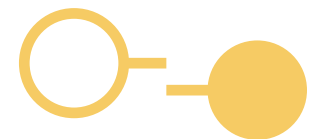




Prototyping Tools Embodying UX Design  
BNY Mellon Global Markets  
September - December 2013

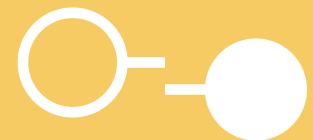
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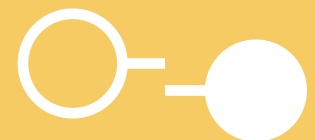
# 1. Introduction

This book documents the process we took in order to complete our semester long project for BNY Mellon. The goal of this project was to focus on one department of BNY Mellon and help their team ultimately increase efficiency for client facing interactions. Over the course of the semester, we were able to conduct necessary primary and secondary research and interviews and finally end with a system architecture that holistically contributed toward our user interface. Our line of business we were assigned was the Global Markets Department.



## 2. Initial Research

For the research portion of our project, we needed to learn more about our department, Global Markets. We decided to interview professors at Carnegie Mellon in order to gain more insight about this line of business.

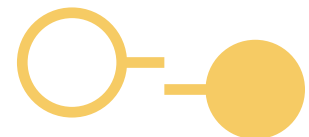


## Interview

We had an interview with Professor Bryan Routledge in Tepper to discuss Global Markets and financial markets as a whole. From this conversation, we were able to lay a foundation to our knowledge in this field. There were many details he revealed to us that helped us find more about Global Markets. He mentioned that “corporations find that their lives are easier to manage if they can predict finance flow or control exchange rates”. In addition, we were able to find out that “asset prices and stock markets are hard to forecast but that’s what everyone wants...providing data in hopes that they can make better predictions.” Professor Routledge gave us a high-level view of the line of business which provided us a stepping stone for further online research.

## Online Research

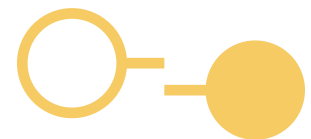
We found that the role of the Global Markets department is to provide clients with services that offer growth and risk management. Because this line of business is spans on a global scale, we sought out to create a product that would increase the efficiency of this department.



## Research Tool

The purpose of the research tool is to gain more insight on the different roles within the Global Markets department. More specifically, the results will help us define the relationships between one person and another as well as the types of collaboration that occur around meetings.

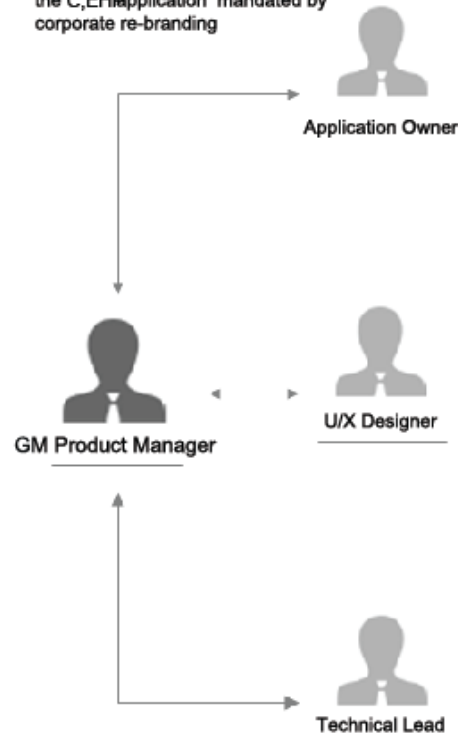
With the research tool we hit a major pivot-point which led us to move our product in a different direction than what we had expected. Before, we wanted to design an information display for the client during meetings and also create a visualization tool for sales to client meetings. After the results, we decided to contextualize information relevant to the client-sales relationship and to create a dashboard for the sales that would be used prior to any client-facing meetings.



# MEETING # AP-1

Goal of this Meeting:

Review the colorization changes to the C, EH Application mandated by corporate re-branding

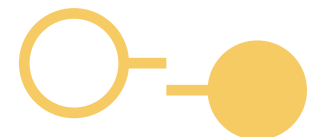


## BEFORE MEETING (preparation)

## DURING MEETING (presentation)

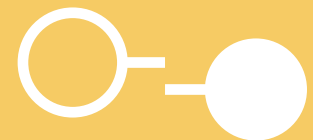
## AFTER MEETING (follow-up)

<p>Tool(s) used: <b>None</b></p> <p>Data shared: Established business need to maintain existing application colors</p> <p>Next step: Attend meeting</p>	<p>Tool(s) used: <b>Webex</b></p> <p>Data shared: Business expectations and demands for color usage in application plus feedback on proposed colorization</p> <p>Next step: Wait for the next iteration of colorization and review with the team</p>	<p>Tool(s) used: Email to review proposed colorization changes</p> <p>Data shared: Feedback on revised colorization with an indication of which changes are acceptable and which are not</p> <p>Reflection: If resolution on colorization cannot be reached, will escalate to upper management</p>
<p>Tool(s) used: <b>User Interface System Guidelines</b></p> <p>Data shared: U/X – U/I corporate guidelines</p> <p>Next step: Attend meeting</p>	<p>Tool(s) used: <b>Webex, U/X-U/I Corporate Style Guide</b></p> <p>Data shared: Corporate guidelines on use of new brand colors and screen layout</p> <p>Next step: Determine how the style guide can be interpreted to accommodate the specific requirements of the application owner</p>	<p>Tool(s) used: <b>U/X-U/I Corporate Style Guide, Axure</b></p> <p>Data shared: Review colorization requests with U/X manager and communicate the business request for approval</p> <p>Reflection: May require modifications to the Style Guide which would be the decision of the U/X manager</p>
<p>Tool(s) used: <b>Screen mockups</b></p> <p>Data shared: Application screen mockups with various color combinations</p> <p>Next step: Summarize options and prepare for meeting</p>	<p>Tool(s) used: <b>Webex, graphics viewer for screen mockups</b></p> <p>Data shared: Application screen mockups with various color combinations plus detailed review of variations from the current colorization</p> <p>Next step: Work with U/X designer to develop several new colorization alternatives for review in subsequent meeting</p>	<p>Tool(s) used: <b>HTML Editor, U/X team screen mockups</b></p> <p>Data shared: Revised screen mockups for review and feedback from all</p> <p>Reflection: If resolution does not occur within 5 days, colorization changes will have to wait for the subsequent application release cycle</p>



### 3. Key Takeaways

After we conducted research, we were able to receive a clearer understanding of what the Global Markets Department does as a line of business. Next, we created a persona and concept map draft that visually represented what we discovered.





## Persona Draft

An early step in designing a product for Global Markets involves creating personas for our users. Personas allowed us to plan for a user-centered design process by always keeping the end-user in mind. With personas, we were able to reduce the chances of making false assumptions about what users will do with what we design.

After extensive research, we were able to create two personas for our users based on a compilation of task-based patterns that align people into an archetype, or generic representation of a user group. The two main users we wanted to target were analysts and sales representatives. For each persona, we defined their responsibilities and created a relevant scenario. The most important aspect of creating the persona was the scenario. Understanding and creating a scenario allowed us to understand their current workflow and look at who they were often interacting with.

## GLOBAL MARKETS



**CHARLES BERNSTEIN**

**SALES**

**28 YEARS OLD**

**DIGITAL DEVICES**



## END GOAL

Impress client  
Acquire business opportunities  
Build relationships  
Present detailed derivative solutions

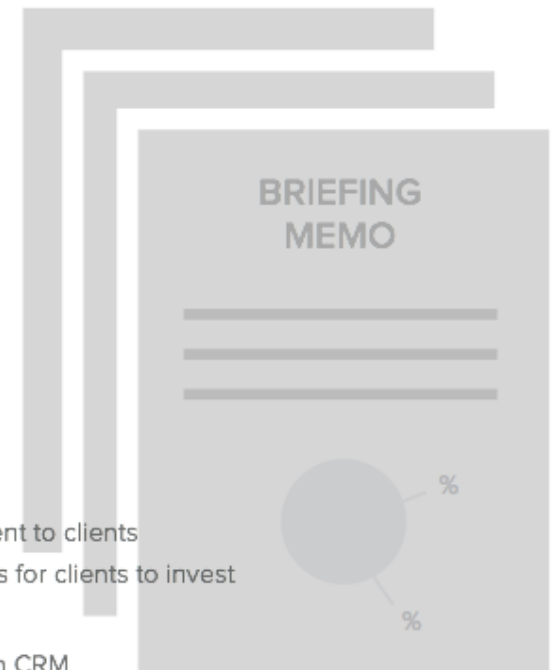
## TASKS

**Identifies** cross-business opportunities  
**Collaborates** with analysts and executives  
**Utilizes** TouchPoint to gather information to present to clients  
**Presents** information, opportunities and strategies for clients to invest  
**Attends** meetings to develop new clients  
**Reviews** and monitors client relationships through CRM

## SCENARIO

Charles Bernstein has been in sales at BNY Mellon for about 2 years specializing in global markets. He often finds himself aggregating relevant data to present for clients and potential clients.

Today, Charles has a phone call meeting planned with Old Mutual. In order to prepare, he logs onto Touchpoint and the CRM tool in order to gather relevant data to present to his clients. After logging onto the home dashboard, he takes note of the risks and opportunities Touchpoint presents. After browsing Touchpoint, he decides to gain more insight by approaching Martin Manesh. Charles receives significant information in a briefing memo regarding a derivative that could possibly help Old Mutual hedge against potential declines in Ghana's currency. In addition to the the Martin's updates, he checks the CRM tool and monitors BNY Mellon's relationship with Old Mutual. Finally, he makes sure he gathers other key metrics to the deck for his call in 5 minutes with Old Mutual.



## GLOBAL MARKETS



**MARTIN MANESH**  
**ANALYST**  
**27 YEARS OLD**

### DIGITAL DEVICES



## END GOAL

Having relevant data ready for client

Communicate digestable data points to sales

Prioritize analysis for sales team

## TASKS

**Interact** with iFlow to measure

**Research** and find new opportunities for sales

**Assess** trade risks between clients and buyers/sellers

**Interpret** financial market data to present to clients through iflow

**Prepares** briefing memos that are presented to clients

## SCENARIO

Analyst Martin Manesh has been a part of BNY mellon for about five years now and has had the opportunity to work as an analyst in the global market department.

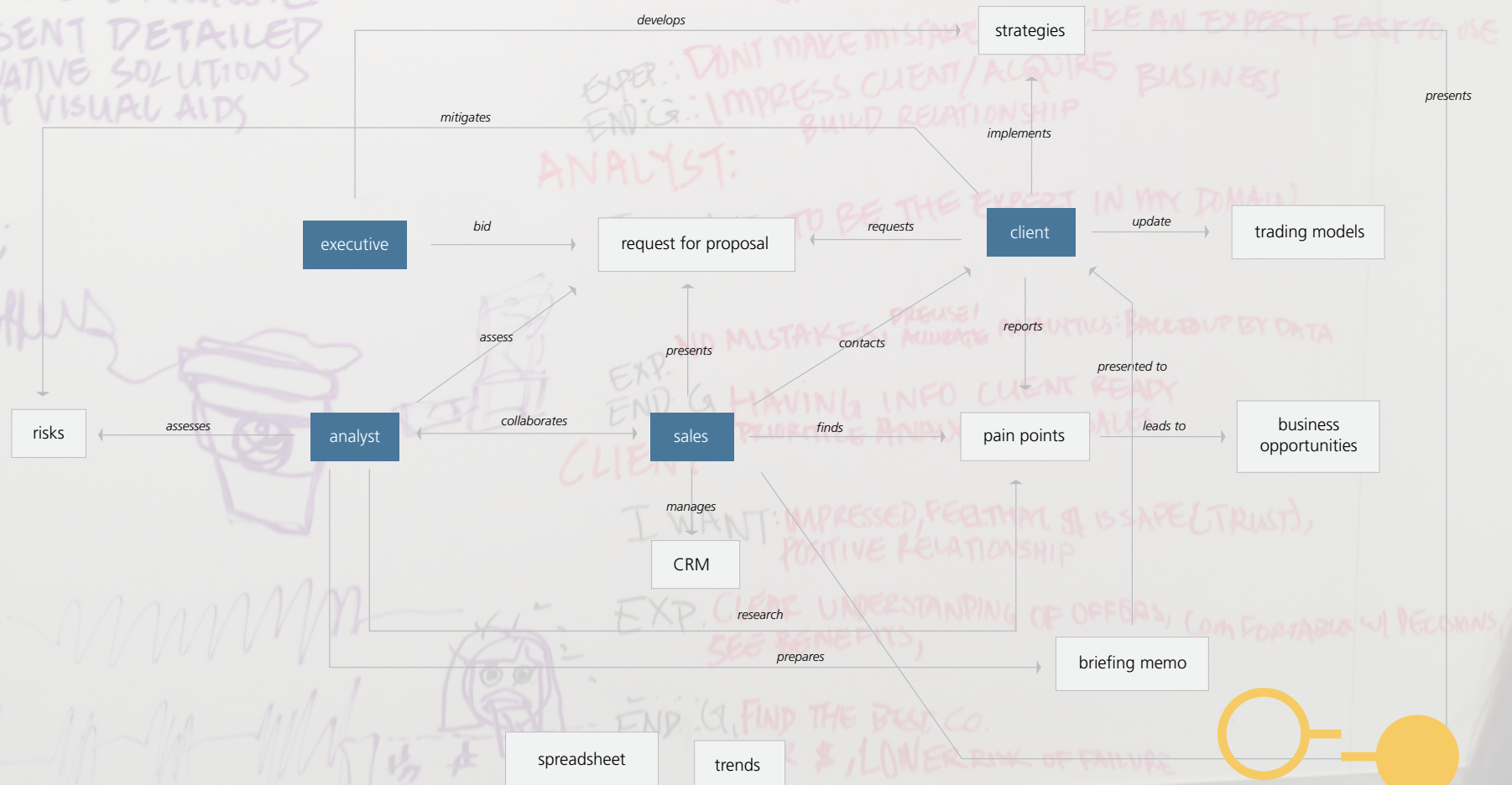
Today, Martin is focusing on Old Mutual and their potential acquisition deal with a company in Ghana. The client is considering options to mitigate risk in this deal because of the recent instability in the country. Martin opens up iFlow to quickly checks the financial flow in Ghana and makes a note for the client. With this information, he contacts the sales department to discuss the client's pain points from their meeting the other day. He spends the rest of his day researching potential buyers to invest in a derivative that will help Old Mutual hedge against possible declines in the Ghana Cedi. He uses these data points to craft a briefing memo that the sales team will use in the next meeting. At the end of the day, Martin uploads a new story on iFlow based on his research that might be useful to some of BNY Mellon's other clients.





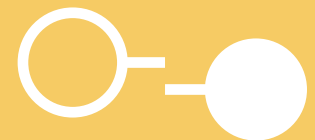
## Concept Map Draft

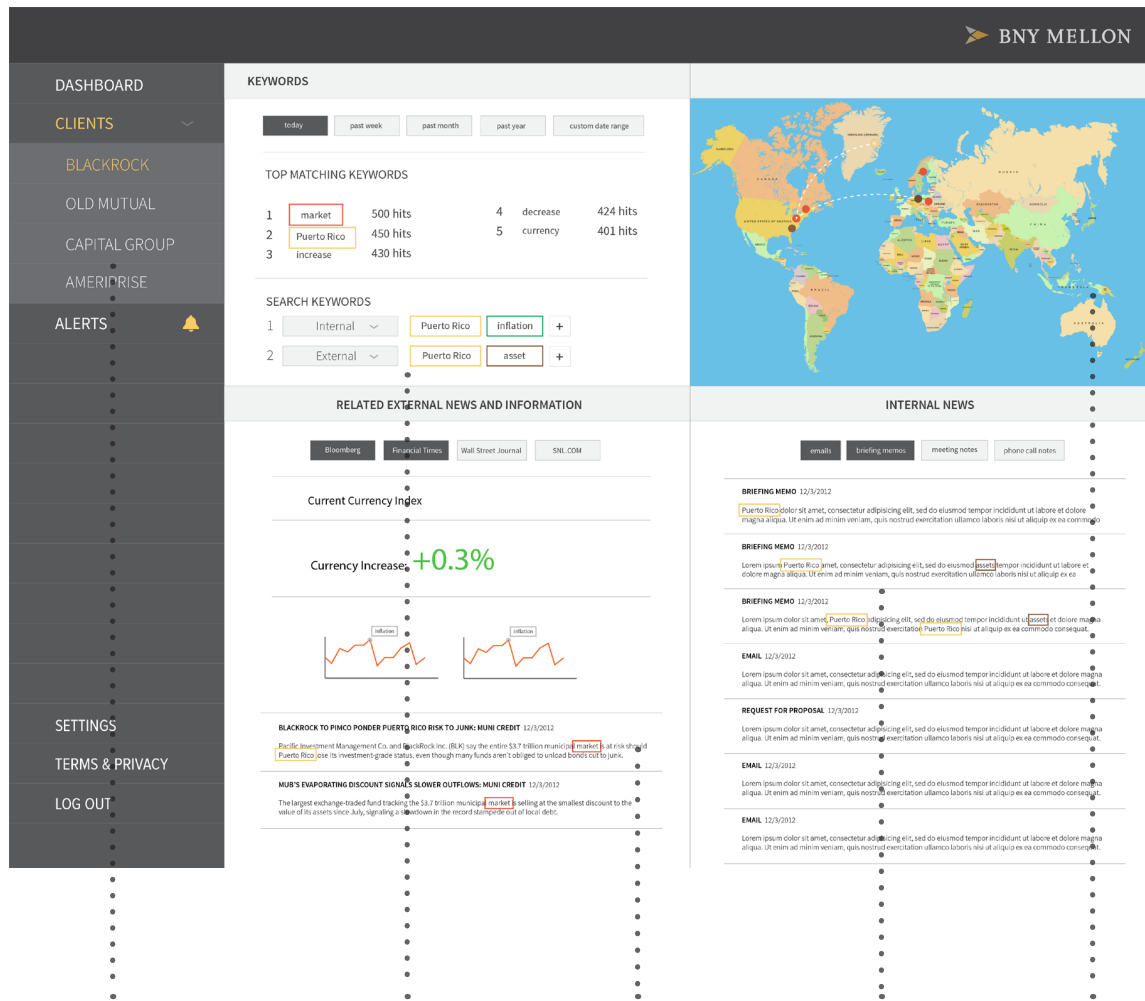
The purpose of creating a concept map was to visually display the workflow that was reflected in the scenario we developed. After the first concept map, we started to see the relationships that existed within the Global Markets Department.



## 4. Preliminary Design Solution

Once we completed the personas and concept maps based on the interviews and research we completed, we came up with a design solution that reflected our discoveries up to this point. At this point in the project, we needed feedback on our personas and concept map. For this phase, we interviewed BNY Mellon to further expand and iterate our process.





Client Name

Keyword Search

External News

Internal News

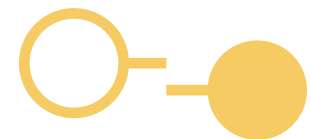
Data Source

Here is our preliminary user interface. It allows the Global Market Department to discover relevant news, contextualize data, and optimize opportunities for clients.

On the left hand side you can see the clients where users can select based on who they are trying to gather data for.

In the main dashboard, users can see the top keywords that come up after data has been inputted. By selecting keywords, the system will select the data that contains these words.

Finally, depending on the articles that appear at the bottom post keyword selection, a dot appears on the map depicting the source of the data source.



## Interview & Critique

We interviewed two employees of the Global Market department, one on the customer relationship management team and the other on the foreign exchange team. During this stage of the product it was important for us to receive feedback from the standpoint of someone who would use our product. In addition, it helped us polish our personas hearing about what they did on days with client meetings.

Starting off, we told both employees that the “goal of our application is to contextualize the data that is being analyzed. We want to see the connections between the internal and external side”. Both interviewees agreed that this goal would be applicable to the line of business. Below are some of the questions we asked them that helped us in our design process.

### *1. What external/internal sources are being used by analysts to interpret information?*

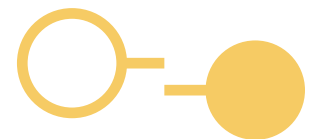
“wealth of external data is being used, we usually look for the currency market, economic figures, political news and crises, currency states, etc. It’s all really important to us when handling clients”.

“...when economic releases and pay roles change, the markets go crazy and they want to know about it”

### *2. What are the most important charts used when analyzing data?*

“...mainly currency movement on the foreign exchange side. On the sales side, they are typically looking at key currency moves, comparing currency high, lows, quarterly charts to work around any trends that work around that pair”

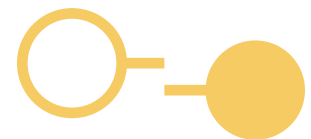
“On the internal data side, sales guys usually are looking briefing memos, meeting notes from calls or in person, iFlow...”



### *3. How would our application fit in with the CRM side?*

“For CRM purposes it needs to get more granular than this. For example, BlackRock is really general they want to see a specific line of business for a meeting.”

After the interviews we conducted, we were able to take a step back and look at our product as a whole. While the current state of the product was applicable, it, as one of the interviewees said, “needs to get more granular than this.” This was our key takeaway from the interviews. In order for the Global Markets team to support their client, they need to always have specific information catered to the client. In addition, we needed to create a page for the user to add their data in. With this feature, it would allow the entirety of the product to be real-time oriented.



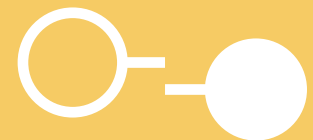
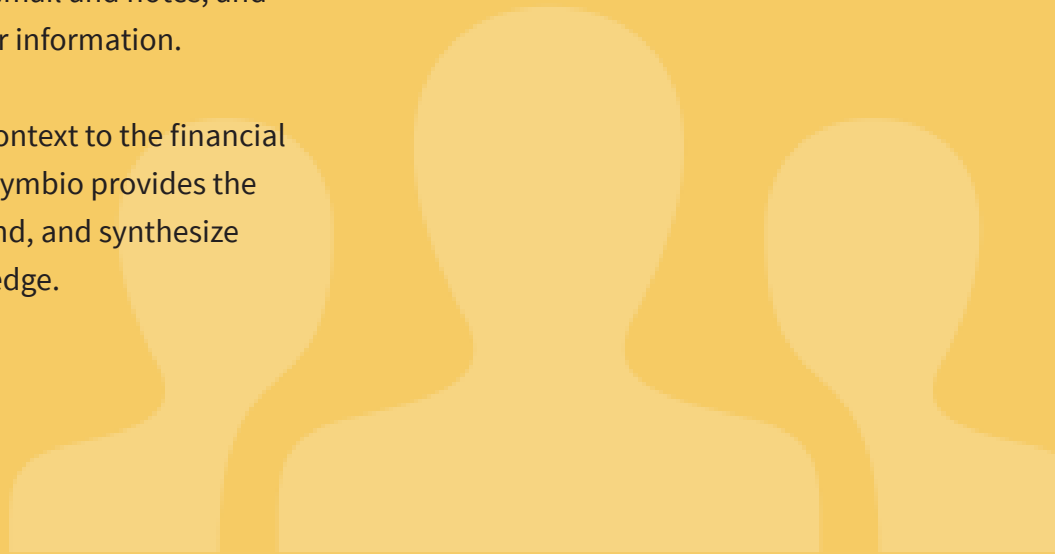


## 5. Final Design

Introducing Symbio, a new and innovative way to empower the global markets department's business decisions.

While preparing responses for proposals from their clients, sales representatives must often access their email and notes, and visit multiple financial websites to gather information.

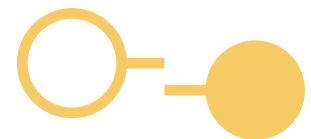
This information is crucial in providing context to the financial data that must be presented to clients. Symbio provides the necessary platform to explore, understand, and synthesize disparate information into useful knowledge.



## Persona

For the final persona, we decided to focus on one main user : the sales representative. The reason for this was that it made more sense, especially after our interviews, that the people who were on the client-facing side had the most ground in maintaining and developing relationships.

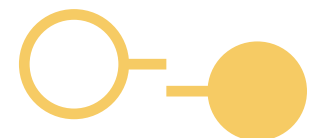
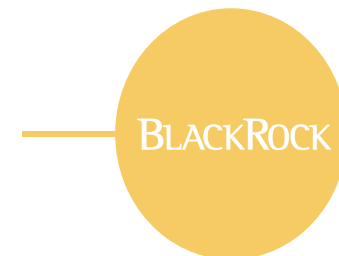
Once we chose the sales representative, we created a scenario that used our product prior to any client meeting they may have.





Charles Bernstein

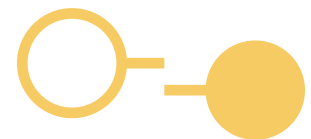
Meet Charles a sales executive of BNY Mellon dealing with platinum level clients His main client is BlackRock who he spends the majority of his time collaborating with In order to curb any competition Charles has to make sure he is always on top of the latest news By using Symbio he can discover and contextualize data that will create future opportunities

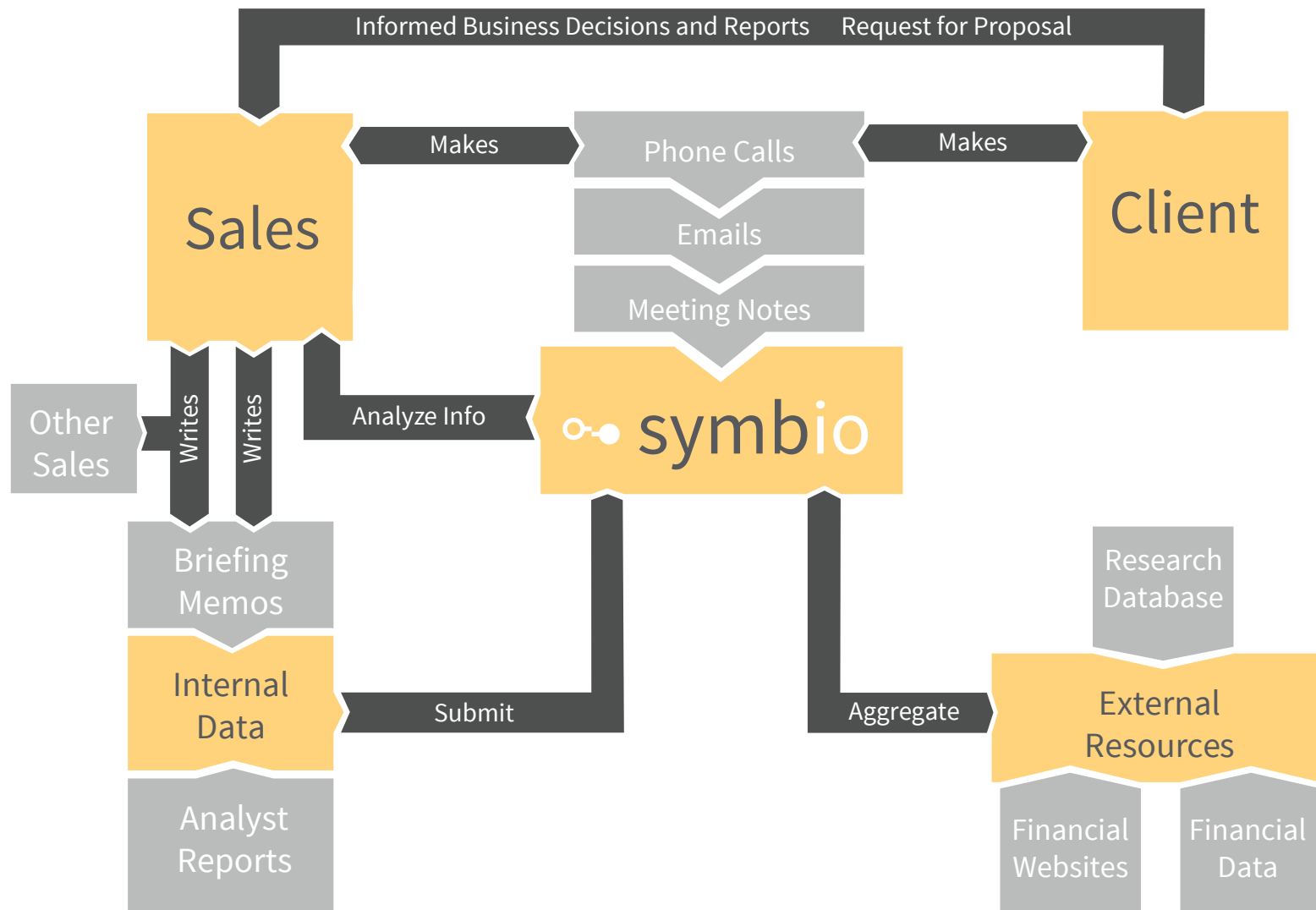


## Concept Map

For the final concept map, we envisioned our product in the workflow of the Global Markets Department. The map demonstrates the sales and client relationship primarily involving various forms of data being used.

Looking at the final concept map, it is clear where Symbio falls, in between the sales and client side. By placing symbio at this intersection, it helps foster and strengthen the client relationship while providing contextual and real-time data.

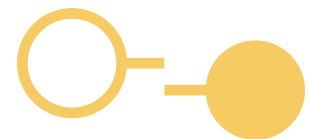


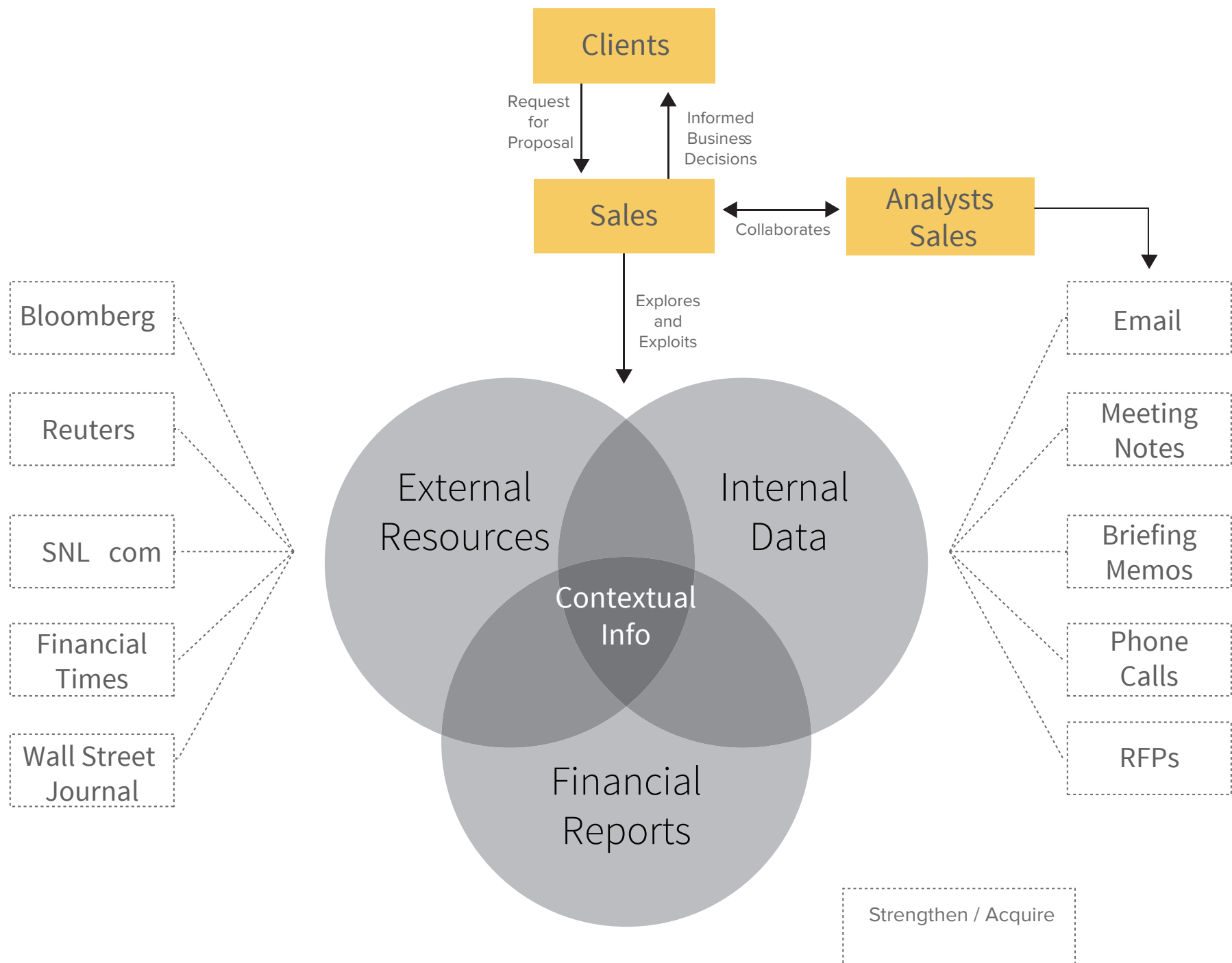


## Information Architecture

By laying out the information architecture of our product, we can see at a high-level what our goal of contextual data derives from. On the left, you can see examples of external resources such as Bloomberg and Reuters and on the right you can see examples of internal data like emails and briefing memos.

Both internal and external data get funneled into Symbio creating the most up to date information that will provide more insight to the client during a meeting.





## Concept of Symbio



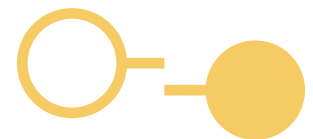
Discover



Contextualize



Optimize







# Discover related news|



Find news that matters



Charles decides to check the related word map on Puerto Rico to see what other related topics are trending in the last week



He discovers that Citigroup has been trending in relation to Puerto Rico

WSJ.

He then checks on current news reports that confirm his newly aggregated information is consistent with the current news articles from the Wall Street Journal

He researches the related articles in order to present a compelling case

Other Related Articles



# Contextualize data

Look at your data through a new lens

Notes a current memo that contains completed research on the financial situation in Puerto Rico

Checks map to see if there any other geographically related articles to Puerto Rico  
Finds applicable article on Bloomberg

Is better equipped to explain and interpret financial data that has been compiled by other analytics

Searches for existing personal notes and other analysts notes to for the upcoming presentation

He adds memo from last meeting



# Optimize opportunity

create opportunities for our client



Finally Charles feels he has all the relevant data he needs for the next meeting with BlackRock. Before he logs out, he sets alerts on some keywords for the day before the meeting with BlackRock.



On the day of the meeting he logs back onto Symbio to see if any related news has come up. He notices three alerts and reads the articles that have been flagged.



Charles heads into the meeting with BlackRock feeling prepared.



# User Interface at a high-level

## User

Shows user in order to base information display on passed searches and patterns

## Timeline

Ability to view keyword trends based on a specified time period

## Clients

Ability to add different clients as well as indicate line of business.

## External Resources

Shows related news based on keyword search. Also has ability to filter by type of source

## Search Keywords

Ability to search relevant documents based on needs

## Top Keywords

Shows important trends within line of business

## Word Map

Visually shows relationship between search keyword and other related trending words to facilitate more discovery

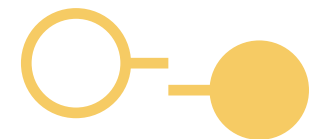
## Map

Provides context through geographic relevance

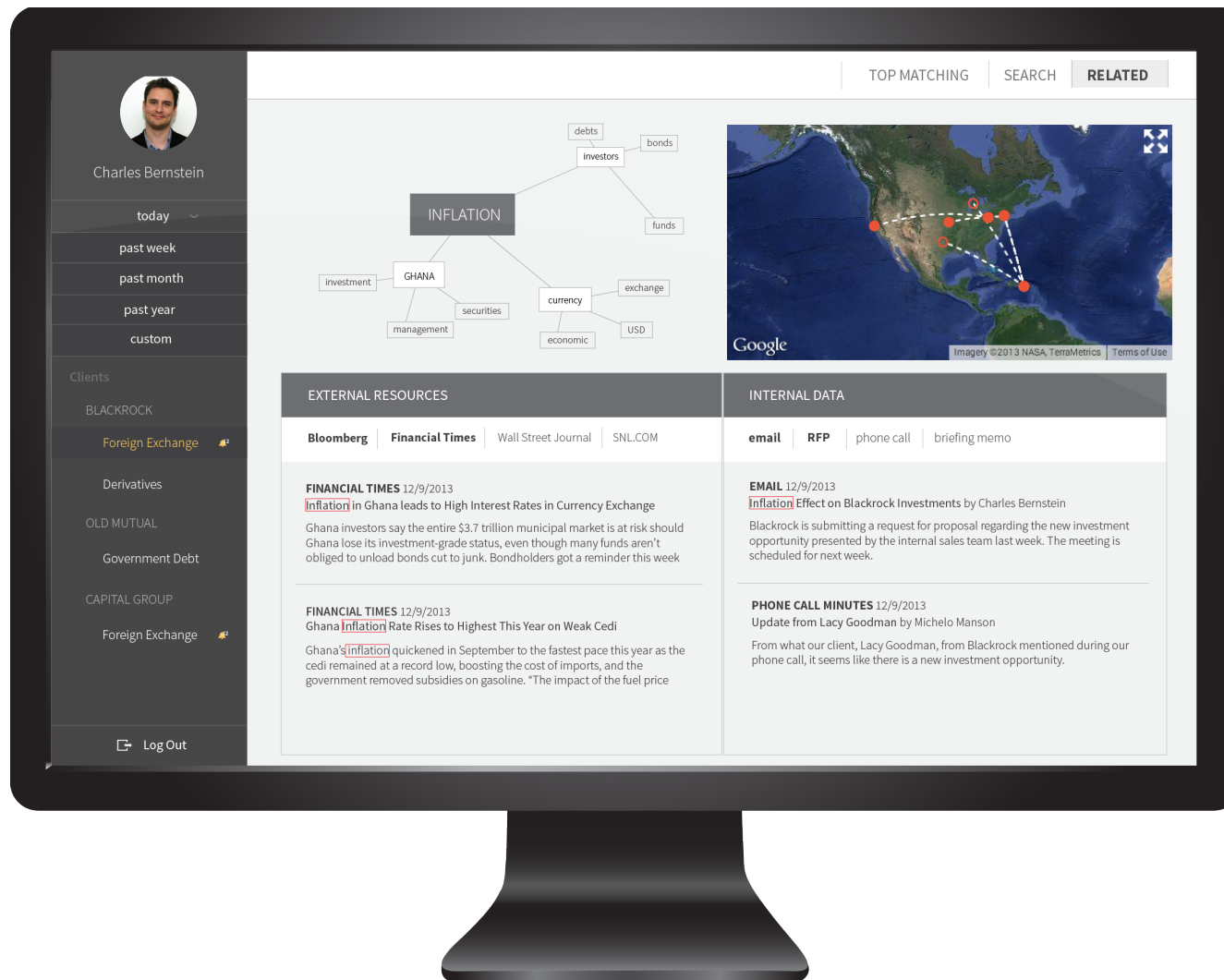
## Internal News

Shows emails RFP notes briefing memos etc that apply to keywords searched

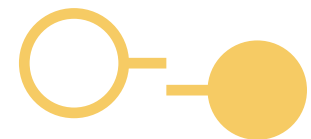
The screenshot displays a user interface for Charles Bernstein. On the left is a dark sidebar with a user profile and a list of clients: BLACKROCK, Foreign Exchange, Derivatives, OLD MUTUAL, Government Debt, CAPITAL GROUP, and Foreign Exchange. The main content area has a top navigation bar with 'TOP MATCHING', 'SEARCH', and 'RELATED'. Below this is a filter section with 'EXTERNAL' and 'INTERNAL' tabs, each containing 'Puerto Rico' and 'municipal markets' options, and a 'Clear' button. To the right of the filters is a Google Map showing a network of red dots connected by dashed lines. Below the map are two columns: 'EXTERNAL RESOURCES' and 'INTERNAL NEWS'. The 'EXTERNAL RESOURCES' column includes links to Bloomberg, Financial Times, Wall Street Journal, and SNL.COM, followed by three news items from the Financial Times dated 12/9/2012 and 12/9/2013. The 'INTERNAL NEWS' column includes links to email, RFP, phone call, and briefing memo, followed by two news items: an email update from Blackrock and a phone call minutes update from Lacy Goodman, both dated 12/9/2012.



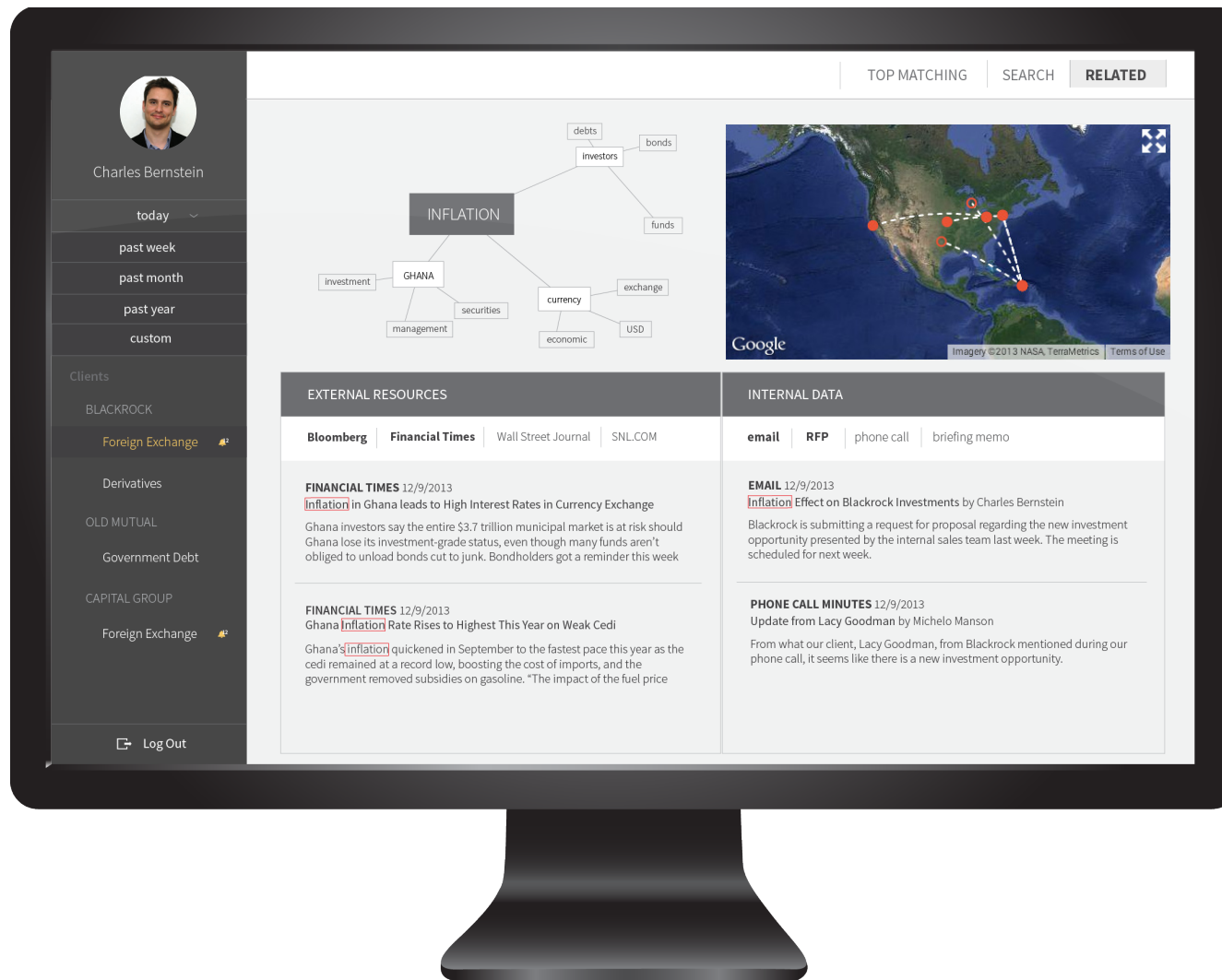
## User Interface Features



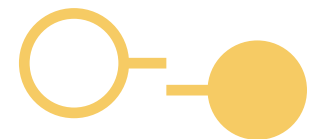
... Previously, there was no top navigation bar where users could toggle among top matching, search, or related. Now, these options are always accessible to the user making it easy to view the relevant information from three different aspects.



## User Interface Features



- • • One of our interviewees expressed the need to be more “granular”. Because of this, we decided to put the timeline features on the very left sidebar. By placing it in this location, it makes it universally accessible for every line of business.



# User Interface Features

ADD/EDIT CLIENTS

Blackrock

Old Mutual


Capital Group

Ameriprise

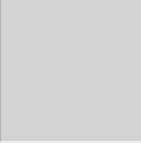
Add Client +

FOREIGN EXCHANGE

Monetary assets and liabilities of foreign subsidiaries having non-U.S. dollar functional currencies are translated at exchange rates at the date of the consolidated statements of financial condition. Non-monetary assets and liabilities of foreign subsidiaries having non-U.S. dollar functional currencies are translated at historical exchange rates. Revenues and expenses are translated at average exchange rates during the period. Gains or losses resulting from translating foreign currency financial statements into U.S. dollars are included in accumulated other comprehensive income, a separate component of stockholders' equity on the consolidated statements of financial condition. Gains or losses resulting from foreign



**Sarah Hagen**  
Fund Manager  
Key contact in discussing new business opportunities within the Financial Exchange department.



**Stanley Ayeni**  
Hedge Manager  
Handles analytics and report support for Multi-Asset portfolio managers. Collaboration is a must.

External Resources Filters

WSJ

Bloomberg

Reuters

Financial Times

Internal Data Filters

email

RFQ

phone call

meeting

ADD LINE OF BUSINESS

Description

DRAG AND DROP IMAGE

**Name of Person**  
Title  
Description

+ ADD CLIENT

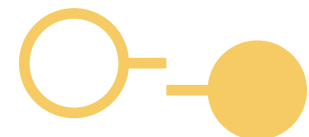
External Resources Filters

Internal Data Filters

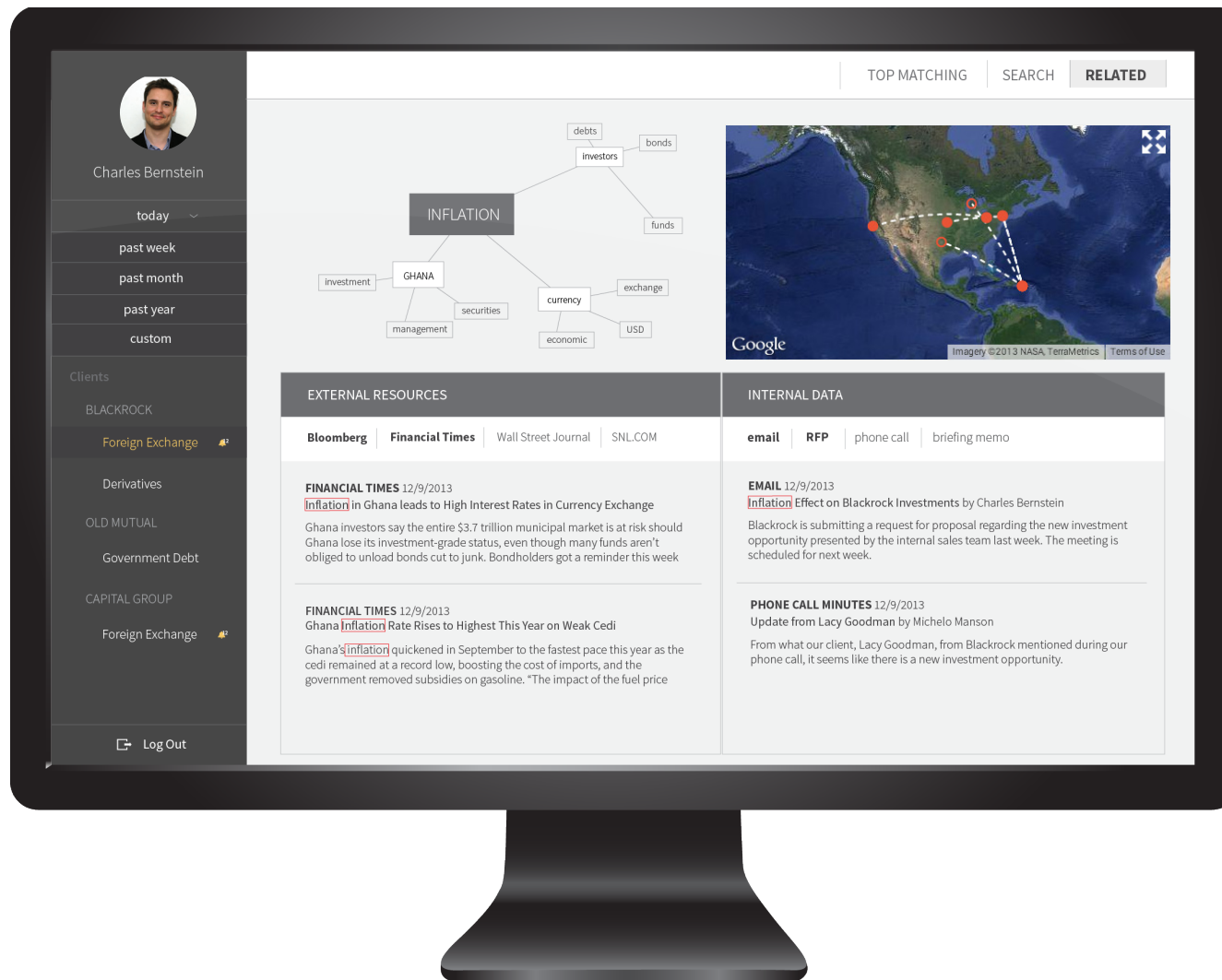
Cancel

Add

- • • • Sales representatives can add a client by entering their company name, add a line of business, and set specific filters that create a customized dashboard. If a sales representative has multiple clients, they can easily manage them by creating multiple profiles.

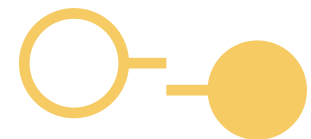


## User Interface Features



... .

If sales representatives want to visualize the location from there the data originated, they are able to do so with the geographic representation of each resource. Users are able to see the connections from the topic source to topic location with an open circle representing external resources and a closed circle representing internal resource.





## User Interface Features

The data being aggregated over extended periods of time comes from many sources ranging from financial websites to internal resources, such as briefing memos and analyst reports. Symbio provides timeline filters that allow sales representatives to adjust the scope of their exploration to the optimal range. With filters, they can discover pertinent information for their clients.

Next, sales representatives can access the top matching keywords accumulated from all documents to see the top word trends within a given time period, and by selecting specific keywords, they can see exactly which resources these keywords appear in. Finally, they can explore the related wordmap to discover new keywords that can provide additional context. These different options give sales representatives a flexible approach to gathering key knowledge for their objectives.

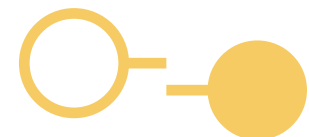
inflation	500 hits	debt	424 hits
currency	450 hits	market	401 hits
funds	430 hits	securities	500 hits
guam	500 hits	data	450 hits
investors	450 hits	puerto rico	430 hits
bonds	430 hits	exchange	430 hits

EXTERNAL RESOURCES

[Bloomberg](#) | [Financial Times](#) | [Wall Street Journal](#) | [SNL.COM](#)

**FINANCIAL TIMES** 12/9/2013  
BlackRock to Pimco Ponder Puerto Rico Risk to Junk: Muni Credit  
Pacific Investment Management Co. and BlackRock Inc. (BLK) say the entire \$3.7 trillion municipal market is at risk should Puerto Rico lose its investment-grade status, even though many funds aren't obliged to unload

**FINANCIAL TIMES** 12/9/2013  
MUB's Evaporating Discount Signals Slower Outflows: Muni Credit  
are too high. Asset Advance "The market still has some long-term concerns about Puerto Rico, but there's not a near-term event which might lead to some re-pricing of Puerto Rico debt," Tucker said. The municipal market is



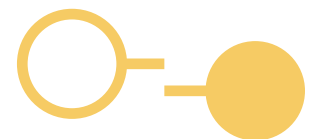
## Prototype

We decided to use HTML5 technology to allow for cross platform usage. Since banking still uses desktop computers for most of their work, it did not make sense to go with a native platform such as IOS or Android.

The development language we chose was Javascript, specifically NodeJS and ExpressJS as the framework for this prototype. NodeJS is an asynchronous non-blocking event-driven architecture that allows for scalable apps to be easily created. Since our focus was on creating a solution predicated on real-time updates and communication, it made sense to build on this platform.

We also used MongoDB as our database solution. In choosing MongoDB over SQL, the document-orientation structure and JSON language response made it a clear winner and suitable for a NodeJS application. MongoDB also has the ability to MapReduce data, which provided key functionality in our prototype.

As an open-source project, our source code can be found at [github.com/mhsieh820/uxtools](https://github.com/mhsieh820/uxtools)



## 6. Conclusion

With Symbio, sales representatives constantly have access to real-time information and alerts to new updates through custom filters. The potential knowledge gained from these updates will offer representatives a cutting-edge advantage over their competitors.

With Symbio,  
New insights are discovered.  
Business decisions are empowered.  
and Client relationships are strengthened.

