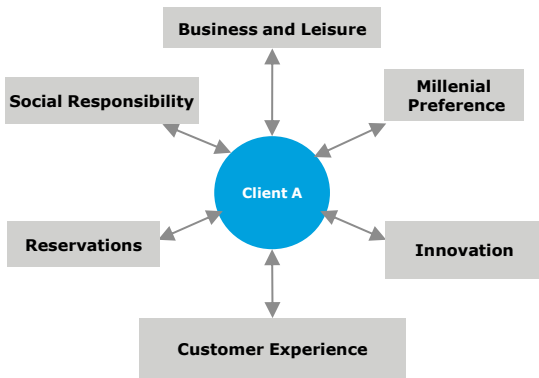
Industry : Travel, Hospitality and Leisure

Business Problem/Issues

A global hotel chain wanted to assess its hotel chain's **popularity and preference** amongst millennials, who travel regularly for business or leisure.

The client also wanted to understand the **overall customer experience in reserving** a hotel stay with them and **latest innovations** in the hospitality and travel sector.

Factors considered



● Client
● Risk Ranked Keywords

Business Benefits

The client was provided with analysis which enabled them in:

Understanding the emerging "Bleisure" trend among millennials

Impact of sharing economy on travel: emergence of poshtels, pod hotels

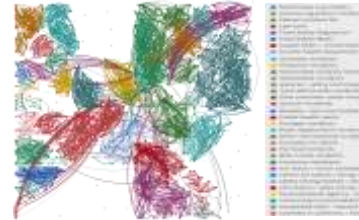
Rapid prototyping through innovation labs

Cyber security concerns for IoT enabled customers

Travel Bots for personalize customer experience

Key Visuals and/or Deliverables

Sourcing data from Quid / Synthesis: Cluster Analysis



Topics reviewed in Hospitality

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User Reach of Social Media



Assessments done on Innovation in the Hospitality Industry



Case Study 4: Geospatial Risk Analytics to evaluate Infrastructure Risk

Industry : Energy and Resources (Oil & Gas)

Business Problem/Issues

The oil and gas client wanted to **streamline** their vast **array of metadata** (which included large repositories of midstream data of half a million miles of transmission pipelines, and historical records of pipeline incidents) and take **informed business decisions** based on the same

Approach / Solution

The Geospatial Analytics team of Deloitte accounted for data availability along with the business requirements and:

- Developed a predictive risk model for pipeline segments
- The model considered input parameters like proximity to water reserves, ecologically sensitive areas and densely populated zones
- These were used to calculate the impact of an incident to surrounding areas
- Pipeline vulnerability was also calculated considering a pipeline's record of incidents, its frequency of inspections, and its intersection with areas prone to natural hazards

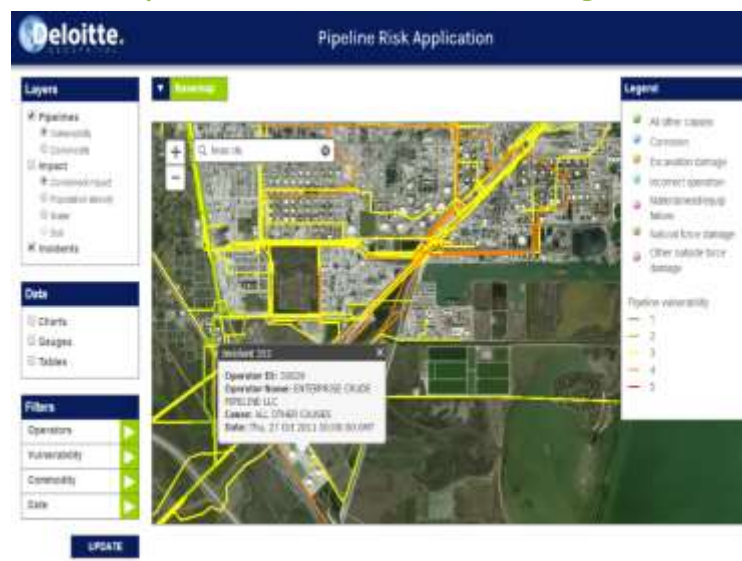
Business Benefits

The pipeline network overlaid on a geospatial view ensured that:

- It could be used to schedule inspections and plan emergency response, since pipeline risk was considered a function of vulnerability and impact
- Users of the pipeline risk application can drill down to particular incidents and specific sections of pipeline to identify areas with the greatest potential risk.

Key Visuals and/or Deliverables

A Risk Application based on a geospatial view of pipeline network with provisions for incident detection among others



Summary: Four step methodology for proactively identifying, assessing and monitoring emerging risks and taking action to mitigate





Thank you

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