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GENERAL INFORMATION

TITLE OF THE CASE	Dual-Desk PhD Researchers
SALES PITCH	An example of an intersectoral mobility open innovation approach implemented between KU Leuven and Siemens Industry Software.
ORGANISATION	KU Leuven – Siemens Industry Software NV
COUNTRY	Belgium
DATE	February 2018
AUTHORS	Claeys Claus Pluymers Bert Van der Auweraer Herman Desmet Wim
NATURE OF INTERACTION	☑ Collaboration in R&D ☑ Academic mobility ☑ Student mobility ☑ Commercialisation of R&D results in science ☐ Lifelong learning ☑ Curriculum development and delivery ☑ Entrepreneurship ☐ Governance
SUPPORTING MECHANISM	☑ Strategic instrument ☑ Structural instrument or approach ☐ Operational activity ☑ Framework condition

CASE STUDY PROFILE

1. SUMMARY

To boost realization of Siemens Industry Software's and KU Leuven's complementary ambitions to advance, respectively, the industrial state-of-the-use and scientific state-of-the-art in mechanic and mechatronic system design and analysis, both organizations co-developed a concept they label 'Dual Desk PhD researchers'.

The researchers have two desks, one at KU Leuven and one at Siemens and divide their time between both, hence benefitting from being submerged in an academically inspiring environment, while at the same time gaining experience on what it means to bring innovation into an industrial context. The researchers can fall back on the fundamental knowledge base of KU Leuven while they can at the same time be challenged by full-scale industrial application studies with end-users through the network of Siemens Industry Software.

Over the past years, several such Dual Desk PhD's have successfully defended their degree and are now continuing their career at KU Leuven, Siemens and other organizations worldwide. KU Leuven and Siemens Industry Software highly appreciate the scheme and are continuously updating and further improving it learning from do's and don'ts experienced, expanding lessons learned to and streamlining processes in legal, financial and doctoral school administrations.

2. BACKGROUND

The KU Leuven Noise and Vibration Research Group which currently counts 90 researchers and is headed by Prof. Wim Desmet, is part of the Mechanical Engineering Department, a vibrant environment of more than 300 researchers (www.mech.kuleuven.be). Research in noise and vibration was initiated in the late sixties, with initial efforts focussed on the development of experimental methods, with the birth of modal analysis and applications in the automotive and aeronautics sectors. The eighties are marked with the introduction of numerical techniques (finite elements and boundary elements) and in the nineties, the scope further widened with the development of active control strategies. During the last decade, the group's expertise in dynamic analysis was further exploited in the context of model based system engineering of smart products and their manufacturing. Today, noise and vibration issues remain a major challenge, not only in the development of high-tech products, processes and systems, but also for the health of people and the well-being of society, for sustainable environment and energy supply, and for safe and comfortable mobility. As such, the KU Leuven research group is continuously challenged to excel and innovate helping to build tomorrow's society.

Siemens Industry Software NV originated from the KU Leuven PMA group in 1979 as Leuven Measurement Systems (later rebranded LMS International). It was one of the earliest spin-offs from KU Leuven at a time this concept was just emerging. Its mission was to create

commercial value propositions starting from the noise and vibration analysis and modeling competence of PMA. The original staff consisting of three university researchers quickly grew through a parallel expansion in content offering and internationalization. Working closely with major customers in the automotive and aerospace industries from the very start, the continuously evolving and increasing demands from the market were captured and translated in extensions in methodology and portfolio. The extensions from test-based refinement to simulation-based virtual prototyping and the broadening of the scope from vibration and acoustics to vehicle dynamics, durability, mechatronics, efficiency and safety were realized in continued close cooperation with its base of origin, developing a golden partnership by establishing novel and unique ways of cooperation and co-development. After the acquisition of LMS by Siemens end of 2012 and renamed as Siemens Industry Software NV (SISW), the expansion of technology platform and solution portfolio continued by organic growth as well as major acquisitions. Fully integrated in the Siemens PLM suite, SISW became the headquarters of the Simulation and Testing Solutions business segment.

3. OBJECTIVES

For KU Leuven the prime objective is advancing state-of-the-art ensuring industrial relevance and in doing so, training PhD researchers at the forefront of academic excellence. For SISW the main goal is to boost the state-of-the-use with innovative technologies, continuously innovating products and services.

4. RESPONSIBILITY

These Dual Desk PhD cases are possible through the help and interaction between the following 5 actors

- The KU Leuven hosting research group (main professor and peer-researchers)
- The Siemens Industry Software research group (main supervisor and peer-researchers)
- KU Leuven and SISW administrative and legal support staff
- The KU Leuven Arenberg Doctoral School
- The mobile PhD researcher in question

IMPLEMENTATION & FUNDING

5. STRATEGY & ACTIVITIES UNDERTAKEN

A steering team, composed out of the corporate RTD Director of Siemens and the head of the KU Leuven Noise and Vibration research group, discuss on regular basis cross-fertilization opportunities between the industrial product and service roadmap and the academic research roadmap. After identifying such opportunities, it is investigated if it makes sense to recruit/host a co-supervised researcher to develop the opportunity towards PhD-level scientific innovation with an industrial valorisation target. Once the research objectives are defined and funding is agreed, an appropriate candidate is selected from within either organization or recruited as new researcher. The process is strongly enabled by dedicated

industry-university funding schemes such as VLAIO Baekeland (Flanders) and H2020 Marie Sklodowska Curie Industrial Doctorates, but can also take the form of a.o. a bilateral PhD programme.

The process of setting up a Dual Desk PhD follows 6 stages:

- Stage 1: Identification of a suitable research topic based on roadmap cross-fertilization analysis and agreement on the corresponding funding scheme to be used.
- Stage 2: Selection of a suitable PhD candidate (internal or external recruitment)
- Stage 3: The first 3 months of the PhD are crucial as during this start-up phase, the researcher should get embedded in both the academic and industry environment and build up a social network with his/her peers.
- Stage 4: Monitoring the progress and steering the research during the main part of the PhD research execution by the joint supervision team.
- Stage 5: Wrap up of the work and defense of the PhD. During this phase, both the academic and industrial output KPI's need to be respected.
- Stage 6: After completion of the PhD, an important phase is the evaluation of the whole process by the steering group to update and improve the process based on lessons learned.

6. MONITORING AND EVALUATION

For every Dual Desk PhD regular progress meetings are held where both supervisors are present. This allows to assess progress according to each party's priorities, update the work plan, confirm next period targets and solve any operational issue of joint relevance (test setups, use cases, investments, research visits, publications, IP...). Where identified by the synchronization meeting, additional ad-hoc progress meetings can be scheduled. Furthermore, evaluation of the PhD is through the procedures outlined by the doctoral schools. At predefined moments, an evaluation is done of the academic level of the work of the PhD students, guaranteeing the PhD-worthiness of the work. Though the industrial supervision, the perspective on real-life validation and future valorization is kept on the radar.

7. SUSTAINABILITY MEASURES

- Periodic roadmap exchange meetings to identify topics of joint research interest (at least yearly). Identifying where academic research tracks and industrial needs meet is the starting point for a joint endeavor. This exchange takes the form of a workshop chaired by the steering team and involving the senior researchers of both parties.
- Periodic synchronization meetings between the steering team members to review the global process and the set of joint projects and programs:(at least bi-monthly). This allows to assess the overall process as well as the global status of the individual research tracks. It is important to timely identify problems with any of the researchers, their supervision, the operational circumstances or practical needs, financing etc. Where needed, extra individual progress meetings can be scheduled.

8. COSTS

Three main cost elements are involved:

- Salary of and working costs related to the mobile PhD researcher
- Costs related to the supervision of the researcher by both industrial and academic supervisors and teams
- Costs related to the supportive administrative environment; these costs are relatively high for the first cases, but once experience and internal templates grow, well-defined and smooth procedures ensure minimal costs for follow-up cases.

9. FUNDING

The process is strongly enabled by dedicated industry-university funding schemes such as the governmental VLAIO Baekeland (Flanders) and H2020 Marie Sklodowska Curie Industrial Doctorates. In particular cases, also fully private funded schemes can be successful.

OUTCOMES & IMPACT

10. OUTCOMES

Success factors driving the growing interest of both KU Leuven and Siemens Industry Software in the Dual Desk PhD scheme are a clear win-win leverage between scientific research advancement and industrial product and process innovation. The combination of academic research being pushed and inspired by industrial problem statements and industrial products and processes being fed with unique and truly revolutionary technologies yields extremely interesting and attractive PhD projects.

11. IMPACTS

Academic institution (KU Leuven):

- Further strengthening the industrial relevance and scope of its (even fundamental) research activities
- Boosting attractiveness for recruiting high-potential researchers who are looking for an industrial environment, yet still want to embark on research studies
- More intense spin-out research project collaboration due to shared understanding and technological foundations

Industrial organisation (Siemens Industry Software)

- Laying the methodology basis for new technology and application domains
- Exploring new scientific approaches in view of innovative customer value propositions
- Deepening the relationship with the academic environment through intensive interaction on themes of common interest but with specific focus
- Preparing next generation of staff engineers with both solid methodological and application knowledge

Dual Desk PhD researcher:

- Is able to combine developing him-herself in both an industrial R&D environment and in an academic research environment.

- Benefit and possible leverage upon wide networks of both organisations towards future career development.
- Enlarge future career perspectives both towards multi-sectoral professions

12. INVOLVED STAKEHOLDERS AND BENEFICIARIES

Obvious benefits for direct involved stakeholders university, industry organisation and researcher (see previous points). Furthermore, strong indirect benefits for the whole eco-system around the mobility triangle in view of boosting high-quality scientific research, employability of expert researchers, attraction of top talents, stimulation of entrepreneurship, etc.; which are clearly also targeted by some of the governmental support schemes.

13. AWARDS / RECOGNITION

Numerous of the dual desk PhD researchers have embarked on successful careers within the involved university or company, or within organisations in the network. One of the best signs of recognition actually is the instalment of new dual desk PhD's supervised by former dual desks.

LESSONS LEARNED

14. PRIMARY CHALLENGES

Typical barriers hindering Dual Desk PhD schemes are dual in nature. First of all, ownership and access rights to results achieved are subject to often tedious discussions with legal departments, yet, based on a level of mutual trust built up and past success stories which are used as template model, a good understanding continuously grows and substantially lowers this barrier. Secondly, the alignment of formal procedures at both organization administrations takes time and needs to be monitored and iterated on the fly.

15. SUCCESS FACTORS

Key requirement here is the open mindset and attitude of the members of the steering group, respecting each other's organization DNA and KPI's. The fact that logistically and culturally the barriers between both organizations are rather low, also contributes to the success of the scheme.

A non-exhaustive list of do's and don'ts:

Do:

- Respect each other's DNA and KPI's
- Be sufficiently transparent and open on roadmap cross-fertilization
- Don't be afraid to attempt new HR and administrative routes within your organization

Don't:

- Follow the temptation of profile dilution
- Forget that the project is a PhD project, needing to advance the international state-of-the-art
- Forget that the project is driven also by an industrial need, requiring to assess the added value for industrial challenges
- Go for short term success; PhD research is by definition a mid-term activity

16. TRANSFERABILITY

Although there is a strong degree of tailoring the scheme towards the specific DNA of the involved company and university, it has been possible to extract generic guidelines for best practice and reproducibility. These allow to setup new dual desk schemes leveraging upon expertise gained.

FURTHER INFORMATION

17. PUBLICATIONS / ARTICLES

Poster with information on this case.
http://science2society.eu/sites/default/files/science2society/public/content-files/article/KUL-SISW-MCAA_Poster.pdf

18. LINKS

Brochure on Best Practices for Open Innovation, including information on this case.
http://science2society.eu/sites/default/files/science2society/public/content-files/article/S2S_D1.3_Cases%20studies%20compiled%20into%20a%20public%20brochure.pdf

Website with information on open innovation cases, such as this case.
www.science2society.eu

19. KEYWORDS

Intersectoral mobility, dual desk PhD, open innovation, industrial doctorate, Baekeland, Marie Sklodowska Curie

20. PUBLIC CONTACT DETAILS

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