GLOBAL UNIVERSITY ALLIANCE
Developing ((O))LEADing and Best Practices

THE INFORMATION REFERENCE FRAMEWORK

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Introduction

Since 2004, the Global University Alliance members has researched, compared, analyzed and developed Best and LEADing Practices around Information Modelling e.g. Information Management and Information Architecture. This includes Information blueprinting, software development, configuration, testing, software implementation as well as Information relations to business rules, measurements, monitoring, linking business reporting and system reporting. In this context the Global University Alliance conducted extensive and wide-ranging research comparing existing Information management, information blueprinting, configuration and implementation concepts with those found in Architecture Frameworks, Information-focused Methods and Common Software Implementation Standards and Methods.

The goal of the analysis and research was:

1. To identify the challenges faced by organizations applying some of the mentioned information modelling and information architecture concepts.
2. To identify common aspects within the representation of the structure and behavior of Information through structured representations (modelling) and the specification of practices of designing and constructing information solutions (Information architecture).

In our analysis of the organizations Information blueprinting, software development, configuration, testing, software implementation, we identified that less than 25% of the organizations succeed with their Information efforts, leaving more than 75% of the organizations feeling that they didn't succeed with their information automation and transformation efforts. It is however important to point out that most project failures are not related to the product or software but are mostly connected to poor information management and information architecture.

The largest failures identified within Information enabled transformation and innovation are found in the areas of:

1. Poor alignment of Information goals with business requirements and business goals
2. Poor requirements management: primarily by linking business and functional requirements together and not adequately distinguishing the role and the nature of each
3. Defining Information tasks based on the process activities, not on the context in which they are executed or the value they produce.
4. Not addressing the possible duplication of business functions, services, and tasks, when automating the manual information.
5. Implementing ERP, CRM, SCM, Portal systems based on the way business is done today as opposed to by designing and building to a future vision, thereby automating the activities that the organization has today (manual) without consideration of their value or by automating the process flows, without paying consideration to the service flows and information flow; creating a nightmare of the broken and siloed flows (information, process, service or other flows which work only within a narrow part of the enterprise) while maintaining support to their various and inconsistent operating models.
6. Not identifying measurement and reporting needs, or not re-thinking the way Information reporting is done, thereby automating the manual way of reporting which the organization has today. The result is that while the full potential of information technology is not obtained, the cost of development is higher than necessary.

7. Applying best practice, out of the box functionality of enabling software to areas where the organization is unique, not understanding that this will destroy the organization's uniqueness and thereby their basis for value creation; perhaps even destroying its ability to compete.
8. Addressing issues related to the duplication of information/data with complex and otherwise unnecessary investments in the integration of these resources without resolving the root cause of the underlying problem.
9. Little to no transformation embedded in the program of investment, leading to a failure to exploit the full potential of the opportunities associated with Information automation.

Our findings were confirmed when cross referencing the Global University Alliance research findings to similar studies in this area. The two global studies supporting as well as adding important perspectives to this analysis were:

10. The 2012 IBM Global CEO study[1] confirmed our findings, in that it concluded that 86% of executives say that while business and Information innovation is extremely or very important to their companies' growth strategy, meanwhile only 19% feel they succeed with any aspects in their value execution.
11. Both the 2011and 2013 McKinsey study[2] on transformation identified that over 72% of transformation programs failed to deliver their actual targets. This resulted in substantial economic and productivity losses of $3 Billion, which corresponds to 4.7 % of global GDP. 48% run over budget, 7% behind schedule and 56 deliver less functionality than predicted. This means that achieving at least $15 million in benefits requires spending of $59 million.

Analyzing the organizations that succeeded with their Information modelling and information architecture into application/software projects, the key observation was that although the Information Modelling and Information and Solution Architecture are considered distinct and different disciplines, they employ the use of common objects e.g. Information object, Information task, Information rules, Information measurements, Information reporting, Information security, Information construct, Information devices, Information delivery as well as Information integration and standardization, etc. Cross referencing this to the failure reasons identified, it became clear that the failure to link the subjects across areas of business, process, service, application, data, platform and infrastructure was the root cause for the failures.

Information Decomposition & Composition	Business Layer				Application Layer		Technology Layer	
	Reason and Goal	Business Competency	Process	Services	Application	Data	Platform	Infrastructure
	Why/Whither	What/Which	How	What	What	What	What	What
Information object Information rules Information task Information events Information measurements Information reporting Information security Information integration Information standardization Information construct Information devices Information delivery	Driver (external & Internal Force) Information Goal (e.g. business, application etc) Information Strategy Business Objective (Critical Success Factor, Plan, Forcast, Budget) Performance Indicator and Information measurements (BPI, KPI-Strat., Tact. & Oper. level) Information Value Expectation & Driver Information Performance Expectation & Driver Requirements	Business Function Business Capability Business Resource & Roles Core Differentiating Competency Core Competitive Competency Non-Core Competency Cost & Revenue Business Object Business Owner Business Rules and Compliance Business Channels and Media Business Workflow	Process Area (categorization) Process Group (categorization) Business Process Process Step Process Activity Events Gateways Management Process Main Process Supporting Process	Service Construct/Delivery Main Service Supporting Service Service Provider Service Consumer Service Tiers Information Object Service Level Agreements Service Measurements Service Owner Service Roles	Application Component (e.g. Logical/Physical) Application Module Application Feature Application Function Application Task Application Service System flow System measures e.g. KPI & PPIs System Reports e.g. Dashboards, Cockpits & Scorecards	Data Component Data Entity Data Service Data Flow Data Owner Data Rules Data Compliance Data Security Data Media Data Channel Data Integration & standardization	Platform Component (e.g. Logical/Physical) Platform Device Platform Service Platform Owner Platform Rules Platform Compliance Platform Security Platform Channel Platform consolidation & standardization	Infrastructure Component (e.g. Logical/Physical) Infrastructure Service Infrastructure Owner Infrastructure Rules Infrastructure Compliance Infrastructure Security Infrastructure integration & standardization Infrastructure Channel
A part of the LEAD Information Reference Framework								

Figure 1: The Information Objects and the areas it should relate to.

[1] Global CEO Study 2012, IBM Institute for Business Value
[2] McKinsey Transformation Study, 2013, McKinsey

Besides the failure to relate the information object across the relevant layers, was one of the additionally findings what the organizations that prevailed actually did, to solve the very mentioned challenges. In analyzing what those organizations did different then does who failed, it became clear that one of the biggest challenges faced by most organizations is a lack of understanding of the common objects within a business and how they relate to each other.

The findings revealed the need for a fundamental shift in approach and thereby the need to totally rethink Information modelling and Information architecture and the relations among both. The foundation for this reconceptualization was to understand the objects that link and relate to the aspects together. Using ontology principles to understand the very nature, the basic categories, as well as using semantic principles to identify which parts relate or should relate exposed sixteen areas that together provide a set of principles that can be used to guide the information decomposition and information composition. The Sixteen main areas are presented in figure 2.

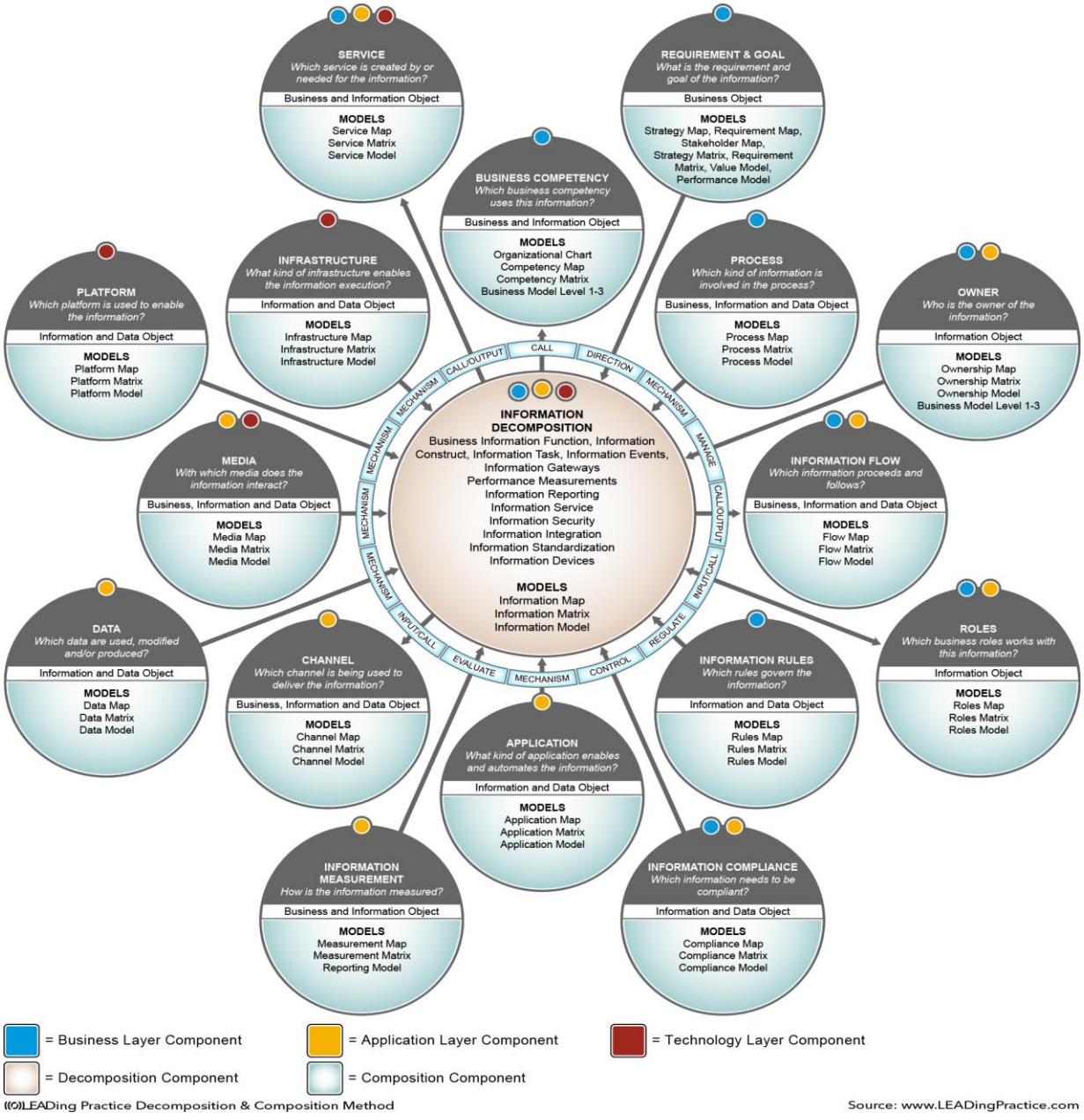

Figure 1: The 16 LEAD Information Decomposition and Composition objects.

The 16 LEAD Information Decomposition and Composition Objects

An Information automates activities of the business, thus making business faster and more reliable, but done improperly at the cost of flexibility and agility of the business. The ability to automate parts of the business requires the practitioners to understand that it is not sufficient to consider only the decomposed Information objects, but also to consider the aspects that direct how the Information needs to support the business in new ways. In Information modelling, these are the most common relations of the decomposition and composition objects:

1. Through its business competencies the business uses a set of Information tasks, functions, and services within applications. This combination, together with the right business model, will reduce cost, improve operation in terms of effectiveness and efficiency, and support revenue growth.
2. Business goals and requirements will dictate the goals and requirements for the Information solution while business objectives, performance expectations and performance indicators can be measured through the executing business and the enabling applications.
3. Business services can be (partly) delivered and/or consumed by information application features, application functions, application tasks and application services. The mentioned parts of the application are subject to the relation between information provider and consumer, to the information service construct / delivery and to whether it is a main or a supporting information service. The services are automated by the application information service, data service, platform service and infrastructure service.
4. Through application information services, business process steps can be automated. Application information tasks automate process activities. These can be executed as pre-programmed, as reaction to specific information events, as well as based on business information decisions.
5. The application information functions, tasks, and services are designed to follow several information flows in the business, such as reporting flow, service information flow, application workflow, data flow and information scenarios.
6. Application information functions, tasks, and information services can be measured directly (information system measurements, information service measurements) as well as delivering measurements for information reporting (business performance indicators, key performance indicators on the strategic, tactical, and operational level, including for service level agreements, process performance indicators) to information scorecards, dashboards, and cockpits.
7. Application information functions, tasks, and information services create, use and/or deliver (parts of) business, information, and data objects. An application uses, modifies, and/or produces data on several hierarchical levels: application information modules work with information data component, application function with information object, and application task with information data service.
8. The enacted business roles performed through its process steps and activities, which are supported by the roles of the respective application information functions and tasks.
9. When dealing with information, different owners can be recognized. All owners have specific responsibilities, which result in different demands and wishes of various aspects of the information. There are information owners with responsibilities concerning business information, process information, service information, value information, performance information, information solutions e.g. application, data, platform and infrastructure, as well as , information security and information compliance.

10. Several information rules, have to be adhered to and embedded in the different areas and parts.
11. When designing, building, implementing, updating, working with application information functions, tasks, and information services the direction is set by information strategies, information policies, information guidelines, information standards, information regulations, and information legislation as well as issues of information governance controls, information risk management, information audit, information evaluation, information security and information monitoring must be taken into account in order to verify their information compliance.
12. Application information services and information interfaces need to support different business information and information technology channels. The business information channels can either include marketing, sales, distribution, service or other channels; the information technology channels can be communication, digital image/screen, programming, broadcasting, I/O, or audio channels.
13. The information data component and information services are used by the application information modules and information tasks.
14. Application information functions, tasks, and information services can make use of media as communication or media used in a computer. The communicating media can be advertising, broadcast / electronic communication networks, digital, electronic, mass, print, recording, social media, media store, multimedia and hypermedia; the computer media can be data storage devices, application software or other computing media.
15. A platform is used to enable an information application on several hierarchical levels: platform component enables application component, platform service enables application service.
16. The information application components and modules reside on infrastructure components. Infrastructure services support the platform services.

As demonstrated, the described sixteen information decomposition and composition objects have relationships, associations and correlations with one another, leading to multiple interaction points. In order to identify and capture all of these information relevant aspects correctly, it was necessary to re-think information modelling and information architecture as it existed. Driven by passion and love for both Enterprise Modelling and Enterprise Architecture, we started to develop the missing information modelling and information architecture gaps and aspects, in essence defining a new Way of Thinking, Working and Modelling information aspects.

The development of LEADing Practice Information Reference framework

In 2004, the first version of LEADing Practice (LEAD 1.0) framework was based on university research, analysis, comparison as well as work with companies. Continuing work through the university alliance on Enterprise Modelling and Enterprise Architecture research, analysis and comparison, yielded a more standardized and principle Information Reference Framework release of LEAD 2.0 (2009). The modelling principles captured so much interest that software vendors like SAP AG, IBM, Software AG (IDS Scheer and ARIS), as well as IGrafx started to investigate and incorporate some of our modelling aspects into their methods and or meta models. Below is a short overview of the last years industry adoption:

- 2010, our LEAD information as well as measurements modelling principles were presented at the IDS Scheer, ARIS Process World.

- 2010, the Official SAP book was published, using our principles: Taylor, J, von Rosing, M., von Scheel, H., Rosenberg, A., Applying Real-World BPM in an SAP Environment, Issue Date: 2011-01, Published by: SAP Press, ISBN: 978-1-59229-343-8, Page(s): 694.
- 2011, The Institute of Electrical and Electronics Engineers published a paper based on the research and findings around combining Information Management, BPM and Enterprise Architecture principles: Presten, T., Hove, M., von Rosing, M., Academic paper on Combining BPM and EA in Complex IT Projects, Published by: IEEE Commerce and Enterprise Computing Page(s): 271 - 278, Issue Date: 2011-05.
- 2010-2012, the Global University Alliance collaborated with TOGAF (The Open Group Architecture Framework) to develop the profession of a Business Architect; this included the process modelling and architecture principles.
- 2010-2011, SAP adapted the LEAD value, process and Information modelling principles into their SAP ASAP Method; thereby facilitating the SAP customers Information of the LEADing Practice modelling and architecture concepts within their blueprint, implementation, maintenance and upgrade methods and approaches.
- 2011-2012: Software AG-IDS Scheer enhance their ARIS process and information and value modelling meta model, based on the LEADing Practice modelling and architecture concepts.
- Starting in 2012, the Government of Canada uses the LEADing Practice modelling and architecture concepts to guide the transformation of key organizations as well as to blueprint/implement SAP and Oracle ERP systems.
- 2012-2013: IBM builds the LEADing Practice modelling and architecture concepts into the rational suite software, enabling advanced Information and System Architecture modelling.
- 2012-2013: IGrafx, builds the entire LEADing Practice modelling and architecture concepts into their process flow, process modeler, performance reporting, and enterprise modeler software.
- Start of 2013, LEADing Practice is the fastest growing open standard and open source community, dedicated to developing Enterprise Modelling and Enterprise Architecture Frameworks and is supported by the 2nd largest certified community of +2500 practitioners.
- 2013, LEGO Group wins the Gartner Group Award: Best BPM Transformation by leveraging the LEADing Practice principles.
- September 2013, LEAD 3.0 was rolled out and currently consists of 10 integrated frameworks, 6 methods, and 3 approaches.

Global University Alliance - Information Focus Group Contacts

With the information modelling and information architecture work, we in the Global University Alliance, try to promote a new way of thinking, working and modelling around how Information modelling and information architecture can identify, create and realize value. The Information concepts are build into the different layers e.g. business, application & technology and then shared and published as an open standard in the LEADing Practice community. Thereby enabling all organizations to build on common leading principles to identify, create and realize value.

In terms of University perspective does the development included an Information Management university curriculum for both Bachelor and Master level. The Information Focus Research contacts are:

Global University Alliance Coordinator:
Professor Mark von Rosing
Head of Global University Alliance, Denmark

Framework Coordinator:
Henrik von Scheel
LEADing Practice, CEO

The members involved in this work have been a team that includes academics, researcher and analysts:

- Information Ontology, Wim Laurier
- Information Semantics, Simon Polovina
- Information Architecture, Mark von Rosing
- Business Process Management, Marlon Dumas
- Service Oriented Computing, Paul Buhler
- Information Management, Hans Scheruhn
- Supply Chain Management & IT, Jay D. Newquist
- Enterprise Architecture, Leon Kappelman
- Enterprise Architecture, Brian Cameron
- Value & Performance Management, Maria Hove
- Enterprise Sustainability, David Coloma
- Project Management, Tom Wilder
- ERP, Karin Gräslund
- Enterprise Engineering, Maxim Arzumanyan
- Enterprise Modelling, Henrik von Scheel
- Measurement & Reporting, Ulrik Foldager

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