



IT University of Copenhagen

Actulus

DATE: September 2014

“The Actulus project demonstrates how valuable industry research collaborations can be for both the industrial partners (actual marketable product, supported by cutting-edge research) and the university partners (better real-life anchoring of research problems, practical validation of research ideas, inspiration for student projects).”

Dr. Jørgen Staunstrup,
Provost, IT University of Copenhagen

FAST FACTS

Country or Region:

DENMARK

Universities:

IT UNIVERSITY OF COPENHAGEN

UNIVERSITY OF COPENHAGEN,
DEPARTMENT OF MATHEMATICAL
SCIENCES (IMF)

Business partners:

- Edlund A/S

Area of UBC:

- RESEARCH & DEVELOPMENT
- COMMERCIALISATION

Project start date: April 2011

Project end date: Spring 2015

Keywords:

- Actuarial Calculus and Computing
- Domain-specific languages
- High-performance computing
- General purpose graphics processing units (GPGPU)

PROJECT SUMMARY

The vision of the project is to develop a new generation of software for demanding calculation tasks in the life and pension business, a so-called calculation platform. The idea is to create a calculation kernel based on systems of partial differential equations which characterise the values which the stakeholders, i.e. policy holders, companies, or financial authorities might want.

The calculation platform can provide the basis for calculations for many different insurance products to be expressed in a specially developed modelling language. In the context of globalisation and more advanced accounting and solvency rules, the demands to software in the life and pension business are increasing, and a number of demands are difficult to meet with the current systems which are primarily based on so-called closed-form expressions. Simultaneously, a continuous society beneficial product development is taking place in the business that requires greater flexibility in the supporting software.

CASE STUDY IN DETAILS

Project Background and Needs

The success criterion is to create a calculation platform which can be marketed primarily in Denmark, and secondarily in the EU. The product shall generalise current technology and be able to solve problems that the current generation of software fails to resolve. An obvious prerequisite, making it a general success criterion in itself, is that the kernel calculates correctly, which calls on actuarial knowledge and innovation, and efficiently, which requires computer scientific knowledge and innovation.

Project Solution

On Actulus the following entities are working together: Edlund A/S, IT University of Copenhagen and the Department of Mathematical Sciences of the University of Copenhagen. Edlund has provided the research challenge and the academic side of the cooperation is working on developing a solution, which is based on a combination of new mathematical methods and a new approach to software development. Upon completion of the

Key Objectives:

- Design and develop a new generation of software for demanding calculation tasks in the life and pension business - calculation platform.
- Contribute to research in the mathematical foundation (on actuarial knowledge).
- Contribute to research in computer science (domain specific languages and parallel computing).

Lessons learned:

- Confirmed the importance for research of close industrial collaboration;
- There is a significant value in a formalized governance structure. The overall governance is done by a steering group led by the industrial partner. There is a very good balance between research and commercial interests in the steering group.
- Value of professional project management for both research and commercial results.

University profile:

The IT University of Copenhagen (ITU) was established in 1999 and is the youngest university in Denmark.

Approximately 2,000 students are enrolled in the university. Since the establishment students with more than 100 different bachelor degrees have been admitted.

ITU's researchers work within twelve internationally recognized research groups. Most researchers participate in collaborative projects with private companies, public institutions and foreign researchers.

ITU is currently working towards becoming a globally interactive university, with faculty, students and staff working in international teams.

ITU has a unique IT focus and expertise and constantly directs its efforts to ensure the quality and relevance of its research and educational programmes.

ITU strives to deliver top quality research and education within a wide range of information technology subjects; from design and game development to business and science.

research Edlund will turn the results into marketable products.

Achievements and Impact

The expected impact of the project is in the form of a calculation platform which can be marketed primarily in Denmark, and secondarily in the EU. The product shall generalise current technology and be able to solve problems that the current generation of software fails to resolve.

Quantifiable Outputs for University

There have been the following quantifiable outputs from the cooperation for the IT University of Copenhagen:

- 1 PhD Graduate (thesis based on the research project) ;
- More than five high quality publications;
- Gaining reputation among Danish stakeholders (hard to quantify, but very important);
- Providing interesting cases for MSc and Bachelor students (in more than 10 instances);
- Strengthening relationships to a very important private company (many university graduates and PhDs employed already).

Quantifiable Outputs for Partner (s)

There have been the following quantifiable outputs from the cooperation for Edlund:

- New product providing significant competitive advantage;
- Strengthening relationships with universities (new employees, access to researchers etc.).

CHECKLIST OF PREREQUISITES TO SUCCESS

Formal aspects

- Formal practical level Co-operation Agreement is signed between University and Partner(s) which defines particular roles, outputs, reporting mechanisms and other relevant aspects.
- Clear roles and responsibilities are defined for University.
- Clear roles and responsibilities are defined for Partner(s).
- Project partners have agreed on specific deliverables to be produced as a result of the co-operation.

- Project is related to at least one strategic priority of the University.
- Project is related to at least one strategic priority of the Partner(s).

Financial and/or Infrastructure aspects

- University invests financial resources in the project.
- Co-operation Partner invests financial resources in the project.
- University invests infrastructure and/or material type (in kind) resources in the project.
- Co-operation Partner invests infrastructure and/or material type (in kind) resources in the project.
- University gains non-monetary but measurable and verifiable benefits from the project.
- Co-operation Partner gains non-monetary but measurable and verifiable benefits from the project.

Human capital aspects

- University is devoting its human capital, know-how, competence to the mutual cooperation, specifically, academic staff and students.
- Co-operation Partner is devoting its human capital, know-how, competence to the mutual cooperation.

Marketing and communication aspects

- Project and/or project results are communicated within mass media channels.
- Project and/or project results are presented in trade-shows, conferences, seminars, other marketing events.
- Project and/or project results are communicated within academic and/or scientific communication channels (research papers, scientific conferences and activities).

For More Information

For more information about the case study contact Dr. Jørgen Staunstrup on jst@itu.dk

For more information about the project "FROM BRIDGING TO SUCCEEDING. University and Business Co-operation Through Success Stories." and for more case studies visit www.university-business.net

For more information about the Nordplus Horizontal programme visit www.nordplusonline.org

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