Power Week

Université IBM i 2019

22 et 23 mai

IBM Client Center Paris

S29 – Préparez vos données DB2 for i pour l'IA et Watson

Pascal POLVERINI et Pascal BLANDIN
ITHEIS et FRESCHE Solutions
pascal.Polverini@freschesolutions.com
pascal.blandin@itheis.com

itheis

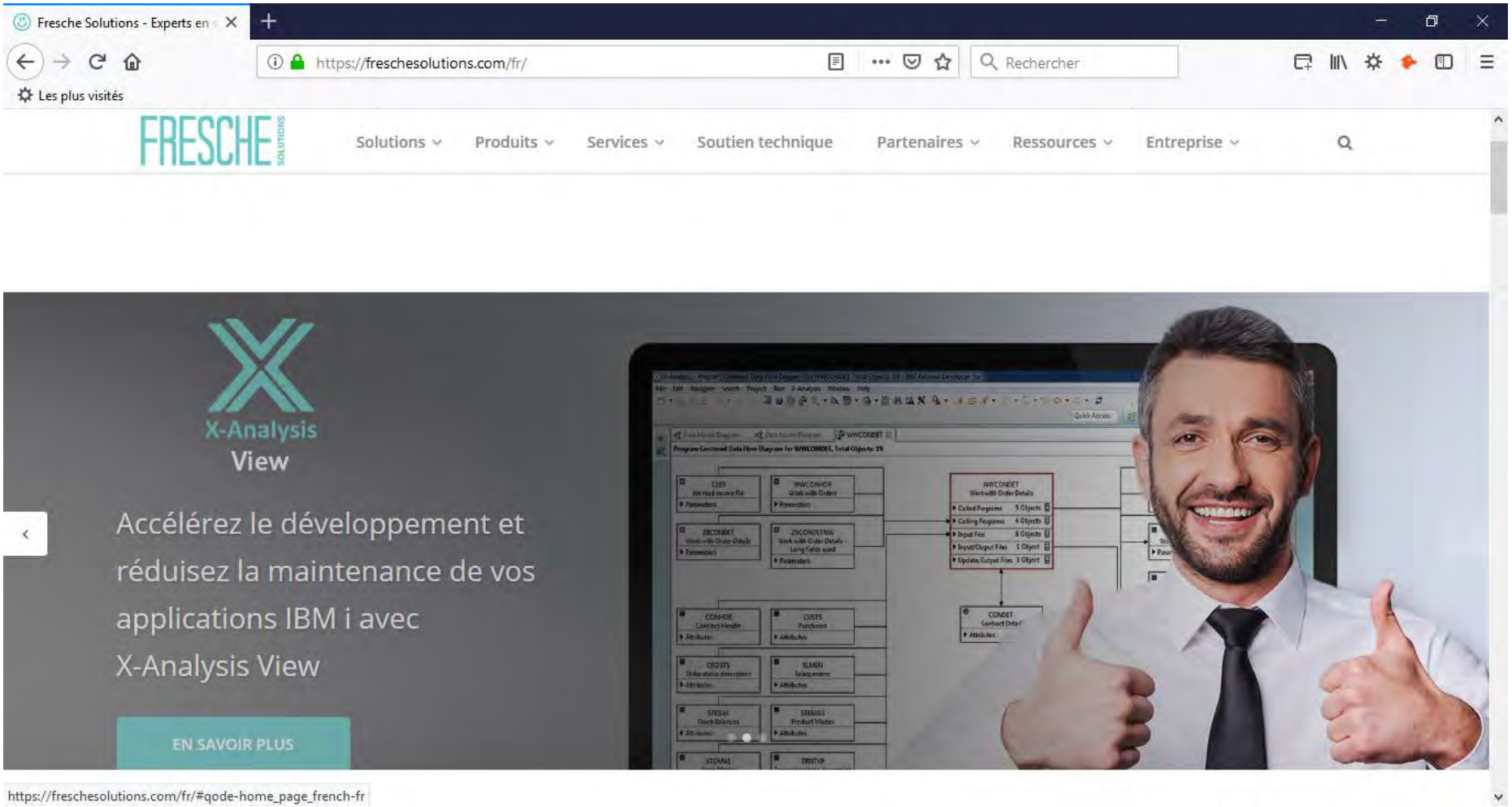
Préparez votre DB2 pour Watson

- 11:00 Pascal BLANDIN, ITHEIS
  - Introduction et agenda
- 11:05 Pascal BLANDIN, ITHEIS
  - Préparez vos données DB2 for i
- 11:20 Pascal POLVERINI, FRESCHE Solutions
  - IA Watson
- 11:50 Questions réponses
- 12:00 Conclusions

ITHEIS : Acteur de la transformation IBMi

itheis

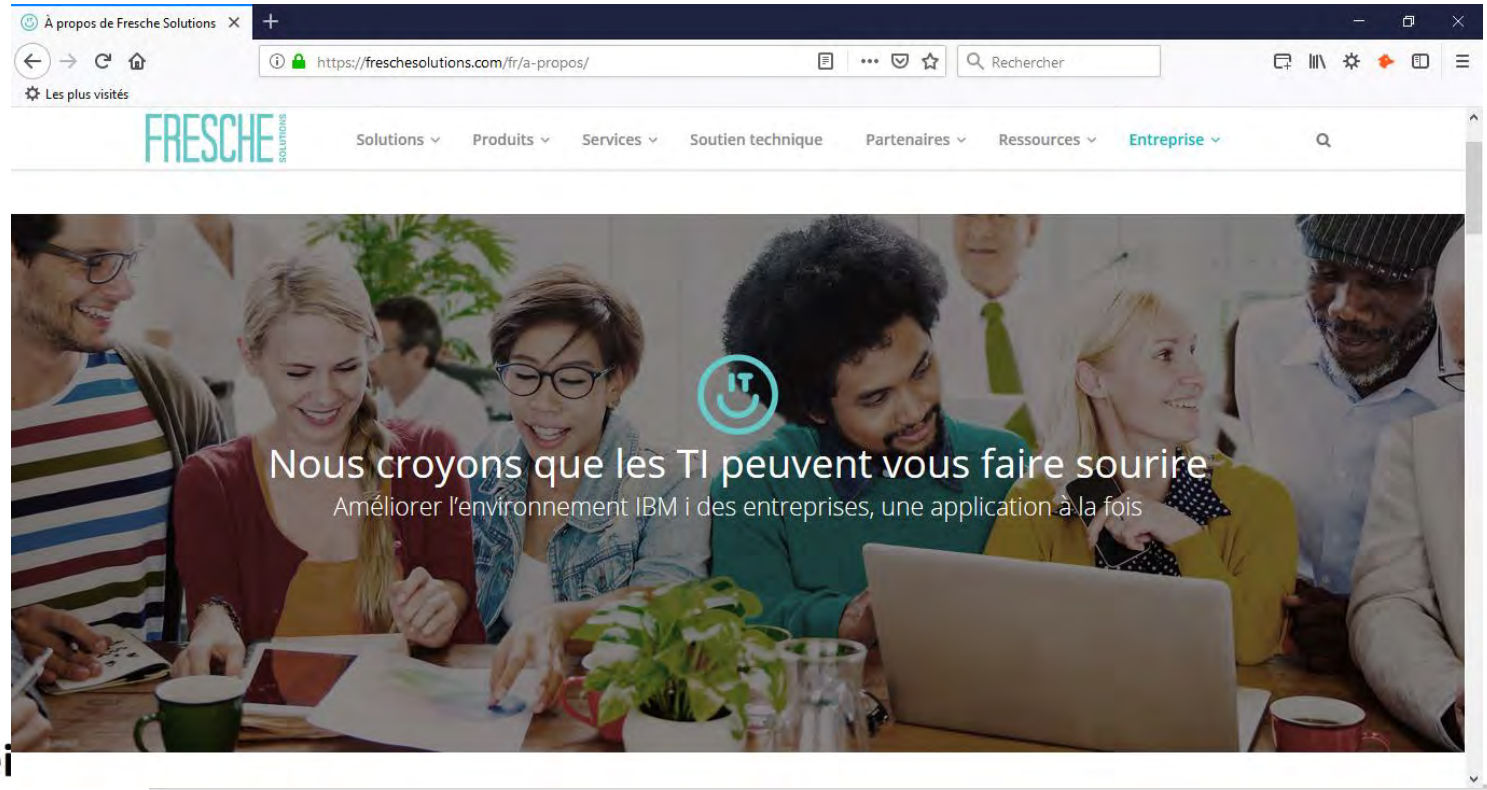
FRESCHE Solutions :



itheis

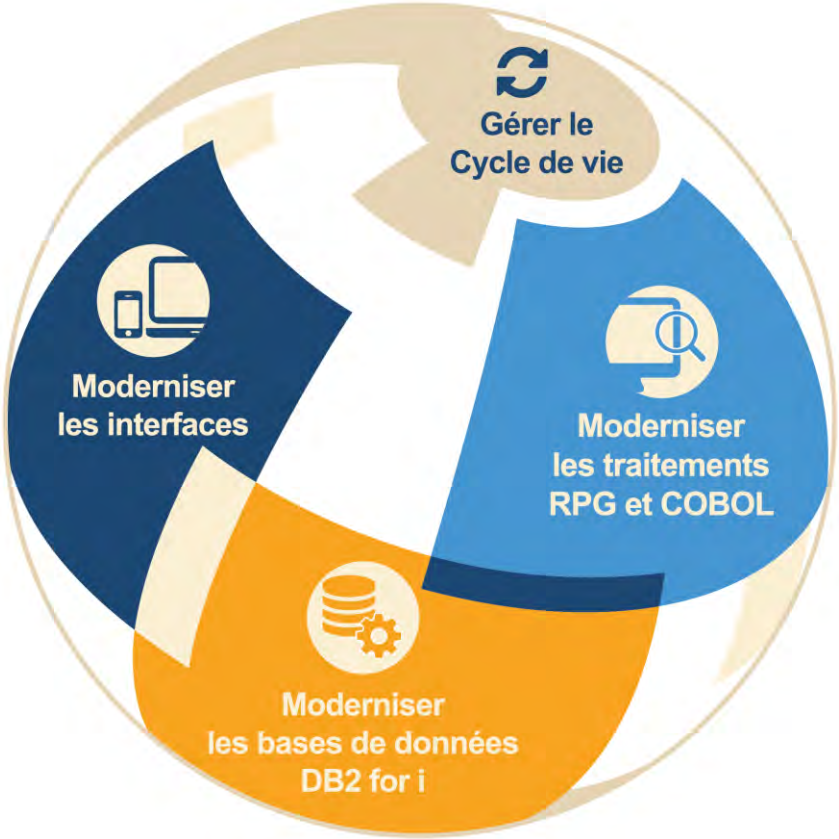
FRESCHE Solutions :

- 450 personnes dédiées IBM i
- Technologies et Services
- Montreal, Melbourne, USA …



ithei

ITHEIS : Intégrateur de solutions



3 niveaux
de
transformation

Approche « Best of breed »

est un positionnement marché qui consiste, pour une solution logicielle, à viser l'excellence sur un segment spécifique. A l'opposé, les "généralistes" cherchent à offrir la couverture fonctionnelle la plus large possible, c'est-à-dire à intégrer de nombreuses fonctionnalités.

itheis

for Business

Transformer 5250 en HTML

Moderniser les interfaces IHM

HTML CSS JS

Copyright Itheis

De RPG à RPG FreeForm, documentation

Moderniser les applications RPG

RPG FreeForm

Copyright Itheis

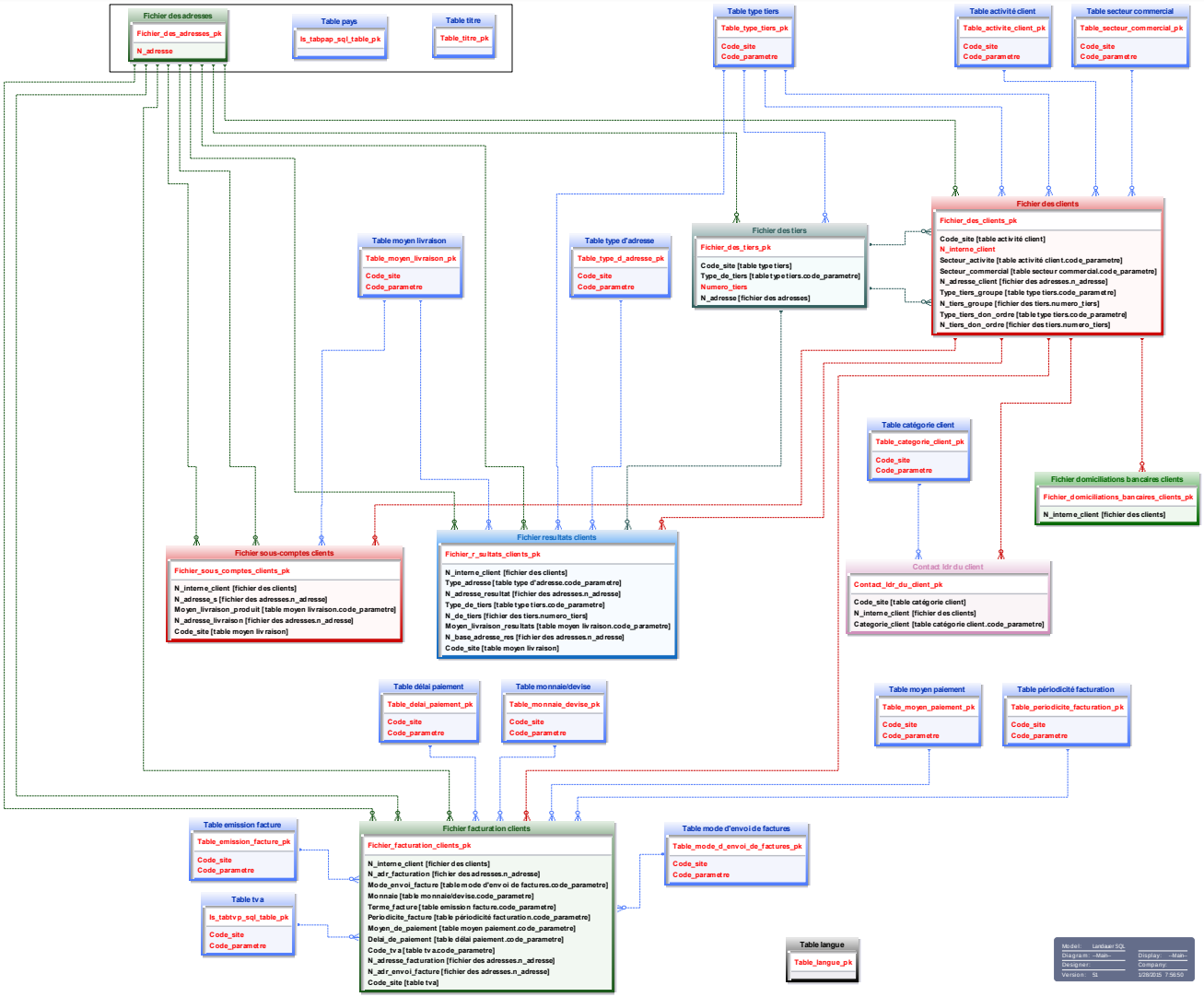
Transformer les DDS en SQL

Moderniser les bases de données DB2

SQL

Copyright Itheis

Retrouver le modèle graphique et gérer DB2



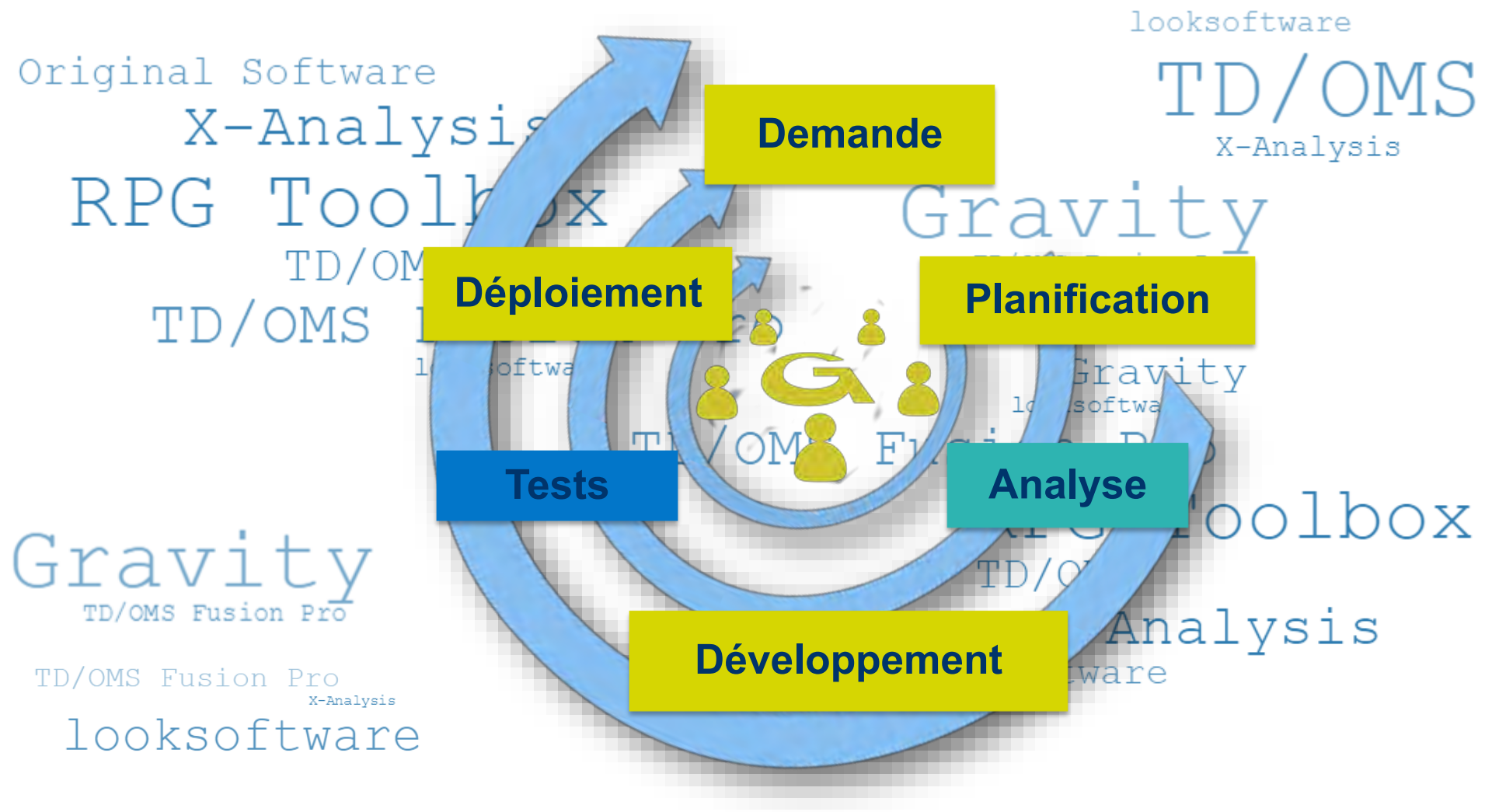
itheis

Gestion des versions : DevOps

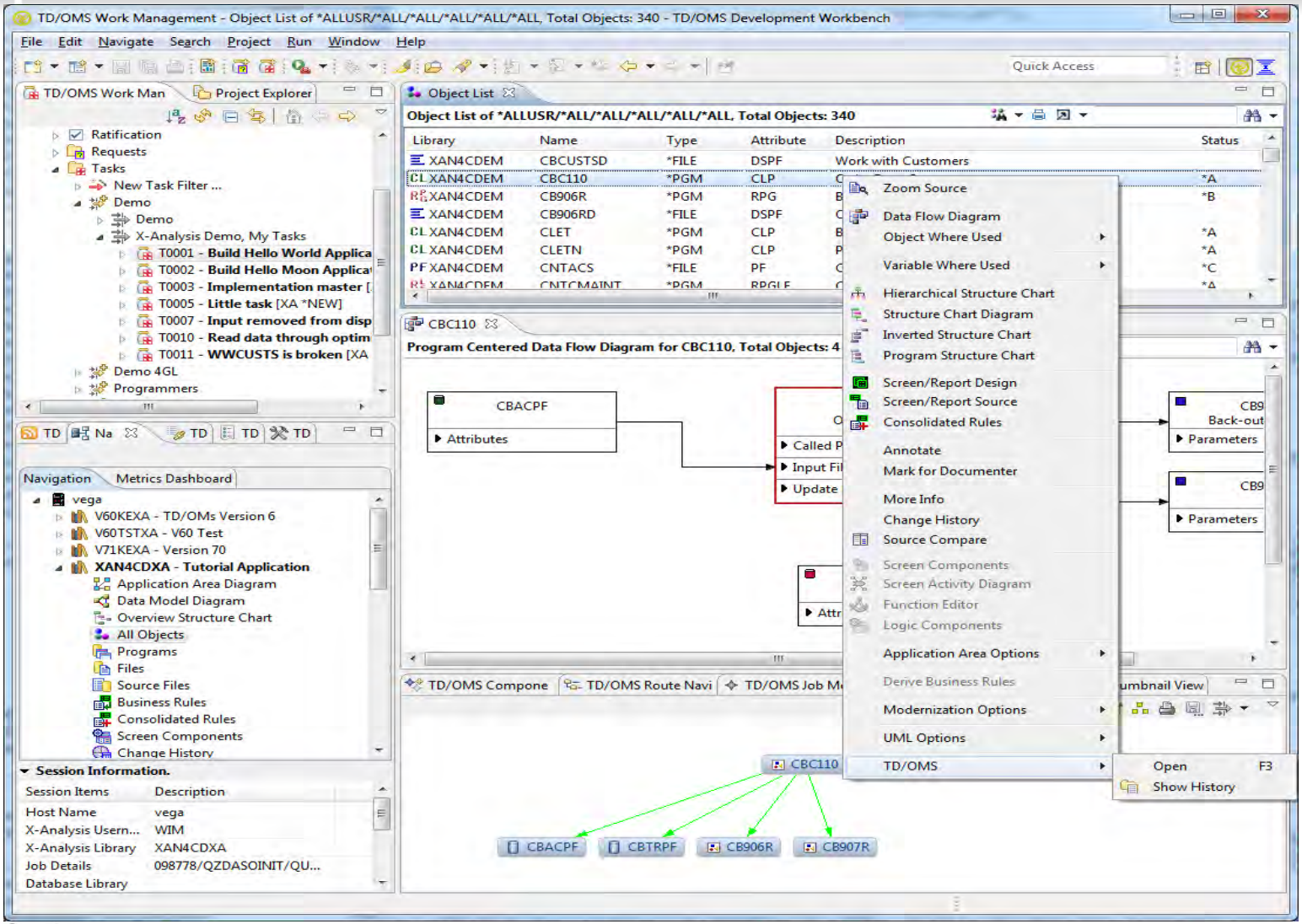
Gérer le cycle de vie des applications

Copyright Itheis

SCM : Gestion des versions
Avec TD/OMS



DevOps intégré dans RDi



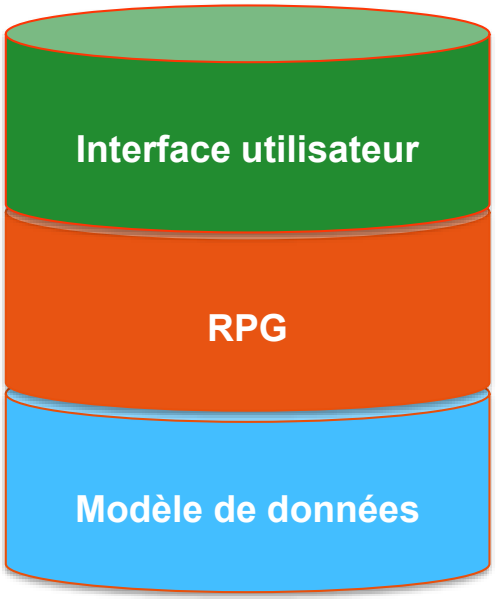
itheis

Interface utilisateur

Système existant

Extraction automatisée

Référentiel

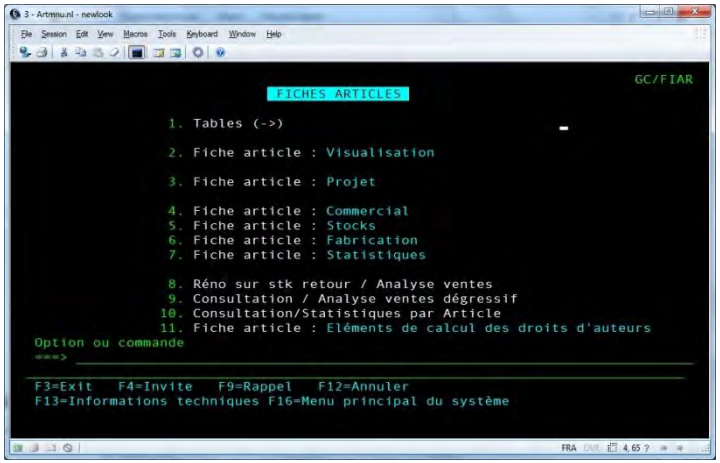


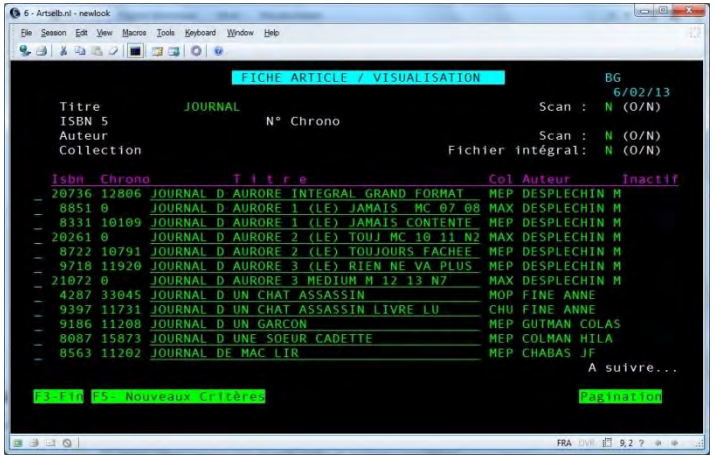
Conception de l'interface utilisateur

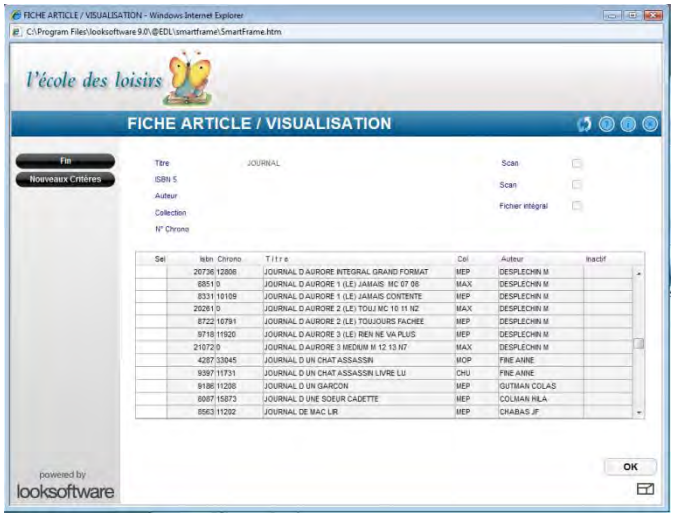
Options

- Webisation
- Nouvelles fonctions Web (carrousel, image, XLS…)
- Re Design de l'interface
- Charte graphique

Transforme 5250 en HTML

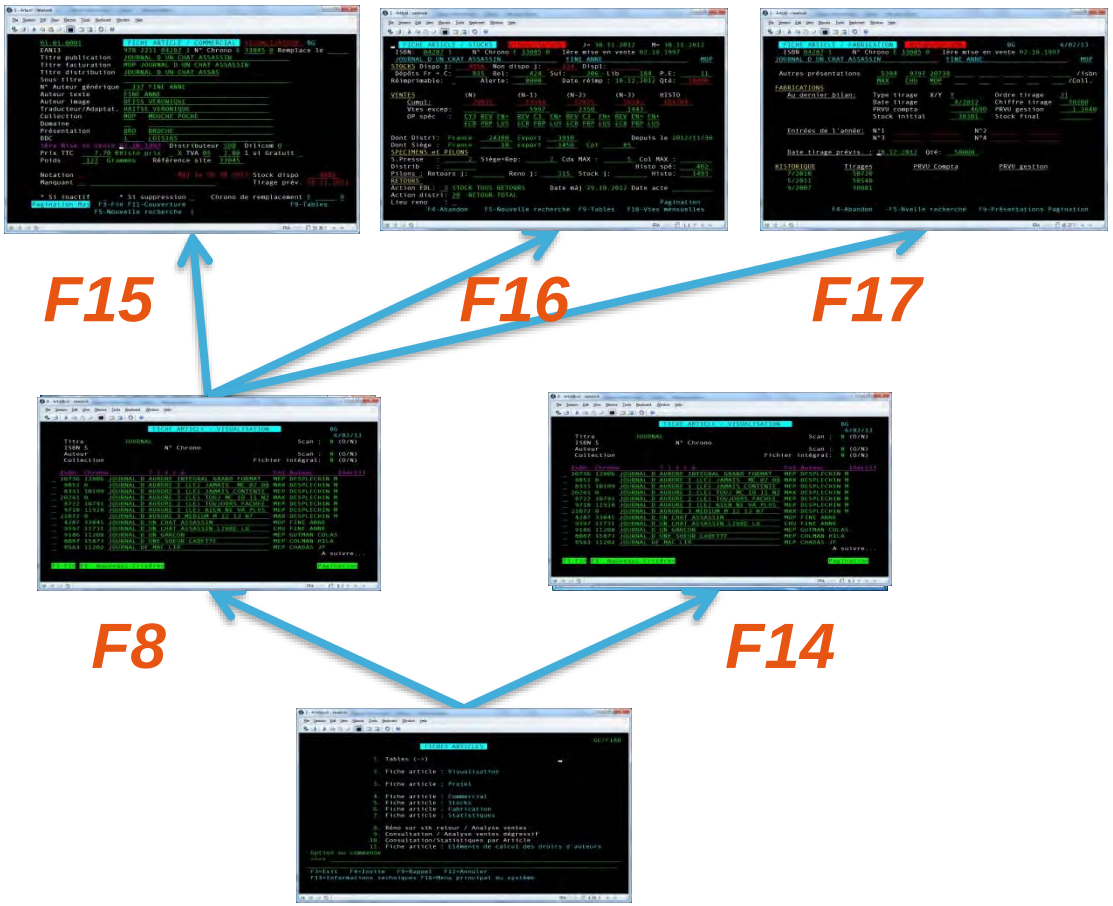






itheis

Revoir la navigation



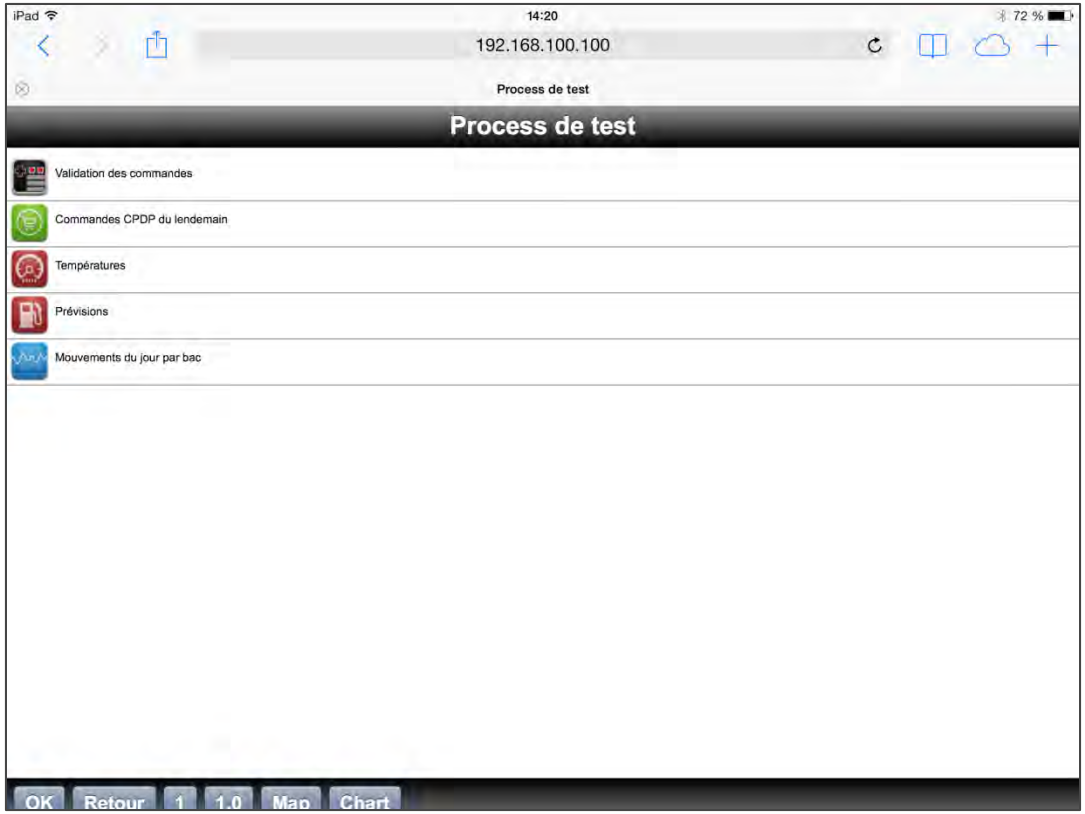
itheis

Regrouper plusieurs écrans

Grâce aux onglets

itheis

Interfaces RPG pour mobiles



itheis

Interfaces tactiles HTML5 et CCS3

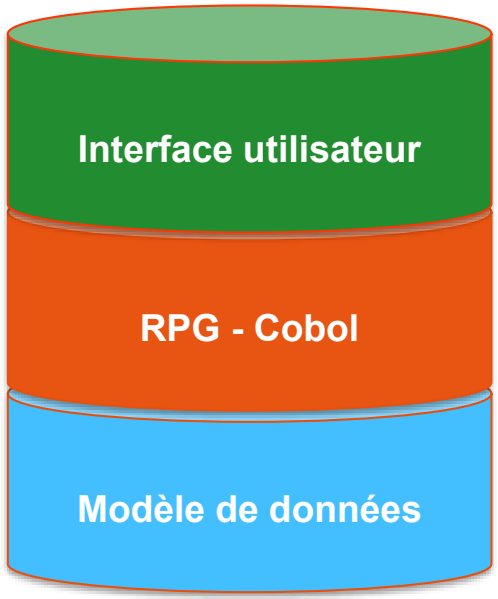
itheis

Modernisation des traitements

Système existant

Extraction automatisée

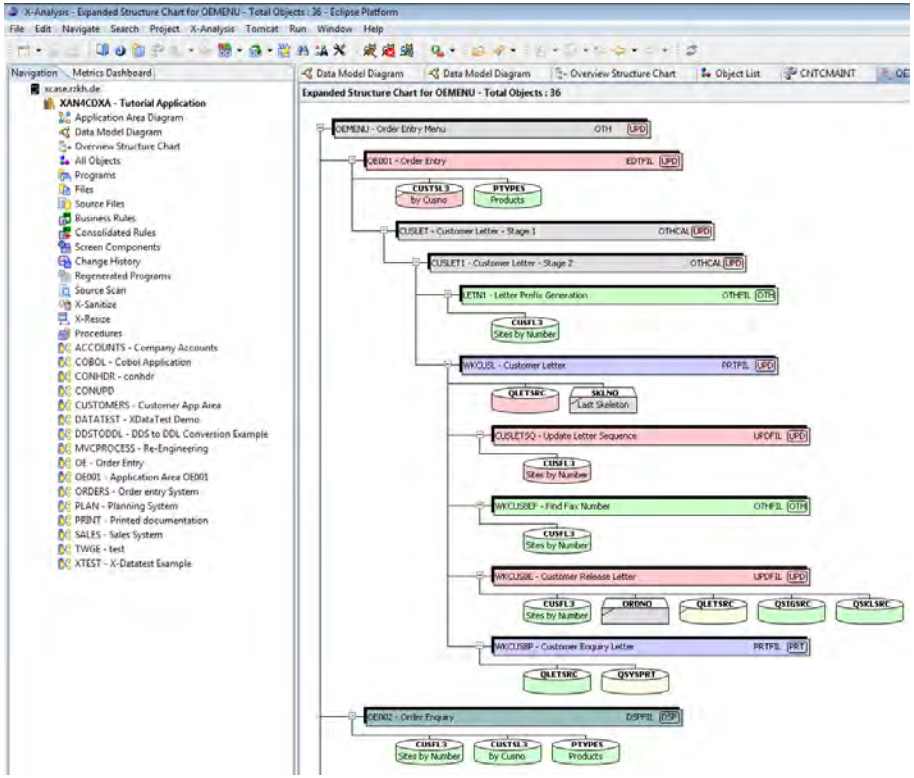
Référentiel



Logique métier

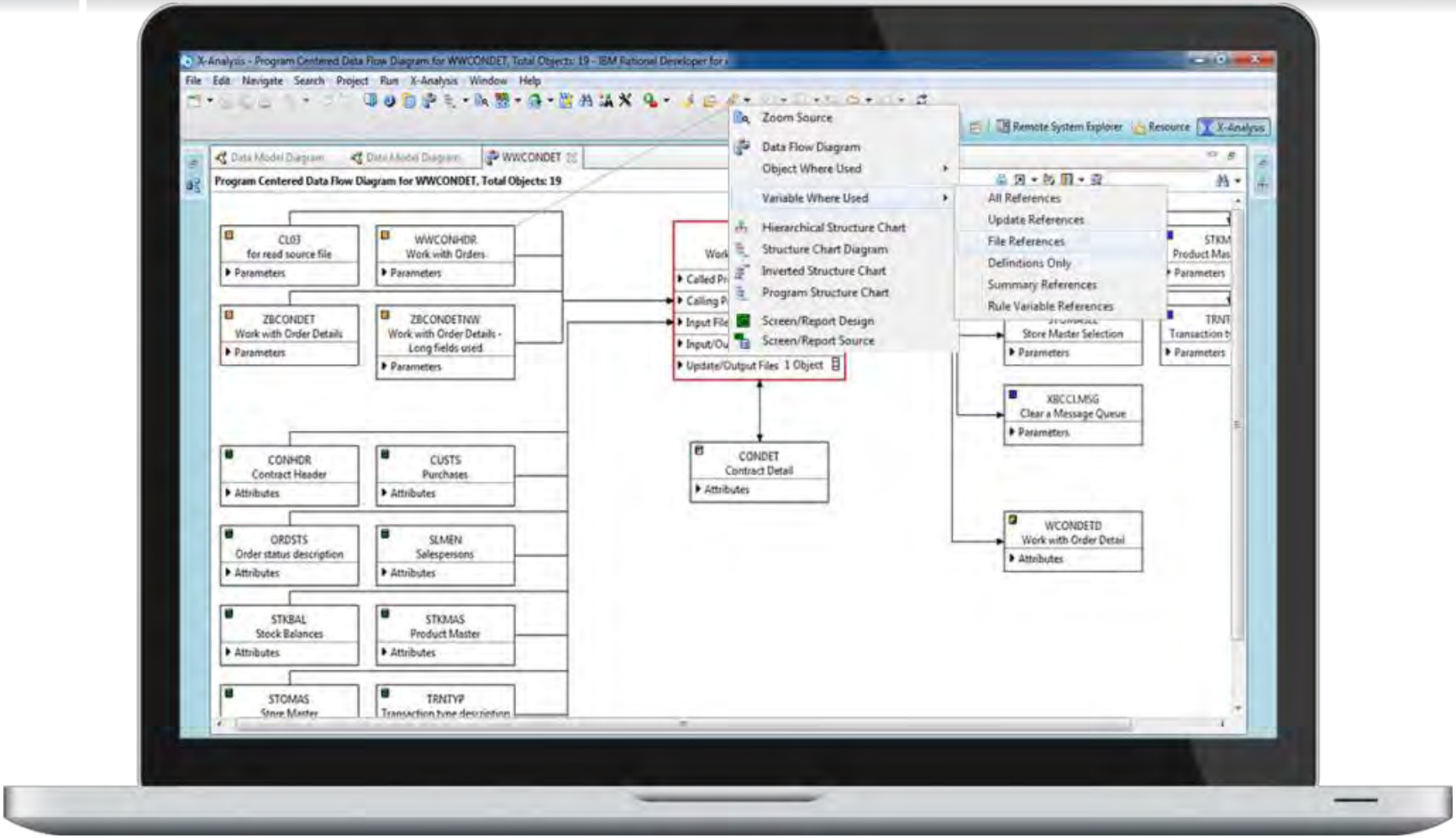
- Validation, contrôles
- Passage en RPG FreeForm
- Retrouve les règles de gestion
- Gère les domaines applicatifs
- Montre les flux inter domaines
- Diagramme processus

Documenter l’existant :

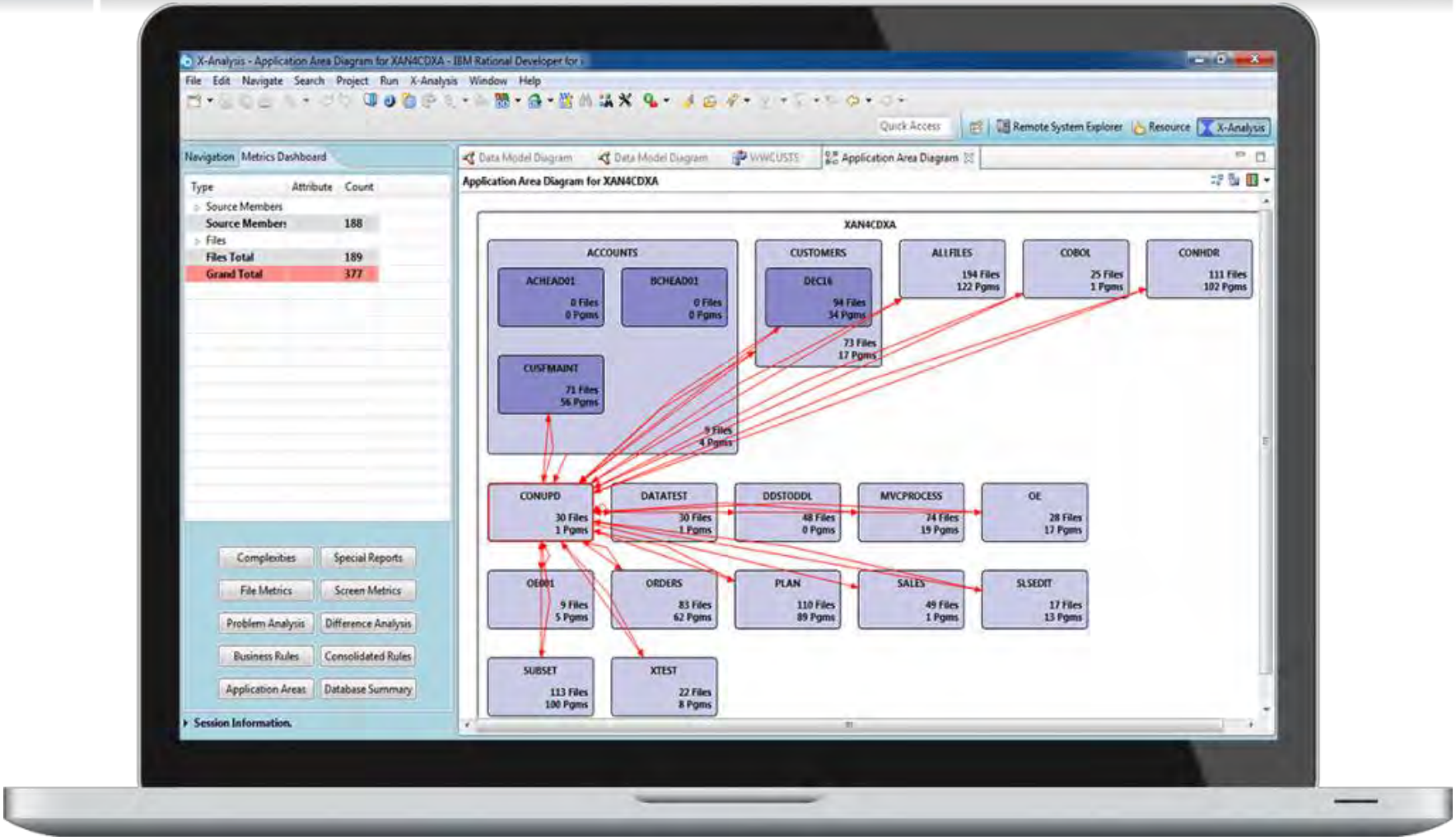


Copyright Itheis

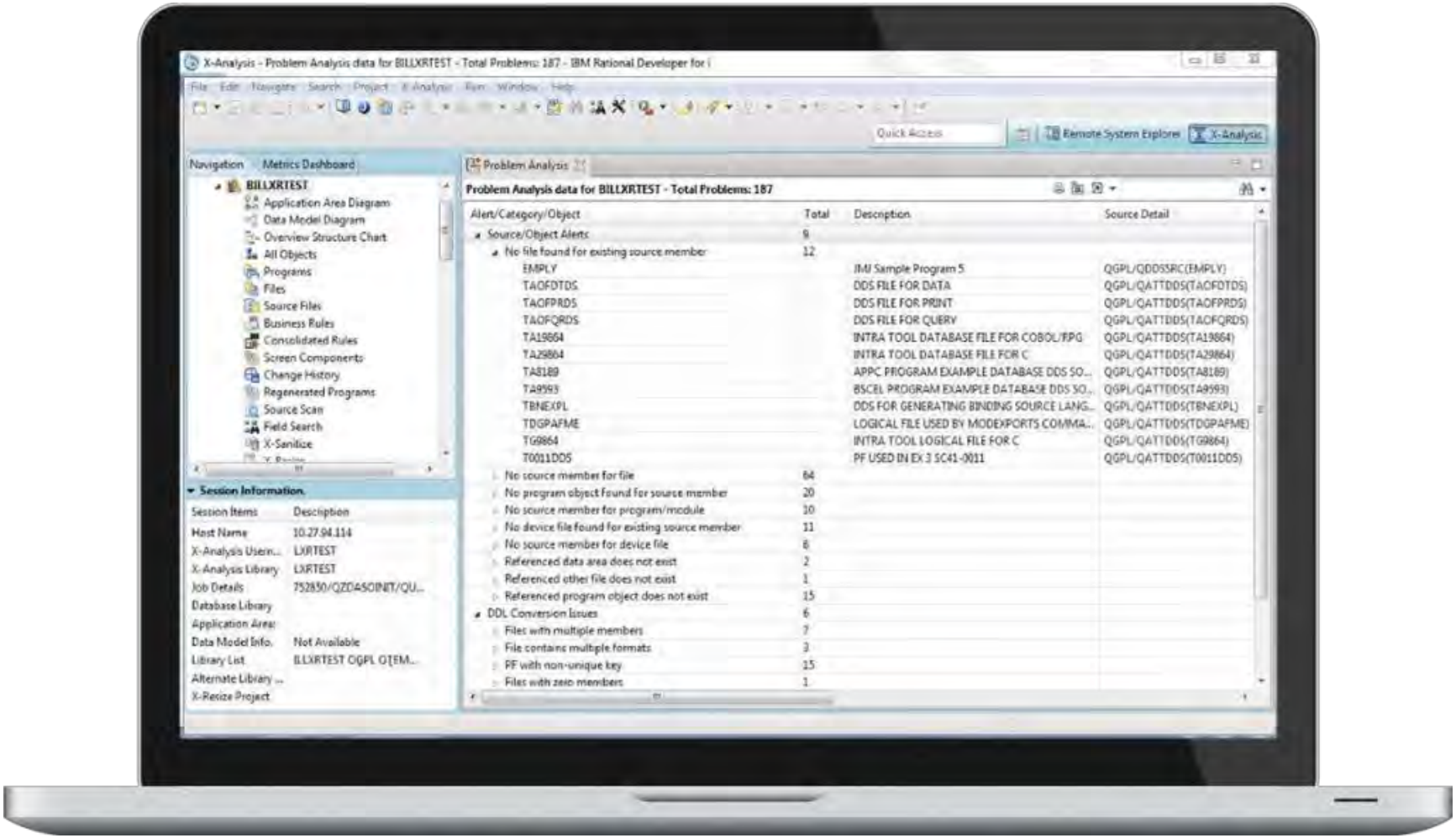
Documenter les Process



Découper en aires applicatives



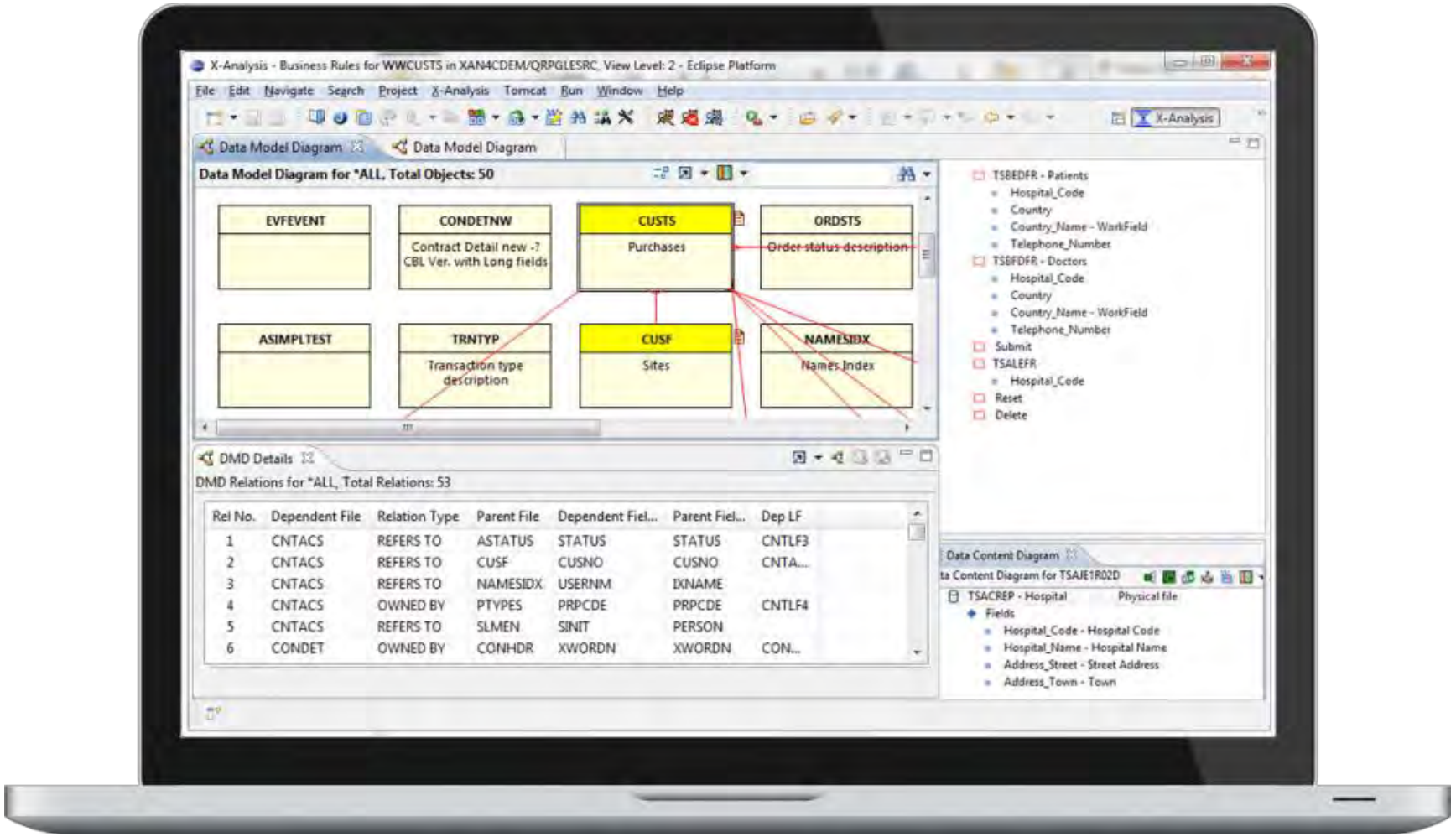
Audit de la complexité



itheis

X-Analysis
Analysis & Productivity Tools

Mesurer l'effet des changements



itheis

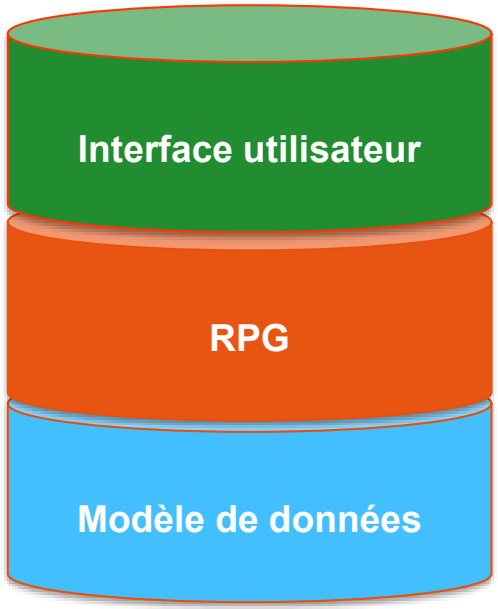
X-Analysis
Analysis & Productivity Tools

La base de données DB2 for i

Système existant

Extraction automatisée

Référentiel

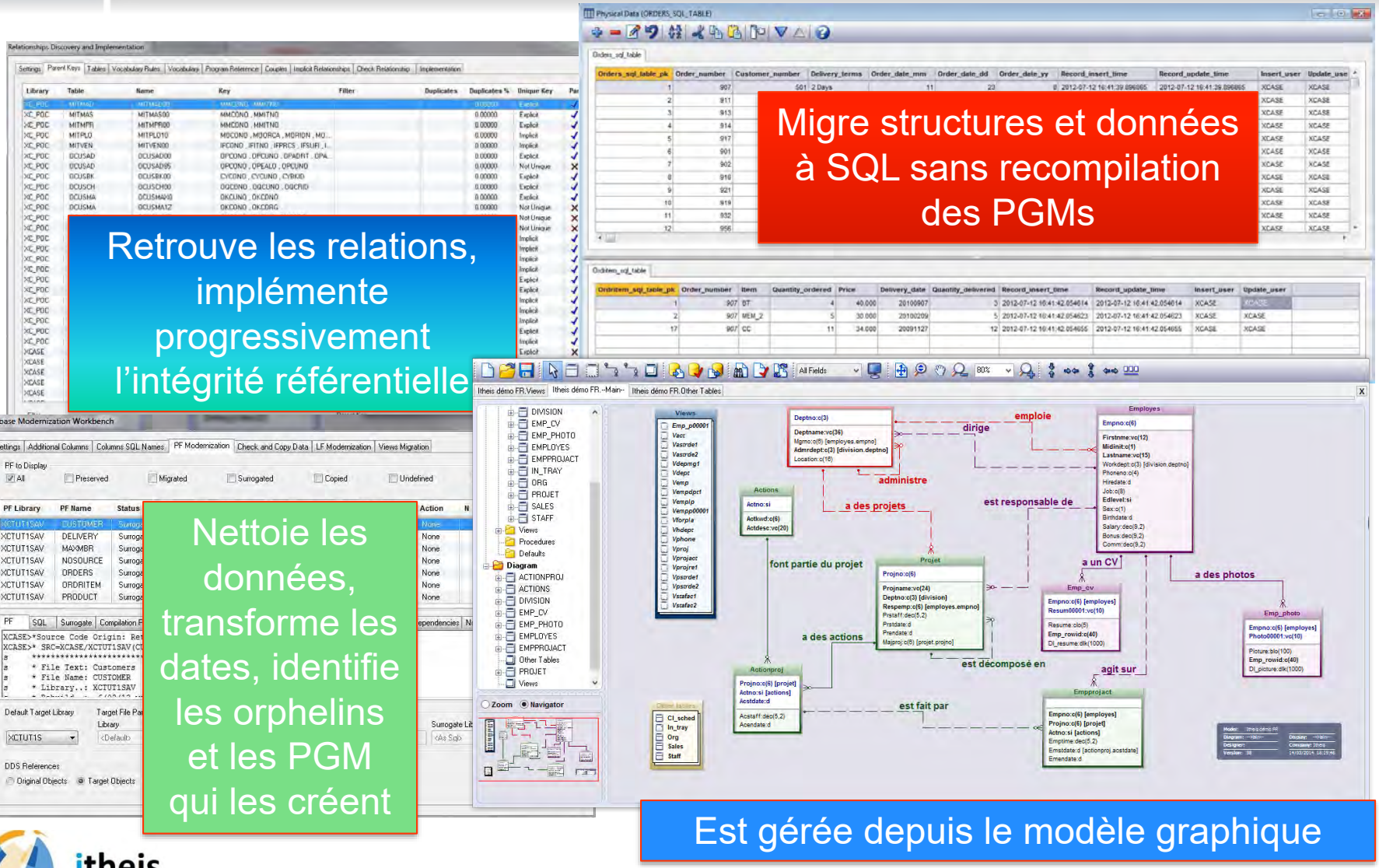


BDD moderne

- Modèle graphique
- Intégrité référentielle
- Migration SQL sans recompil.
- Cleaning des données
- Nom longs
- Intègre Table des tables
- Génération des SQL Views

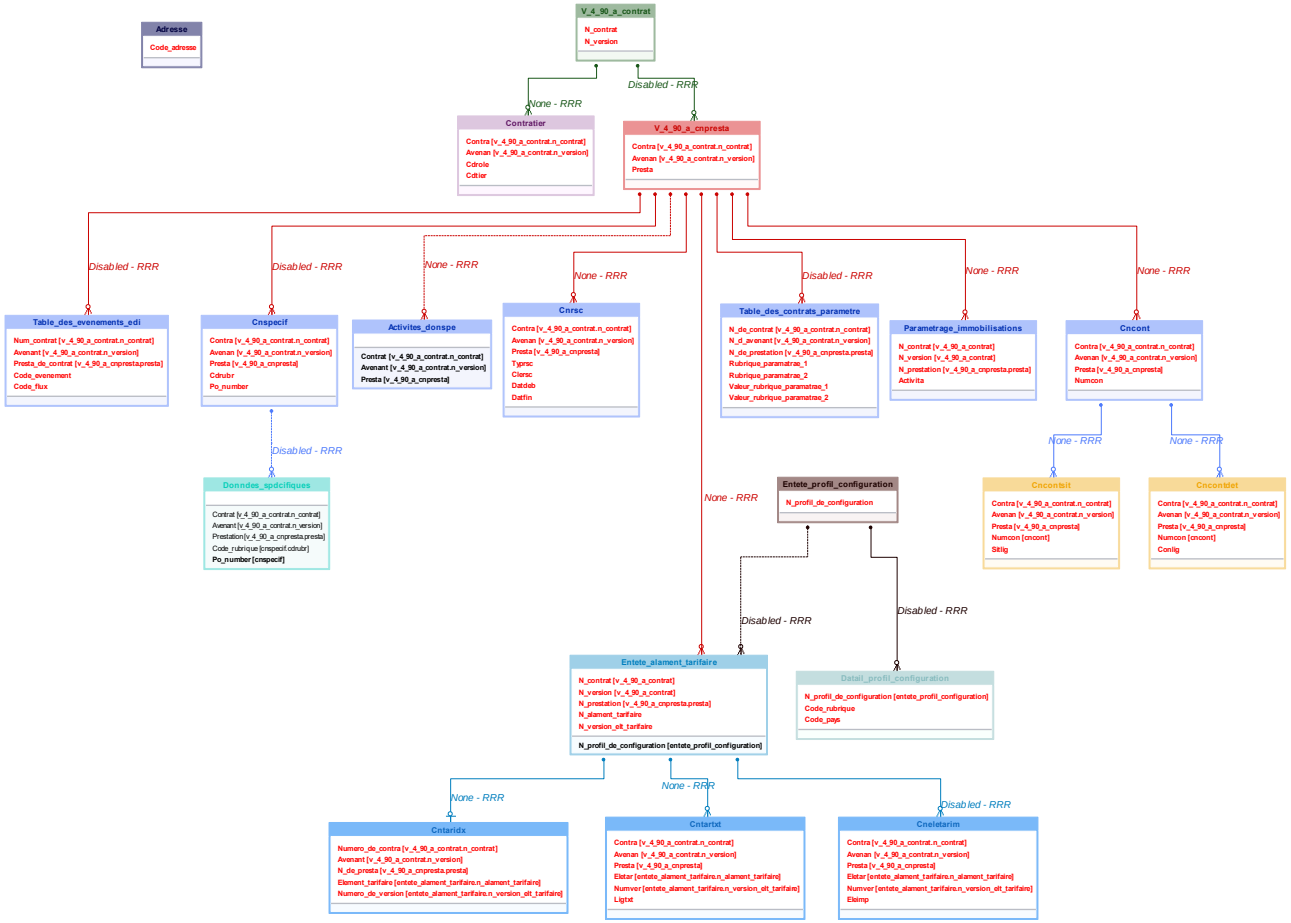
itheis

Moderniser DB2 for i avec Xcase



itheis

Une image vaut mieux qu'un long discours



itheis

Ils nous font confiance

Pascal BLANDIN

Préparer DB2 for i

Pascal BLANDIN pascal.blandin@itheis.com

ITHEIS
Directeur

itheis

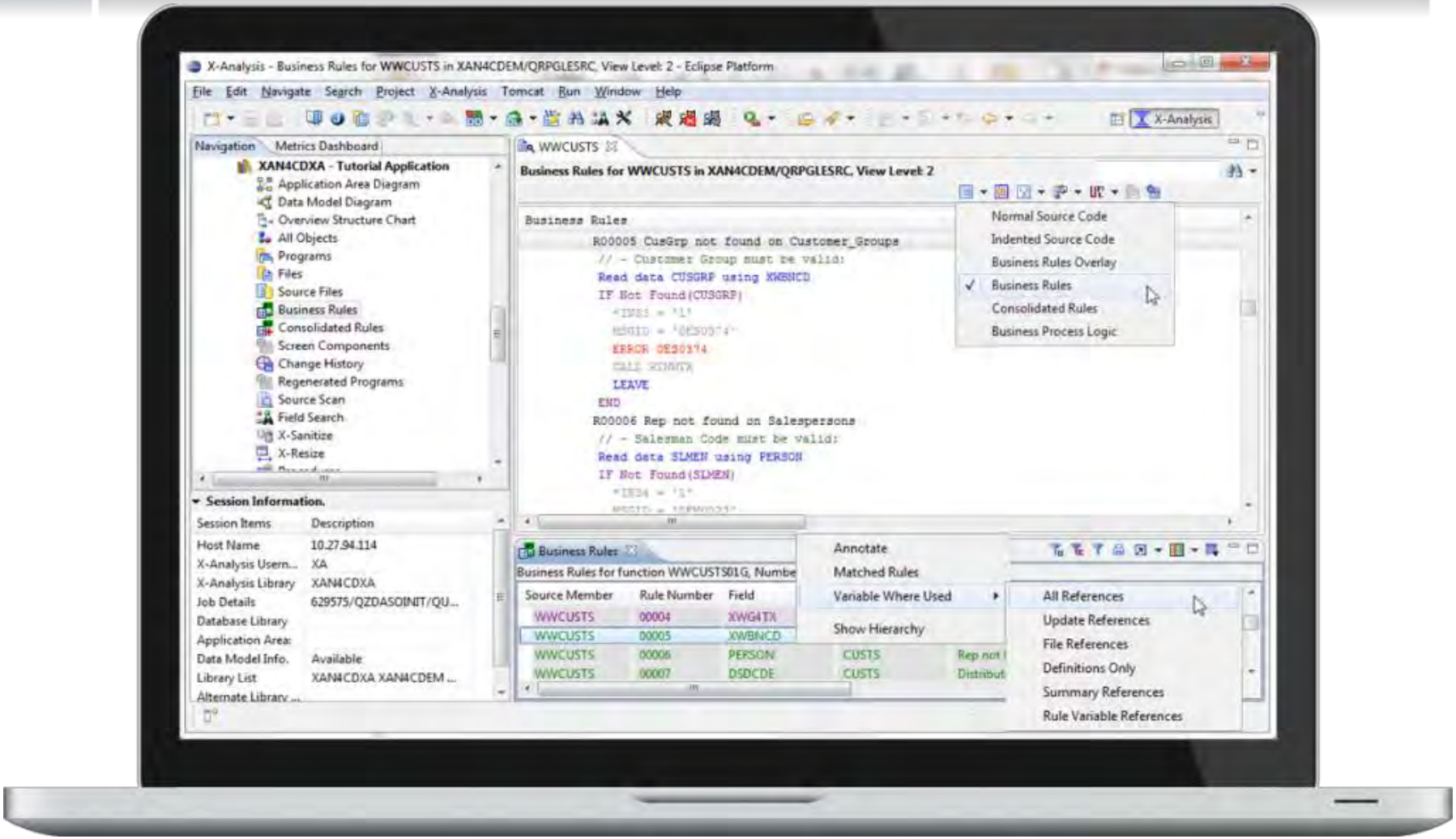
Plan d'action DB2 en 10 jours

- Retrouver le modèle relationnel
- Identifier les DATA invalides et les corriger

Pour ensuite…

- Passer à SQL ?
- Implémenter vos règles dans DB2 ?

Retrouver les règles de gestions

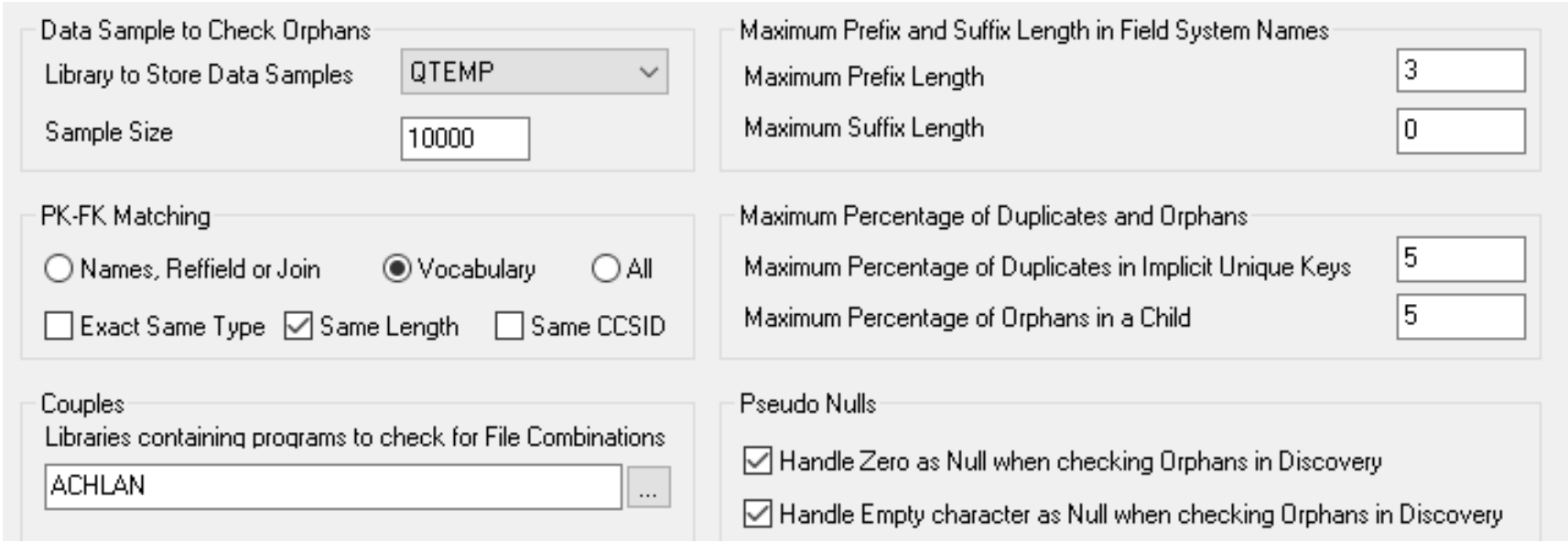


Pourquoi retrouver le modèle ?

- Pour documenter (expliciter)
- Pour répondre au règlementaire
- Pour intégrer plus vite les nouveaux
- Pour identifier les orphelins
- Pour + d'intelligibilté

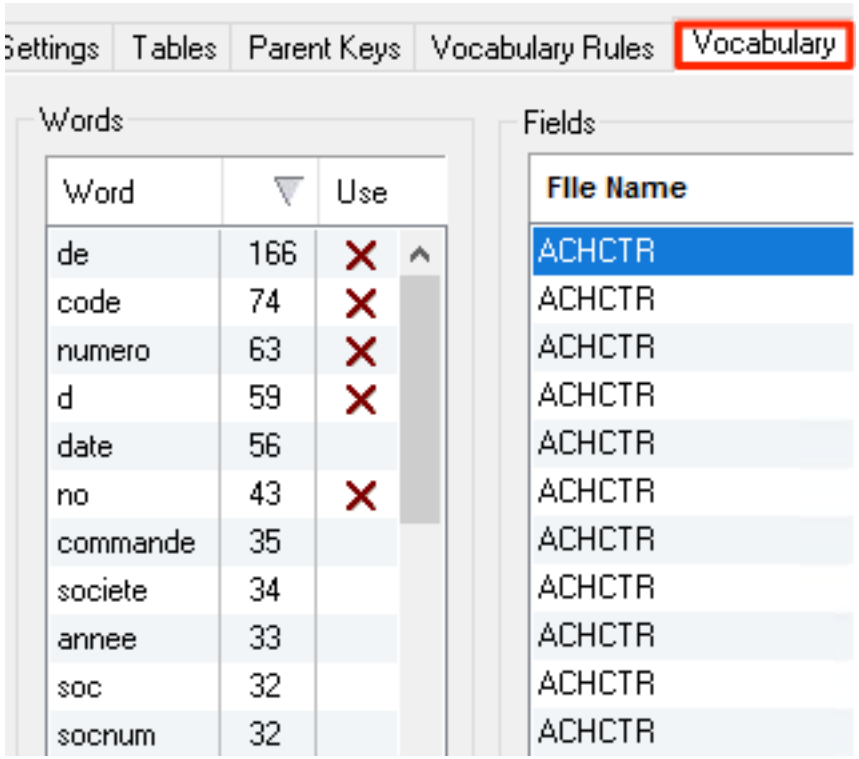
Comment retrouver le MDL ?

- On selectionne un sous ensemble de PF et de Tables puis on paramètre l'outil Xcase



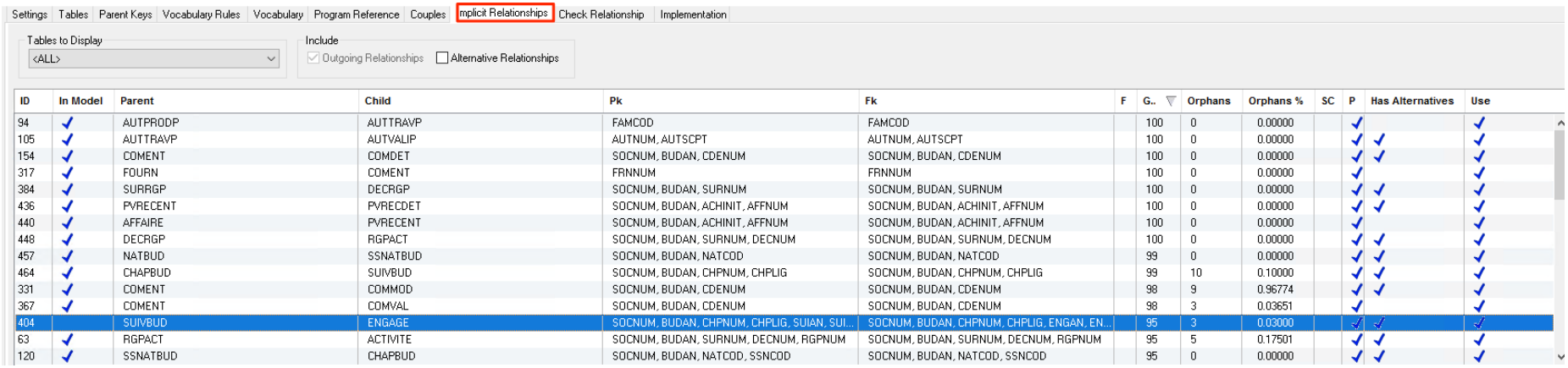
Comment retrouver le MDL ?

- On précise les règles de vocabulaire



Comment retrouver le MDL

- On valide les propositions



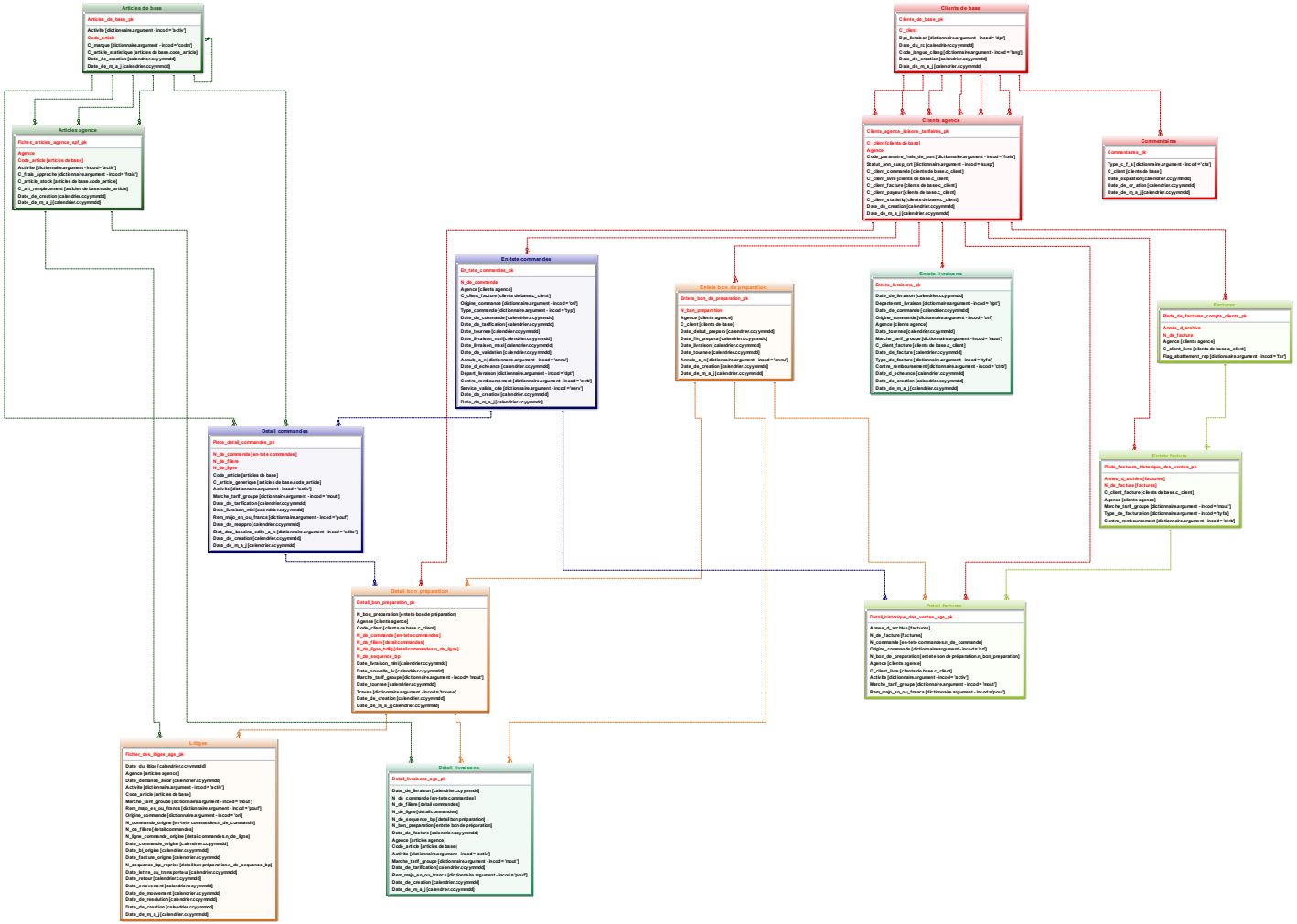
ID	In Model	Parent	Child	Pk	Fk	F	G..	Orphans	Orphans %	SC	P	Has Alternatives	Use
94	✓	AUTPRODP	AUTTRAVP	FAMCOD	FAMCOD		100	0	0.00000		✓		✓
105	✓	AUTTRAVP	AUTVALIP	AUTNUM, AUTSCPT	AUTNUM, AUTSCPT		100	0	0.00000		✓	✓	✓
154	✓	COMENT	COMDET	SOCNUM, BUDAN, CDENUM	SOCNUM, BUDAN, CDENUM		100	0	0.00000		✓	✓	✓
317	✓	FOURN	COMENT	FRNNUM	FRNNUM		100	0	0.00000		✓		✓
384	✓	SURRGP	DECRGP	SOCNUM, BUDAN, SURNUM	SOCNUM, BUDAN, SURNUM		100	0	0.00000		✓	✓	✓
436	✓	PVRECENT	PVRECDET	SOCNUM, BUDAN, ACHINIT, AFFNUM	SOCNUM, BUDAN, ACHINIT, AFFNUM		100	0	0.00000		✓	✓	✓
440	✓	AFFAIRE	PVRECENT	SOCNUM, BUDAN, ACHINIT, AFFNUM	SOCNUM, BUDAN, ACHINIT, AFFNUM		100	0	0.00000		✓		✓
448	✓	DECRGP	RGPACT	SOCNUM, BUDAN, SURNUM, DECNUM	SOCNUM, BUDAN, SURNUM, DECNUM		100	0	0.00000		✓	✓	✓
457	✓	NATBUD	SSNATBUD	SOCNUM, BUDAN, NATCOD	SOCNUM, BUDAN, NATCOD		99	0	0.00000		✓	✓	✓
464	✓	CHAPBUD	SUIVBUD	SOCNUM, BUDAN, CHPNUM, CHPLIG	SOCNUM, BUDAN, CHPNUM, CHPLIG		99	10	0.10000		✓	✓	✓
331	✓	COMENT	COMMOD	SOCNUM, BUDAN, CDENUM	SOCNUM, BUDAN, CDENUM		98	9	0.96774		✓	✓	✓
367	✓	COMENT	COMVAL	SOCNUM, BUDAN, CDENUM	SOCNUM, BUDAN, CDENUM		98	3	0.03651		✓		✓
404		SUIVBUD	ENGAGE	SOCNUM, BUDAN, CHPNUM, CHPLIG, SUIAN, SUI...	SOCNUM, BUDAN, CHPNUM, CHPLIG, ENGAN, EN...		95	3	0.03000		✓	✓	✓
63	✓	RGPACT	ACTIVITE	SOCNUM, BUDAN, SURNUM, DECNUM, RGPNUM	SOCNUM, BUDAN, SURNUM, DECNUM, RGPNUM		95	5	0.17501		✓	✓	✓
120	✓	SSNATBUD	CHAPBUD	SOCNUM, BUDAN, NATCOD, SSNCOD	SOCNUM, BUDAN, NATCOD, SSNCOD		95	0	0.00000		✓	✓	✓

Evaluation sur la base de :

- Nombre d'orphelin
- La qualité du vocabulaire
- La présence d'index
- Absence de clé parente (PK)
- Absence de clé enfant (FK).

itheis

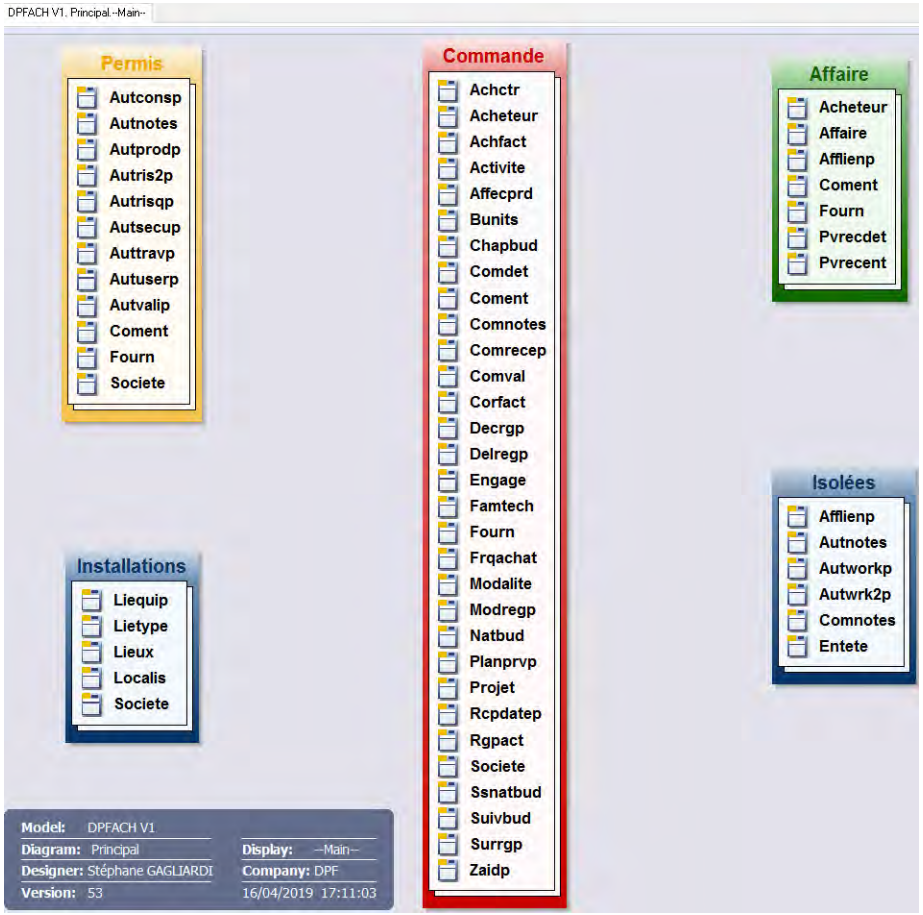
Expliciter le MDL en 10 jours

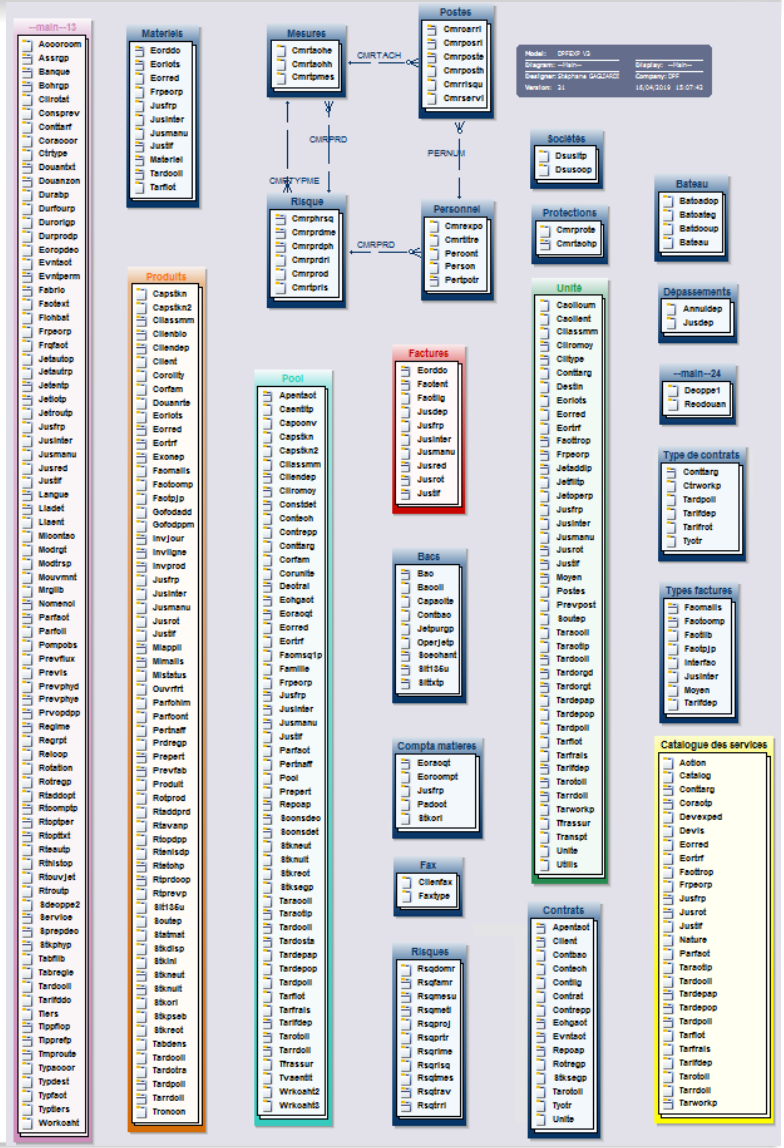


itheis

Découper en sous modèles

- On met en forme





itheis

Pourquoi est ce infaillible ?

On croise 4 niveaux d'information :

- Les META données
- Les Données
- Les relations PGM/Fichiers (DSPDBR)
- Et la validation d'un "sachant"

Les avantages

- Obtention du référentiel des Données
- Optimisation des accès
- Identification des doublons et des datas invalides

- SQL Ready !!! Et… WATSON Ready

Pascal POLVERINI

Intelligence Artificielle
WATSON

Pascal POLVERINI
Pascal.Polverini@freschesolutions.com

FRESCHE Solutions
IBM i ISV Advisory Council - Redbook co-author

itheis

What you need to know about AI and Cognitive systems V2

Pascal Polverini

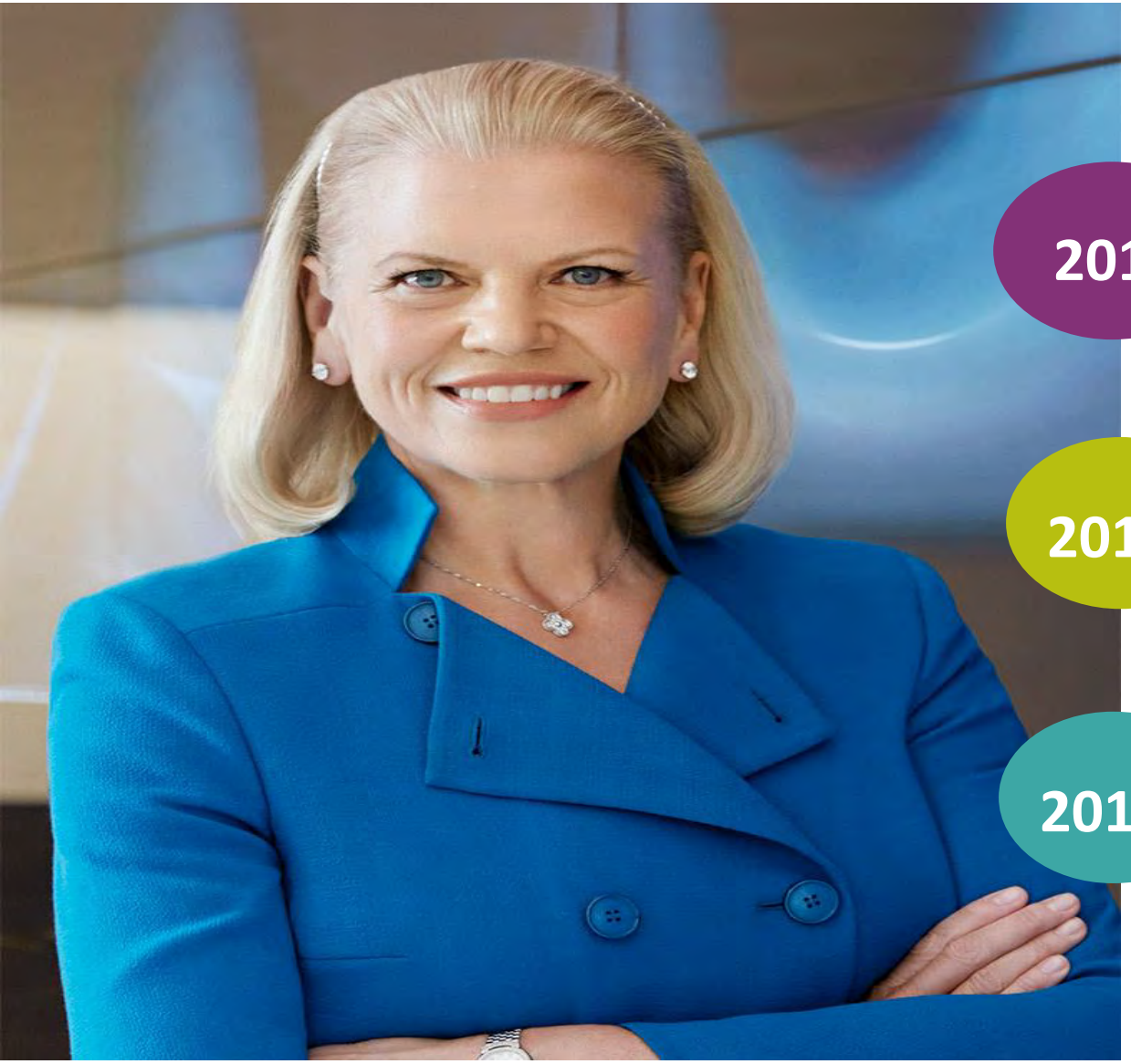
Solution architect

Redbooks author

POWERUp 2019 ANAHEIM

FRESCHE SOLUTIONS

IBM CEO Ginni Rometty



Cognitive Era, AI

2017 "If it's Digital, it will become Cognitive"

2018 "It is an Exponential moment, it happens when Business and Technology Architecture change at the same time"

2019 "We never overpromised on Watson AI"

History and determinant factors

1997

IBM/BigBlue wins at CHESS
vs Kasparov

2011

IBM/Watson wins at JEOPARDY vs 2 greatest champs

2016

Google/DeepMind wins at GO vs Sedol

A new version of AlphaGo needed no human examples to figure out how to clobber the best Go player in the world.

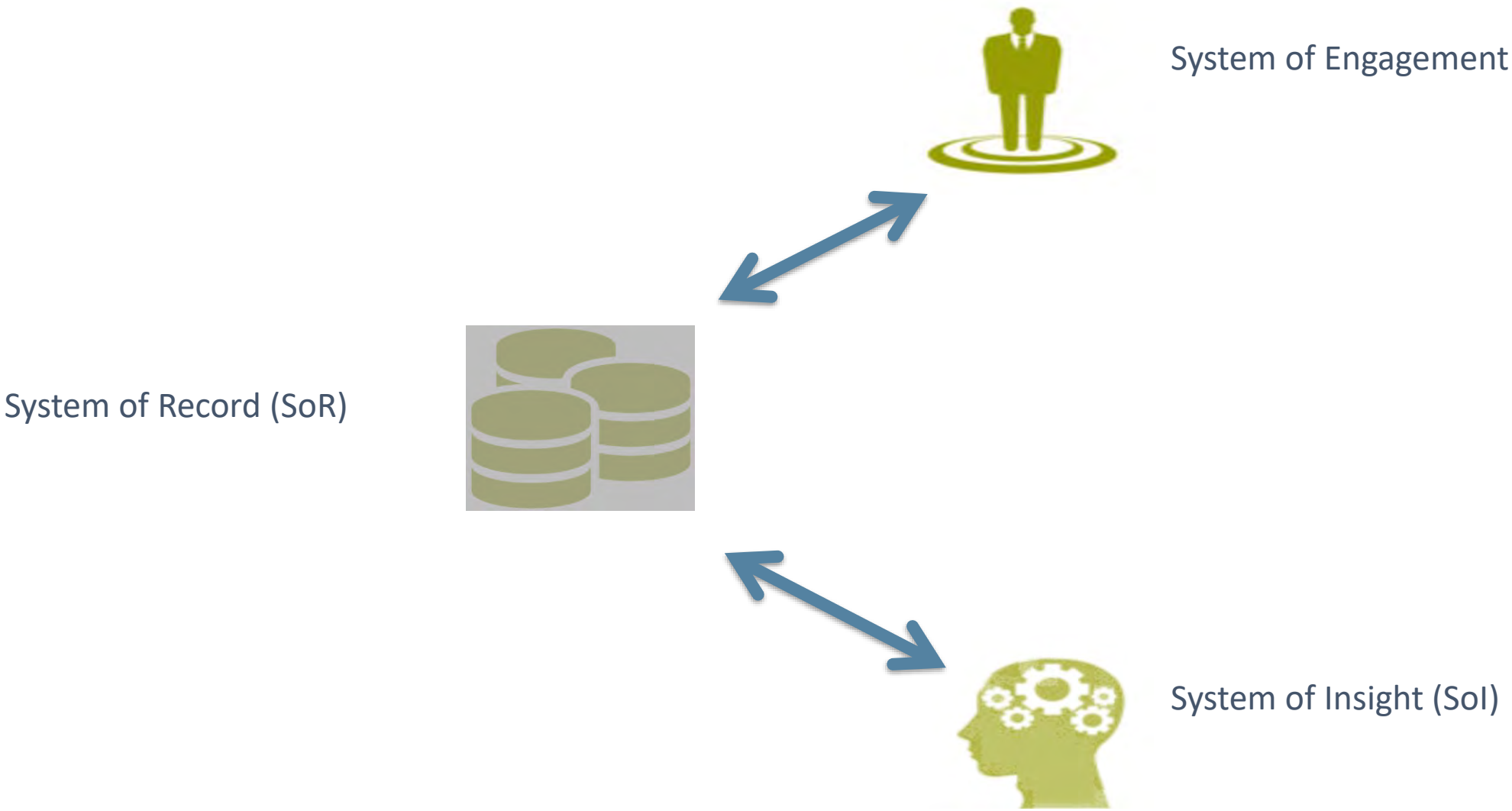
2017

AI learns to learn on its own.

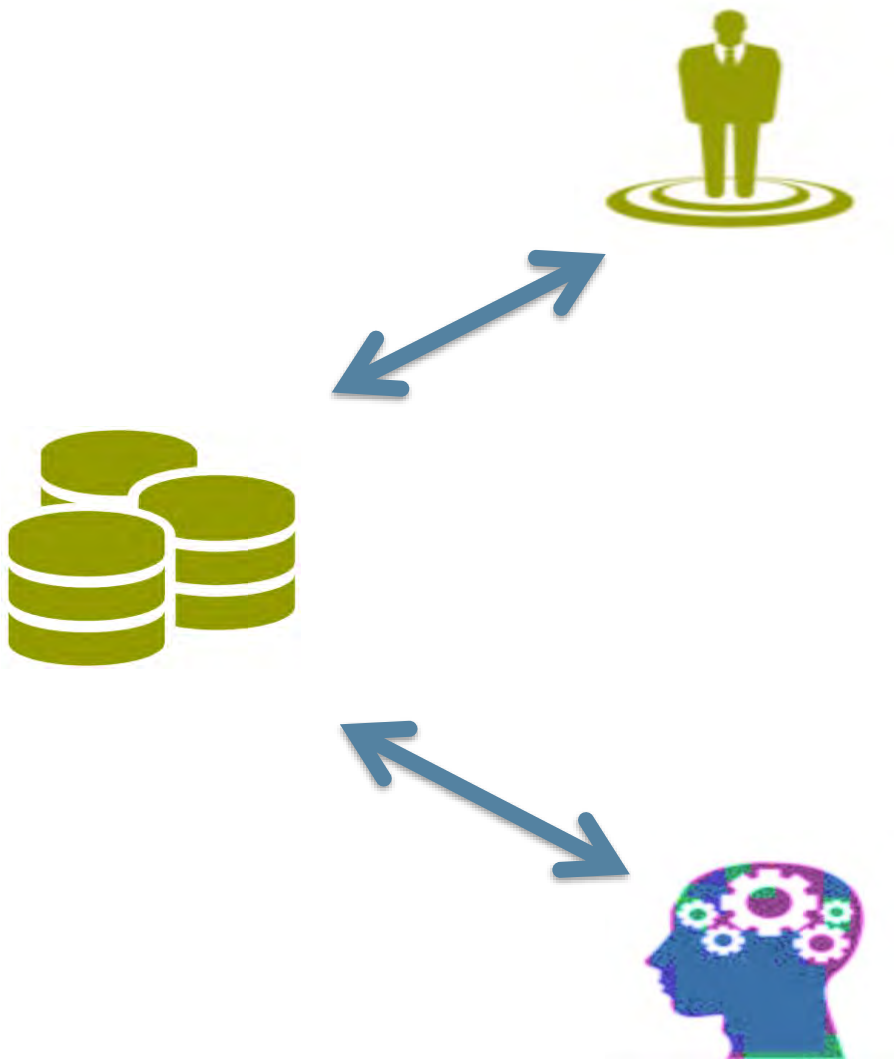
Digital Transformation

System of Record (SoR)

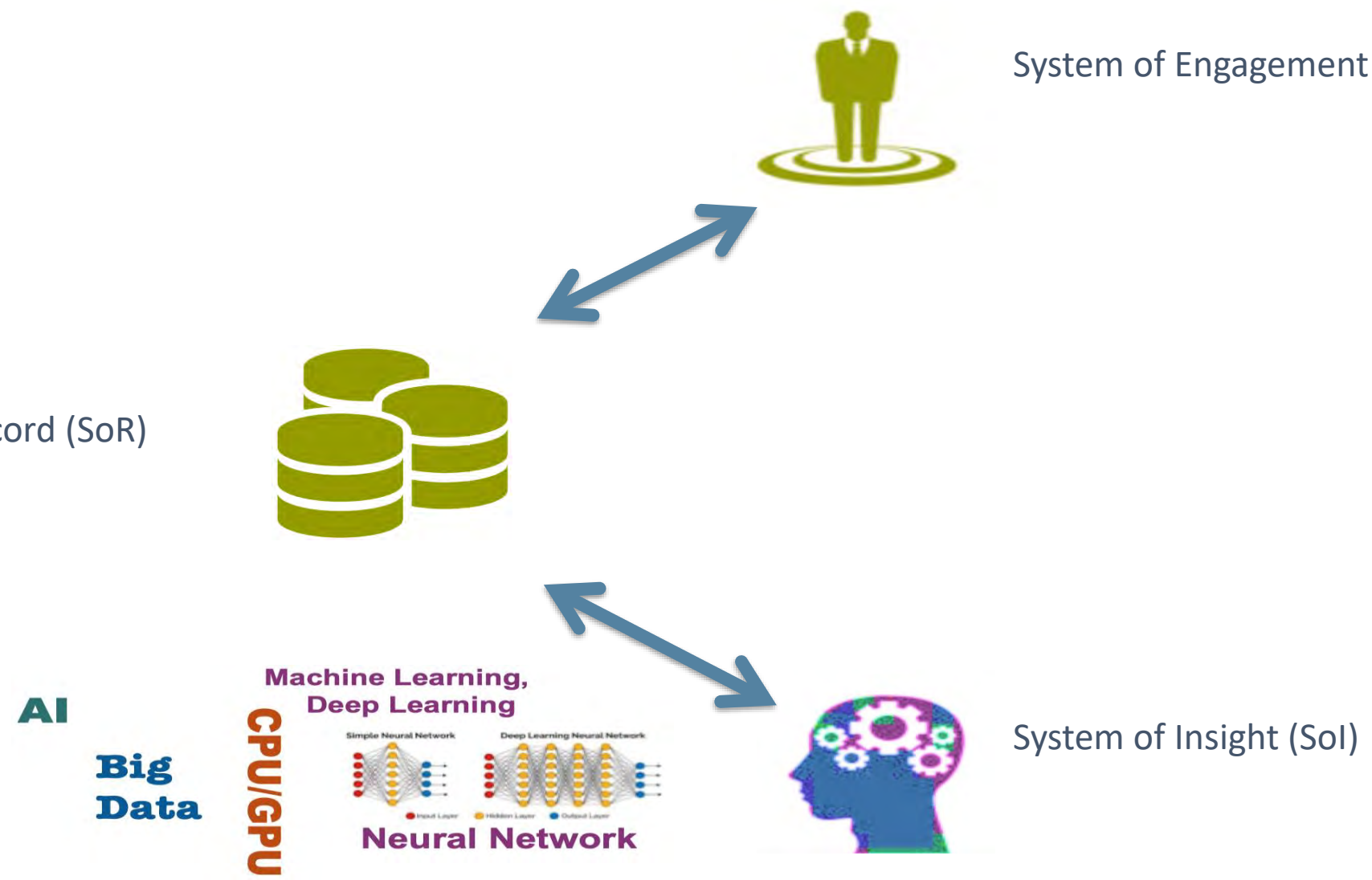
Digital Transformation

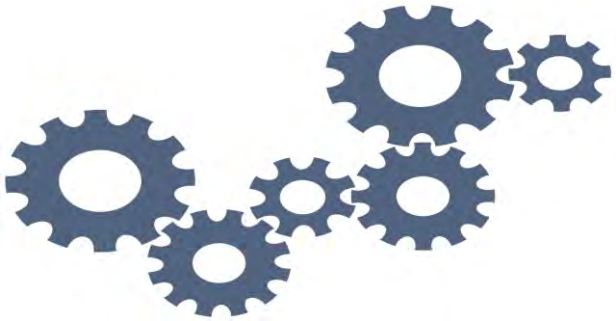


Digital Transformation



Digital Transformation



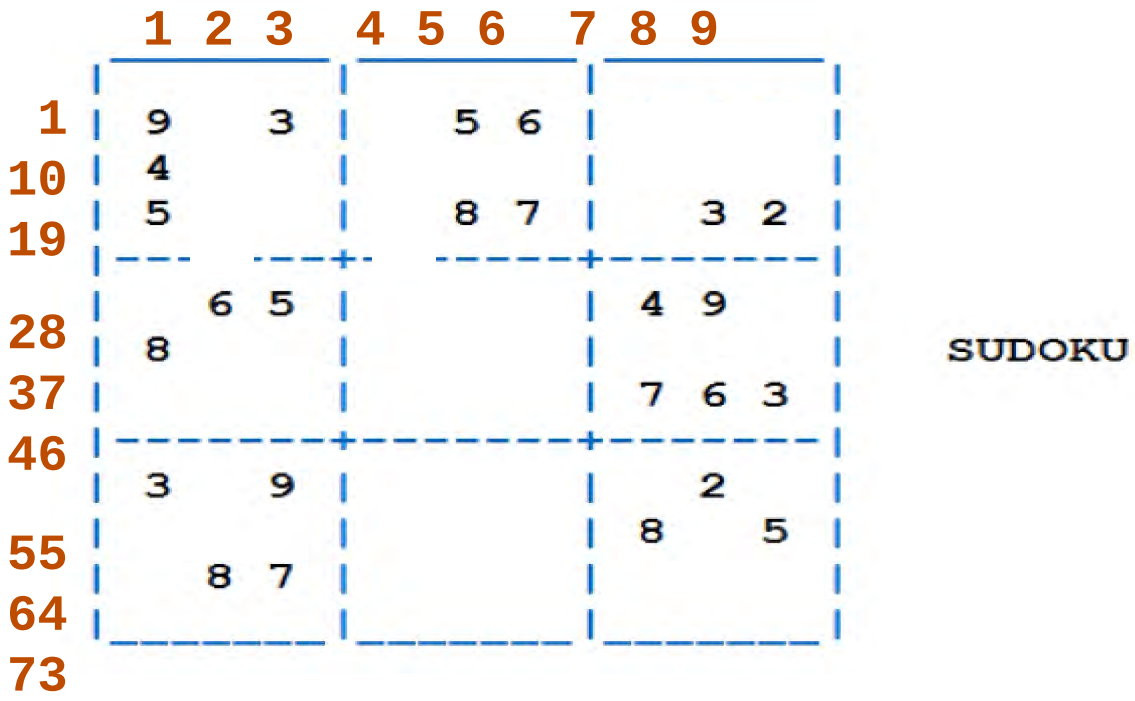


How this works?

FRESCHE SOLUTIONS

9 3	5 6	
4		
5	8 7	3 2
6 5		4 9
8		
		7 6 3
3 9		2
		8 5
8 7		

SUDOKU


1 2 3 4 5 6 7 8 9
1
10
19
28
37
46
55
64
73
9 3 5 6
4
5 8 7 3 2
6 5 4 9
8
7 6 3
3 9 2
8 5
8 7

SUDOKU

```
                          Work with Members Using PDM                C104730F

File  . . . . . .   QRPGLESRC
  Library . . . .     PASCAL          Position to  . . . . .

Type options, press Enter.
 2=Edit          3=Copy  4=Delete 5=Display      6=Print     7=Rename
 8=Display description  9=Save  13=Change text  14=Compile  15=Create module..

Opt  Member      Type        Text
     SUDOKU      RPGLE       Sudoku solver


                                                                      Bottom
Parameters or command
===> call pascal/sudoku
F3=Exit          F4=Prompt        F5=Refresh       F6=Create
F9=Retrieve      F10=Command entry F23=More options F24=More keys
```

9 7 3	2 5 6	1 8 4
4 2 8	3 9 1	5 7 6
5 1 6	4 8 7	9 3 2
7 6 5	1 3 2	4 9 8
8 3 4	7 6 9	2 5 1
2 9 1	5 4 8	7 6 3
3 5 9	8 1 4	6 2 7
6 4 2	9 7 3	8 1 5
1 8 7	6 2 5	3 4 9

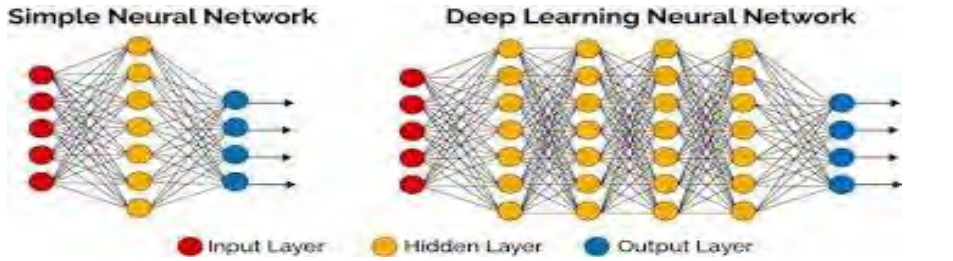
SUDOKU

9 7 3	2 5 6	1 8 4
4 2 8	3 9 1	5 7 6
5 1 6	4 8 7	9 3 2
7 6 5	1 3 2	4 9 8
8 3 4	7 6 9	2 5 1
2 9 1	5 4 8	7 6 3
3 5 9	8 1 4	6 2 7
6 4 2	9 7 3	8 1 5
1 8 7	6 2 5	3 4 9

Mode: topleft-botright
Invalid attempts: 231,676
Current square :
Back corrections: 28,577
Resolution time : 2min 30sec

Mode: more intelligent
Invalid attempts: 2,264
Current square :
Back corrections: 253
Resolution time : 2sec

Machine Learning, Deep Learning



Neural Network

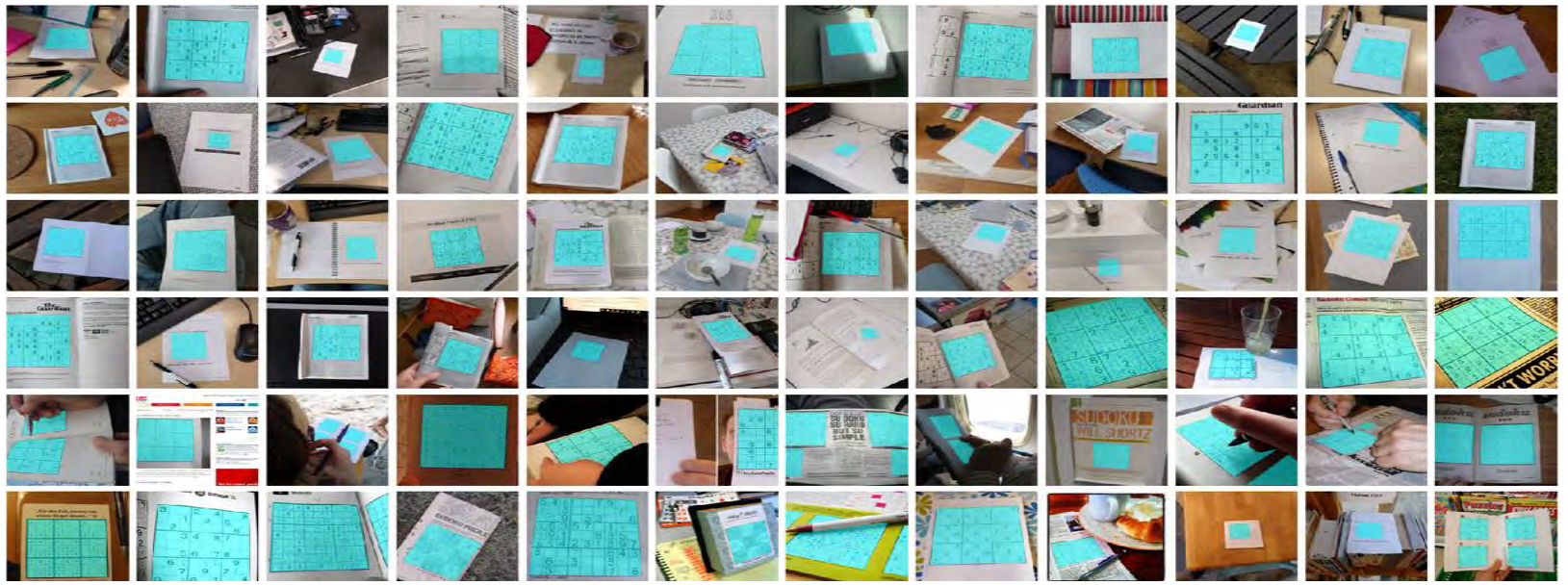
SUDOKU

9 7 3	2 5 6	1 8 4
4 2 8	3 9 1	5 7 6
5 1 6	4 8 7	9 3 2
7 6 5	1 3 2	4 9 8
8 3 4	7 6 9	2 5 1
2 9 1	5 4 8	7 6 3
3 5 9	8 1 4	6 2 7
6 4 2	9 7 3	8 1 5
1 8 7	6 2 5	3 4 9

Mode: more intelligent
Invalid attempts: 2,264
Current square :
Back corrections: 253
Resolution time : 2sec

WEB
SUDOKU
Hard Puzzle 1,851,567,493
Back to puzzle
Print another...
© Web Sudoku 2018 - www.websudoku.com
1 of 1
28/08/2018, 13:16
SHATTER RESISTAN

FRESCHE SOLUTIONS



FRESCHE SOLUTIONS

Find the puzzle

Find the boxes

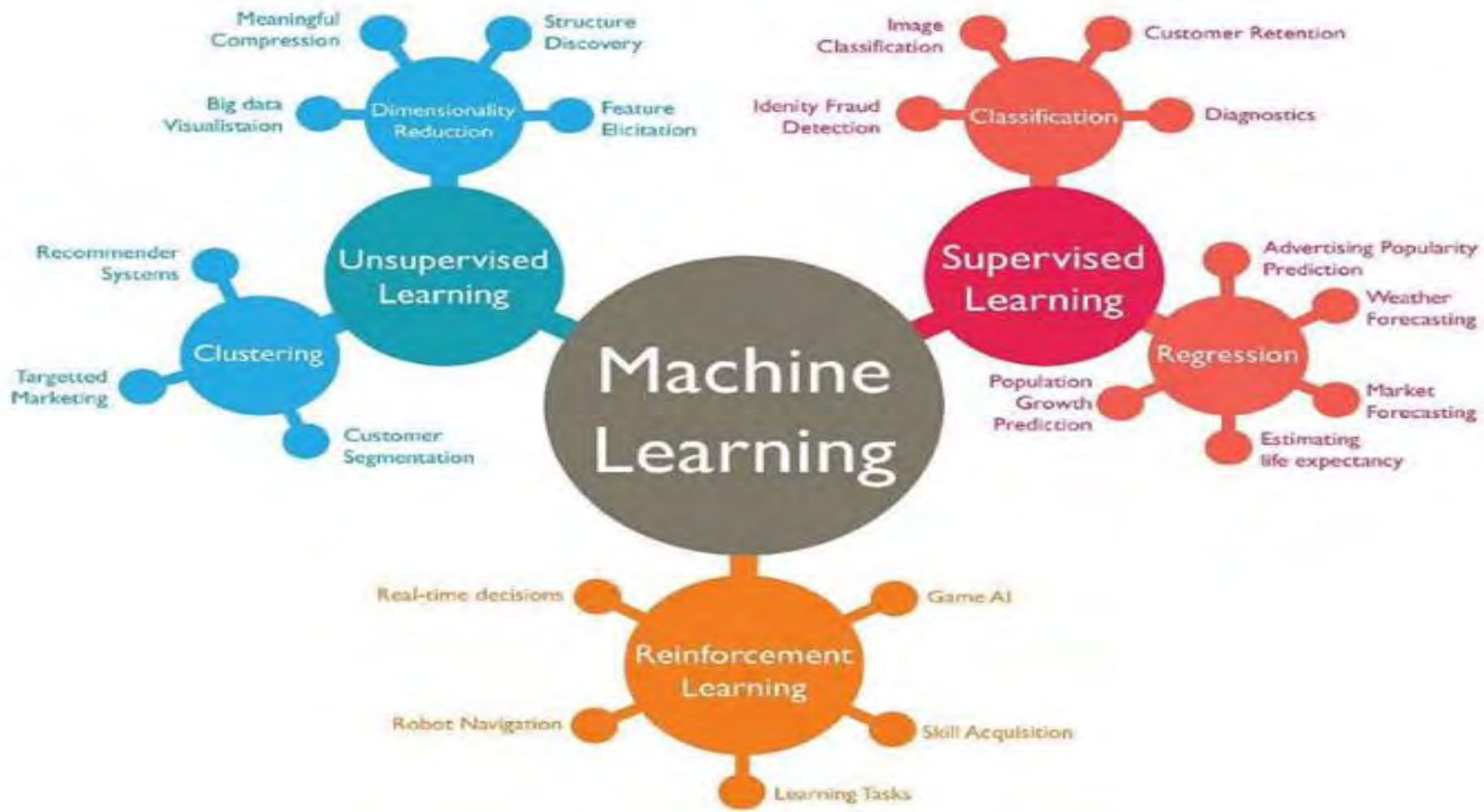
Read the numbers

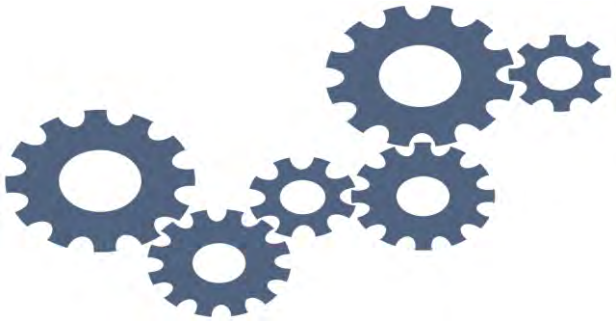
$$\begin{bmatrix} 4 & 1 & \cdots & ? & ? \\ 7 & ? & \cdots & ? & ? \\ \vdots & \vdots & \cdots & \vdots & \vdots \\ ? & ? & \cdots & 7 & ? \\ ? & 7 & \cdots & ? & ? \end{bmatrix}$$

Solve

$$\begin{bmatrix} 4 & 1 & \cdots & 6 & 8 \\ 7 & 8 & \cdots & 3 & 2 \\ \vdots & \vdots & \cdots & \vdots & \vdots \\ 4 & 2 & \cdots & 7 & 5 \\ 6 & 7 & \cdots & 4 & 1 \end{bmatrix}$$

FRESCHE SOLUTIONS

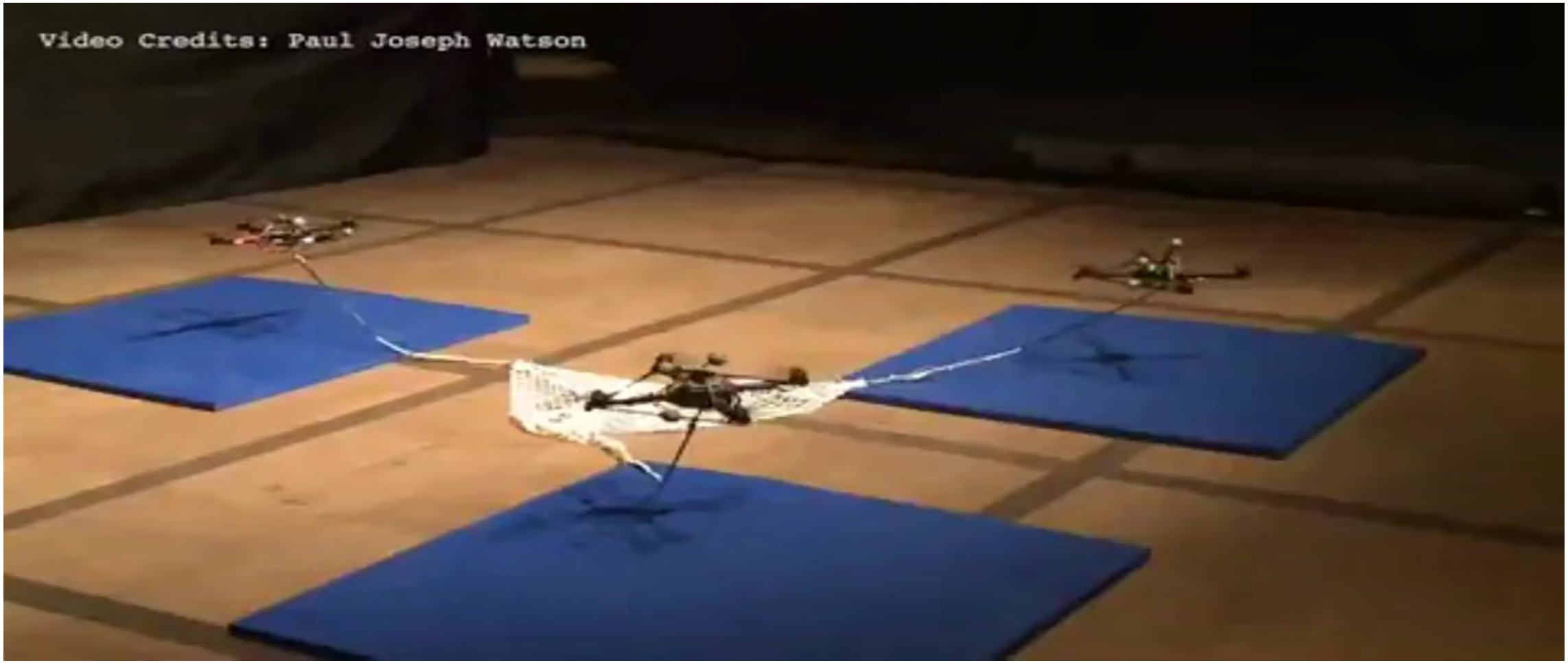


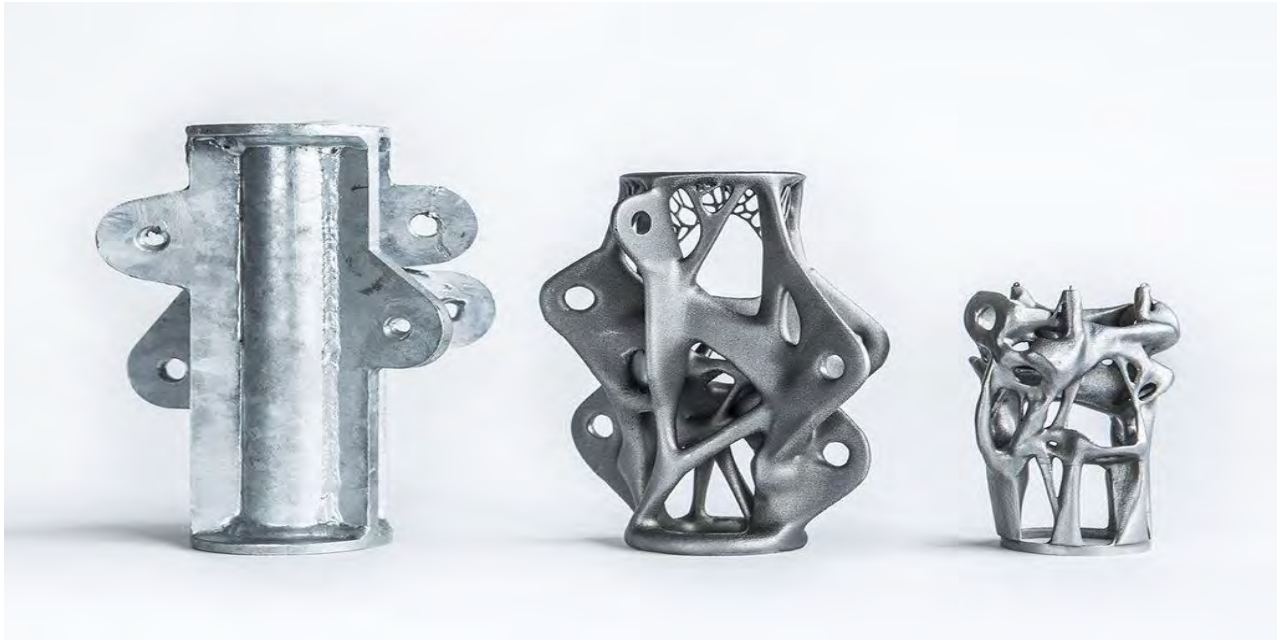


Some live examples?

FRESCHE SOLUTIONS

person

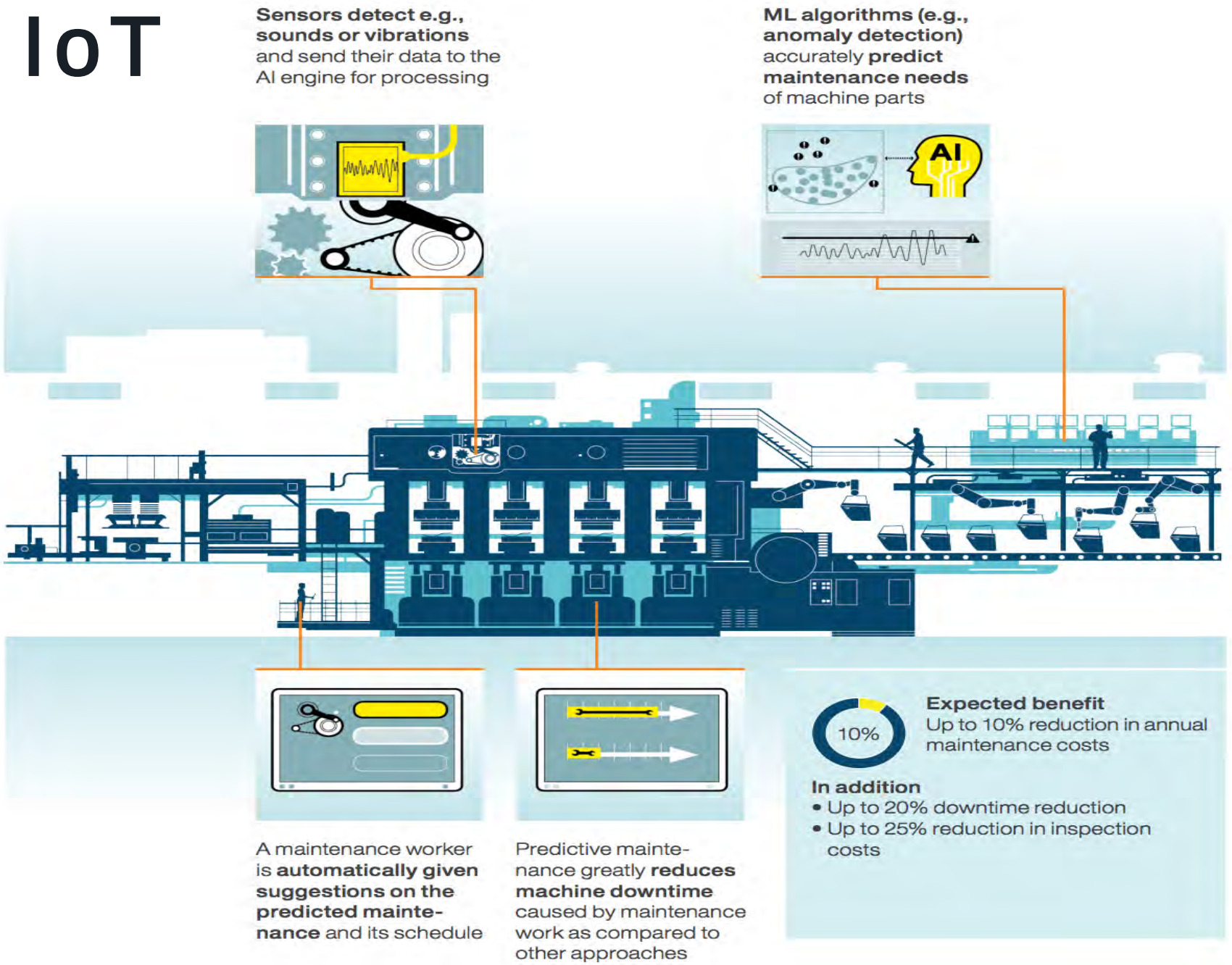

Video Credits: Paul Joseph Watson



Design process

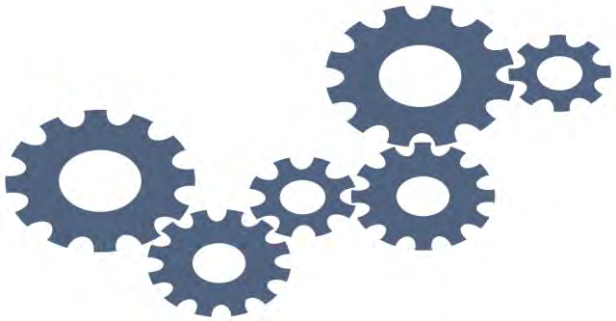
→ 40% material saving

IoT



Production line

→ Anomaly Detection
→ Predictive Maintenance



How to start integration?

FRESCHE SOLUTIONS

BUSINESS NEEDS

DIGITAL SOLUTIONS

COGNITIVE SOLUTIONS

FRESCHE SOLUTIONS

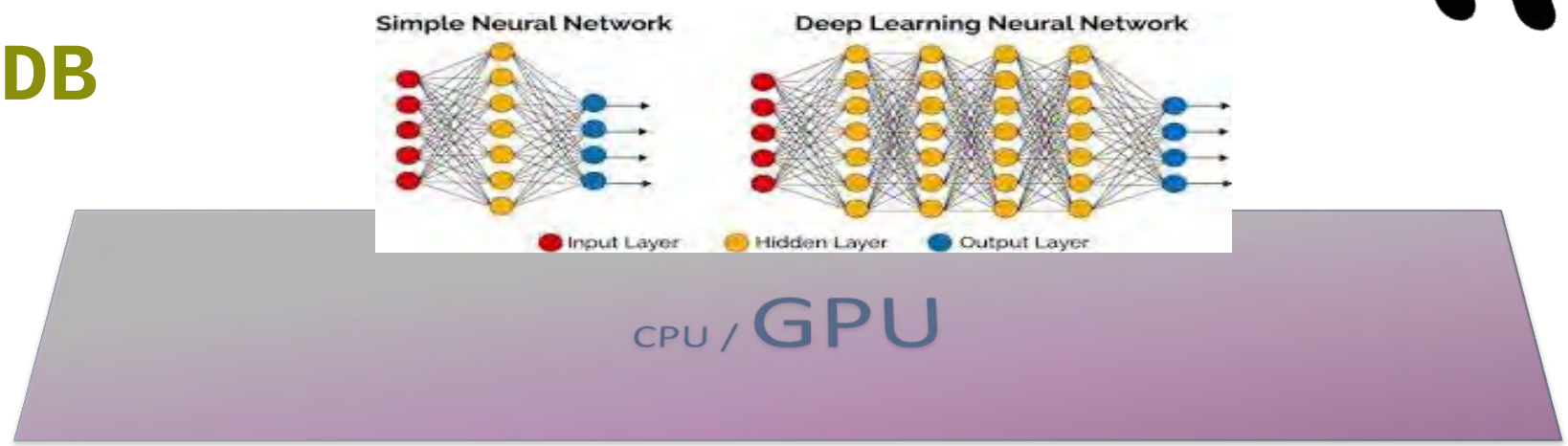
IoT

Big Data , DB

data

data

AI bot
Chatbot
Virtual assistant



FRESCHE SOLUTIONS

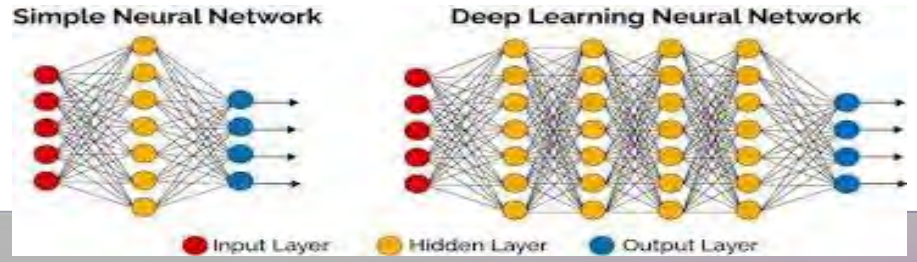
IoT

Big Data , DB

data

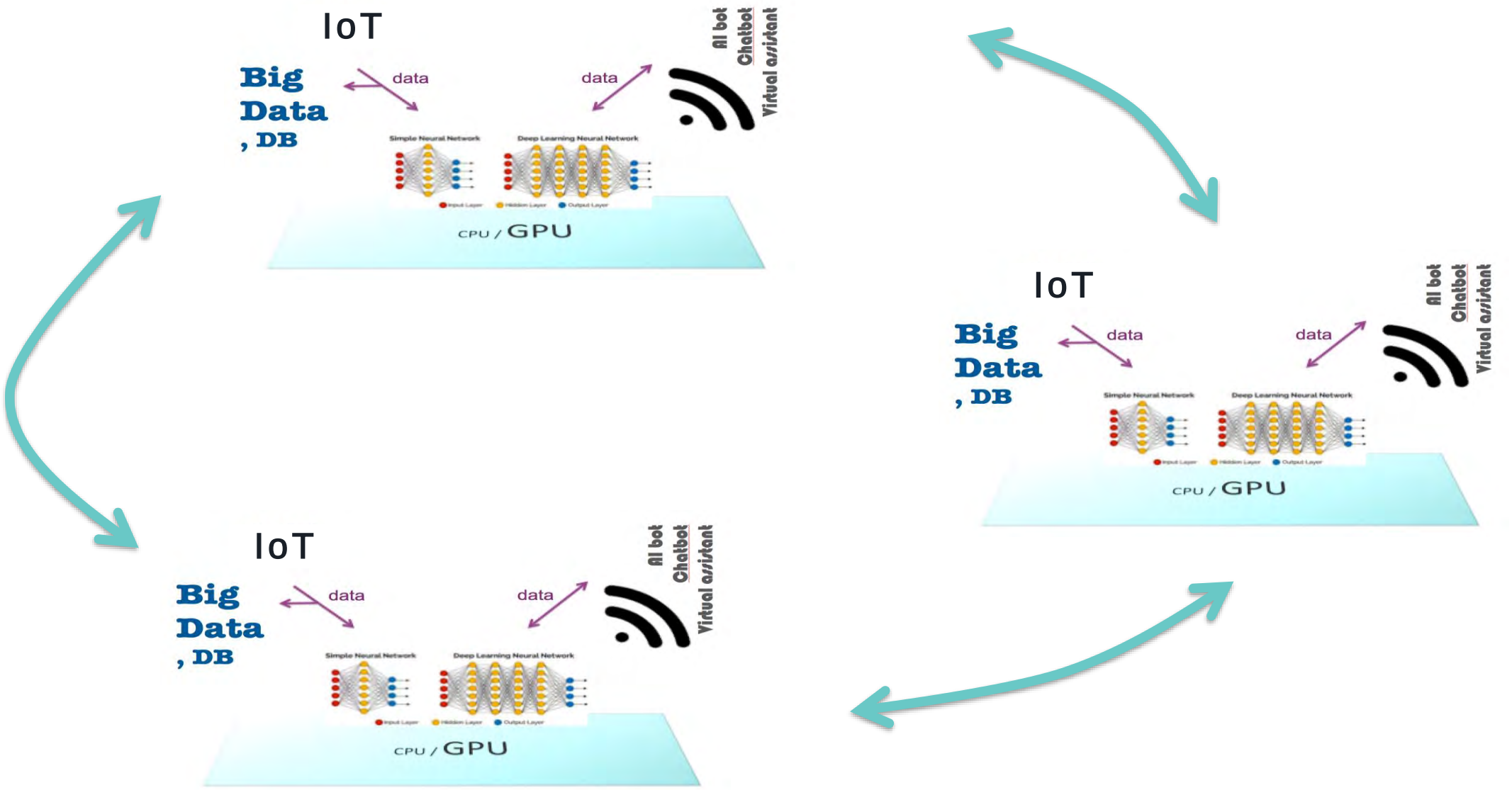
data

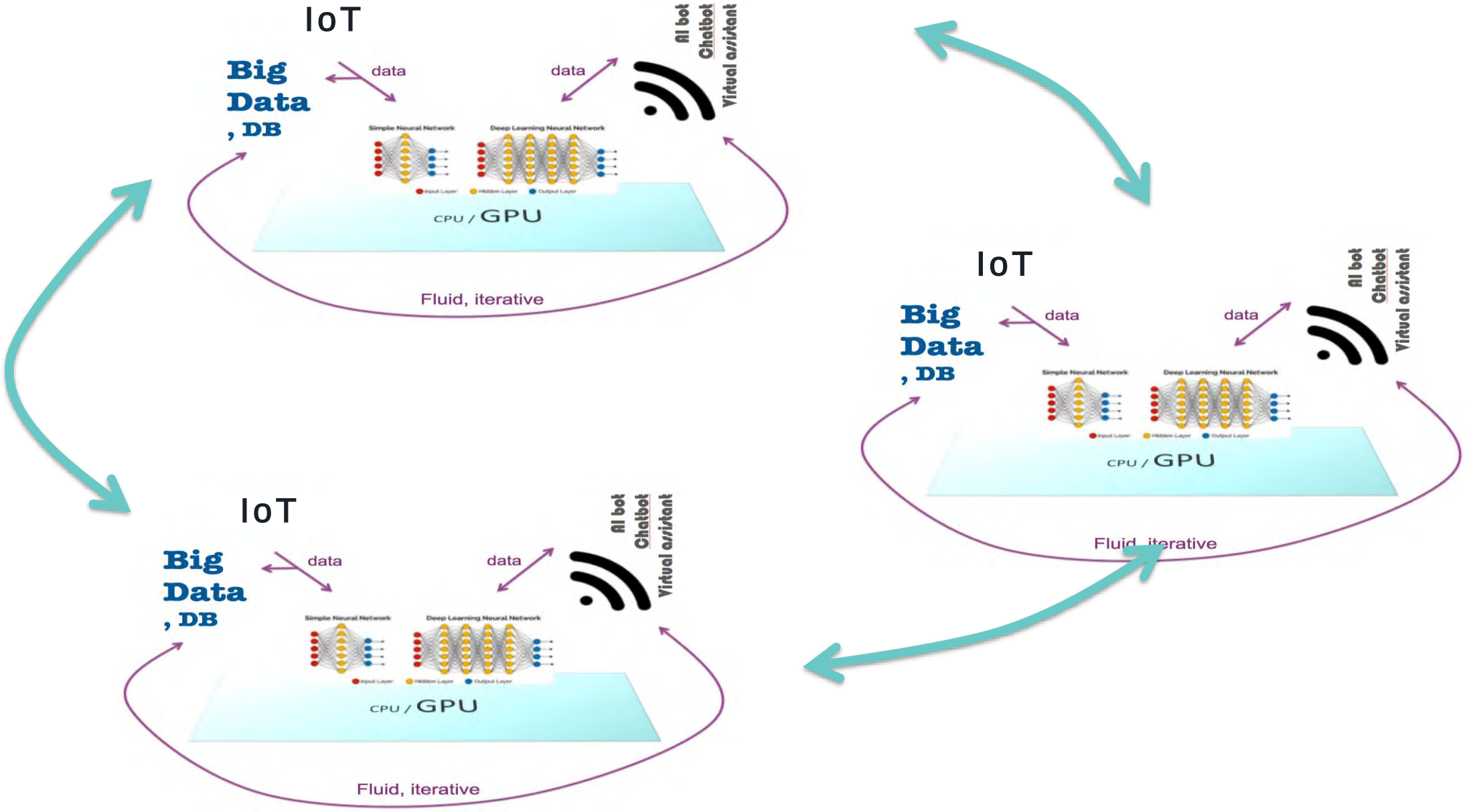
AI bot
Chatbot
Virtual assistant

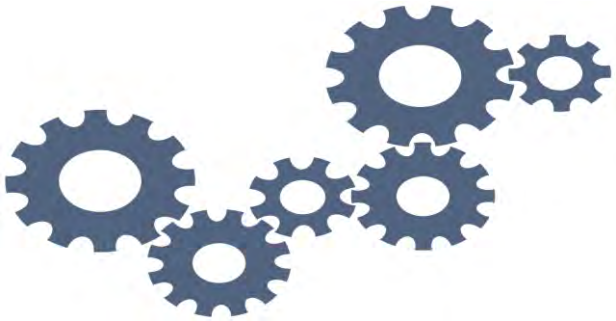


CPU / GPU

Fluid, iterative

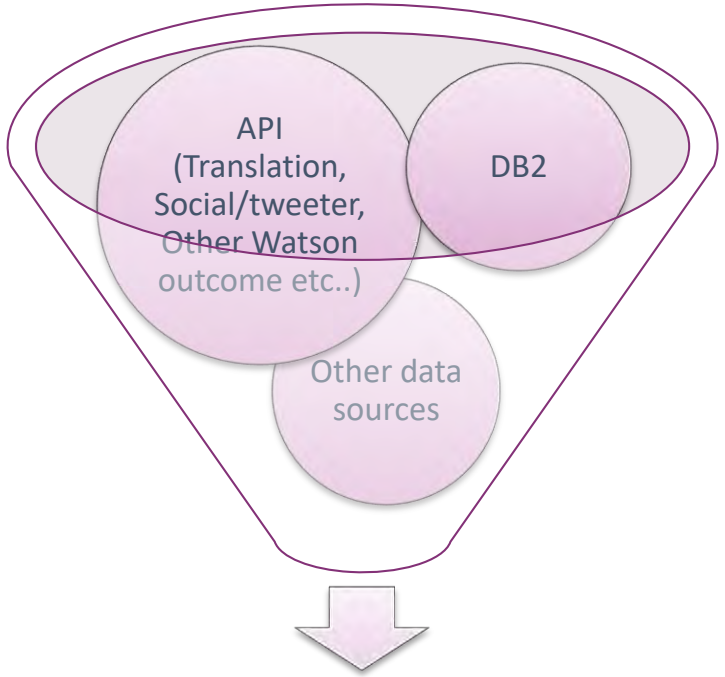

IoT
Big Data , DB
data
data
AI bot
Chatbot
Virtual assistant
Simple Neural Network
Deep Learning Neural Network
CPU / GPU
IoT
Big Data , DB
data
data
AI bot
Chatbot
Virtual assistant
Simple Neural Network
Deep Learning Neural Network
CPU / GPU
IoT
Big Data , DB
data
data
AI bot
Chatbot
Virtual assistant
Simple Neural Network
Deep Learning Neural Network
CPU / GPU


IoT
Big Data , DB
data
data
AI bot
Chatbot
Virtual assistant
Simple Neural Network
Deep Learning Neural Network
CPU / GPU
Fluid, iterative
IoT
Big Data , DB
data
data
AI bot
Chatbot
Virtual assistant
Simple Neural Network
Deep Learning Neural Network
CPU / GPU
Fluid, iterative
IoT
Big Data , DB
data
data
AI bot
Chatbot
Virtual assistant
Simple Neural Network
Deep Learning Neural Network
CPU / GPU
Fluid, iterative



Integration Example With DATA

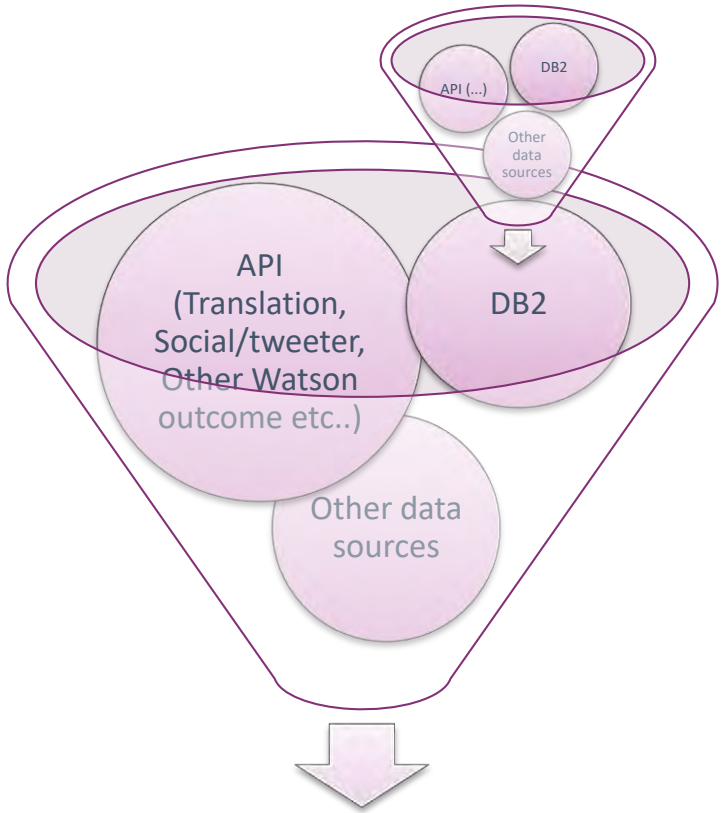
Exploration/Exploitation



Big flat table

Watson Analytics
(or Watson Cognos Analytics)

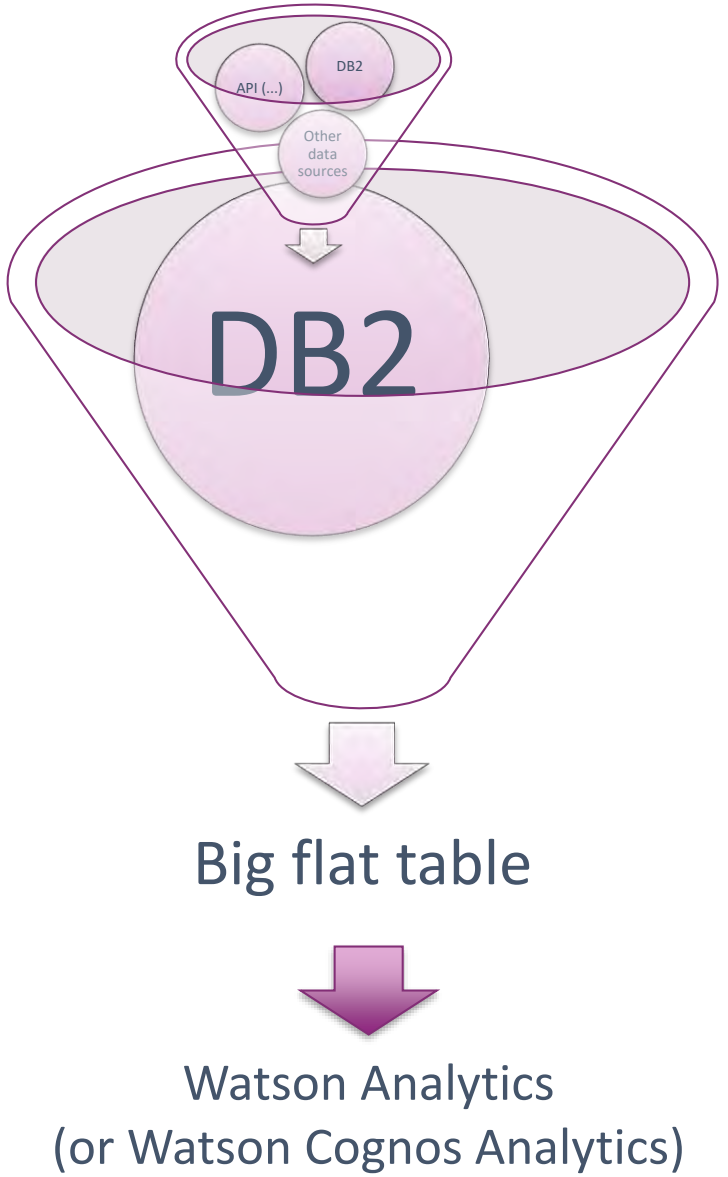
Exploration/Exploitation



Big flat table

Watson Analytics
(or Watson Cognos Analytics)

Exploration/Exploitation



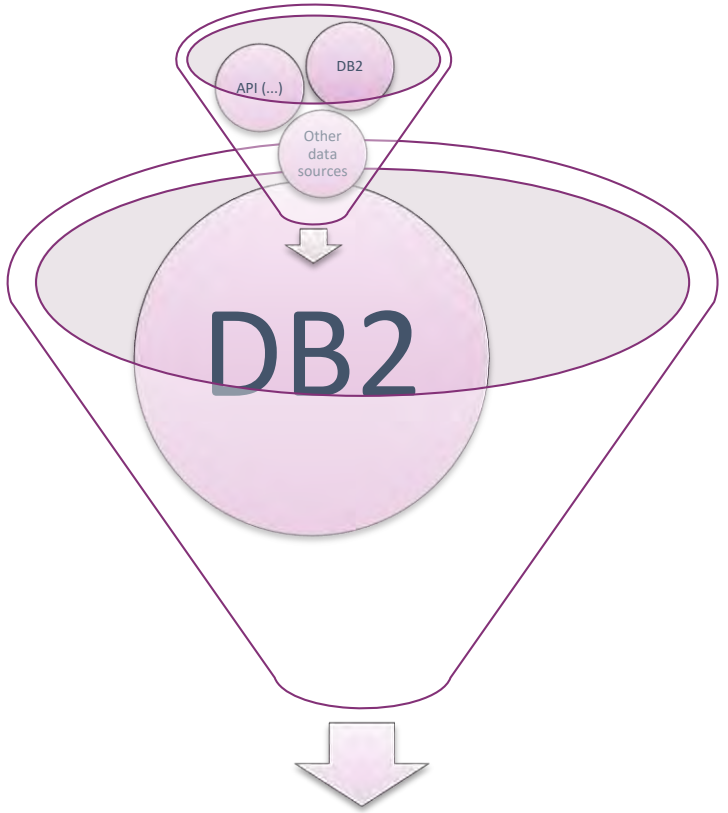
Exploration/Exploitation

Create a flat table with all relevant information

- Create View, merge tables…
  - “Reverse back” Relational DB relationships towards a flat table
  - If necessary, set meaningful column heading

Enrich the table with metadata

- Use RESTful services from DB2 to call API
  - systools.urlEncode + systools.httpGetClob
  - → Call Watson API, Tweeter, etc...



Big flat table

Watson Analytics
(or Watson Cognos Analytics)

Exploration/Exploitation

Create a flat table with all relevant information

- Create View, merge tables…
  - "Reverse back" Relational DB relationships towards a flat table
  - If necessary, set meaningful column heading

Tolling can help

Enrich the table with metadata

- Use RESTful services from DB2 to call API
  - systools.urlEncode + systools.httpGetClob
  - → Call Watson API, Tweeter, etc...

https://www.ibm.com/watson-analytics
https://www.ibm.com/analytics/cognos-analytics

Watson Analytics
(or Watson Cognos Analytics)

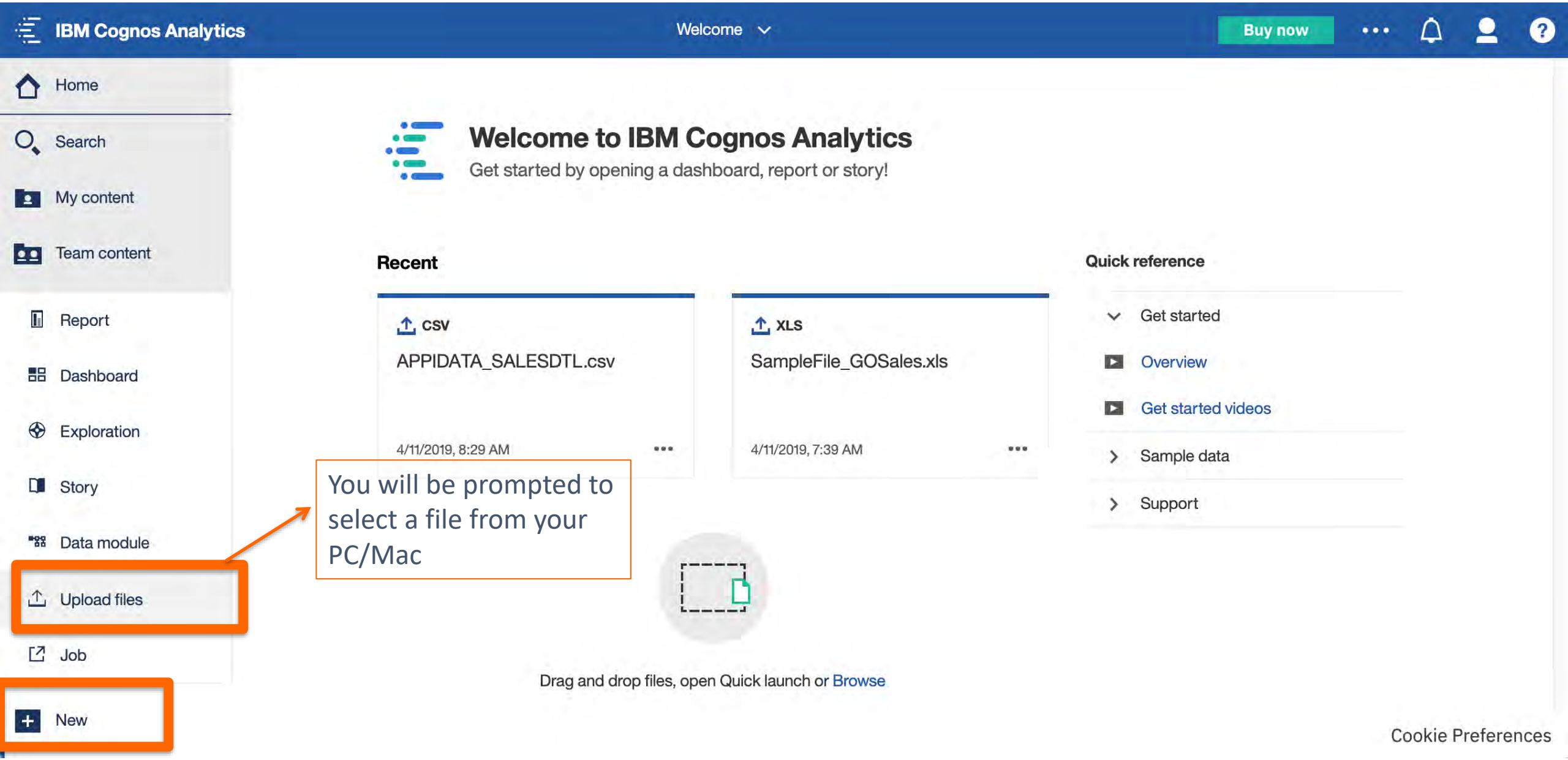
https://console.bluemix.net
https://cloud.ibm.com

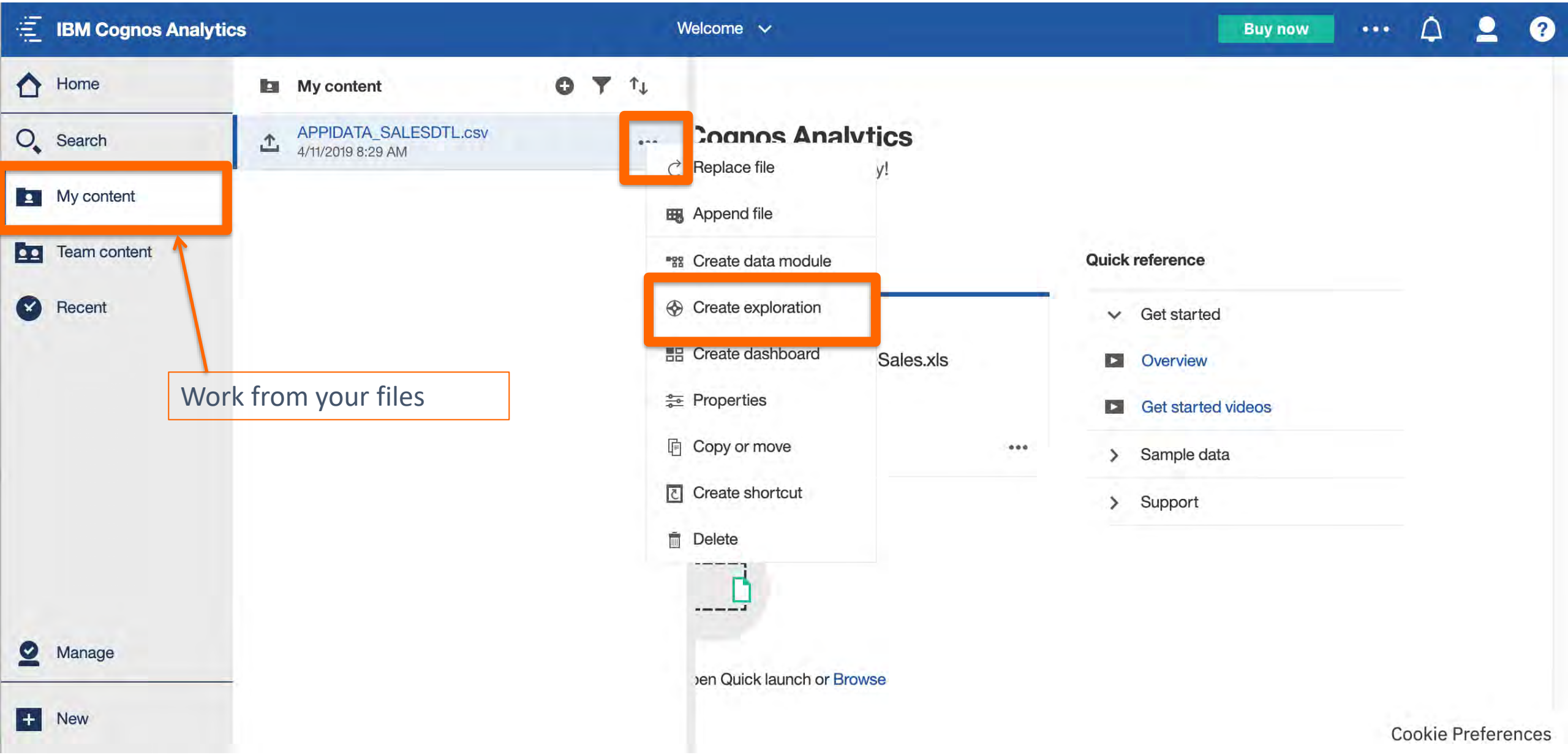
https://developer.twitter.com

Exploration/Exploitation

https://www.ibm.com/watson-analytics

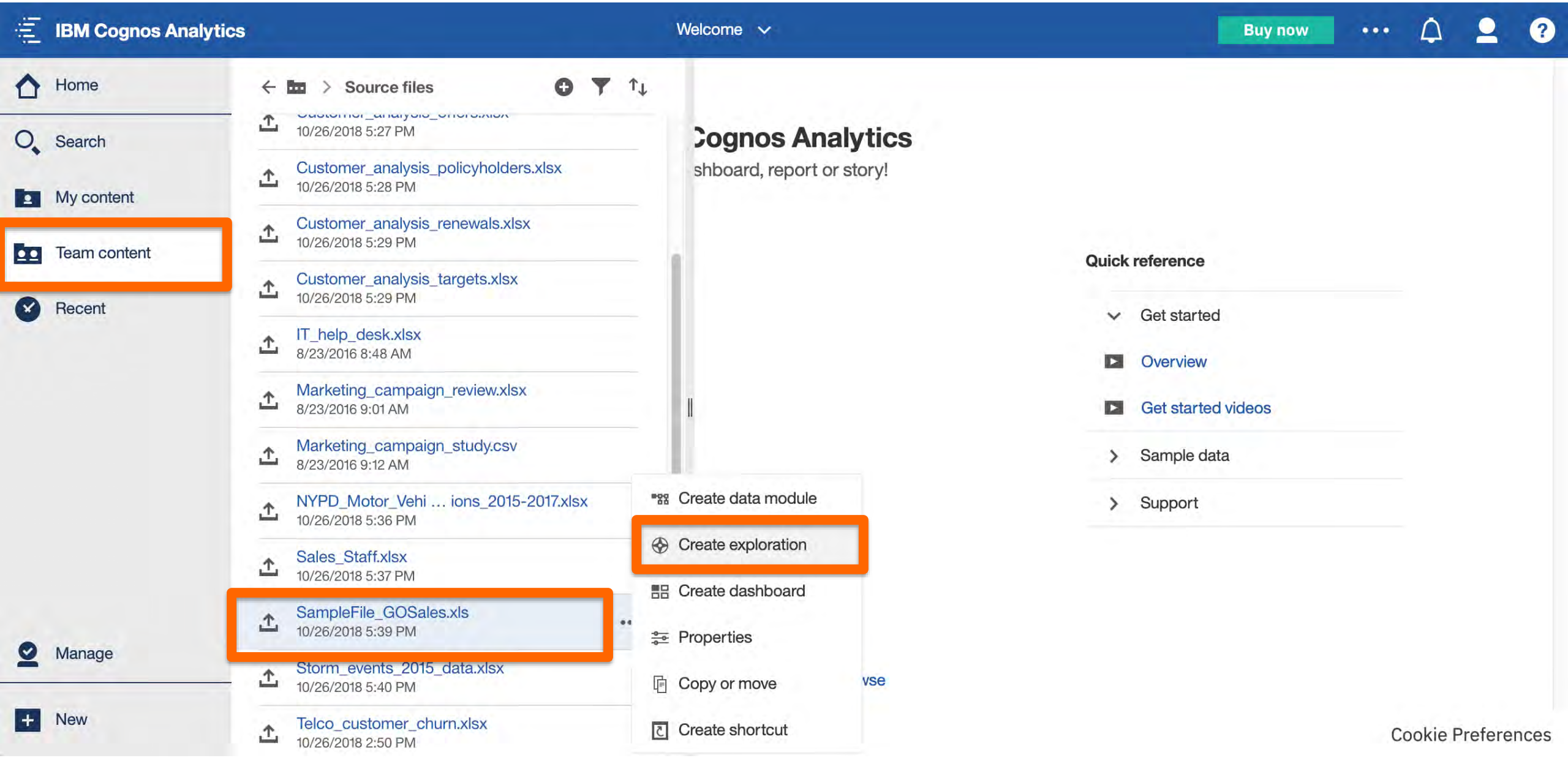
https://www.ibm.com/analytics/cognos-analytics


IBM Cognos Analytics
Welcome
Buy now
Home
Search
My content
Team content
Report
Dashboard
Exploration
Story
Data module
Upload files
Job
New
Welcome to IBM Cognos Analytics
Get started by opening a dashboard, report or story!
Recent
CSV
APPIDATA_SALESDTL.csv
4/11/2019, 8:29 AM
XLS
SampleFile_GOSales.xls
4/11/2019, 7:39 AM
Quick reference
Get started
Overview
Get started videos
Sample data
Support
You will be prompted to select a file from your PC/Mac
Drag and drop files, open Quick launch or Browse
Cookie Preferences


IBM Cognos Analytics
Welcome
Buy now
Home
Search
My content
Team content
Recent
Manage
New
My content
APPIDATA_SALESDTL.csv
4/11/2019 8:29 AM
Replace file
Append file
Create data module
Create exploration
Create dashboard
Properties
Copy or move
Create shortcut
Delete
Work from your files
Sales.xls
Quick reference
Get started
Overview
Get started videos
Sample data
Support
Browse
Cookie Preferences

Exploration/Exploitation

Let’s use a common file available on the website itself
for our pedagogical presentation


IBM Cognos Analytics
Welcome
Buy now
Home
Search
My content
Team content
Recent
Manage
New
Source files
10/26/2018 5:27 PM
Customer_analysis_policyholders.xlsx
10/26/2018 5:28 PM
Customer_analysis_renewals.xlsx
10/26/2018 5:29 PM
Customer_analysis_targets.xlsx
10/26/2018 5:29 PM
IT_help_desk.xlsx
8/23/2016 8:48 AM
Marketing_campaign_review.xlsx
8/23/2016 9:01 AM
Marketing_campaign_study.csv
8/23/2016 9:12 AM
NYPD_Motor_Vehi … ions_2015-2017.xlsx
10/26/2018 5:36 PM
Sales_Staff.xlsx
10/26/2018 5:37 PM
SampleFile_GOSales.xls
10/26/2018 5:39 PM
Storm_events_2015_data.xlsx
10/26/2018 5:40 PM
Telco_customer_churn.xlsx
10/26/2018 2:50 PM
Create data module
Create exploration
Create dashboard
Properties
Copy or move
Create shortcut
Cognos Analytics
shboard, report or story!
Quick reference
Get started
Overview
Get started videos
Sample data
Support
Cookie Preferences

New exploration *

Buy now

New

Ask a question

Navigation paths

Sample File Go Sales Xls

- Retailer Country
- Province Or State
- City
- Postal Code
- Short Postal Code
- abc Order Method Type
- abc Retailer Type
- abc Retailer
- abc Product Line
- abc Product Type
- abc Product
- # Product Number
- Year
- Quarter
- Quantity
- Unit Cost

Create a visualization

Drag and drop fields
or choose visualization type

Choose a type

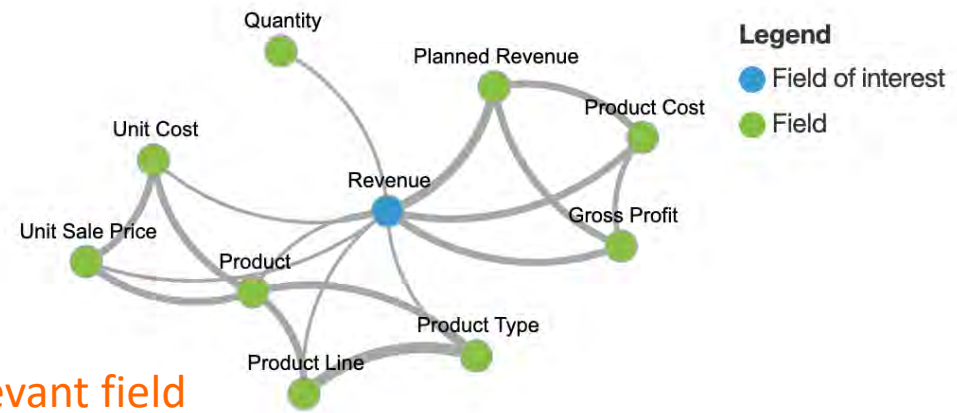
Explore relationships in your data

To get started, select your field of interest to see how other fields relate to it

Field of interest Reset to original

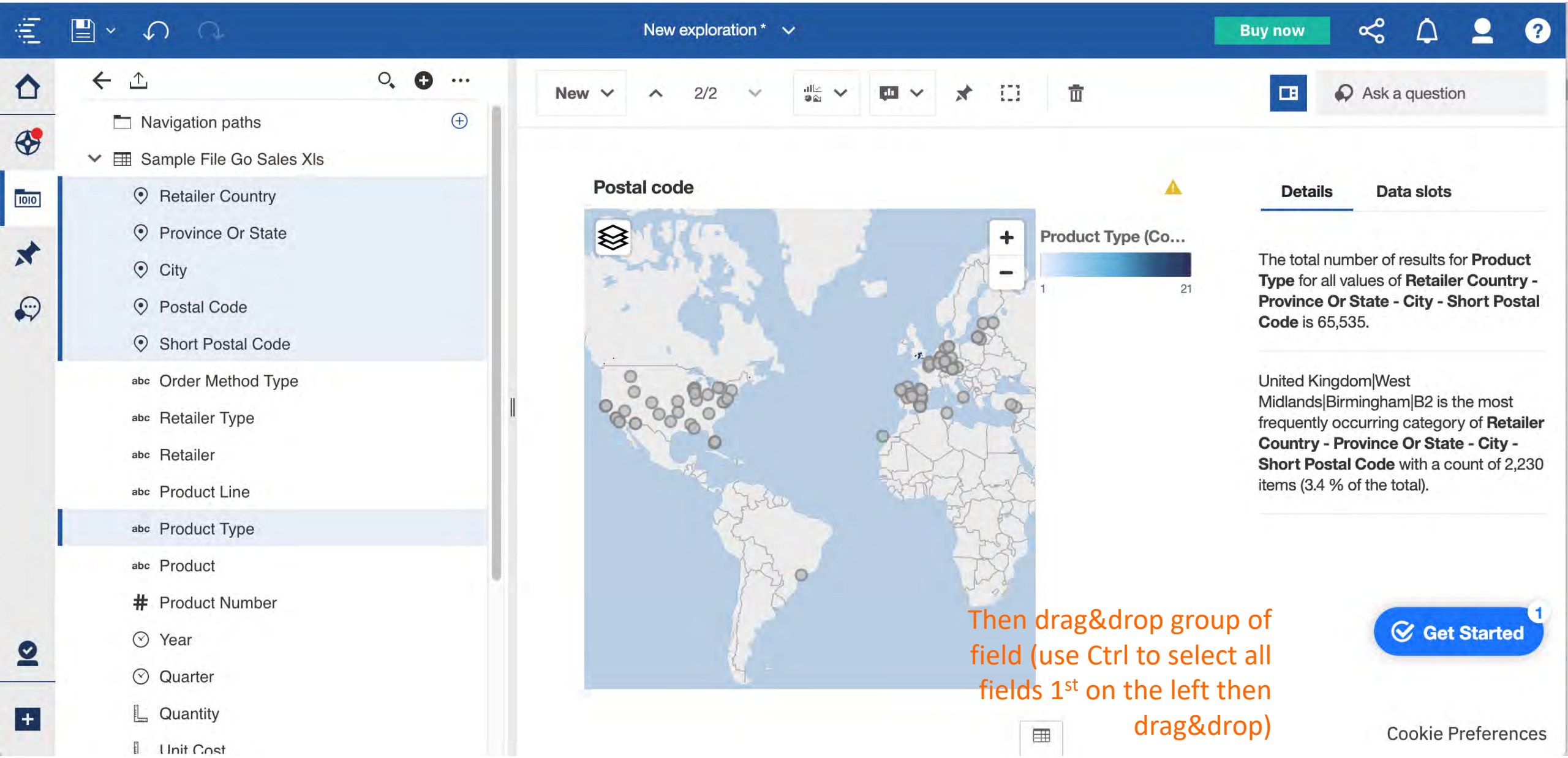
Enter field name | Quantity | Revenue | Product

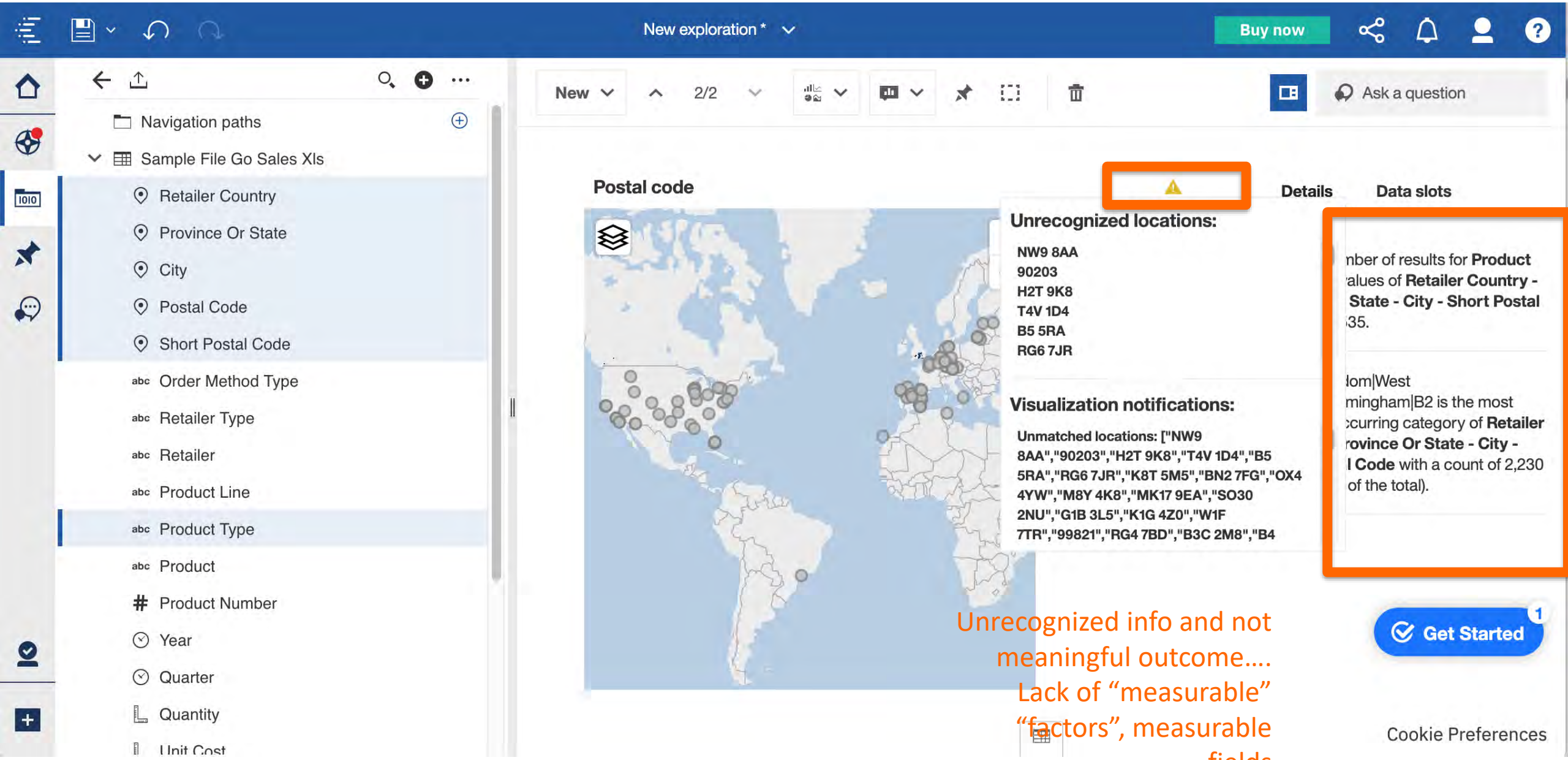
Filter unique fields 2 — 50



Select 1st a relevant field
to start perspective from

Cookie Preferences


New exploration *
Buy now
Navigation paths
Sample File Go Sales Xls
Retailer Country
Province Or State
City
Postal Code
Short Postal Code
Order Method Type
Retailer Type
Retailer
Product Line
Product Type
Product
Product Number
Year
Quarter
Quantity
Unit Cost
New
2/2
Ask a question
Postal code
Product Type (Co...
1
21
Details
Data slots
The total number of results for Product Type for all values of Retailer Country - Province Or State - City - Short Postal Code is 65,535.
United Kingdom|West Midlands|Birmingham|B2 is the most frequently occurring category of Retailer Country - Province Or State - City - Short Postal Code with a count of 2,230 items (3.4 % of the total).
Then drag&drop group of field (use Ctrl to select all fields 1st on the left then drag&drop)
Get Started
Cookie Preferences


New exploration *
Buy now
Navigation paths
Sample File Go Sales Xls
Retailer Country
Province Or State
City
Postal Code
Short Postal Code
Order Method Type
Retailer Type
Retailer
Product Line
Product Type
Product
Product Number
Year
Quarter
Quantity
Unit Cost
New
2/2
Ask a question
Postal code
Details
Data slots
Unrecognized locations:
NW9 8AA
90203
H2T 9K8
T4V 1D4
B5 5RA
RG6 7JR
Visualization notifications:
Unmatched locations: ["NW9 8AA","90203","H2T 9K8","T4V 1D4","B5 5RA","RG6 7JR","K8T 5M5","BN2 7FG","OX4 4YW","M8Y 4K8","MK17 9EA","SO30 2NU","G1B 3L5","K1G 4Z0","W1F 7TR","99821","RG4 7BD","B3C 2M8","B4
nber of results for Product
alues of Retailer Country -
State - City - Short Postal
35.
lom|West
mingham|B2 is the most
curring category of Retailer
rovince Or State - City -
l Code with a count of 2,230
of the total).
Get Started
1
Unrecognized info and not meaningful outcome…. Lack of “measurable” “factors”, measurable fields
Cookie Preferences

New exploration *

Buy now

New 2/2

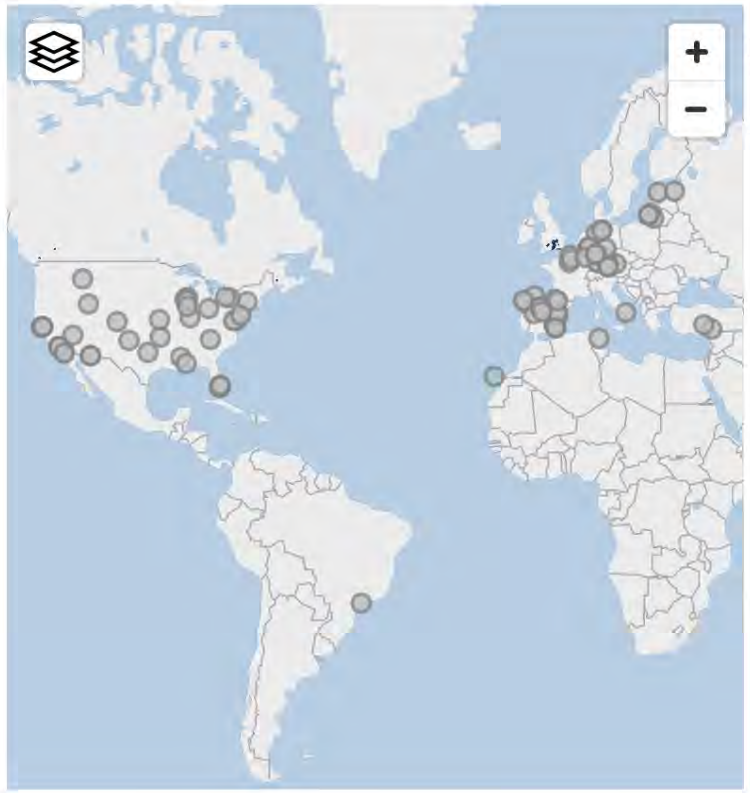
Ask a question

Navigation paths

Sample File Go Sales Xls

- Retailer Country
- Province Or State
- City
- Postal Code
- Short Postal Code
- abc Order Method Type
- abc Retailer Type
- abc Retailer
- abc Product Line
- abc Product Type
- abc Product
- # Product Number
- Year
- Quarter
- Quantity
- Unit Cost

Postal code



Details Data slots

The total number of results for **Product Type** for all values of **Retailer Country - Province Or State - City - Short Postal Code** is 65,535.

United Kingdom|West Midlands|Birmingham|B2 is the most frequently occurring category of **Retailer Country - Province Or State - City - Short Postal Code** with a count of 2,230 items (3.4 % of the total).

Not very useful details, why?

Get Started 1

Cookie Preferences

New exploration *

Buy now

New 2/3

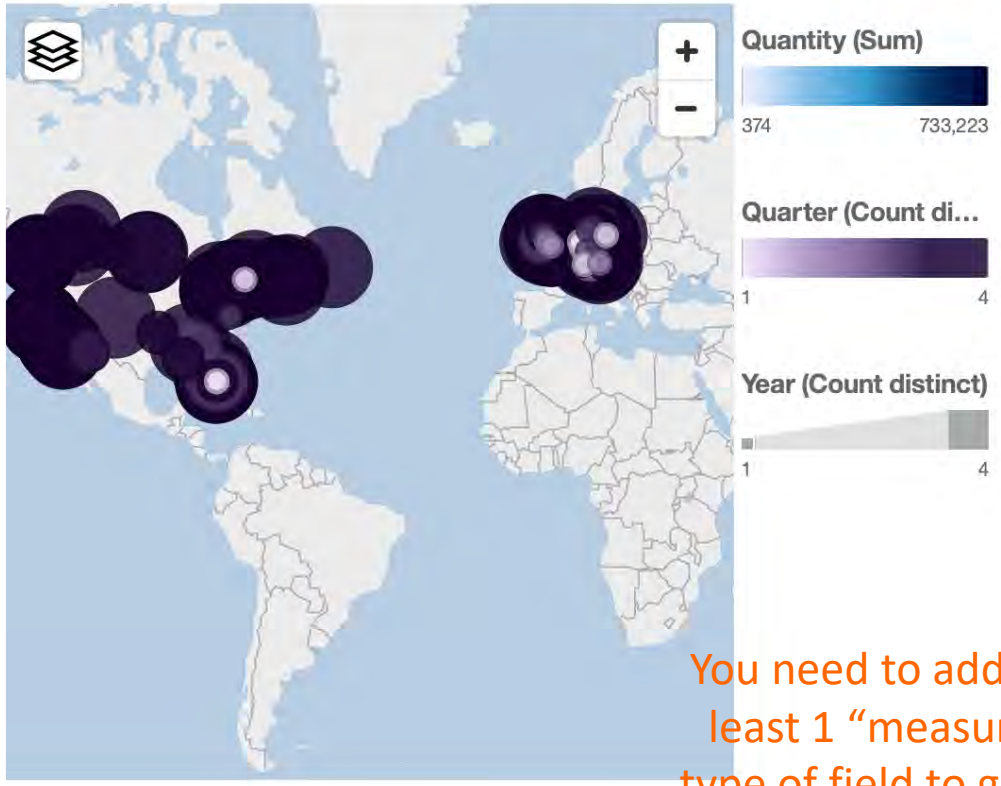
Ask a question

Sample File Go Sales Xls

- Retailer Country
- Province Or State
- City
- Postal Code
- Short Postal Code
- abc Order Method Type
- abc Retailer Type
- abc Retailer
- abc Product Line
- abc Product Type
- abc Product
- # Product Number
- Year
- Quarter
- Quantity
- Unit Cost

Measure

y Retailer country, Province or State, City, Short postal code 5



You need to add at least 1 “measure” type of field to give sense to your data exploration

Details | Data slots

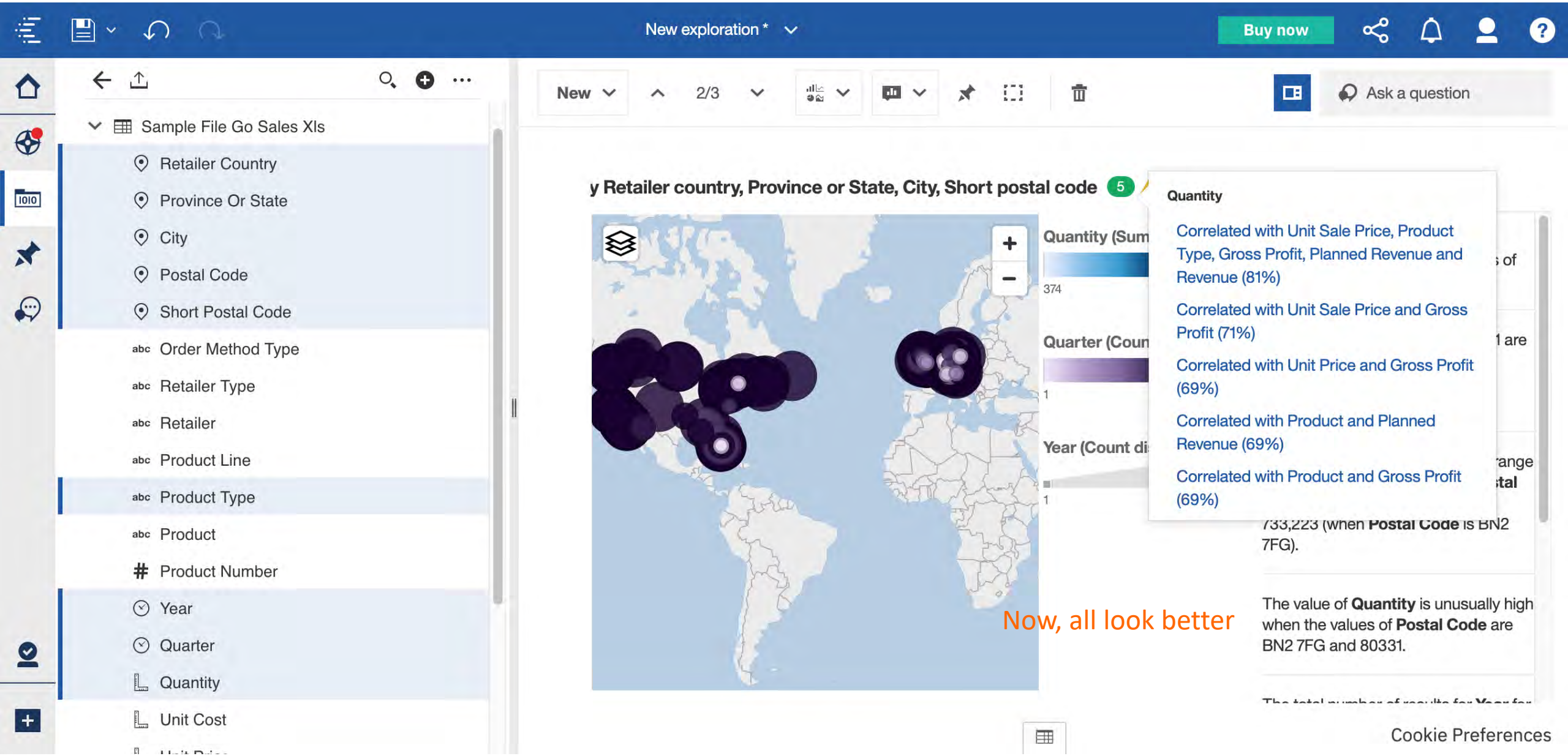
The sum of **Quantity** for all values of **Postal Code** is 24,063,928.

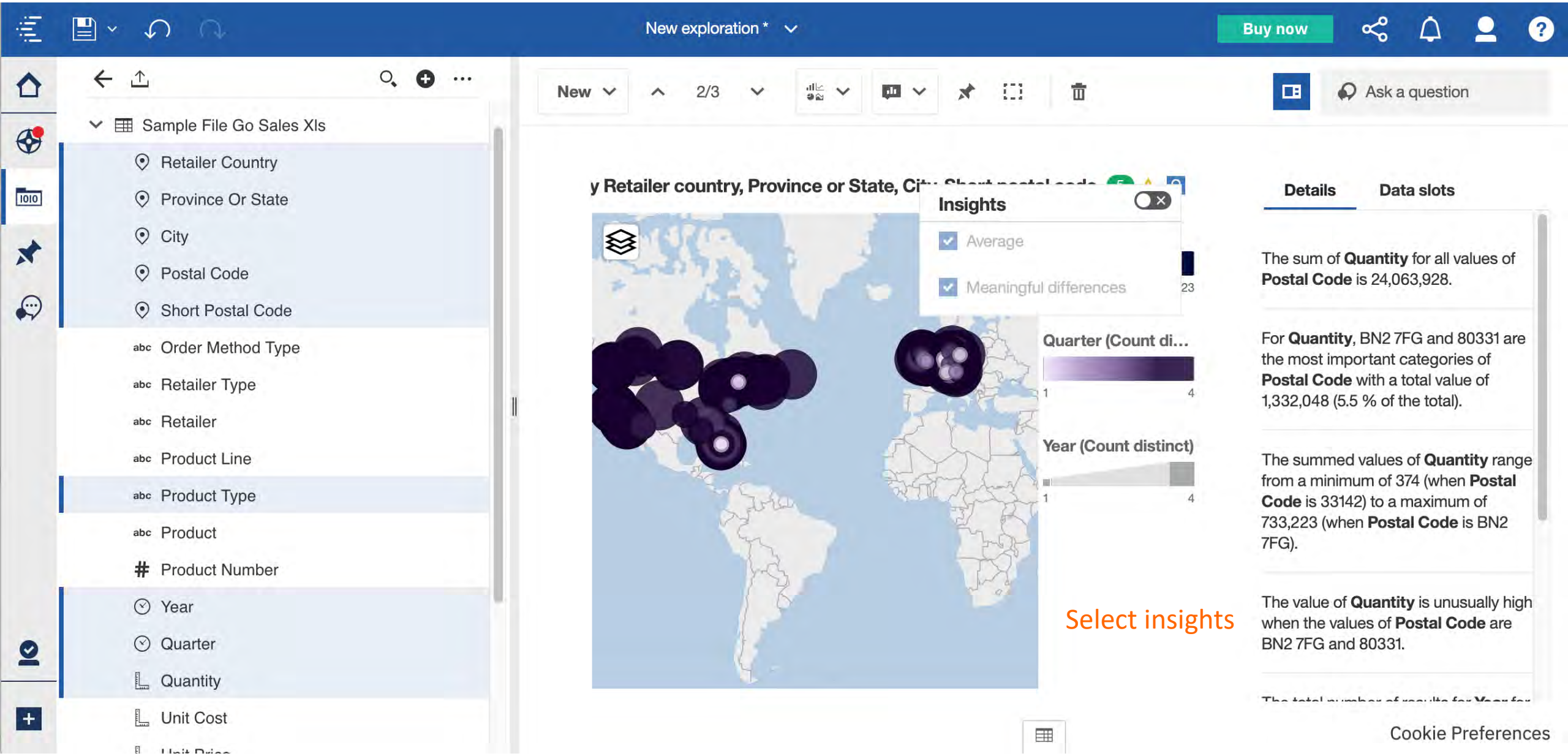
For **Quantity**, BN2 7FG and 80331 are the most important categories of **Postal Code** with a total value of 1,332,048 (5.5 % of the total).

The summed values of **Quantity** range from a minimum of 374 (when **Postal Code** is 33142) to a maximum of 733,223 (when **Postal Code** is BN2 7FG).

The value of **Quantity** is unusually high when the values of **Postal Code** are BN2 7FG and 80331.

Cookie Preferences


New exploration *
Buy now
Sample File Go Sales Xls
Retailer Country
Province Or State
City
Postal Code
Short Postal Code
Order Method Type
Retailer Type
Retailer
Product Line
Product Type
Product
Product Number
Year
Quarter
Quantity
Unit Cost
New
2/3
Ask a question
y Retailer country, Province or State, City, Short postal code
5
Quantity (Sum
374
Quarter (Coun
1
Year (Count di
1
Quantity
Correlated with Unit Sale Price, Product Type, Gross Profit, Planned Revenue and Revenue (81%)
Correlated with Unit Sale Price and Gross Profit (71%)
Correlated with Unit Price and Gross Profit (69%)
Correlated with Product and Planned Revenue (69%)
Correlated with Product and Gross Profit (69%)
Now, all look better
The value of Quantity is unusually high when the values of Postal Code are BN2 7FG and 80331.
Cookie Preferences


New exploration *
Buy now
Ask a question
New
2/3
Sample File Go Sales Xls
Retailer Country
Province Or State
City
Postal Code
Short Postal Code
Order Method Type
Retailer Type
Retailer
Product Line
Product Type
Product
Product Number
Year
Quarter
Quantity
Unit Cost
Insights
Average
Meaningful differences
Quarter (Count di...
Year (Count distinct)
Details
Data slots
The sum of Quantity for all values of Postal Code is 24,063,928.
For Quantity, BN2 7FG and 80331 are the most important categories of Postal Code with a total value of 1,332,048 (5.5 % of the total).
The summed values of Quantity range from a minimum of 374 (when Postal Code is 33142) to a maximum of 733,223 (when Postal Code is BN2 7FG).
The value of Quantity is unusually high when the values of Postal Code are BN2 7FG and 80331.
Select insights
Cookie Preferences

New exploration *

Buy now

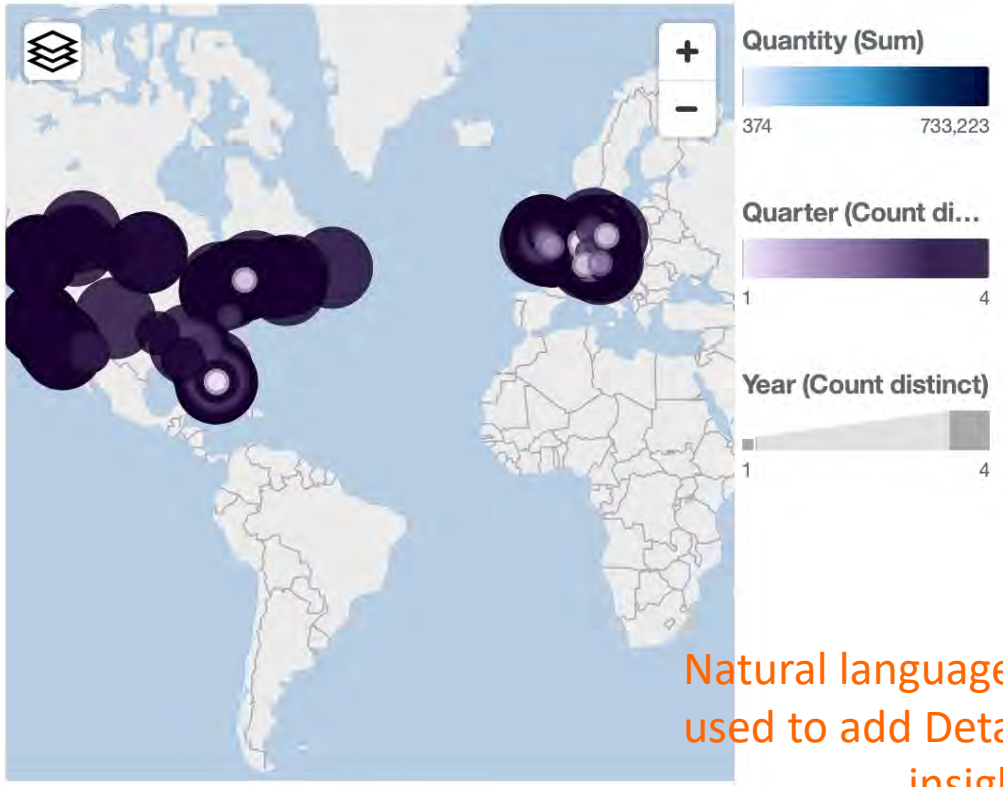
Sample File Go Sales Xls

- Retailer Country
- Province Or State
- City
- Postal Code
- Short Postal Code
- Order Method Type
- Retailer Type
- Retailer
- Product Line
- Product Type
- Product
- Product Number
- Year
- Quarter
- Quantity
- Unit Cost

New 2/3

Ask a question

y Retailer country, Province or State, City, Short postal code 5



Natural language is used to add Details insights

Details | Data slots

Code is 33142) to a maximum of 733,223 (when **Postal Code** is BN2 7FG).

The value of **Quantity** is unusually high when the values of **Postal Code** are BN2 7FG and 80331.

The total number of results for **Year** for all values of **Retailer Country - Province Or State - City - Short Postal Code** is 65,535.

United Kingdom|West Midlands|Birmingham|B2 is the most frequently occurring category of **Retailer Country - Province Or State - City - Short Postal Code** with a count of 2,230 items (3.4 % of the total).

Cookie Preferences

New exploration *

Buy now

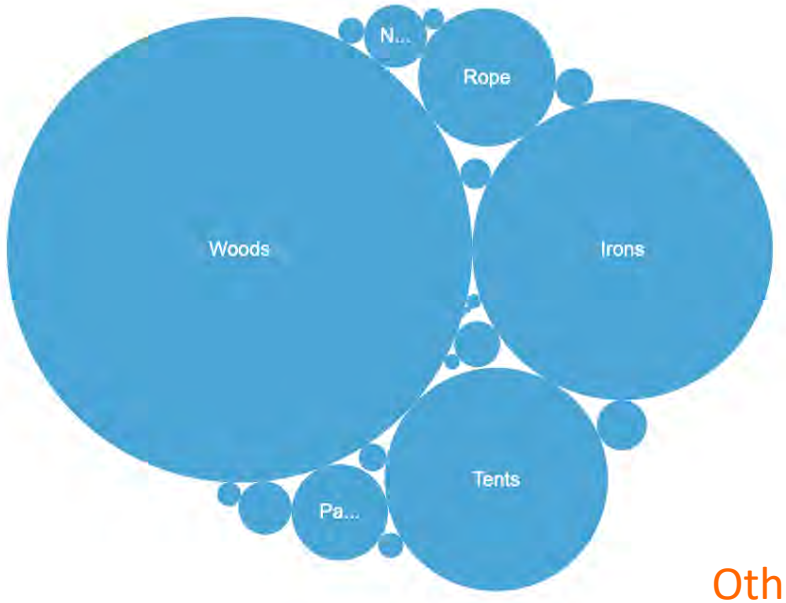
Sample File Go Sales Xls

- Retailer Country
- Province Or State
- City
- Postal Code
- Short Postal Code
- Order Method Type
- Retailer Type
- Retailer
- Product Line
- Product Type
- Product
- Product Number
- Year
- Quarter
- Quantity
- Unit Cost

New 3/3

Ask a question

Product type and Unit sale price



Other views, diagrams

Details | Data slots

The average of **Unit Sale Price** for all values of **Product Type** is 100.466.

The average values of **Unit Sale Price** range from a minimum of 4.894 (when **Product Type** is Sunscreen) to a maximum of 1,021.857 (when **Product Type** is Woods).

Product Type strongly drives **Unit Sale Price** (82%).

The value of **Unit Sale Price** is unusually high when **Product Type** is Woods.

Eyewear is the most frequently occurring category of **Product Type**

Cookie Preferences

YOUR THOUGHTS?

Thank you
Pascal Polverini

pascal.polverini@freschesolutions.com