IBM Innovate 2014 Keynote
An Ecosystem of Innovation:
Creating Cognitive Apps Powered by IBM Watson and IBM Bluemix

Jyotsna (Jo) Mishra
Asia-Pacific Marketing Leader
Watson Group
jyotsna.mishra@sg.ibm.com

Innovate2014

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Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput or performance that any user will experience will vary depending upon many factors, including considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve results similar to those stated here.
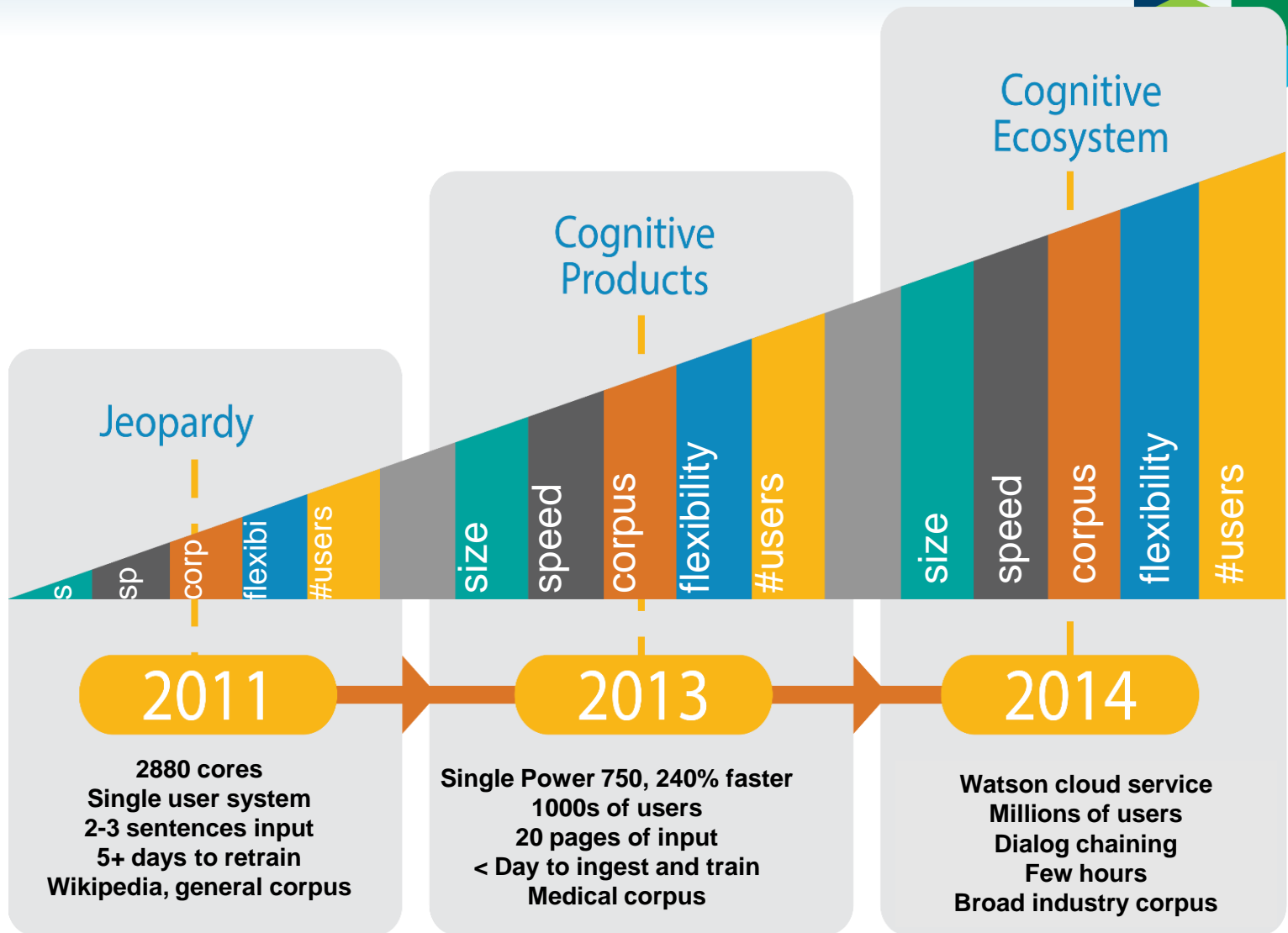
Topics

- What is Watson?

- How Watson works?

- Watson Ecosystem & Watson Developer Cloud

- How do I start my journey?

- Recap & Q&A

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On February 14, 2011

IBM WATSON
made history

Bringing Watson technology to market

Jeopardy

size / speed / corpus / flexibility / #users

2011

2880 cores
Single user system
2-3 sentences input
5+ days to retrain
Wikipedia, general corpus

Cognitive Products

size / speed / corpus / flexibility / #users

2013

Single Power 750, 240% faster
1000s of users
20 pages of input
< Day to ingest and train
Medical corpus

Cognitive Ecosystem

size / speed / corpus / flexibility / #users

2014

Watson cloud service
Millions of users
Dialog chaining
Few hours
Broad industry corpus

Watson is Cognitive Computing

Watson understands me.

Watson engages me.

Watson learns and improves over time.

Watson helps me discover.

Watson establishes trust.

Watson has endless capacity for insight.

Watson operates in a timely fashion.

Understands natural language

Generates and evaluates hypotheses

Adapts and learns
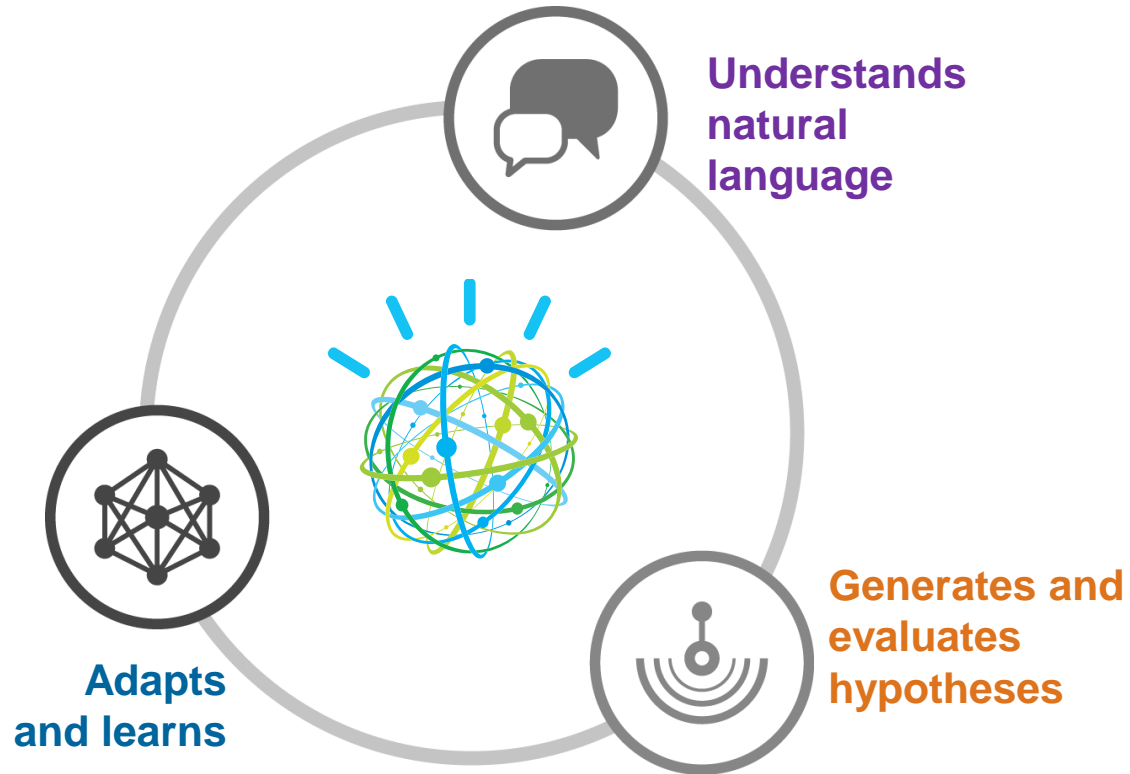
Consider this Natural Language Question

A restaurant in Chicago?

Several critics have raved about Zhivago and what a masterpiece it was. Was it shown in Russia in 2001?

Are we talking about Art or Sculpture or Movie or Food?

Plain Number (or) a Temporal Reference?

Keyword search and expert systems are not able to recognize the subtleties, idiosyncrasies, and ambiguities inherent in common human language

This is how Watson would respond with Movies related content ingested as Corpus

Deep natural language processing is NOT keyword search

Watson is not about rules-based search or speech processing

- Traditional systems use keyword and synonym matching to find documents

- Expert systems need rules to demonstrate expertise

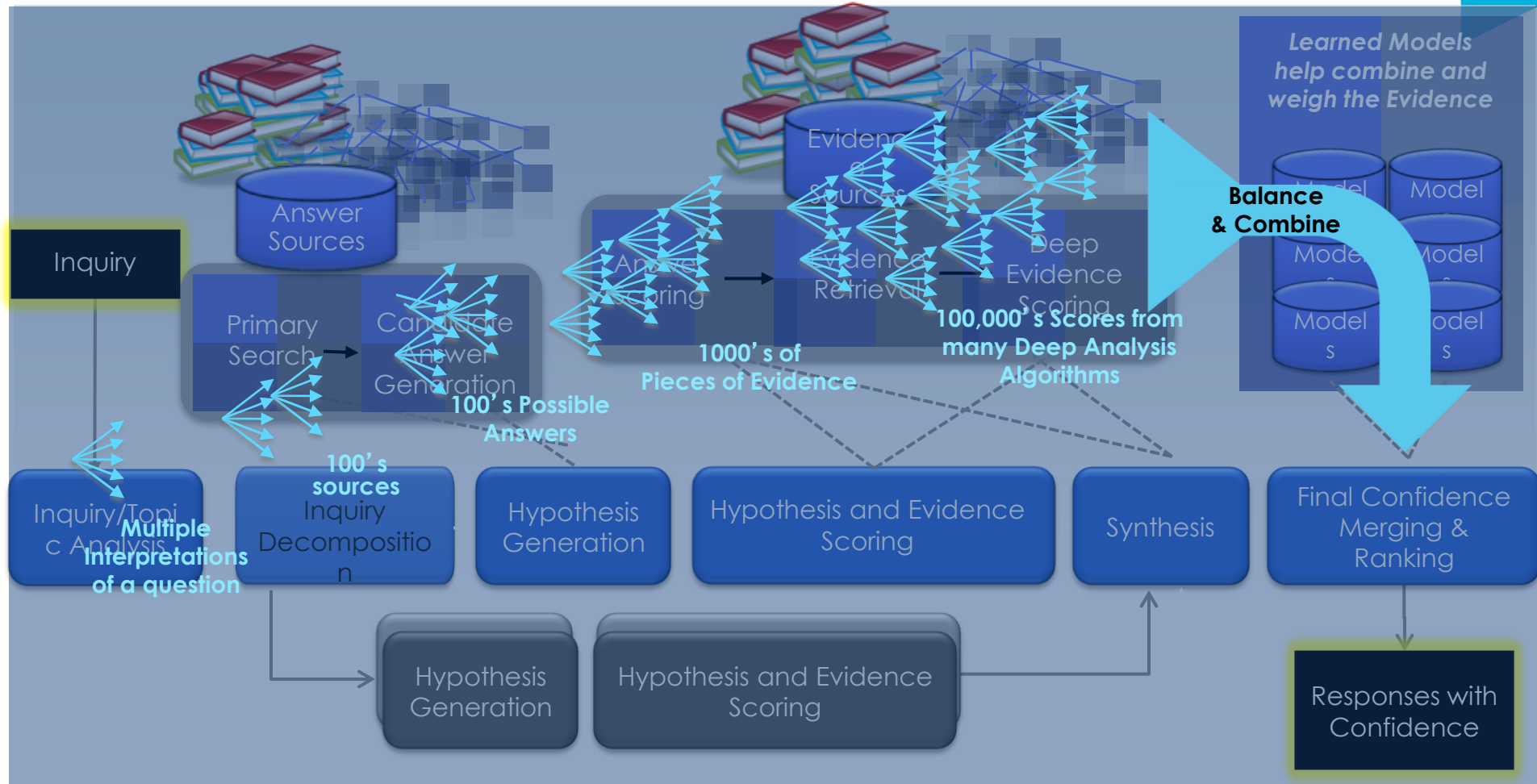- These systems trade off precision for accuracy outside of what they are programmed to recognize

Cognitive systems, like humans, know how to apply context, fill in the gaps, resolve ambiguity and uncertainty, and accurately interpret language
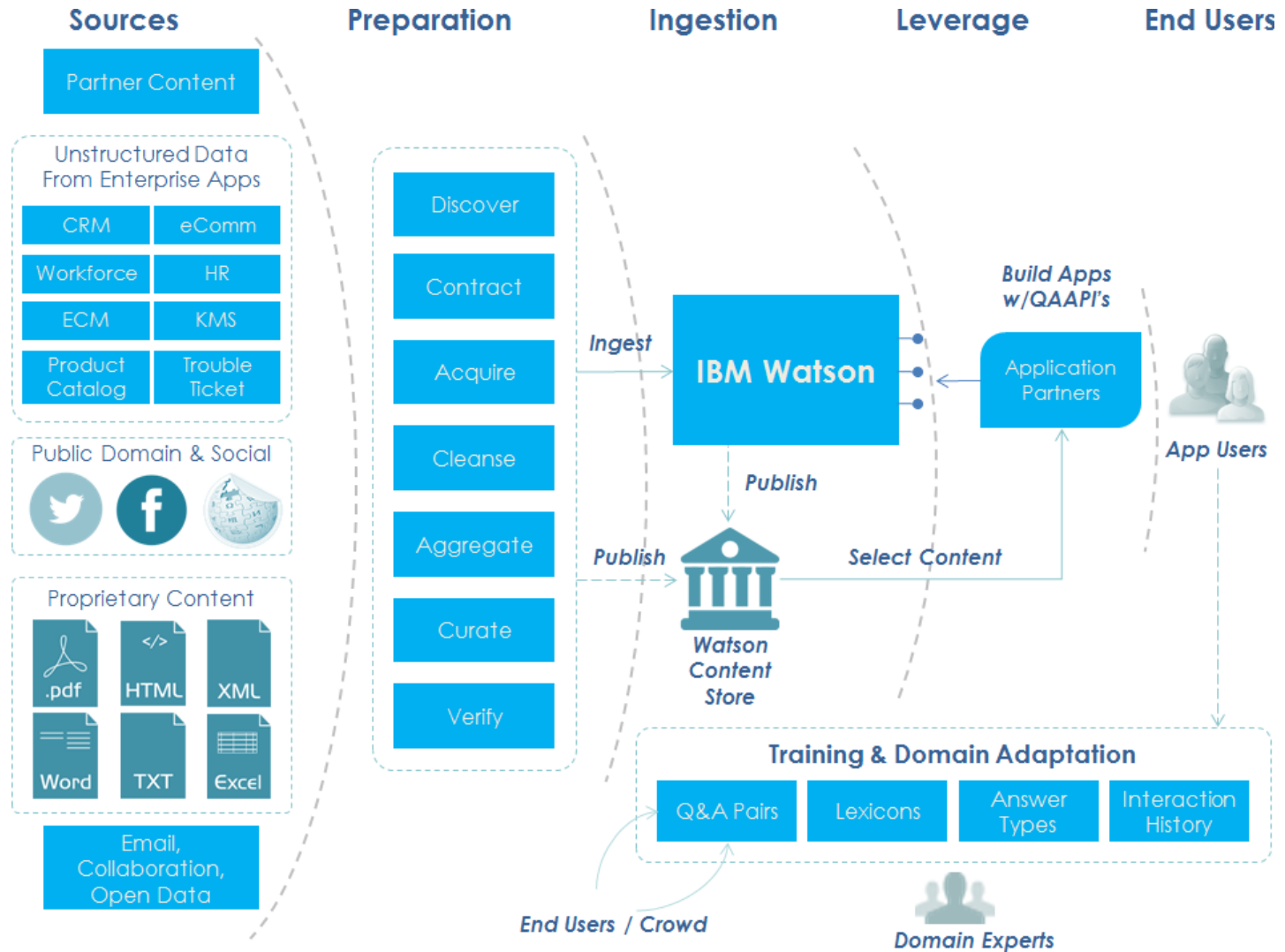
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How Watson works: DeepQA Architecture

Learned Models help combine and weigh the Evidence

Balance & Combine

Inquiry

Answer Sources

Primary Search

Candidate Answer Generation

100's Possible Answers

Evidence Sources

Answer Scoring

Evidence Retrieval

Deep Evidence Scoring

1000's of Pieces of Evidence

100,000's Scores from many Deep Analysis Algorithms

Model

Inquiry/Topic Analysis

Multiple Interpretations of a question

Inquiry Decomposition

100's sources

Hypothesis Generation

Hypothesis and Evidence Scoring

Synthesis

Final Confidence Merging & Ranking

Hypothesis Generation

Hypothesis and Evidence Scoring

Responses with Confidence

Building a Watson based app – How does it all come together?

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Bringing Watson to Market

Transforming industries and professions with services-led engagements.

Advancing cognitive computing across the enterprise with repeatable **solutions**.

Bringing the cognitive experience to market through an **ecosystem** of partners.

Watson Ecosystem

Startups · **Enterprise** · **Universities**

$100M — Planned equity investments in Ecosystem

2400+ — Ecosystem Partner Applications

400 — Mobile Developer Challenge applications, 25 semi-finalists

7 — Universities partnering to deliver cognitive curriculum in fall 2014

Watson Ecosystem: A cognitive marketplace

The IBM Watson Ecosystem brings the cognitive capabilities of Watson to the cloud, allowing third parties to harness Watson's cognitive capabilities. The ecosystem is comprised of three key components:

Watson Developer Cloud
delivers the tools, methodologies, software developer kits and API(s) for ISVs to build the next generation of cognitive applications.

Watson Content Store
brings together sources of free and fee data, including general knowledge, industry-specific content, and subject matter expertise.

Watson Talent Hub
helps bridge ISVs' resource gaps by providing a marketplace for critical cognitive, big data, UI, and mobility skills.

What does a partner get through the IBM Watson Ecosystem

- **Use** the **Watson Developer Cloud**
  - Use the Watson Experience Manger and other tools
  - API to access the Q&A service to Watson
  - Documentation
  - Ability to enrich Watson using content and train and test an application
  - Customizable user interface to embed in an application
  - Guidelines on using Watson elements in the application
- **Obtain or provide** content in the Watson Content Store for use in applications
- **Access** to a network of partners, customers, content and talent through the IBM Watson Ecosystem
- Use of a collaborative community including IBM's technical, marketing and sales

What is the cost to be part of the IBM Watson Ecosystem?

Process for building your *"Powered by Watson"* app

Access Watson Developer Cloud
using Watson Experience Manager
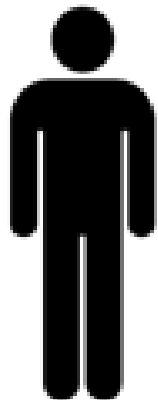
Develop app
"Powered by Watson"
using APIs

Enrich Watson
with content

Train Watson
using tools and
experts

Test app
functional and
non-functional

Deploy application

What is Watson Films?

- Demo application, hosted in IBM Bluemix, that demonstrates how to integrate & interact with Watson using QAAPI and other cognitive services + 3rd party services

- Allows end users to ask questions in natural language about films and film making in general

- Watson is ingested with following content,
  - Wikipedia about the list of the top 100 greatest American films of all time per the American Film Institute (HTML format)
  - "The Essential Reference Guide for Filmmakers" from Kodak (PDF)

- Extracts terms / movie names from the question

- Twitter API's to fetch tweets about the movie extracted from the question.

- Shows the sentiment of the (extracted) tweets about the movie

- Shows a heat map of tweets about movies happening across the globe

- Searches if the extracted movie is available on iTunes and Rotten Tomatoes

- Used structured data about movie box office to answer appropriate questions

- Generate insights on customer preferences based on digital footprint

Architecture of Watson Films
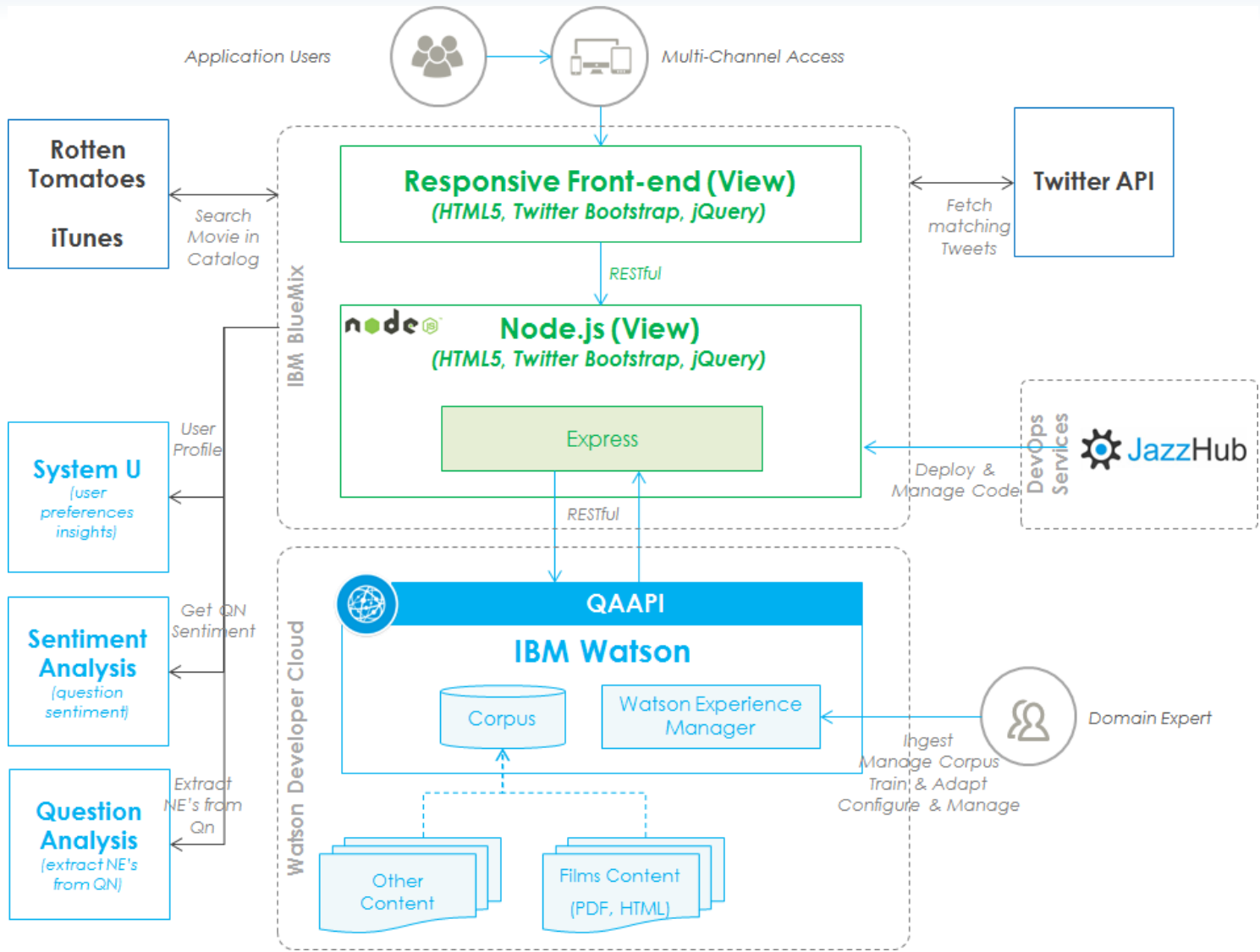
Fork the Application from IBM JazzHub

https://hub.jazz.net/project/dimascio/WatsonFilmsDW

Note: The application made available in IBM JazzHub is a stripped down version of the what was shown as demo. The application in IBM JazzHub essentially contains core functionality and the view code needed to integrate with Watson QAAPI and render the results.

Mobile Developer Challenge Semi-finalists - Examples

**Fashion
Red Ant**
A sales trainer that lets employees easily identify individual customers' likely interests.

**Retail
CrayonData**
Helps consumers simplify choices in every aspect of life.

**Microfinance
Xoriant**
Lets rural customers access microfinance organization and related data on the go.

**Education
Majestyk Apps**
A cognitive companion that improves education.

**Fitness
BrightMinded**
A virtual personal trainer that follows users through all aspects of their fitness experience.

**Cities
Ontodia**
Concierge service lets users ask detailed questions about local government and private resources.

**Agriculture
Strategia Tecnologia**
Helps family farmers get answers to their questions about agriculture.

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How do I start my journey with IBM Watson?

1. What is the **business value** to the "*Powered by Watson*" application you intend to build?

2. Does the application draw upon the **unique characteristics and capabilities of a cognitive** offering?

3. Has the **content that will fuel the application** been identified and can it be secured/licensed for the intended use?

The best use cases…

✓ Have a question and answer interaction pattern, with questions posed in **natural language**

✓ Seek answers and insights from a defined content repository comprised largely of **unstructured data**

✓ Need **transparency and supporting evidence** for confidence weighted responses to questions and queries

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Phase 1: Engage

1 Join IBM Partner World at **http://ibm.com/PartnerWorld**

2 Analyze use case for Watson business and technical synergy

3 Submit Watson Ecosystem application and receive acceptance
https://ibm.biz/watsonecosystemapply

4 Obtain access to the Watson Developer Cloud through the Watson Experience Manager

Where can I go to learn more?

Learn:
https://ibm.biz/watsonecosystem-youtube

Share:
https://ibm.biz/watsondeveloper

Apply:
https://ibm.biz/watsonecosystemapply
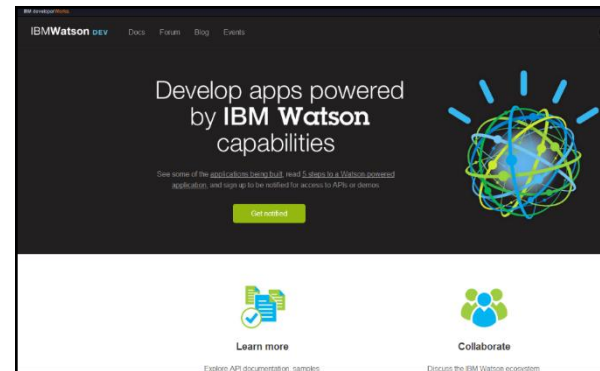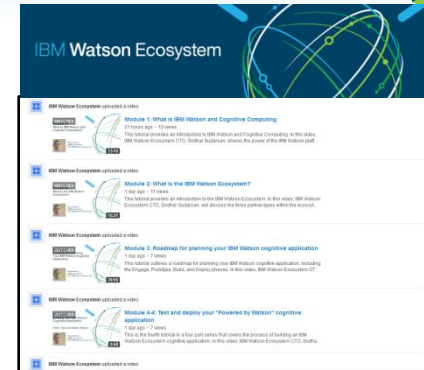
Some Interesting Links

- http://www.ibmwatson.com

- Apply to the Watson Ecosystem program

  – http://www.ibm.com/smarterplanet/us/en/ibmwatson/ecosystem.html

- Developer Q&A Forum

  – https://www.ibmdw.net/watson/

- Watson Developer Cloud Enterprise

  – http://www.ibm.com/smarterplanet/us/en/ibmwatson/assets/pdfs/Watson_Developer_Cloud_Enterprise_Final.pdf

- Growing social dialogue

  – Twitter: @IBMWatson

  – LinkedIn: Watson Advocates Group

  – Facebook: facebook.com/ibmwatson

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Recap & Summary

- Watson is a type of Cognitive System
- What makes Watson different are three powerful technologies
  - natural language
  - hypothesis generation, and
  - evidence based learning
- Before IBM Watson can answer user questions content must be ingested into a corpus to formulate correct answers
- Watson produces multiple answers and each of them contains a probabilistic confidence and supporting evidence
- Adapting Watson to a new domain is done through Training
- Integrating with Watson can be via RESTful QAAPI (or) embedding Watson UI
- IBM Watson Ecosystem is composed of mutually benefiting, interconnected partners to collaborate and create the next generation of cognitive apps.
- IBM Watson Developer Cloud provides developers access to technology, tools and APIs, including training and ways to develop and test applications built with Watson.

Questions

Acknowledgements and Disclaimers

Thank You

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