



GLOBAL UNIVERSITY ALLIANCE INDUSTRY STANDARDS RESEARCH

The value of applying standards to increase the level of reusability, replication and standardization

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What is the Global University Alliance

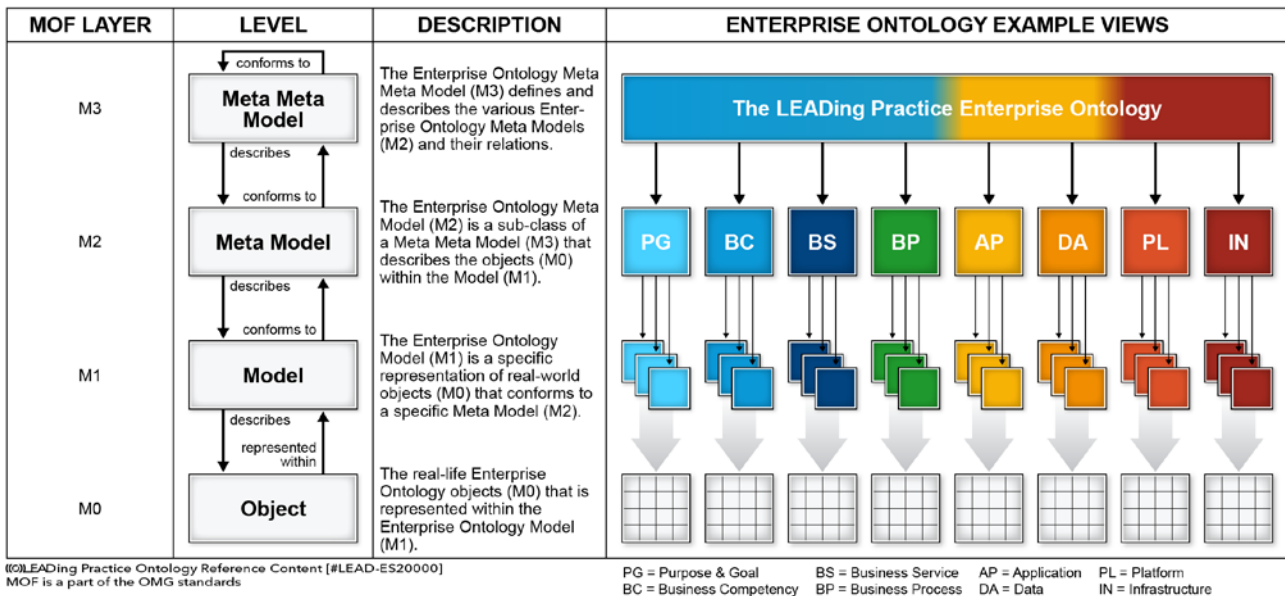
Founded in 2004, the Global University Alliance is a non-profit organization and international consortium of university lecturers and researchers whose aim it is to provide a collaborative platform for academic research, analysis and development and to explore leading practices, best practices as well as to develop missing practices. The Global University Alliance currently consists of 450+ universities, lecturers and researchers from across the world and is growing rapidly in size and scope.

The Global University Alliance aims to align intellectual resources across the academic world to:

- **RESEARCH:** Address research concerns and questions that span around enterprise ontology and thereby the enterprise concepts, design, functions, tasks, information handling and governance and the relationships between those concepts within enterprise modelling and enterprise architecture disciplines.
- **UNIVERSITY CURRICULUM:** Develop university curriculums for both Bachelor and Master level (existing BPM, SOA, Enterprise Architecture, Sustainability, Information Management and Project Management).
- **DEVELOP STANDARDS:** Package applied academic research and findings into frameworks, methods and approaches that can be used by industries and universities alike.
- **COMMUNITY SHARING:** Share and publish the findings either in publications or to this open standard community.

The Global University Alliance (GUA) is an open group of academics with the ambition to provide both business and academia with state-of-the-art insights. Through its ties with the LEADing practice community, which includes large firms and governments, the GUA is able to evaluate and valorize its scientific output. Since 2004, the members of the GUA strive for a continuous improvement of their expertise through the research, comparison, analysis and development of Best and LEADing Practices in Business. Throughout this process, the GUA built its own implicit ontology that revolves around its expertise of Best and LEADing practices.

As ontology formally represents knowledge as a set of concepts within a domain, and the relationships between those concepts, it can be used to model a domain and support reasoning about concepts. The Global University Alliance has used the concept of ontology as both a shared vocabulary and the very definition of its objects and concepts. In order to go the next steps and fully use the potential of its ontology.



The basis for Ontology is the Enterprise Semantics. The term Semantics arises from Ancient Greek: *σημαντικός* – *sēmantikós* – and is originally about the study of meaning. The word semantics itself denotes a range of ideas and focuses on the relation between signifiers, symbols and objects. Semantics (or Semantic) is about making meaning from the objects using the best possible signifiers and symbols. It includes those signifiers and symbols used to describe the relationship between objects as this comparison further enhances their meaning. Enterprise Semantics is therefore the study of objects and symbols used to describe the enterprise, what they stand for, their underlying formal logics and their relationship and correlation.

The formal study of semantics intersects with many other fields of inquiry, including:

- **Enterprise Ontology** – the nature of something as well as the basic categories.
- **Enterprise Pragmatics** – the sharing of meanings gathered from Enterprise Semantics across its diverse interpretations in practice, leading towards a universal truth whilst maintaining these wide-ranging interpretations and beliefs in the real world.
- **Modelling Perspective**- the impact of modelling and engineering as it most usefully aligns the relevant parts of the enterprise.
- **Enterprise Philosophy** considers the fundamental principles that underlie the formation and operation of a specific object (and thereby business/enterprise).

For more information: www.globaluniversityalliance.net.

Why we develop Industry Standards

Simply said, the lack of existing Industry Standards in the areas of Business Management, Enterprise Modelling, Information & Technology, Enterprise Transformation, Enterprise Engineering and Enterprise Architecture has created the demand for such a community.

Our analysis and research within the Global University Alliance, a group of 450+ universities, academics and researchers has identified that the lack of repeatable standards has high costs, lack of innovation and business process inefficiencies. The need to develop reusable and replicable patterns that can be implemented by any organization, both large and small, regardless of its products/services or activities was therefore apparent.

How we develop the Industry Standards

The Industry Standards are the result of international industry experts and academic consensus. The standards are both agnostic and vendor neutral and are built on repeatable patterns that can be reused/replicated and thereby implemented by any organization, both large and small, regardless of its products/services or activities. All together describing the set of procedures an organization needs to follow in order to replicate the ability to identify, create and realize value in the specified area/subject. The Industry Standards have been developed in the following ways:

- Research and analyze Industry Best Practices & Leading Practices.
- Identifying common and repeatable patterns (the basis of our standards).
- Develop the Industry Standards that increase the level of re-usability and replication.
- Build Industry accelerators within the standards, enabling to adopt and reproduce the Best & Leading Practices.

Industry Standard Development Areas

We develop Industry Standards in the following 6 areas:

1. Industry Management Standards (#LEAD-ES10EMaS)
2. Industry Modelling Standards (#LEAD-ES20EMoS)
3. Industry Engineering Standards (#LEAD-ES30EES)
4. Industry Architecture Standards (#LEAD-ES40EAS)
5. Industry Information & Technology Standards (#LEAD-ES50EITS)
6. Industry Transformation & Innovation Standards (#LEAD-ES60ETIS)

Today, over 3000 people in the above 6 areas has developed and worked with the 124 different Industry Standards and the 56 different Industry User Groups.

Industry Management Standards

Name:	Reference Content #
Strategy Management Reference Content	LEAD-ES10001PG
Growth: Core Differentiating & Core Competitive Reference Content	LEAD-ES10002BC
Value Management Reference Content	LEAD-ES10003PG
Performance Management Reference Content	LEAD-ES10004PG
Executive Communication & Story Telling Reference Content	LEAD-ES10005EX
Control Management incl. Evaluation & Audit Reference Content	LEAD-ES10006GO
Planning Management Reference Content	LEAD-ES10007BC
Procurement Management Reference Content	LEAD-ES10008BC
Human Resource Management Reference Content	LEAD-ES10009BC
Production Management Reference Content	LEAD-ES10010BC
Product Management Reference Content	LEAD-ES10011BC
Marketing Management Reference Content	LEAD-ES10012BC
Sales & Customer Service Management Reference Content	LEAD-ES10013BC
Call Center Management Reference Content	LEAD-ES10014BC
Supply Chain & Logistics Management Reference Content	LEAD-ES10015BC
Compliance Management Reference Content	LEAD-ES10016GO
Risk Management Reference Content	LEAD-ES10017ALL
Governance Reference Content	LEAD-ES10018GO
Portfolio Management Reference Content	LEAD-ES10019ALL
Program Management Reference Content	LEAD-ES10020ALL
Project Management Reference Content	LEAD-ES10021ALL
Financial Management Reference Content	LEAD-ES10022BC
Risk Ontology Reference Content	LEAD-ES10023ALL
Policy Reference Content	LEAD-ES10024PG
Outsourcing Reference Content	LEAD-ES10025ALL

Contract Management Reference Content	LEAD-ES10026BC
Policy Management Reference Content	LEAD-ES10027PGBC
Culture Reference Content	LEAD-ES10028ALL
Deliver on Promise Reference Content	LEAD-ES10029ALL
Enterprise DNA Reference Content	LEAD-ES10030ALL

Industry Modelling Standards

Name:	Reference Content #
Ontology Reference Content	LEAD-ES20000
Forces & Drivers Modelling Reference Content	LEAD-ES20001PG
Stakeholder Reference Content	LEAD-ES20002EX
Requirement Modelling Reference Content	LEAD-ES20003PG
Business Model Reference Content	LEAD-ES20004BC
Business Process Reference Content	LEAD-ES20005BP
Revenue Model Reference Content	LEAD-ES20006BC
Value Model Reference Content	LEAD-ES20007BCPG
Service Model Reference Content	LEAD-ES20008BCBS
Performance Model Reference Content	LEAD-ES20009BCPG
Operating Model Reference Content	LEAD-ES20010BC
Cost Model Reference Content	LEAD-ES20011BCPG
Role Modelling Reference Content	LEAD-ES20012BC
Competency Modelling Reference Content	LEAD-ES20013BC
Measurement Reference Content	LEAD-ES20014PG
Workflow Reference Content	LEAD-ES20015ALL
Channel Reference Content	LEAD-ES20016ALL
Capability Modelling Reference Content	LEAD-ES20017ALL
Enterprise Sustainability Reference Content	LEAD-ES20018ALL
Case Management Reference Content	LEAD-ES20019ALL
Business Ontology Reference Content	LEAD-ES20020ALL
Meta Modelling Reference Content	LEAD-ES20021ALL
Value Chain Reference Content	LEAD-ES20022PGBC
Event Model Reference Content	LEAD-ES20023ALL
Enterprise GPS Reference Content	LEAD-ES20024ALL

Industry Engineering Standards

Name:	Reference Content #
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Decomposition & Composition Reference Content	LEAD-ES30001ALL
Lifecycle Management Reference Content	LEAD-ES30002ALL
Testing Reference Content	LEAD-ES30003SA
Enterprise Requirement Reference Content	LEAD-ES30004ES
Quality Reference Content	LEAD-ES30005EM
Geographical Information System (GIS) Reference Content	LEAD-ES30006EM
Agile Reference Content	LEAD-ES30007ES
Categorization & Classification Reference Content	LEAD-ES30008ES
Enterprise Tiering Reference Content	LEAD-ES30009ALL
Integrated Planning Reference Content	LEAD-ES30010ALL
Performance Engineering Reference Content	LEAD-ES30011ALL
Value Engineering Reference Content	LEAD-ES30012PG
Service Engineering Reference Content	LEAD-ES30013BS
Process Engineering Reference Content	LEAD-ES30014BP
Information Engineering & Systems Engineering Reference Content	LEAD-ES30015BCSAD

Industry Architecture Standards

Name:	Reference Content #
Layered Enterprise Architecture Reference Content	LEAD-ES40001ALL
Business Architecture Reference Content	LEAD-ES40002PGBCPSI
Value Architecture Reference Content	LEAD-ES40003PG
Process Architecture Reference Content	LEAD-ES40004BP
Service Oriented Architecture Reference Content	LEAD-ES40005BS
Application Architecture Reference Content	LEAD-ES40006SAID
Information Architecture Reference Content	LEAD-ES40007BCSAD
Data Architecture Reference Content	LEAD-ES40008SAI
Platform Architecture Reference Content	LEAD-ES40009PL
Infrastructure Architecture Reference Content	LEAD-ES40010IL
EA Governance Reference Content	LEAD-ES40011GO
Security Architecture Reference Content	LEAD-ES40012CS
Cloud Architecture Reference Content	LEAD-ES40013CC
Agile Enterprise Architecture Reference Content	LEAD-ES40014ALL

Industry Information & Technology Standards

Name:	Reference Content #
IT Strategy Reference Content	LEAD-ES50001PG
Business Model of IT Reference Content	LEAD-ES50002BC
IT Process Map Reference Content	LEAD-ES50003BP
IT Center of Competency Reference Content	LEAD-ES50004BC
Cloud Computing Reference Content	LEAD-ES50005CC
Cyber Security Reference Content	LEAD-ES50006CS
Knowledge Management Reference Content	LEAD-ES50007PGIDBC
Analytics & Intelligence Reference Content	LEAD-ES50008PGIDBC
Automated Reporting Reference Content	LEAD-ES50009PGIDBC
Application Reference Content	LEAD-ES50010SAIDBCBP
Application Modernization & Optimization Reference Content	LEAD-ES50011SAIDBCBP
ERP Reference Content	LEAD-ES50012SADIBC
Software Testing Reference Content	LEAD-ES50013SADI
Information Management Reference Content	LEAD-ES50014BCIDSA
Data Reference Content	LEAD-ES50015DISABC
Rule Modelling Reference Content	LEAD-ES50016PGBCSADI
Service-Oriented Computing Reference Content	LEAD-ES50017ES
Platform Reference Content	LEAD-ES50018PLES
Infrastructure Reference Content	LEAD-ES50019IL
Social Media Reference Content	LEAD-ES50020ALL
Blueprinting Reference Content	LEAD-ES50021ALL
Implementation Reference Content	LEAD-ES50022ALL
Cloud Ontology Reference Content	LEAD-ES50023ALL
Robotic Automation Reference Content	LEAD-ES50024ALL
Smart Automation Reference Content	LEAD-ES50025ALL
Industry 4.0 Technology Reference Content	LEAD-ES50026ALL

Industry Transformation & Innovation Standards

Name:	Reference Content #
Alignment & Unity Reference Content	LEAD-ES60001ALL
Change Management Reference Content	LEAD-ES60002ALL
Maturity Reference Content	LEAD-ES60003ALL
Continuous Improvement Reference Content	LEAD-ES60004ALL
Organizational Development Reference Content	LEAD-ES60005ALL
Optimization Reference Content	LEAD-ES60006ALL
Effectiveness Reference Content	LEAD-ES60007ALL

Efficiency Reference Content	LEAD-ES60008ALL
Re-engineering Reference Content	LEAD-ES60009ALL
Root Cause Analysis Reference Content	LEAD-ES60010ALL
Transformation Benchmarking Reference Content	LEAD-ES60011ALL
Innovation Reference Content	LEAD-ES60012ALL
Alignment of Portfolio, Program & Project Management Reference Content	LEAD-ES60013ALL
Innovation & Transformation Blueprinting & Implementation Method Reference Content	LEAD-ES60014ALL
Transformation Reference Content	LEAD-ES60015ALL
Digital Innovation & Transformation Reference Content	LEAD-ES60016ALL
Industry 4.0 Innovation & Transformation Reference Content	LEAD-ES60017ALL

The Enterprise Standards published by LEADing Practice is the last stage of a long process that commonly starts with the proposal of new work within their work groups. Here are some abbreviations used for development and amendment of the standard (with its status):

Description	Formal Abbreviation
Enterprise Standard Proposal	LEAD-ESP
Enterprise Standard Draft	LEAD-ESD
Enterprise Standard	LEAD-ES
Enterprise Standard-Amendment	LEAD-ESA
Specification & Report	LEAD-TR
Publicly Available Specification	LEAD-PAS
Available Trends Assessment	LEAD-ATA

The Industry User Groups

The Industry User Groups are industry organizations and people who have similar industry interests, goals, and/or concerns. We have 11 Industry Standards & User Groups with 56 sub-industry standards and their corresponding working groups.

1. Financial Services (#LEAD-IS1)
2. Industrial (#LEAD-IS2)
3. Consumer Goods (#LEAD-IS3)
4. Consumer Services (#LEAD-IS4)
5. Energy (#LEAD-IS5)
6. Public Services (#LEAD-IS6)
7. Healthcare (#LEAD-IS7)
8. Utilities (#LEAD-IS8)
9. Transportation (#LEAD-IS9)
10. Communication (#LEAD-IS10)
11. High Tech (#LEAD-IS11)

As our Industry User Groups have members distributed throughout the world, they communicate with various technologies from web sessions, chat capabilities, message boards, mailing lists and Skype meetings. While the user groups are devoted to one Industry or sub industry, the subjects researched and analyzed within the industry are used as input in the multiple industry standards. However, it can happen that a specific user group is devoted to a narrow range of industry ideas and concepts or has strict confidentiality or security requirements. In this case the industry user group is closed and does not collaborate with the other Industry User Groups.

All user group work is documented and the industry standards they produce (open for the LEADing Practice community or closed for only that user group) are tracked under the following Industry Standard reference content numbers:

Financial Services User Group & Industry Standard Committee

Industry Group Name:	Reference Content #
Central Bank	LEAD-IS10001
Commercial Bank	LEAD-IS10002
Insurance	LEAD-IS10003
Real Estate	LEAD-IS10004

Industrial User Group & Industry Standard Committee

Industry Group Name:	Reference Content #
Aerospace & Defense	LEAD-IS20001
Automotive	LEAD-IS20002
Chemicals	LEAD-IS20003
Forestry & Paper	LEAD-IS20004

Metal & Mining	LEAD-IS20005
Construction & Materials	LEAD-IS20006
Electronics & Electrical Equipment	LEAD-IS20007
Manufacturing	LEAD-IS20008

Consumer Goods User Group & Industry Standard Committee

Industry Group Name:	Reference Content #
Automobiles & Parts	LEAD-IS30001
Food	LEAD-IS30002
Beverage	LEAD-IS30003
Tobacco	LEAD-IS30004
Consumer Durable & Apparel Goods	LEAD-IS30005

Consumer Services User Group & Industry Standard Committee

Industry Group Name:	Reference Content #
Retail	LEAD-IS40001
Postal	LEAD-IS40002
Travel & Hotel	LEAD-IS40003

Energy User Group & Industry Standard Committee

Industry Group Name:	Reference Content #
Oil & Gas	LEAD-IS50001
Electric Power & Natural Gas	LEAD-IS50002
Alternative Energy	LEAD-IS50003

Public Services User Group & Industry Standard Committee

Industry Group Name:	Reference Content #
Defense (Public)	LEAD-IS60001
Finance & Treasury	LEAD-IS60002
Customs & Border Services	LEAD-IS60003
Foreign Affairs & Trade	LEAD-IS60004
Health	LEAD-IS60005
Agriculture & Food	LEAD-IS60006
Labor & Social Services	LEAD-IS60007

Secret Intelligence Services	LEAD-IS60008
Social Services	LEAD-IS60009
Energy & Natural Resources	LEAD-IS60010
Education	LEAD-IS60011
Environment	LEAD-IS60012
Tourism	LEAD-IS60013
Transport & Infrastructure	LEAD-IS60014
Justice	LEAD-IS60015
Culture	LEAD-IS60016
Local Government	LEAD-IS60017

Healthcare User Group & Industry Standard Committee

Industry Group Name:	Reference Content #
Health Care Equipment & Services	LEAD-IS70001
Pharmaceuticals & Biotechnology	LEAD-IS70002

Utilities User Group & Industry Standard Committee

Industry Group Name:	Reference Content #
Electricity Utilities	LEAD-IS80001
Gas, Water & Multiutilities	LEAD-IS80002
Power Producers	LEAD-IS80003

Transportation User Group & Industry Standard Committee

Industry Group Name:	Reference Content #
Airline	LEAD-IS90001
Railways	LEAD-IS90002
Shipping	LEAD-IS90003

Communication User Group & Industry Standard Committee

Industry Group Name:	Reference Content #
Media	LEAD-IS100001
Media & Entertainment	LEAD-IS100002
Publishing	LEAD-IS100003
Telecommunication	LEAD-IS100004

High Tech User Group & Industry Standard Committee

Industry Group Name:	Reference Content #
Software & Services	LEAD-IS110001
Technology Hardware & Equipment	LEAD-IS110002

Also the Industry Standards published by LEADing Practice are the last stage of a long process that commonly starts with the proposal of new ideas and thereby work within the mentioned Industry Committee. Here are some abbreviations used for development and amendment of the industry standard (with its status):

Description	Formal Abbreviation
Enterprise Standard Proposal	LEAD-ESP
Enterprise Standard Draft	LEAD-ESD
Enterprise Standard	LEAD-ES
Enterprise Standard-Amendment	LEAD-ESA
Specification & Report	LEAD-TR
Publicly Available Specification	LEAD-PAS
Available Trends Assessment	LEAD-ATA

Using the Industry Standards

We realize that organizations apply various method and approaches; therefore we have ensured that all our Industry Standards published have a structured Way of Thinking, Working, Modelling, Implementation and Governance. To ensure full integration to other methods and approaches within an organization, the Industry Standards have an ontology and semantic concept built in that allows for the Industry Standards meta objects to be reused.

This includes applying the various standards:

- Management Principles – to define the strategy, objectives, performance indicators as well as to administer, govern and control the various enterprise initiatives.
- Engineering Principles – how and where it can or needs to be decomposed and composed together.
- Modelling Principles – which design concepts can or should be applied.
- Architecture Principles – which architecture rules apply and which artifacts and templates (e.g. maps, matrices and models) could or should be applied.
- Information & Technology principles - that enables the automation and optimization of the organization.
- Transformation & Innovation principles - where and how can things be optimized, modernized or thought through in a new way.

Creating the ability to "Unify" different enterprise standards together as well as combine them with the industry standards (or vice versa) concepts in combining the relevant aspect. Developing a whole new concept of agile integration and standardization.

Who do we coordinate and collaborate with

The organizations we work with are for the most Enterprises in forms of business or universities. Furthermore we work standards organization we collaborate or coordinate with, are standards developing organization (SDO), standards body or standards setting organization (like governments). Among some of them are:

- **US Government:** Several United States Federal government agencies develop and issue standards and specifications. The General Services Administration and the Department of Defense are the two primary agencies responsible for issuing procurement standards and specifications. To identify those issued use the Index of Federal Specifications, Standards and Commercial Item Descriptions (published by GSA) and The Index of Specifications and Standards (published by the Department of Defense).
- **Canadian Government:** Develops national policies and standards for Canada. Offering a wide range of standards development services, including development of National Standards of Canada (NSC), CGSB standards, specifications, and Government of Canada (GC) forms and support to the development of International (ISO) Standards.
- **The International Organization for Standardization known as ISO,** is an international standard- setting body composed of representatives from various national standards organizations. ISO is a voluntary organization whose members are recognized authorities on standards, each one representing one country. Members meet annually at a General Assembly to discuss ISO's strategic objectives. The organization is coordinated by a Central Secretariat based in Geneva. The Technical Management Board is responsible for over 250 technical committees, who develop the ISO standards.
- **The Object Management Group (OMG®)** is a technology standards consortium. OMG Task Forces develop enterprise integration standards for a wide range of technologies and an even wider range of industries. OMG's modeling standards, including the Unified Modeling Language (UML) and Model Driven Architecture (MDA), enable powerful visual design, execution and maintenance of software and other processes. OMG also hosts organizations such as the user-driven information-sharing Cloud Standards Customer Council (CSCC) and the IT industry software quality standardization group, the Consortium for IT Software Quality (CISQ).
- **The Open Group** is a global consortium that enables the achievement of business objectives through IT standards. With more than 400 member organizations, they have a diverse membership that spans various sectors of the IT community. The Open Group, among others have developed the framework and methods around TOGAF.
- **IEEE - The Institute of Electrical and Electronics Engineers (IEEE, read I-Triple-E)** is a professional association dedicated to advancing technological innovation and excellence. IEEE's Constitution defines the purposes of the organization as "scientific and educational. In pursuing these goals, the IEEE serves as a major publisher of scientific journals and organizer of conferences, workshops, and symposia (many of which have associated published proceedings). It is also a leading standards

development organization for the development of industrial standards (having developed over 900 active industry technical standards) in a broad range of disciplines.

How can I join?

We have +450 Universities, academics and researchers involved with the LEADing Practice research and development. To get involved on an educational level or research via the Global University Alliance, please contact the Chairman of the Global University Alliance Board, Prof. Mark von Rosing at mvr@globaluniversityalliance.net.

The Industry Standards Board

The Industry Standard Board consists of the following 13 members:

Name	Organization	Position
Professor Mark von Rosing	Global University Alliance	Board Chairman and Head of Research
Professor Simon Polovina	Global University Alliance Board Co-Chairman	Head of Enterprise Semantics research and development
John A. Zachman	Global University Alliance Board member	Head of Enterprise Architecture research and development
Professor A. W. Scheer	Global University Alliance Board member	Head of Business Process research and development
Professor Wim Laurier	Global University Alliance Board member	Head of Enterprise Ontology research and development
Professor Hans Scheruhn	Global University Alliance Board member	Head of Information Management research and development
Professor Maxim Arzumanyan	Global University Alliance Board member	Head of Enterprise Engineering research and development
Henrik von Scheel	LEADing Practice	Research Advisory Group