Splunk in Financial Services

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Forward-Looking Statements

During the course of this presentation, we may make forward-looking statements regarding future events or the expected performance of the company. We caution you that such statements reflect our current expectations and estimates based on factors currently known to us and that actual events or results could differ materially. For important factors that may cause actual results to differ from those contained in our forward-looking statements, please review our filings with the SEC.

The forward-looking statements made in this presentation are being made as of the time and date of its live presentation. If reviewed after its live presentation, this presentation may not contain current or accurate information. We do not assume any obligation to update any forward looking statements we may make. In addition, any information about our roadmap outlines our general product direction and is subject to change at any time without notice. It is for informational purposes only and shall not be incorporated into any contract or other commitment. Splunk undertakes no obligation either to develop the features or functionality described or to include any such feature or functionality in a future release.

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Introduction

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Overall FSI Digital Transformation
Top Industry Drivers

Fintech Disruption
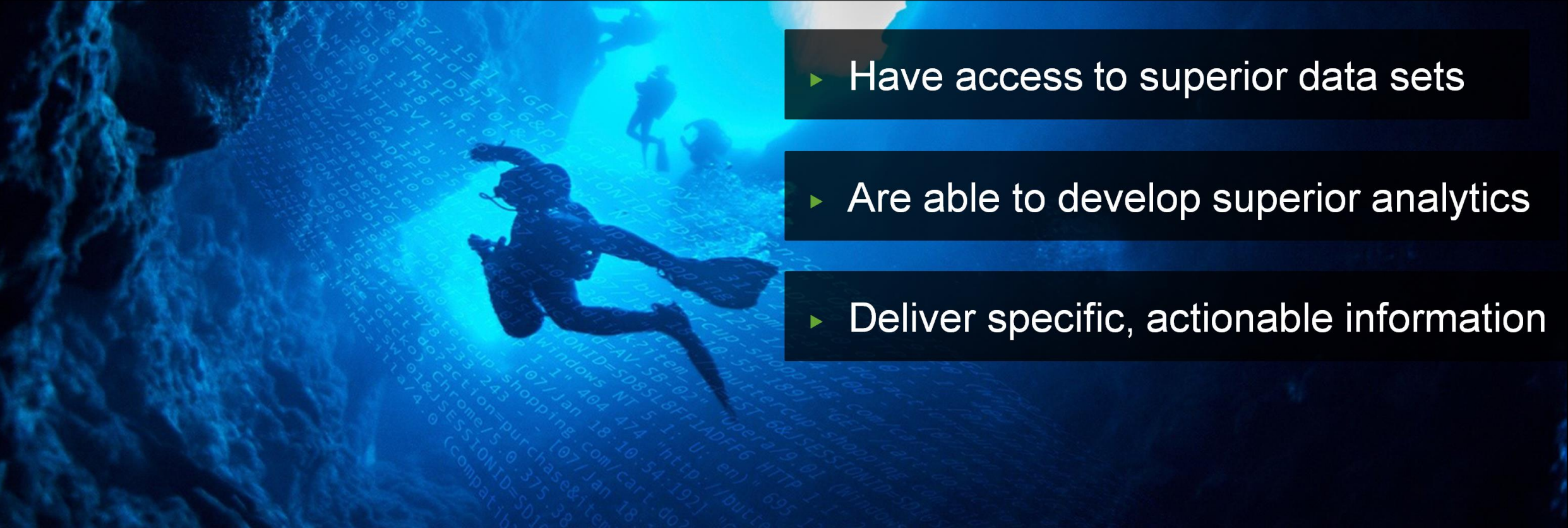
Digital Technologies

Cloud Services

Cyber Security

Advanced Analytics

Modernize Core Banking & Payments

Integrated Risk & Compliance

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Ingredients for Success – Analytics is Key

According to research from Morgan Stanley & BCG, the disruptors and winners will be those financial institutions that . . .

▸ Have access to superior data sets

▸ Are able to develop superior analytics

▸ Deliver specific, actionable information

Data Analytics for FIs: The Journey from Insights to Value, October 2016

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These Ingredients for Success Rely Heavily on Machine Data

Volume | Velocity | Variety | Variability

Machine data is the fastest growing, most complex, most valuable area of big data

GPS, RFID, Hypervisor, Web Servers, Email, Messaging, Clickstreams, Mobile, Telephony, IVR, Databases, Applications, Telematics, Storage, Servers, Security Devices, Desktops, Wire data, Social data, Environmental

Why is analyzing machine data challenging?
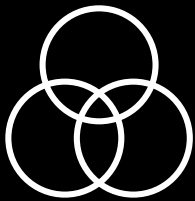
Machine data is
real time,
unstructured, and
unpredictable
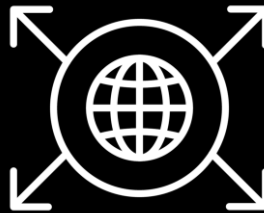
Requires
massive scale
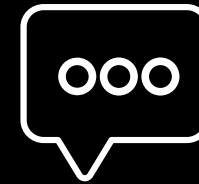
You don't always
know which
questions to ask

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Splunk takes a Disruptive Approach to Unstructured Data

Traditional

- Schema at Write
- SQL
- ETL

Structured RDBMS

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- Schema at Read
- Search
- Universal Indexing

Unstructured

Volume   Velocity   Variety

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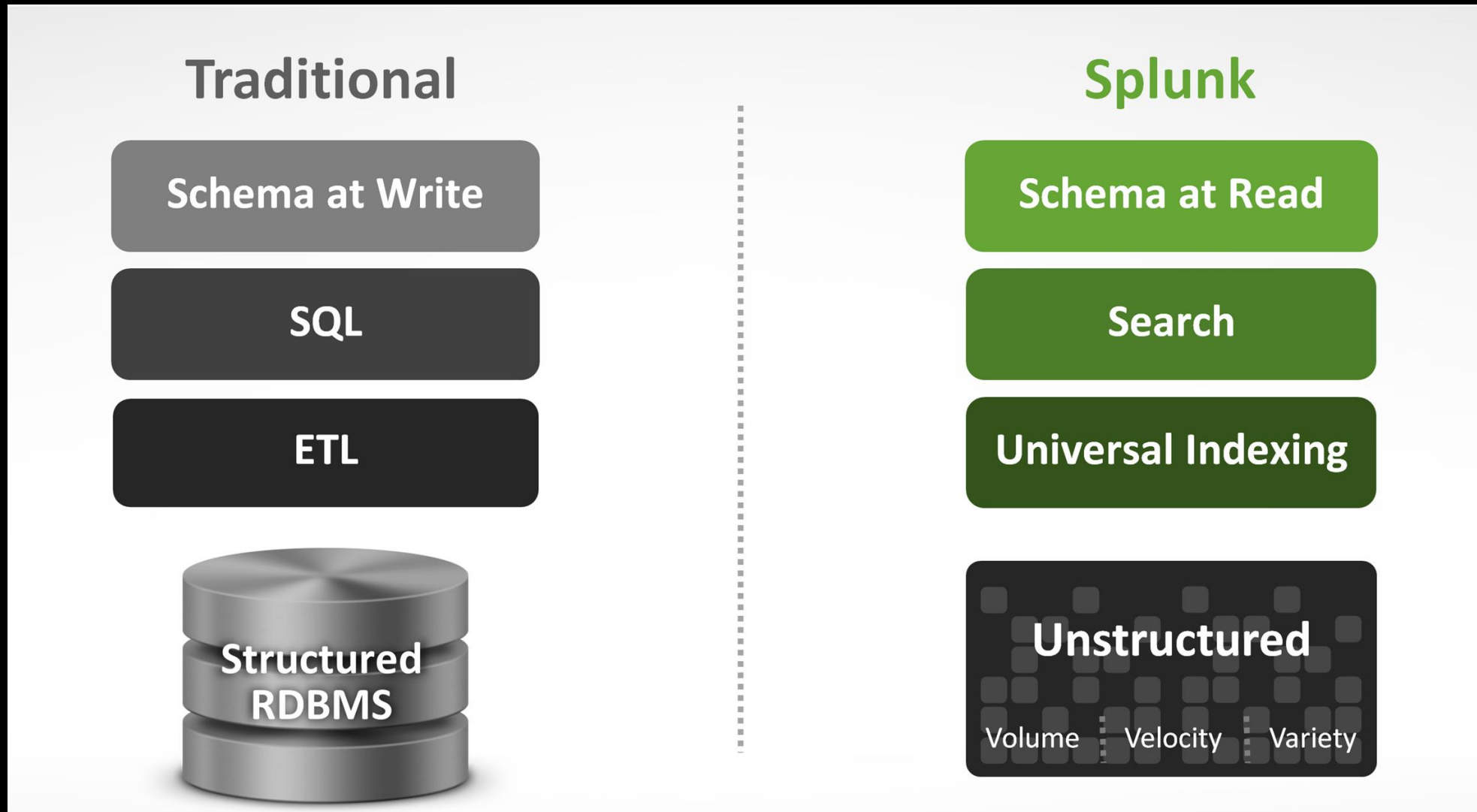
FSI Machine Data is Unstructured, Diverse and Resides in Silos
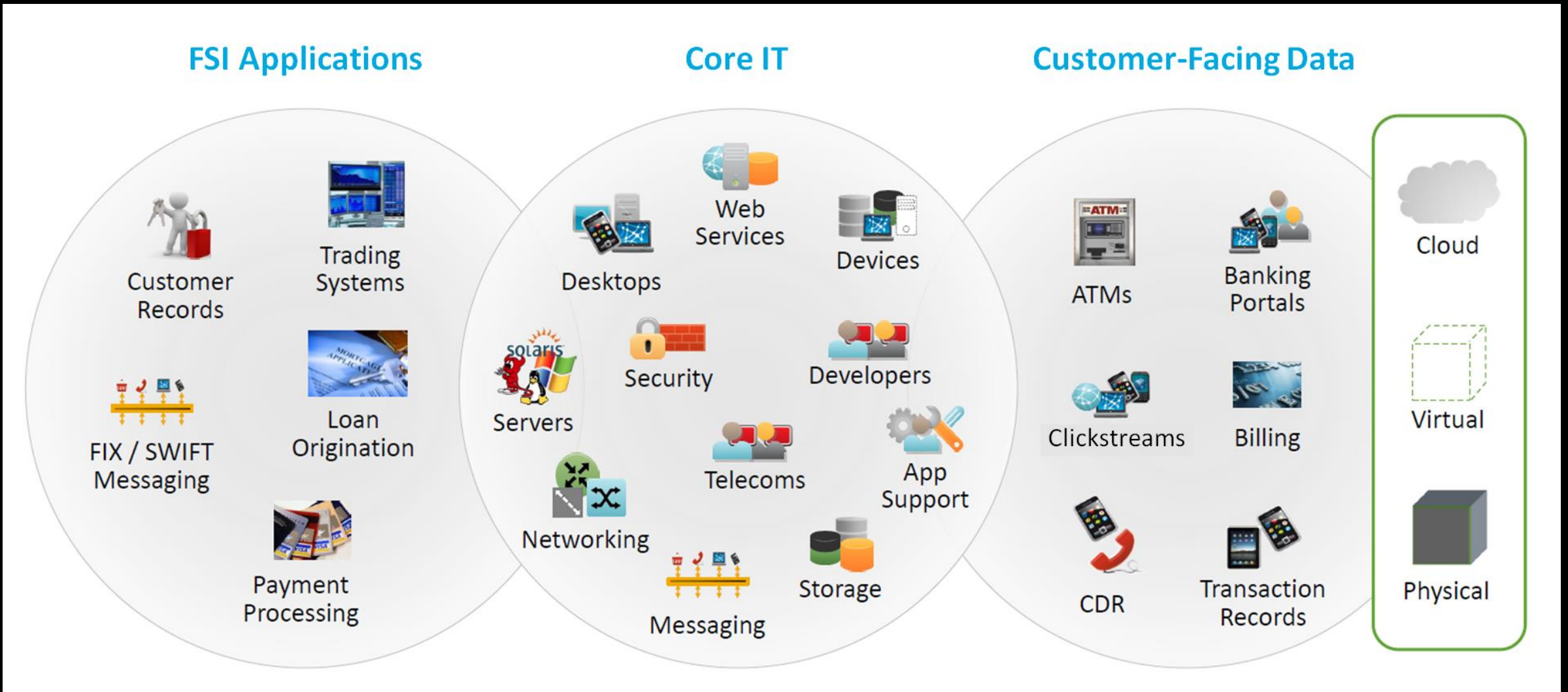
FSI Processes & Services use Data from these Different Silos

Sample Trade Processing Flow
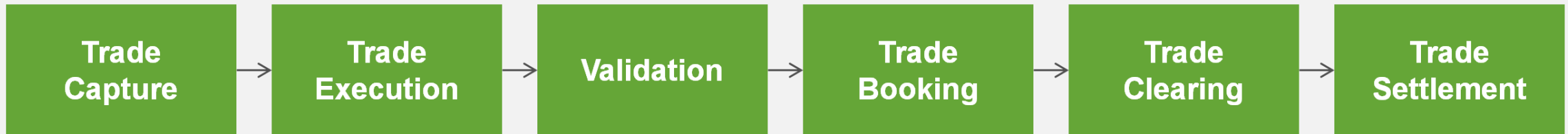
Trade Capture	→	Trade Execution	→	Validation	→	Trade Booking	→	Trade Clearing	→	Trade Settlement

Diverse IT Systems Support Trade Processing

Front & Back Applications	Hardware	Message Queues (SWIFT/FIX)	Enterprise Service Bus	Networking	Devices

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Hence, Gaining End-to-End Process Visibility is Challenging

Diverse IT Systems Support Trade Processing

Front & Back Applications

Hardware

Message Queues (SWIFT/FIX)

Enterprise Service Bus

Networking

Devices

Search & Identify

Monitor Systems/Processes

Gain Operational Visibility

Get Business Insights

▸ What caused the delay in processing or settlement?

▸ Where are the transaction confirmation details?

▸ Does the user have access to the right data?

▸ How many transactions were processed?

▸ Can we prevent the problem from happening?

▸ How is the customer experience? Did we meet SLAs?

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Splunk transcends Silos and turns FSI Machine Data into Answers for Numerous Use Cases

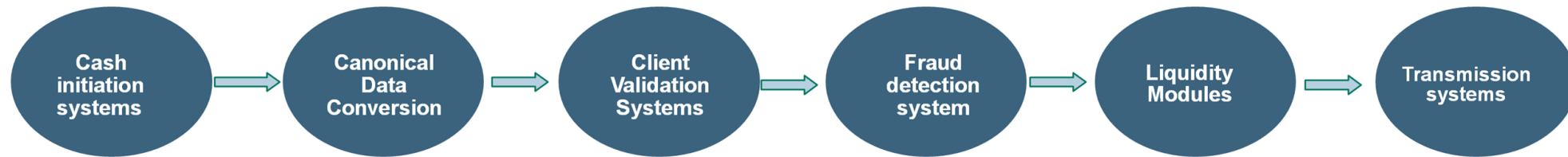# Customer Examples

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Transaction Process Flows at Northern Trust

Complexity of Transaction Processing

Transactions go through several complex life cycles across systems.

Cash initiation systems → Canonical Data Conversion → Client Validation Systems → Fraud detection system → Liquidity Modules → Transmission systems

Northern Trust

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Northern Trust: Tracking Payments and Business Transactions

"With Splunk, we bring value to our business community."

– *Director, Transaction Processing Operations*

► Able to locate transactions anywhere within the environment

► End-to-end view of process flows

► Able to monitor system health and troubleshoot abnormal events

► Increased Straight-Through Processing Rate; reduced settlement risk

► Rapid system development; without Splunk would have required 20+ weeks of professional services

Northern Trust

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Unicredit: Operational Visibility Across Multiple Payment Channels

► Began using Splunk for monitoring online applications

► > 500 universal forwarders; > 180 source types

► Now have advanced to using Splunk as a development platform for complex applications

► One such application monitors all high value payment processes

► Monitoring happens at three different levels: infrastructure; application; business process

► Customer feedback is that general functionality is outstanding; Python SDK, Java SDK, and REST APIs are very powerful

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Unicredit – Monitoring Payments at Three Levels

Layer

Target Group

Aggregation & Integration

Business Process

It **checks performance** and **availability of end to-end process** leveraging also on functional monitoring results/application.

• Process

• Business- / Process-Owner
• IT Application Manager

Function

It **checks performance and availability** of application functionality e.g. by simulation end-user experience, interfaces, queues etc. – legal constraints to be considered.

• Application

• IT Application Manager
• Application Owner

Technology

It **manages and monitors base infrastructure** in terms of **resources utilization** (memory, CPU, file systems, swap, network, disk space, throughput…) and **main subsystems activity** (processes, services…)

• Components on Mainframe/Open (JCL, DB, Server…)

Server   Data Base   Storage   etc..

• Application Owner
• Operating / IT Provider

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SECURITY

Nasdaq: Keeping Markets Moving

> "Splunk allows us to have a single skill set that is common across the entire organization. Information security is writing queries but using the same language as our operations team."
>
> – *AVP, Nasdaq*

▶ Using Splunk Enterprise to monitor potential external security breaches and UBA to detect insider threats

▶ Analyst efficiency to gather data and speed security investigations has increased by more than 50 percent

▶ Provides deep understanding of data and reusable correlation rules across all support engineer levels

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COMPLIANCE

FIS: Mitigating Security and Compliance Risks

> "In addition to using Splunk for monitoring security incidents, FIS also uses the platform to meet the requirements of various industry and government regulations it is subject to."
>
> — *Senior Director, Regulatory Compliance*

► Index data from over 55 global locations

► Helps meet requirements of FFIEC, GLBA, SOX, and others

► Log monitoring for regulatory compliance requirements including audit trails, data retention, and change management

► Removes need for purpose-built monitoring solutions for each regulation

FRAUD

PostFinance: Improving Fraud Detection and Customer Experience
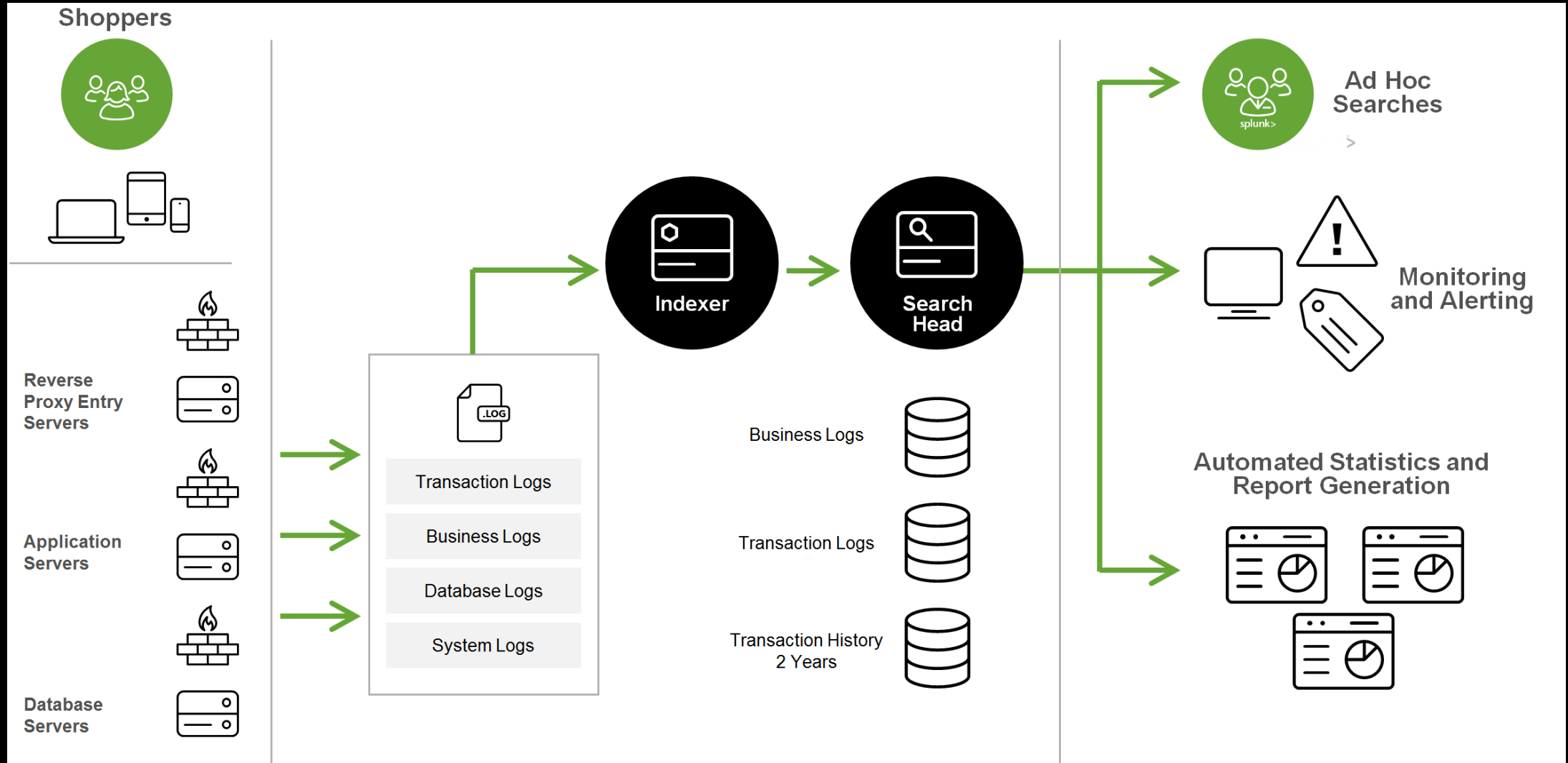
> "Our use of the Splunk platform has grown dramatically and it is now an integral part of our IT operations, providing insights in areas from e-commerce to security and fraud. Ultimately, with Splunk Enterprise, we have improved the protection we offer customers."
>
> — *Head of IT Infrastructure, PostFinance*

▸ Streamlined fraud detection across online banking and payment platforms

▸ Operational visibility enables rapid identification and response to online threats

▸ Improved ability to respond to new merchant needs

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PostFinance Splunk Architecture

Shoppers

Reverse Proxy Entry Servers

Application Servers

Database Servers

Transaction Logs

Business Logs

Database Logs

System Logs

Indexer

Search Head

Business Logs

Transaction Logs

Transaction History 2 Years

Ad Hoc Searches

Monitoring and Alerting

Automated Statistics and Report Generation

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ELECTRONIC TRADING

Global Investment Bank: Real-Time Electronic Trading Visibility

Financial Services

▸ Alerting on application errors for faster troubleshooting

▸ Transaction profiling across electronic trading processes

▸ Solve issues such as incorrect market data, trading latency, or improper display of data in trading applications

▸ Monitoring of trader adoption of new applications – management wants to see movement away from spreadsheets

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LOAN & TREASURY SERVICES

Scotiabank: Building Critical Monitoring Solutions

> "We have yet to find a situation where we could not address a monitoring gap with Splunk."
>
> – *Director, Performance Management*

▶ Reduce MTTR and improve application availability

▶ Developed custom monitoring for specific technologies

▶ Built dashboards of critical business platforms for VPs

▶ Gained real-time view of business volumes (e.g. wire payments; account transfers)

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IT OPERATIONS

Intercontinental Exchange: Complete View Across Network of Exchanges

> "Data can now be correlated from both NYSE and ICE to give a complete picture of the enterprise."
>
> – *Director, IT Monitoring*

▶ Centralized logging, alerting and search for IT operations

▶ Build dashboards for insight across 11 exchanges managed by ICE

▶ Application troubleshooting for developers

▶ Retired two SIEMs; consolidated everything into Splunk

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CME Group: Enabling Timely Trade Settlement Processing

"With Splunk, we were able to switch from using multiple monitoring tools to a single platform solution for both IT and business executives."

– Senior Director, Application Monitoring

► Monitoring performance of all applications, including those supporting the settlement process

► Threshold-based alerting on exchange activity (may show application problems or trigger proactive support)

► Trade matching engine dashboards and KPIs so developers can see potential performance impact of changes

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Summary

At Over 1,200 Financial Services Customers Globally
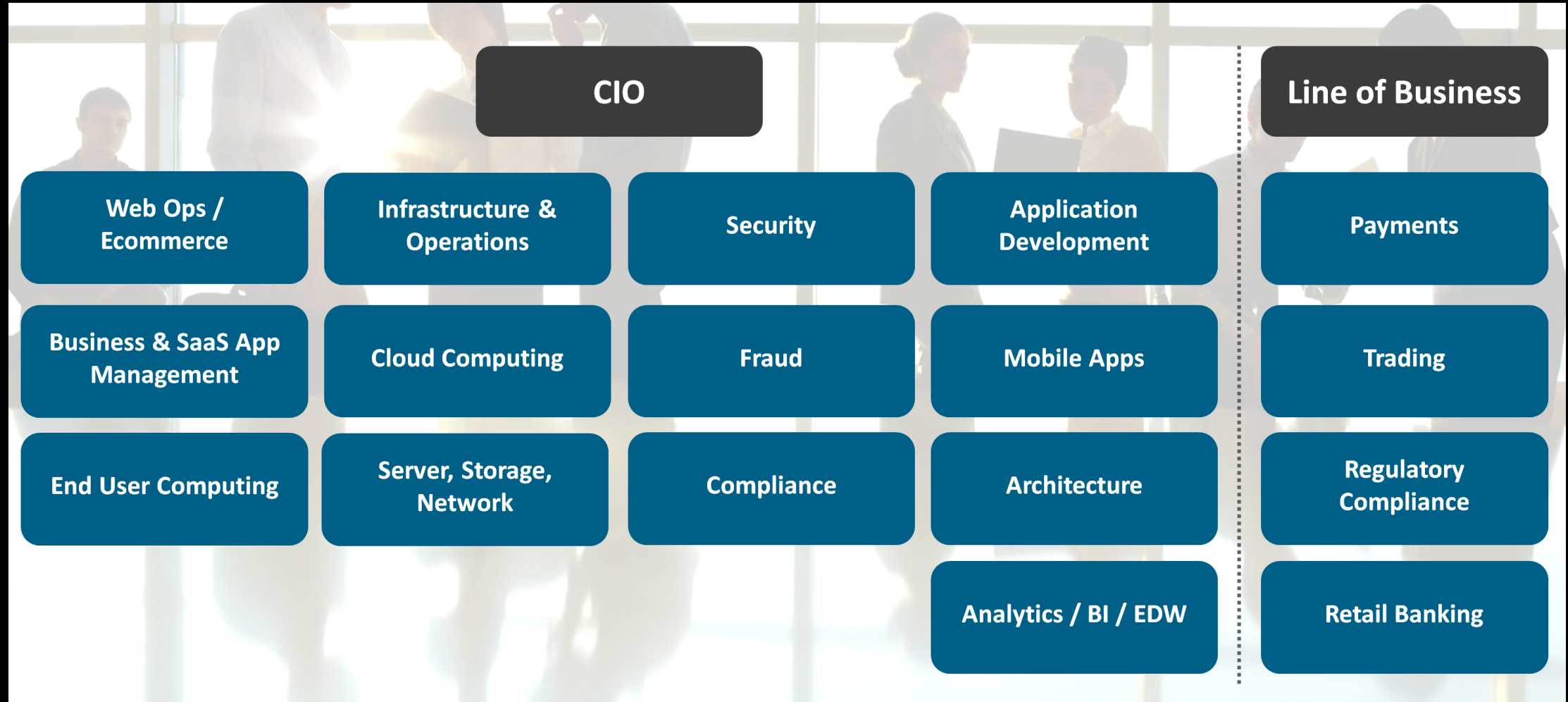
Evolution of Splunk at a Major Financial Institution
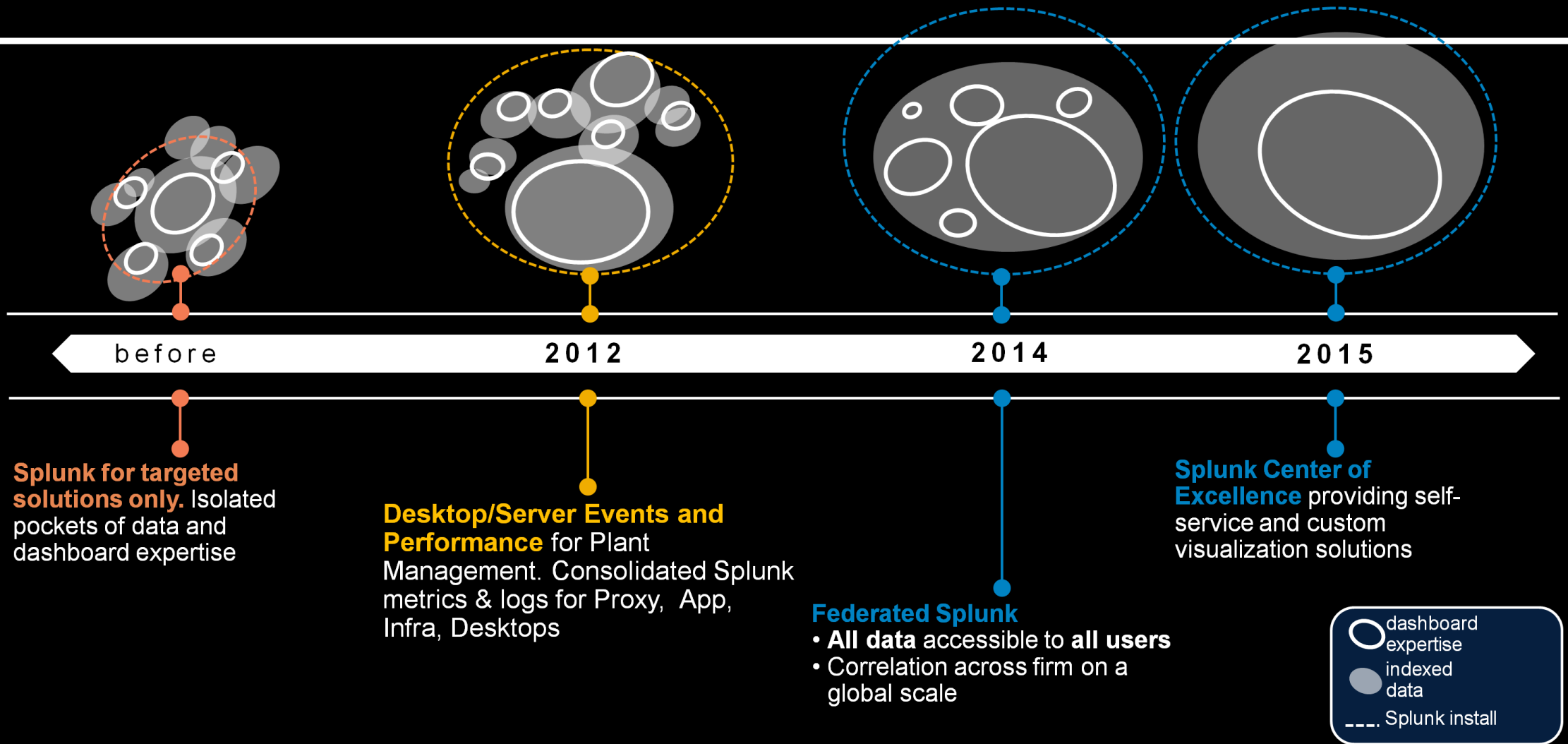
before 2012 2014 2015

Splunk for targeted solutions only. Isolated pockets of data and dashboard expertise

Desktop/Server Events and Performance for Plant Management. Consolidated Splunk metrics & logs for Proxy, App, Infra, Desktops

Federated Splunk
- **All data** accessible to **all users**
- Correlation across firm on a global scale

Splunk Center of Excellence providing self-service and custom visualization solutions

dashboard expertise
indexed data
Splunk install

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Continue Your Journey

▶ Learn more about Splunk for Financial Services:

http://www.splunk.com/en_us/solutions/industries/financial-services.html

▶ Download a FREE trial: *splunk.com/download*

▶ Get a FREE onsite demo: *Contact your Splunk Sales Engineer or Rep*

▶ Get a FREE Machine Data 101 Hands-on Workshop: *Contact your Splunk Sales Engineer or Rep*

▶ Get started fast: *splunk.com/education*

▶ Find your local user group at https://splk.it/slack

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Thank You

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