Bloomberg at a glance

• Bloomberg Professional Service
• Trading Systems
• Tradebook
• Bloomberg Enterprise
• News
• Media
• Bloomberg Law/BNA
• Bloomberg New Energy Finance
• Bloomberg Government
Bloomberg by the numbers

- Founded in 1981
- 325,000 subscribers in 170 countries
- Over 19,000 employees in 192 locations
- Over 4,800 Engineers
1. In Move to Amsterdam From London, EMA Pushes to Keep Staff (1)
2. Amsterdam bans controversial 'beer-bikes'
3. Forbes: Amsterdam's New-School Cool Luxury Hotels
4. The Best Alternatives for Overcrowded Travel Destinations
5. Straight Up: Bar Brasserie Occo, Amsterdam
7. Straight Up: Bar Brasserie Occo, Amsterdam
8. Straight Up: Bar Brasserie Occo, Amsterdam
9. The Traveller 10 Amsterdam Attractions Without the Queues
10. Amsterdam Attractions
11. Amsterdam Restaurants
12. River Cruises Aim for Millennials with DJs, Adventure Trips
14. The 35 Must-Try Cocktails Around the World
15. The Secrets of Amsterdam's Red Light District - From a Vice Cop Turned Tour Gui...
Ghana’s Growing Government Erodes Pledge to Protect Public Purse

• Team of ministers and deputies to increase to 110 people
• Unplanned spending announced in January startled markets

By Ekow Dontoh

(Bloomberg) -- Ghanaian President Nana Akufo-Addo’s plan to enlarge the government may undermine his administration’s efforts to convince investors it'll keep the purse strings tight.

Akufo-Addo has announced nominations and appointments of ministers and deputies that could increase the size of the team to run his two-month old administration to 110 people, the largest in the West Africa nation’s history and up from 84 under his predecessor John Dramani Mahama. The group of officials is 50 percent bigger than that of South Africa, the continent’s most industrialized economy, and three times the size of the ministerial team in Nigeria, where the population is seven times bigger.

Ghana’s finance ministry this month announced plans to cut the fiscal deficit as it sought to fulfill campaign promises and raise investor confidence eroded by the announcement in January of a 7 billion-cedi ($1.5 billion) hole in the budget. While Finance Minister Ken Ofori-Atta, who will now have three
Sugar Falls to Lowest in 10 Months as Cocoa Futures Advance
Sugar Falls to Lowest in 10 Months as Cocoa Futures Advance
SOFTS: Cocoa Extends Rally; Sugar Drops to Lowest in Since M..
SOFTS: Sugar Drops to 10-Month Low as Speculators Flee Mar...
Ivory Coast Said to Face 200b CFA Francs Losses Over Cocoa ...

People
John Mahama (Republic of Ghana)
Ken Ofori-Atta (Republic of Ghana)
Manji Cheto (Teneo Intelligence)
Nana Akufo-Addo (Republic of Ghana)

Topics
BUSINESS Business News
AGR Agriculture
BIZNEWS Bus, Eco, Govt News
BUD Budget News
CMD Commodities
CMDX Commodities, ex-Energy
Fed Extends Capital-Plan Deadline for Four Banks to January (1)
(Updates with Citigroup’s results starting in the fourth paragraph.)
By Dakin Campbell and Jeff Kearns

June 24 (Bloomberg) -- The Federal Reserve extended deadlines until next year for new capital plans from Citigroup Inc. and the U.S. units of HSBC Holdings Plc, Royal Bank of Scotland Group Plc and Banco Santander SA after objecting to earlier versions.

The four banks’ June 26 deadline was pushed to Jan. 5, the due date for the next round of annual plans, the Fed said today in a statement in Washington. Regulators objected to the companies’ submissions during the central bank’s 2014 Comprehensive Capital Analysis and Review, a
News queries

- Arbitrarily complex Boolean queries
  - For both search and alerting
  - AND, OR, NOT, NEAR, wildcards and phrase queries…
  - Users create queries as large as 20K characters (or more!)
- Searches using keywords and metadata
  - Topics, companies (and lists, e.g., with 1000s of companies), people, sources, …
- Stories from 125K+ sources
  - Users privileged for a subset of these sources
  - Can be turned on/off per user
  - ACLs can have a few, many or all of the users
- Searches and stories in 40 languages
  - Any user can have a subset of these selected
## News queries

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<th>Type</th>
<th>Search Terms</th>
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<td>Keywords</td>
<td>&quot;BARACK OBAMA&quot; N/10 &quot;WAR*&quot; IN STORYTOP/75</td>
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<td>Ticker Lists</td>
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<td>Companies</td>
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<td>People</td>
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<td>IRAQ, AFGHAN</td>
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<td>Industries</td>
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<tr>
<td>Sources</td>
<td>BLOOMBERG, TWT</td>
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</table>

### Query Preview

**KEYWORDS:**
"BARACK OBAMA" N/10 "WAR*" IN STORYTOP/75
WITHIN NOT TOPIC: ODD AND (REGION: IRAQ OR REGION: AFGHAN) AND (WIRE: BLOOMBERG OR WIRE: TWT)
News search

325K+ Subscribers
9 Million Searches PER DAY
1 Million Stories PUBLISHED EACH DAY
INDEX OF 500 MILLION STORIES

500 Stories PER SECOND
Available for Search in ~100ms

180ms RESPONSE TIME
Alerts in 100ms
1.5 MILLION SAVED SEARCHES
Solr // Learning to Rank

- The News Search Cloud
  - Open source: Solr
  - Hundreds of shards, and thousands of Solr cores
  - Multiple tiers: ‘recent’ collection to optimize chronological results
  - Ability to fix bugs and contribute to core engine
  - Solr committers in-house

- Machine Learning
  - Allows continuous relevance tuning
  - SOLR LTR plugin
Multi-linguality

• Traditional search engines struggle when dealing with queries in different languages

• Typically specialized by “market” (e.g., en-US, en-GB, …)

• All components are specialized “vertically” for a market
  • Online spell correction
  • Terms/query expansion
  • Click counts on URLs vary from market to market

• Why is this different for us?
Multi-linguality

• Suppose you are an natural energy trader (oil, gas, …)
  • access news in multiple languages is an advantage
  • news will appear first in the language of the country where it happens
  • e.g., if you trade in oil and your target markets are in South America, knowing Spanish is a **big** advantage, but knowing both Spanish and Portuguese is a **huge** advantage

• More than 1/3 of the queries are executed in 2 languages or more
Multi-linguality

• Everything starts with the documents: news stories are annotated with entities and topics
  • There are 1000s of possible topics in our system
  • Plus entities like people, companies, …

• Queries are also translated into entities and topics and then matched against the index
Multi-linguality

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Search at Bloomberg

Search for Bloomberg is unique

- Neither web search nor enterprise search
- Search means different things for different areas
  - Federated search
  - Screening (multi parameter filtering)
  - Geospatial search
  - News search
- Data is heterogeneous, but connected
- Precision is very important
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<th>Ticker</th>
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</table>
HEINEKEN NV Equity

HEIA NA Equity

Heineken NV's Exposure to Related Companies:
Suppliers are sorted by the cost (COGS/CAPEX/SGBA/R&D) paid by HEIA NA. Customers are sorted by the revenue HEIA NA gets from the customers.

Anadolu Efes Biraci... Anheuser-Busch InBe...
Federated Search

Unified Search for the Bloomberg Terminal

- Searches through around 60 data sources
  - Structured, semi-structured and pure text sources
- Our goal is to ease information discovery
  - Focus on what you are looking for, not where it might be
  - One interface to find all the data, analytics, news, …
- Results are presented in one relevance-ranked list
Banking Industry - North America

Industry Outlook
Earnings
Critical Themes
Comp Sheets

Selected News Articles

- Tweaking a Chat Trips Up Ex-Jefferies Bond Trader Jesse Litvak
- Fidelity’s $100 Billion Bond King Banks on Trump Reflation Trade
- Wall Street Rates Traders Said to Get Up to 20% Bonus Increases
- BB&T Insiders Sold More Stock Than at Any Bank Post-Election
- PayPal Has Been Talking With Amazon on Payments, CEO Says
- Ex-Jefferies Bond Trader Convicted on One of 10 Fraud Counts

Equities

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<thead>
<tr>
<th>Name</th>
<th>Mkt Cap</th>
<th>1D % Chg</th>
<th>1Yr EPS Gr</th>
<th>P/E</th>
<th>Dvd Yld</th>
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<tbody>
<tr>
<td>62) WELLS FARGO &amp; CO</td>
<td>284.29B</td>
<td>-1.01%</td>
<td>-3.59%</td>
<td>14.19</td>
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<tr>
<td>63) US BANCORP</td>
<td>90.14B</td>
<td>0.16%</td>
<td>2.20%</td>
<td>16.32</td>
<td>2.02%</td>
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<tr>
<td>64) PNC FINANCIAL SERVICES GROUP</td>
<td>59.14B</td>
<td>-0.06%</td>
<td>-0.72%</td>
<td>16.85</td>
<td>1.74%</td>
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Federated Search

Unified Search for the Bloomberg Terminal

- Users can query using Natural Language
- Searches dynamic content
- Has unique challenges
  - Data is varied in structure and popularity
  - Usage patterns vary vastly
  - Feedback is sparse
  - Precision is key
tech acquisition in asia last week.

Selected News Articles

- Jack Ma Takes Aim at Trump's Wall With MoneyGram Deal: Gadfly
- Jack Ma’s Ant Financial Buys MoneyGram for $880 Million
- Wanda’s Driving Too Fast Down Boulevard of Broken Dreams: Gadfly
- Toshiba Selling Chip Unit Stake May Be Least Bad Option: Gadfly
- Japan’s Raw Deal Shows India Needs to Cure Delhi Belly: Gadfly
- Goldman Sachs Said to Work on Sale of Toshiba’s Chip Business

Mergers and Acquisitions

<table>
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<th>Ann Date</th>
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<td>01/24/17</td>
<td>Design Camp LLC</td>
<td>Kabuni Ltd</td>
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</table>
Increasingly entity-oriented search

- companies
  - stocks, bonds, location, …
- people
  - government officials, board members, C-suite, …
  - …
- products/commodities
  - prices, …
- countries, regions, …
- economic indicators (GDP, operating surplus, …)
- sentiment, polarity, popularity, …
  - …
Lots of potential for applications

- Smarter search, smarter alerts
  - news, stock prices, commodities, interest rates, …

- Query/document tagging, search, and recommendations
  - sentiment, polarity, saliency/aboutness, …

- Information landscapes
  - …

- …
Conclusions

• Search at Bloomberg is unique in many ways

• Federated Solr/ML-based search architecture for search (open source!)

• Multi-lingual, complex searches involving companies, people, and more

• The world (and also Bloomberg!) increasingly moving towards entity-oriented search
Data Science Research Grant Program

Bloomberg invites faculty worldwide to apply for unrestricted gifts that support research in broadly construed data science, including natural language processing, machine learning, and data mining. We also invite proposals for creation of, or contributions to, open source software used for data science.

Applications

Faculty members, research scientists, and post-doctoral fellows at universities worldwide are eligible to serve as Principal Investigators (PIs). A PI can lead one proposal per cycle, but can serve as co-PI on other proposals.

Applications should be submitted here in PDF format. We prefer a single file containing all materials, named after the first PI's last name and first name. Please note that Bloomberg cannot accept any proposal containing confidential or proprietary information.

The application deadline for Round 5 will be announced before the end of 2017.

https://www.techatbloomberg.com/data-science-research-grant-program/
Q&A

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@edgarmeij

PS. We’re hiring :-)

Bloomberg