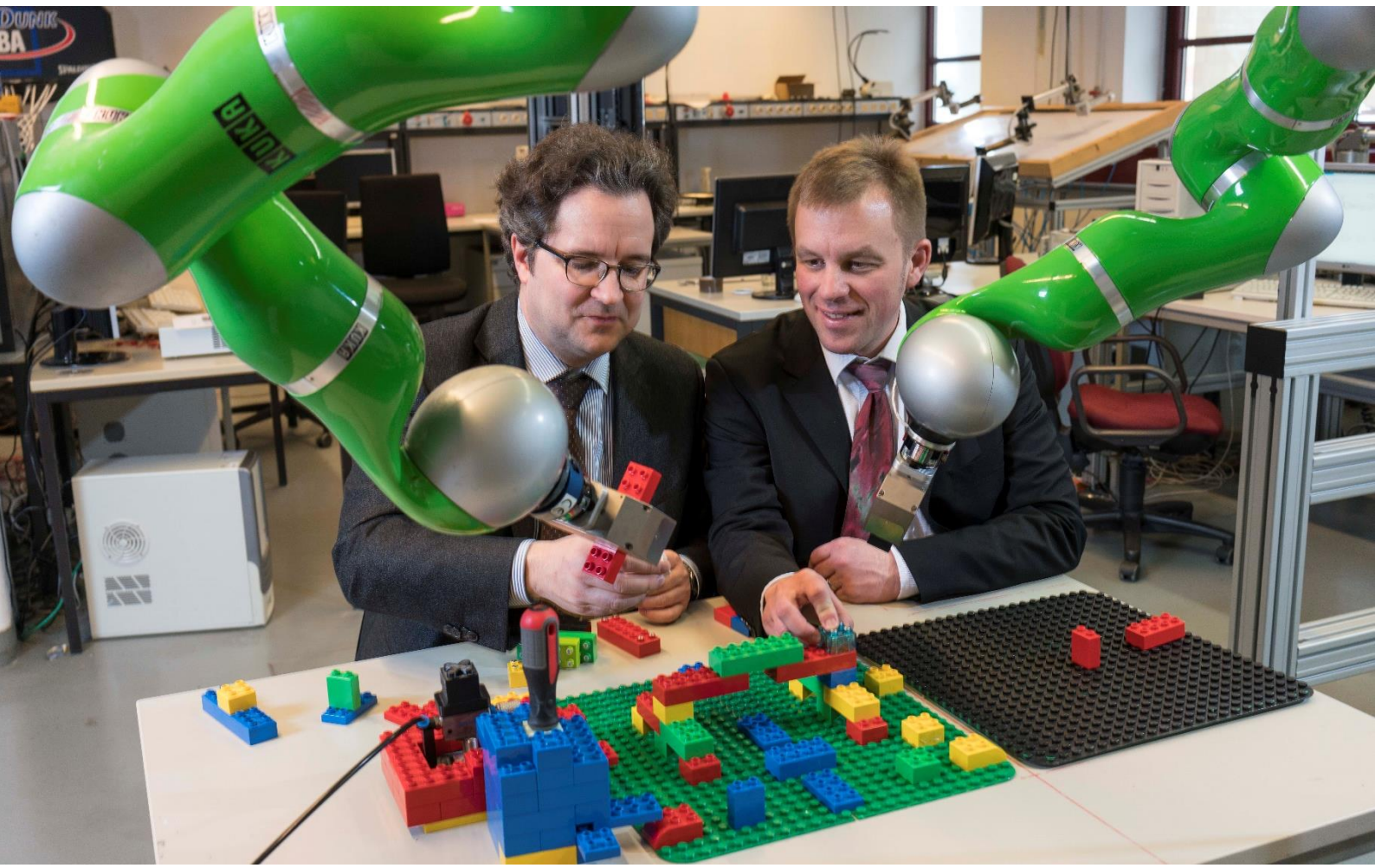


Siemens research cooperation with universities: Strategic university relations strengthening Siemens' ingenuity

Munich, Germany





General Information

Title	Siemens research cooperation with universities										
Pitch	Strategic university relations strengthening Siemens' ingenuity										
Organisation	Siemens AG										
Country	Germany										
Author	Balzhan Orazbayeva (Science-to-Business Marketing Research Centre)										
Nature of interaction	<table><tr><td><input checked="" type="checkbox"/> Collaboration in R&D</td><td><input type="checkbox"/> Lifelong learning</td></tr><tr><td><input checked="" type="checkbox"/> Commercialisation of R&D results</td><td><input type="checkbox"/> Joint curriculum design and delivery</td></tr><tr><td><input type="checkbox"/> Mobility of staff</td><td><input checked="" type="checkbox"/> Mobility of students</td></tr><tr><td><input type="checkbox"/> Academic entrepreneurship</td><td><input type="checkbox"/> Student entrepreneurship</td></tr><tr><td><input type="checkbox"/> Governance</td><td><input type="checkbox"/> Shared resources</td></tr></table>	<input checked="" type="checkbox"/> Collaboration in R&D	<input type="checkbox"/> Lifelong learning	<input checked="" type="checkbox"/> Commercialisation of R&D results	<input type="checkbox"/> Joint curriculum design and delivery	<input type="checkbox"/> Mobility of staff	<input checked="" type="checkbox"/> Mobility of students	<input type="checkbox"/> Academic entrepreneurship	<input type="checkbox"/> Student entrepreneurship	<input type="checkbox"/> Governance	<input type="checkbox"/> Shared resources
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Supporting mechanism	<table><tr><td><input type="checkbox"/> Strategic</td></tr><tr><td><input checked="" type="checkbox"/> Structural</td></tr><tr><td><input checked="" type="checkbox"/> Operational</td></tr><tr><td><input type="checkbox"/> Policy</td></tr></table>	<input type="checkbox"/> Strategic	<input checked="" type="checkbox"/> Structural	<input checked="" type="checkbox"/> Operational	<input type="checkbox"/> Policy						
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Summary	<p>Siemens has worked in close cooperation with numerous universities and research institutes around the world for decades. They have done so within the scope of the open innovation strategy, which fosters the company's long term success and strengthens its innovative power. For the last 15 years, the University Relations Department has been operating Siemens' long term strategic approach to university-business cooperation known as the Centre of Knowledge Interchange (CKI) Programme. Today Siemens cooperates extensively with eight CKI strategic partner universities in Germany, Austria, China and the United States. Here collaboration extends not only to individual departments or research groups, but to the entire university focusing on joint research activities and talent acquisition.</p>										



Introduction & Overview

1. BACKGROUND

Founded in 1847 in Germany by Werner von Siemens as a start-up for communication technology, Siemens has grown into one of the largest European industrial conglomerates with a global presence. One of the world's largest producers of energy-efficient, resource-saving technologies, Siemens today is a leading supplier of systems involving power generation, transmission and medical diagnosis. Business to Society (B2S) is a company's philosophy, which reflects Siemens' mission towards society – 'ingenuity for life'.

Siemens' university relations have a long history of providing benefits for both company and higher education institutions. Today Siemens works in close cooperation with numerous universities and research institutes around the world within the scope of the open innovation strategy, which fosters the company's long term success and strengthens its innovative power and potential of an open company.

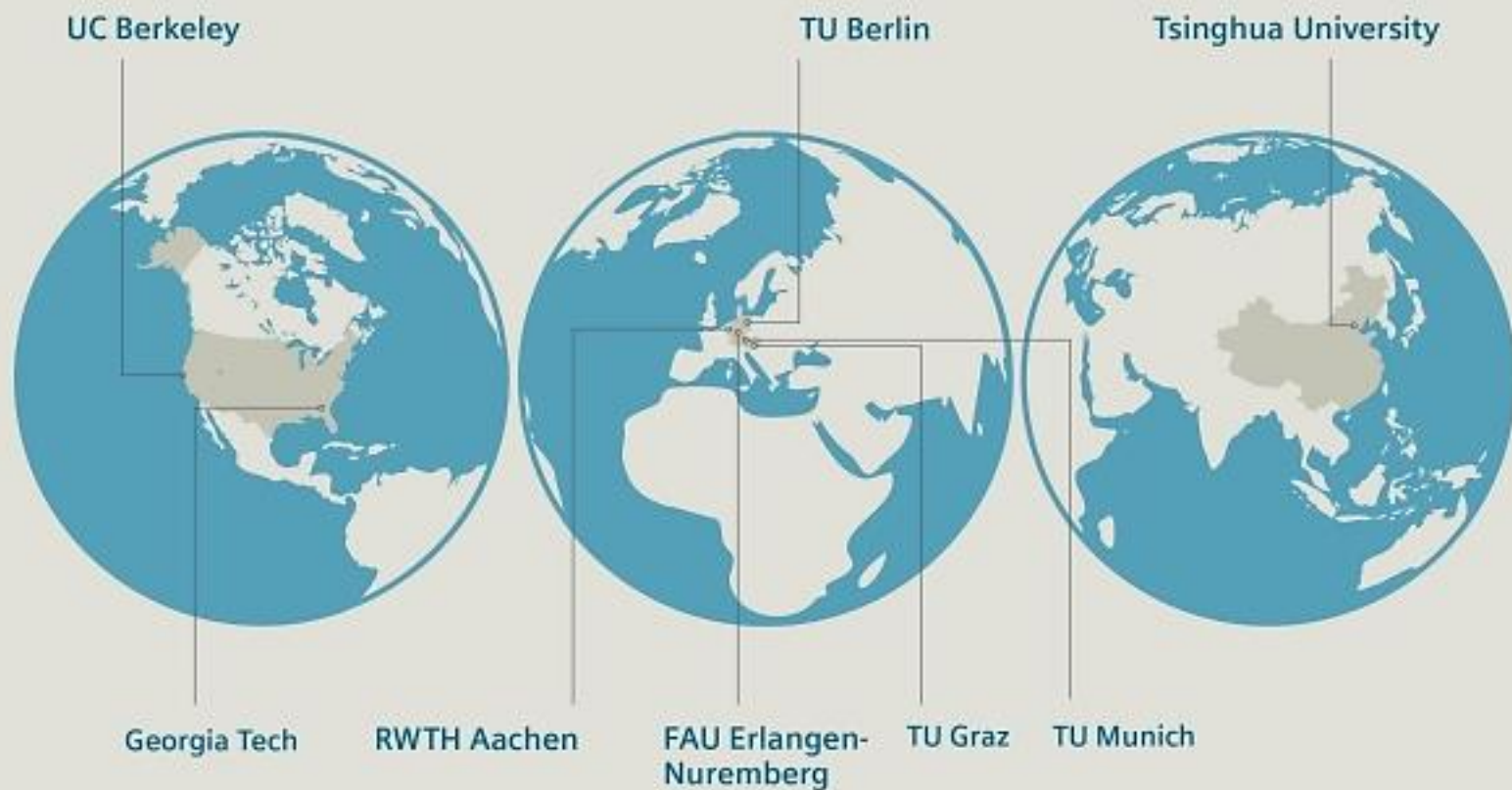
Open Innovation, which means engaging third parties in the research and development (R&D) process, is crucial for Siemens' survival and effective existence in today's globalised and competitive environment. **Siemens'¹ University Relations (UR) Unit** manages and coordinates the company's interactions and cooperation with universities, playing the crucial role in establishing networking points for Siemens's employees with both academics and students.

In its relationships with universities, Siemens is working at three levels of cooperation.

- ▶ All universities with which Siemens has non-strategic collaborations are called **Partner Universities**, which generally do not involve the UR unit. On this level of cooperation, the focus of the activity generally is contract research, which is limited in time and is dedicated to a specific topic.
- ▶ **Principal Partner (PP)** Universities are the next level of cooperation, which universities can achieve after already having certain positive experiences in conducting research or performing other joint activities with Siemens. PP universities can be nominated for either R&D activities or human resources purposes, or both. Currently Siemens has 16 global R&D PP universities all over the world and more than 50 local HR PPs.
- ▶ The highest level of partnership is the **Centre of Knowledge Interchange (CKI)**. CKI partnerships are of a much broader base than the other two kinds of university cooperation. Here collaboration extends not only to individual departments or research groups, but to the entire university focusing on both joint research activities and talent acquisition. There are eight CKI universities, with which Siemens has a long term strategic partnership. Partners include:
 - RWTH Aachen in Germany;
 - Technical University of Berlin in Germany;

- Technical University of Munich in Germany;
- University of Erlangen-Nuremberg in Germany;
- Graz University of Technology in Austria;
- Tsinghua University in China;
- University of California at Berkeley in the United States; and
- Georgia Institute of Technology in the United States.

Centers of Knowledge Interchange



2. OBJECTIVES AND MOTIVATIONS

In the last decades, Siemens has engaged in collaborative activities with a great number of universities and research institutions. These relationships have proven to generate innovations for the company by bringing researchers and instructors into contact with Siemens' experts. The experts within Siemens aim to put research results into practice, provide professors with topics for their research agendas and students' dissertations, acquire talent and enable PhD candidates to get in touch with potential employers.

However, during the development, Siemens found themselves working with a wide range of different stakeholders involved in the collaboration process. This made it significantly harder to meet all stakeholders' expectations from the partnership and to manage and coordinate the interactions, which in turn hindered the effective and timely fulfilment of the UBC activities. Siemens' management discovered that without a dedicated management function, Siemens would cooperate with too many diverse higher education institutions, which would take place in mostly small one-off projects and not align with a long-term strategy.

For these reasons, in 2001 Siemens' top management initiated the corporate **UR Programme**. Siemens saw the need to create a new strategic approach to facilitate partnerships with the most outstanding global universities on a higher and more strategic level. Resultantly, the UR Programme aims to coordinate the numerous existing collaborations whilst nominating strategic partner universities on two levels, CKI universities and PP universities. A further reason for creating the UR programme was the significant overlap that was experienced in their cooperation between the research and talent recruitment area. Consequently, there was a necessity to combine innovation and research activities with talent acquisition, bringing researchers and future employees together.

Both Siemens and universities benefit from the CKI type of cooperation. In order to produce a steady stream of high quality technologies and innovations, Siemens works closely with the selected CKI universities to link industrial and academic worlds and thus to promote research and recruiting activities. CKI partnerships aim to identify strategic, long-term focussed technology fields, crucially important for the company, and to recruit talented, ambitious young employees.

3. STAKEHOLDERS

Inter-organisational intermediaries are playing the key role for managing the relations with CKI universities. There are four different types of intermediaries, who make the collaboration between two parties running: management sponsor, CKI director, UR managers (for R&D and HR) and CKI manager.

- ▶ The **management sponsor** is a top-level executive manager, normally either a Siemens management board member or country CEO. The main task of the management sponsor is to represent Siemens on the highest level in the bilateral relationship with the CKI partner university. Although the role of the management sponsor is considered an essential success factor for the effective realisation of strategic partnership development, he/she does not possess any

dedicated Siemens CKI budget for the joint R&D projects. Normally management sponsors are appointed 'for life', which means that the personal interest in UBC with the specific CKI partner and their high level of commitment are essential;

- ▶ The **CKI director** together with the university president are the main contact persons on the university side. Therefore, it is essential that the CKI director has close relationships with the university management and the relevant Siemens units and departments. In practice, the choice of the CKI director depends on the history of the Siemens relationships with the CKI partner individually, varying from university to university. Ideally the CKI director is either a top-management executive for the innovation and research or a dean of the relevant faculty, who already has working experience or close ties with Siemens;
- ▶ The **UR Managers (R&D and HR)** of Siemens work together with CKI managers and are responsible for building the management team and to ensure the proper and effective interaction between two parties;

The **UR Managers of R&D** are the members of the Siemens Corporate Technology UR team in charge of relationships with a specific focus and are responsible for the development of the R&D activities. Usually each UR manager of R&D is responsible for one CKI university, of which he/she is ideally an alumnus or already has personal and professional ties to. Since all UR managers of R&D are members of one Siemens unit, together they can ensure the effective exchange between all CKI universities as they are also representatives of each of the nine CKI partners. UR Managers of R&D spend about 20% of their working time at each university;

The **UR Managers of HR** are also Siemens staff, working for the human resources department. Their specific focus is on the talent acquisition and on employer branding. They act as a central contact point for HR and manage the partnership in cooperation with the UR Manager R&D as well as the university sponsor. Usually they take care of more than one CKI or PP university per country. Generally, UR Managers of HR spend about 10% of their working time per university;

- ▶ The **CKI Managers** are in charge of the network-building between academia and Siemens. They are employed within the university normally at the dedicated industry liaison offices, at the technology transfer units, at the president's office or simply at the chair of CKI director. The spectrum of the tasks and responsibilities of CKI manager varies from university to university. However, they often organise, promote and manage events, such as for example CKI conferences, expert workshops, recruiting events, at the CKI partner universities and in cooperation with Siemens. Furthermore, one of their main tasks is to promote joint R&D projects within the university, which could be potentially interesting for both Siemens and academic researchers.

The main responsibility of the inter-organisational intermediaries is to distinguish and direct relations between the two organisations. This can be a complicated process as there are many different stakeholders involved in the bilateral ties: from the individual Siemens researchers working with CKI universities, academic researchers undertaking industrial collaboration to Siemens managers and PhD supervisors. The CKI programme is a monitored and structured

way to strategically develop and effectively manage the collaboration between Siemens and the university partners.

Supporting this process, the Corporate Technology unit utilises Big Data applications (Academic Research Intelligence, e.g. Elsevier's SciVal) to identify and access the main fields of scientific research at all major universities worldwide, including the CKI university partners. Additionally, there is also the Siemens internal social media network platform (moderated by the UR unit), where the company can offer access to specific user and research groups to exchange ideas and experiences with regards to the joint research projects.





Implementation

4. INPUTS

Siemens invests both human and financial resources as the primary inputs for CKI cooperation.

For each CKI university, a senior Siemens management sponsor is nominated. He is supported by two UR managers, for R&D activities and talent acquisition respectively. These positions within Siemens are mirrored on the university side, led by a CKI director.

There is a base investment from Siemens, which is used for CKI personnel salaries and diverse CKI events. Generally speaking, Siemens finances all CKI offices at their CKI partner universities, which are located at the university facilities, either in the technology transfer units or at the head offices of the campuses. Therefore, there is no specific investment for facilities, because the CKI units are directly located at the universities, which also allows Siemens to have an access to university rooms, e.g. for joint events. In this way, Siemens supply the finance for personnel and the university provides the infrastructure.

On an annual basis, partners organise CKI conferences in different formats. The events are hosted mainly by the universities and include the whole spectrum of the stakeholders, from the top management, professors and academics, down to students. These events provide a space for open discussions, idea and experience exchange as well as future planning of the strategic partnership development.

5. ACTIVITIES

R&D projects as well as talent acquisition are the main activities in which the CKI collaborations are working. Siemens and CKI universities conduct numerous large-scale, long-term research projects, which have a strategic impact on both company and universities.

In respect to the recruitment of human resources, Siemens aims to directly access potential employees and align research and recruiting activities at the universities, to become more effective and efficient in promoting Siemens as the employer of choice.

In some cases, Siemens is involved in the process of creating policy recommendations at the university, especially towards governmental educational and innovation policy, by working together with different stakeholders in the special advisory boards. It also works the other way around, with the Siemens departments inviting university professors from CKI partners to provide input and advice from the scientific side.

Professional mobility is another form and one of the newest models of cooperation for Siemens with its CKI partners. This activity allows Siemens a more in depth opportunity to develop university-industry relationships, whilst facilitating expert exchange on a strategic level with selected CKI universities. This UBC activity is a new form of the CKI programme and is set to be one of the promising directions for the future collaboration development.

6. OUTPUTS

Conducting research together, promoting talents and expanding contacts, the CKI programme is as a bond between Siemens and universities.

CKI contributes to the company's success in many functions, including enhancement of the research and development, shaping **Siemens'** technology and innovation agenda, new knowledge and technology absorption, effective talent acquisition and strong employer branding. The main output of the CKI programme for the company is that the whole spectrum of possible ties and contacts with the selected universities have been organised in a structured and transparent system. This allows Siemens to collaborate more effectively with academics, foster research and development and optimise student talent acquisition.

Academics are in turn also expected to profit extensively from the proposed framework for strategic collaboration with Siemens. This partnership brings academic researchers and educators into direct contact with the interested and engaged industry representatives. This means that their research results are brought into practice; provide new perspectives, enable extensive experience exchange and provide professors with topics for their students' dissertations. Additionally, it enables doctoral candidates to get in touch with potential employers, thus facilitating the student mobility channels between two parties at the same time.

The following are further signs of the success of their strategic collaborations with universities:

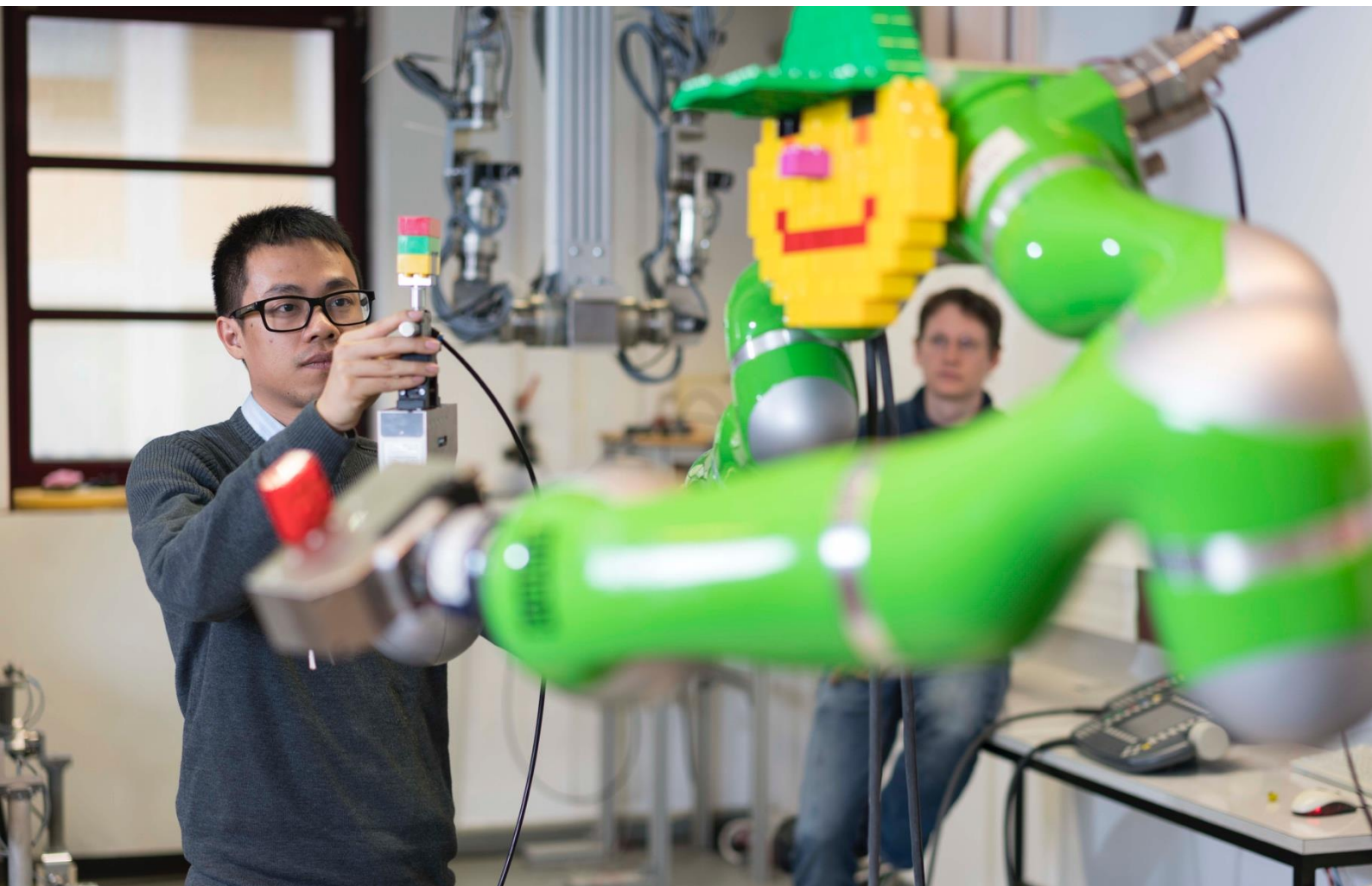
- ▶ All CKIs are consistently among the Siemens' top 10 research partners based on money spent in contract research and strategic projects undertaken by Siemens are mostly conducted with CKI universities (e.g. Manufacturing Centre of Excellence or SFB Future Train with RWTH, CT research building on TU Munich campus etc.);
- ▶ Strategic CKI are good sources of co-authored publications (higher rates of publications). In terms of top collaboration partners in terms of publications (Siemens employees are paper co-authors) 4 of the top 6 collaboration partners are CKI universities – all with well above 150 joint publications according to Elsevier Scopus;
- ▶ Whilst few patents are undertaken with university partners in comparison with their in-house patent numbers, the ones that are created primary come from strategic projects which are conducted at CKI universities;
- ▶ The level and speed with which research can be undertaken with their CKI partners is reduced because Siemens have created Master Research Agreements with all CKI and negotiation time for contracts is therefore reduced drastically, sometimes from months to days;
- ▶ For almost all CKI universities, in employer rankings among engineering students, Siemens ranks higher at the CKI unis than it does on average among all engineering students in the country. In other words, their engagement at the CKI universities results in more students naming us their employer of choice, according to Universum Employability Ranking;

- ▶ Siemens experience four times more hires from CKI registered universities than they have for their second-tier universities (Principal Partner), indicating that CKI status is providing a good source of human capital.

7. IMPACTS

The CKI programme is an effective way of creating the right collaborative environment and effective framework for bringing different stakeholders together. Furthermore, the programme helps to manage expectations of different parties involved in the intensive long-term strategic partnership. The major collaborative projects are directly aligned with **Siemens** corporate strategy, which, of course, is extremely beneficial for Siemens, since the company is working together with the university partners on different solutions that are capable of advancing Siemens' core interests. The programme helps to guarantee the company's long term success in the context of the open innovation strategy.

Furthermore, the partner **universities** also benefit substantially from the relationship with Siemens by having future-oriented focussed and funded R&D, as well as a pathway for post-graduate students to find a career in one of the world's leading companies. The universities also benefit through an enhanced reputation for further R&D projects and for attracting students to the institutions.





Support & Influencing factors

8. BARRIERS AND DRIVERS

The issue of funding is one of the biggest barriers. Although there is a based corporate investment for running CKI offices and sponsorship of CKI events, the CKI programme is not intended for funding joint R&D research projects, which means that Siemens and academic researchers need to acquire money for the joint projects themselves. To this end, Siemens have proven to be quite adept at acquiring European funding, with Siemens AG being named in second place in a list of top industry participants for FP7 signed grant agreements in respect to the numbers of project participations for the period 2007-2013².

From 2008 till 2014 Siemens has been offering a five-year-'matching' fund programme, which allowed sponsorship of at least 50% of the external project costs for Siemens researchers, in the case that they were willing to cooperate with strategic university partners for the delivery of the joint research projects. This model was considered to be a driver that can help to channel players from both parties to strategically work together on the fundable base, which in turn is able to make CKI programme more attractive for the stakeholders involved.

Occasionally, Siemens employees seek to cooperate outside the partner universities. In this case, Siemens top management can forbid its researchers to collaborate with other universities, besides CKI partners, which can cause undesirable and highly *disadvantageous consequences*. To avoid this, generally the Siemens UR unit tries to work together with and convince Siemens decision makers to collaborate with CKI universities, making this type of strategic collaboration attractive. Thus the inter-organisational intermediaries are the most important players in this programme, driving and fostering the collaboration with selected partner universities.

9. KEY SUCCESS FACTORS

The main factor guaranteeing the success of the CKI programme are the inter-organisational intermediaries, who basically keep the partnerships between Siemens and the universities running. A unique feature of the CKI strategy, is that the collaborating process involves the Siemens internal and external intermediaries. These actors do not participate in research activities, but play a crucial role in bridging two parties to achieve following goals, including:

- ▶ increasing research collaborations with universities in general;
- ▶ concentrating and increasing Siemens research collaborations at the selected CKI universities and
- ▶ aligning research and innovation activities with talent acquisition and employer branding at the CKI universities.

After a university has been nominated, a contract is set up, where all conditions are fixed: the confirmation of the strategic partnership, responsibilities of CKI office staff and financing of the CKI office by Siemens.

It is also an essential ingredient to have the commitment of high-level management, who specifically show dedication and personal interest in facilitating the bilateral relationships and are skilled networkers.





Further Information

10. MONITORING AND EVALUATION

Siemens needs to determine to what extent a partnership has been successful and what kind of impression the respective CKI university, directors, managers, and specialists have made while collaborating the company partner. Siemens' in-house cooperation database (UNICO+) for example makes search evaluation on the project level possible. In this case, project leaders and researchers involved in the joint research are able to evaluate the projects and specifically the collaboration with universities. The database platform is open for Siemens employees and is accessible by the research community involved in the partnerships.

Furthermore, Siemens uses specific KPIs, for HR and R&D respectively, to assess the success of the university partnerships. The numbers of hired students and student applicants are used for example for the talent acquisition evaluation. In addition, HR staff regularly conducts student surveys on the employer attractiveness, where the Siemens' employer branding is evaluated. The main KPIs used to monitor the research activities are the volume of the research and the total funding volume and in addition, patents, sponsored PhD theses and joint publications. However, it is not enough to use these numbers to evaluate the success of partnership with universities.

For this reason, UR prepares and runs an annual University Steering Committee at each CKI which includes the Siemens Management Sponsor, the UR managers, CKI director and manager and others. If the company has internal doubts on the validity of the CKI status of a university, an internal analysis is conducted, which includes the review of the current status and the preparation of the recommendations for the future strategic development. The working style of the steering committees is very open and more or less informal, providing an opportunity to easily solve open issues, to exchange ideas and experiences on specific topics of the collaboration agenda. This also makes the CKI programme valuable because, owing to the long partnerships and long term orientation, stakeholders are able to build trusting relationships and interact very openly with each other.

11. SUSTAINABILITY MEASURES

The selection criteria for choosing the right university partner and the right people for the CKI unit positions are the factors that assure and prove the long-term stable ties and sustainable relationships with Siemens. If necessary, the company reviews the cooperation process and partnership activities to analyse the future potential and to make the process sustainable. Overall, the whole CKI model of collaboration with selected partners is itself sustainable in its nature. Sustainability is driven by the high commitment of the both parties and all involved stakeholders, including the Siemens und university managing board.

12. TRANSFERABILITY

Siemens is one of the first German companies to fund intermediary organisations dedicated to UBC. Siemens's case was not directly transferred by any company; however, the CKI programme has inspired a number of firms to establish dedicated, sponsored intermediary units responsible for bridging different stakeholders. BMW has a very similar approach to university partners. It has also inspired universities to work with this format, for example the Technical University of Munich, which is planning to assign one more 'CKI manager' for strategic cooperation with other industry partners.

13. PUBLICATIONS AND ARTICLES

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14. LINKS

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Corporate Technology. <https://www.siemens.com/content/dam/internet/siemens-com/innovation/innovation/pdfs/ct-standardpraesentation-16-9-en.pdf>

15. CONTACT PERSON



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16. REFERENCES

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