



**Addressing Information Access
Challenges in Financial Services**
White Paper

ENDECA
101 Main Street
Cambridge, MA 02142
Telephone 617.674.6000



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1. THE NATURE OF THE ISSUE

Large financial institutions are under increasing pressure to grow organically, introduce new products and services more quickly, improve customer service levels, and comply with both current and future regulations. And all this needs to happen while maintaining or reducing costs.

These goals require an improved ability to leverage information assets to support varying and un-predictable decision making. Functions ranging from sales and marketing to front and back office operations to compliance and risk management require users to make operational decisions based on unanticipated questions.

Business users faced with frequent, economically important decisions tend to have variable information needs. Changing environmental factors and large user communities drive areas in which predictive delivery mechanisms, such as pre-aggregation or static reporting, do not satisfy the range of questions in play. The result is that these users have little ability to identify the information assets available to support their decisions, limited access to those assets across systems and silos, and few means to explore the data in an unrestricted fashion that allows discovery and goal completion.

Endeca's mission is to better inform decision making at all levels of an organization, thus enabling the company as a whole to function more productively. The Endeca Information Access Platform® is an innovative technology that powers a new category of Information Access applications, not possible with previously existing search, database, and business intelligence tools.

The Root Causes

Variability of information needs stems from two major factors: (1) changing environments that require users to ask un-anticipated questions, and (2) large sets of users with varying objectives and thought processes. In the first case, many operations within organizations impose situational analyses that cannot be predicted in part or whole. Examples include Compliance, Risk Management, and Fraud Detection. In each of these environments, the nature of the objective and the information being uncovered will vary based on the particulars of the situation being investigated.

In the second case, large sets of users such as agents, brokers, operational managers, call center reps, or website visitors all want to investigate a body of information in their own unique way. Each user may have a different goal and a different approach to achieving the understanding they seek. In these situations, the users' objectives and unique discovery paths will vary greatly. Failure to support all of these unique goals and paths can lead to dissatisfied customers, decreased sales effectiveness, and increased operational costs.

Complicating the issue is the fact that the information assets supporting these decisions are usually fragmented and heterogeneous in nature. Relevant information is often housed in a variety of locations such as core systems, trading and risk management applications, operations, data warehouses, content management, email, and file systems, and these stretch across organizational silos such as product lines, functional areas, geographies, and subsidiaries. In addition, relevant information can be comprised of structured data such as accounts and transactions and unstructured items such as documents and email.

Limitations of Traditional Tools

Traditional tools that have been applied to these types of information needs fall into three major categories: search, database, and business intelligence.

On the surface, search technology seems like a flexible solution for information discovery. Users are not confined and can scan large sets of unstructured content through keyword queries. The problem with this technology, however, is that it does not take into account the rich structure associated with the information it indexes. The outcome is a lengthy list of results with no summarization or context attached. This offers little ability to refine and take next steps beyond starting a new keyword query and hoping the result set is better.

For example, if "compliance" were entered into a traditional search engine, results could include IT compliance, health care (HIPAA), OSHA, FDIC, SEC, Sarbanes-Oxley, etc. These values would span across the spectrum of possible dimensions such as type, industry, country, etc. But because the search engine does not index the structure of the data, results

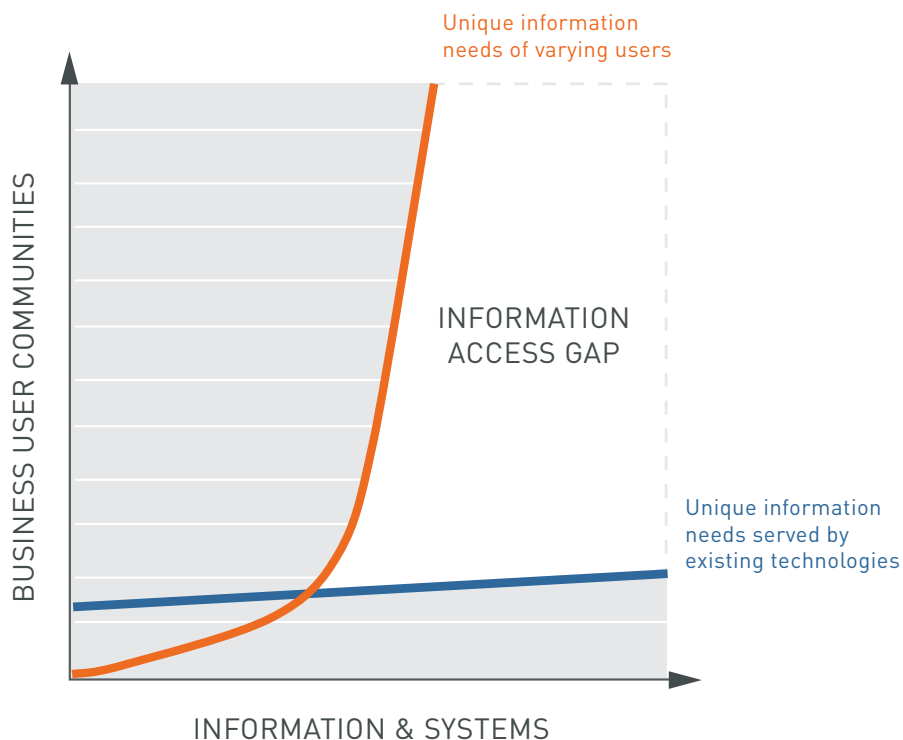
would simply be mixed together throughout the lengthy list. Although search technologies have become “smarter” with their ability to analyze and predict relevancy, this is never a perfect science as people and situations will always uniquely define what is relevant to them.

Relational databases and applications built on top of them are designed and optimized to support transactional environments, imposing rigid schemas and data definitions on inbound and outbound data. Because of this transactional nature, these applications are usually very strong at supporting a business process or workflow. Reports and queries built on top of databases, however, tend to be static in nature and do not offer the consumer an interactive way to explore beyond the pre-defined format. The result tends to be a series of IT cycles to produce additional reports.

Business intelligence tools rely on pre-calculated aggregate information. These tools provide a robust analytical, modeling, and planning capability, but fall short of meeting the needs of the everyday business users. As analytics are calculated in advance and data is populated into cubes and provided to users through reports or semi-static interfaces, end users have little ability to redefine the views to suit their individual needs. Record-level data is not available to them, and refinement of views typically requires a “power user” who can rewrite queries and rebuild cubes and calculations. There is also no ability to incorporate unstructured information such as contracts or invoices into the analytical process.

The Information Access Gap

Endeca defines the “Information Access Gap” as the difference between the number of unique user objectives and the ability of existing information access solutions to support these discovery paths. This gap highlights the fact that the majority of operating decisions within organizations are made based on limited, incomplete, or inaccurate information. And as these decisions accumulate, organizations can experience significant drains on overall productivity.



2. THE ENDECA APPROACH

Unlike traditional tools, Endeca does not assume that relevant questions can be fully anticipated for a given user. Instead of pre-defining relevance like search, or pre-calculating analytics like business intelligence, Endeca dynamically summarizes and re-summarizes information for users at the speed of thought. This allows a user to ask questions they want, through Guided Navigation or best-of-breed search, and conduct an iterative investigation process that ultimately leads to complete and effective information discovery and analysis.

A Multi-Step Discovery Process

Our patented indexing technology allows a user to explore a unified set of information, uniquely defining and refining context through a range of filter types. And at each step in the process, Endeca's MDEX™ Engine technology dynamically summarizes resulting information and recalculates analytics based on the current context. This paradigm is unique, and provides a business user with a set of relevant next steps, always in context, and without requiring training.

A Unified Information Cache

Endeca provides its patented summarization and discovery experience on top of a unified view of heterogeneous information, called the Meta-relational index. Multiple forms and sources of structured and unstructured content can be seamlessly ingested into this patented index, retaining the meta-data and structure associated with the underlying sources but not imposing a rigid structure. For example, Endeca can bring together information such as trade records, risk management data, watch and restricted securities lists, email messages, analyst reports and news. The result is a rich, unified, and self-describing data set that exposes not only the information but also the relationships within the information. It is this radically new type of data architecture, optimized for information retrieval and dynamic summarization, that makes the Endeca experience possible.

The Net Benefit

As users perform a series of refinements on top of a unified information view, they ultimately learn more about the information they are examining and achieve a holistic understanding of the situation. The benefits of leveraging this paradigm are three-fold:

- **Completeness of Discovery** – As users explore and refine iteratively, they discover not only desired information but also “what they don't know they know.”
- **Accuracy of Decisions** – Guided Navigation presents only valid next steps, re-summarizing dynamically based the user's unique actions at each step.
- **Operational Efficiency** – A unified view across structured and unstructured sources increases efficiency and reduces manual data-gathering and consolidation.

3. A PARADIGM SHIFT FOR FINANCIAL SERVICES

So what does this mean for Financial Services?

The Financial Services industry is uniquely challenged with varying information needs in decision-making situations at all levels of an organization. Endeca can be deployed in many of these areas to improve information access for key resources and functions:

Compliance

Compliance groups have deployed robust surveillance systems to monitor trading rooms and expose suspect activity, but this is only half the challenge. Once potential issues are identified, the investigatory process is highly manual and time-consuming. Information can be spread across organizational silos and can reside in multiple trade capture, order management, portfolio management, and compliance systems. Furthermore, unstructured enterprise content such as email, news, and instant messages that aid the investigation process is often unidentified or inaccessible. And even if information is available, users lack the tools to adequately explore the data to achieve an accurate, timely, and complete analysis.

Endeca can help organizations greatly enhance their response capabilities by offering a powerful, ad-hoc investigatory capability for compliance. This high-value tool sits downstream of surveillance systems and helps increase the value proposition they offer. Output of these systems is indexed, along with trade activity, reference data associated with trades, and unstructured content such as news, email, and instant messaging, to provide a total picture of the trading world.

Dynamic analytics provide point-in-time and time-series views of trading activity and associated unstructured content, allowing users to refine the underlying set of transactions in any way they see fit to ultimately better understand a situation. This means users can quickly discover the relationships between transactional data and other information so that they are able to increase their insight into suspicious behavior, automating what has been a largely manual task, and enabling compliance personnel to quickly identify which potential issues are “false positive” and which ones require more investigation.

Customer Relationship Management

To fully understand their clients, firms often find it necessary to leverage customer information across multiple sources. The challenge is further complicated because these sources exist inside different lines of business. Existing investments such as sales automation, revenue management, and customer service systems provide point solutions, but not an integrated view of the customer, limiting the overall value of existing information. Traditional customer data integration (CDI) initiatives aim to solve this problem, but are limited in the user experience they can provide and are often complex, costly, and time-consuming.

Endeca for Customer Relationship Management enables organizations to unify disparate sources and create a vehicle to empower sales, marketing, and client service to explore a 360-degree view of customer-centric information. Endeca's adaptive architecture leverages existing CRM investments to provide flexible and adaptive summarizations and drill-in capability to a full set of record-level data. This integrated information access provides the ability for marketing, call center reps, relationship managers, insurance agents, or financial advisors to better target products and services and support high-value clients through zero-training interfaces. The result is an improved understanding of customers, lower cost of sales and service, and higher customer satisfaction, retention, and sales.

Business Performance Analytics

Providing meaningful reports and analytics to business users is critical for well-informed decision-making. But what good is a reporting and analytics solution if only power users and IT have the ability to take advantage of its full functionality? As companies are increasingly emphasizing information transparency and decision making for a broadening group of business users, it becomes critical to have analytics and interactive reporting that are easy to use, powerful and flexible.

Endeca allows users to drill from summary analytics down to detailed information quickly and easily, discovering answers to business questions that they didn't even think of asking prior to the process. Endeca-powered analytics applications

have led to significant improvements in decision making for ordinary business users, directly addressing the pain felt by most companies using traditional business intelligence tools that require complex queries or are limited to pre-defined aggregate data.

A unique and differentiated user experience, based on interactive investigation, is the key to driving user adoption and well-informed decision making, which ultimately creates dramatic improvements in business performance. Whether it is sales activity analytics, marketing campaign spend, or investment portfolio performance, Endeca can help create action based on understanding at all levels of an organization.

Risk Management

Financial services firms have deployed a variety of risk management applications to measure market, credit and operational risks at the corporate, line of business, and trading desk levels. The proliferation of new financial instruments and rising trading volume has created an abundance of risk management applications, data, reports, and processes. Risk managers and executives require a cohesive business view of their risk exposure that is timely, accurate, and highlights concentrations.

Their challenge is to support investigation and analysis based on a unified view of risk information that is spread among applications, across lines of business, and contained in a variety of custom reports. Furthermore, additional structured and unstructured information is desired, such as general market information, credit and equity reports, foreign exchange and commodity reports, and economic data. Organizations tend to have the information on hand; what they lack is a tool that supports an iterative investigation process and guides users as they explore a rich data set to gain both a cohesive business view and insight into specific areas of interest.

Endeca can help firms provide their users with an information-centric solution that exposes and leverages the dimensions of data and documents as well as the relationships among these dimensions. Users iteratively investigate in unique ways, applying filters through Guided Navigation, search, or interactive analytics, to instantly answer ad-hoc questions and improve their transparency into and understanding of risk concentrations. For example, a user could navigate by asset class, then market risk, then FX rates, then a country report, or alternatively, by FX rates, then a country report, then market risk, then by asset class. The order is completely up to the user, and at each step in the process, Endeca instantly and dynamically re-summarizes information and re-calculates analytics based on the new context. This paradigm encourages users to explore risk without limiting them to pre-defined reports or pre-aggregated values.

Knowledge Management

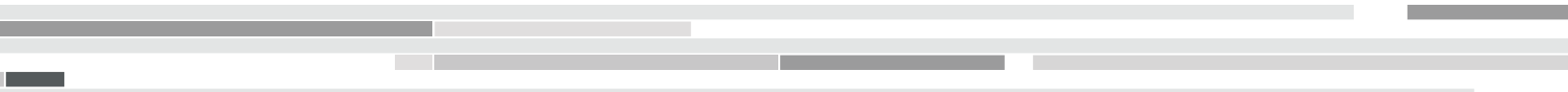
Employees who rely on key information assets, such as investment research, often lack knowledge of what is available and do not have a single point of access to get what they need. Furthermore, they have little transparency into the actual contents of available materials.

To improve productivity, accelerate innovation, and increase efficiency, Endeca for Knowledge Management provides an effective exploration vehicle to find and understand information assets throughout the enterprise. Endeca's unmatched Guided Navigation experience allows individuals to meet each of their information goals more effectively, driving aggregate efficiencies and productivity gains at the corporate level.

For example, an investment banking associate could better understand and leverage best practices from the vast array of existing pitch-books, research, and financial models that exist from past deals. Or an insurance underwriter could better explore past contracts that involved underwriting complex corporate assets with similar characteristics. Or a portfolio manager could more effectively explore and understand available research, both externally sourced or internally created, and across both tabular transactional data and unstructured assets such as analyst reports and news releases.

Websites

Financial customers are increasingly turning to online channels to research product information and fulfill self-service goals. Endeca powers unmatched customer experiences on the web, where the information needs of the vast number of users are almost completely unpredictable in nature. Endeca's superior search capabilities, integrated with Guided Navigation, encourages exploration and discovery of information in a multi-step manner. This creates significant advantages



for businesses leveraging the online channel to cross-sell and up-sell products and services. Endeca's customers have seen more than 100% increases in site registrations, site usage, and data downloads.

Whether exposing unstructured informational content, or structured product data such as funds or derivatives, Endeca promotes intuitive exploration and improved understanding by online clients and financial advisors.

Better Decisions, Better Results

Endeca solutions focus on areas where there is typically a high level of unpredictable information needs. These can vary because of situational reasons (such as regulatory compliance) or large numbers of users. In either case, a predictive report or pre-calculated set of analytics (such as data cubes) cannot fully satisfy the audiences in question. Furthermore, fragmented and heterogeneous information traditionally requires lengthy and costly integration efforts to achieve benefits associated with singular analyses.

Endeca provides large user communities with the ability to serve their own information needs, in a zero training environment, to make better operational decisions. Prior to this capability, these information needs went unmet – due to the cost associated with serving each one of them. So as more information provides more users with improved decision making at all levels of an organization, the results add up to tangible, corporate-level top and bottom line benefits.