Knowledge, Research & Education at University and in Industry

Jan Vobeccky

ABB Switzerland Ltd. Semiconductors, Product Management & Technology
CTU in Prague, Faculty of Electrical Engineering, Microelectronics Department
Outline

- Introduction
- Knowledge
- Research
- Education
- Summary

Disclaimer: The objective of this presentation is not to evaluate the organizations under discussion, but rather to inspire by their best practices…
How CTU in Prague is organized
Eight faculties

CTU in Prague

23,500 students
4,000 employees
13,400 BSc.
5,200 MSc.
2,300 PhD.

The Times Higher Education Supplement Ranking 2009: 394. CTU in Prague
How ABB is organized
Five global divisions

- **Power Products**
  - $11.3 billion
  - 34,000 employees
- **Power Systems**
  - $6.6 billion
  - 16,000 employees
- **Automation Products**
  - $9.0 billion
  - 36,000 employees
- **Process Automation**
  - $7.3 billion
  - 27,000 employees
- **Robotics**
  - $1.0 billion
  - 5,000 employees

2009 revenues (US$) and employees per division

- ABB’s portfolio covers:
  - Electricals, automation, controls and instrumentation for power generation and industrial processes
  - Power transmission
  - Distribution solutions
  - Low-voltage products
  - Robots and robot systems
Power Systems
Knowledge

"Knowledge is Power"
Francis Bacon (1561-1626)
Knowledge

Discipline based Research*
Academic, investigator-initiated, discipline based production of knowledge, homogeneous, hierarchical,

Research in a context of application*
Context-driven, problem-focused, interdisciplinary based production of knowledge, heterogeneous, temporary, specific, localized...

*1994 Gibbons et al, The new production of knowledge
External Sources of Knowledge (Information)

External Sources of Knowledge at CTU in Prague
External Sources of Knowledge at CTU in Prague
CTU Central Library vs. other Universities
Knowledge Management Control

- **Groupware** (e.g. Lotus Notes)
- Intranet
- Document Management System
- Content Management System
- Web Engines
- Push Technology (e.g. IP Agent)
- Helpdesk Systems
- Workflow Technologies
- Data Warehouse
- Data Mining Tools
- Expert Systems
- Distance Learning
- e-Learning Systems

- Companies with best-performing IT investments are often most frugal IT spenders
- SW and SW-oriented services too costly for industry →
  - Universities provide more advanced services
  - Universities profit from multi-user approach of services
  - Industry puts money mainly to core functions and businesses
  - Industry is mostly customer & competition driven
Knowledge Management (example)

ABB’s Process Automation:
Expert Optimizer, Knowledge Manager and SpectraFlow solutions combined into a single Collaborative Production Management operational unit.

Expert Optimizer
- Raw Mix Preparation
- Economic Process Optimization

Knowledge Manager
- Laboratory Information Management Systems module
- Production Information Management Solution module

ABB’s Automation Division Service organization:
A global Knowledge Management System APSwebs to help with best-in-class practices and field experiences to better execute site service contracts

… is all about networking and sharing knowledge and best practices within ABB’s service organization worldwide…
Protection of Knowledge (IP)

Situation at CTU

- Money from IP wanted
- Increase reputation through IP

……rather than ….

- support start-up´s of spin-off companies
- strengthen cooperation with industry - bridge the gap between academia and industry
- master the technology transfer

Strategy of ABB

- Safeguard and enhance technological leadership in the market
- Protect proprietary technology of own products and systems
- Protect brand, identity and reputation
- Defend own IP rights against misappropriation and un-authorised use by others
- Avoid conflicts with third party's rights
Protection of Knowledge (IP)

Implementation in ABB

- Group wide process and structure to ensure
  - IP rights generation, ownership, maintenance and exploitation
  - Alignment with business & technology strategies
  - Proper awareness and capabilities throughout the organization

- Global Management designed to achieve
  - Involvement of all functions concerned
  - Harmonized and effective decisions (Review Process)
  - Flexible adaptation to changing strategies and regulations

- Strategic orientation to:
  - Core technologies, products and markets
  - Quality rather than quantity
  - Value creation through long term company assets
Research

CTU in Prague
- Research at Departments
- Research at Institutions
- To strengthen reputation and attractiveness for students
- Maintain leadership between technical universities within CR
- To improve worldwide ranking
- Annual investment highly dispersed (Government, Grant Agencies, Industry, …)

ABB
- Factory Research
- Corporate Research Institutions
- To strengthen market position
- Ensure technology leadership
- To increase profitability
- Annual investment more than $1billion (from own revenues)
Research

CTU in Prague
- Research Institutions

ABB
- Corporate Research Institutions

Research Institutions spread everywhere → remote information services needed…
Research & Access to Information

University

- Public sources - journals, books, patents,…
- Cooperation with research institutions and industry
- Strongly dependent on public sources (= mostly history)

Industry

- Public sources - journals, books, patents,…
- Cooperation with research institutions and universities
- Technology offers from suppliers
- Cooperation with competitors
- More dependent on forecasting (= often wrong) and road mapping
Cooperation of Industry with Universities

Industry cooperates with highly ranked institutions, developers of relevant IPs, top experts / specialists. Core business covered by industry. IP kept by industry. Reasons for cooperation?

→ Access to information, future trends, modern technologies, … Access of talented graduates to industry.
R&D in Industry: Context and Expectations

- Explore future technologies and trends, with high risk of failure
- Results: not clearly defined at outset, often intangible
- Often broad relevance to ABB (often cross-BU/division)

- Mostly predictable, aim to limit and control risks
- Results: typically well-defined, includes significant share of product maintenance
- Mostly specific relevance to Business Unit

„Research as part of the Business Strategy”
“Right balance between short-term vs. long-term orientation”
Measuring and Reviewing R&D in Industry

Environment:
Customers, Competitors, Governments, Suppliers, other Stakeholders
Research

- is a global activity (spread worldwide),
- needs well defined strategy,
- needs efficient strategic and operational metrics,
- needs efficient planning,
- bridging the gap between University and Industry is a never ending task …

Growing role of

→ on-line and remote information services and infrastructures,
  i. e. the Digital part of Library,
→ bibliometric tools
→ close cooperation between Library and IT Specialists,
→ close cooperation between Library and Researchers,…
Want to know more about e-learning?

Join the online forum and connect with e-learning developers

The forum is open to all ABB employees and designed to connect e-learning developers of all skill levels. Whether you are new to e-learning or have lots of experience, the forum will help you find answers and support from other e-learning developers across the ABB organization.

Launched by ABB University, the forum is open to e-learning developers from all ABB organizations. A moderator group of very experienced developers manages the forum structure and will keep the content current.

To join the e-learning forum, click here.

Education
Academic Calendar 2009/2010

Faculties

- Faculty of Civil Engineering
- Faculty of Mechanical Engineering
- Faculty of Electrical Engineering
- Faculty of Nuclear Sciences and Physical Engineering
- Faculty of Architecture
- Faculty of Transportation Sciences
- Faculty of Biomedical Engineering
- Faculty of Information Technology
Record number of web visitors for ABB University

Over the last few years, ABB University has invested significantly in its Learning Management System (LMS) and promoted its training web pages to employees and customers alike. LMS is the global application that helps the ABB Learning Centers to easily manage processes needed for delivering training online.

As a result of these efforts, the ABB University’s course locator recorded almost 35,000 visitors in 2009, where web visitors can choose from over 900 courses.

Welcome to ABB University!

ABB University overview presentation
Learn about our organization, objectives and administration.

High5 moved to TP Online
Click here to learn more.

ABB University Team Room
Everything you need to know about ABB University.

Course locator

Technology & solutions
ABB product related courses for project planning, operating, and maintenance personnel.

Personal competencies & skills
Personal development of social competencies including languages and cultures.

Business processes & tools
Training courses relating to the business processes of development, manufacture, sell and deliver projects and products.

Management & leadership
Comprehensive management development curriculum for developing the leadership competence of junior managers.

Comments (16)

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Gudrun Jackson
gudrun.jackson@us.abb.com
**CTU in Prague**
- Covers multiple technical fields
- Operates within the Czech Republic

**ABB University**
- Covers technology, management & business oriented fields
- Operates at many corners of the globe
Education

CTU in Prague
- A classical teaching organization built from 8 faculties
- Comprising approximately 15 learning centers in single country

ABB University
- A virtual organization built from all ABB divisions
- Comprising approximately 120 learning centers in over 30 countries
Education

CTU in Prague Objectives
- Attract maximum of fresh talents
- Deliver excellent education
- Maintain the established brand name
- Optimize teaching models across faculties

ABB University Objectives
- Remain close to customers
- Maintain a corporate identity
- Synergies across all divisions and countries
- Optimize business processes & tools
- Eliminate internal competition

Lecture-based vs. Competence-based learning
Blended Learning – combine delivery methods

- **Classroom training**
  - Worldwide locations

- **On-site training**
  - Conducted at a plant site or other suitable training facility

- **Virtual Classroom training**
  - Real-time interaction with live instructor and application sharing via computer

- **Web-based training (WBT)**
  - Online access and completion of courseware modules
On-site Training Example

Werte Kolleginnen

Den Umgang und Einsatz verschiedener Präsentationsmedien und Tools beherrschen wirksam, schlüssig und gekonnt.
Diese füllen Sie im Kurs …

CHW060 Präsentationstechnik im Beruf – Medien wirksam einsetzen und effektiv informieren [Version Deutsch]
CHW060 Presentation Techniques – Effectively Informing your Business Partners [Version English]

Der 2-tägige Kurs richtet sich an Fach- und Führungskräfte, ist auf das ABB Umfeld zugeschnitten und wird von Andrea Bischoff, Präsentationslehrer und Managing Director von HPS Schweiz durchgeführt, ein seit über 20 Jahren führendes Spezial-Trainingsinstitut.

Details zum Kurs und die Möglichkeit sich anzumelden finden Sie unter folgenden Links:

klick ⇒ CHW060

nächster Kurs in Deutsch: Mi+Do. 20. + 21. Okt 2010

klick ⇒ CHW060

next course in English: Tue+Wed. 7. + 8. Dec 2010

Auskunft erteilt Markus von Allmen, PS-BT (5 55 00).
Anmelden können Sie sich über obigen Link oder per Lotus Notes bei Anniv Guini, Tel. 056-599 32 25
(Bitten heben Sie diese Mail an Interessierte oder Ihre MA weiter)

Wir würden uns freuen, von Ihnen zu hören.

Mit freundlichen Grüßen

Markus von Allmen
ABB University
Learningcenter Business Processes

P.S.: ABB University in Internet:
ABB University Switzerland on Internet
Education

- Industry is already teaching worldwide (close to customers)
- The best Universities are also going global (operate all over the world)

- Growing role of
  - on-line and remote information services and infrastructures
  - e-learning
  - worldwide searching for talents (especially in technical fields)
Summary

Current State
Suggestions
Propsals
Hints
Claims

KRE´10

CTU Knowledge Industry Research Education University

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Summary – Current situation

The level of services provided by CTU Library is excellent (my personal view), but

- Access to information is fast as has been never before,
- Amount of digital information to be processed on daily basis is enormous,
- Our operations (teaching/servicing) are more and more remote (global),
- Our „customers“ (students/buyers/users) are all over the world,
- Technical fields need to gain back at least a part of their attractiveness, …

Consequences

→ Growing role of on-line and remote information services and infrastructures,
→ Increasing demands on the flexibility of librarians and their services,
→ Increasing demands on the skills of users and providers,
→ Increasing efficiency of search engines is a must,
→ Increasing role of e-learning,
→ Cost is a limiting factor, both in the Industry and Academia,
Summary – Claims against Libraries

- **Provide state-of-the-art services**
  - Provide maximum possible on-line and remote information services
  - Provide search engines with high efficiency
  - Enlarge the portfolio of sources, e.g. Patent database, all prominent publishers should be available, digitize old publications, books, ...

- **Learn and teach new skills**
  - Build your teams for required skills and flexibility
  - Understand “customer” needs – present, future, latent
  - Stay close to enthusiastic “customers” – scientists, teachers, students
  - Be step ahead of them
  - Train your “customers” / be involved in university teaching
  - Be open and brave to changes

- **Logistics and Management**
  - Continue in joint usage of resources for a wider portfolio of services (cost efficiency)
  - Cooperate closely with IT specialists
Summary – Claims against Management

→ **Assure continuous and sufficient financial support** (stability)
→ Negotiate alliances with other subjects for joint usage of information sources

………………
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→ Stimulate appropriate technical level and skilled labour in Libraries (Prestige),
→ Stimulate the growth of the University (Level of Library)
→ Require the usage of efficient business processes and tools (Efficiency),
→ Support the understanding of strategic value of state-of-the-art technologies for Libraries and their services
→ Move bibliometric evaluation from Faculties to Libraries
  (Independent judgement, unification, empower the position of Library…)
Thank you for your attention…