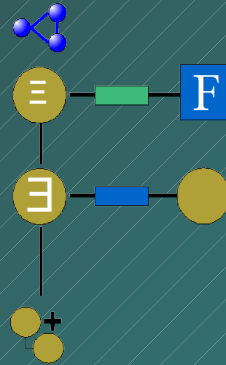


Breaking the conspiracy for ignorance

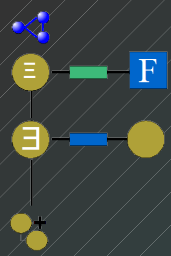


Increased product and production knowledge and control through:

- Semantic data and -applications for the finance industry.
- Straight application of knowledge in the production processes.

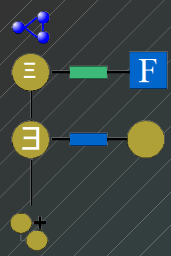
Oct, 5 2009

Eddy Vanderlinden



Stakeholders

- **Financial Institutions** gain an integrated tool for description and management of products and business processes, allowing all stakeholders role-specific access to the information they need. Additionally, they will realize a substantial reduction of the production costs.
 - **Financial regulators** can express policies and directives in a clear and unambiguous manner, reducing errors of interpretation.
 - **Operational and Financial Auditors** can get a full picture of a production and accounting situation while the meaning of any transaction is clear through its context.
 - **Consumers of Financial Products**, including individual and institutional investors can get a clearer ‘line of sight’ regarding the value and risk profile. They benefit from stronger protection by being serviced through a knowledgeable supplier.
-
-



About the author

- Economic degree with specialities in accountancy, operations research and portfolio management.
 - Near to 30 years of experience in the financial sector. The last 10 years as independent consultant and project manager.
 - Teacher in college in different I.T. Topics: database management, networks, programming,...
 - Experience can only be claimed when the acquired knowledge leads to lessons learned. These lessons should be relevant and transmittable.
-
-



Context of the presentation

- Observation The context are the notes taken during years of consulting in the finance industry. Those notes include perceived success- and failure factors.
 - Analysis The notes are enriched with causes
 - Actions:
 - Based on that analysis we determine criteria for solutions
 - The criteria were used on our odyssey through data management systems
-
-



Finance industry specifics

- Dysfunctions are fully impacting the P/L bottom line
 - The changes of the service specification are many: compare a stock order with a car order during its life-cycle
 - Many interfering parties: customer, broker, custodian, agent, fiscal and reporting authorities,...
 - Intangible nature of the handled material
 - Weak standardization
-
-

Data representation models

ANSI/SPARC model	Knowledge model	Contents
External layer	Knowledge representation	Reports
		Data entry- and manipulation forms
		Query forms
		Application files
		Charts
		XML/XSD files
		HTML pages
		Browsers
		Utilities
Conceptual layer	Knowledge management	Ontology
Physical layer	Knowledge base	RDBMS
		HTML pages
		Flat text files
		Other ontologies
		ODBC/JDBC connections
		XML files



Structure of the presentation

1. Share the lessons learned based on experience, generalize and abstract from these lessons
 2. Verify if the lessons apply to the audience through a questionnaire found [here](#)
 3. Build the criteria for solutions
 4. Break the conspiracy for ignorance
-
-

Risk: False feeling of control

Lesson 1: the data should provide information

- Systematically and periodically one is drowned in data
- Correct data in a missing context : interpretation difficulties
- Hidden business meaning and risks
- The data does not contain the expected information

Lesson 1: data should provide information

The reported figures are clear on their contents

- Always
- Regularly
- Sometimes
- Seldom
- Never

All computable risks are clear through the figures

-
- Always
 - Regularly
 - Sometimes
 - Seldom
 - Never
-
-

Risk: Internal fraud

Lesson 2: version control on level of processes and operations is needed

- Société Générale: fraud by a former controller, the split of functions was respected but not over time
- Data models do not include the time dimension
- Version control of models is not applied: changes to non existing functionalities
- Logging is not performed or does not allow a version reconstruction and audit
- Roll-back of processes (iso transactions) is not possible: no status information

Lesson 2: version control needed (A)

It is possible to reconstruct the functioning models/programs at any point in time

- Always
- Regularly
- Sometimes
- Seldom
- Never

It is possible to roll back chains of transactions for any group of processes

- Always
 - Regularly
 - Sometimes
 - Seldom
 - Never
-
-

Lesson 2: version control needed (B)

History information is available

- Always
- Regularly
- Sometimes
- Seldom
- Never

History information is taken into consideration when decisions are taken or conclusions drawn

-
- Always
 - Regularly
 - Sometimes
 - Seldom
 - Never
-
-

Risk: Internal fraud

Lesson 3: Visualize internal control GAPS

- Internal control procedures are violated
- Misuse of rules is silently tolerated
- Internal control gaps
 - Rounding differences are posted on an internal account and transferred to the own account
 - Automated sales proceeds are posted on an account under control of a personnel member
 - Cash postings with other financial institutions are delayed
 - Referential systems containing settlement information are manipulated
 - Currencies in which transactions occur are switched

Lesson 3: visualize gaps

Internal control covers all processes and procedures

- Always
- Regularly
- Sometimes
- Seldom
- Never

Internal control procedures are consistently applied

-
- Always
 - Regularly
 - Sometimes
 - Seldom
 - Never
-
-

Risk: Manipulation

Lesson 4: request for a formal and unambiguous documentation

- Ratio's offer double interpretation liberties
 - Report descriptions are ambiguous
 - Product definitions are unclear: unfulfilled expectations
 - Confusing terminology
 - Comparison of products is impossible
 - Structured transmission of product data is impossible
-
-

Lesson 4: formal and unambiguous documentation needed

There is a regular critical assessment of the contents of reports with the ones we report to

- Always
- Regularly
- Sometimes
- Seldom
- Never

Product definitions include all necessary aspects and risks

- Always
 - Regularly
 - Sometimes
 - Seldom
 - Never
-
-

Risk: surprised by disaster

Lesson 5: request an executable disaster recovery plan

- Customers are insolvent: new niche, new risks
- Suppliers do not fulfil their obligations: SLA follow up
- Collaterals become worthless

Lesson 5: disaster plan need (A)

All possible risks are identified (internal & external)

- Always
- Regularly
- Sometimes
- Seldom
- Never

Risks are assessed according to impact and probability

-
- Always
 - Regularly
 - Sometimes
 - Seldom
 - Never
-
-

Lesson 5: disaster plan need (B)

A risk profile is established :
impact/probability

- Always
- Regularly
- Sometimes
- Seldom
- Never

For risks proper action is taken: transfer of risk, reduction of the risk, reduction of occurrence or probability

-
- Always
 - Regularly
 - Sometimes
 - Seldom
 - Never
-
-

Risk: Production “accidents”

Lesson 6: production monitoring and control needed

- Specification changes are not managed
- Processes with suppliers are not synchronized
- Impossible or unclear status reporting over the processes and procedures: unknown or inaccessible
- Production processes are not demonstrable under control: no updated dashboard
- No benchmarks for processes: material errors due to stress situations, no KPI's,...
- Roll-back for processes is impossible (cfr version)

Lesson 6: production control (A)

Key Process Indicators
are defined and
monitored

- All
- Most
- Some
- Rare
- None

Benchmarks are defined
per production level for
the process: capacity
limits

-
- All
 - Most
 - Some
 - Rare
 - None
-
-

Lesson 6: production control (B)

Bottlenecks in production
are detected timely

- Always
- Regularly
- Sometimes
- Seldom
- Never

The reaction to
bottlenecks is effective

-
- Always
 - Regularly
 - Sometimes
 - Seldom
 - Never
-
-

Risk: Unforeseen commitments

Lesson 7: knowledge caption, management and representation need

- Business rules are defined and adapted on the spot
 - The physical data model is referenced when speaking about enforced business rules
 - High flexibility of the customer agreements per customer or per product
 - IT programs form the memory of the business
 - Specifications for IT developments are cumbersome because of lacking AS IS situation
-
-

Lesson 7: knowledge representation

The business rules are defined and accessible as framework for product managers

- Always
- Regularly
- Sometimes
- Seldom
- Never

Processes and procedures are clear and accessible

- Always
 - Regularly
 - Sometimes
 - Seldom
 - Never
- 

Risk: missed business opportunities

Lesson 8: need for a mapping conceptual- and physical data model

- New services to specific customers cannot be delivered in time: rigid models and applications
- Functional concepts cannot be translated into physical ones
- The models are no longer corresponding to the business reality: no IT support to the business

Lesson 8: mapping conceptual/physical data model (A)

Each served combination client/product finds a solution in the business rules

- Always
- Regularly
- Sometimes
- Seldom
- Never

The IS tools support the client/product combination

-
- Always
 - Regularly
 - Sometimes
 - Seldom
 - Never
-
-

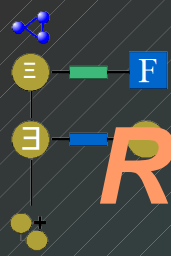
Lesson 8: mapping conceptual/physical data model (B)

The business rules are enforced by IS tools

- Always
- Regularly
- Sometimes
- Seldom
- Never

The mapping between the concepts and physical enforcements are clear: à priori or à posteriori checks.

-
- Always
 - Regularly
 - Sometimes
 - Seldom
 - Never
-
-



Risk: missed efficiency opportunities

Lesson 9: need for extendible conceptual and physical data models

- New products, markets and regulations do not find a translation into existing concepts.
- Product, market, legislation and regulatory changes are costly and not implemented timely
- The procedures for changes are discouraging the applicants



Lesson 9: flexibility of the data models

Change management:
Changes in products or
productions are timely
and swiftly implemented

- Always
- Regularly
- Sometimes
- Seldom
- Never

Both conceptual and
physical data models
have shown to be generic
(flexibly adaptable)

- Always
 - Regularly
 - Sometimes
 - Seldom
 - Never
-
-

Risk: functional abends

Lesson 10: impact of changes needs to be ready clear

The impact of changes is unclear, thus:

- Unnecessary tests
- Missing necessary tests
- Non-regression testing is missing the real scope

Lesson 10: recognized impact of changes

All performed tests are necessary or have non-regression purposes

- Always
- Regularly
- Sometimes
- Seldom
- Never

All necessary tests are performed

-
- Always
 - Regularly
 - Sometimes
 - Seldom
 - Never
-
-

Risk: no timely information

Lesson 11: documentation should be ready accessible and relevant

- Literature in stead of documentation
- Documentation without methodology
- No scope limitation, nor in width, nor in depth with as consequence: overlapping and shortcomings
- Applications are documented in stead of end-to-end processes
- No global picture since links between processes are missing

Lesson 11: accessible documentation

Mandatory modifications in programming can be delivered in time

- Always
- Regularly
- Sometimes
- Seldom
- Never

The documentation is organized cross-application

-
- Always
 - Regularly
 - Sometimes
 - Seldom
 - Never
-
-

Risk: fictitious information

Lesson 12: technical information should be made clear to non-specialists

- The level of communication of the technical staff to the management is of such a high level that the subject becomes pure fiction.
- Higher management does not realize any more the product and production risks and approves unknown methods.

Lesson 12: throw light on the matter

Communication carries mutual understanding of all parties

- Always
- Regularly
- Sometimes
- Seldom
- Never

Technical matters are clearly explained and documented so that all aspects are understood

-
- Always
 - Regularly
 - Sometimes
 - Seldom
 - Never
-
-

Risk: conspiracy for ignorance

Lesson 13: Ignorance must promote from an excuse to a fault qualification

Quotes registered during the financial crisis:

- “I did not understand the full extend of the measures I voted for” a board member of a renown bank.
 - “I relied on specialists to consider the risks” a CEO of another renown bank.
 - “We could not afford loosing the business” a credit rating agencies spokesman.
 - “The impacts were not clear at that time”: an auditor having put the required tick mark.
-
-

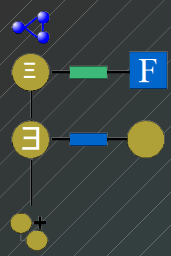
Lesson: increased risk awareness

The product- and productions risks are re-evaluated since the crisis

- All
- Most
- Some
- Rare
- None

The costs for new rules will levy with the earnings of safer products

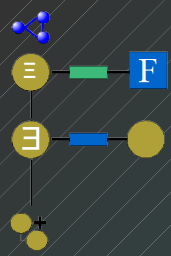
-
- All
 - Most
 - Some
 - Rare
 - None
-
-



Forms of ignorance

- Darkness
- Mystery
- Unacquainted
- Unfamiliar
- Unknown with





Breaking the conspiracy

- If ignorance is an acceptable excuse
- If ignorance is omnipresent also in daily ongoing business
- If ignorance is invoked as excuse so frequently that it becomes common and accepted...

Then, knowledge management is not a fancy hype.

We have the duty to remove the main reason for failure.

The alternative: inertia leads to

- Loss of trust
 - Cut of credit lines
 - Bankruptcy
 - Crisis in the financial economic sector
 - Worldwide spread of the crisis
 - Customers going broke
 - Economies landing in a recession
 - Worldwide spread of the recession
-
-

Overview of the lessons learned

- 1: the data should provide information
- 2: version control on the level of processes and operations is needed
- 3: visualize internal control GAPS
- 4: request for a formal and unambiguous documentation
- 5: request for an executable disaster recovery plan
- 6: production monitoring and control needed
- 7: knowledge capture, management and representation need
- 8: need for a mapping conceptual- and physical data model
- 9: need for generic conceptual- and physical data models
- 10: impact of changes needs to be ready clear
- 11: documentation should be ready accessible and relevant
- 12: technical information should be made clear to non-specialists
- 13: ignorance must promote from an excuse to a fault qualification
(added after financial crisis)

Criterion 1: the solution provides a data model

- 1: the data should provide information
 - 2: version control on the level of processes and operations is needed
 - 3: visualize internal control GAPS
 - 4: request for a formal and unambiguous documentation
 - 5: request for an executable disaster recovery plan
 - 6: production monitoring and control needed
 - 7: knowledge caption and management need
 - 8: need for a mapping conceptual- and physical data model
 - 9: need for generic conceptual and physical data models
 - 10: impact of changes needs to be ready clear
 - 11: documentation should be ready accessible and relevant
 - 12: technical information should be made clear to non-specialists
 - 13: ignorance must promote from an excuse to a fault qualification
-
-

Criterion 2: the data model must be generic of nature

- 1: the data should provide information
 - 2: version control on the level of processes and operations is needed
 - 3: visualize internal control GAPS
 - 4: request for a formal and unambiguous documentation
 - 5: request for an executable disaster recovery plan
 - 6: production monitoring and control needed
 - 7: knowledge caption and management need
 - 8: need for a mapping conceptual- and physical data model
 - 9: need for generic conceptual and physical data models
 - 10: impact of changes needs to be ready clear
 - 11: documentation should be ready accessible and relevant
 - 12: technical information should be made clear to non-specialists
 - 13: ignorance must promote from an excuse to a fault qualification
- (added after financial crisis)

Criterion 3: the solution provides a thesaurus: taxonomy and lexicon

- 1: the data should provide information
 - 2: version control on the level of processes and operations is needed
 - 3: visualize internal control GAPS
 - 4: request for a formal and unambiguous documentation
 - 5: request for an executable disaster recovery plan
 - 6: production monitoring and control needed
 - 7: knowledge caption and management need
 - 8: need for a mapping conceptual- and physical data model
 - 9: need for generic conceptual and physical data models
 - 10: impact of changes needs to be ready clear
 - 11: documentation should be ready accessible and relevant
 - 12: technical information should be made clear to non-specialists
 - 13: ignorance must promote from an excuse to a fault qualification
- (added after financial crisis)

Criterion 4: the solution provides a means of managing temporal info

- 1: the data should provide information
- 2: version control on the level of processes and operations is needed
- 3: visualize internal control GAPS
- 4: request for a formal and unambiguous documentation
- 5: request for an executable disaster recovery plan
- 6: production monitoring and control needed
- 7: knowledge caption and management need
- 8: need for a mapping conceptual- and physical data model
- 9: need for generic conceptual and physical data models
- 10: impact of changes needs to be ready clear
- 11: documentation should be ready accessible and relevant
- 12: technical information should be made clear to non-specialists
- 13: ignorance must promote from an excuse to a fault qualification
(added after financial crisis)



Criterion 5: the solution provides a dashboard function

- 1: the data should provide information
 - 2: version control on the level of processes and operations is needed
 - 3: visualize internal control GAPS
 - 4: request for a formal and unambiguous documentation
 - 5: request for an executable disaster recovery plan
 - 6: production monitoring and control needed
 - 7: knowledge caption and management need
 - 8: need for a mapping conceptual- and physical data model
 - 9: need for generic conceptual and physical data models
 - 10: impact of changes needs to be ready clear
 - 11: documentation should be ready accessible and relevant
 - 12: technical information should be made clear to non-specialists
 - 13: ignorance must promote from an excuse to a fault qualification
- (added after financial crisis)
-



Criterion 6: the solution provides graphical representations

- 1: the data should provide information
 - 2: version control on the level of processes and operations is needed
 - 3: visualize internal control GAPS
 - 4: request for a formal and unambiguous documentation
 - 5: request for an executable disaster recovery plan
 - 6: production monitoring and control needed
 - 7: knowledge caption and management need
 - 8: need for a mapping conceptual- and physical data model
 - 9: need for generic conceptual and physical data models
 - 10: impact of changes needs to be ready clear
 - 11: documentation should be ready accessible and relevant
 - 12: technical information should be made clear to non-specialists
 - 13: ignorance must promote from an excuse to a fault qualification
- (added after financial crisis)
-

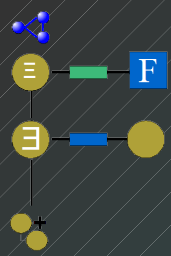


The journey towards an optimal solution

Once the criteria established, an odyssey began in the land of:

- Philosophers on the nature of things
- Mathematicians on descriptive logics
- Standards applied in other economic sectors
- Communication possibilities
- IT-architecture and programming techniques

The final proposal satisfied all criteria and more...



The ontology

The first step towards an optimal solution is the implementation of an ontology.

An ontology provides the description of concepts in a specific context through:

- a lexicon function: dictionary
- a taxonomy function: hierarchy from general to specialized concepts
- nominated relations between concepts

An ontology simply satisfies all 6 criteria.



The RDF (S) ontology representation

Resource Description Framework (Schema) originates from attempts to turn data found on the internet into meaningful information. RDF enables:

- Ontologies become readable by men and machines
 - To reference information cross platform and format
 - To store information in the most generic way
 - To generate inferred data with the help of reasoners
 - Difference conceptual and physical data model disappears
-
-

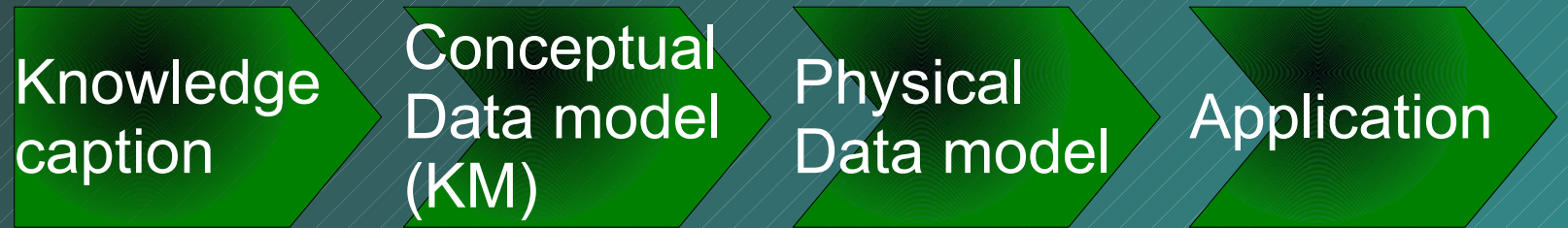
The OWL format ontology

OWL stands for Web Ontology Language and is build on top of RDFS which it extends.

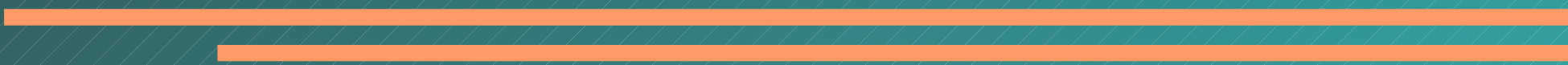
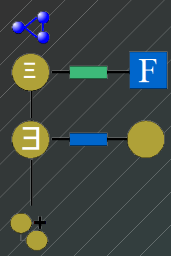
- The creation of OWL was necessary for some applications where advanced inferences were necessary
 - Since inferences are mainly made from the properties applied to concept's individuals, those properties become more sophisticated.
 - The engines to generate the inferences have to adapt to the new versions of owl
-
-

From data model to software application

The past:

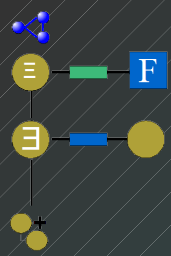


The present:



Summary of differences traditional / semantic application development

Aspect	Conventional application	Semantic web application
Business implementation	Translation of functional analysis to technical analysis. Translation of technical analysis into programming language.	Functional analysis = data model. Technical analysis = data model. Program = data model. The data model serves the 3 purposes.
Production monitoring	Has to be developed via KPI's (Key Performance Indicators), dashboards, software development,...	Is demonstrated straight through the implementation of the model.
Documentation	Is not uniform, seldom up-to-date, not 'just-in-time' accessible.	Uniform documentation straight from the data model, accessible through Java-docs.
Messages	Manual mapping of each message field. At each message modification there is a program modification	XML compliant. The finance ontology is ISO 20022 compliant.
User interfaces	1 for the customer via internet 1 for the front office 1 for the back office Each with different access rights and permissions.	Single interface with different access rights and permissions according to the internal policy.
Languages	Many programming languages, specialized persons and infrastructure needed.	No programming, modelling is performed.
Functions	The functions are nested in servers, separate software components.	The functions form an integral part of the model. They can be called through web services.
Database	Entities/relationships with codification of the values: translation, documentation, access to the documentation and updates necessary.	Ontology with plain text description: readable to men and machines.
	Same codes can have different meanings when systems get connected.	
	Design and optimization with keys, indexes, inner and outer joins whereby finally the structure remains frozen because of the complexity and unknown impact of changes.	No database design: we promote the use of triple stores. The design for optimization is left to the database provider.
	Inflexible by nature: adding a column (property) to an entity is dramatic in view of interface and server adaptations, testing, data warehousing...	Ontologies are by definition generic.



Thank you for your attention

Ontology modelling, cooperative development and
application development.

E-mail: e.vanderlinden@fadyart.com
More information on <http://fadyart.com>

