

Gdansk University of Technology:

Technology:

The special purpose vehicles driving GUT commercialisation activities

Gdansk, Poland





General Information

Title	Strategic development of UBC at the Gdansk University of Technology	
Pitch	The special purpose vehicles driving Gdansk University of Technology commercialisation activities	
Organisation	Gdansk University of Technology	
Country	Poland	
Author	Dr. Samo Pavlin (University of Ljubljana)	
Nature of interaction	<input checked="" type="checkbox"/> Collaboration in R&D <input checked="" type="checkbox"/> Commercialisation of R&D results <input type="checkbox"/> Mobility of staff <input checked="" type="checkbox"/> Academic entrepreneurship <input type="checkbox"/> Governance	<input type="checkbox"/> Lifelong learning <input type="checkbox"/> Joint curriculum design and delivery <input type="checkbox"/> Mobility of students <input checked="" type="checkbox"/> Student entrepreneurship <input type="checkbox"/> Shared resources
Supporting mechanism	<input type="checkbox"/> Strategic <input checked="" type="checkbox"/> Structural <input checked="" type="checkbox"/> Operational <input type="checkbox"/> Policy	
Summary	<p>Gdansk University of Technology is one of the oldest universities in Poland; however, in recent years it has opened itself up to the economic and social changes and demands of the environment, becoming an important actor in the regional economy. The university's new strategy strongly encourages cooperation with business and the commercialisation of research results. An important role of supporting UBC is played by several tacit and explicit processes and structures that are changing the perception of the university in the regional innovation and economic development. In this context, the newly established Centre for Knowledge and Technology Transfer (CKTT), and the Excento Special Purpose Vehicle (SPV) drive the technological commercialisation activities of the university.</p>	



Introduction & Overview

1. BACKGROUND

Gdansk University of Technology (GUT), established in 1904, is one of the oldest universities in Poland. It employs 2,500 staff, including 1,200 academic teachers and has more than 26,000 students. The university has nine faculties in the following fields: architecture; chemistry; electronics, telecommunications and informatics; electrical and control engineering; applied physics and mathematics; civil and environmental engineering; mechanical engineering; ocean engineering and ship technology; management and economics.

The university's mission is based on the knowledge triangle, which has three main integral activities: research, education and innovation. It contains five primary principles that should be followed and reached by 2020:

- ▶ fundraising in line with the priorities of the region, the country and the EU in order to implement strategic tasks;
- ▶ stimulation for developing innovation;
- ▶ implementation of new modes of teaching and learning: lifelong learning, team design, e-learning, research-oriented practice, modernisation of teaching and research laboratories;
- ▶ supporting talent;
- ▶ elimination of barriers and administrative burdens, supporting best practice, a culture of work and innovation.

GUT has several different units, ranging from central units, such as *i) scientific research centres* (e.g. Centre for Advanced Technologies "Pomorze", Marine Military Technologies Centre, Molanote, Linte²), *ii) teaching centres*, *iii) central administration* and *iv) units that are assigned to support and perform specific tasks*, such as the Centre for Knowledge and Technology Transfer, which is particularly oriented to UBC.

The concept of UBC received more extensive and high-level attention and saw public discussions at the Polish national level around 2011. In 2012, this led to GUT introducing a new strategy with a greater emphasis on commercialisation, innovation and cooperation. The background to the strategy was based on the above-mentioned **knowledge triangle: research, education and innovation**, but was also aimed at **quality, progress and cooperation**. This aim will be achieved by providing high-quality education for the needs of the dynamic development of the economy and society based on knowledge, scientific research at the highest international level, in the conditions of the globalising world and the implementation of innovative projects to support the transformation of civilisation and cultural enrichment.

2. OBJECTIVES AND MOTIVATIONS

According to its strategy¹, GUT's core objective is "to become a modern technical university and a renowned opinion-forming centre, as well as the initiator and implementer of application undertakings and innovative tasks in cooperation with the business sector".

The main reason for GUT starting with intensifying cooperation with business is related to the regional and national needs for highly qualified engineers. Companies are looking for innovative solutions through R&D conducted jointly with scientific institutions. This is also the prerequisite for governmental investments and subsidies. Until recently there has been a low level of innovation and R&D investments from private funds in Poland compared to the European average. Through co-funding research projects the government tries to improve the situation.

3. STAKEHOLDERS

The inclusion of different stakeholders varies in different professional fields. For example, the chemical industry enjoys a very intensive cooperation with the Faculty of Chemistry, who provide expertise and research for their industry partners. The same goes for the IT sector. In these two fields, students and young researchers are also highly involved.

In other fields, such as shipbuilding, heavy industry or energy sector, cooperation with business preferably includes professors and senior researchers due to the long duration of the projects and their complexity.





Implementation

4. INPUTS

GUT has provided a range of inputs for facilitating the implementation of its new UBC strategy. The main inputs are *financial resources* in terms of additionally received financial support from European funds (e.g. European Social Fund, European Regional Development Fund) that led to the development of new infrastructure – new scientific and research centres, laboratories, practically-oriented study facilities etc. New infrastructure also demanded a reorganisation of human resources – new staff employed for providing support to UBC and enabled cascading requirements from researchers, lecturers and HEI managers.

5. ACTIVITIES

Most commercialisation activities are run through two entities: the **Centre for Knowledge and Technology Transfer** (CKTT), and the **Excento Special Purpose Vehicle** (SPV).

The CKTT was established in 2011 to support researchers with commercialisation of their research results. CKTT is responsible for direct commercialisation, such as licensing research results, sales, intellectual property processes, contract research, etc.

The centre's other role has been to **recognise the needs/unsolved problems of business** and try to find academic teams willing to cooperate in **finding solutions for them**. The centre plays the role of an intermediary among professors and researchers on one side and entrepreneurs on the other, supporting in: finding appropriate contacts, preparing documents, commercialising academic research, and finding financial resources.

It also offers **support to spin-off companies** with awareness of the importance of making products out of research and technology that would sell on the market. The other forms of support to spin-off companies include the protection of intellectual property, forming working teams composed of scientists and managers, mentoring from the field of commercialisation, support in the patent application process, and support in finding financial resources. The patent process follows the patent protection strategy that provides patenting first on a national level, but also on an international level. Almost all inventions are patented nationally, and they also grant 10–20 licenses per year.

The **SPV is aimed at indirect commercialisation** (spin-off companies that implement innovations and technology developed at the university). The SPV, named Excento, was established in 2014 and currently has six spin-off companies in which it holds shares. Due to Polish national regulations, universities cannot directly take charge of spin-off companies (see section on outputs for more details) but this can be achieved through the SPV. However, CKTT and the SPV have common politics and a common board, they cooperate closely, enabling them to make decisions on implementing particular projects (whether aimed for direct or indirect commercialisation).

Activities within the new strategy have also led to a few large investment projects at the GUT dedicated to science and business cooperation and **resulting in the construction of innovative technological and science centres**:

- ▶ **the Nano-technology centre** – the total investment in the Centre was €18m. The Centre consists of a total of 36 education and research laboratories equipped with

modern equipment. The centre includes two parts: (i) research and education facilities that belong to the Faculty of Mathematics and Physics, and the second part comprising: (ii-a) laboratories, where the installed equipment is used mainly for testing the mechanical properties of materials, which belongs to the Faculty of Mechanical Engineering and (ii-b) office and lecture part equipped with modern ICT positions belonging to the Centre for Mathematics Teaching and Distance Learning Centre;

- ▶ **the Centre of Maritime and Military Technology** – is a separate body but still within the university structure. It is involved in many large national military projects, especially for the navy, which are vitally important for the aspect of finances and innovation;
- ▶ **the ICT Cluster** – in terms of development it is one of the most advanced clusters in Poland awarded with the title of the Key Pomeranian Region Cluster in the competition organised by the Regional Board. The cluster brings together around 140 entities from the ICT industry, operating in the field broadly defined as electronics industry, IT services and telecommunications services;
- ▶ **Centre of Excellence in Manufacturing Research Infrastructure Application CD NIWA** provides its users with comprehensive services in the area of technological competence for innovative manufacturing platforms, applications, offering access to advanced IT infrastructure and a wide range of consulting services. The investment in the project is approx. €10m;
- ▶ **Centre for Advanced Technologies POMERANIA** - a group of laboratories specialising in the performance of research services in the field of information and telecommunications technologies, functional materials and nanotechnology, environmental protection and biotechnology, chemistry, nutrition and medicinal chemistry. The ATC consists of 10 laboratories (8 located at GUT and 2 at the University of Gdansk), which are equipped with modern research equipment. The cost of the project is approx. €6m, the biggest project from the regional funds. The Centre is intended for direct cooperation with industry. It was primarily aimed at cooperation with small companies from the region, however its operation rose above the regional to the national level.

GUT is a member of several regional clusters from the following fields: i) biotechnology, chemistry, pharmacy (the Pomeranian Bio-Eco-Chemical Cluster), ii) maritime (Polish Maritime Cluster), iii) HVAC industry – air-conditioning, refrigeration and ventilation (KlimaPomerania), iv) information and communication technologies (Interizon Pomeranian ICT Cluster), v) civil engineering (Gdańsk Construction Cluster) and energy (Baltic Eco-Energy Cluster). Working with clusters, GUT participates in the organisation of joint conferences and events, the promotion of clusters and GUT activities in terms consistent with the action lines of a particular cluster. GUT was the initiator of Interizon Pomeranian ICT Cluster and is now its administrator. This cluster has now the special status of national key cluster.

6. OUTPUTS

UBC activities conducted within the GUT provide a wide range of different outputs. The university staff, professors, scientists and researchers are highly encouraged to commercialise their research results. A valuable part of the commercialisation that is mainly supported by the CKTT emphasises production, which should be the result of research processes and developed technology. There are currently **six spin-off companies which are the result of UBC:**

- ▶ NovaPUR – development and production of polyurethane foams from renewable raw materials;
- ▶ ChillID – production of intelligent label indicators providing information about the quality and length of the product life cycle; Argevide – a NOR-STA service platform which is the knowledge base about standard targets and requirements, the criteria for their evaluation and methods to meet them by an organisation;
- ▶ PeGie – promotion of the university sports brand and organisation of sports events;
- ▶ AssisTech – implementation of the C-Eye system: a fully integrated system to support the assessment of the state of consciousness of people suffering from any damage to the central nervous system;
- ▶ Detoxed Home – technology for manufacturing a test for the detection of active endocrine compounds (e.g. bisphenols) in the human body. The test results will be used to develop specific recommendations for the elimination of harmful substances from the environment of the person.

GUT has also undertaken a few large investment dedicated to UBC; for example, the Nanotechnology Centre, Laboratory of Innovative Electro Energy Technologies and Integration of Renewable Energy Sources, Engineer of the Future.

In the last decade, GUT has generated more than 250 patents, 200 R&D projects with national and international funds are being implemented, and within three years the university has signed 700 contracts with entrepreneurs².

The main output, however, is related to improved integration of UBC activities in the traditional university professional roles and development of a culture that supports UBC.

7. IMPACTS

The organisational changes which also led to new investments were very important for facilitating the cooperation of university research with external partners, primarily industrial partners although GUT also cooperates with other universities.

The number of projects with industry has risen significantly. Without industrial partners, research groups cannot apply for particular project funding and thus close connections with industry are needed to obtain funding for research. At the same time, improving the research infrastructure is very important to remain an attractive partner to industry.

Professors and senior researchers involved in projects with industry build their professional capacities, which results in up-to-date knowledge that is brought into the classroom. Having both theoretical and practical knowledge is also well appreciated by the students. The changed modes of teaching and learning which led to the increased practical orientation of study programmes provide students with broader knowledge that can be directly applied to respond to labour market needs, which has also resulted in graduates' higher employability.

The most visible projects in the university are also causing a lot of interest among university staff who are not involved directly, which leads to promotion of the general idea of cooperation with business.

UBC in GUT has also changed the 'entrepreneurship' culture in the region. On the one hand, it has brought awareness of entrepreneurship into education and, on the other hand, encouraged the industry sector to be more willing to engage in cooperation with the university in order to find new solutions.





Support & Influencing factors

8. SUPPORTING MECHANISMS

There are numerous mechanisms supporting UBC in GUT at different levels. One of GUT's main internal support mechanisms, is the CKTT, which effectively acts as an intermediary between the stakeholders mentioned above.

Through the strategic alignment of GUT's internal strategies towards the Polish national strategies, there is strong internal support towards UBC. The university strategy is in line with the main points of the new innovation strategy for Poland but also includes specific aspects of the university to provide a balance among commercialisation, research and education.

Implementation of the strategy included the re-organisation and establishment of units' entities dedicated to supporting UBC. The university established the CKTT which acts as an intermediary between university researchers and business. Support for cooperation with business is also given by the university's central administration by supporting faculties, professors and researchers who are willing to cooperate with business.

9. BARRIERS AND DRIVERS

The barriers to UBC lie in the differences between business people and researchers. Cooperation is sometimes difficult due to the lack of a common language. An example might be **a different understanding of the concept of "the finished project"**. The university often understands this as to develop a prototype, whereas business understands it as a technology ready for production.

Another considerable barrier is a different perspective between GUT and business on **time horizons**, whereby the researchers' time horizons are usually longer.

A barrier arising from legal regulations is linked to habilitation processes. Young researchers who are in the habilitation process, which can only be achieved by academic activities and achievements (scientific publications, teaching obligations etc.), are unwilling to cooperate with business. It is **not their priority to innovate, as this does not contribute to their habilitation**. Moreover, the older generations see practically-oriented activities as being less academically valuable.

Despite the willingness for cooperation from the business sector, business people sometimes find it difficult to **establish appropriate initial contacts** within the university, which is perceived as another barrier.

Even though GUT has had some large successful investments, which were also financially demanding, it still faces **financial barriers** due to **decreased national investments in R&D**. A financial contribution should also have been on the side of industry; however, there is a lack of willingness from industry to invest and take risks.

The main driver of UBC is the awareness that it is **impossible to conduct research development projects without partners from industry** who play an important role in such activities. Both the entrepreneurs and the university are increasingly aware that new technological developments and

innovative economy require joint projects in the university-business relationship. Research conducted at the university must **answer the market needs** and the projects must be **based on innovative research** that will be utilised by business.

10. FUTURE CHALLENGES

Many of the future challenges refer to improving the communication activities:

- ▶ **the establishment of an information centre** that will serve as a first contact point for entrepreneurs to access GUT staff;
- ▶ **the promotion of academic activities** and the identification of the most effective communication channels between GUT and business; and
- ▶ **communication with the wider public:** future students, public and professional schools, the regional political environment, the Ministry of Science and Higher Education etc.

Another challenge ahead is balancing and integrating the traditional role of the university to become more entrepreneurial and commercialisation related.

This includes enabling new structures in which it would be possible to make better co-existence of work between project managers, entrepreneurs, researchers and professors. This also includes development of new job positions with new roles. This goes along with a redefinition of the roles within structure of GUT with greater possibilities for the promotion of researchers without outstanding academic achievements but with vast practical knowledge that can be sold to business or further developed. It would be necessary to persuade "traditional" colleagues that, even if somebody is perhaps not the best academic, he/she might be very successful in practical projects, solving practical problems for entrepreneurs and industry. Another envisaged activity is the creation of interdisciplinary teams of professionals within centres.

Future challenges also include the establishment of channels for knowledge commercialisation through formal university structures, like a centre of technology, to attract GUT staff to commercialise within university structures, and not privately. In this context, UBC could also be enhanced by the professional staff in charge of preparing project applications based on academic ideas from the financial and administrative points of view. It will also be a great challenge to maintain the number of joint projects, which is also a prime indicator of successful UBC.

11. CONTEXT

UBC has also received strong support from the national policies and strategies, resulting inter alia in expectations of the general public to foster the cooperation between universities and business. GUT is actively involved in regional activities and has robust cooperation with the business sector, which is defined by its environmental features and characteristics (e.g. maritime). Economic conditions and the environment are much better than a few years ago. Entrepreneurs have started to appreciate the cooperation with universities and their strategies are also more open regarding university cooperation.

The university has good contacts with associations of employers and has its own association of employers called the University-Business Club, which has around 50 members. Club members are entrepreneurs, usually GUT alumni. By also being members of other external associations they serve as a good promotional body for the university.

The size of the university, one of the largest in Poland and the biggest in northern Poland, plays an important role in the regional environment and economy. Its geographical position beside the Baltic Sea plays an important role in the implementation of study programmes. Due to the size and location of the university it attracts high quality candidates for study, and because of the quality of research it also attracts the biggest companies in the region. This is especially true for companies in the ICT industry, which is well developed in the region.

12. KEY SUCCESS FACTORS

The main indicators confirming the success of UBC activities are the amount of money brought into the university – over €15m since 2013, the number of newly established companies - 6 spin-offs since 2013, the number of patents - more than 150 patents granted from 2013, the amount of research carried out in order of companies - more than 500 since 2014. etc.

UBC also enhances the graduates' employability. This is measured by both the university staff (career office) and government services.





Further Information

13. MONITORING AND EVALUATION

GUT authorities regularly analyse the most important parameters related to the transfer of technology and development of innovation at the university such as the number of: patent applications (national and international), innovative solutions, licenses granted, established spin-off and spin-out, projects and research carried out on behalf of companies, applications for grants for projects in the framework of scientific and industrial cooperation.

The analysis of these indicators allows them to control the performance and to correct any processes

14. SUSTAINABILITY MEASURES

The sustainability of the strategy is safeguarded by the university senate, which adopts and votes for the strategy, thereby preventing constant changes to be made by the university leadership.

In addition, the requirements of European funds envisage sustainability not only during the project's realisation phase, but also after the project funding ends. This encourages maintaining cooperation and connections with industry partners.

15. TRANSFERABILITY

The concept can be fairly easily transferred but has not received sufficient recognition by policy makers and higher education institutions in Poland and the EU because it was primarily dedicated to GUT and its community.

An important part of the process that would allow for its implementation beyond GUT, is to determine and implement the same, consistent targets by all entities and persons related to UBC. GUT internal policy, CKTT, SPV and all such units must be properly coordinated and clearly defined.

16. AWARDS AND RECOGNITION

The activities of GUT in support of UBC have received numerous awards. The ICT cluster supported by GUT received an award for being one of the most successful clusters in Poland. The ICT cluster has received special awards for the largest consortium, the biggest project, the most successful patent in monetary terms, the largest contract etc.

UBC also enjoys strong support from the regional industry sector among companies which are encouraged and willing to cooperate with the university.

Selected laboratories and study courses at GUT possess certificates confirming the quality of education and research. Most important examples are:

- ▶ Three certificates of Accreditation Commission for Technical Universities for the following fields of study: computer, biotechnology and Control Engineering;

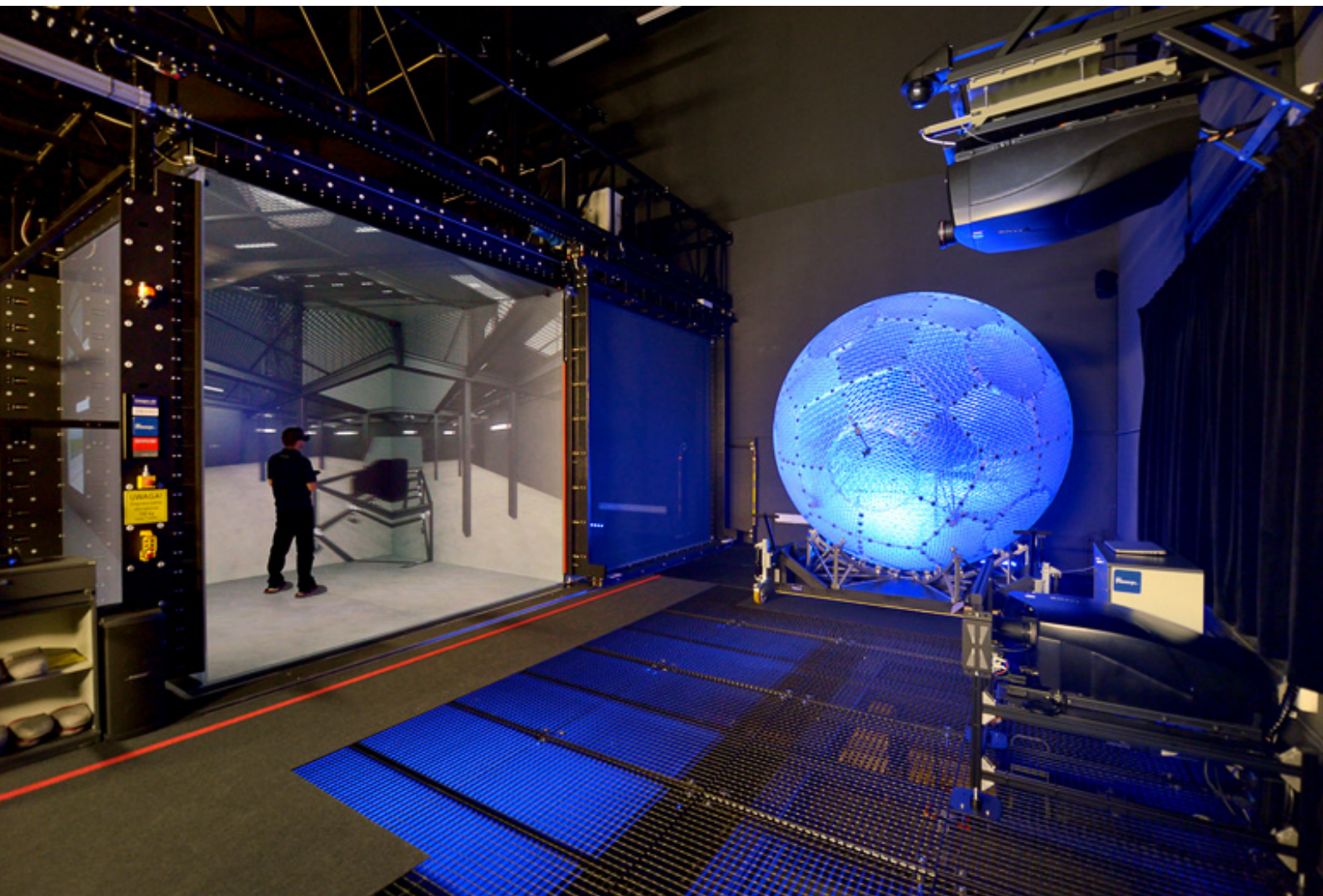
- ▶ Certificate of CUDA Teaching Center at the Faculty of Electronics, Telecommunications and Informatics for their involvement in the development of education in the field of parallel processing using CUDA technology;
- ▶ The world's first accreditation of Microsoft Modern Lab was awarded to the computer laboratory at the Faculty of Electronics, Telecommunications and Informatics at GUT;
- ▶ Certificate as part of Cadence Certified Lab Program was received by the Laboratory of Integrated and Programmable Circuits of the Chair of Microelectronic Systems of the Faculty of Electronics, Telecommunications and Informatics at GUT; and
- ▶ Materials Research Laboratory at the Faculty of Mechanical Engineering holds three certificates of recognition of the Polish Register of Shipping concerning, among others, research of metals, their properties, ultrasound research, etc. (source: GUT Facts and Figures).

Three clusters, which GUT is involved have been awarded the title of key clusters for development of the Pomerania region. These are: Pomeranian ICT Cluster, which also has been awarded national key cluster, Gdańsk Construction Cluster and Baltic Eco-Energy Cluster. (source: GUT Facts and Figures).

17. PUBLICATIONS AND ARTICLES

GUT Facts and Figures

<http://zie.pg.edu.pl/documents/10693/41771077/Facts%20and%20figures.pdf>



18. LINKS

Gdansk University of Technology <http://pg.edu.pl/en>

Strategy of GUT (in Polish) <http://pg.edu.pl/documents/10607/42d7ebe6-0cb5-4ec2-8955-4bff5063f587>

Centre for knowledge and technology transfer <http://ctwt.pg.edu.pl/en>

Excento <http://excento.pl>

19. CONTACT PERSON



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20. REFERENCES

¹ Strategy of GUT: <http://pg.edu.pl/documents/10607/42d7ebe6-0cb5-4ec2-8955-4bff5063f587>

² GUT Facts and Figures