

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
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pascal.blandin@itheis.com

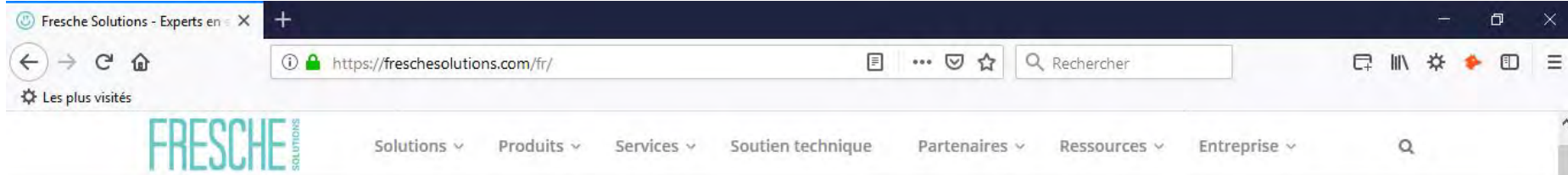
Préparez votre DB2 pour Watson

- 🍏 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



FRESCHE Solutions :



X-Analysis View

Accélérez le développement et réduisez la maintenance de vos applications IBM i avec X-Analysis View

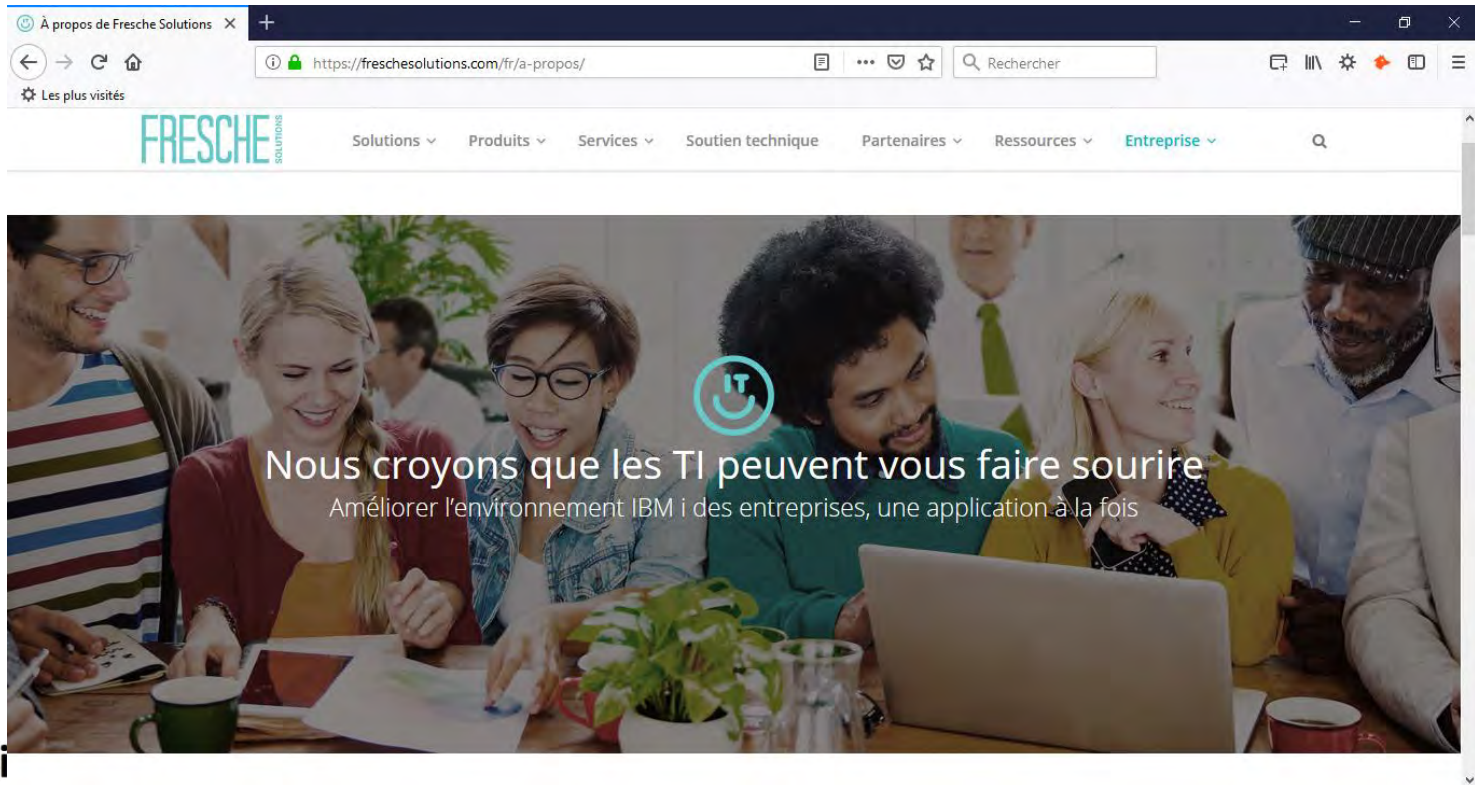
EN SAVOIR PLUS

The advertisement features a smiling man in a white shirt and tie giving two thumbs up. Behind him is a large tablet displaying a complex data flow diagram with various nodes and connections, representing the X-Analysis View software interface.

https://freschesolutions.com/fr/#qode-home_page_french-fr

FRESCHE Solutions :

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



À propos de Fresche Solutions

https://freschesolutions.com/fr/a-propos/

Rechercher

Les plus visités

FRESCHE SOLUTIONS

Solutions ▾ Produits ▾ Services ▾ Soutien technique Partenaires ▾ Ressources ▾ **Entreprise ▾**

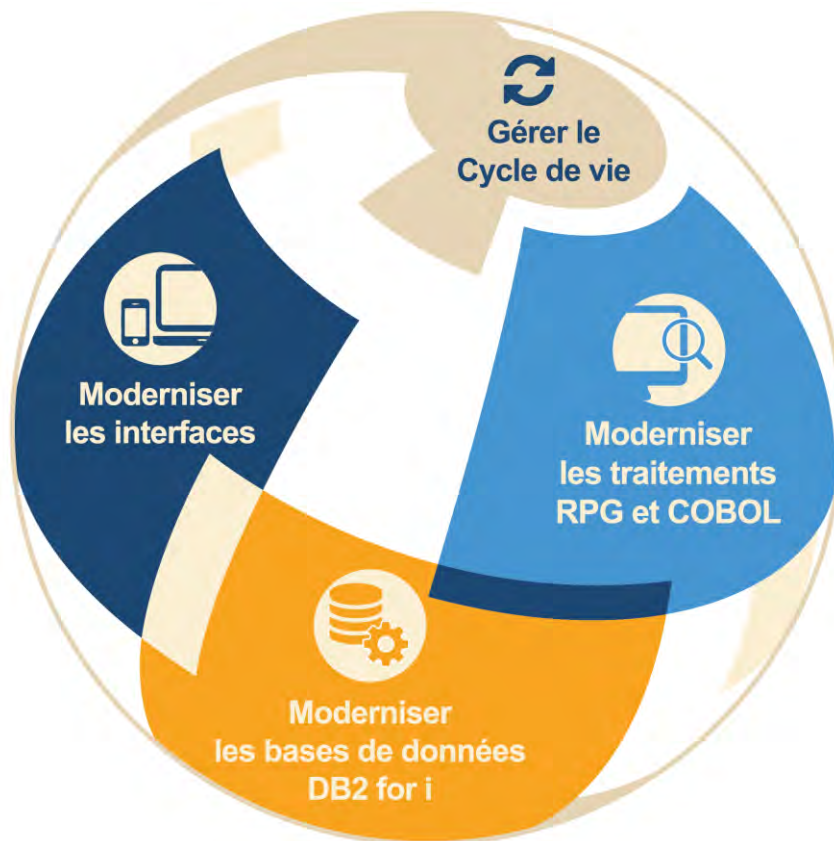
IT

Nous croyons que les TI peuvent vous faire sourire

Améliorer l'environnement IBM i des entreprises, une application à la fois

ithe

ITHEIS : Intégrateur de solutions

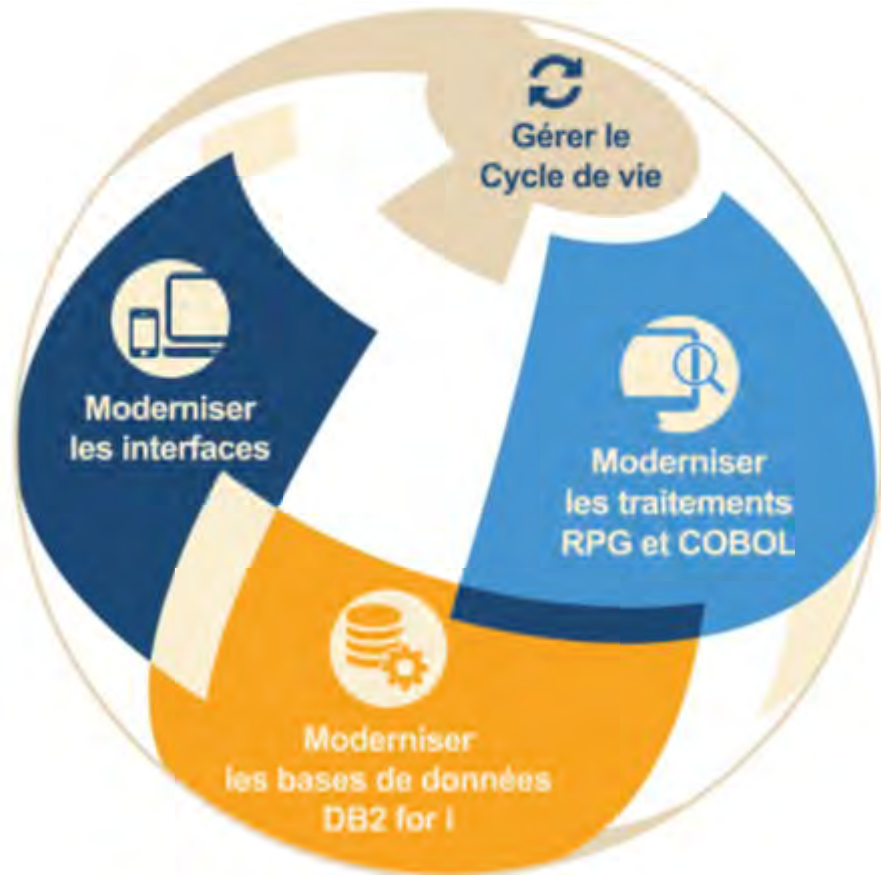


3 niveaux
de
transformation

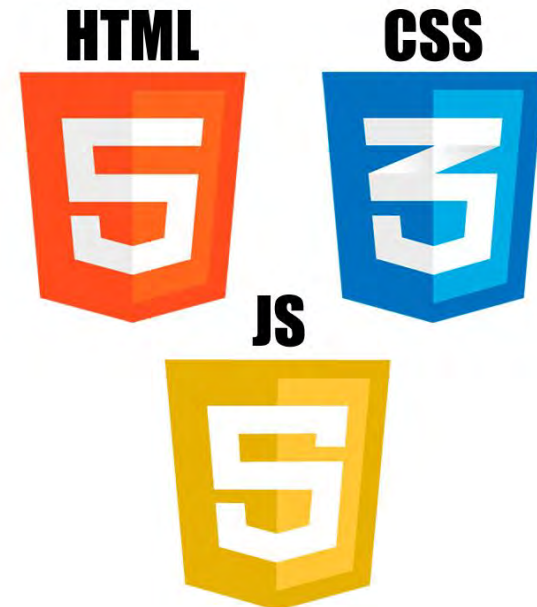
Approche « Best of breed »

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.

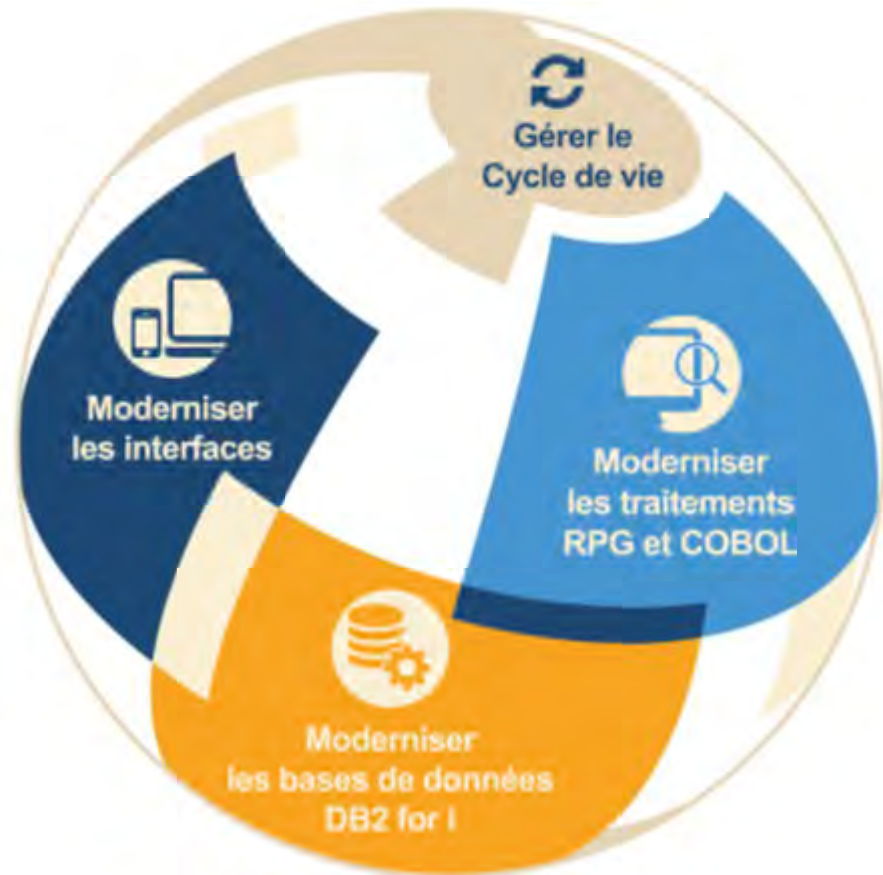
Transformer 5250 en HTML



Moderniser les interfaces IHM



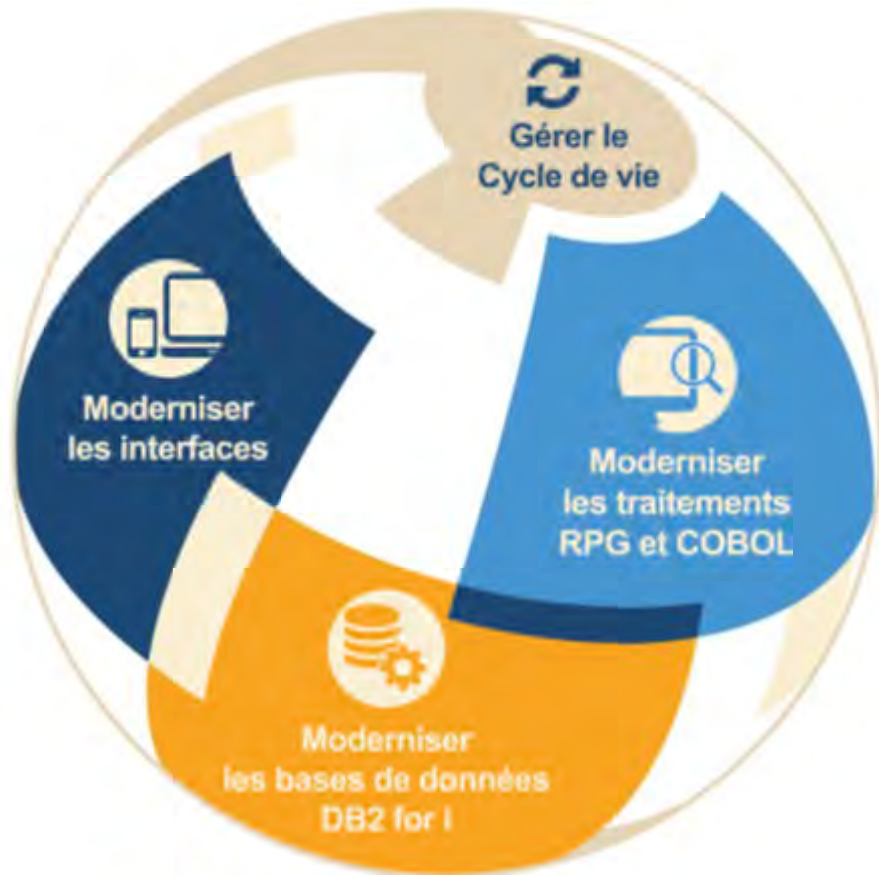
De RPG à RPG FreeForm, documentation



Moderniser les applications RPG

RPG FreeForm

Transformer les DDS en SQL

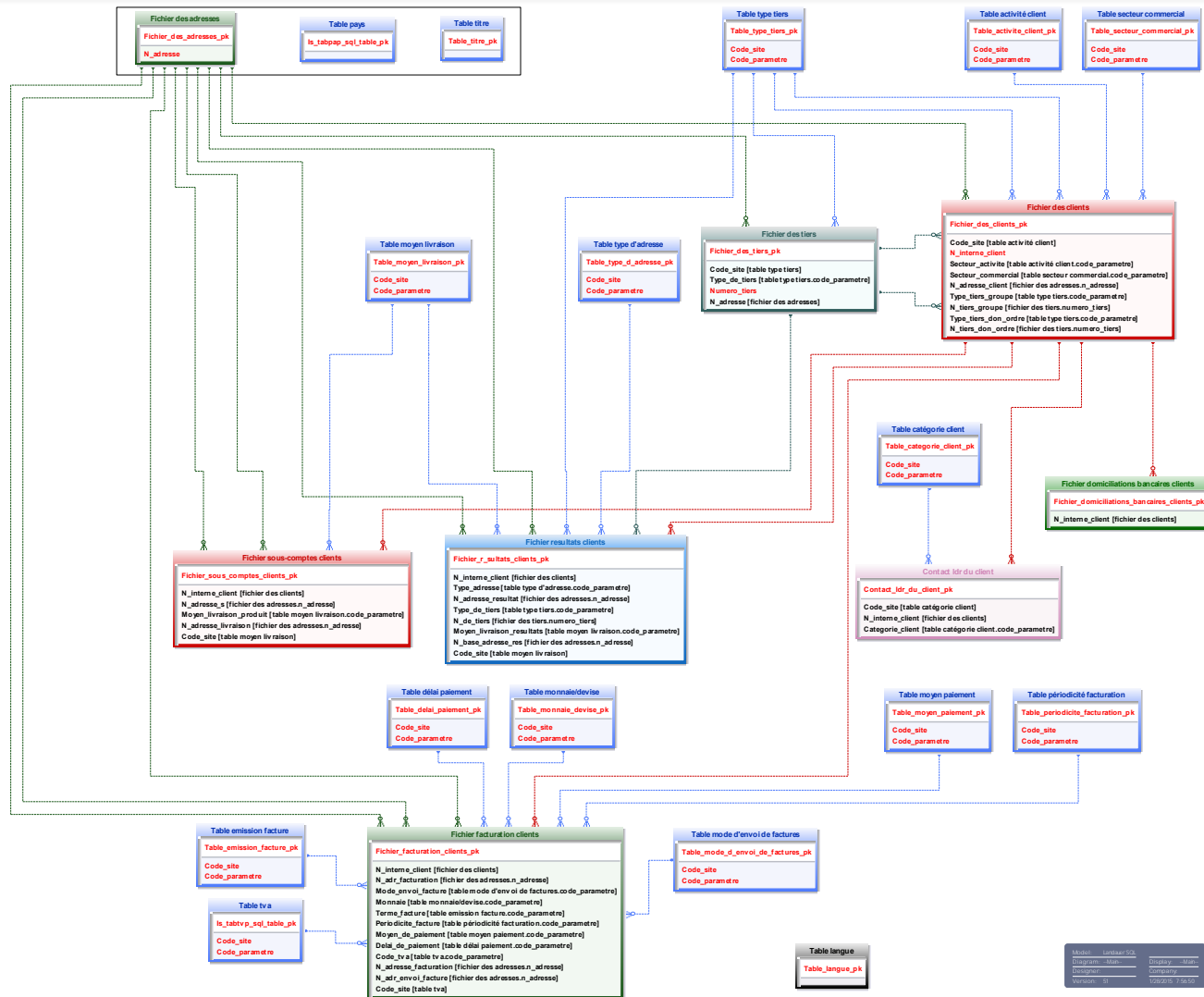


Moderniser les bases de données DB2

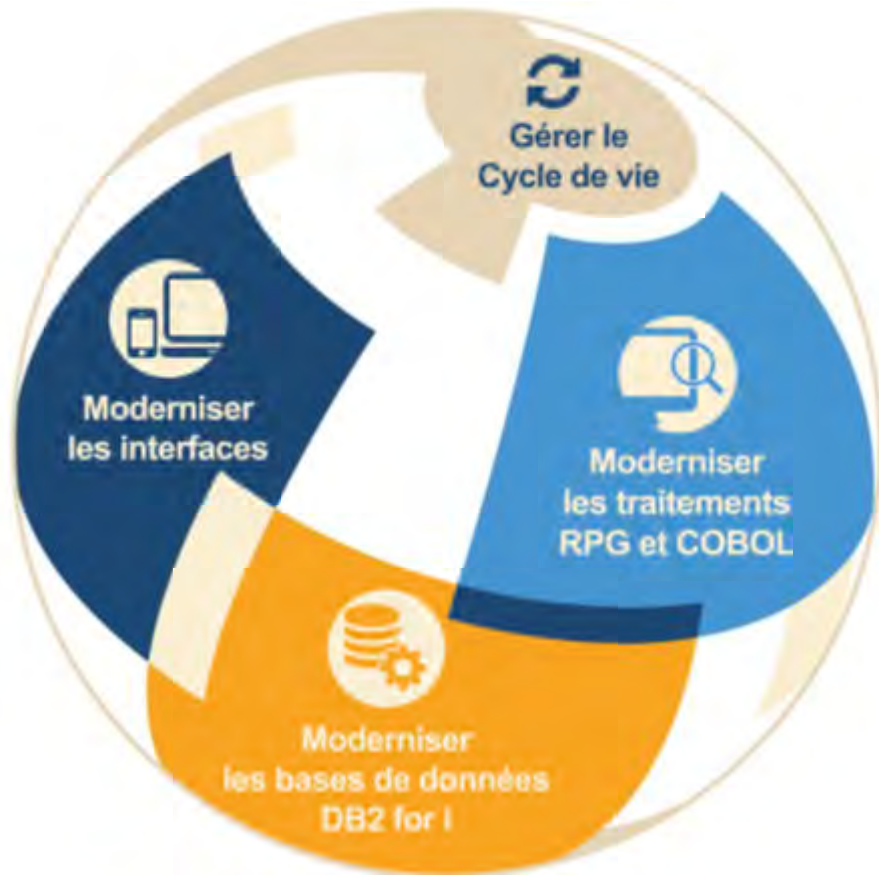
SQL



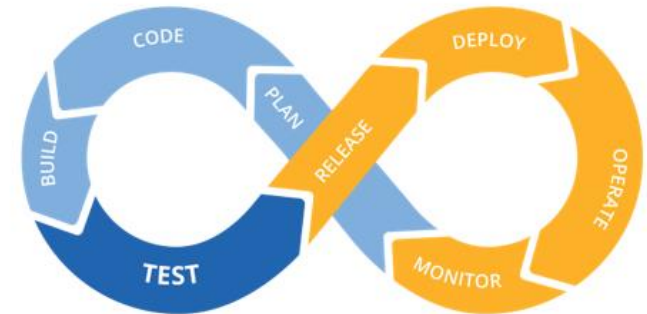
Retrouver le modèle graphique et gérer DB2



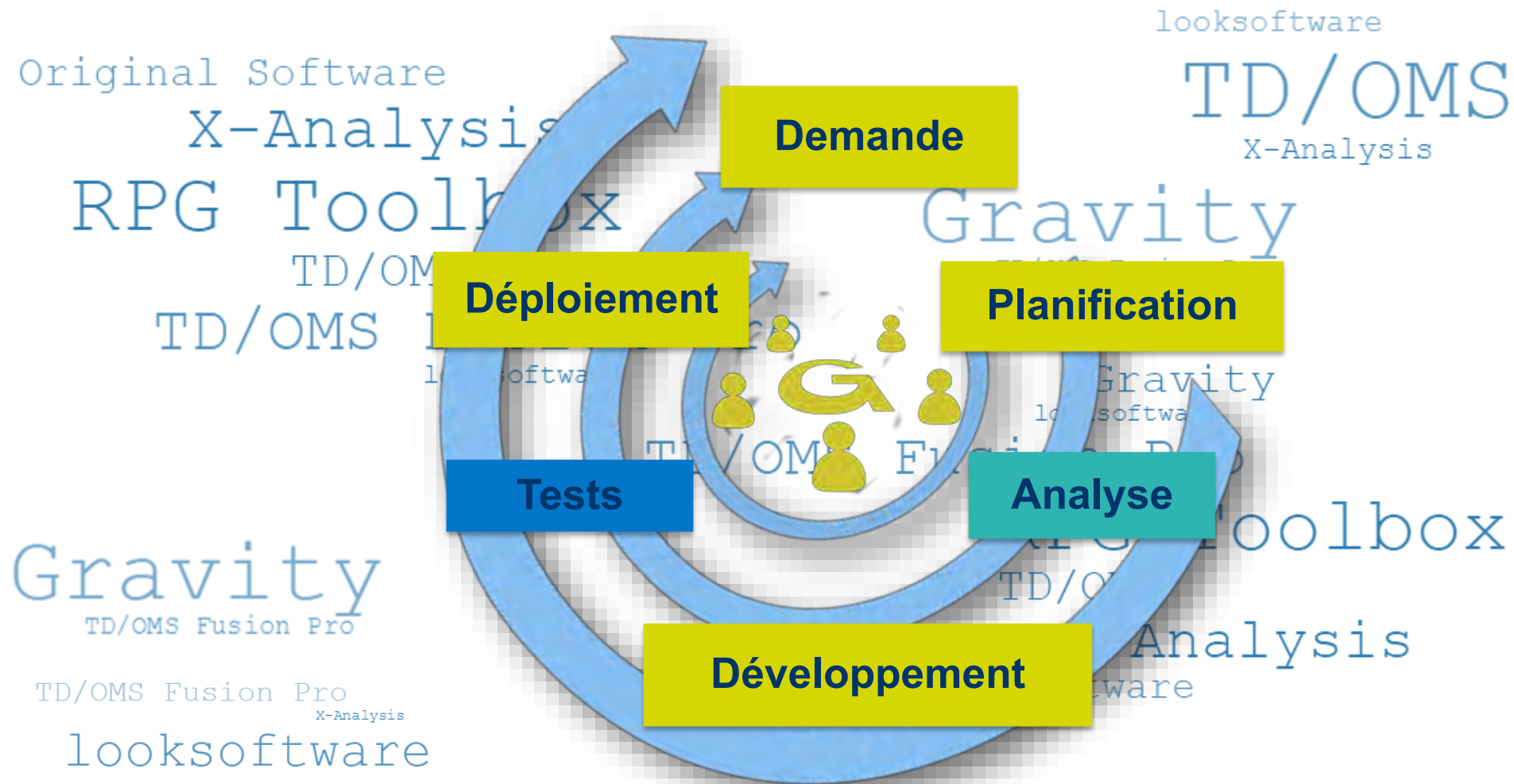
Gestion des versions : DevOps



 Gérer le cycle de vie des applications



SCM : Gestion des versions Avec TD/OMS



DevOps intégré dans RDi

The screenshot displays the TD/OMS Work Management interface. The main window title is "TD/OMS Work Management - Object List of *ALLUSR/*ALL/*ALL/*ALL/*ALL/*ALL, Total Objects: 340 - TD/OMS Development Workbench".

Object List Table:

Library	Name	Type	Attribute	Description	Status
XAN4CDEM	CBCUSTSD	*FILE	DSPF	Work with Customers	
XAN4CDEM	CBC110	*PGM	CLP		
XAN4CDEM	CB906R	*PGM	RPG		*B
XAN4CDEM	CB906RD	*FILE	DSPF		*A
XAN4CDEM	CLET	*PGM	CLP		*A
XAN4CDEM	CLETN	*PGM	CLP		*C
XAN4CDEM	CNTACS	*FILE	PF		*A
XAN4CDEM	CNTCMAINT	*PGM	RDGLE		*A

Program Centered Data Flow Diagram for CBC110:

The diagram shows a box for "CBCACPF" with "Attributes" listed below it. A red box highlights the "Called P" and "Input File" options. Below the diagram, four boxes are shown: "CBCACPF", "CBTRPF", "CB906R", and "CB907R", with green arrows pointing from "CBC110" to each of them.

Context Menu:

- Zoom Source
- Data Flow Diagram
- Object Where Used
- Variable Where Used
- Hierarchical Structure Chart
- Structure Chart Diagram
- Inverted Structure Chart
- Program Structure Chart
- Screen/Report Design
- Screen/Report Source
- Consolidated Rules
- Annotate
- Mark for Documenter
- More Info
- Change History
- Source Compare
- Screen Components
- Screen Activity Diagram
- Function Editor
- Logic Components
- Application Area Options
- Derive Business Rules
- Modernization Options
- UML Options
- TD/OMS

Navigation Metrics Dashboard:

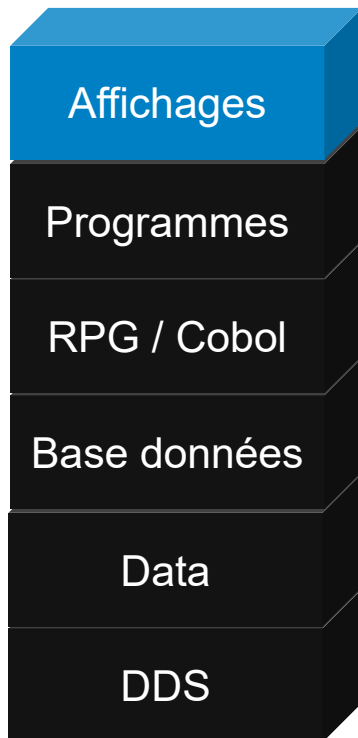
- vega
 - V60KEXA - TD/OMs Version 6
 - V60TSTXA - V60 Test
 - V71KEXA - Version 70
 - XAN4CDXA - Tutorial Application**
 - Application Area Diagram
 - Data Model Diagram
 - Overview Structure Chart
 - All Objects
 - Programs
 - Files
 - Source Files
 - Business Rules
 - Consolidated Rules
 - Screen Components
 - Change History

Session Information:

Session Items	Description
Host Name	vega
X-Analysis User...	WIM
X-Analysis Library	XAN4CDXA
Job Details	098778/QZDASOINIT/QU...
Database Library	

Interface utilisateur

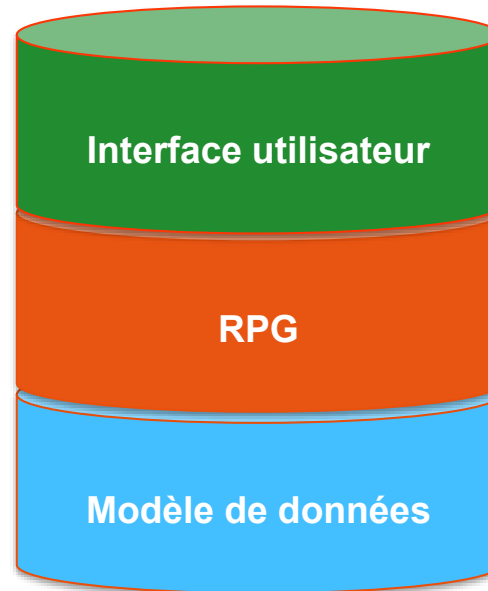
Système existant



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

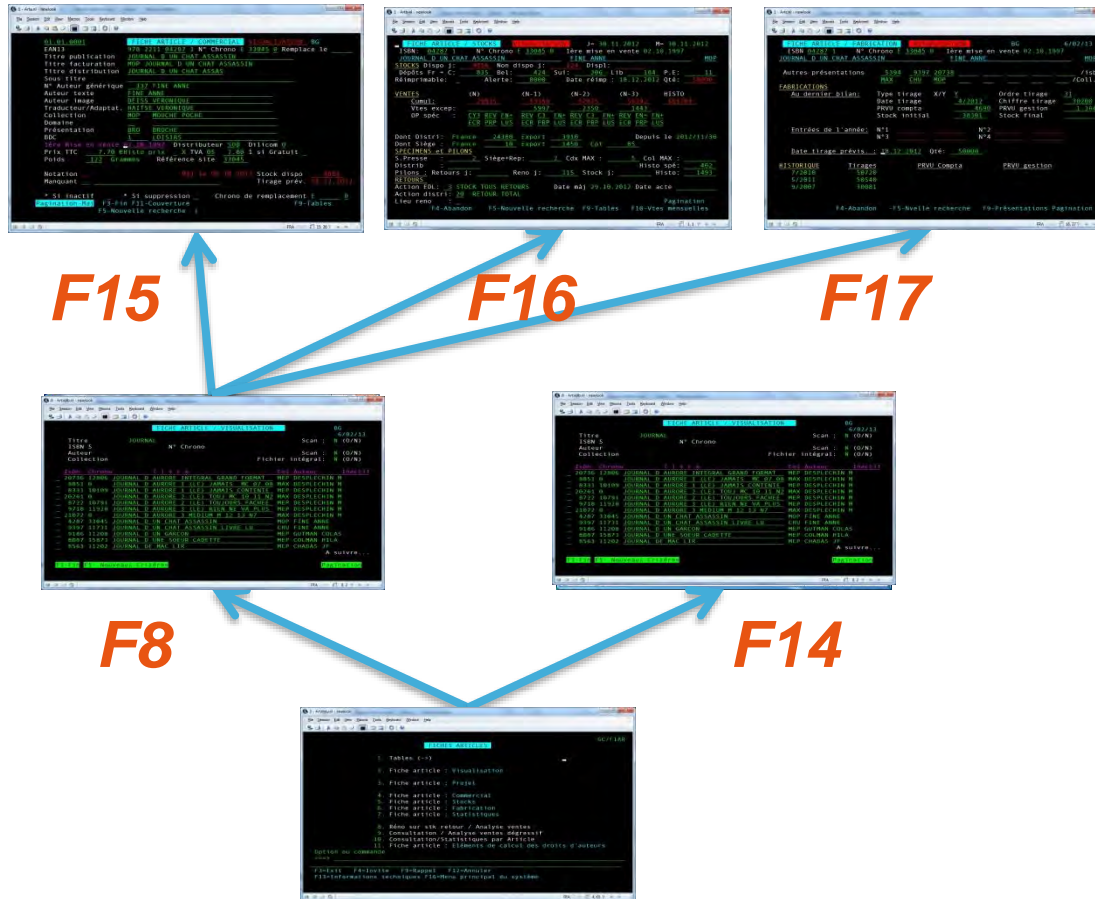
```
3 - Artimunt - newlook
FICHES ARTICLES
1. Tables (->)
2. Fiche article : Visualisation
3. Fiche article : Projet
4. Fiche article : Commercial
5. Fiche article : Stocks
6. Fiche article : Fabrication
7. Fiche article : Statistiques
8. Réno sur stk retour / Analyse ventes
9. Consultation / Analyse ventes dégressif
10. Consultation/Statistiques par Article
11. Fiche article : Eléments de calcul des droits d'auteurs
Option ou commande
F3=Exit F4=Invite F9=Rappel F12=Annuler
F13=Informations techniques F16=Menu principal du système
```



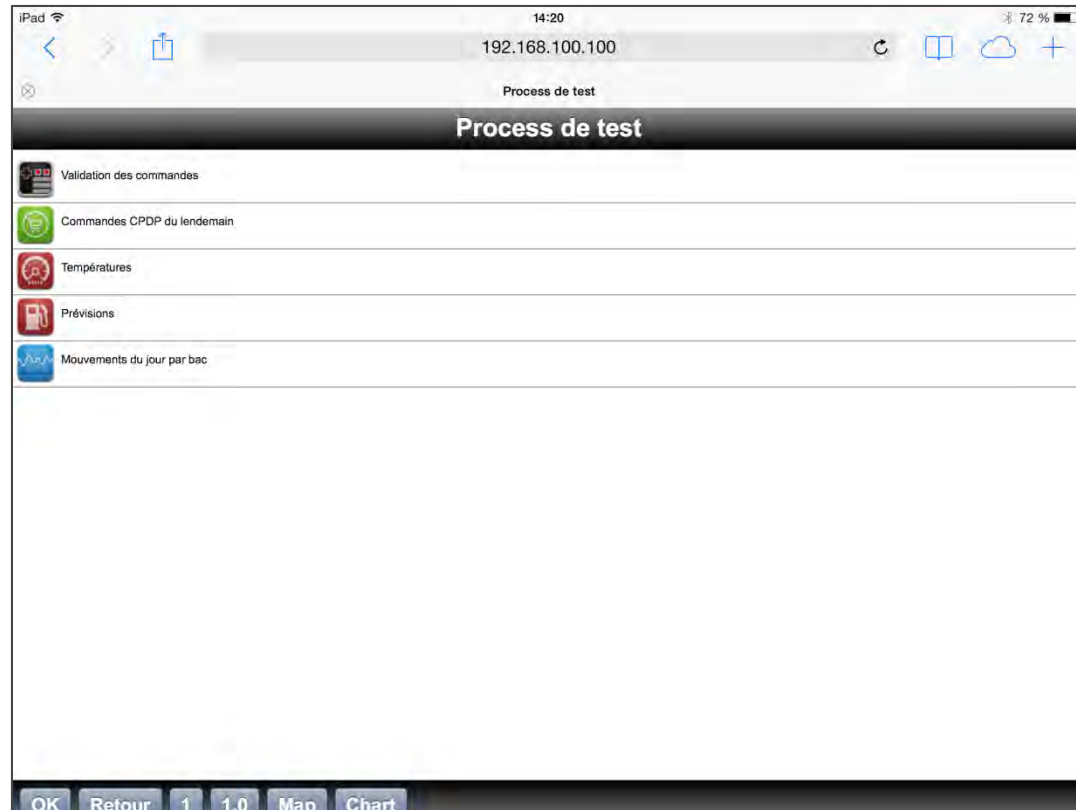
```
6 - Artlib.nl - newlook
FICHE ARTICLE / VISUALISATION
Titre JOURNAL Scan : 6/02/13
ISBN 5 N° Chrono Scan : N (O/N)
Auteur Fichier intégral : N (O/N)
Collection
Isbn Chrono Titre Col Auteur Inactif
20736 12806 JOURNAL D AUREORE INTEGRAL GRAND FORMAT MEP DESPLECHIN M
8851 0 JOURNAL D AUREORE 1 (LE) JAMAIS MC 07 08 MAX DESPLECHIN M
8331 10109 JOURNAL D AUREORE 1 (LE) JAMAIS CONTENTE MEP DESPLECHIN M
20261 0 JOURNAL D AUREORE 2 (LE) TOUJ MC 10 11 N2 MAX DESPLECHIN M
8722 10791 JOURNAL D AUREORE 2 (LE) TOUJOURS FACHEE MEP DESPLECHIN M
9718 11920 JOURNAL D AUREORE 3 (LE) RIEN NE VA PLUS MEP DESPLECHIN M
21072 0 JOURNAL D AUREORE 3 MEDUM M 12 13 N7 MAX DESPLECHIN M
4287 33045 JOURNAL D UN CHAT ASSASSIN MOP FINE ANNE
9397 11731 JOURNAL D UN CHAT ASSASSIN LIVRE LU CHU FINE ANNE
9186 11200 JOURNAL D UN GARCON MEP GUTMAN COLAS
8087 15873 JOURNAL D UNE SOEUR CADETTE MEP COLMAN HILA
8563 11202 JOURNAL DE MAC LIR MEP CHABAS JF
A suivre...
F3=Filt F5=Nouveaux Critères Pagination
```



Revoir la navigation



Interfaces RPG pour mobiles



Interfaces tactiles HTML5 et CCS3

iPad 14:20 192.168.100.100 72%
Validation des commandes

Validation des commandes

N° commande	001050
Date cde	7/11/2013
Nom fournisseur	SNEF TECHNOLOGIES
Objet	
Libellé	ACHAT PC
Qté cdée	1,00
P.U.	850,00
Chapitre	218300 32
Lieu	999999
Famille	INFGESTMAT
Code projet	NOPROJ

OK Retour Valider

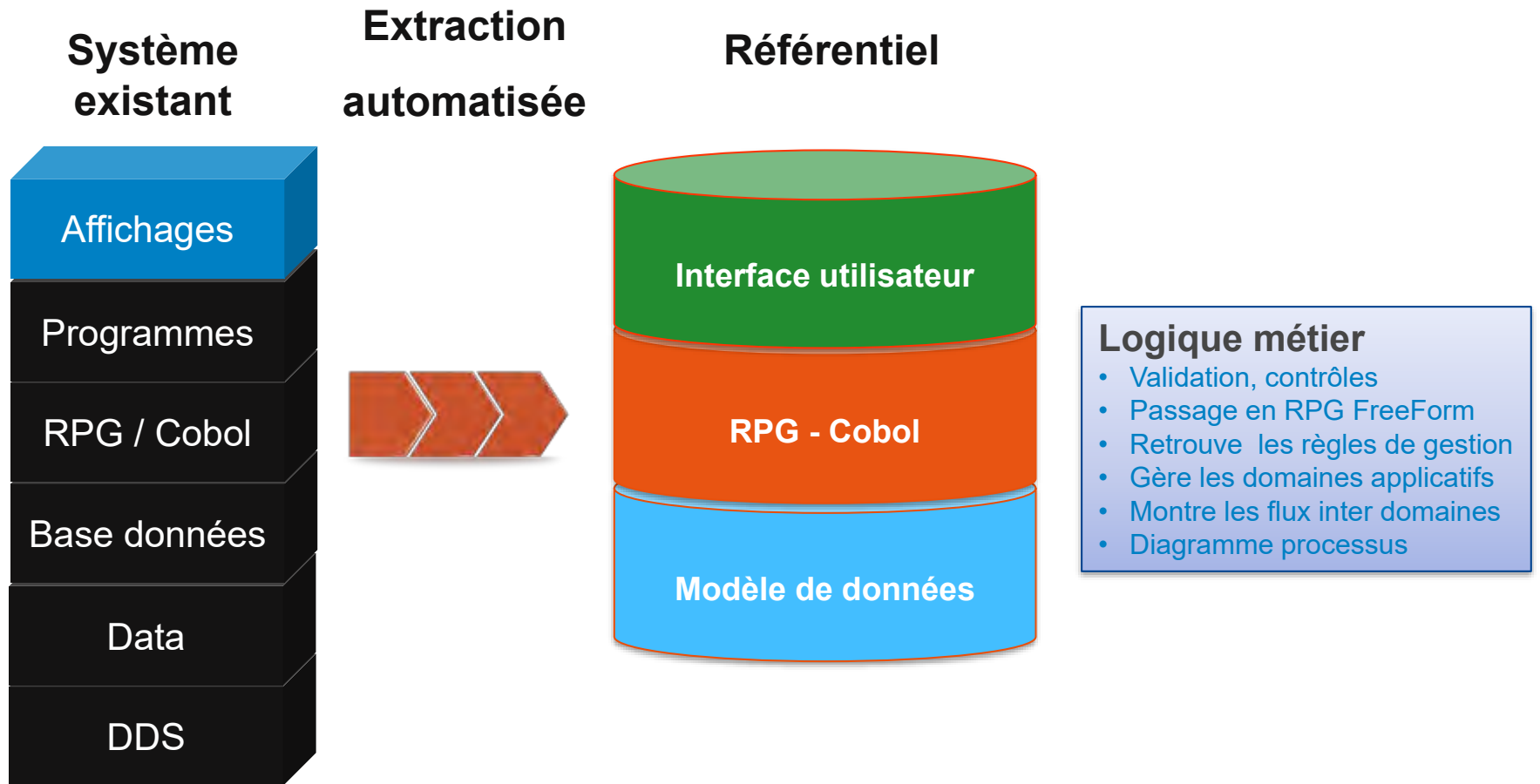
Validation des commandes

N° commande	001672	Date cde	8/01/2014
Fournisseur	DOMS (EX SEVERIN)		
Objet	Fourniture de vannes 14" PN40		
Montant	41.546,44		

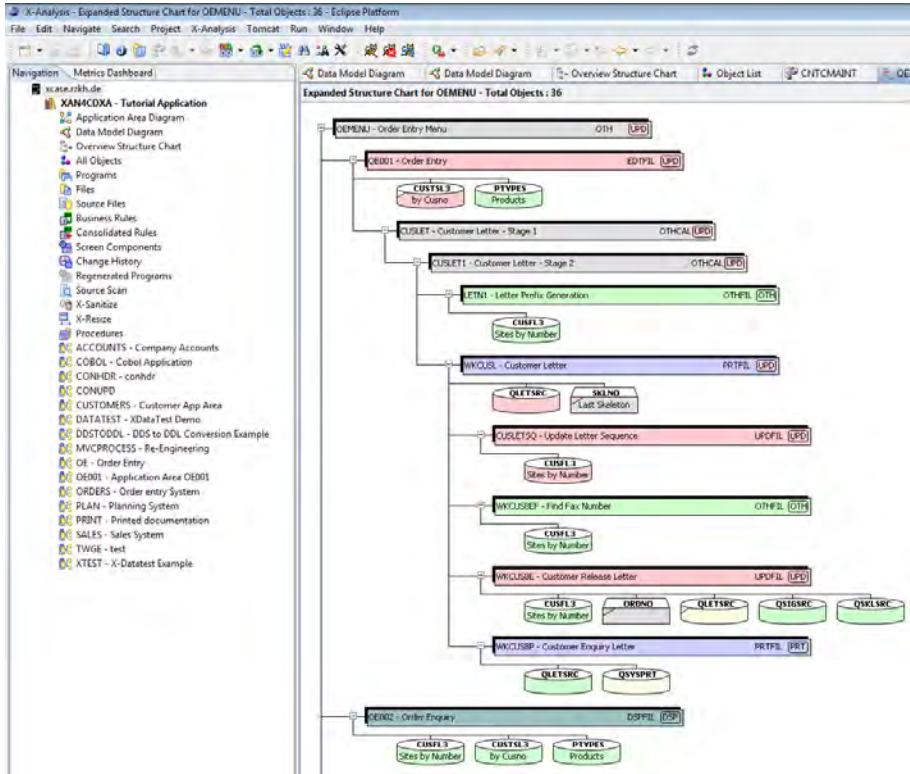
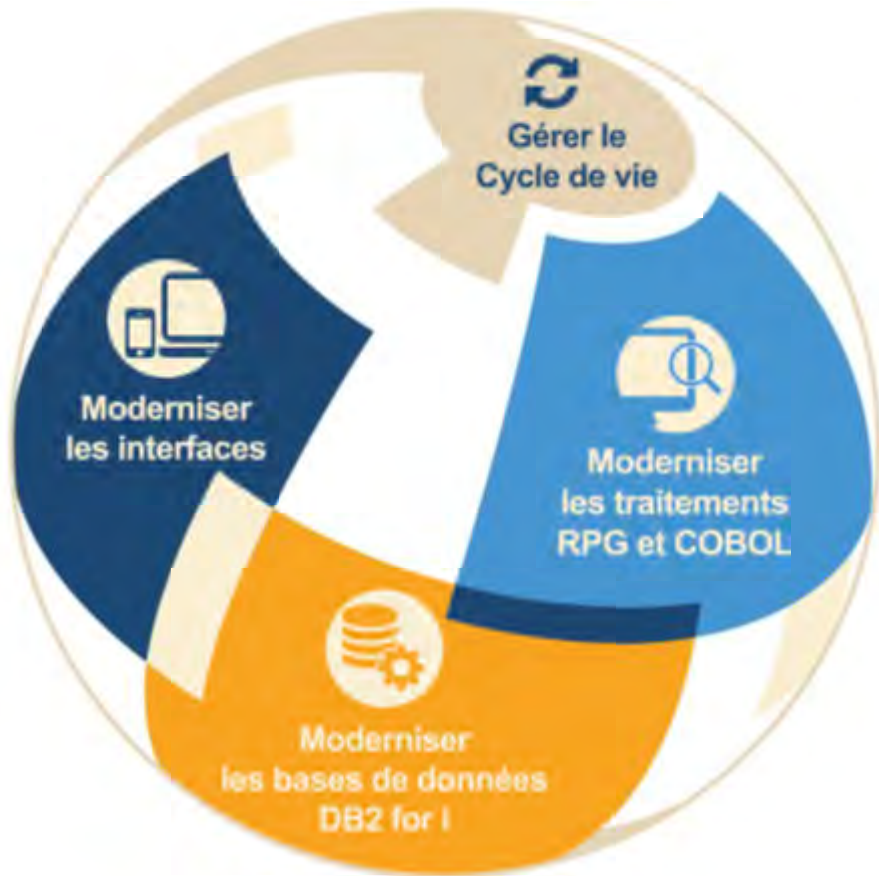
Quantité	PrixUnitaire	Chapitre	Lieu	Famille
Assist Echant 12/2013				
1,00	4.922,00	611600 01	900301	ECHANTILLO
Analyses sur assistance 12/2013				
1,00	32.374,44	611700 01	900301	MESUANALY
Gammas PLN+Fer 12/2013				
8,00	250,00	611600 01	300100	MESUANALY
Gammas Esso 12/2013				
3,00	250,00	611600 01	100100	MESUANALY
Gammas Corse 12/2013				
6,00	250,00	611600 01	100102	MESUANALY

Retour Aide Valider

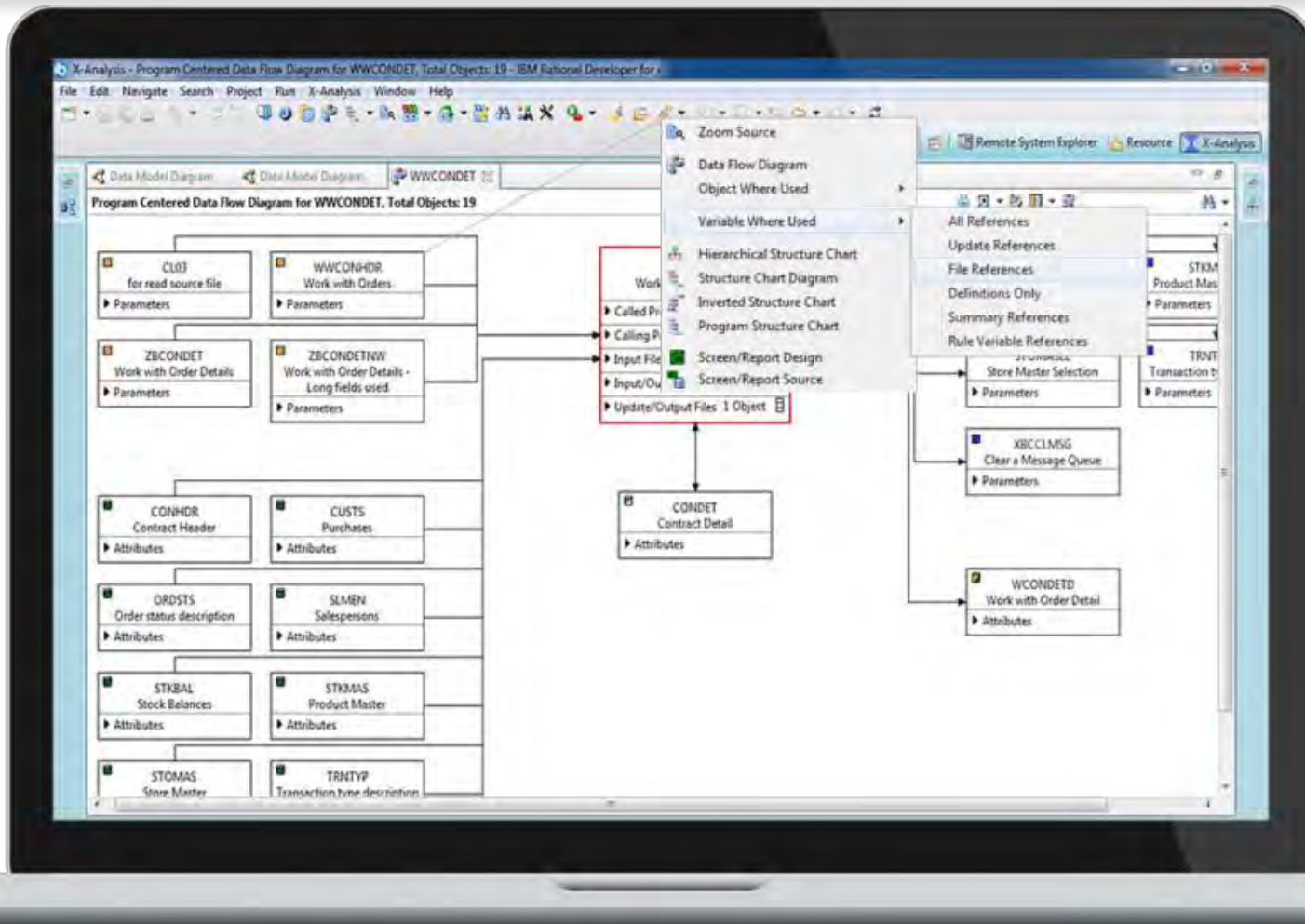
Modernisation des traitements



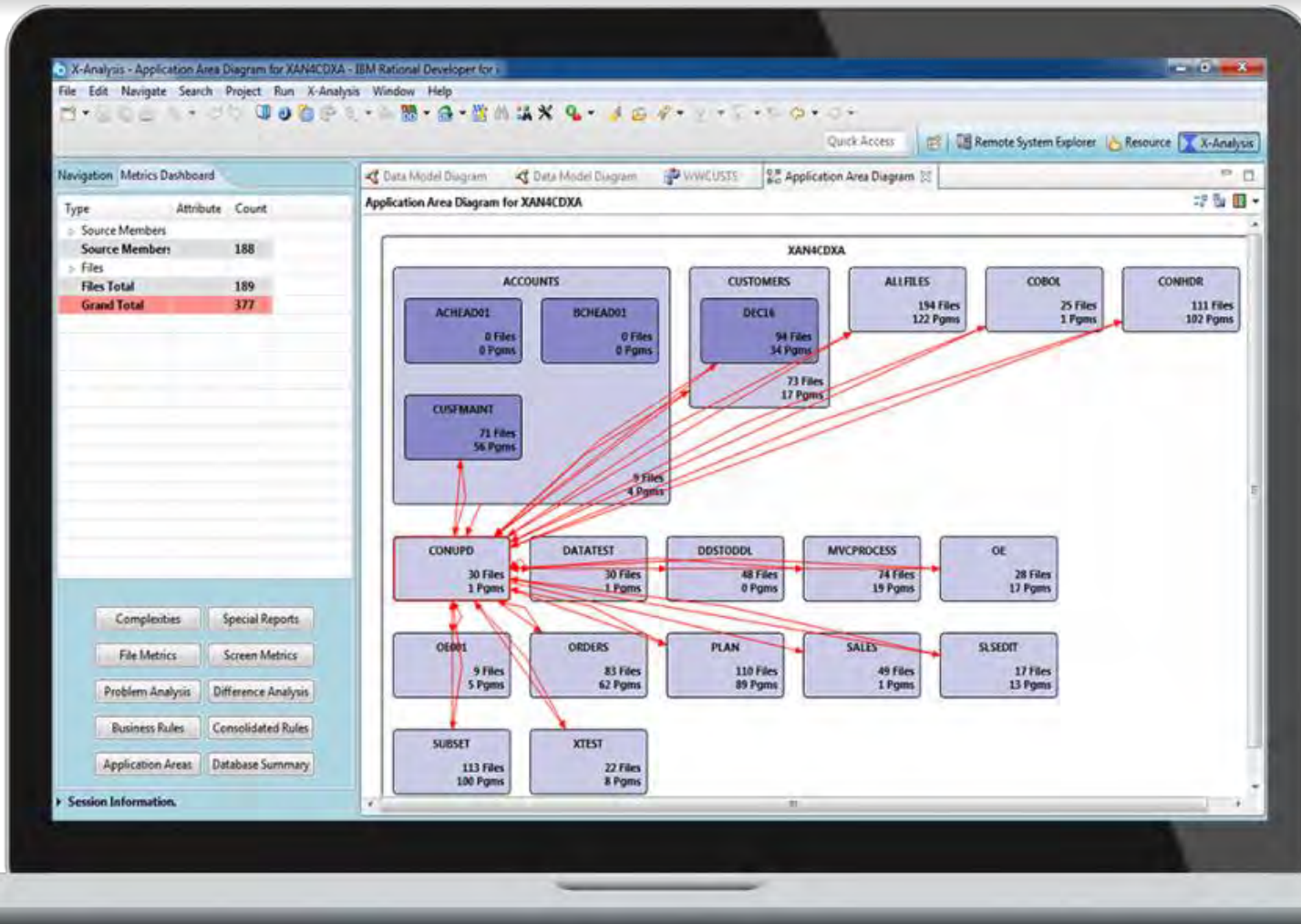
Documenter l'existant :



Documenter les Process



Découper en aires applicatives



Audit de la complexité

X-Analysis - Problem Analysis data for BILLXRTEST - Total Problems: 187 - IBM Rational Developer for i

Navigation Metrics Dashboard

- Application Area Diagram
- Data Model Diagram
- Overview Structure Chart
- All Objects
- Programs
- Files
- Source Files
- Business Rules
- Consolidated Rules
- Screen Components
- Change History
- Regenerated Programs
- Source Scan
- Field Search
- X-Sanitize

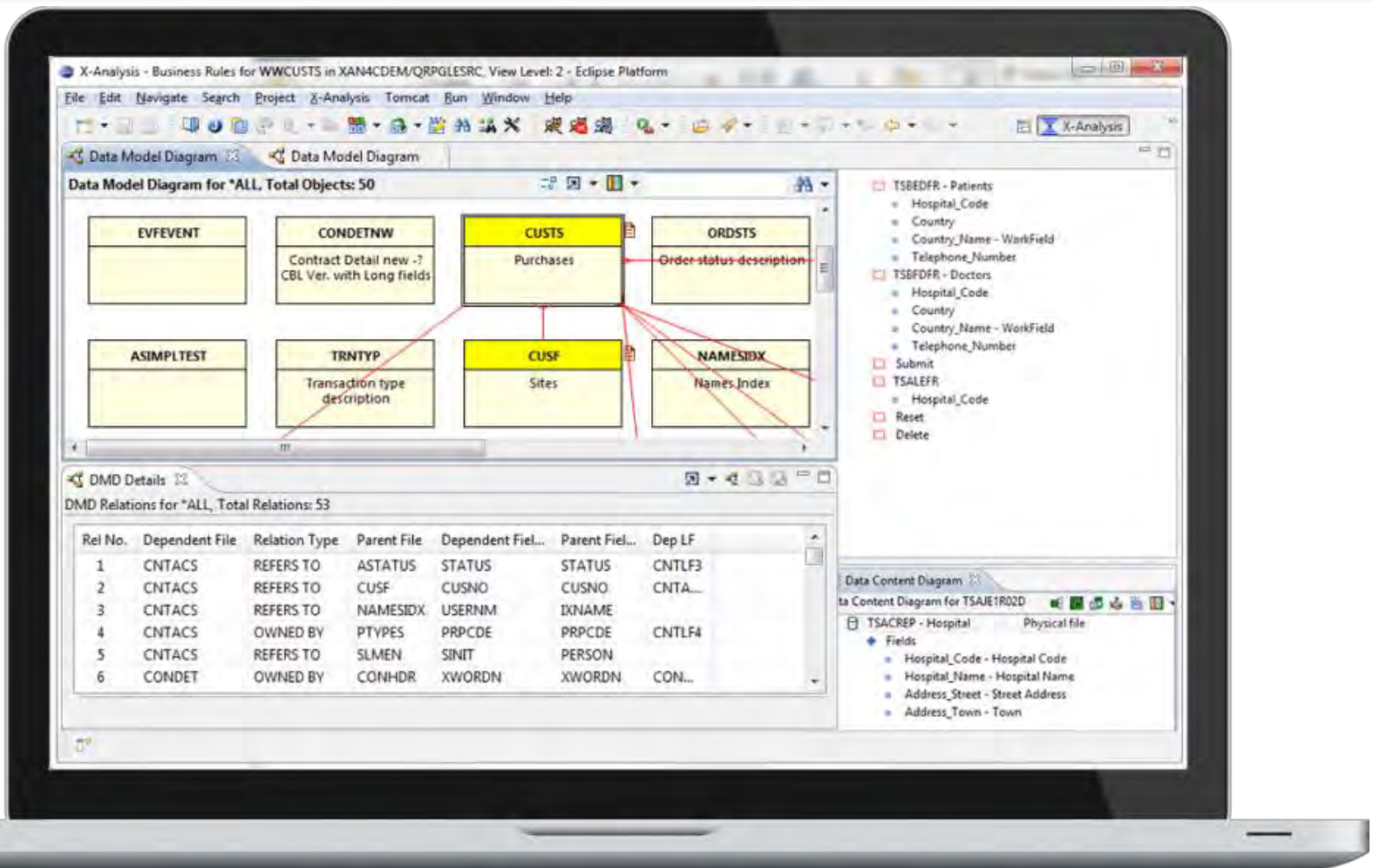
Session Information

Session Items	Description
Host Name	10.27.94.114
X-Analysis User...	LXRTEST
X-Analysis Library	LXRTEST
Job Details	752850/QZDASOINIT/QU...
Database Library	
Application Area	
Data Model Info	Not Available
Library List	BLXRTEST QGPL QTEM...
Alternate Library ...	
X-Resize Project	

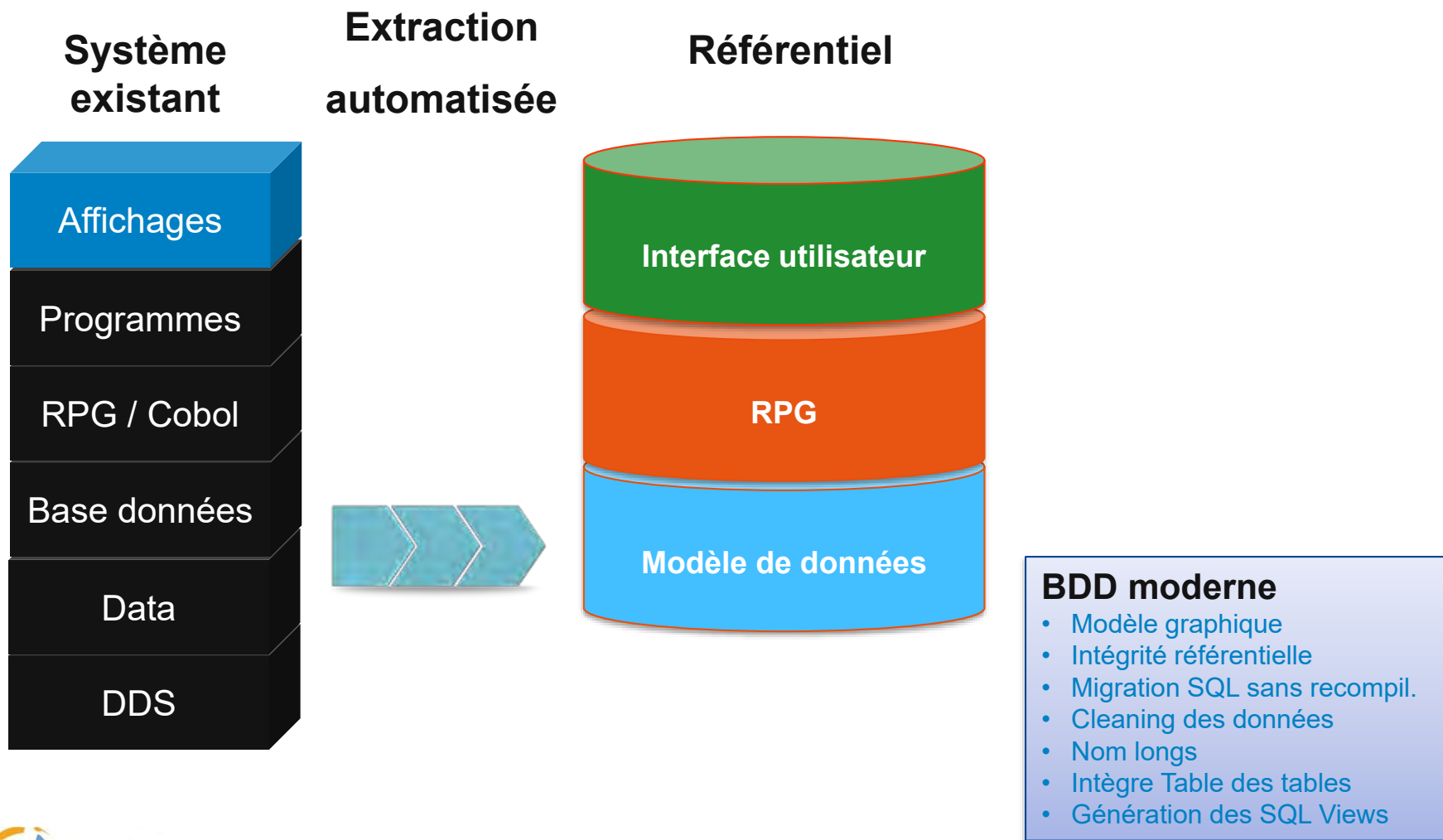
Problem Analysis data for BILLXRTEST - Total Problems: 187

Alert/Category/Object	Total	Description	Source Detail
Source/Object Alerts	9		
No file found for existing source member	12		
EMPLY		IBM Sample Program 5	QGPL/QDDSSRC(EMPLY)
TAOFDTDS		DDS FILE FOR DATA	QGPL/QATTD05(TAOFDTDS)
TAOFPRDS		DDS FILE FOR PRINT	QGPL/QATTD05(TAOFPRDS)
TAOFQRDS		DDS FILE FOR QUERY	QGPL/QATTD05(TAOFQRDS)
TA1964		INTRA TOOL DATABASE FILE FOR COBOL/PPG	QGPL/QATTD05(TA1964)
TA29864		INTRA TOOL DATABASE FILE FOR C	QGPL/QATTD05(TA29864)
TA8189		APPC PROGRAM EXAMPLE DATABASE DDS SO...	QGPL/QATTD05(TA8189)
TA9593		BSCCL PROGRAM EXAMPLE DATABASE DDS SO...	QGPL/QATTD05(TA9593)
TBNEXPL		DDS FOR GENERATING BINDING SOURCE LANG...	QGPL/QATTD05(TBNEXPL)
TDGPAFME		LOGICAL FILE USED BY MODEXPORTS COMMMA...	QGPL/QATTD05(TDGPAFME)
TG9864		INTRA TOOL LOGICAL FILE FOR C	QGPL/QATTD05(TG9864)
T0011D05		PF USED IN EX 3 SC41-0011	QGPL/QATTD05(T0011D05)
No source member for file	64		
No program object found for source member	20		
No source member for program/module	10		
No device file found for existing source member	11		
No source member for device file	8		
Referenced data area does not exist	2		
Referenced other file does not exist	1		
Referenced program object does not exist	15		
DDL Conversion Issues	6		
Files with multiple members	7		
File contains multiple formats	3		
PF with non-unique key	15		
Files with zero members	1		

Mesurer l'effet des changements



La base de données DB2 for i



Moderniser DB2 for i avec Xcase

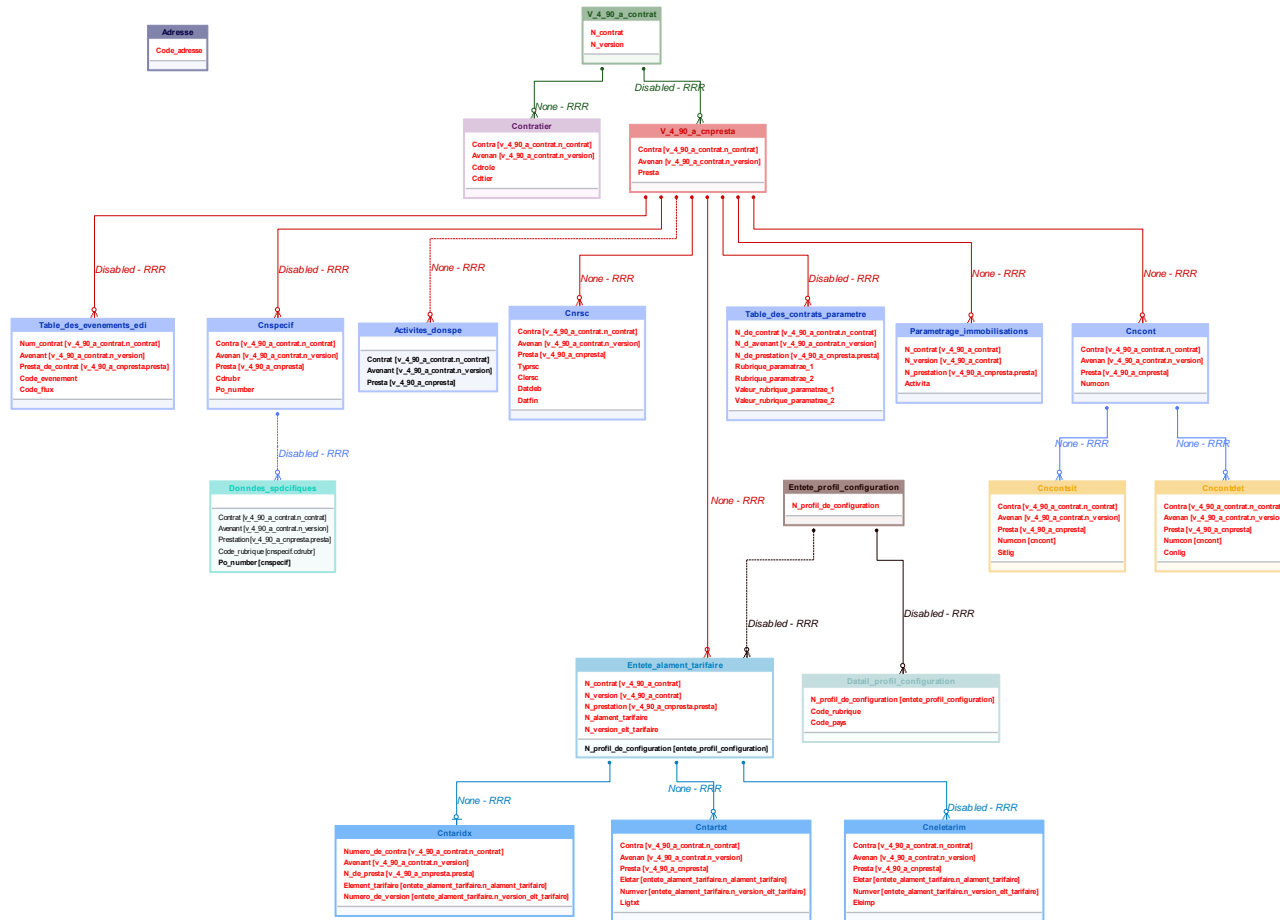
Retrouve les relations, implémente progressivement l'intégrité référentielle

Migre structures et données à SQL sans recompilation des PGMs

Nettoie les données, transforme les dates, identifie les orphelins et les PGM qui les créent

Est gérée depuis le modèle graphique

Une image vaut mieux qu'un long discours



Ils nous font confiance



GEODIS



Pascal BLANDIN

Préparer DB2 for i



Pascal BLANDIN pascal.blandin@itheis.com

ITHEIS
Directeur

Plan d'action DB2 en 10 jours

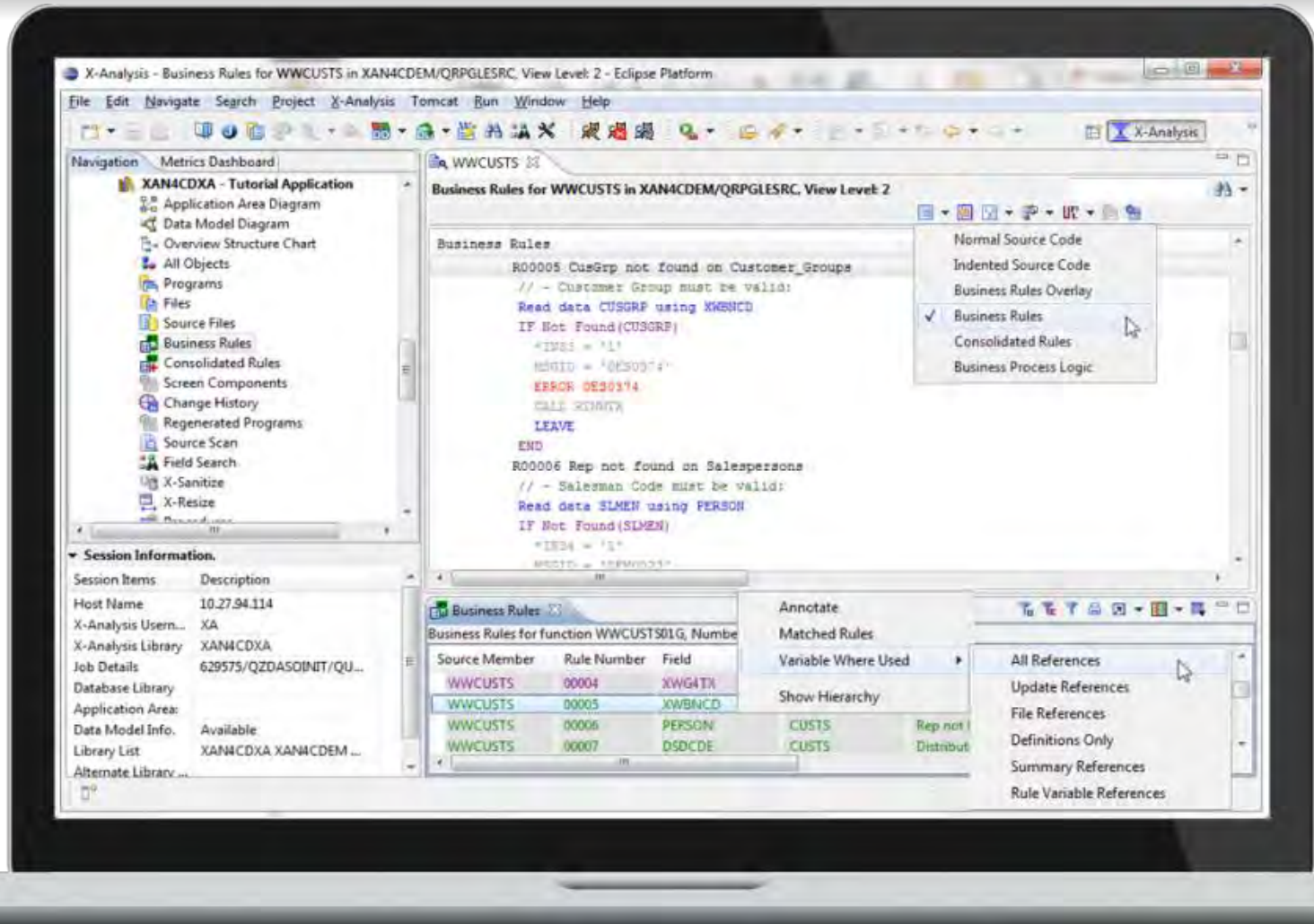
- Retrouver le modèle relationnel
- Identifier les DATA invalides et les corriger

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 réglementaire
- Pour intégrer plus vite les nouveaux
- Pour identifier les orphelins
- Pour + d'intelligibilité

Comment retrouver le MDL ?

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

<p>Data Sample to Check Orphans</p> <p>Library to Store Data Samples <input type="text" value="QTEMP"/></p> <p>Sample Size <input type="text" value="10000"/></p>	<p>Maximum Prefix and Suffix Length in Field System Names</p> <p>Maximum Prefix Length <input type="text" value="3"/></p> <p>Maximum Suffix Length <input type="text" value="0"/></p>
<p>PK-FK Matching</p> <p><input type="radio"/> Names, Reffield or Join <input checked="" type="radio"/> Vocabulary <input type="radio"/> All</p> <p><input type="checkbox"/> Exact Same Type <input checked="" type="checkbox"/> Same Length <input type="checkbox"/> Same CCSID</p>	<p>Maximum Percentage of Duplicates and Orphans</p> <p>Maximum Percentage of Duplicates in Implicit Unique Keys <input type="text" value="5"/></p> <p>Maximum Percentage of Orphans in a Child <input type="text" value="5"/></p>
<p>Couples</p> <p>Libraries containing programs to check for File Combinations</p> <p><input type="text" value="ACHLAN"/> ...</p>	<p>Pseudo Nulls</p> <p><input checked="" type="checkbox"/> Handle Zero as Null when checking Orphans in Discovery</p> <p><input checked="" type="checkbox"/> Handle Empty character as Null when checking Orphans in Discovery</p>

Comment retrouver le MDL ?

- On précise les règles de vocabulaire

Settings Tables Parent Keys Vocabulary Rules **Vocabulary**

Words

Word	▼	Use	▲
de	166	✗	▲
code	74	✗	
numero	63	✗	
d	59	✗	
date	56		
no	43	✗	
commande	35		
societe	34		
annee	33		
soc	32		
socnum	32		

Fields

File Name

- ACHCTR
- ACHCTR
- ACHCTR
- ACHCTR
- ACHCTR
- ACHCTR
- ACHCTR
- ACHCTR
- ACHCTR
- ACHCTR

Comment retrouver le MDL

- On valide les propositions

Settings Tables Parent Keys Vocabulary Rules Vocabulary Program Reference Couples **Implicit Relationships** Check Relationship Implementation

Tables to Display: <ALL>

Include: Outgoing Relationships Alternative Relationships

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

Découper en sous modèles

- On met en forme

DPFACH V1. Principal--Main--

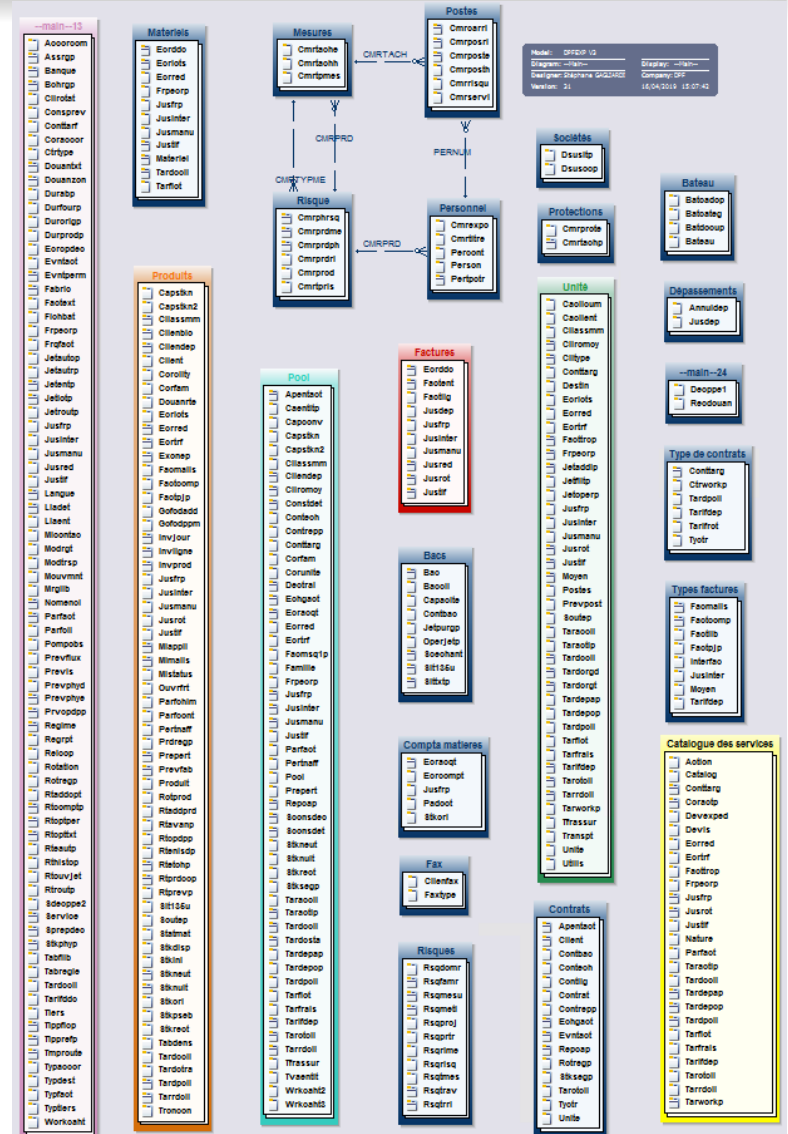
The screenshot shows a software interface with a central list of modules. The modules are organized into several categories, each with a colored header:

- Permis (Yellow header):** Autconsp, Autnotes, Autprod, Autris2p, Autrisqp, Autsecup, Auttravp, Autuserp, Autvalip, Coment, Fourn, Societe.
- Commande (Red header):** Achctr, Acheteur, Achfact, Activite, Affecprd, Bunits, Chapbud, Comdet, Coment, Comnotes, Comrecep, Comval, Corfact, Decrgp, Delregp, Engage, Famtech, Fourn, Frqachat, Modalite, Modregp, Natbud, Planprvp, Projet, Rcpdatep, Rgpact, Societe, Ssnatbud, Suivbud, Surrqp, Zaidp.
- Affaire (Green header):** Acheteur, Affaire, Afflienp, Coment, Fourn, Pvrecedet, Pvrecent.
- Isolées (Blue header):** Afflienp, Autnotes, Autworkp, Autwrk2p, Comnotes, Entete.

At the bottom left, there is a metadata box:

Model: DPFACH V1
Diagram: Principal
Designer: Stéphane GAGLIARDI
Version: 53

Display: --Main--
Company: DPF
16/04/2019 17:11:03



Pourquoi est ce infallible ?

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



What you need to know about AI and Cognitive systems V2

Pascal Polverini

Solution architect

Redbooks author

FRESCHÉ SOLUTIONS

IBM CEO Ginni Rometty



2017

Cognitive Era, AI

"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)

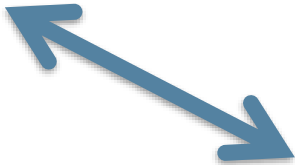


Digital Transformation

System of Record (SoR)



System of Engagement (SoE)



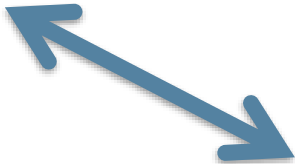
System of Insight (SoI)

Digital Transformation

System of Record (SoR)

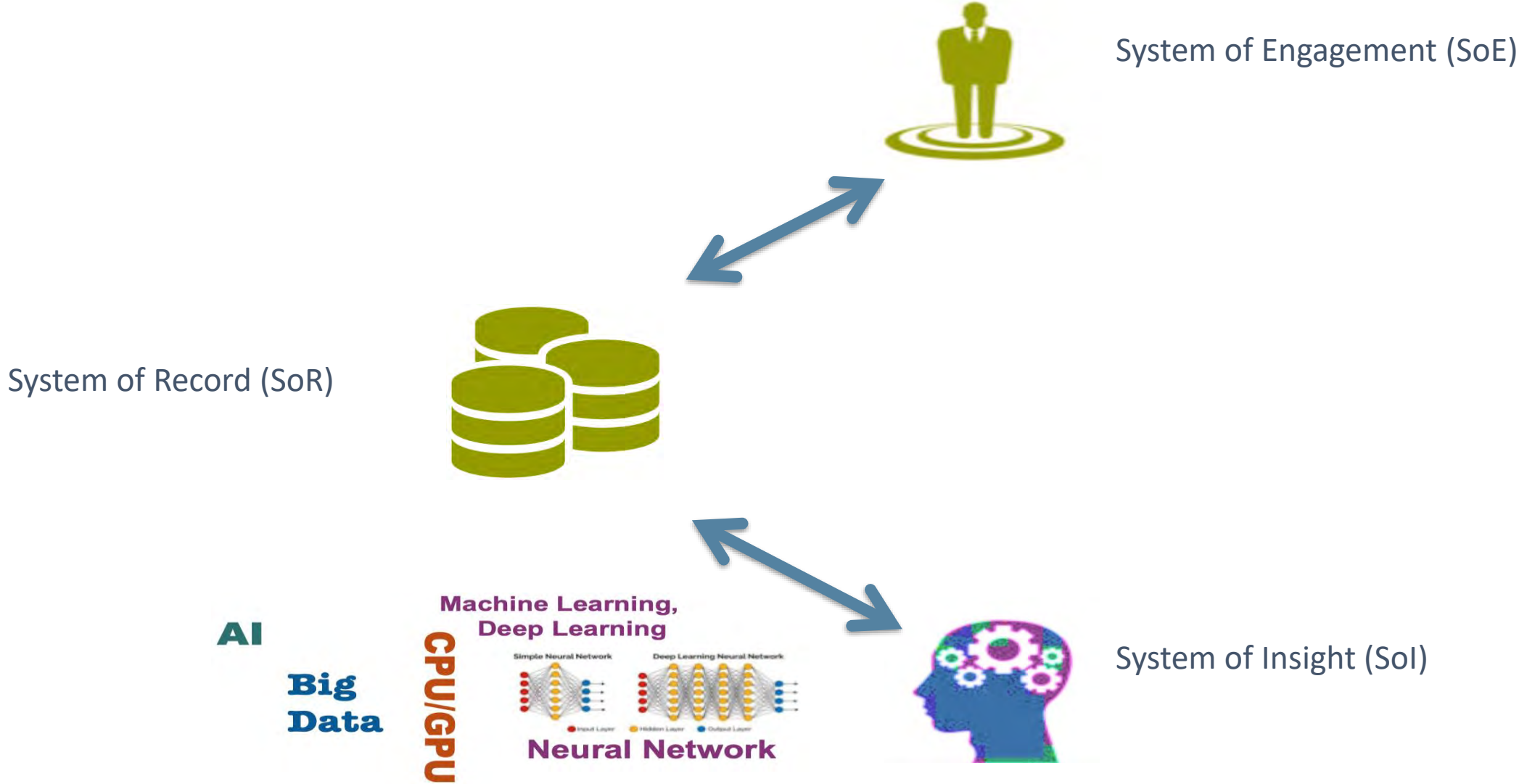


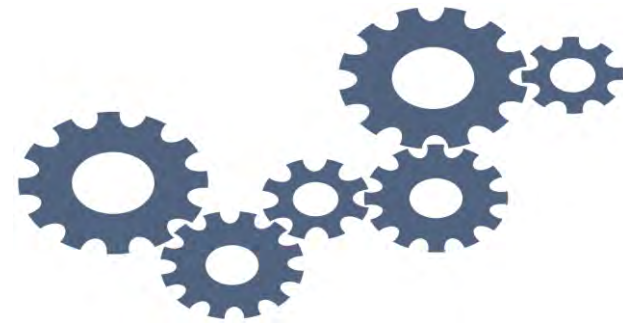
System of Engagement (SoE)



System of Insight (SoI)

Digital Transformation





How this works?

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

SUDOKU

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

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	<u>RPGLE</u>	<u>Sudoku solver</u>

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

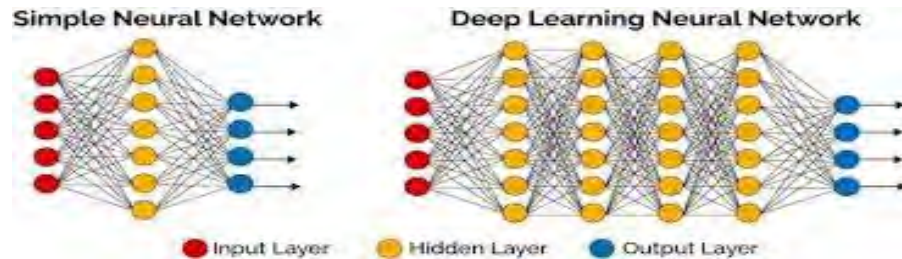
Current square :

Back corrections: 253

Resolution time : 2sec

Machine Learning, Deep Learning

SUDOKU



Neural Network

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

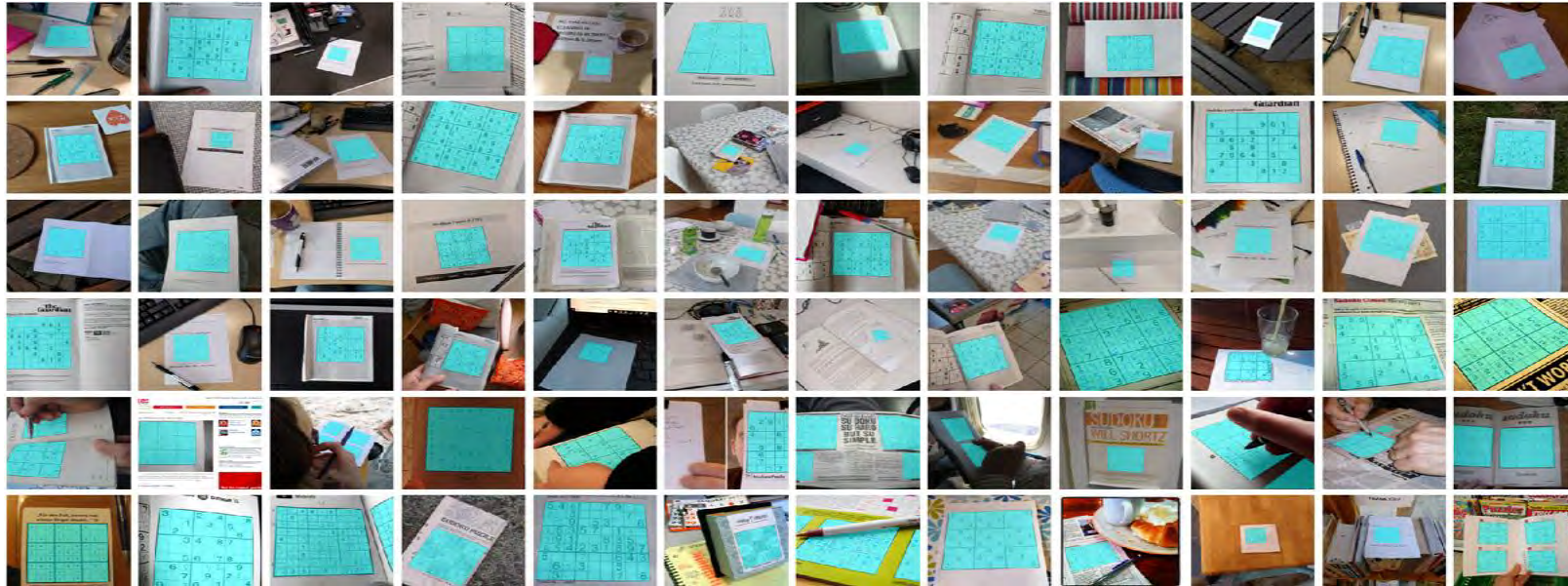
Current square :

Back corrections: 253

Resolution time : 2sec









Find the boxes

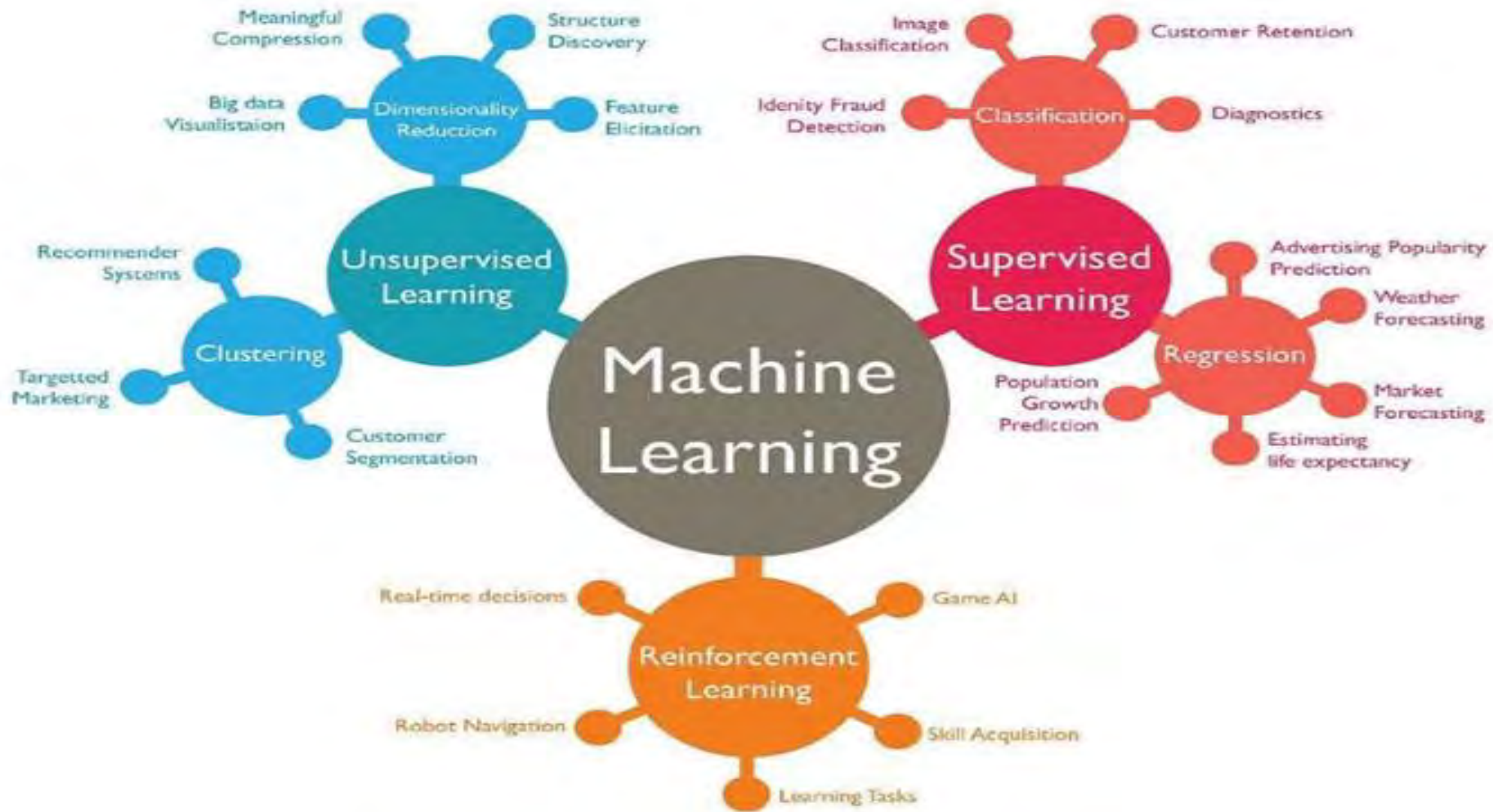
4	1	3				7
7		8	3		5	
9	5	6				8 8
				1		
					7 3	
	8				2 6	
2		7		4	8 5	
		5			6 7	
	7		8 5		3	

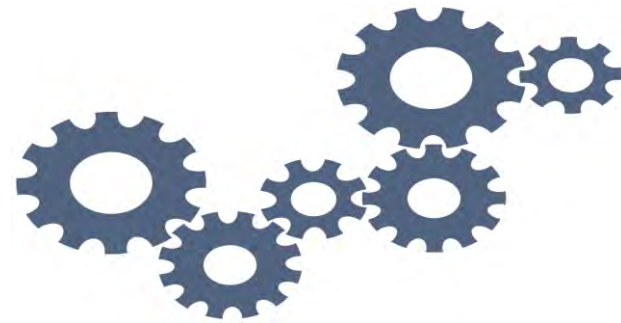
Read the numbers

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

Solve

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





Some live examples?

The background of the slide is a dark teal gradient with a network of glowing nodes and connecting lines. The nodes are small circles, some of which are brightly lit with a cyan glow. The text 'YOLO v2' is centered in a white, bold, sans-serif font.

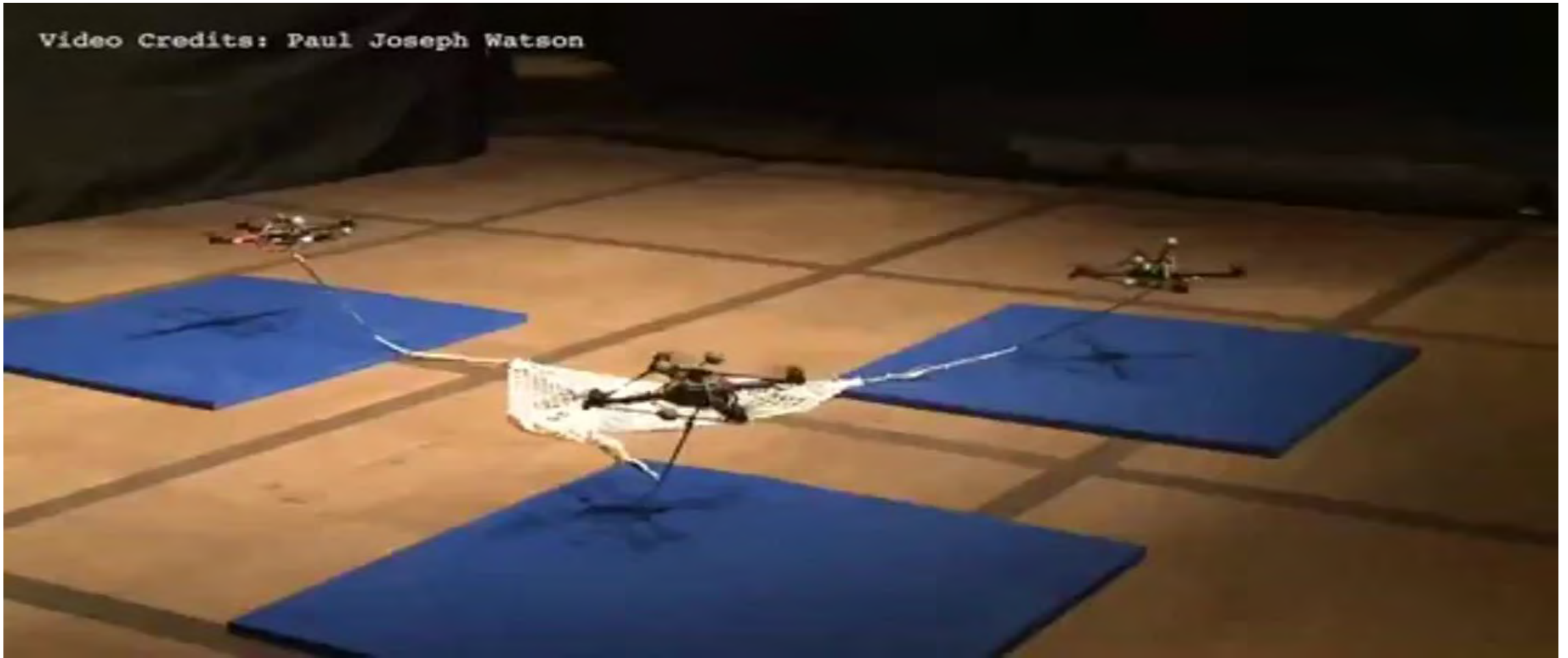
YOLO v2

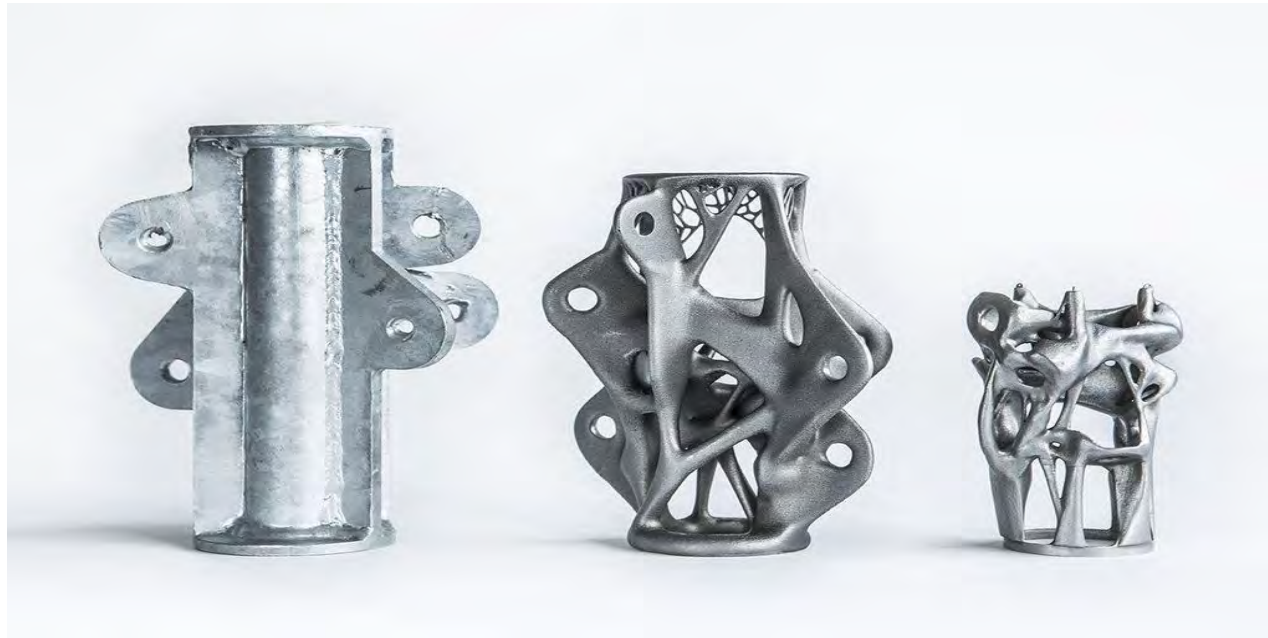
<http://pureddie.com/yolo>

person



Video Credits: Paul Joseph Watson



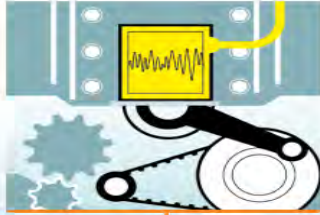


Design process

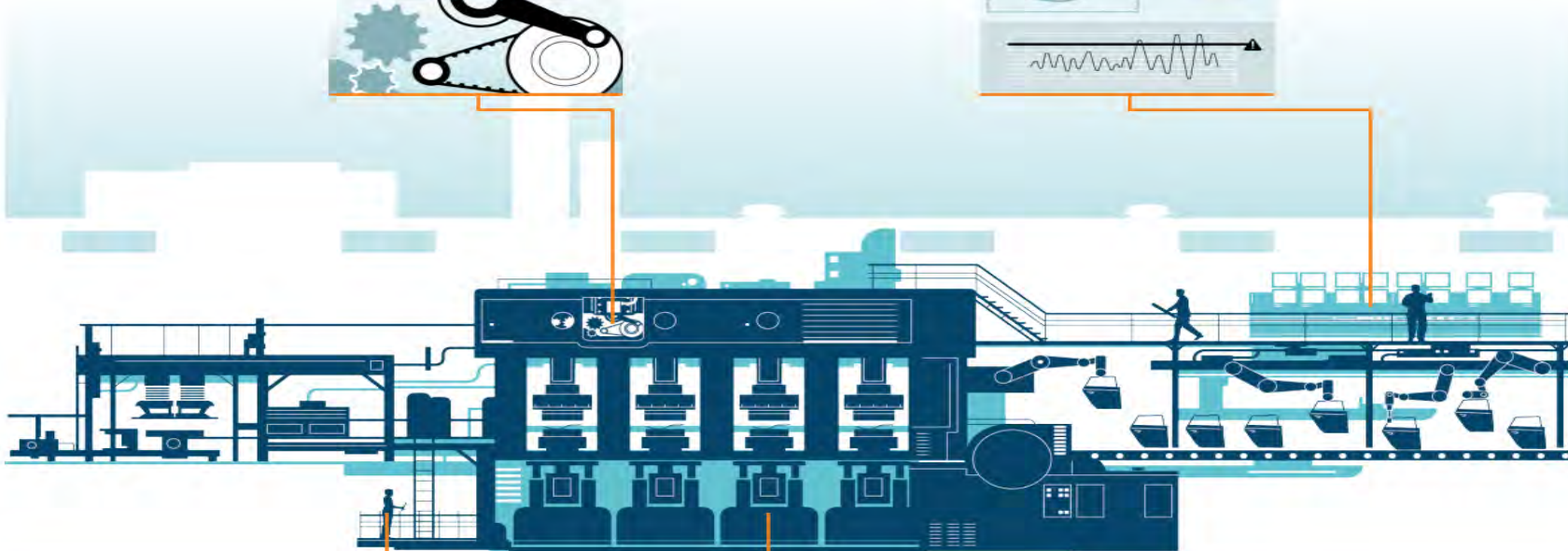
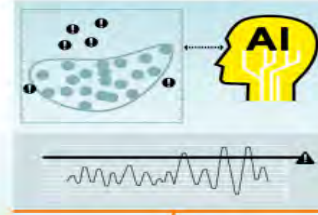
→ 40% material saving

IoT

Sensors detect e.g., sounds or vibrations and send their data to the AI engine for processing



ML algorithms (e.g., anomaly detection) accurately predict maintenance needs of machine parts

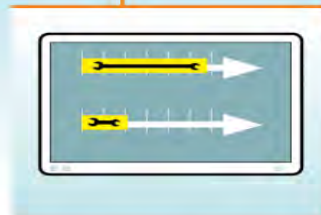


Production line

- Anomaly Detection
- Predictive Maintenance



A maintenance worker is **automatically given suggestions on the predicted maintenance** and its schedule



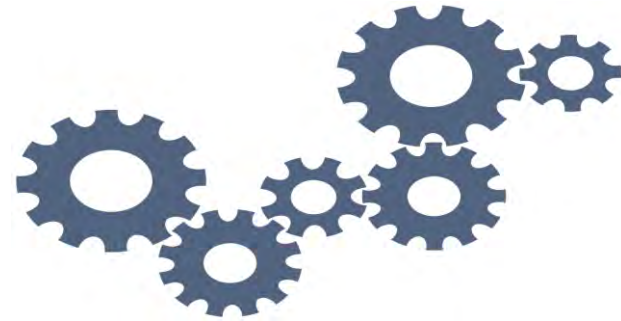
Predictive maintenance greatly **reduces machine downtime** caused by maintenance work as compared to other approaches



Expected benefit
Up to 10% reduction in annual maintenance costs

In addition

- Up to 20% downtime reduction
- Up to 25% reduction in inspection costs



How to start integration?

BUSINESS NEEDS



DIGITAL SOLUTIONS



COGNITIVE SOLUTIONS

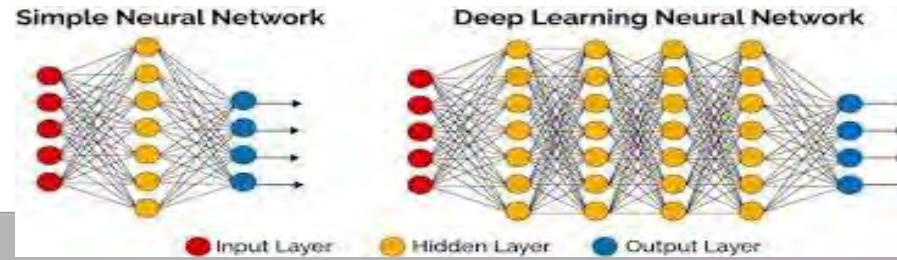


IoT

Big Data
, DB



AI bot
Chatbot
Virtual assistant



IoT

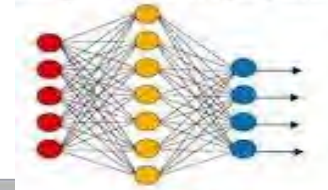
Big Data

DB

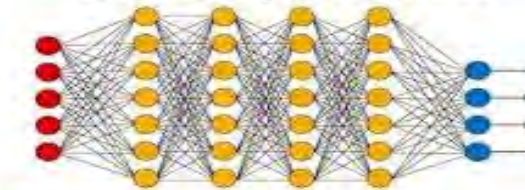
AI bot
Chatbot
Virtual assistant



Simple Neural Network



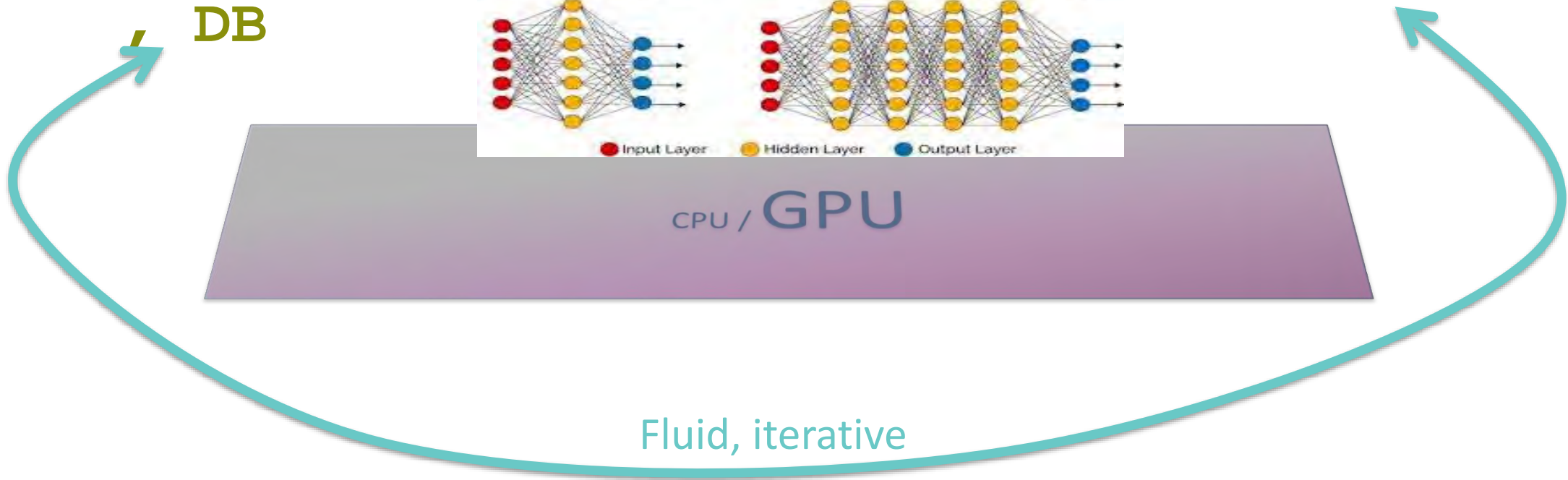
Deep Learning Neural Network

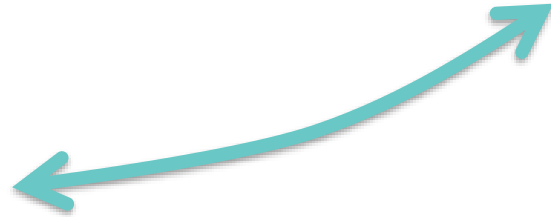
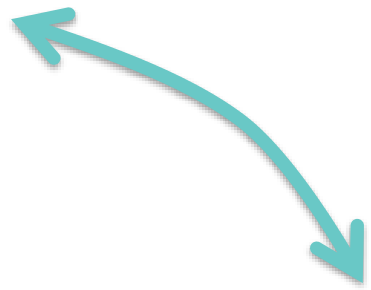
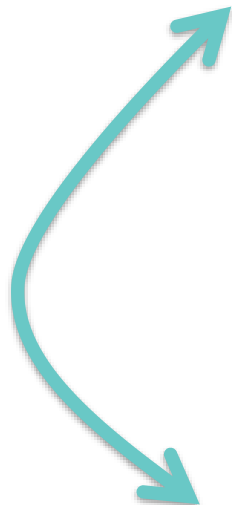
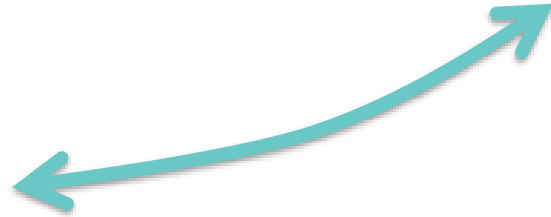
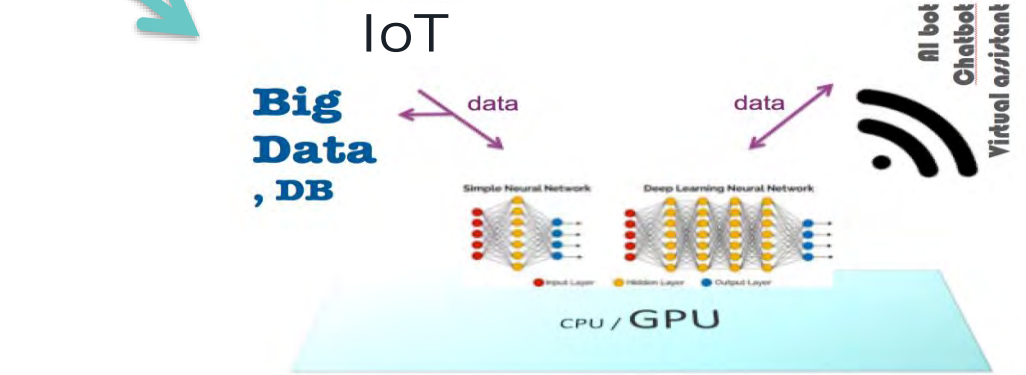
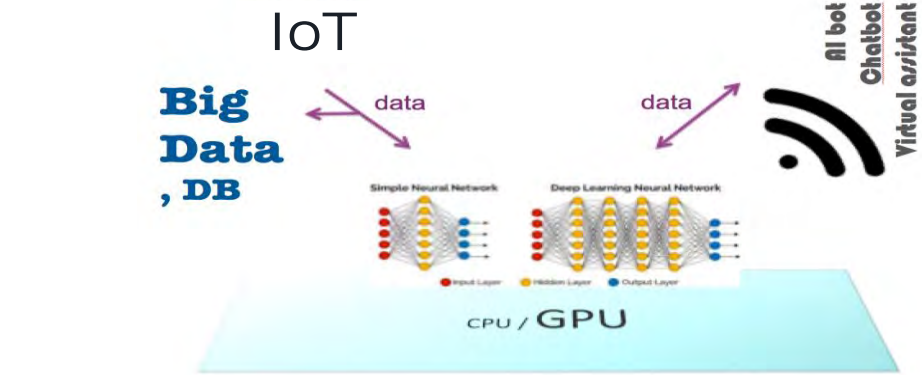
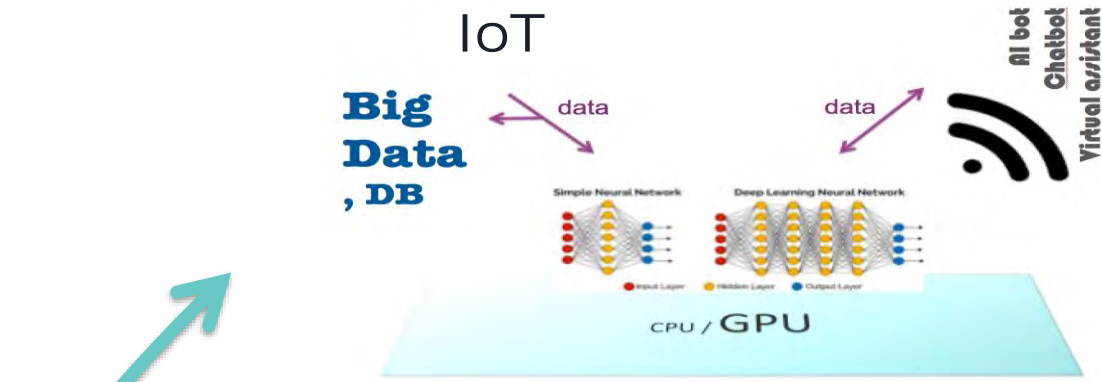


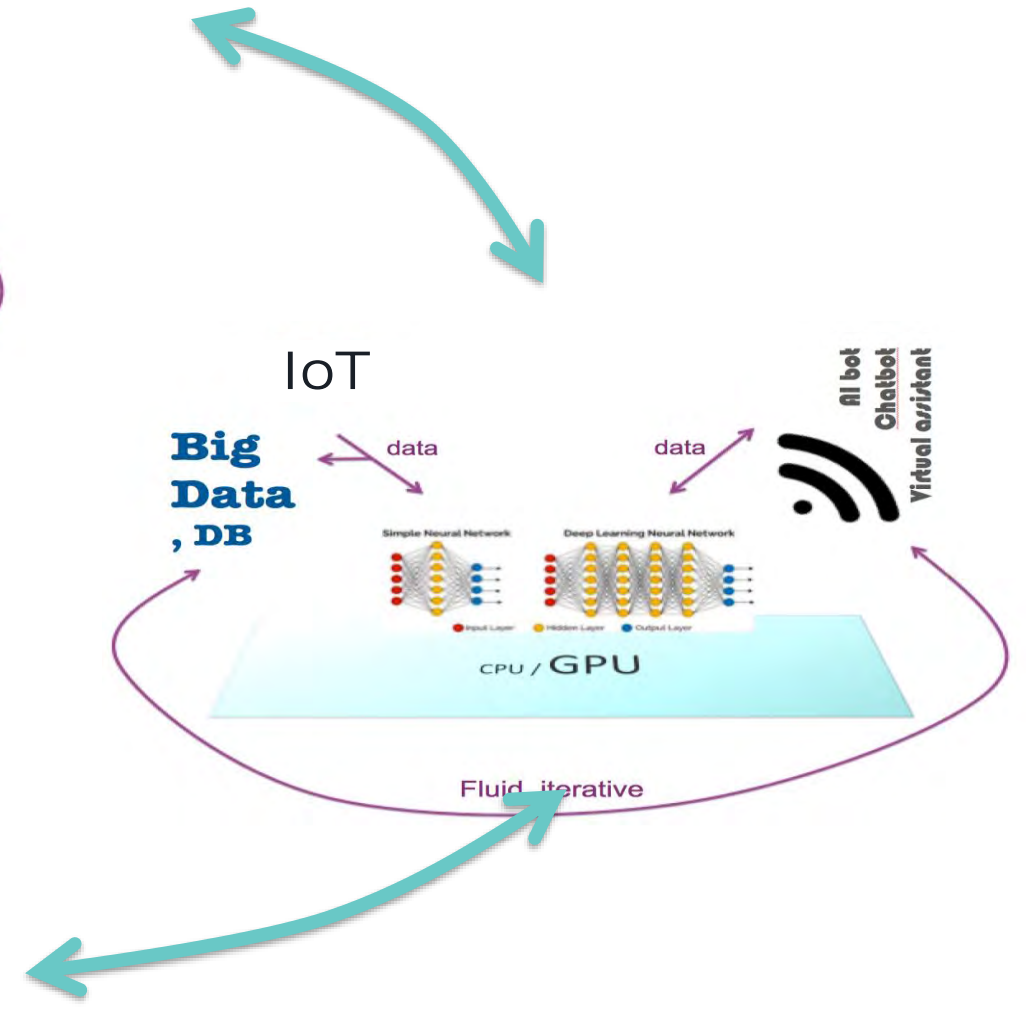
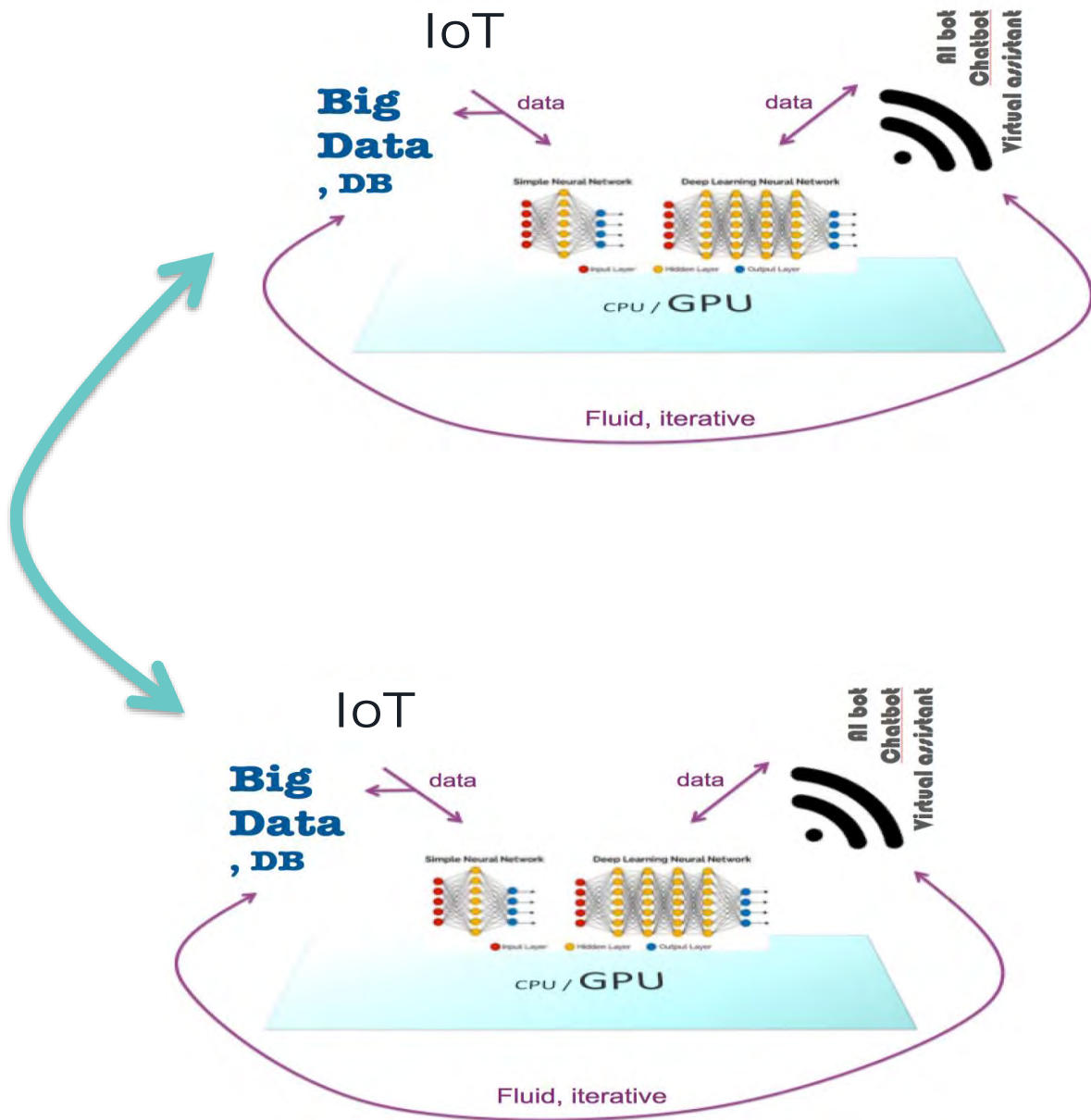
● Input Layer ● Hidden Layer ● Output Layer

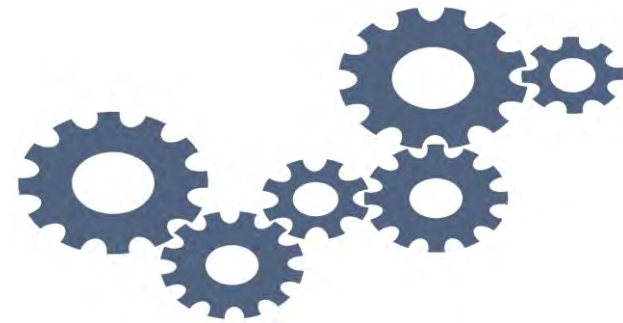


Fluid, iterative



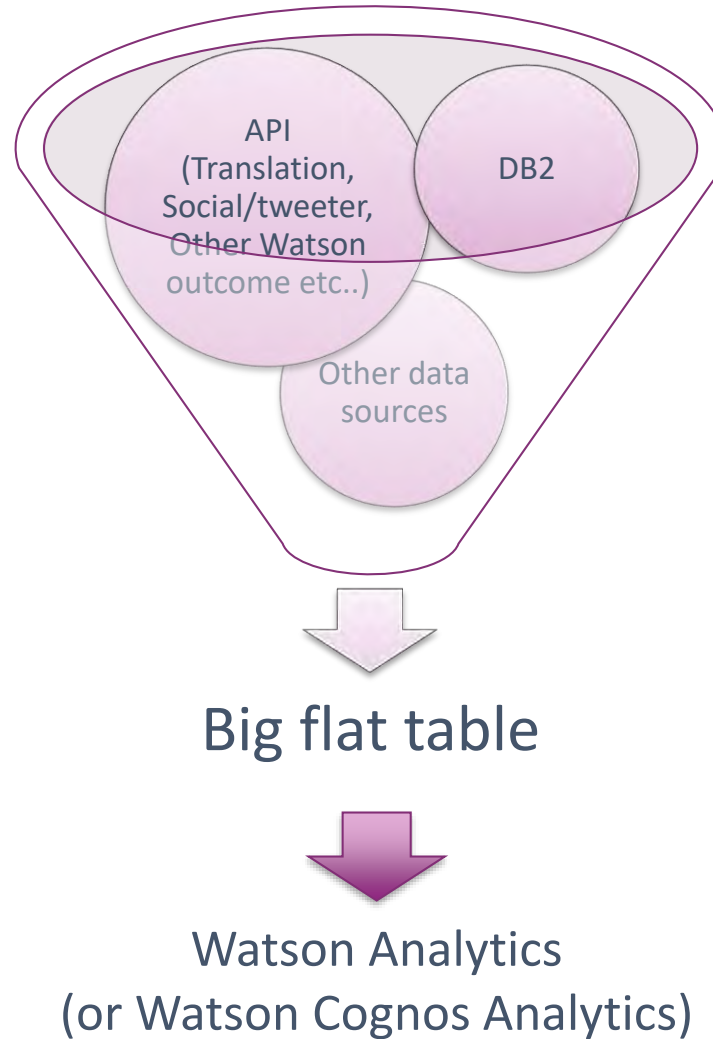




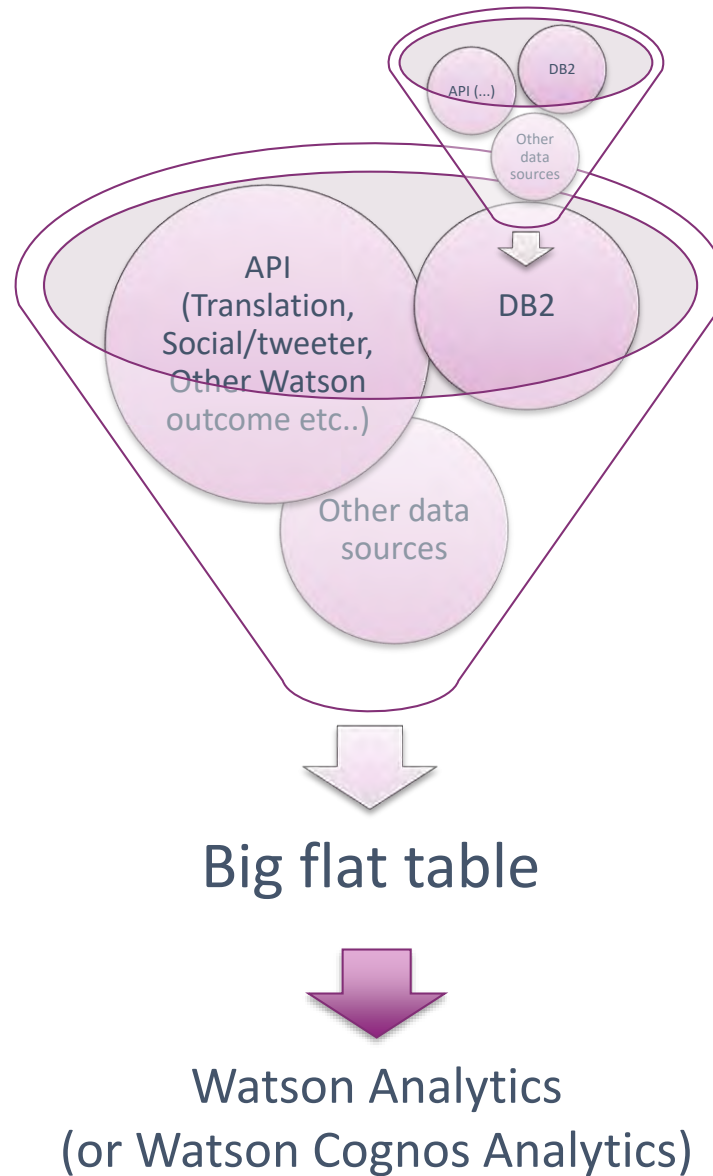


Integration Example With DATA

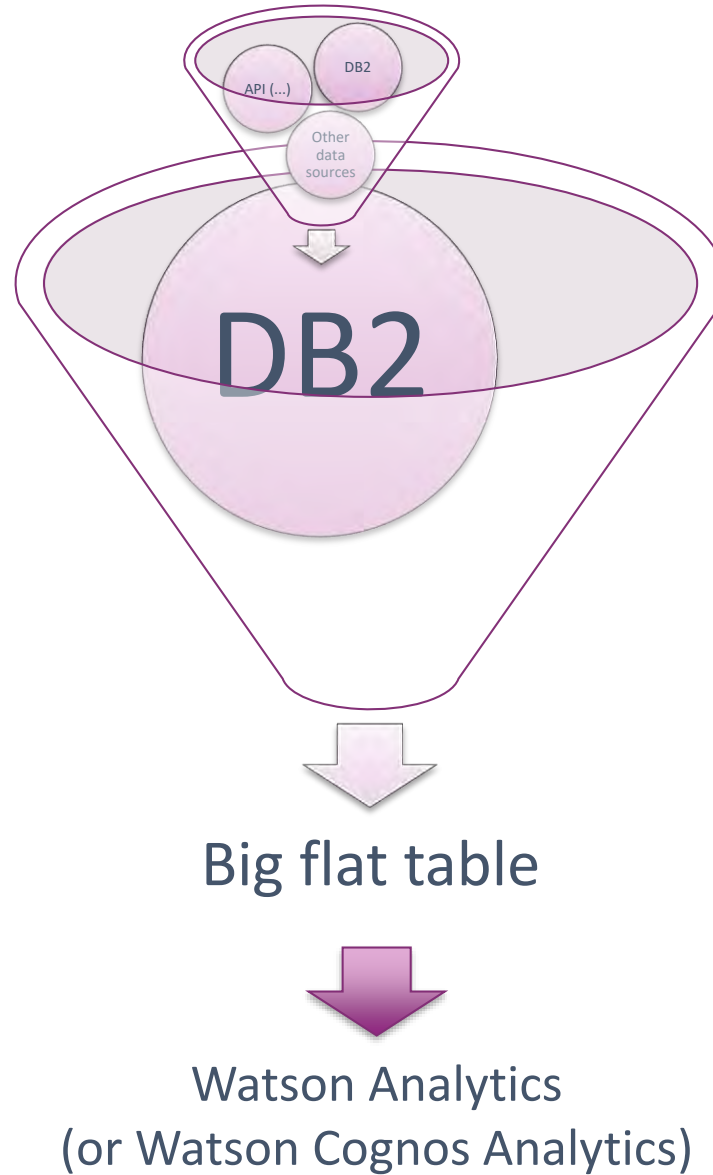
Exploration/Exploitation



Exploration/Exploitation



Exploration/Exploitation



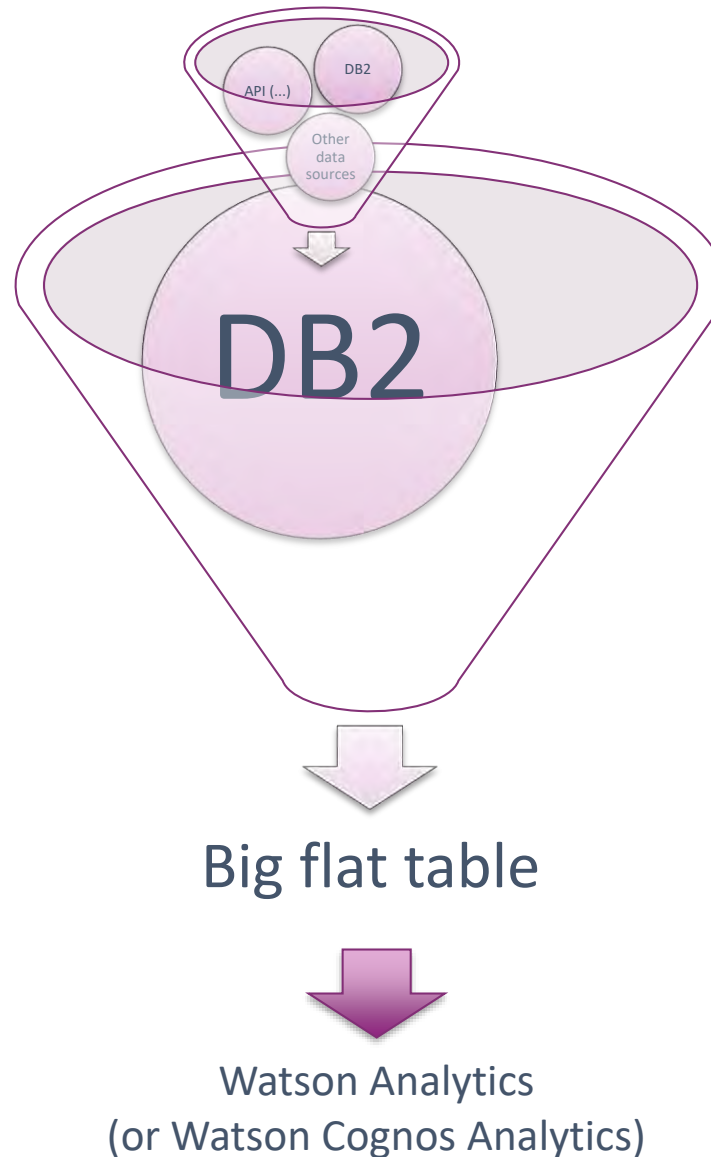
Exploration/Exploitation

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...



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

<https://developer.twitter.com>

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

Watson Analytics
(or Watson Cognos Analytics)

Exploration/Exploitation

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



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



- 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!

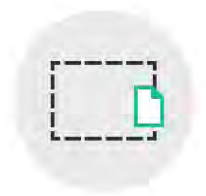
Recent

 CSV APPIDATA_SALESDDL.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](#)

- Home
- Search
- My content
- Team content
- Recent

- Manage
- New

My content +

APPIDATA_SALESCTL.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






Quick reference



- ▼ Get started
- [Overview](#)
- [Get started videos](#)
- > Sample data
- > Support

Open Quick launch or [Browse](#)













Exploration/Exploitation

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

-  Home
-  Search
-  My content
-  **Team content**
-  Recent

-  Manage
-  New

Source files

	Customer_analysis_errors.xlsx	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

Cognos Analytics

shboard, report or story!

Quick reference

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- Create data module
- Create exploration**
- Create dashboard
- Properties
- Copy or move
- Create shortcut

- 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 ▾

Create a visualization
Drag and drop fields or choose visualization type

Choose a type

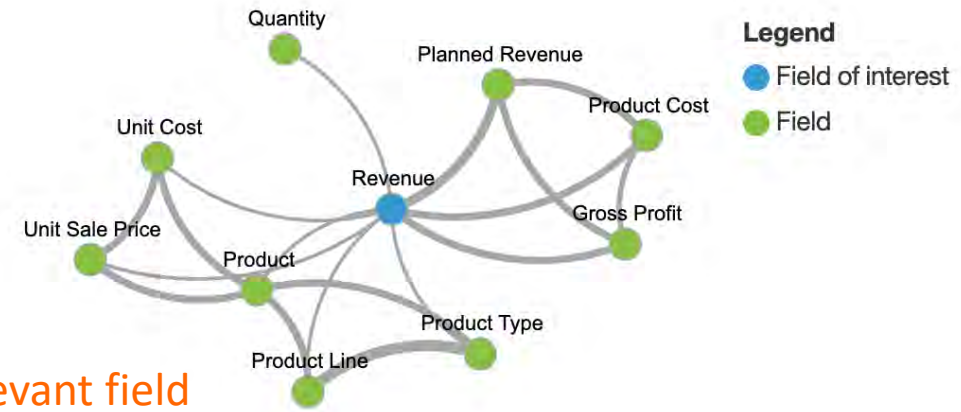
Explore relationships in your data

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

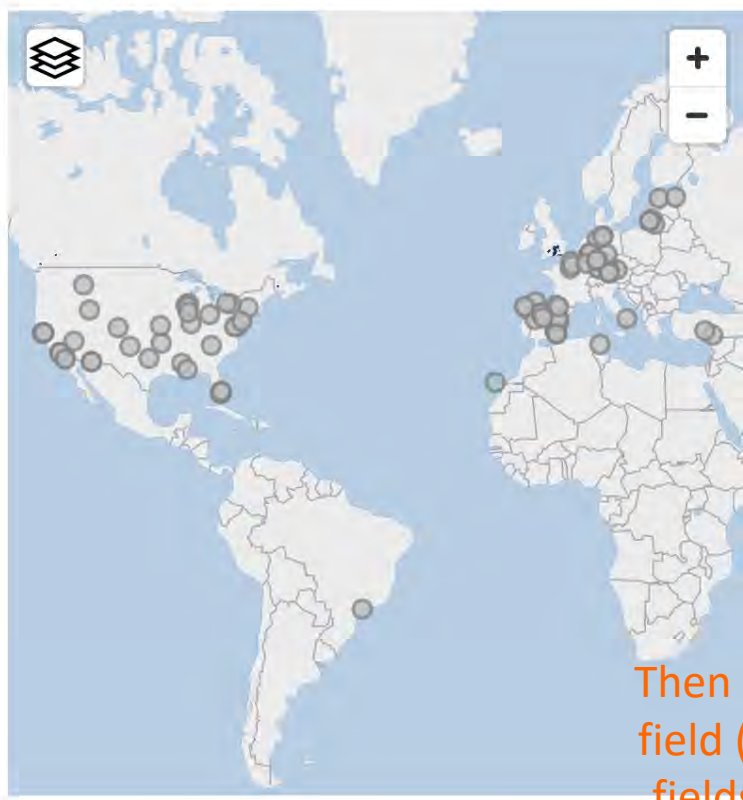


Select 1st a relevant field to start perspective from

- 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 Chart Table Map Grid Trash

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).

Then drag&drop group of field (use Ctrl to select all fields 1st on the left then drag&drop)

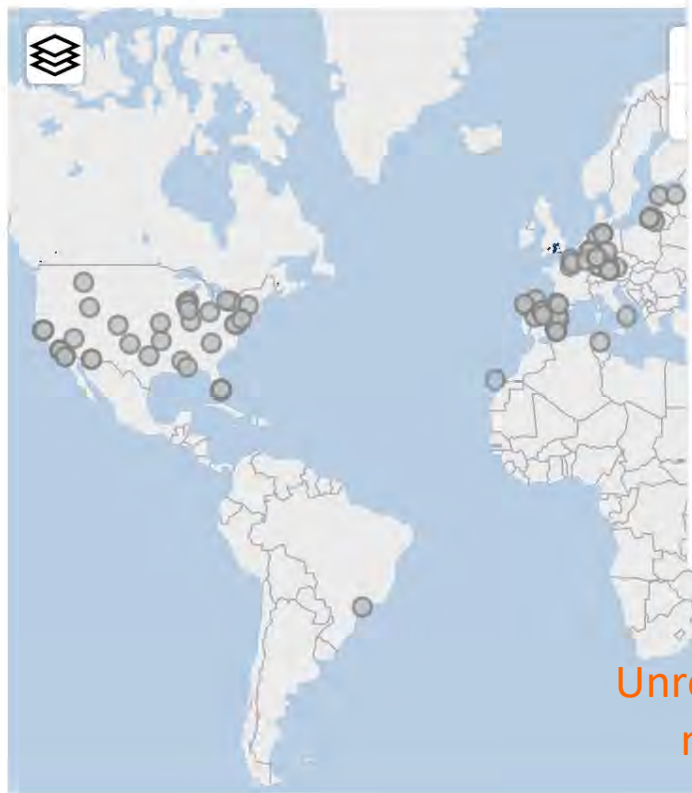
Get Started

Cookie Preferences

- 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
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- Quantity
- Unit Cost

New 2/2 Visualization Chat Settings Delete Ask a question

Postal code



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

Details Data slots

Number of results for **Product** values of **Retailer Country - State - City - Short Postal** 35.

lomb|West mingham|B2 is the most occurring category of **Retailer Province Or State - City - I Code** with a count of 2,230 of the total).

Unrecognized info and not meaningful outcome.... Lack of "measurable" "factors", measurable fields

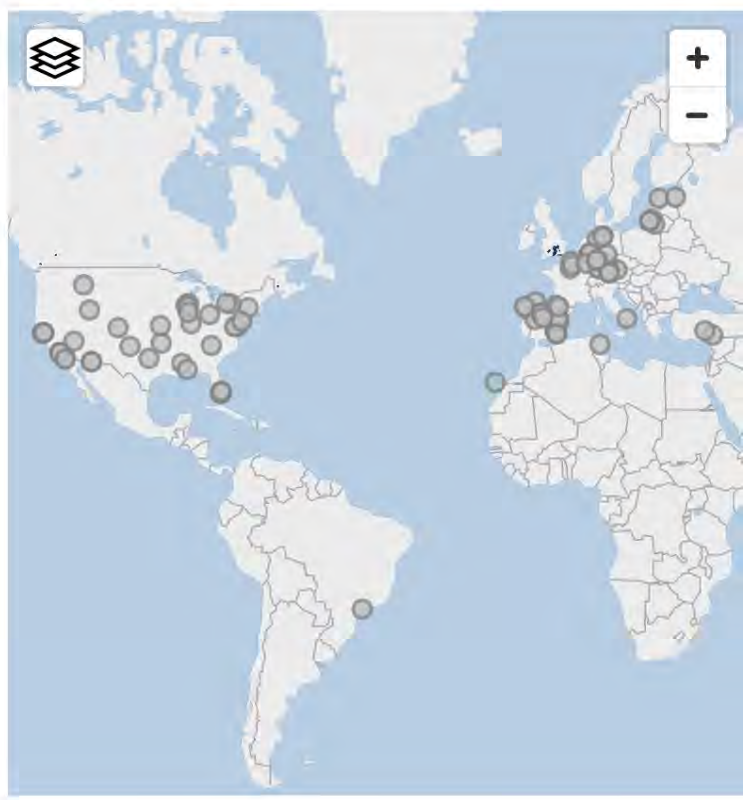
Get Started

Cookie Preferences

- Navigation paths
- Sample File Go Sales Xls
 - Retailer Country
 - Province Or State
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 - Postal Code
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 - Order Method Type
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 - Year
 - Quarter
 - Quantity
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New 2/2 Product Type (Co... 1 21

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

Cookie Preferences

- 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
 - Unit Price

New 2/3 [Chart Icon] [Table Icon] [Map Icon] [Trash Icon]

Quantity by Retailer country, Province or State, City, Short postal code



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).

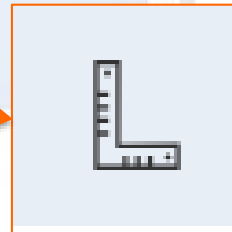
The summed values of **Quantity** range from a minimum of 374 (when **Postal Code** is 33142) to a maximum of 733,223 (when **Postal Code** is BN2 7FG).

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

The total number of results for Year for

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

Quantity

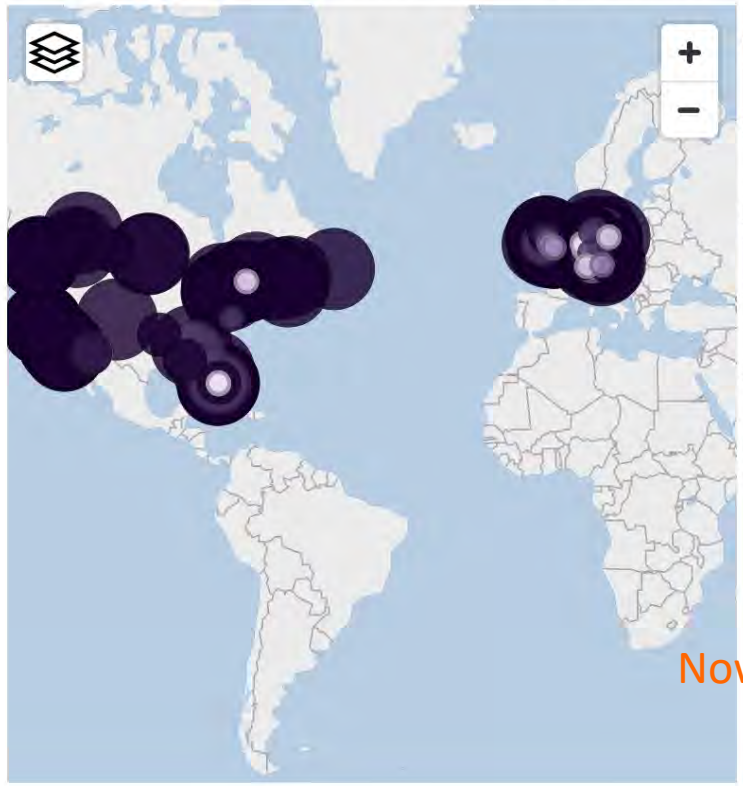


Measure

- 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 [Chart Icon] [Table Icon] [Map Icon] [Trash Icon] [Fullscreen Icon] [Ask a question]

Quantity by Retailer country, Province or State, City, Short postal code 5



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

733,223 (when **Postal Code** is BN2 7FG).

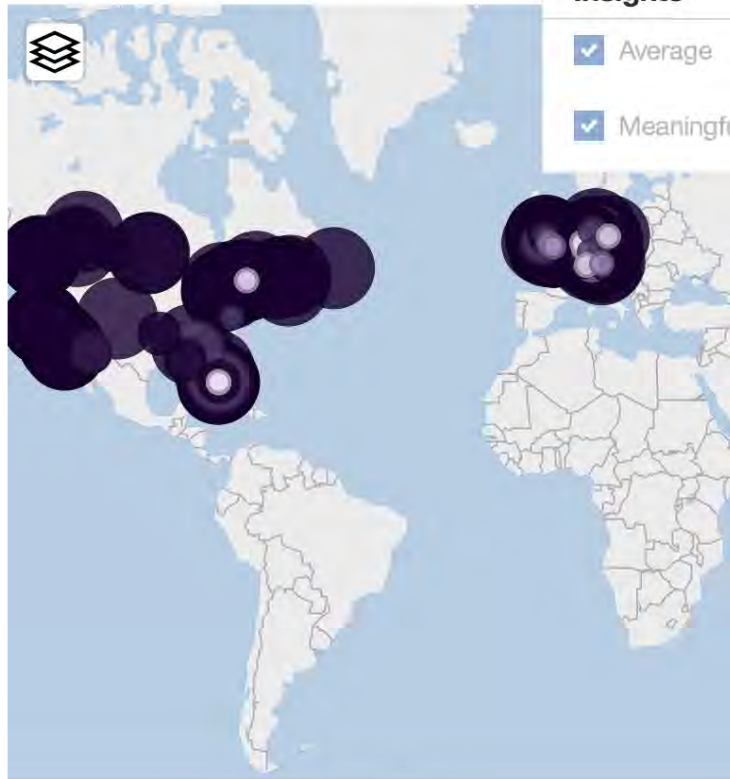
The value of **Quantity** is unusually high when the values of **Postal Code** are BN2 7FG and 80331.

The total number of results for Year for

- 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
 - Unit Price

New 2/3 [Chart Icon] [Table Icon] [Share Icon] [Refresh Icon] [Delete Icon]

by Retailer country, Province or State, City, Short postal code



Insights

- Average
- Meaningful differences



Select insights

Details Data slots

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

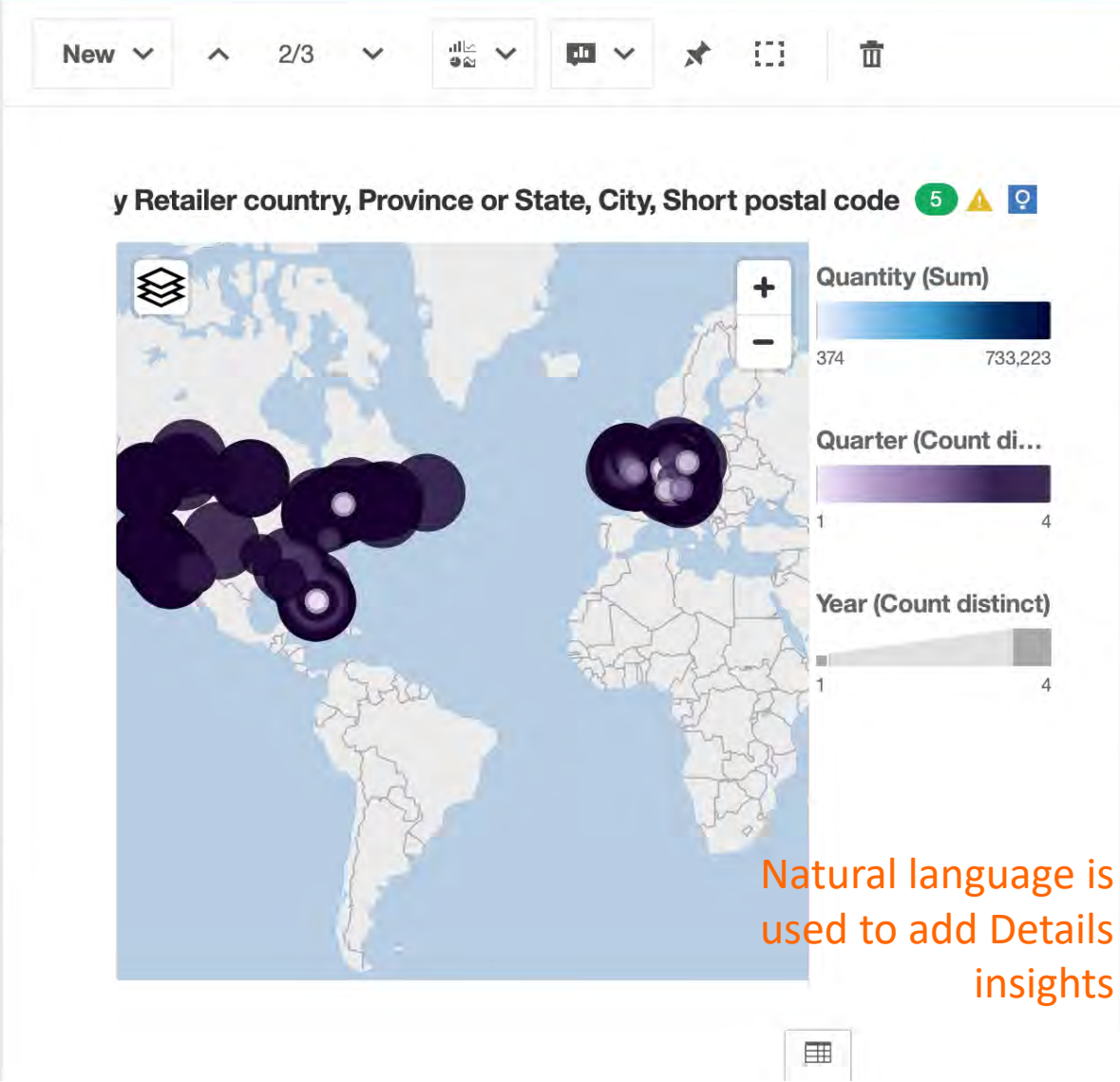
For **Quantity**, BN2 7FG and 80331 are the most important categories of **Postal Code** with a total value of 1,332,048 (5.5 % of the total).

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.

The total number of results for Year for

- 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
 - Unit Price



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).

FRESCHHE
SOLUTIONS



**YOUR
THOUGHTS?**

Thank you
Pascal Polverini

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