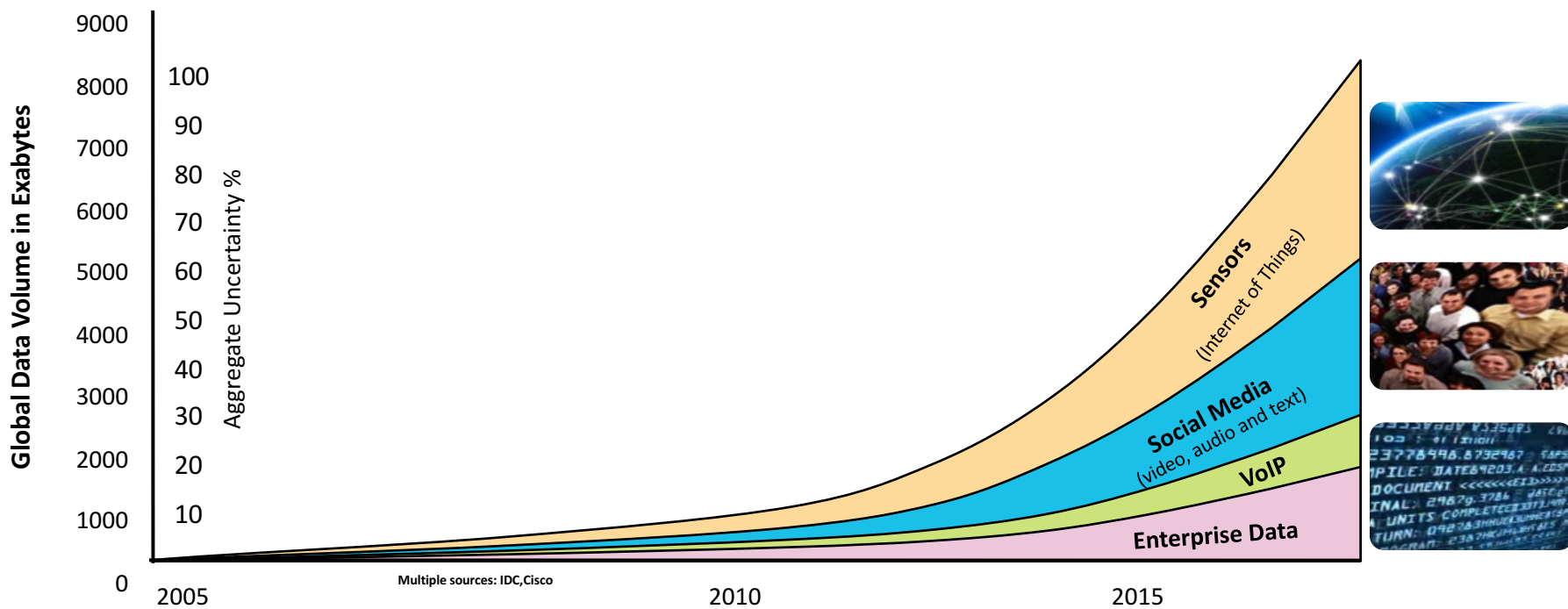


Watson Talks to IBM i

Tim Rowe – Business Architect, Application Development
Scott Forstie – Business Architect, Db2 for i



Demanding new approaches in technology and strategy



Digital Trends

- Everybody is talking about **digital reinvention**, creating new experiences and disrupting business models.

81%

of shoppers conduct online research before making big purchases.

(Source: AdWeek, November 2014)

\$75B

US in-store mobile payment volume will reach \$75 billion this year.

(Source: Business Insider, June 2016)

Uber

World's largest taxi company
owns **no vehicles**

80%

By 2020, 80% of the buying process is expected to occur without any direct human-to-human interaction.

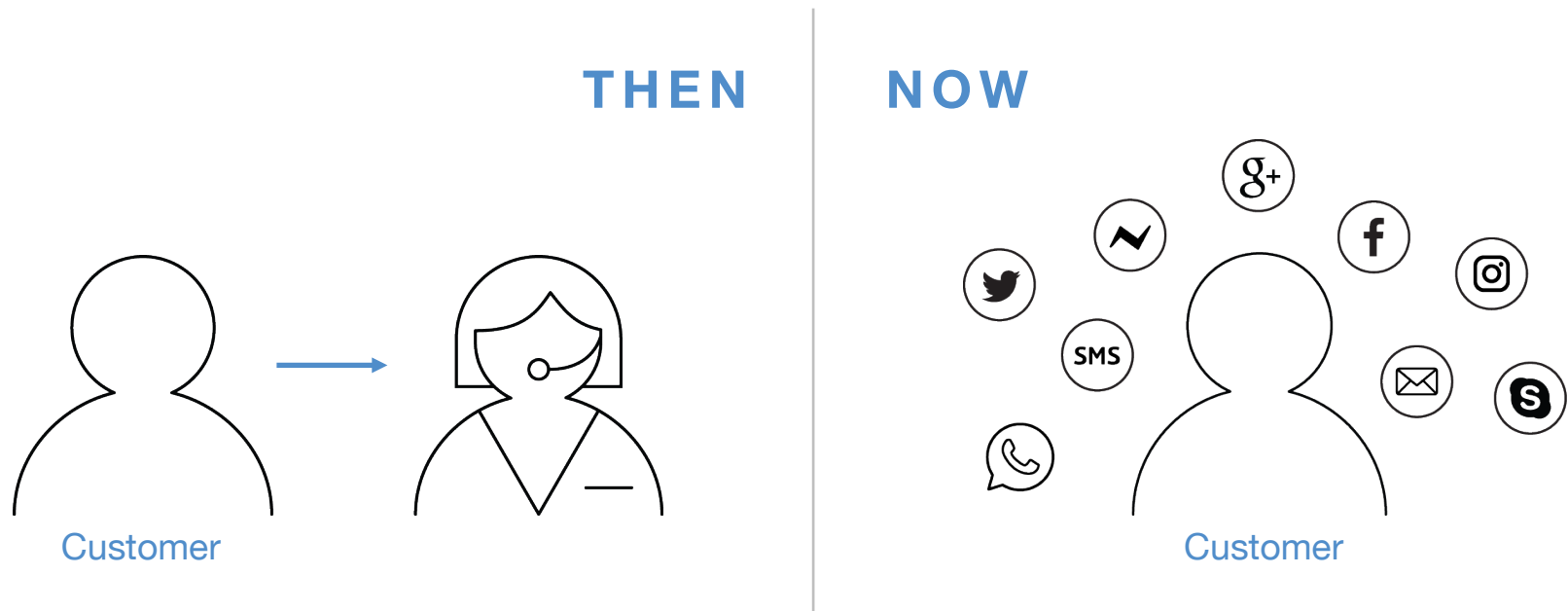
(Source: Forrester)

Facebook

World's most popular media owner
creates no content

But is that being digital enough...?

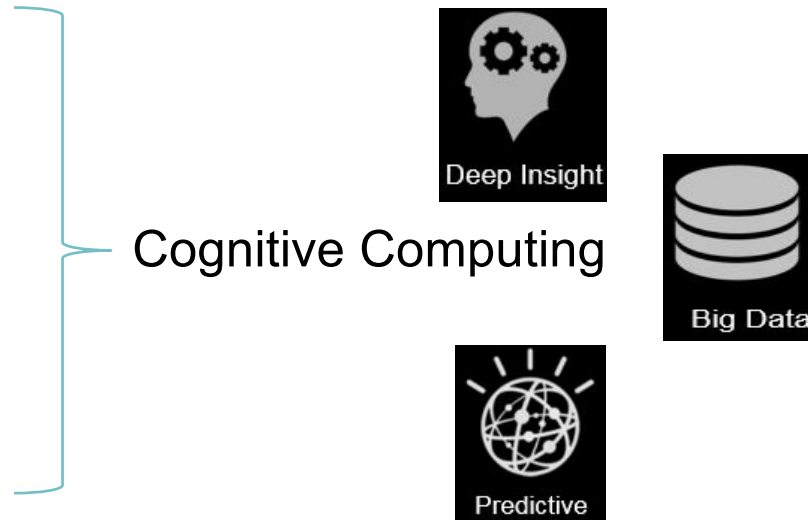
Customers are Shifting from Traditional Channels



Cognitive Systems

Cognitive computing is the simulation of human thought processes in a computerized model

- Adaptive
- Interactive (Expert System)
- Natural Language Processing
- Iterative and Stateful
- Contextual
- Reasoning Capacity
- Machine Learning (AI)
- Fast (Real Time)
- Needs Big Data



Cognitive computing systems learn and interact naturally with people to extend what either humans or machine could do on their own

Building Blocks

Apps

- Mobile App
- Cloud Foundry


Services

- Cloudant DB
- Watson Visual Recognition
- Connect to my data center

Infrastructure

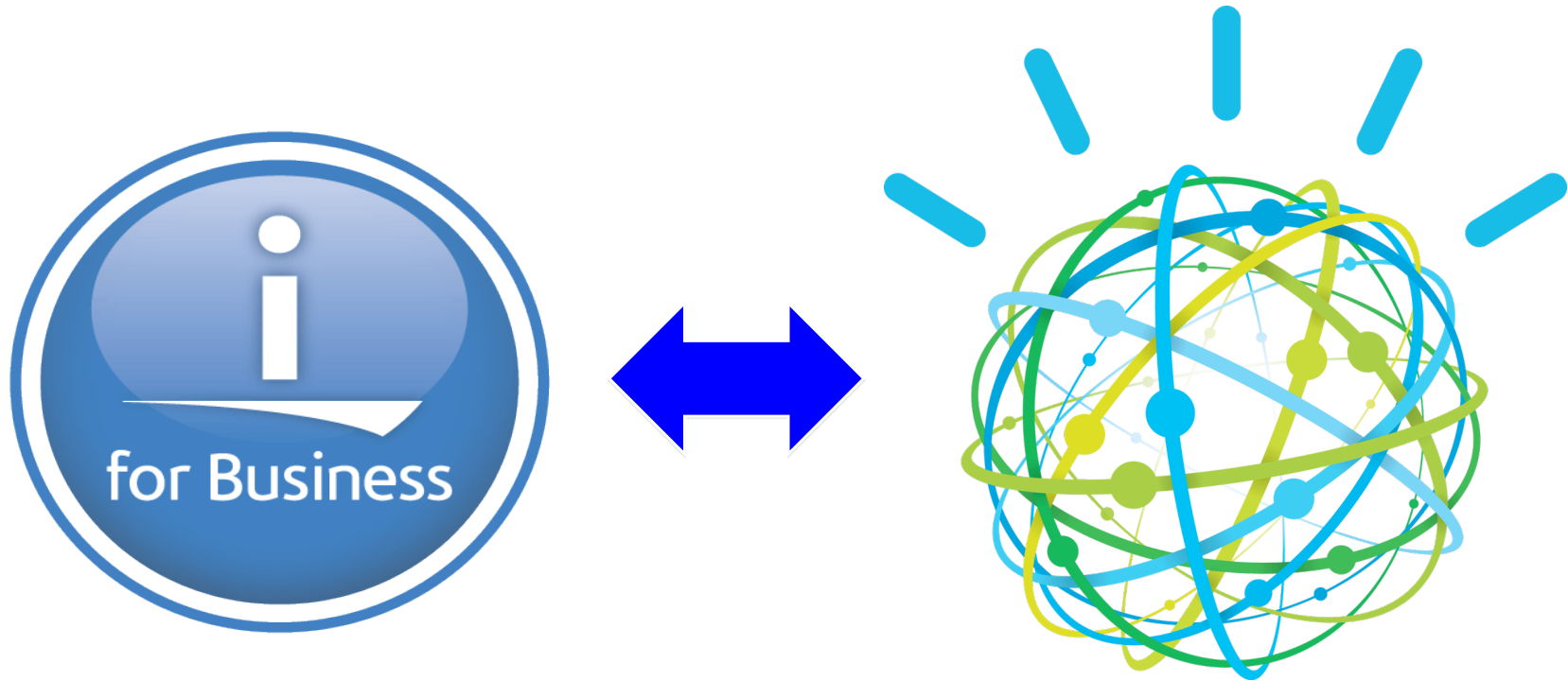
- Cloud Object Storage
- Bare Metal Servers



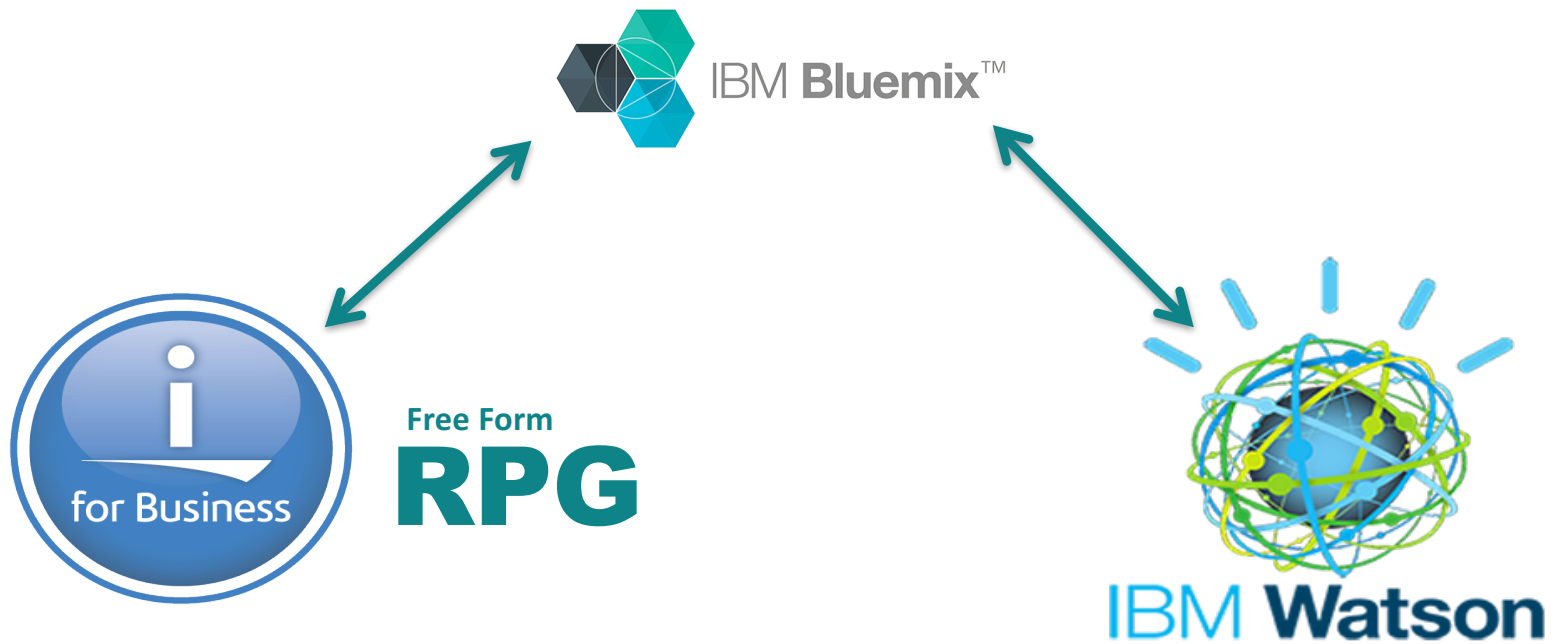
The background is a dark blue, monochromatic image. It features a laptop in the top left corner with keys like 'H', 'N', and 'M' visible. A stethoscope is positioned in the top right. In the bottom left, there are medical forms, one of which is a clipboard with a pen and the text 'MEDICAL CENTER'. A glowing blue globe with a network of lines and dots is centered in the lower half of the image. The text is overlaid in the center, with the words 'enhances', 'scales', and 'accelerates' in a light blue color.

Watson is creating a new partnership
between people and computers
that **enhances**, **scales** and **accelerates**
human expertise.

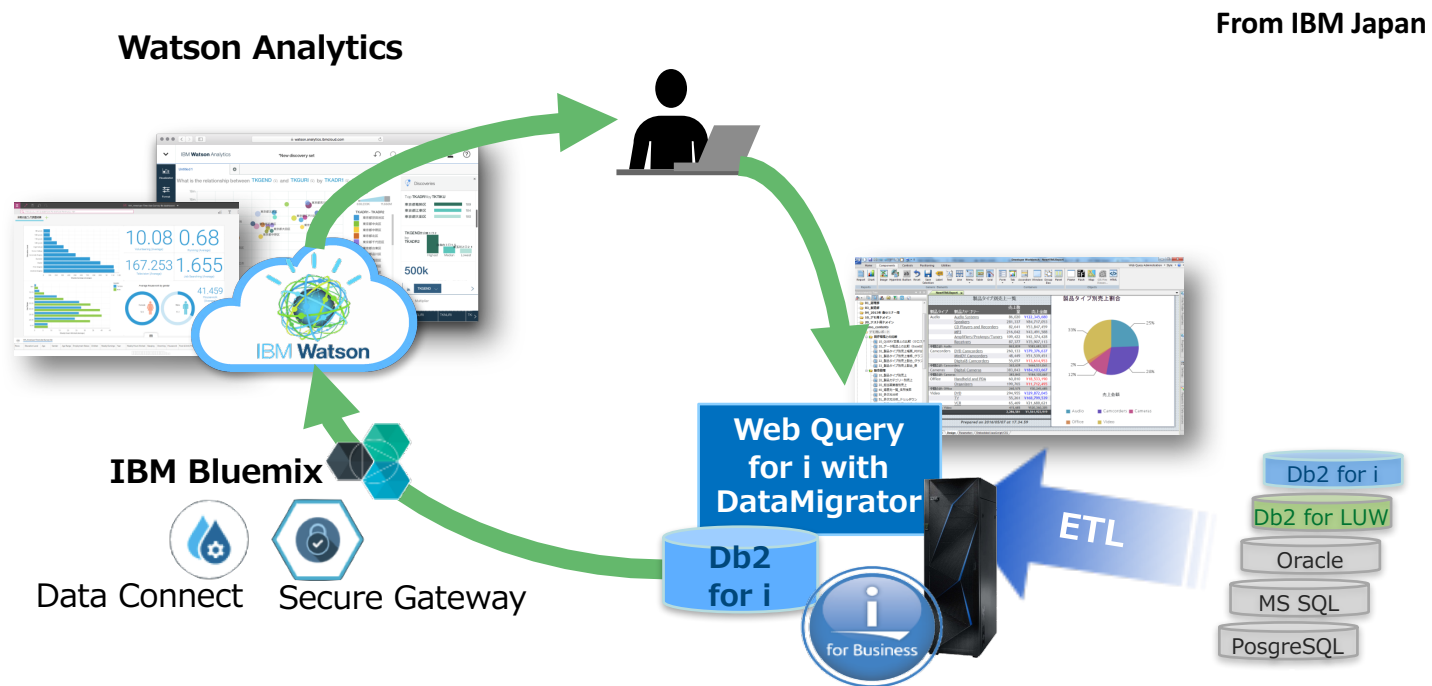
IBM i and IBM Watson



Extending Applications to Watson



Connecting Data to Watson



IBM i and IBM Watson



IBM i and Watson

Agenda

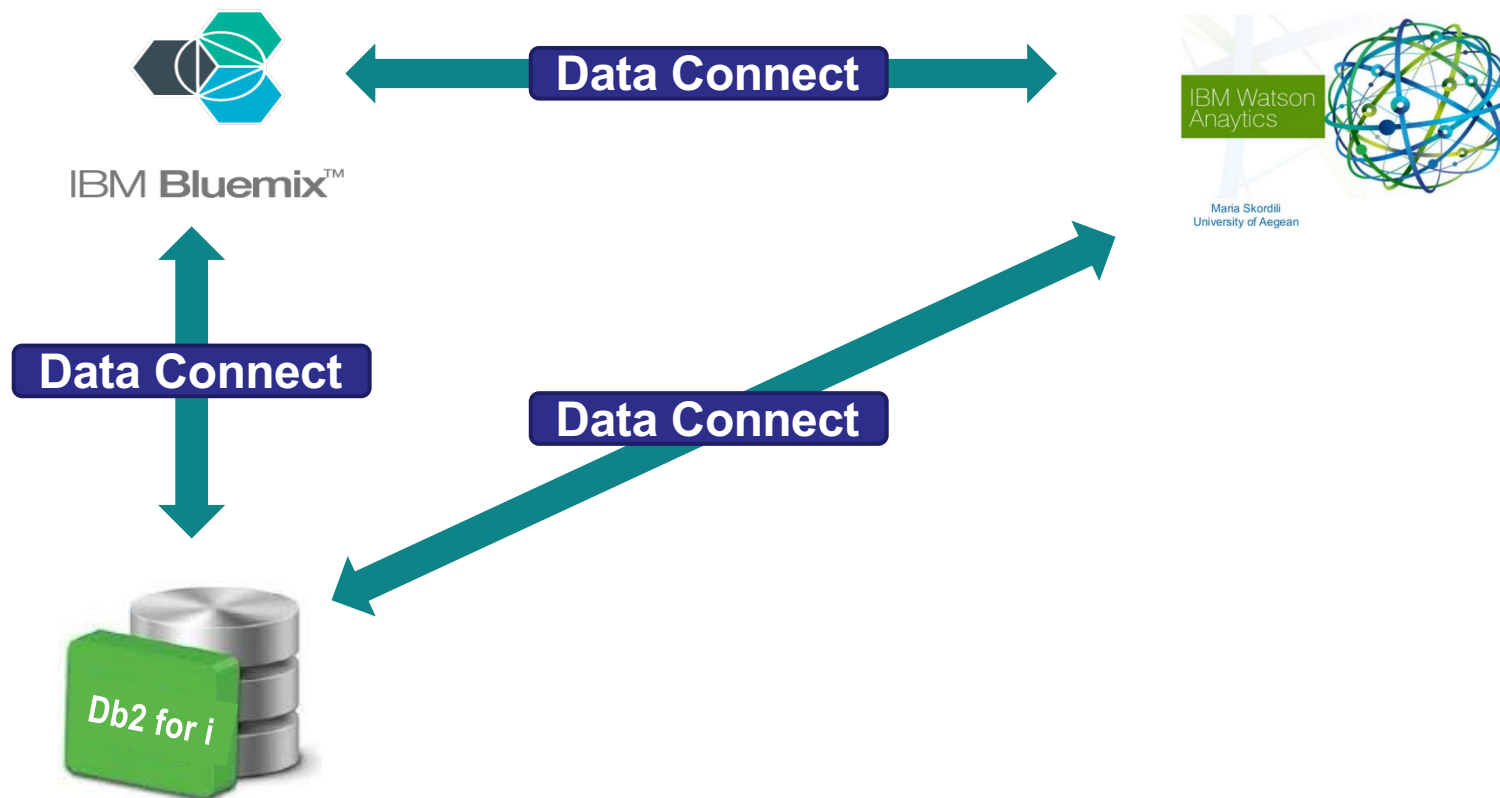
- What is Watson? What is Bluemix?
- Data Preparation, Data Connect, and Watson Analytics
- RPG and IWS and Open Source
- HTTP Functions, JSON_TABLE, & Watson Services
- Demos
 - **You decide Tim's and Scott's fate...
Who is Jake and who is Elwood?
(Watson will help)**



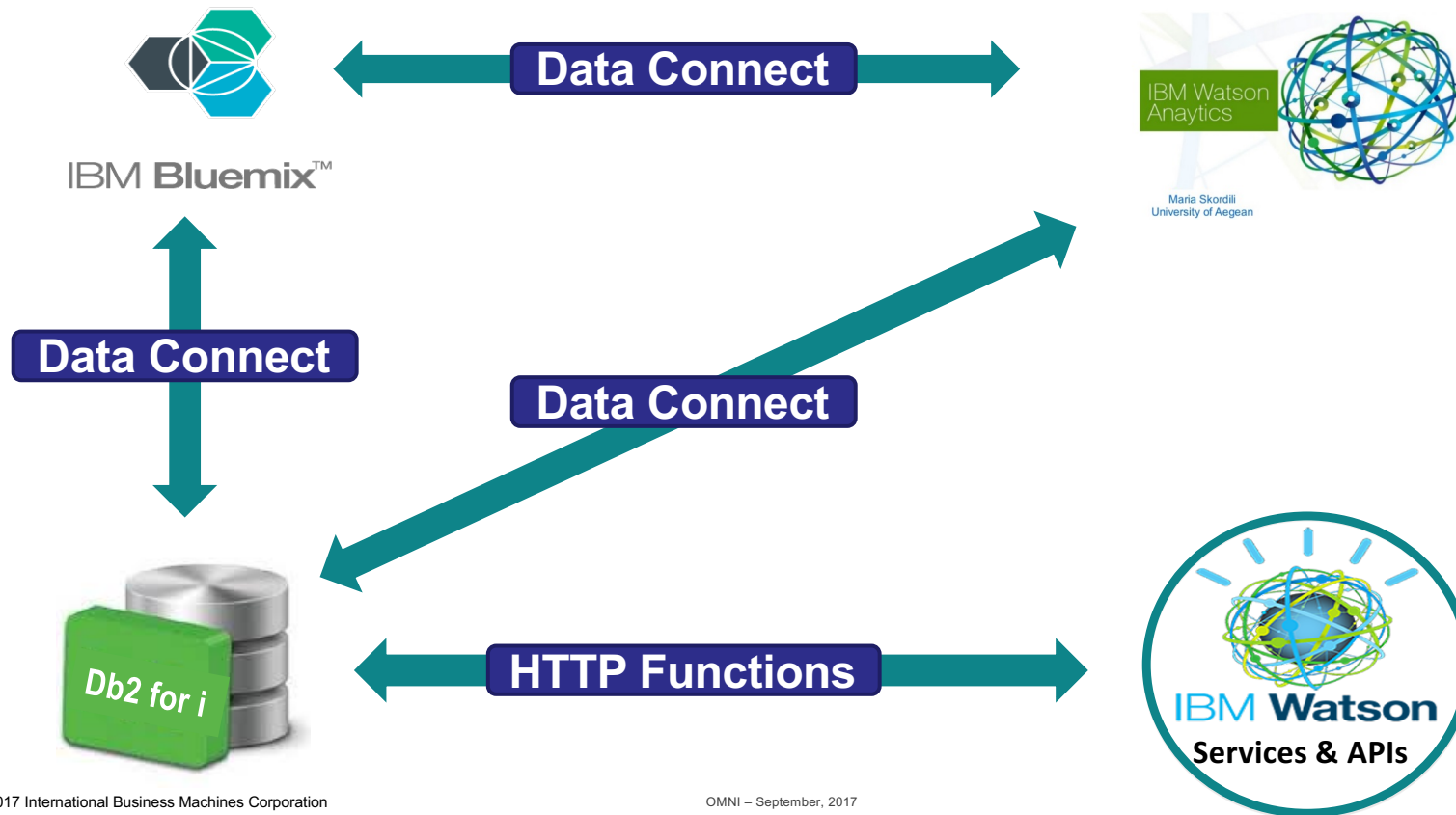


Data Connect, Watson Analytics, Db2 Web Query Data Migrator

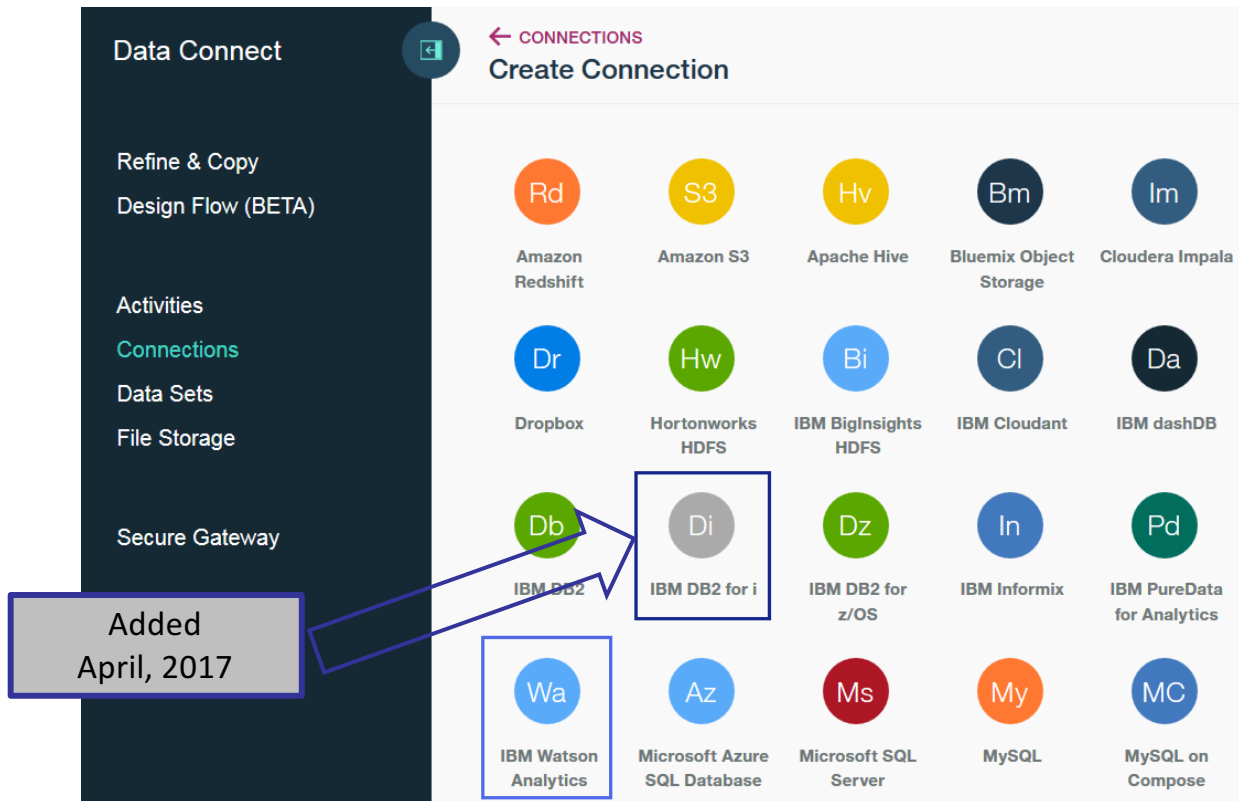
Connecting IBM i to Watson



Connecting IBM i to Watson



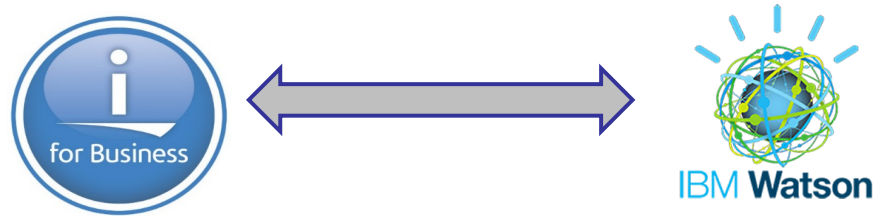
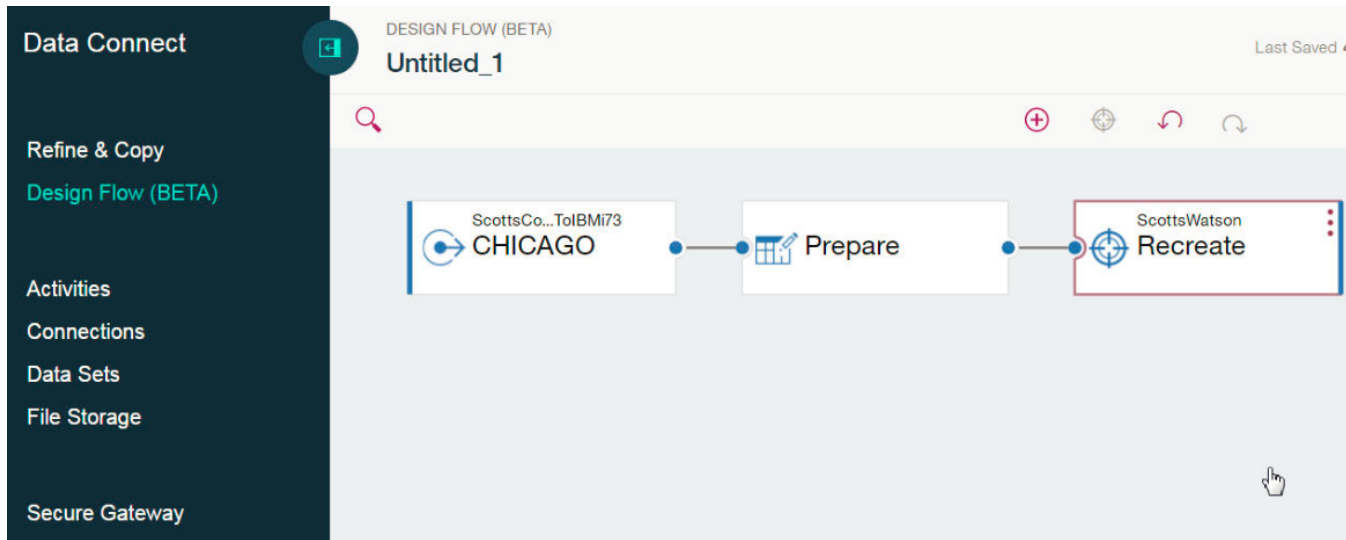
Bluemix's Data Connect



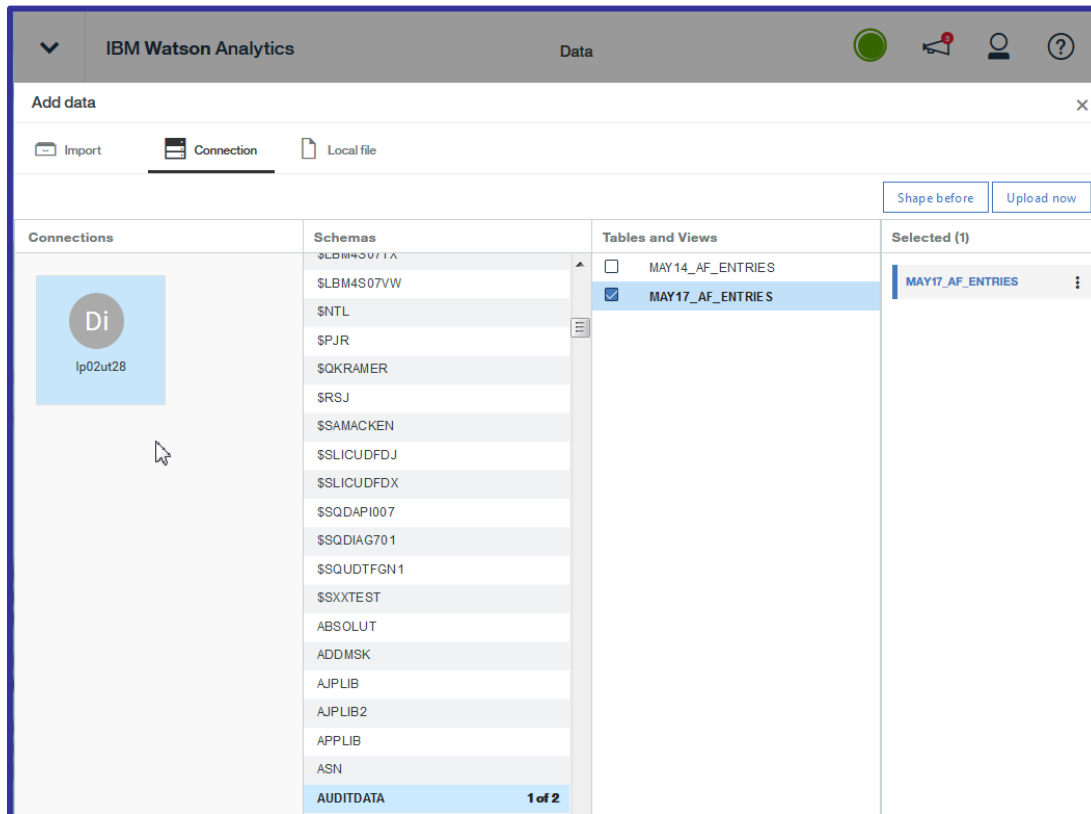
The screenshot shows the 'Data Connect' interface with a sidebar on the left and a main grid of connection options. The sidebar includes: Data Connect, Refine & Copy, Design Flow (BETA), Activities, Connections (highlighted), Data Sets, File Storage, and Secure Gateway. The main grid is titled 'CONNECTIONS Create Connection' and contains 25 connection cards arranged in a 5x5 grid. Each card has a colored circle with a letter and the name of the service below it. A callout box with the text 'Added April, 2017' has arrows pointing to the 'IBM DB2' and 'IBM DB2 for i' cards.

Letter	Service Name
Rd	Amazon Redshift
S3	Amazon S3
Hv	Apache Hive
Bm	Bluemix Object Storage
Im	Cloudera Impala
Dr	Dropbox
Hw	Hortonworks HDFS
Bi	IBM BigInsights HDFS
Cl	IBM Cloudant
Da	IBM dashDB
Db	IBM DB2
Di	IBM DB2 for i
Dz	IBM DB2 for z/OS
In	IBM Informix
Pd	IBM PureData for Analytics
Wa	IBM Watson Analytics
Az	Microsoft Azure SQL Database
Ms	Microsoft SQL Server
My	MySQL
MC	MySQL on Compose


Moving data from Db2 for i to Watson Analytics

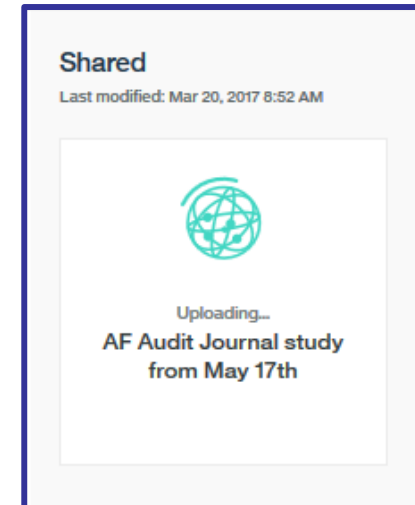


Moving Db2 for i data into Watson Analytics



The screenshot shows the IBM Watson Analytics interface. At the top, it says "IBM Watson Analytics" and "Data". Below that is an "Add data" section with options for "Import", "Connection", and "Local file". The "Connection" option is selected. The interface is divided into four panes: "Connections", "Schemas", "Tables and Views", and "Selected (1)".

Connections	Schemas	Tables and Views	Selected (1)
	<ul style="list-style-type: none"> \$LBM4S07VW \$NTL \$PJR \$QKRAMER \$RSJ \$SAMACKEN \$SLICUDFDJ \$SLICUDFDX \$SQDAP1007 \$SQDIAG701 \$SQUDTFGN1 \$SXXTEST ABSOLUT ADDMASK AJPLIB AJPLIB2 APPLIB ASN AUDITDATA 1 of 2 	<ul style="list-style-type: none"> <input type="checkbox"/> MAY14_AF_ENTRIES <input checked="" type="checkbox"/> MAY17_AF_ENTRIES 	<ul style="list-style-type: none"> MAY17_AF_ENTRIES

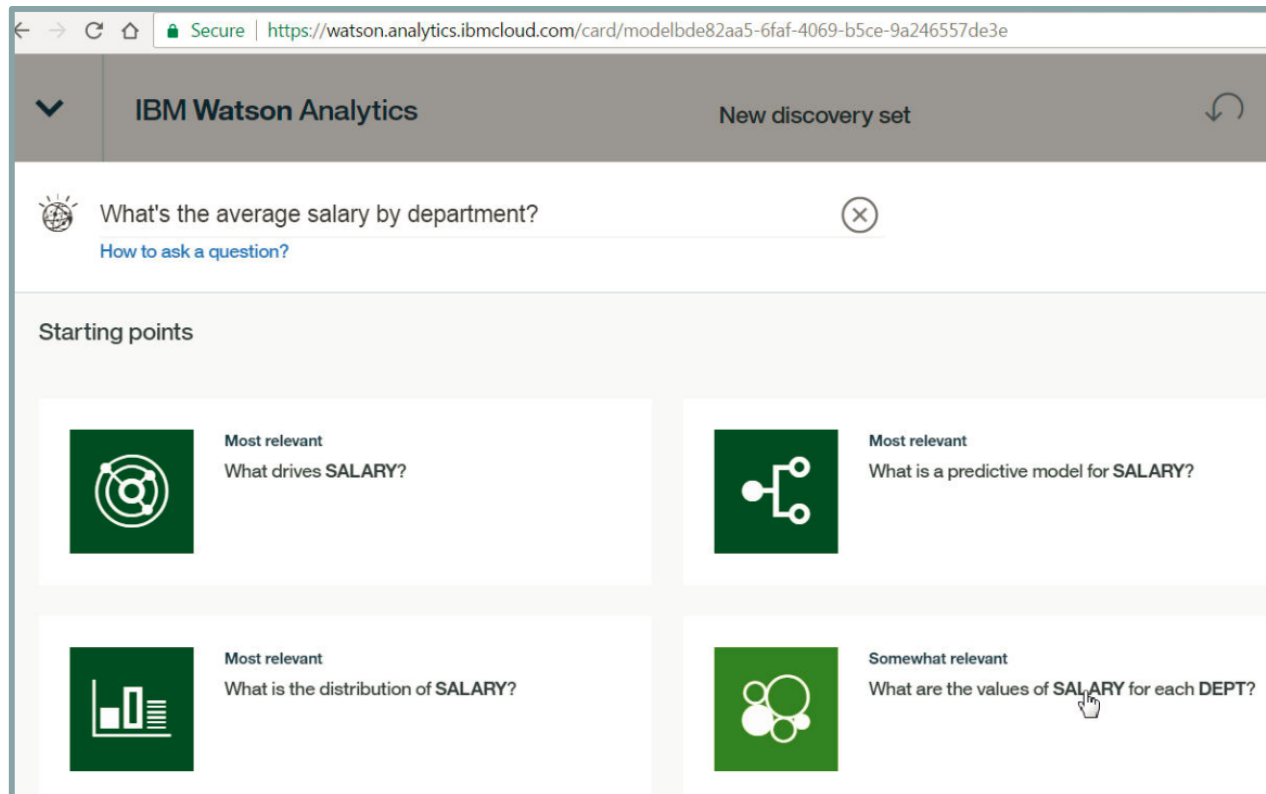


Shared
Last modified: Mar 20, 2017 8:52 AM

Uploading...

AF Audit Journal study from May 17th

Watson Analytics




The screenshot shows the IBM Watson Analytics web interface. At the top, there is a navigation bar with the text "IBM Watson Analytics" and "New discovery set". Below this is a search bar containing the question "What's the average salary by department?". Underneath the search bar, there is a section titled "Starting points" which contains four suggested questions, each with an icon and a relevance rating:

- Most relevant:** What drives SALARY? (Icon: Target symbol)
- Most relevant:** What is a predictive model for SALARY? (Icon: Network diagram)
- Most relevant:** What is the distribution of SALARY? (Icon: Bar chart)
- Somewhat relevant:** What are the values of SALARY for each DEPT? (Icon: Three overlapping circles)

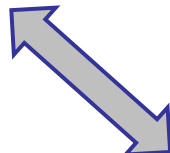
Learning how to ask a good question

Watson Analytics & Db2 for i data

 Ask a question about your data

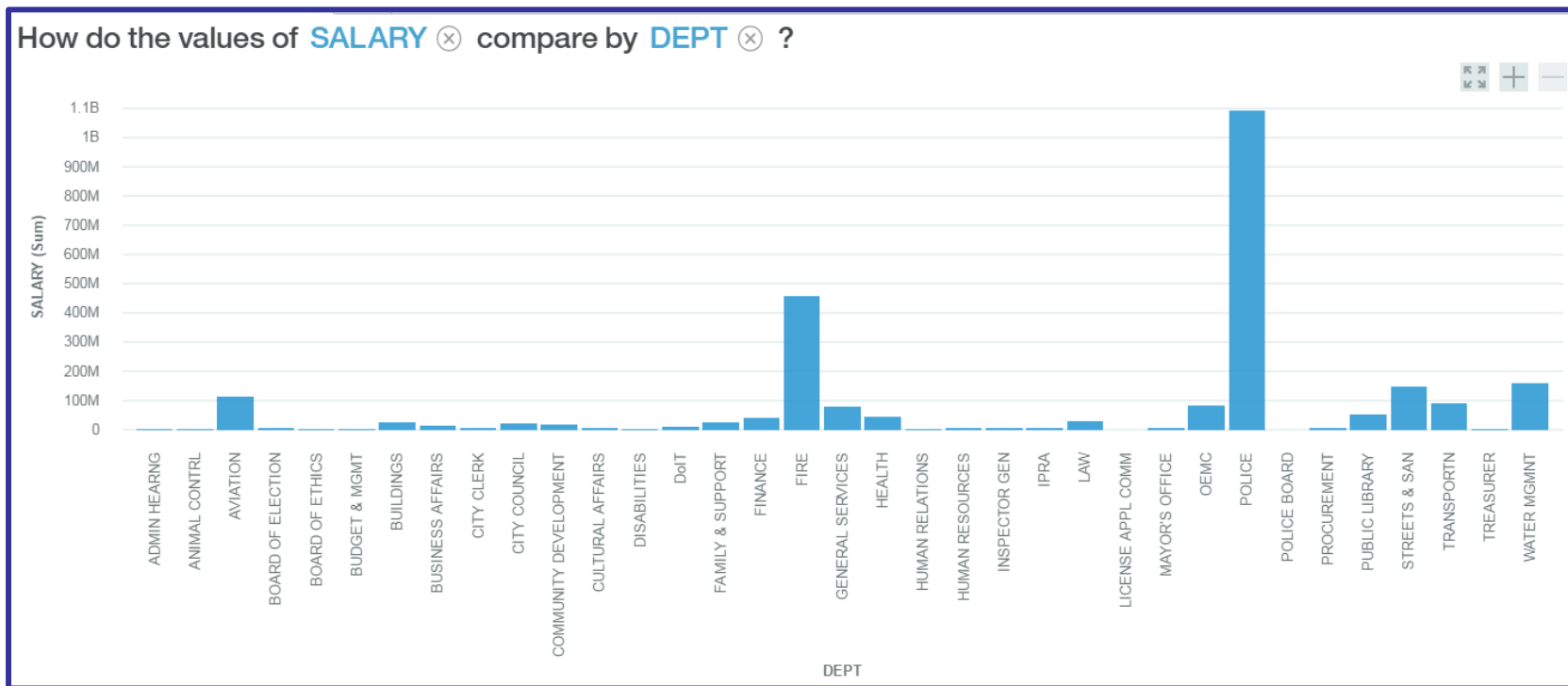
Select a category

- Variety pack
- Variety pack
- Compare data
- Understand relationships and identify patterns**
- Aggregate data
- Sort and filter data
- Predict data
- All available examples

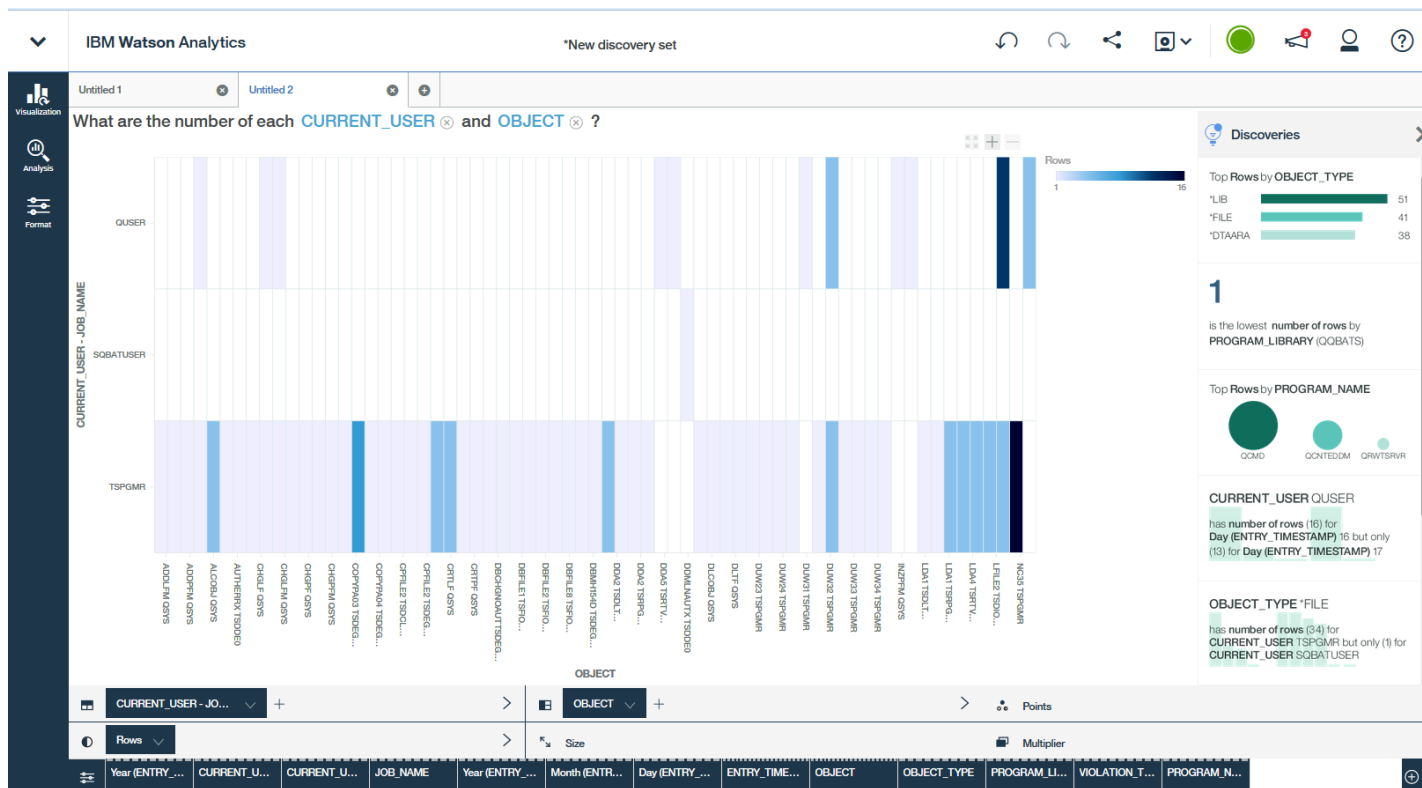


What is the relationship between and by ?

Watson Analytics – Controlled visualization



Analysis and Discovery



What does it cost? (watson.analytics.ibmcloud.com)

Visit this site for complete pricing details:
www.ibm.com/us-en/marketplace/watson-analytics/purchase

Free	Plus	Professional
Upload spreadsheets, get visualizations, discover insights and build dashboards—all on your own.	Get all the features of Free plus more storage and data sources, including databases and Twitter.	Get all the features of Plus plus a multi-user tenant to collaborate, more storage and more data.
\$0 ⁰⁰ USD	Starting at \$30 ⁰⁰ USD* per month per user	Starting at \$80 ⁰⁰ USD* per month per user
Try free edition	Purchase now	Purchase now
1 user	1 user	1 or more users
1 MB of storage included	2 GB of storage included	100 GB of storage included
Professional single user trial for first 30 days	Add storage in 10GB increments for a minimal fee	Add storage in 50GB increments for a minimal fee
	Access relational databases, on prem and on cloud	Access relational databases, on prem and on cloud
	Access 18 data connectors	Access 19 data connectors including IBM Cognos reports
	Access Twitter data	Access Twitter data
Limited access to IBM Analytics Exchange offerings	Full access to IBM Analytics Exchange data & offerings	Full access to IBM Analytics Exchange data & offerings
*Price excludes sales tax and VAT		

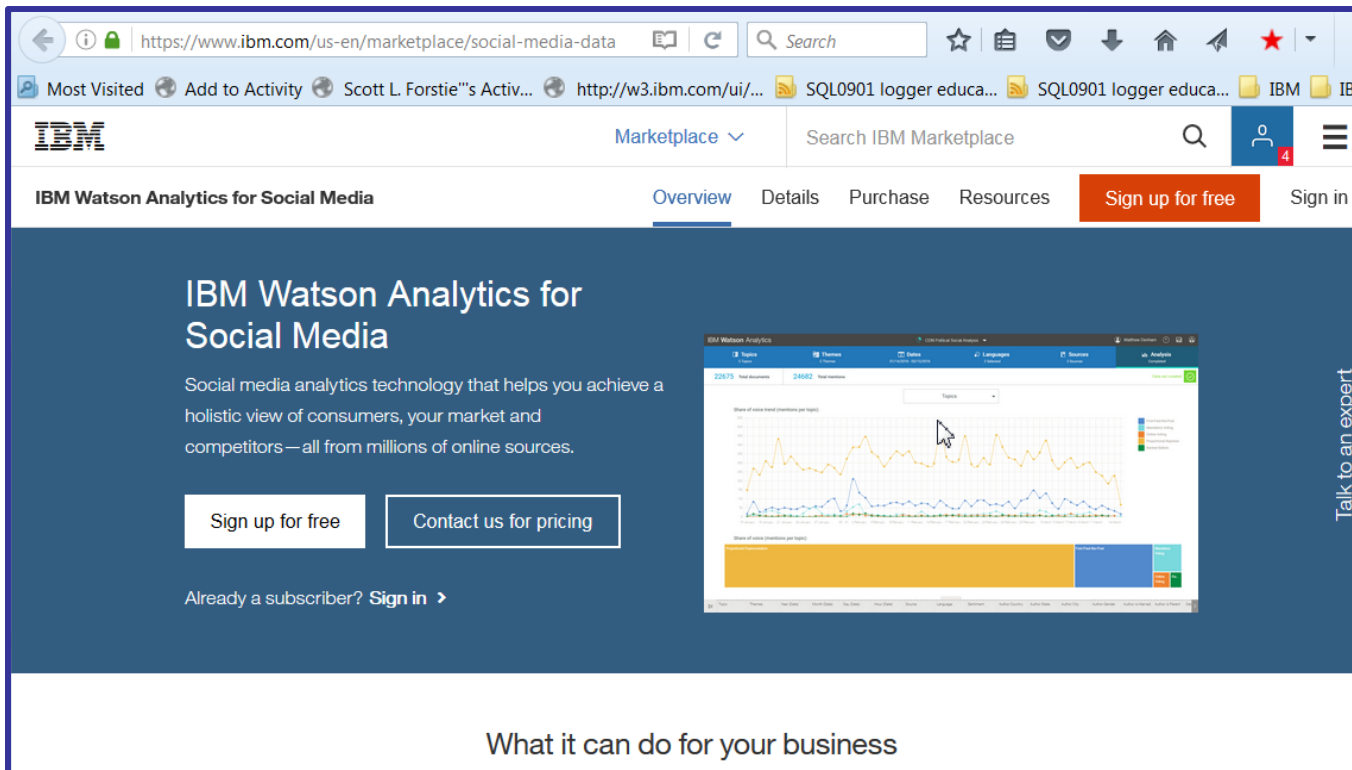
Data security in Watson Analytics

Details about the data security and other topics are answered here:

<https://www.ibm.com/communities/analytics/watson-analytics-blog/ibm-watson-analytics-security-frequently-asked-questions-2/>

Specifications for Watson Analytics	Standards	Encryption
Data centers	SOC2 and ISO 27001 http://www.softlayer.com/compliance	
Operating system	CentOS (see diagram A above)	
Data storage platform	DB2, MongoDB	
Certifications targeted	ISO 27001 certified	
Regulatory Acts	HIPAA Ready Moving forward with FFIEC enablement	
Encryption (data at rest)		aes-cbc-essiv:sha256
Encryption (data in transit)		SSL over http. HTTPS
Logging vendor access	Syslog	

Incorporating Social Media content



IBM Watson Analytics for Social Media

Overview Details Purchase Resources [Sign up for free](#) Sign in

IBM Watson Analytics for Social Media

Social media analytics technology that helps you achieve a holistic view of consumers, your market and competitors—all from millions of online sources.

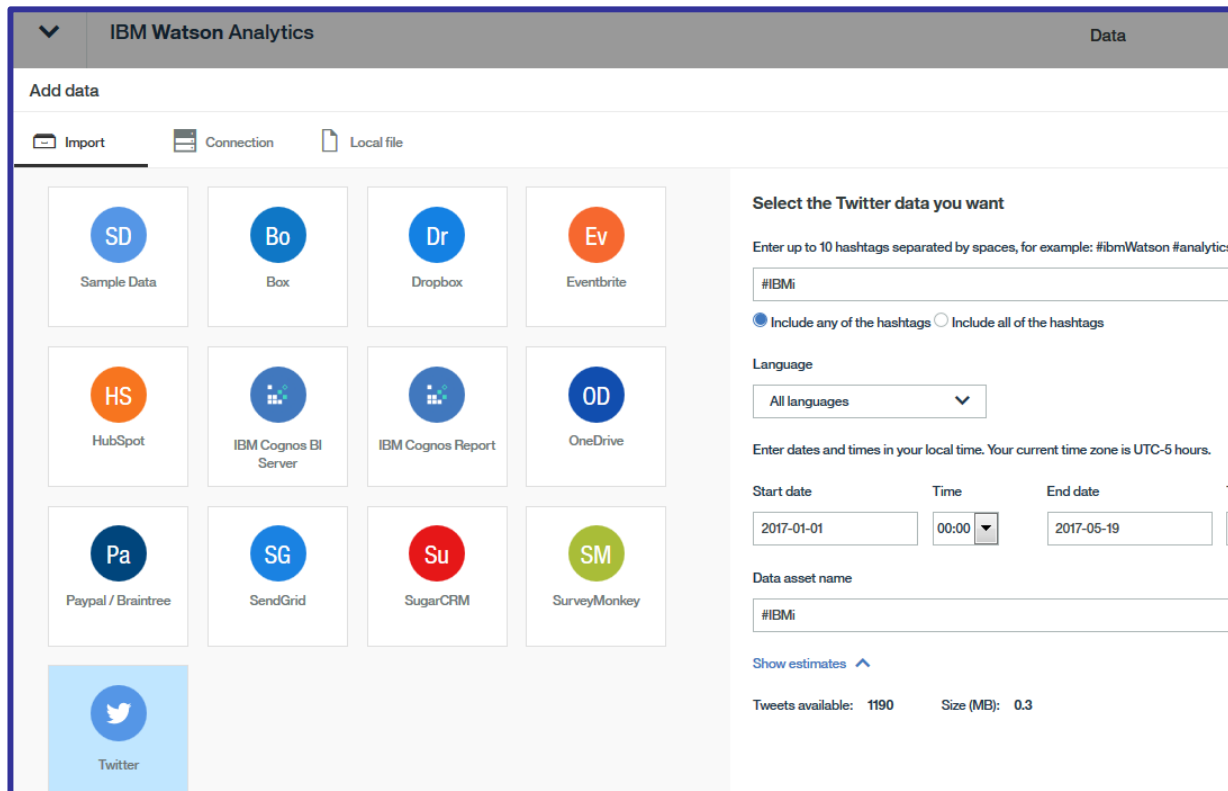
[Sign up for free](#) [Contact us for pricing](#)

Already a subscriber? [Sign in](#)

Talk to an expert

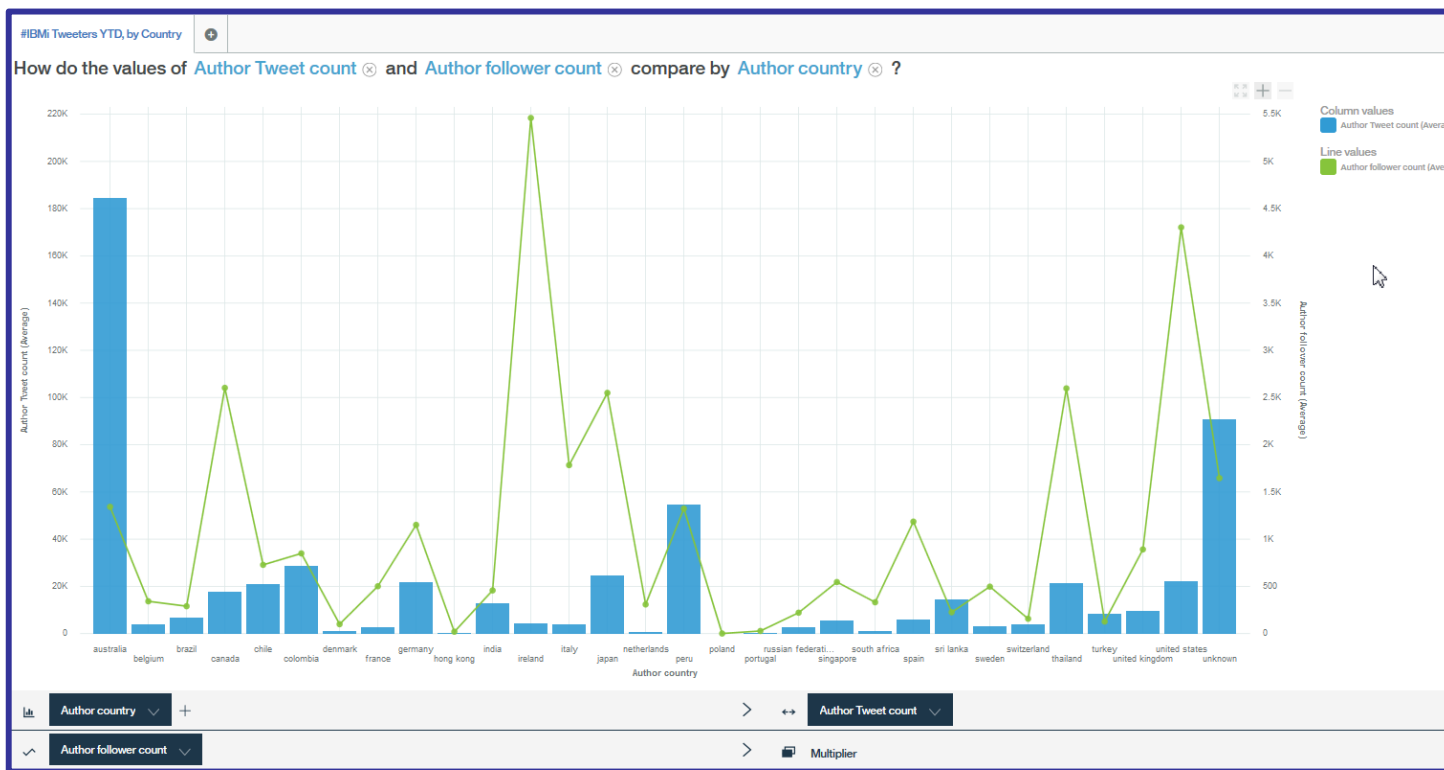
What it can do for your business

Incorporating Social Media content



The screenshot shows the 'Add data' interface in IBM Watson Analytics. It features a grid of data source icons including Sample Data, Box, Dropbox, Eventbrite, HubSpot, IBM Cognos BI Server, IBM Cognos Report, OneDrive, PayPal / Braintree, SendGrid, SugarCRM, and SurveyMonkey. The Twitter icon is highlighted in blue. To the right, a configuration panel titled 'Select the Twitter data you want' includes a text input for hashtags (containing '#IBMi'), radio buttons for 'Include any of the hashtags' (selected) and 'Include all of the hashtags', a language dropdown set to 'All languages', date and time selection fields (Start date: 2017-01-01, Time: 00:00, End date: 2017-05-19), a data asset name field (containing '#IBMi'), and a 'Show estimates' link. Below this, it displays 'Tweets available: 1190' and 'Size (MB): 0.3'.

#IBMi Tweets YTD



Watson Lexicon

“Watsoning”

[wat-sunning]

Verb

1. To utilize Watson Services or Watson Analytics from an IBM i
2. To amaze and astound your colleagues when you implement Watson technologies within your IBM i

WAAS – Watson As A Service

IBM i Data Centric Cognitive Consulting Workshop

The IBM Systems Lab Services team has a workshop to help clients develop their Cognitive strategy and more...

Discussion items include:

1. Cognitive application and database architecture(s)
2. Data access paths and analysis methods
3. Cognitive services access and use

Contact Mike Cain (mcain@us.ibm.com) for details

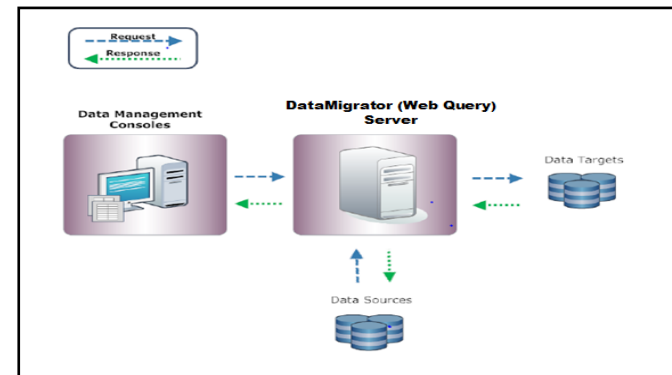
Watson and Data Preparation

- **The Data Lake has become a Data Ocean**
 - Data can be consolidated on Db2 for i prior to being moved to Watson
 - SQL on IBM i can turn non-traditional data into Watson consumable data
For example: History log, Audit journal, Data Journal, Messages, Performance detail, ...
- **In many cases, data will need to be prepared in some manner**
 - Only the RPG programmer understands how the data is stored:
 - “If field COMPANY = 001, join to File B, else join to File C” logic;
 - Dates stored in non date data types
 - Multiple data elements stored in a single field
 - Formatting and Extracting the data as is required by the service
- **Shredding and/or stitching back together the data returned from the service**
 - Data may come into the IBM i in XML, JSON, or some other format
 - To incorporate this into your analytics or operational applications you want this back in Db2 for i

Db2 Web Query DataMigrator ETL Extension

■ Meta Data Driven Data Prep

- Automate consolidation, organization, “untangling” and optionally, the build of a data warehouse
- Consolidate data from many different data sources
- Data transformations as needed
- Run data flows via the IBM i job scheduler

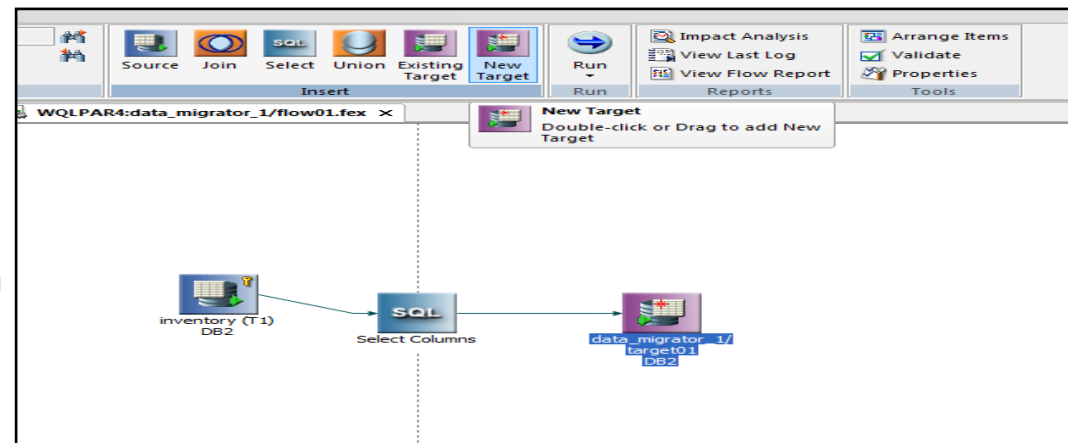


■ ETL (Extract, Transform, and Load)

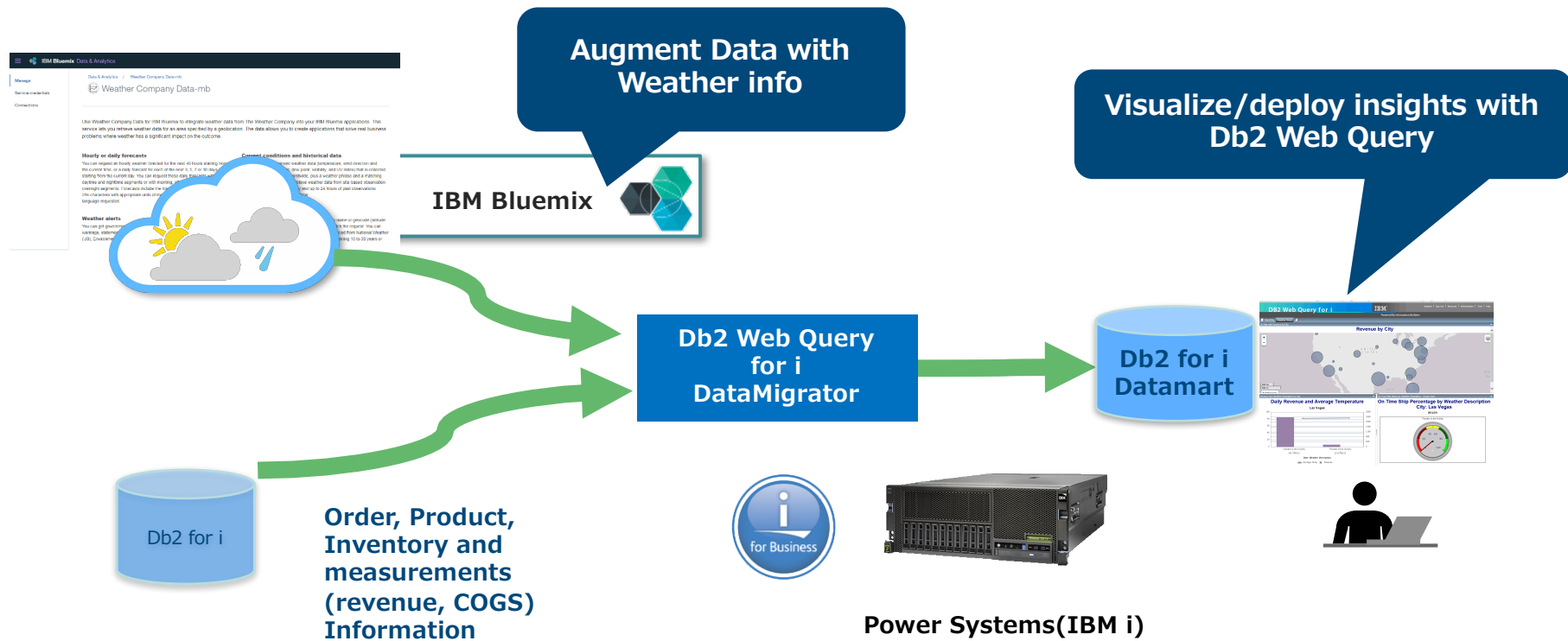
- All components run in IBM i
- Multiple load types can be defined

■ Integrated with Db2 Web Query

- Shared services and administration



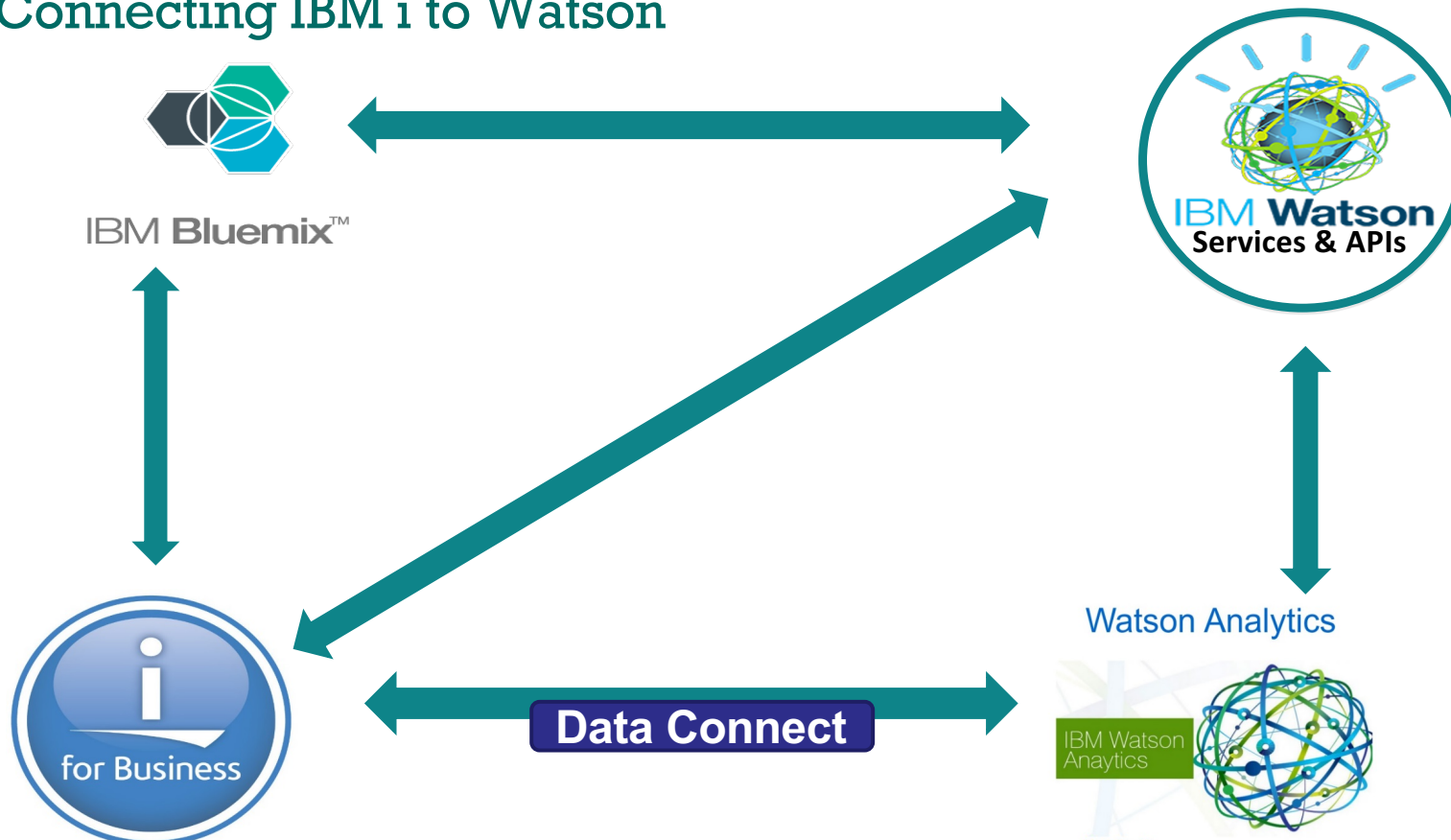
Process Schematic



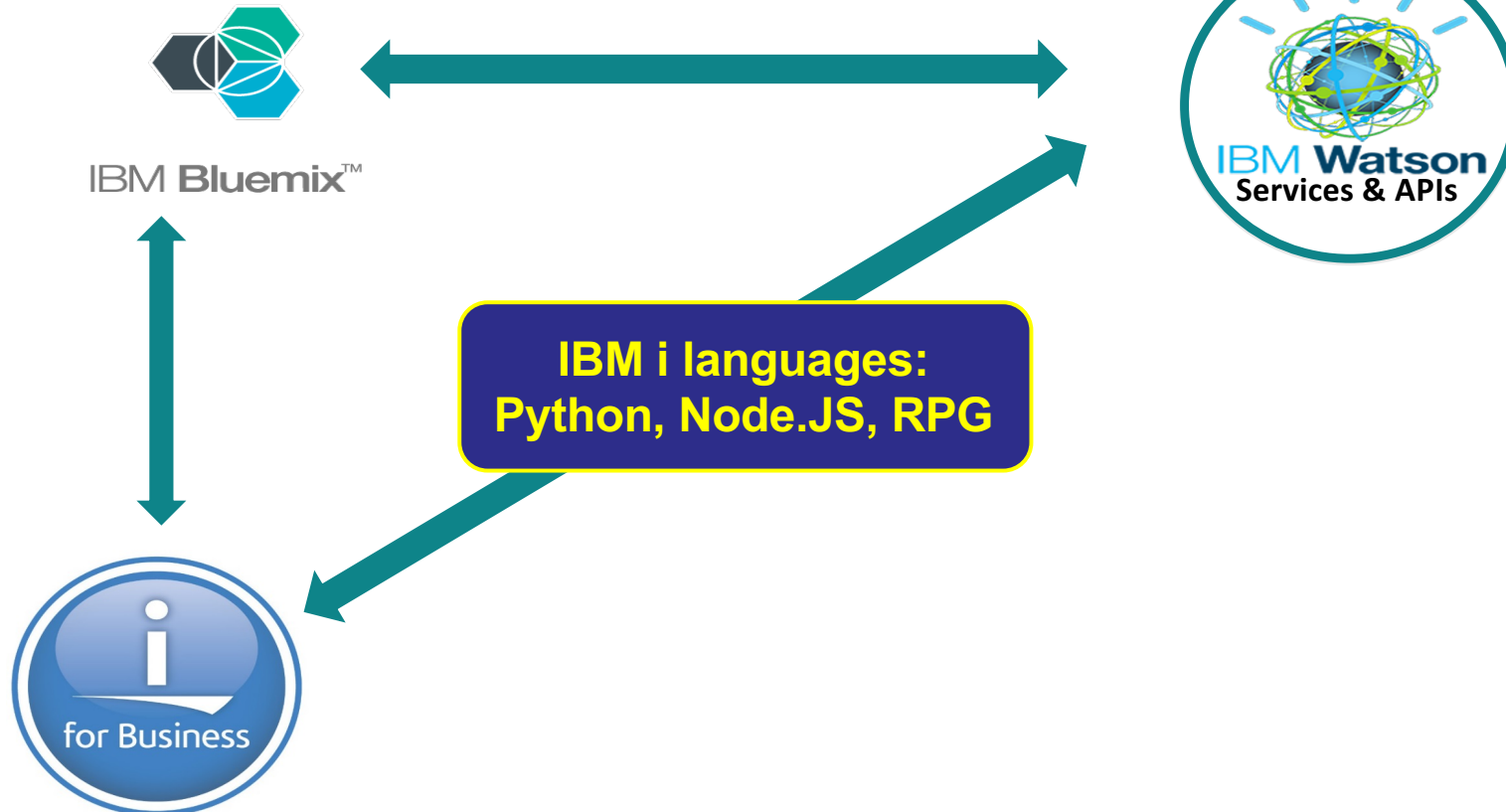


RPG and IWS and Open Source

Connecting IBM i to Watson




For the Developer...



Connecting RPG to Watson

- Details in this document
 - Paul Tuohy "RPG TALKS TO WATSON"
- <https://www.itjungle.com/2016/09/27/fhg092716-story01/>

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THE FOUR HUNDRED
Power Systems & IBM i Insight
REPRINTED FROM VOLUME 16, NUMBER 21 – September 27, 2016

RPG Talks To Watson

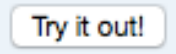
by Paul Touhy

Yes, RPG can talk to Watson. No special software required, nothing to install, nothing to configure. You just need to be on V7R1, have the ability to use embedded SQL and write just a few lines of code--none of which are complicated. To see how it works, all you have to do is copy/paste the display file and RPG code in this article, compile and call.

On the off chance that you don't know what Watson is, Watson is the IBM computer that, in 2011, competed on the U.S. quiz show *Jeopardy!* against former winners Brad Rutter and Ken Jennings. Watson won by a mile.

Wikipedia describes Watson as "a question answering (QA) computing system that IBM

Language Translator - Request URL -

- Clicked on the link for Language translation
- Under Translate/Get, Click on the option to "Translates the input text from the source language to the target language."
 - Input the following and click 
 - model_id : ja-en
 - text : This is a test.
- “Request URL” is displayed
 - https://watson-api-explorer.mybluemix.net/language-translator/api/v2/translate?model_id=en-ja&text=This%20is%20a%20test.
 - The variable parts being the from and two languages (ja-en) and the encoded text (%20 is the encoding for a space).

translate

GET /v2/translate

Parameter	Value	Description	Parameter Type	Data Type
model_id	en-ja	The unique model_id of the translation model that is used to translate text. The model_id inherently specifies source language, target language, and domain. If the model_id is specified, there is no need for the source and target parameters, and the values are ignored.	query	string
source		Used in combination with target as an alternative way to select the model for translation. When target and source are set, and model_id is not set, the system chooses a default model with the right language pair to translate (usually the model based on the news domain).	query	string
target		Used in combination with source as an alternative way to select which model is used for translation. When target and source are set, and model_id is not set, the system chooses a default model with the right language pair to translate (usually the model based on the news domain).	query	string
text	This is a test.	Input text in UTF-8 encoding. Multiple text query parameters indicate multiple	query	string

Request URL

`https://watson-api-explorer.mybluemix.net/language-translator/api/v2/translate?model_id=en-ja&text=This%20is%20a%20test.`

Response Body

これはテストです。

Provided by IBM Japan

RPG Sample Program using Watson API

- This ILE RPG sample application uses the Watson API "Language Translator"
 - Translate the original sentence with “Language Translator” and output the result on the 5250 screen

```

Watson 翻訳
言語 (1= 英語 , 2= スペイン語 , 3= フランス語 , 4= イタリア語 , 5= 日本語 )
原文の言語 : 5      訳文の言語 : 1

原文 :
この翻訳は、 Watson API を使っています。

訳文
This is translated using the Watson API.

SQLCode: 00000

F3=Exit
MA*  A           Mw           04/015
    
```

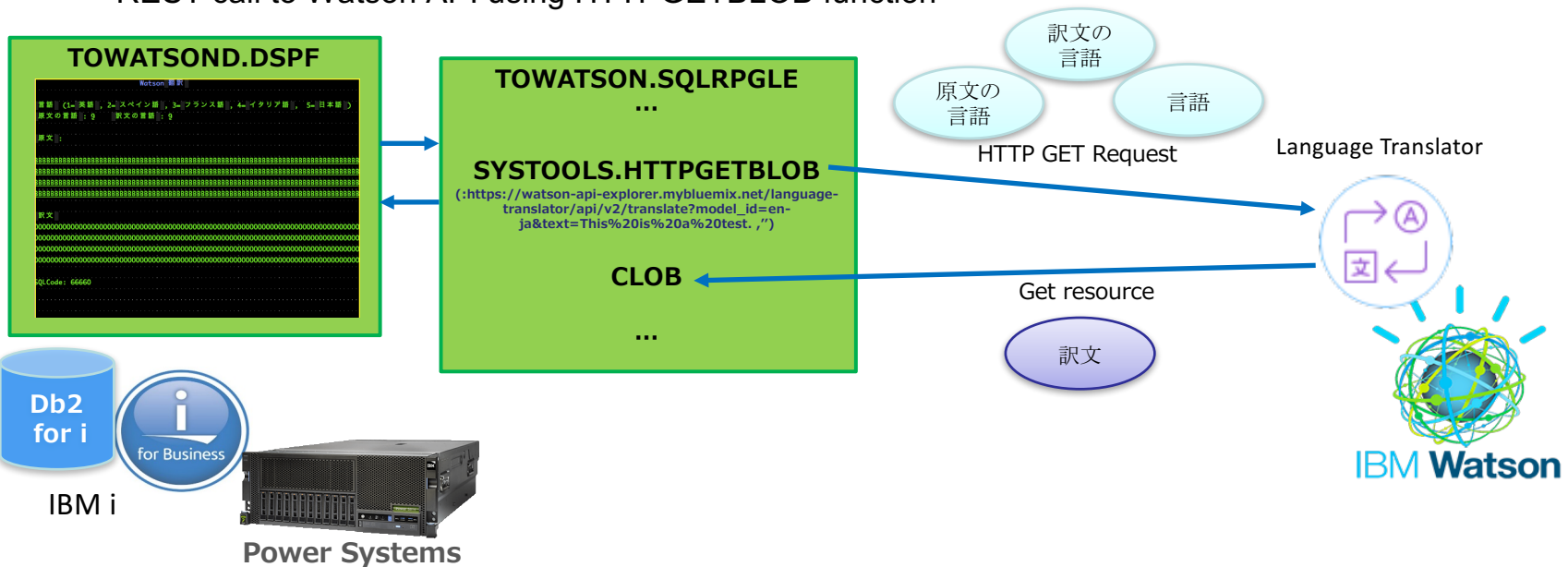
※ Not recommend that your program should be green screen, don't want anyone to get the impression that there is any special web configuration, or anything like that, involved in this process.

Provided by IBM Japan

ILE RPG Sample Program using Watson API

- Cooperative image of ILE RPG and Watson API -

- Use Db2 for i HTTP functions available on IBM i 7.1 and later
 - Provide REST HTTP method sample SQL procedure (function) in "SYSTOOLS" schema
 - REST call to Watson API using HTTPGETBLOB function



RPG Sample Program using Watson API - Display File -

- Sample source : Display File “TOWATSOND.DSPF”

- Input fields

- FROMLANG
- TOLANG
- FROMTEXT

- Output fields

- TOTEXT
- SQLCODEO

- F3 : exit the program

```

A                                     INDARA
A                                     DSPSIZ(24 80 *DS3)
A                                     CF03(03)
A          R DATAR
A                                     1 27'Watson翻訳'
A                                     COLOR(BLU)
A                                     3 1'言語 (1=英語, 2=スペイン語,'
A                                     3 35'3=フランス語, 4=イタリア語,'
A                                     3 67' 5=日本語)'
A                                     4 1'原文の言語:'
A          FROMLANG          1 0B 4 15VALUES(1 2 3 4 5)
A                                     EDTCDE(X)
A                                     4 20'訳文の言語:'
A          TOLANG          1 0B 4 34VALUES(1 2 3 4 5)
A                                     EDTCDE(X)
A                                     6 1'原文:'
A          FROMTEXT          3200 B 8 1CHECK(LC)
A                                     13 1'訳文'
A          TOTEXT          320A 0 14 1
A                                     19 1'SQLCode:'
A          SQLCODEO          5 00 19 10
A                                     24 2'F3=Exit'
A                                     COLOR(BLU)
    
```

Provided by IBM Japan

RPG Sample Program using Watson API - Main Procedure -

Sample source : ILERPG "TOWATSON.SQLRPGLE" 1/3

- A) The data structure defines an array of language codes. The codes correspond to the number entered for the from/to languages on the screen (1 = English (en), 2 = Spanish (es) etc.).
- B) The program loops through displaying the screen until F3 is pressed.
- C) On every iteration of the loop, the program calls the transLate_Text() subprocedure, passing parameters for the from language code, to language code, from text and to text.

```
**free
ctl-opt option(*srcStmt: *noDebugIO) dftactGrp(*no);
dcl-F toWatsonD workstn(*ext) usage(*input: *output) indDs(WSI);
dcl-Ds WSI qualified;
  F3Exit ind pos(3);
end-Ds;

A dcl-Ds *n;
  *n char(10) inz('enesfritja');
  lang char(2) dim(5) pos(1);
end-Ds;
exec SQL
  set option naming = *SQL;
exfmt dataR;
B dow not WSI.F3Exit;
  transLate_Text(lang(fromLang) :
C                                     lang(toLang) :
                                     fromText :
                                     toText);

SQLCode0 = SQLCODE;
exfmt dataR;
endDo;
*inLR = *on;
```

Provided by IBM Japan

RPG Sample Program using Watson API - Main Procedure -

Sample source : ILERPG "TOWATSON.SQLRPGLE" 2/3

- A) The HTTPGETCLOB function will return a CLOB. RPG does not recognize the CLOB data type so we define "textBack" as a variable with an SQL type of CLOB. When the program is compiled, this definition will result in a data structure with two sub fields – "textBack-Len" (which will contain the length of data returned) and "textBack_Data" (which will contain the data)
- B) URLENCODE is called to encode the entered text. Encoding will translate any special characters that might cause problems (like & or <) to their coded equivalent.

```
dcl-Proc translate_Text;
  dcl-Pi *n;
  fromLang char(2) const;
  toLang char(2) const;
  fromText char(320) const;
  toText char(320);
  end-Pi;
  dcl-s str1 varchar(1000);
  dcl-s str2 varchar(1000);
  A dcl-s textBack SQLType(CLOB: 320);
  if (fromLang =toLang);
    toText = fromText;
    return;
  endIf;

  str1 =%trimR(fromText);
  exec SQL
  B values trim(systools.urlencode(:str1, '')) into
  :str2;
```

Provided by IBM Japan

RPG Sample Program using Watson API - transLate_Text() Sub procedure -

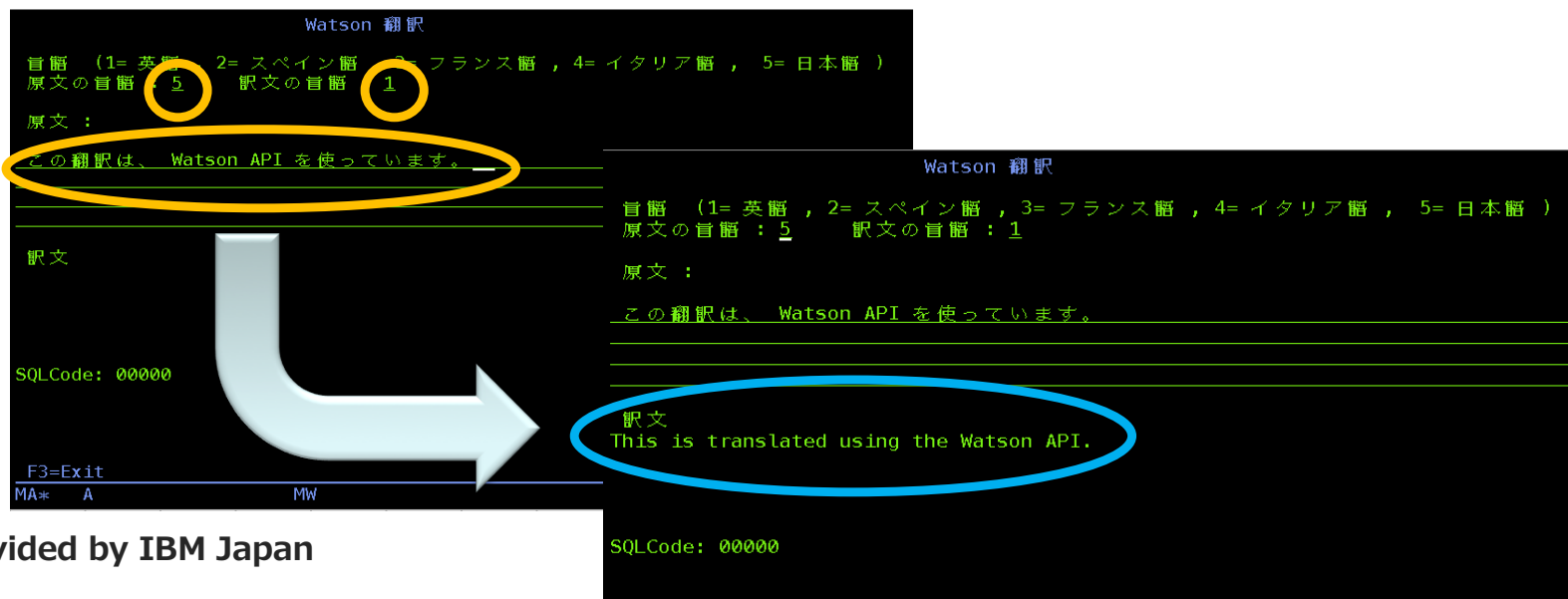
- Sample source : ILERPG "TOWATSON.SQLRPGLE" 3/3
- C) Construct the URL to make a REST call to Watson to do the translation.
- D) Use HTTPGETCLOB to make a REST call to Watson. The returned value is placed in the "textBack" CLOB defined earlier.**
- E) If data was returned, retrieve the indicated length of data "textBack_Len" from "textBack_Data".

```
C str1 ='https://watson-api-explorer.mybluemix.net/' +  
    'language-translator/api/v2/translate?model_id=' +  
    fromLang + '-' + toLang + '&text='+ str2;  
D exec SQL  
  values char(systools.httpgetclob(:str1, ''), 256)  
  into :textBack;  
  toText = *blanks;  
E if (textBack_Len >0);  
  toText =%subSt(textBack_Data: 1: textBack_Len);  
  endIf;  
  return;  
end-Proc;
```

Provided by IBM Japan

RPG Sample Program using Watson API - Call program -

- CALL TOWATSON
 - Input the parameters of "Original language", "Translation language", "Original sentence" and enter



The image displays two screenshots of an RPG program interface for Watson translation. The left screenshot shows the input screen with the following text:

```

Watson 翻訳
言語 (1= 英語 , 2= スペイン語 , 3= フランス語 , 4= イタリア語 , 5= 日本語 )
原文の言語 : 5   訳文の言語 : 1
原文 :
この翻訳は、 Watson API を使っています。
訳文
SQLCode: 00000
F3=Exit
MA*  A           MW
    
```

The right screenshot shows the output screen with the following text:

```

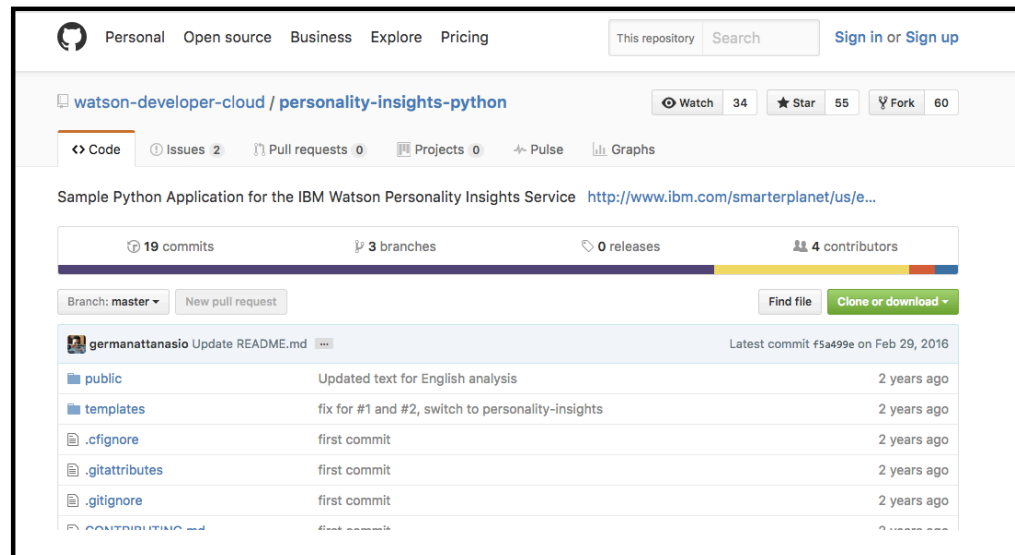
Watson 翻訳
言語 (1= 英語 , 2= スペイン語 , 3= フランス語 , 4= イタリア語 , 5= 日本語 )
原文の言語 : 5   訳文の言語 : 1
原文 :
この翻訳は、 Watson API を使っています。
訳文
This is translated using the Watson API.
SQLCode: 00000
    
```

A large blue arrow points from the input screen to the output screen, indicating the flow of the program. The original sentence and the translated output are highlighted with yellow and blue circles, respectively.

Provided by IBM Japan

Python and Watson

- IBM has published many examples of how to talk to Watson.
 - e.g. Python "Personality Insights" app
 - <https://github.com/watson-developer-cloud/personality-insights-python>



Python and Watson

[Learn more about this service](#)

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Personality Insights Python Starter Application

The Watson Personality Insights service uses linguistic analytics to extract a spectrum of cognitive and social characteristics from the text data that a person generates through text messages, tweets, posts, and more.

Keep Exploring:

[Documentation](#)

[API Details](#)

Try the service

Mr. Vice President, my old colleague from Massachusetts and your new Speaker, John McCormack, Members of the 87th Congress, ladies and gentlemen:

This week we begin anew our joint and separate efforts to build the American future. But, sadly, we build without a man who linked a long past with the present and looked strongly to the future. "Mister Sam" Rayburn is gone. Neither this House nor the Nation is the same without him.

6437 words

Clear

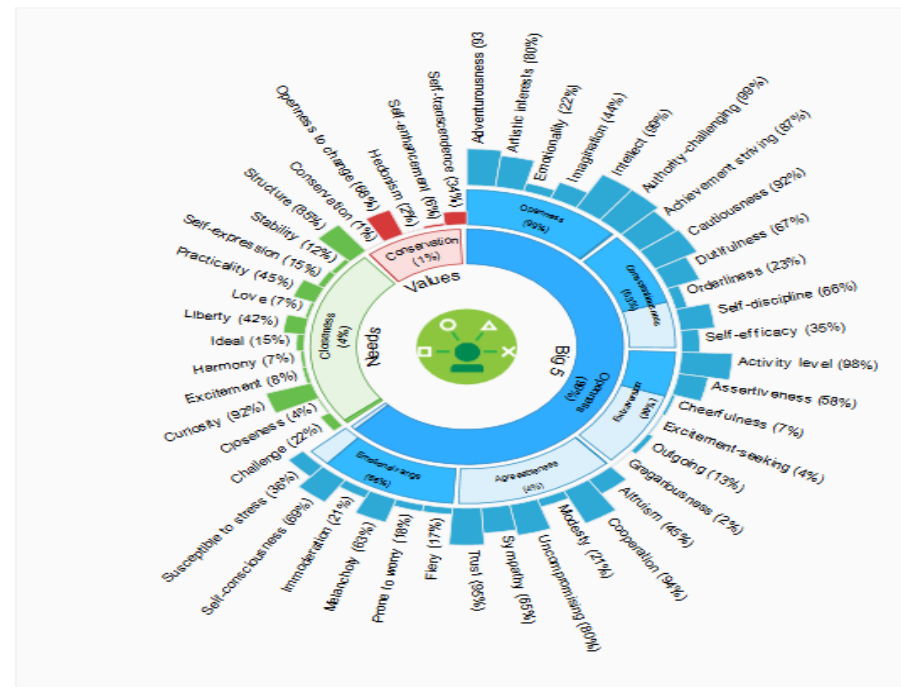
Analyze

Python and Watson

Data Behind Your Personality

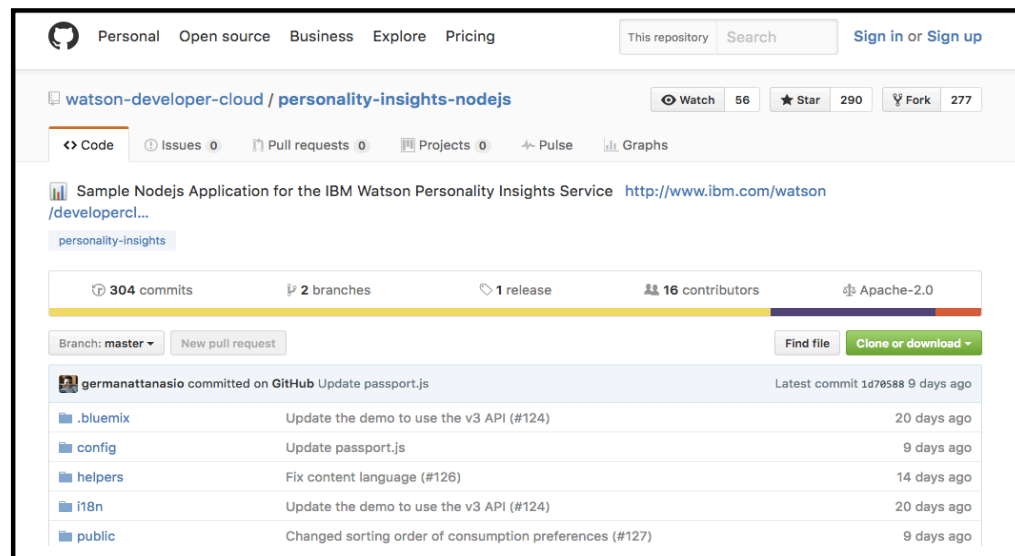
Name	Value ± Sampling Error
Big 5	
Openness	99% (± 5%)
Adventurousness	93% (± 5%)
Artistic interests	80% (± 10%)
Emotionality	21% (± 4%)
Imagination	44% (± 6%)
Intellect	99% (± 5%)
Authority-challenging	98% (± 8%)
Conscientiousness	63% (± 7%)
Achievement striving	87% (± 9%)
Cautiousness	92% (± 9%)
Dutifulness	66% (± 5%)
Orderliness	23% (± 6%)
Self-discipline	66% (± 4%)
Self-efficacy	34% (± 9%)
Extraversion	39% (± 5%)
Activity level	98% (± 7%)
Assertiveness	57% (± 8%)
Cheerfulness	7% (± 10%)
Excitement-seeking	3% (± 8%)
Outgoing	12% (± 7%)
Gregariousness	2% (± 5%)

Visualization of Personality Data



Node.JS and Watson

- Personality Insights
 - Node.JS version
 - Output in a different format
 - <https://github.com/watson-developer-cloud/personality-insights-nodejs>



Node.JS and Watson

Summary

You are shrewd, excitable and guarded.

You are dispassionate: you do not frequently think about or openly express your emotions. You are independent: you have a strong desire to have time to yourself. And you are reserved: you are a private person and don't let many people in.

Your choices are driven by a desire for organization.

You are relatively unconcerned with both taking pleasure in life and tradition. You prefer activities with a purpose greater than just personal enjoyment. And you care more about making your own path than following what others have done.

[How did we get this?](#)

You are likely to _____

- be sensitive to ownership cost when buying automobiles
- like historical movies
- read often

You are unlikely to _____

- be influenced by social media during product purchases
- prefer style when buying clothes
- be influenced by brand name when making product purchases

Personality **% = percentile

Openness 96%

Emotional range 95%

Conscientiousness 78%

Consumer Needs **% = percentile

Structure 90%

Practicality 76%

Curiosity 75%

Values **% = percentile




Stimulation 41%




Helping others 16%

Achievement 12%

Node.JS and Watson

Tweets and Replies Body of Text Your Twitter Personality

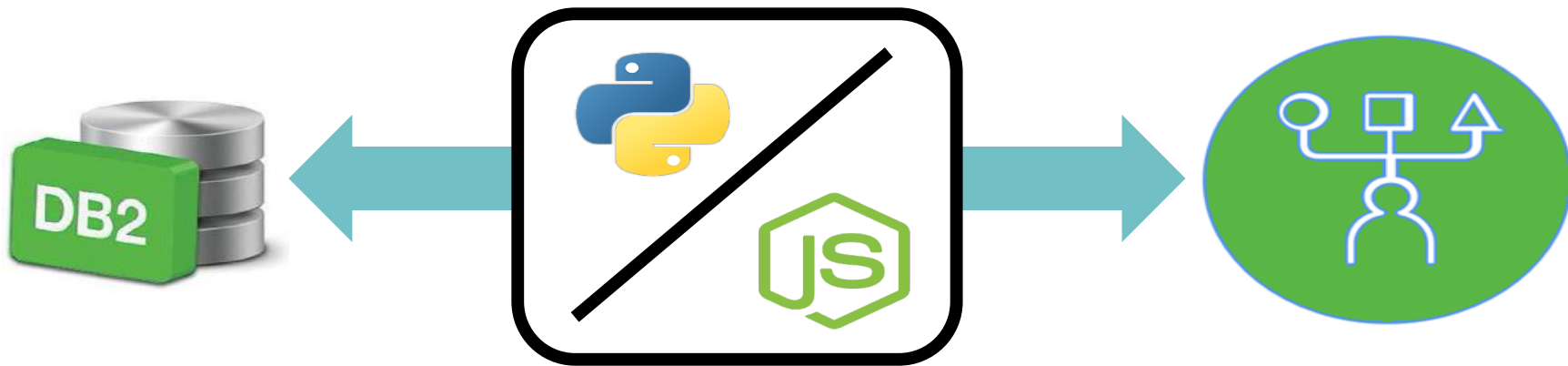
Choose:  @Oprah (EN)  @KingJames (EN)  @DonFranciscoTV (ES)

 @pontifex_es (ES)  @trikaofficial (AR)  @faridyu (JA)

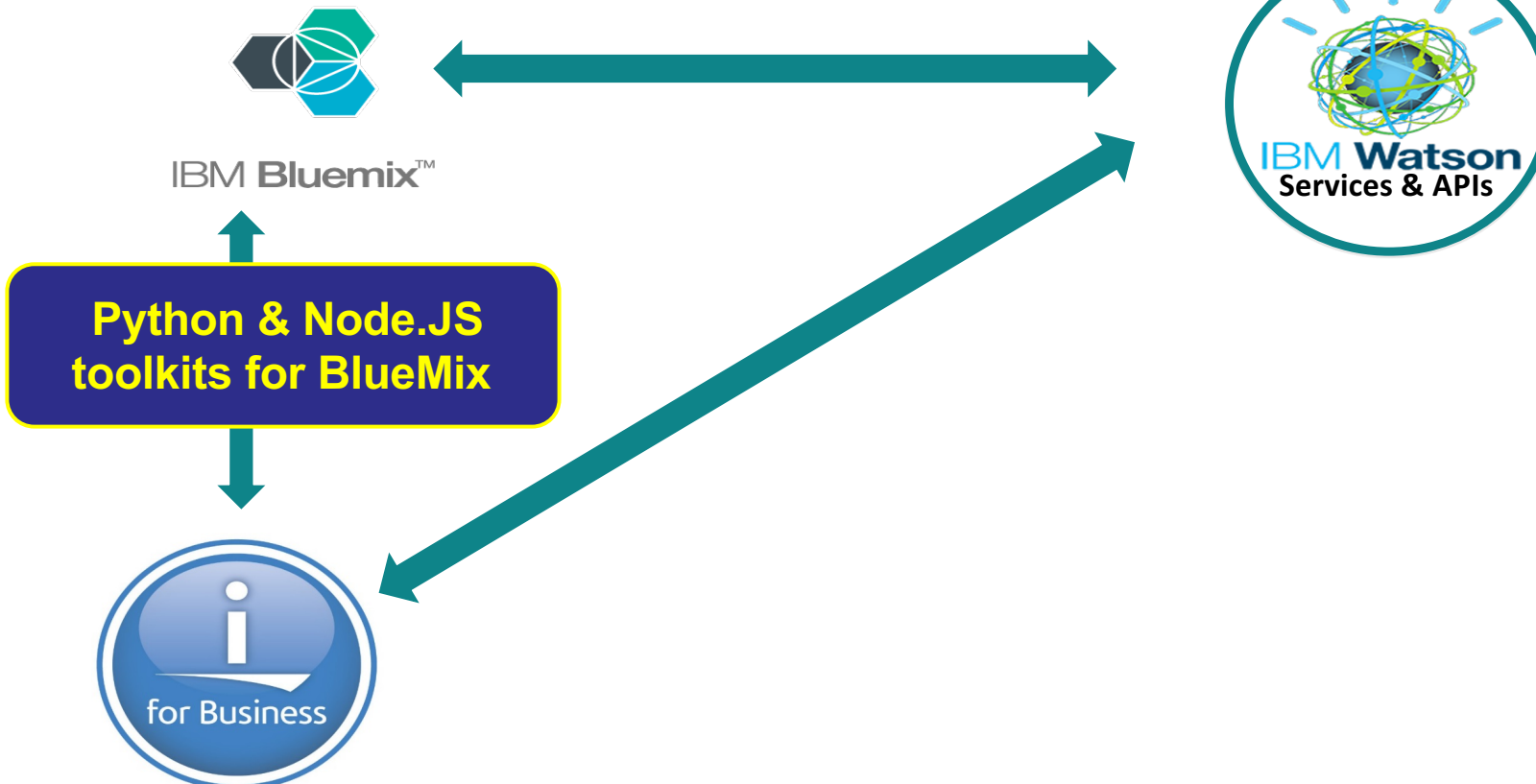
Analyze

Can Node.JS and Python programs integrate with IBM i data? YES!

- IBM i integration delivered with the languages
- Watson integration delivered with the languages

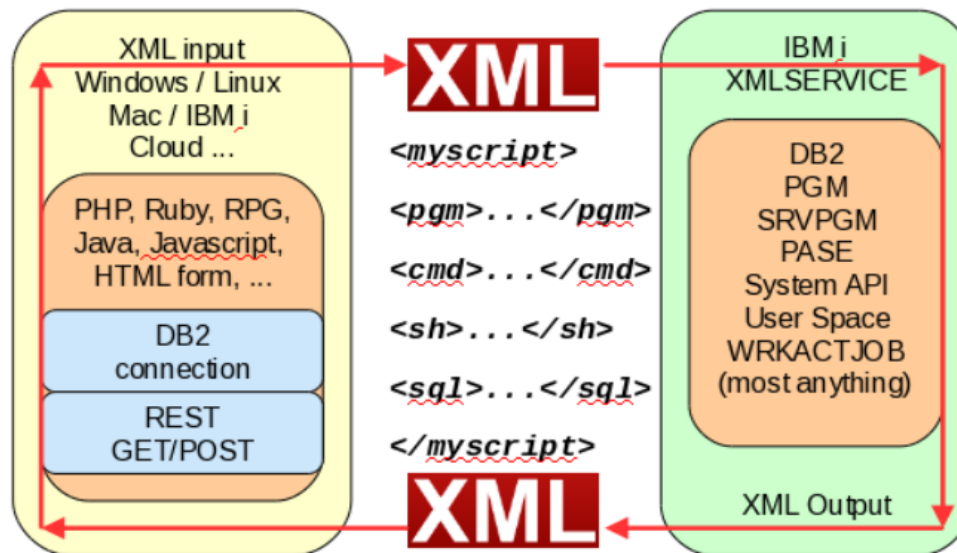


For the Developer...



Enabling easy extension of OSS for IBM i - XMLService

- Allows access to IBM i programs, service programs, shell commands, and even Db2!
- Can be called locally or remotely, stateful or stateless, very flexible!
- Toolkits are written for several languages, to make it even easier!

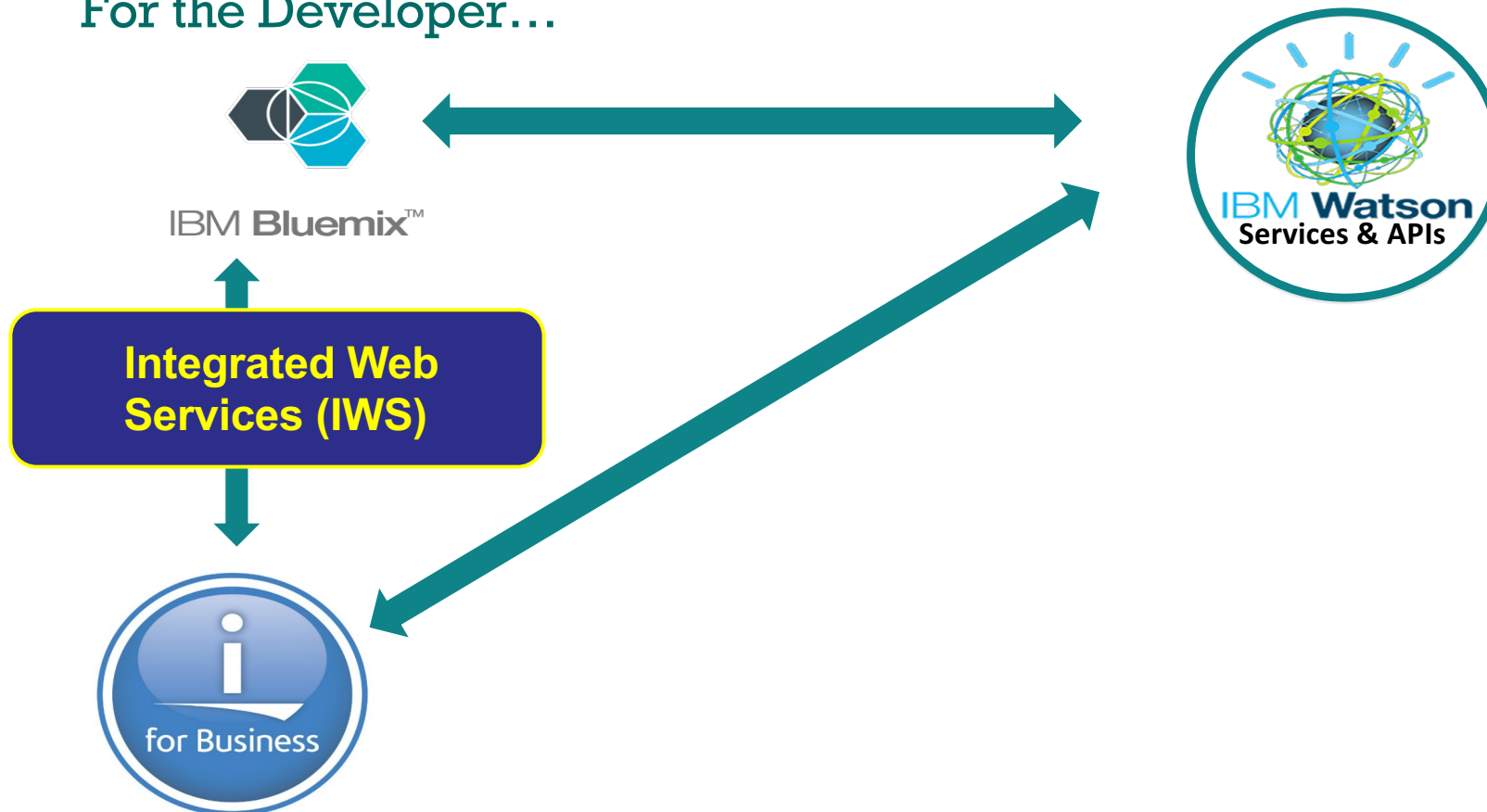


Python and Node.JS toolkits

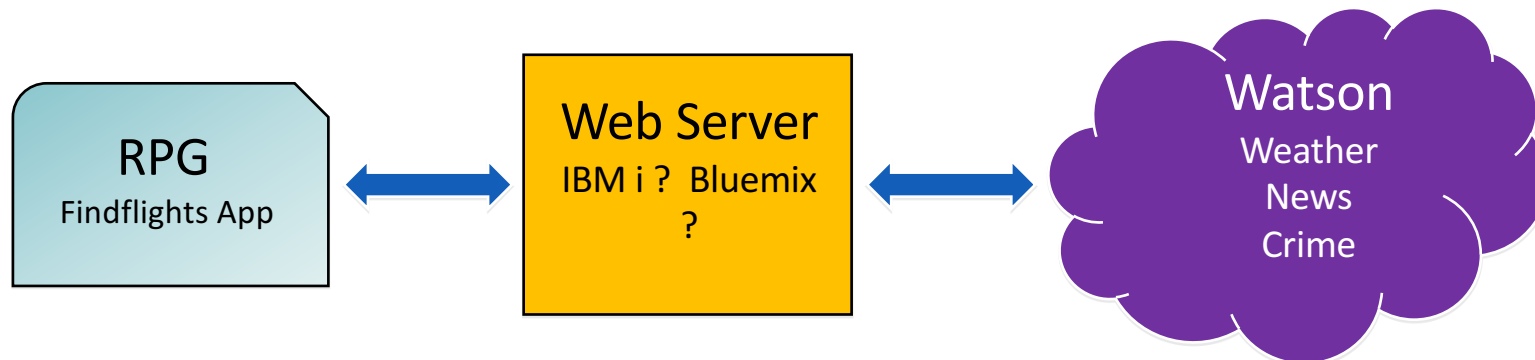
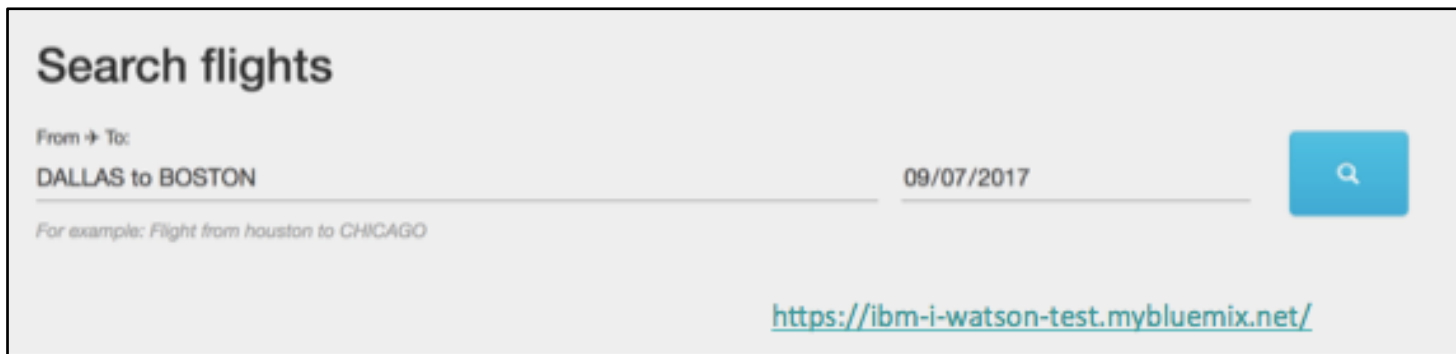
- Node.JS toolkit
 - <https://bitbucket.org/litmis/nodejs-itoolkit>

- Python itoolkit-lite
 - <http://yips.idevcloud.com/wiki/index.php/XMLSERVICE/Python>
 - <https://bitbucket.org/litmis/python-itoolkit>

For the Developer...

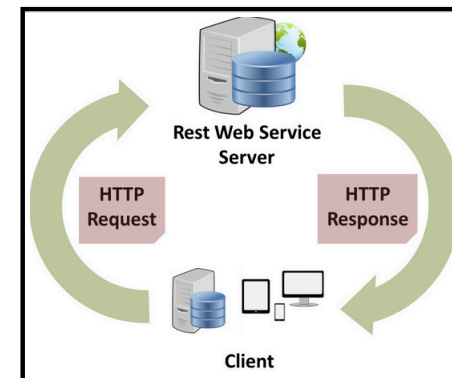


Using a REST API with Watson



Integrated Web Services (IWS) server enables IBM i APIs

- IWS Integrated in IBM i
 - First delivered in 2008 – SOAP only
- Since 2016 also delivers RESTful APIs with Open API specifications
- Wizard based creation
 - intuitive web-based graphical interface – just point and click
 - developers with or without IBM i skills can create RESTful APIs
- No new programming languages or development environments to learn
- Supports standard JSON and XML message formats
 - Translates to and from format of IBM i programs



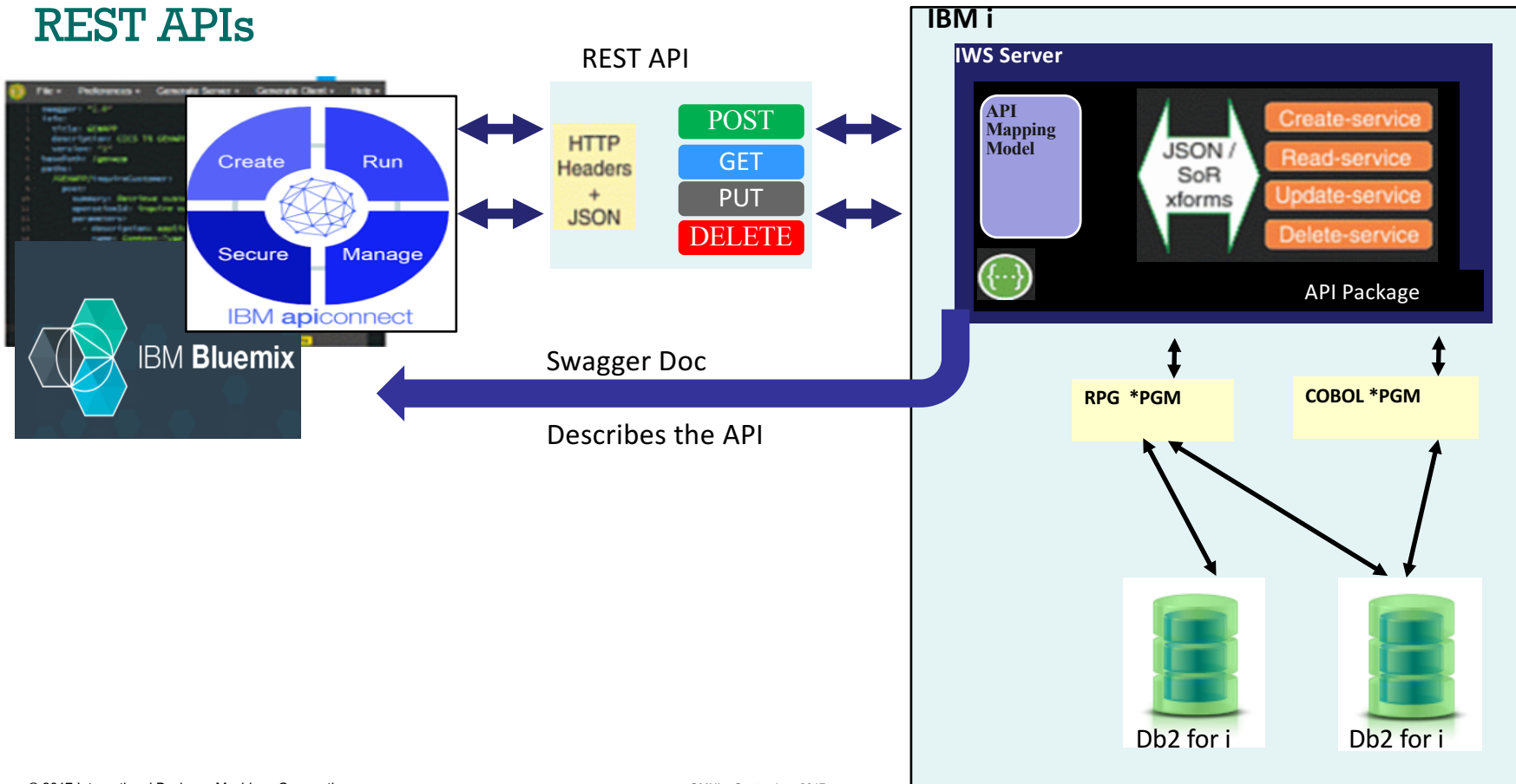
Note: z/OS Connect is comparable to what IBM i has but IBM i easier to use and seems to be a nicer way to deploy programs as RESTful web services (based on AIX development comments)

Swagger is the key to integration

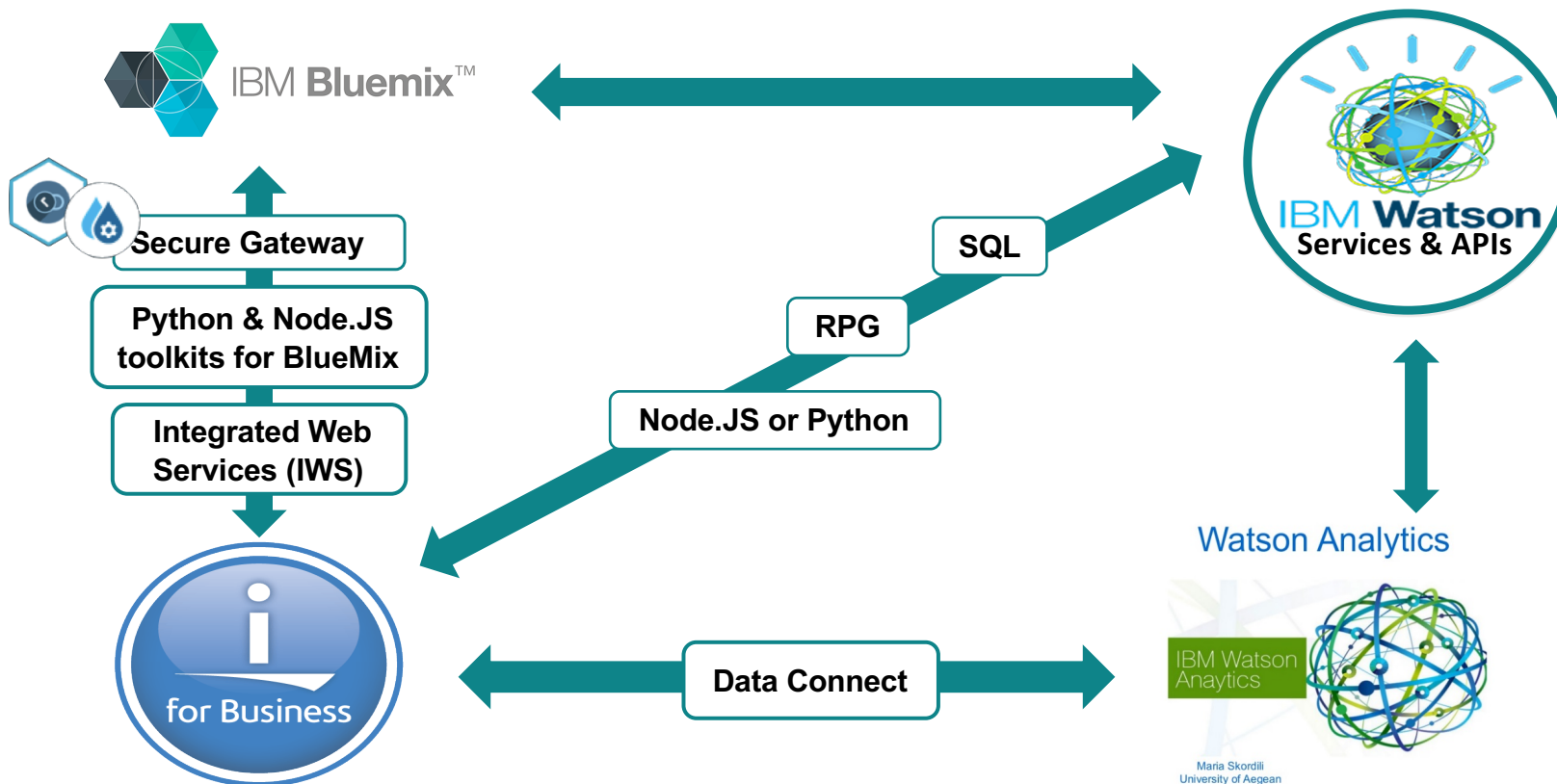


- A Swagger document is the REST API equivalent of a WSDL document for a SOAP-based web service
 - Specifies the list of resources that are available in the REST API and the operations that can be called on those resources
 - Specifies the list of parameters to an operation, including the name and type of the parameters
- Delivered on IWS end of 2016 (@ IBM i 7.1 and higher)
- Allows IBM i RESTful APIs to be exposed in various platforms, such as **IBM Bluemix Platform** and **IBM API Connect**

REST APIs
















Connecting IBM i to Watson



Watson Resources

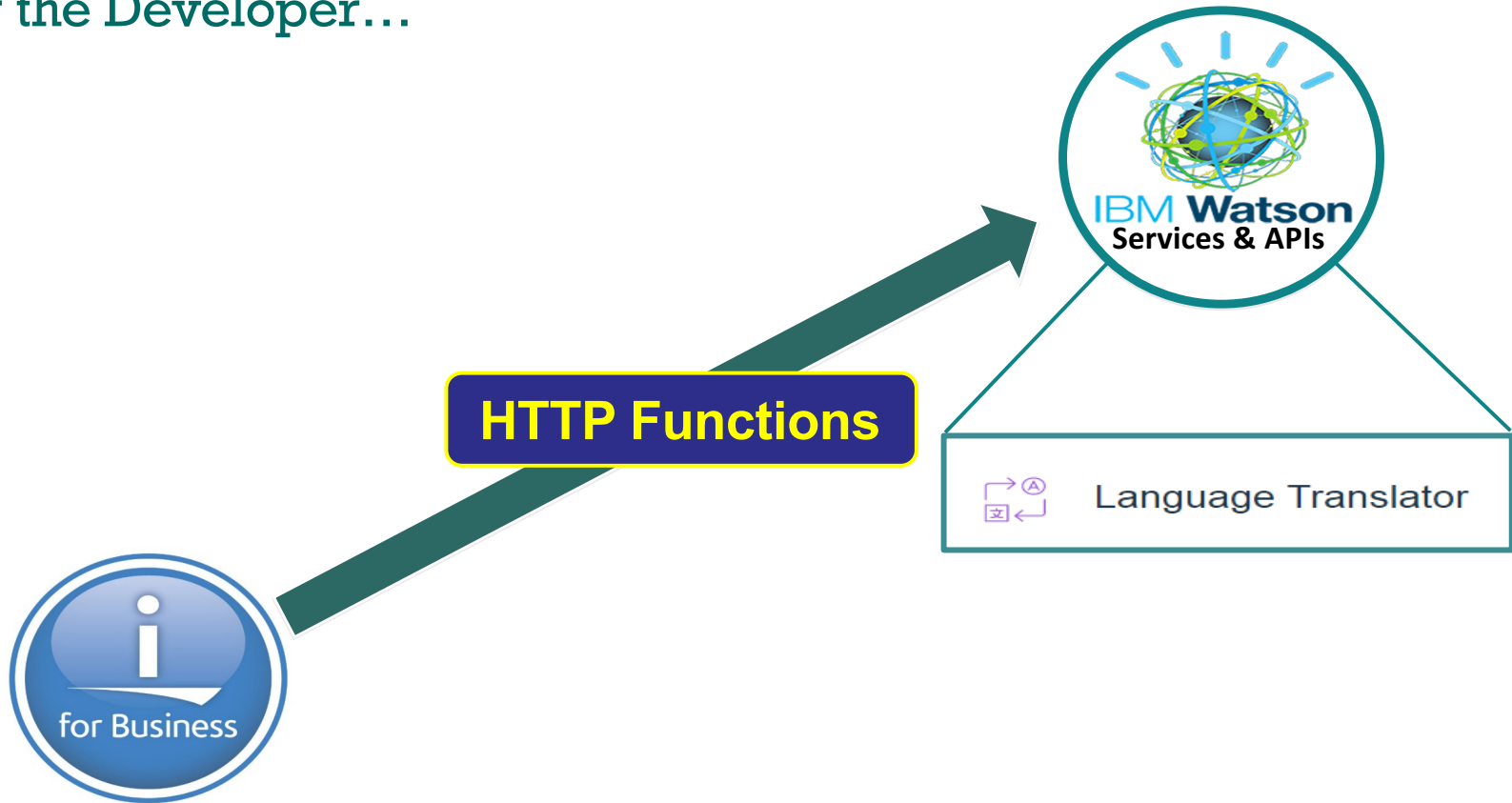
Use IBM Watson’s Language, Vision, Speech and Data APIs, directly from IBM i

<p>Language</p>	<ul style="list-style-type: none">  Natural Language Classifier Classify text sentences  Conversation Automate interaction with end users by adding natural language interface to application  Personality Insights Estimate an individual's characteristics from text  Tone Analyzer (Unsupported Japanese) Analyze text emotion, sociability and style 	<ul style="list-style-type: none">  Retrieve and Rank Return answer candidates for natural language questions  Document Conversion Convert a document to a new format  Natural Language Understanding (Unsupported Japanese) understand the language of short texts and make predictions about how to handle them.  Language Translator (Partially Unsupported Japanese) ※1 Translate text from one language to another
<p>Vision</p>	<ul style="list-style-type: none">  Visual Recognition Detect meaning included in image contents 	
<p>Speech</p>	<ul style="list-style-type: none">  Speech to Text Convert speech to text 	<ul style="list-style-type: none">  Text to Speech Convert text to speech
<p>Data Insights</p>	<ul style="list-style-type: none">  Discovery (Unsupported Japanese) Add cognitive search and content analysis engines to applications to identify patterns, trends, and actionable insights that help to make better decisions  Tradeoff Analytics (Unsupported Japanese) Support to make better choices when faced with multiple 	

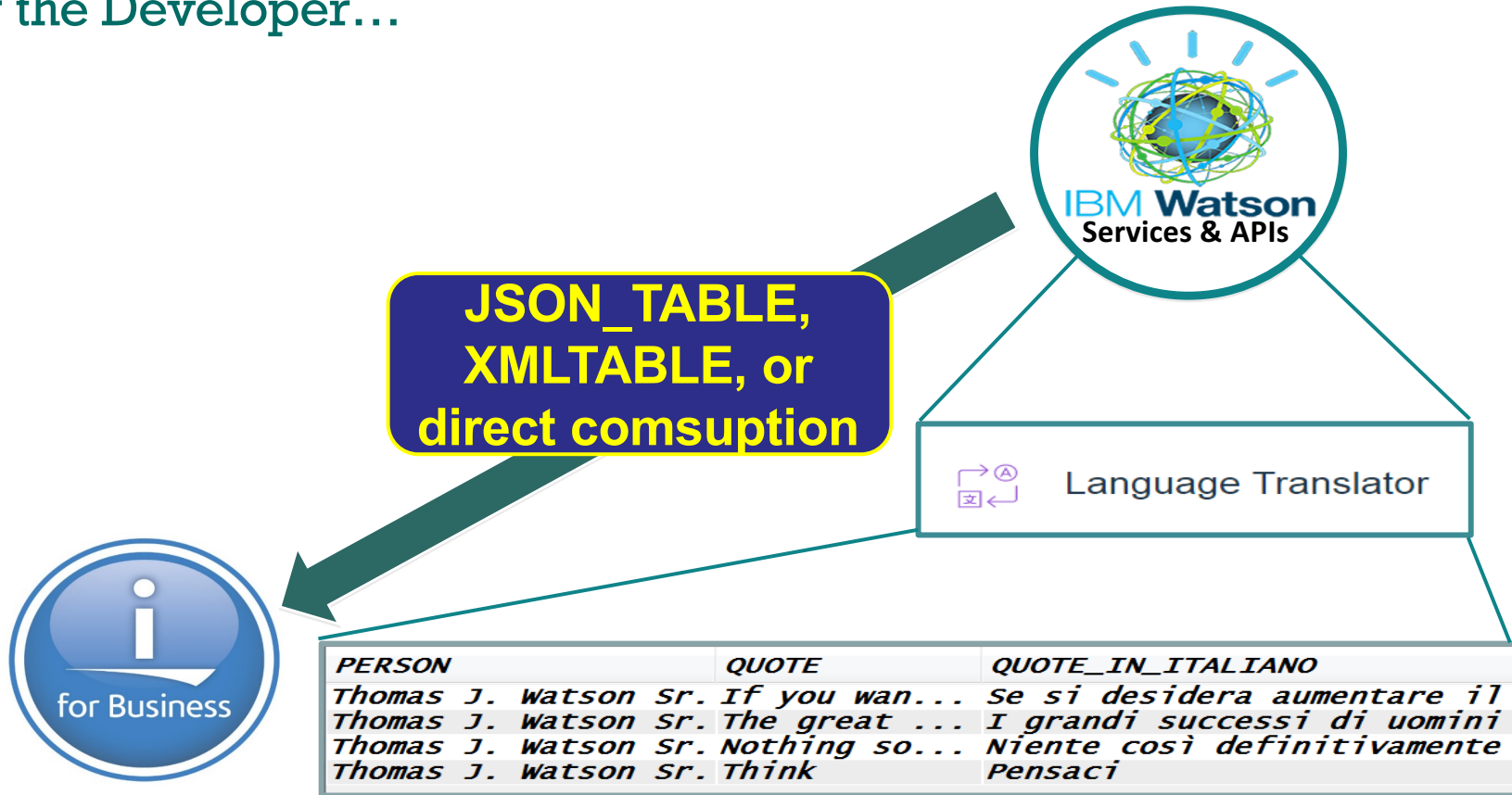


HTTP Functions, JSON_TABLE, & Watson Services

For the Developer...



For the Developer...



Watson's Language Translator

Visit this site for complete pricing details:

<https://www.ibm.com/watson/developercloud/language-translator.html#pricing-block>

PRICING

Standard Plan

250,000 characters FREE for standard translations*

\$0.02/thousand characters after the first 250,000

Includes News, Conversational, and Patent models

Advanced Plan

\$0.02/thousand characters for standard translations**

Custom Model Translations
- \$0.10/thousand characters

Custom Model Maintenance
- \$15.00/model/month, pro-rated daily

Premium

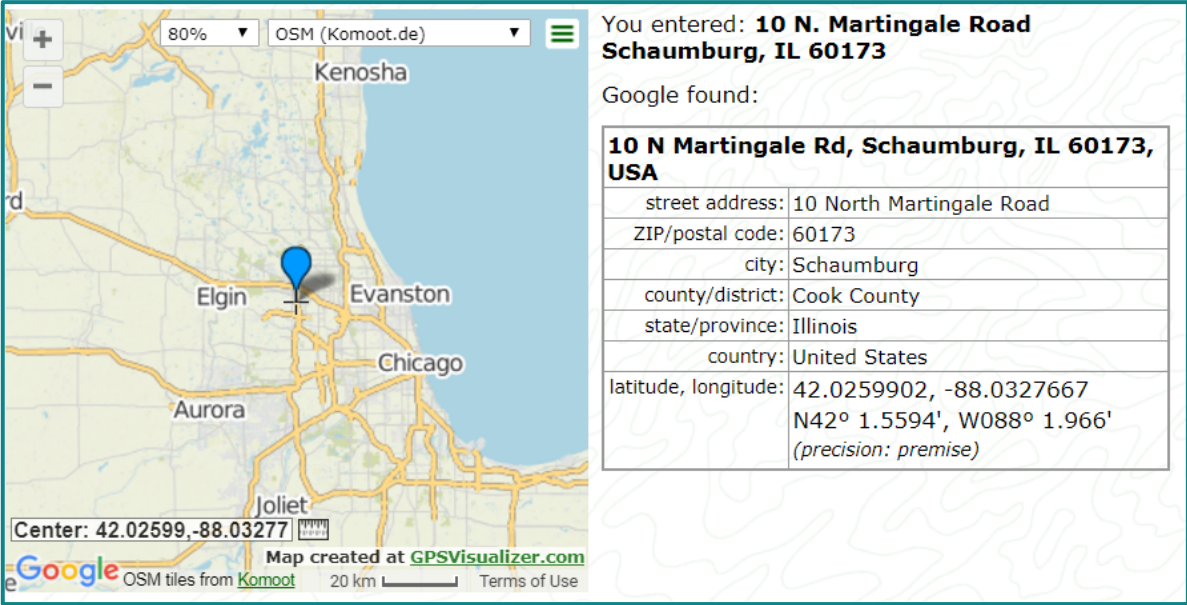
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[Click here to find out more](#)

OMNI Conference @ IBM Schaumburg

- www.gpsvisualizer.com/geocode
(or choose your fave)
- With the geocode, we can query Bluemix's Weather Channel using SQL



You entered: **10 N. Martingale Road Schaumburg, IL 60173**

Google found:

10 N Martingale Rd, Schaumburg, IL 60173, USA	
street address:	10 North Martingale Road
ZIP/postal code:	60173
city:	Schaumburg
county/district:	Cook County
state/province:	Illinois
country:	United States
latitude, longitude:	42.0259902, -88.0327667 N42° 1.5594', W088° 1.966' <i>(precision: premise)</i>

Center: 42.02599,-88.03277

Map created at GPSVisualizer.com

Google OSM tiles from Komoot 20 km Terms of Use

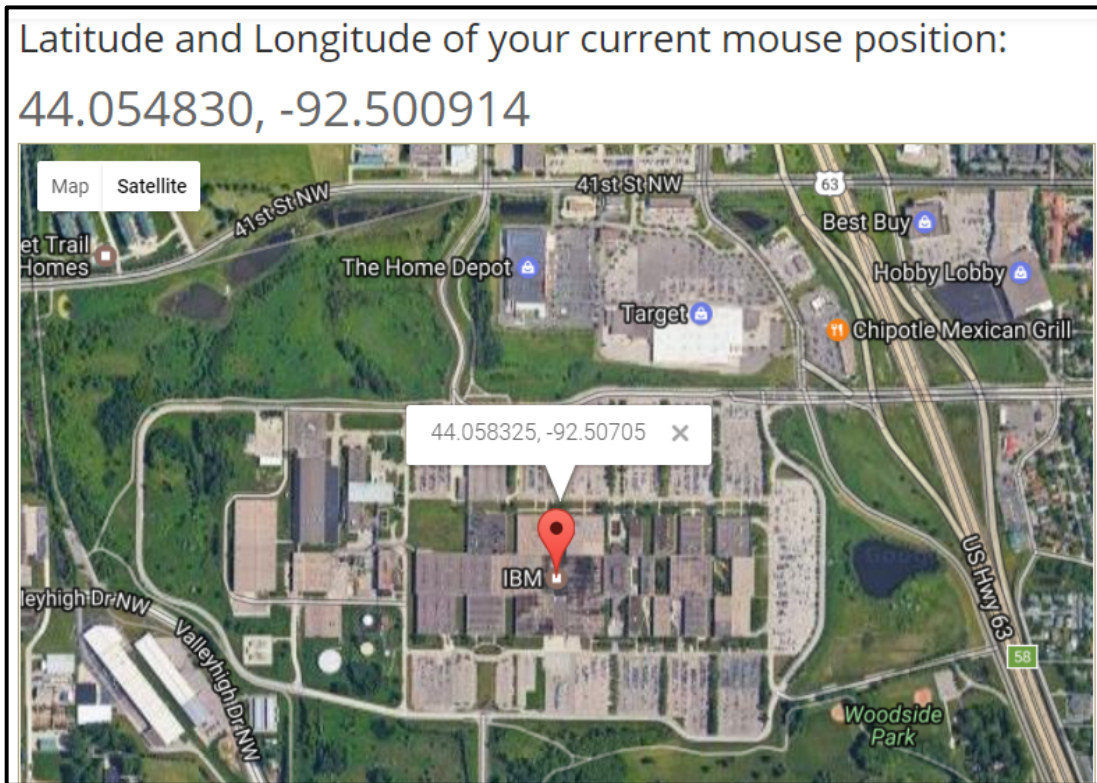
Weather Almanac – OMNI Conference @ IBM Schaumburg

```
-- Return almanac detail...
SELECT * FROM JSON_TABLE(
  SYSTOOLS.HTTPGETCLOB('https://' concat weatherCo.username concat
    ':' concat weatherCo.password concat '@' concat
    'twcservice.mybluemix.net/api/weather/v1/geocode/' concat
    weatherCo.latitude concat '/' concat weatherCo.longitude concat
    '/almanac/daily.json?start=0918&end=0920&units=e', ''),
  '$' COLUMNS( NESTED PATH '$."almanac_summaries"[*]' COLUMNS(
    "almanac_dt" VARCHAR(4), "avg_hi"      DECIMAL(4,1),
    "avg_lo"      DECIMAL(4,1), "record_lo" DECIMAL(4,1) ))) AS X ;
```

<i>almanac_dt</i>	<i>avg_hi</i>	<i>avg_lo</i>	<i>record_lo</i>	<i>avg_precip</i>	<i>avg_snow</i>
<i>0918</i>	<i>74.0</i>	<i>53.0</i>	<i>40.0</i>	<i>0.10</i>	<i>0.00</i>
<i>0919</i>	<i>74.0</i>	<i>53.0</i>	<i>40.0</i>	<i>0.11</i>	<i>0.00</i>
<i>0920</i>	<i>73.0</i>	<i>52.0</i>	<i>36.0</i>	<i>0.11</i>	<i>0.00</i>

Large User Group – January 2018 meeting

- Contrast the CEC event with the LUG event
- January in Minnesota is an “interesting” time for weather
- Change the Geocode global variables & start and end dates



Large User Group – January 2018 meeting

```
-- Return almanac detail... LUG event in Rochester, MN USA
SELECT * FROM JSON_TABLE(
  SYSTOOLS.HTTPGETCLOB('https://' concat weatherCo.username concat
    ':' concat weatherCo.password concat '@' concat
    'twcservice.mybluemix.net/api/weather/v1/geocode/' concat
    weatherCo.latitude concat '/' concat weatherCo.longitude concat
    '/almanac/daily.json?start=0121&end=0126&units=e', ''),
  '$' COLUMNS( NESTED PATH '$.almanac_summaries[*]' COLUMNS(
    "almanac_dt" VARCHAR(4), "avg_hi" DECIMAL(4,1),
    "avg_lo" DECIMAL(4,1), "record_lo" DECIMAL(4,1) ))) AS X ;
```

<i>almanac_dt</i>	<i>avg_hi</i>	<i>avg_lo</i>	<i>record_lo</i>	<i>avg_precip</i>	<i>avg_snow</i>
0121	24.0	7.0	-39.0	0.02	0.40
0122	24.0	7.0	-37.0	0.02	0.40
0123	24.0	7.0	-34.0	0.02	0.40
0124	24.0	8.0	-34.0	0.02	0.40
0125	24.0	8.0	-23.0	0.02	0.50
0126	24.0	8.0	-30.0	0.02	0.40



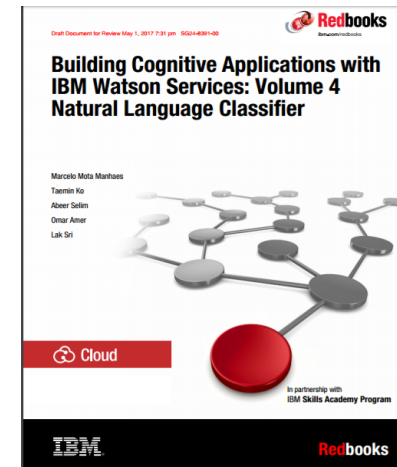
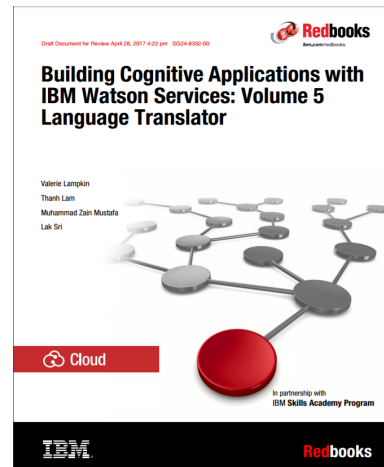
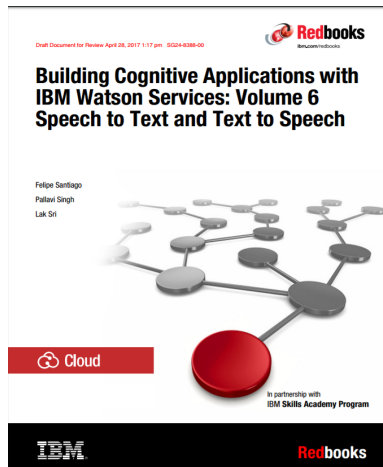


Wrap up and demo

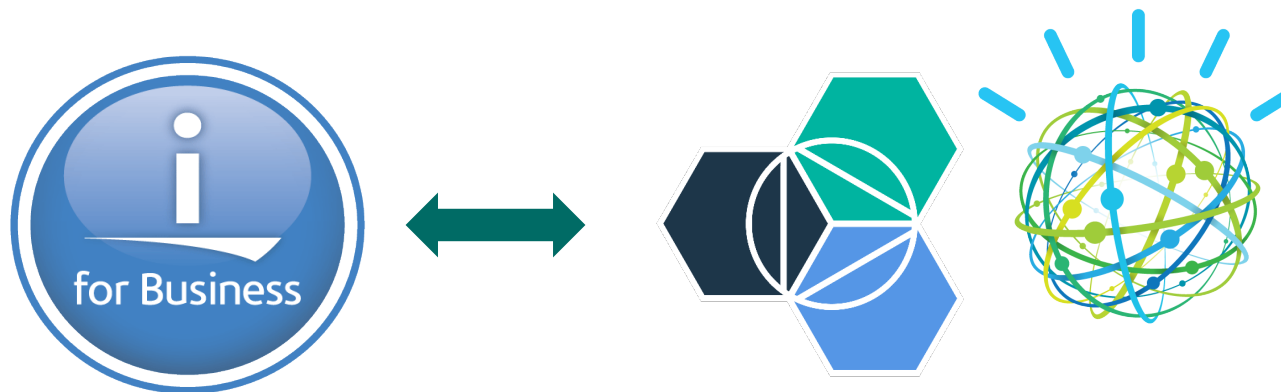
Watson Resources

- “How to” Redbooks on Watson
- Some are “*hot*” off the presses

<https://www.redbooks.ibm.com/Redbooks.nsf/domains/watson?Open>



IBM i Driveway to Watson



- Pilot event held September 6 & 7, 2017
- 30+ Attendees
- Technical details for using BlueMix and Watson with IBM i
- Mix of Education and Workshop style
- We expect this event to be repeated
- <http://www.common.org/events/ibm-i-driveway-watson/>

Thank You

Cognitive Systems 

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Revised September 26, 2006

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