

**SparkCognition™ Knowledge Studio transforms human expertise and siloed data into a digital knowledge asset that helps employees make better and faster decisions.**

**BUILDING KNOWLEDGE**

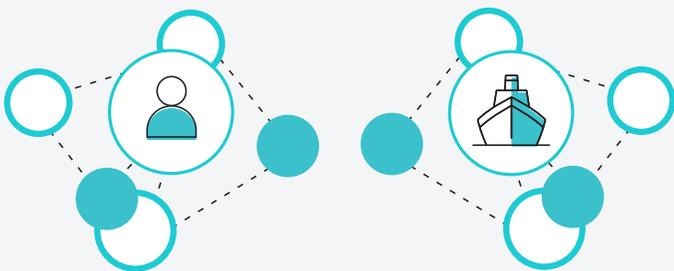
SparkCognition Knowledge Studio enables enterprises to build and derive value from knowledge. At the core of the Knowledge Studio is the Computational Knowledge Graph (CKG), a unique technology that separates conceptual modeling and operations on the data from the data content itself. This separation provides fluidity of modeling within a graph and makes it possible to repurpose any data into a relevant structure. The product enables users to create structural models from enterprise knowledge and know-how from diverse sources (including tribal knowledge) and blend that with computational models that mathematically encode human expertise and are trained by subject matter experts (SMEs).

**DIGITAL KNOWLEDGE LAYER**

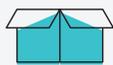
The blending of the knowledge and computational models creates the digital knowledge layer. This digital knowledge demonstrates the relationships and interdependencies between various operational concepts that are key drivers of operations, such as ships, cargo types, ports, contractual agreements, and more. For example, an SME working for an oil company can visually explore the knowledge graph to find all drilling-related incidents at specific depths by using Knowledge Studio’s machine learning classification algorithm that labels the data into categories like wells, people, and activities.

The digital knowledge layer enables SMEs to rapidly create cognitive applications that accelerate and enhance decision making.

**STRUCTURAL MODELS**



Ships



Cargo

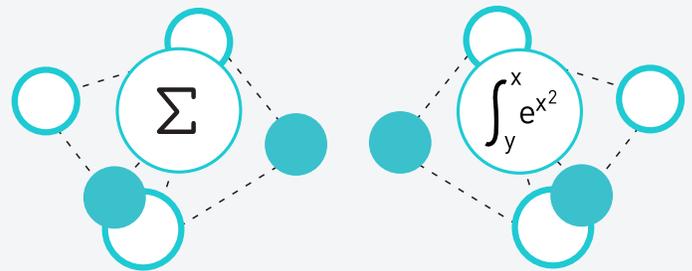


People



Ports

**COMPUTATIONAL MODELS**



Classifiers



Similarity



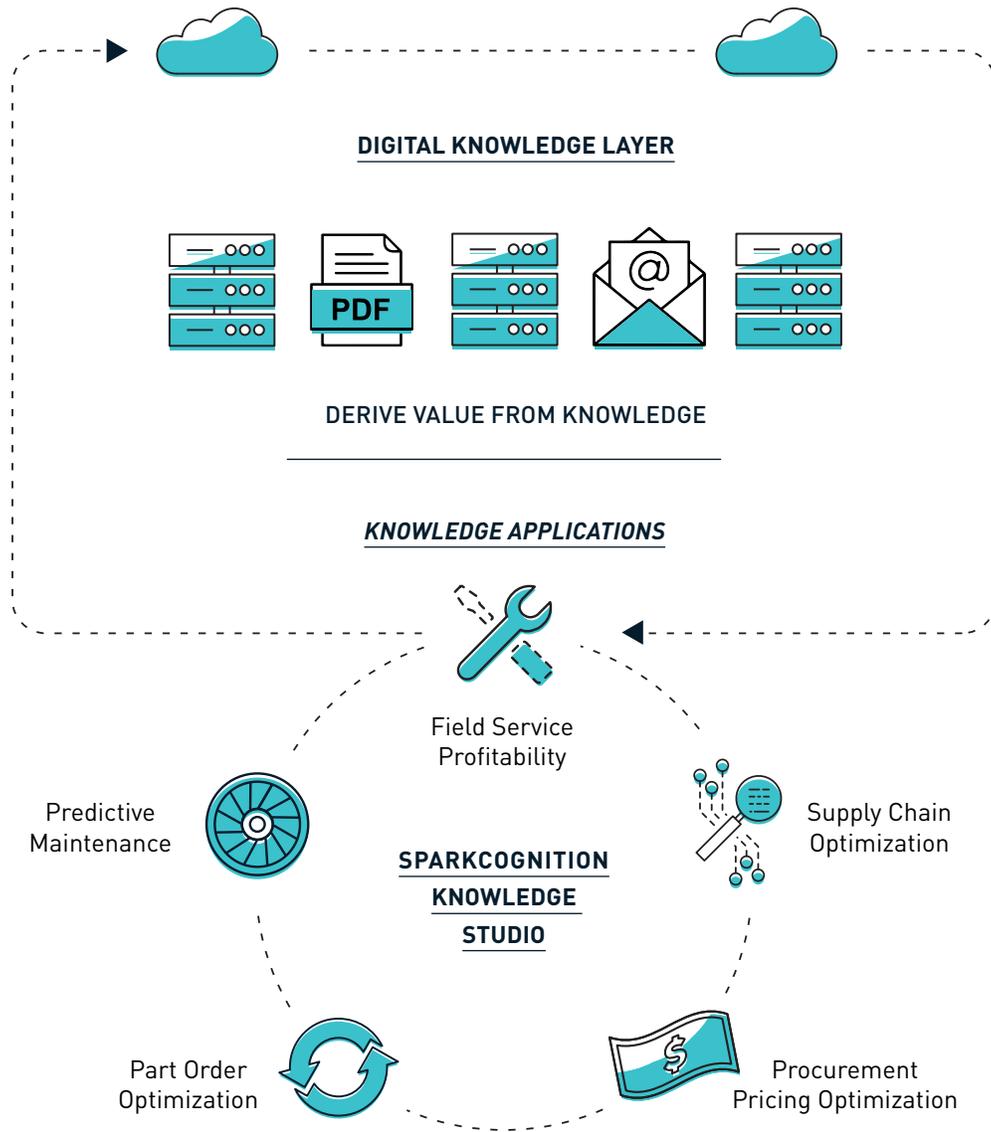
Predictors



Simulation

**AI-DRIVEN APPLICATIONS**

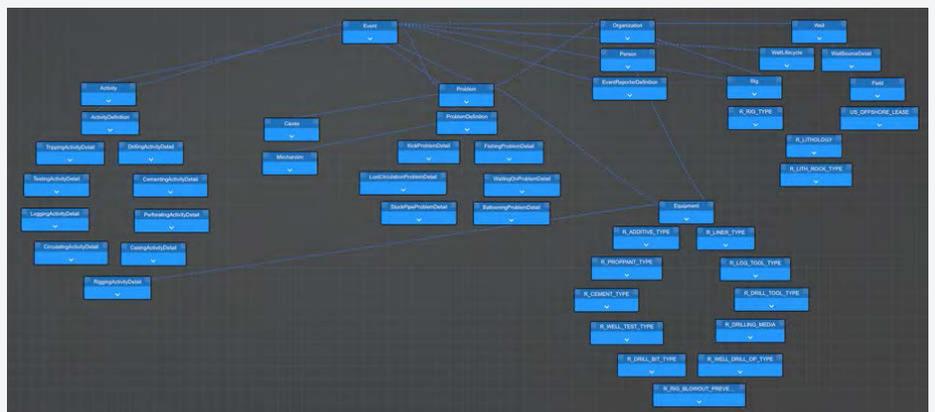
Knowledge-based AI algorithms enable SMEs to build intelligent, modular applications at scale. An application designed for one use case can easily be extended and applied to other use cases.



Knowledge Studio provides a self-service and highly intuitive interface including a variety of authoring experiences all in a low-code type of environment.

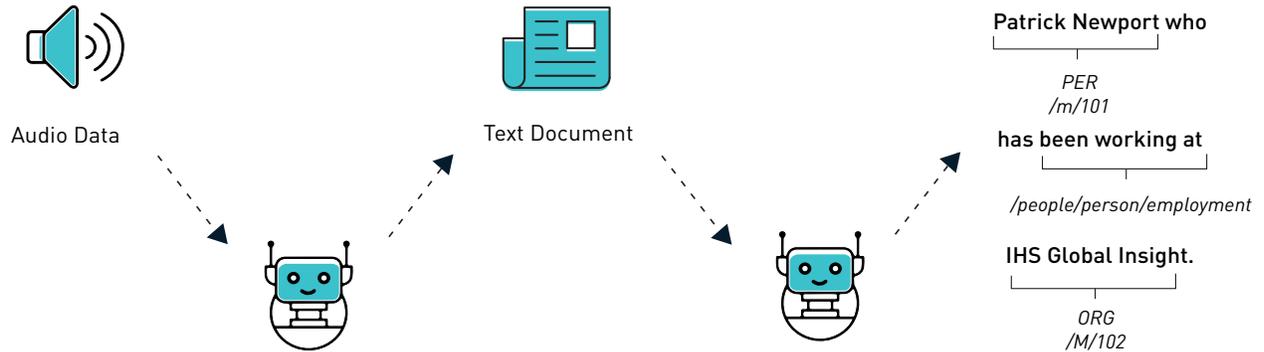
**These include:**

- Bayesian network assistant
- OLOG assistant
- Goal-oriented planning assistant (GOAP)



## KNOWLEDGE BOTS

Knowledge bots listen to events and take autonomous action, such as performing classification or prediction, updating a simulation, or any arbitrary operation.



Knowledge Studio Bots that build knowledge and create the graph perform tasks that assist users in creating models. These capabilities bring knowledge into the graph by performing tasks such as:

- Detecting when new data becomes available
- Detecting and normalizing datatypes across data
- Discovering relationships between data entities and properties in the graph

Knowledge Studio Bots that derive value from knowledge perform tasks such as:

- Automating building and selecting the optimum machine learning models appropriate for the targeted problem and data
- Extracting and normalizing units of measurement from disparate data
- Reasoning over knowledge by consuming existing or new services that expose knowledge

## COMMAND LINE INTERFACE FOR DEVELOPERS

A custom command line interface (CLI) provides interactive and scripted access to many convenient system actions such as schema management, data loading, querying, and administration. The command line interface is easily extensible with custom plugins, making it simple for developers to add functionality.

```
sc-kstudio help load-doc
Usage: sc-kstudio [command]

Commands:
sc-kstudio init           Initial config setup
sc-kstudio add-endpoint  Add new endpoint to .graphqlconfig
sc-kstudio get-schema    Download schema from endpoint
sc-kstudio schema-status Show source and timestamp of the local schema file
sc-kstudio ping          Ping GraphQL endpoint
sc-kstudio query <file> Run query/mutation
sc-kstudio diff          Show a diff between two schemas
sc-kstudio playground    Open interactive GraphQL Playground
sc-kstudio lint          Check schema for linting errors
sc-kstudio load [--csvdebug] [--mapping] Loads data from sources using
```

## KNOWLEDGE APPLICATIONS

Knowledge Studio enables SMEs to build knowledge-based AI applications that help employees make better and faster decisions. These cognitive applications are powered by models that provide decision support for critical business functions to help employees optimize operations and workflows.

The screenshot shows a web application titled 'Schedule Optimizer' for 'ACME'. It displays a table of invoices for 'BESTO' with ID '00051420'. The table has columns for Invoice #, Invoice Amount, Due Date, Balance Due, and Predicted Loss. A context menu is open over the table, showing options like 'Phone to pay', 'Call - Recommended', 'Call back customer', 'Do not call back', 'Call - Checkin', and 'Call back later'.

Invoice #	Invoice Amount	Due Date	Balance Due	Predicted Loss
00000001	1000.00	10/10/2015	1000.00	-10.00
00000048	1016.50	12/10/2015	1016.50	-12.44
00000080	18138.79	12/30/2015	18138.79	-7.18
00000097	9895.40	10/10/2015	9895.40	-3.29
00000100	9195.40	11/30/2015	9195.40	-4.06
00000205	8824.71	11/30/2015	8824.71	-1.94
00000134	3007.82	12/30/2015	3007.82	-1.27
00000072	2588.50	12/30/2015	2588.50	-1.18
00000104	2475.14	10/10/2015	2475.14	-0.90
00000772	2855.30	12/20/2015	2855.30	-0.88
00000770	2821.15	12/20/2015	2821.15	-0.97
00000023	2234.26	12/30/2015	2234.26	-0.91
00000153	2245.81	09/00/015	2245.81	-0.78
00000082	1388.03	11/20/2015	1388.03	-0.72
00000207	2103.80	10/10/2015	2103.80	-0.70
00000037	1821.48	11/30/2015	1821.48	-0.63
00000032	1410.28	12/20/2015	1410.28	-0.49
00000205	1378.00	12/10/2015	1378.00	-0.46
00000141	1318.17	11/20/2015	1318.17	-0.44
00000206	1098.55	11/20/2015	1098.55	-0.36
00000307	951.75	12/30/2015	951.75	-0.32
00000105	793.41	12/10/2015	793.41	-0.22
00000108	704.79	11/20/2015	704.79	-0.24
00000326	735.00	12/10/2015	735.00	-0.24

## AD-HOC ANALYTICS

Knowledge Studio portal enables users to query, visually explore, and navigate the digital knowledge layer encapsulated in the Computational Knowledge Graph. Knowledge Studio can also be extended with popular data visualization software such as Tableau and Power BI for ad-hoc analytics.



## ARCHITECTURE

Knowledge Studio's micro-services architecture uses GraphQL, which provides an increasingly popular interface to the Computational Knowledge Graph. The architecture also uses Docker containerization for enhanced agility, portability, and security, making it easy to extend the platform with additional components.

This architecture structures the development of applications as a collection of loosely coupled services based on lightweight protocols. It improves modularity and makes the application easier to develop, test, and maintain. It also parallelizes development by enabling small autonomous teams to develop, deploy, and scale their respective services independently.

Knowledge Studio's architecture makes it easy for developers to swap or add new microservices and provides the developer ecosystem with a wealth of established tools to help them in their development efforts.



## CLOUD NATIVE

Knowledge Studio is cloud native, allowing enterprises to deploy the platform on Microsoft Azure for greater enterprise security, scalability, and control.

## ABOUT SPARKCOGNITION

SparkCognition's award-winning AI solutions allow organizations to predict future outcomes, optimize processes, and prevent cyberattacks. We partner with the world's industry leaders to analyze, optimize, and learn from data, augment human intelligence, drive profitable growth, and achieve operational excellence. Our patented AI, machine learning, and natural language technologies lead the industry in innovation and accelerate digital transformation. Our solutions allow organizations to solve critical challenges—prevent unexpected downtime, maximize asset performance, optimize prices, and ensure worker safety while avoiding zero-day cyberattacks on essential IT and OT infrastructure. To learn more about how SparkCognition's AI solutions can unlock the power in your data, visit [www.sparkcognition.com](http://www.sparkcognition.com).