Semantics
The business technology disruptor of the future
The Parable of the Table
The Parable of the Table
Ecology of Semantic computing

- User interface and applications
- Trust
- Proof
- Unifying Logic
- Querying: SPARQL
- Ontologies: OWL
- Rules: RIF/SWRL
- Taxonomies: RDFS
- Data interchange: RDF
- Syntax: XML
- Identifiers: URI
- Character Set: UNICODE

Ecology of Business computing

- Huge number of frameworks etc
- No standard trust model
- No standard proof model
- No standard
- Plethora of query languages
- No standard modelling language
- Many incompatible rules languages
- No standard taxonomic representational languages - XML common
- No standard data interchange languages
- XML
- No concept of URI
- Unicode Pervasive

Cryptography
Process-centric thinking
1950's until 1990's

Application Centric Thinking
1950's until now

what does this system need to do?
automate these manual workflow tasks
Information management (IM) is the collection and management of information from one or more sources and the distribution of that information to one or more audiences. This sometimes involves those who have a stake in, or a right to that information. Management means the organization of and control over the structure, processing and delivery of information.

ISO 42010: Information (in information processing)
Knowledge concerning objects, such as facts, events, things, processes, or ideas, including concepts, that within a certain context has a particular meaning.
Application Centric Thinking

- Ongoing high project failure rates
- Many epic failures e.g. Affordable Care solutions in US, ERP payroll solutions in AU, health projects in the UK...
- High costs of change
- Over complex solutions

http://www.standishgroup.com/outline
https://www.projectsmart.co.uk/white-papers/chaos-report.pdf
Application Centric Thinking

Relational DB
- SQL interoperability
- Costly
- Scaling hits a wall
- Data silos
- Limited semantics
- Data complexity causes data proliferation & code proliferation

Enterprise Resource Planning
- Ever increasing complexity and feature creep
- Costly
- Massive underlying databases (>10,000 tables)
- Implementation failures
- Integration complexity

Enterprise Data Modeling
- Skills mismatch
- Long implementation timeframes
- ‘Ivory tower’ syndrome
- Round trip modelling - Conceptual/Logical/Physical
- Massively complex models

SOA
- Process centric
- Complex technology stacks
- Shared message culture
- ESB’s were very complex
- Still lots of point to point integration
- Information was missing!!

Data Warehousing
- ETL slow
- Data completedness
- Resource intensive
- Complexity
- Schema agreement
The Parable of the Bank

Traditional Approach
- Application-centric
- Branches
- Tellers
- Cash

Revolutionary Approach
- Knowledge-centric
- Customers
- Accounts
- Interest Rates
- Balances
- Credit

1968
- Desktop Computing
- ATM
- Electronic Transfers
- Branches
- Tellers
- Cash

1998
- Desktop Computing
- ATM
- Electronic Transfers
- Branches
- Tellers
- Cash

2018
- Mobile Apps
- Block Chain
- Branches
- Tellers
- Cash

Banking Example

No change
Business Evolution - Solutions & Experiences

<table>
<thead>
<tr>
<th>RESOURCES</th>
<th>RAW MATERIAL</th>
<th>INGREDIENT</th>
<th>PRODUCT</th>
<th>SYSTEM</th>
<th>SOLUTION</th>
<th>CONSUMER</th>
<th>OPERATING UNIT</th>
<th>COMMUNITY</th>
<th>GEOGRAPHIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>Wheat</td>
<td>Flour</td>
<td>Bread</td>
<td>Sandwich</td>
<td>Meal</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Family  Club  Govt
Flooring Retail / Wholesale business

**Before**
- Small data domain (POS)
- Transactional - sell, ship, install, forget
- Many manual processes
- Reactive, based on largest application (ERP)

**After**
- Consumer experience paramount
- Automation everywhere
- Greatly increased data domain - CRM, Social, Media, in-home Installer App

Transform
Business Need

- Agility
- Low Marginal Cost Operation
- Persistent & Valuable Asset Base
Technology Need

- Doing
- Analysing
- Knowing
Business Technology Market Fit

Consumer

SME

Enterprise

Browse Our Software Categories
Find your software in one of our 700+ categories. From Accounting to Yoga Studio Management, we cover it all!
Traditional IT solutions are complex, expensive and inflexible. Most businesses don’t even know where to start.

<table>
<thead>
<tr>
<th>Integration</th>
<th>Intelligence</th>
<th>Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bespoke integrations</td>
<td>Modelling data</td>
<td>Lack of resources</td>
</tr>
<tr>
<td>Middleware</td>
<td>Unifying data</td>
<td>Lack of expertise</td>
</tr>
<tr>
<td>Expensive vendors</td>
<td>Warehousing data</td>
<td>Don’t know where to start or who to trust</td>
</tr>
<tr>
<td>Complex platforms</td>
<td>Transforming data</td>
<td>Multiple vendors</td>
</tr>
<tr>
<td>Constant maintenance</td>
<td>Finding insights</td>
<td>Incompatible software</td>
</tr>
<tr>
<td>22% of global IT spend</td>
<td>Confusing products</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lack of capability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>80% of projects fail</td>
<td></td>
</tr>
</tbody>
</table>
Unification
Quality
Meaning

The answer is in the knowledge.

Data is locked up in our applications and is hard to extract for use across the business.

Application-sourced data does not play nicely across the enterprise.

Data relationships are not explicit and context is missing so we rely on expensive and complex manual or code fixes to solve problems.
Knowledge brings business and technology together

Business
UX
Agility
Automation

IT
Integration
Intelligence
Implementation

Data
Unification
Quality
Meaning
Explicit Knowledge =

Coded + Accessible + Maintainable
Build Business Model becomes schema. Business Model drives “build and operate”.

Legacy data ingestion + transformation
Application & Service Integration
Transactional and analytics use cases
Master data management
Information governance
Security and platform management
Asset life cycle management
Enterprise Computing Reinvented

Personal Operating System

Business Operating System
Future Research & Development Directions

- Entity resolution
- Very large scale ontology / instance data visualisation
- Declarative UI generation from Shapes
- Low / no code semantic model driven development
- IoT integration with semantics
- Standardised transaction support for SPARQL
- Horizontal scalability in triple stores
- Performant real-time reasoning
- Effective graph partitioning for multi tenancy


http://www.datacentricmanifesto.org
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