RWTH AACHEN CAMPUS
INNOVATION FACTORY

Better. Faster. Leaner.

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Let's Go to Aachen
Start Innovating

Businesses get to implement innovations better, faster and leaner at the Innovation Factory. The unique ecosystem of RWTH Aachen Campus makes that possible. Academia and industry work together closely, which allows them to tap previously unimagined potential.

A Different Approach

The innovation process at the Innovation Factory begins with agility instead of the traditional creation of a technical and functional specifications document. Constructive trial and error methods shorten the route from the initial idea to the prototype and finally series production.

The RWTH Aachen Campus ecosystem offers businesses everything they need to create successful innovations. Experts configure the relevantly required competences. Individually or as part of a consortium, the protected spaces in the Innovation Factory environment promote innovation in all its forms – and that quickly.

Open Innovation

Anyone can take this alternative route to innovation. Visitors are welcome to see for themselves, what potential Aachen holds for their business and can experience the local ecosystem and exciting flagship projects first hand: a low-cost electric car, the autonomous People Mover or a small electro-hybrid aircraft, the Silent Air Taxi.

Prof. Dr. Günther Schuh
Initiator of the Innovation Factory
Managing Director of RWTH Aachen Campus GmbH
Executive Director of the Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen University

Growing Ecosystem
The RWTH Aachen Campus

The Innovation Factory is based on the ecosystem RWTH Aachen Campus, which has produced a fruitful collaboration between academia and industry. The campus is globally outstanding in its professional and spatial dimension.

Long Research Tradition

RWTH Aachen University was founded by the German emperor Wilhelm I of Prussia in 1870 as a polytechnic university to significantly drive industrialization.

In the early 1950s, the number of students began to grow from initially 1,000 to currently over 45,000 and the upward trend is continuing. RWTH Aachen is one of the world's leading technical universities and renowned specifically for its outstanding engineering expertise. In addition to the 260 institutes at RWTH Aachen, there are numerous external research institutes represented on campus today.

Successful Industry Cooperation

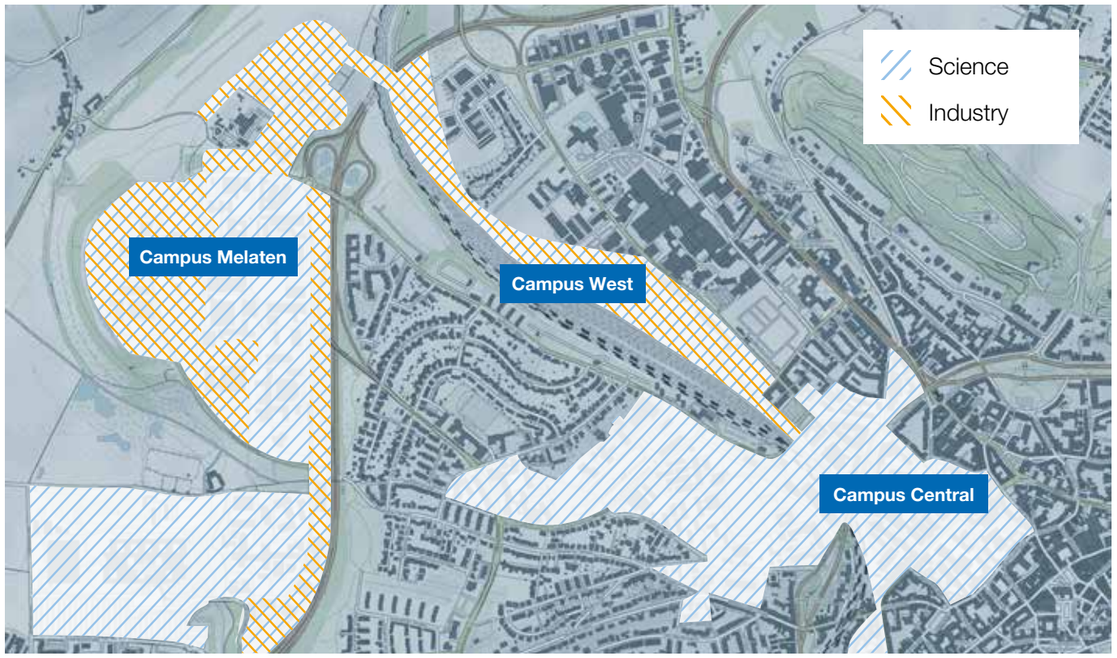
The high regard in which RWTH Aachen is held, is partly due to intensive cooperative partnerships with the industry for many years. As a result of these successes, some first large-scale institutes began leaving the city center in the mid-1970s to relocate to the university expansion area Melaten. By the mid-1980s, the university hospital moved to its new premises in the immediate vicinity. In 2009, the new RWTH Aachen Campus laid the foundation for today's development. Growing numbers of industry businesses seek space for a presence on campus and private investors build the necessary, state-of-the-art premises on public land to accommodate them.

Space, Research, Diversity

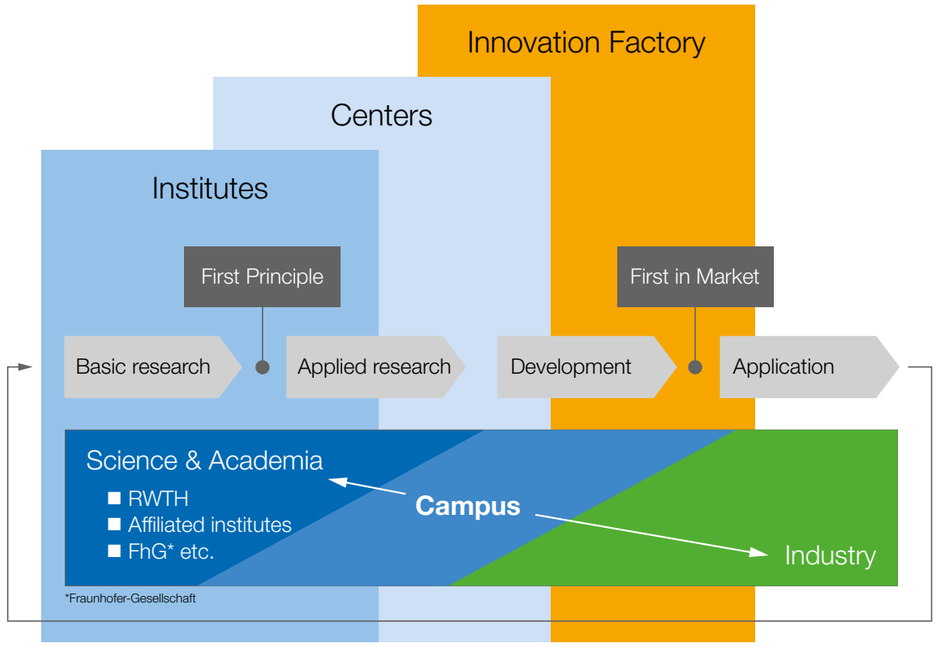
In terms of space, the initiative is based on the expansion areas Campus Melaten and Campus West. In terms of content, the scope of work represented at RWTH Aachen far surpass the scope of any traditional technical university. Interdisciplinary teams of academics work closely with industry consortia on groundbreaking and visionary solution approaches in the newly created centers to answer the core questions of our time with regard to the future.

But the concept of the Innovation Factory goes one step further: Its central focus is on a better, faster and leaner implementation of innovation.

There are currently more than 360 companies active on RWTH Aachen Campus, and the numbers continue to grow. These include multinationals, hidden champions from the mid-size segment, right up to highly specialized small businesses and startups. More and more of these businesses create their own incubators and accelerators, whose growth is powered by the recruitment of first rate graduates from Aachen universities.



Academia and industry are creating an ecosystem on RWTH Aachen Campus



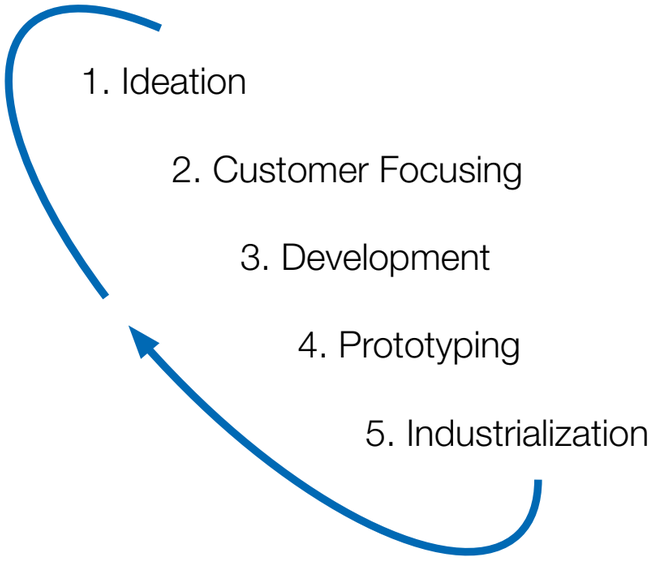
The Innovation Factory rounds off the campus concept and bridges the gap between academia and industry

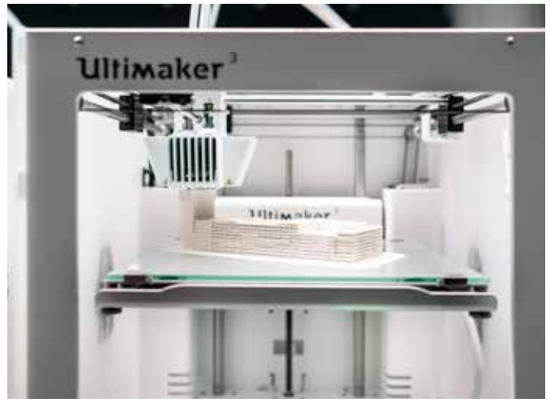
Innovation – Better, Faster, Leaner

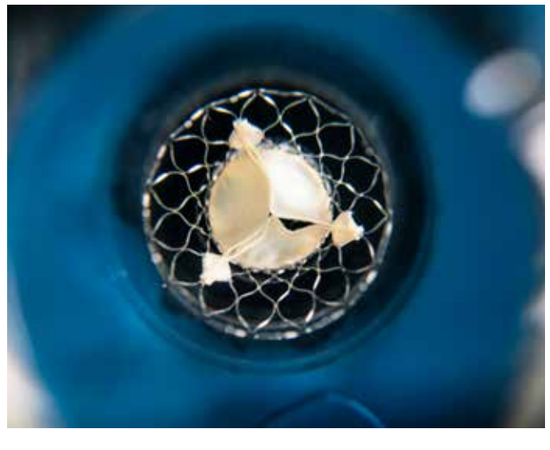
Factors for Success

Structured and target oriented: The Innovation Factory's factors for success are based on the five stages of the innovation process.

On RWTH Aachen Campus, businesses find everything needed for successful innovation in each of these stages. The experts at the Innovation Factory are the first point of contact when it comes to configuring the cumulative competences of its ecosystem. Supported by interdisciplinary know-how, business project teams find pioneering solutions far off the beaten track in a new and inspiring environment.







1. Ideation
Thinking outside the Box

Freedom, openness, inspiration: The Innovation Factory provides all the prerequisites for creative ideation.

Questioning the Status Quo

Creative processes need space. That is why the Innovation Factory is the perfect place – far away from restrictive business structures and daily routine. Developer teams are encouraged to think productively and outside the box. Ideas are not immediately tested for feasibility – instead, thoughts and ideas are given the opportunity to fly.

The actual RWTH Aachen Campus environment provokes chance meetings and stimulates spontaneity in interactions. Unplanned encounters often provide the seed that grow new and creative ideas. Curiosity, interest in exchanging ideas and the opportunity to discuss topics of common interest – these are just some of the factors that makes the ecosystem of RWTH Aachen Campus uniquely special.

Developing Creative Ideas and Solutions

Bringing together specific areas of expertise and looking beyond the constraints of individual disciplines: That is the type of interplay, where tremendous solution potential is created. Challenges are analyzed and examined jointly and knowledge is shared with mutual trust.

Moderators and coaches at the Innovation Factory support teams in their efforts to open their minds for new ideas far beyond established concepts. There is no right or wrong – and there certainly aren't any bad ideas. Disruptive innovations are sometimes the result of far-fetched ideas.

2. Customer Focusing

Walking in the Customer's Shoes

Success is that which wins over the customer. That is why the viewpoint of the target group is at the center of all considerations right from the start.

Recognizing Needs

A new product must satisfy a demand to become successful in the market. That is why developers at the Innovation Factory think from the standpoint of the customer. The user story answers the following questions: What are our customer's objectives? What are their activities? What are the customer-side criteria with regard to requirement and acceptance? The user story is consciously kept short and concise and generally doesn't include more than two sentences.

Customer Feedback

Another unique feature of the Innovation Factory is its quick access to actual customer feedback. Initial user experiences are collected by way of acceptance tests using prototypes close to series production. The results are fed back immediately into further development. Such authentic data contributes significantly to the positive reception of the final product in the market and to creating an emotional connection.

3. Development
The Agile Route to Success

During the next stage, the team derives development challenges from the user story. The agile process follows two basic principles.

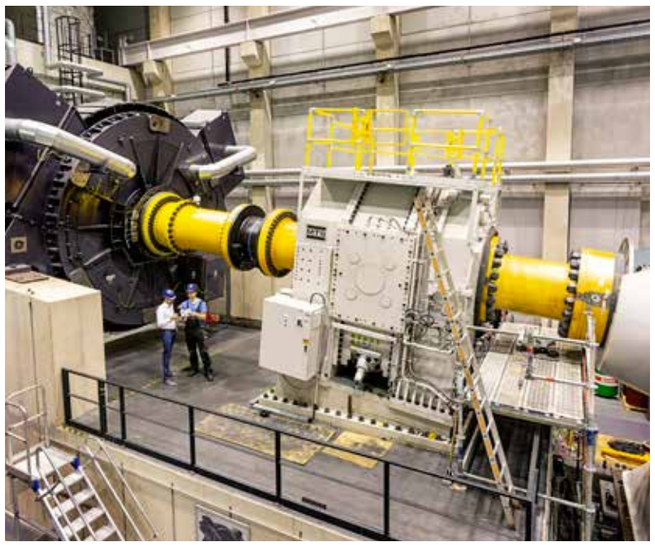
Prioritization of the Core Function

All previously defined customer requirements are translated into technical functions. The main focus here is on essential core functions that must be prioritized. The overall system is not a main concern at the start; instead, each of the core functions are processed and developed in isolation. This may involve a parallel development of multiple approaches to maximize results early on and find the best procedure to use.

Trial and Error

Teams use a trial and error process for dynamic process in short development cycles. An early failure promotes the finding of new and better approaches based on the initial results.

RWTH Aachen Campus offers all the means and the infrastructure needed to get valuable results before any physical prototypes are produced: Software simulations, virtual rooms and augmented reality transform abstract concepts into experiences that assist in the decision of if and how an idea should be developed further.



4. Prototyping
Touchable Ideas

Requirements for specific technologies increase as the innovation process progresses. While a simple workshop may have been sufficient at the start, more complex production and testing facilities will be needed later.

Comprehensive Infrastructure

The ecosystem at the disposal of the Innovation Factory makes available virtually all relevant machines, technologies and test procedures. Developers have readily accessible capacities and competent experts at their fingertips. Everything needed to create functional or design prototypes – be it hardware or software competences – is provided.

Minimum Viable Products

Customers can only give meaningful feedback for product ideas they can touch and use. Since developers and customers often differ in their abstractive ability, a "meeting of the minds" is needed. That is the purpose of Minimum Viable Products (MVPs), which demonstrate the relevant core functionalities. MVPs usually bundle multiple approaches (so-called "increments") and convey an initial manifestation of an idea.

Initial testing of MVPs is done on site within the team, with various idea approaches. This method of quick learning and sharing of findings drives the team forward. MVPs are also used for the acceptance tests described earlier under "Customer focus".

5. Industrialization

The Step Towards Series Production

Markets differ and customers often need differing product and service variants. That increases complexity – for production and installation and also for procurement and storage.

Variety Made Simple

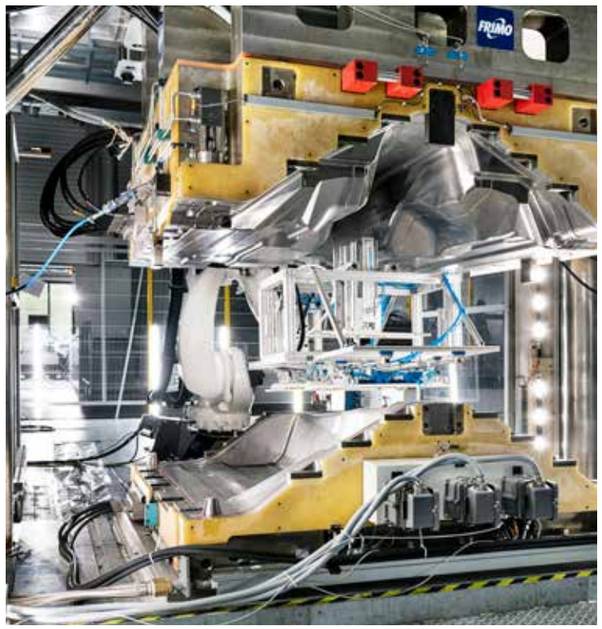
That is where complexity management comes to the fore. It aims to utilize standards in the company-internal value chain for as long as possible. Ideally, variants are created as a final step. To do so, the product structure must be defined correctly.

Professional Scaling

Production technologies and therefore the required machine pool is defined by the envisaged batch sizes. The higher that number, the more capital-intensive the production facility. The experts on RWTH Aachen Campus are highly experienced in configuring machine parks.

Factory planning is more than just the outer shell – it is also the layout of the production facility. The experts in Aachen work with the developer team on the creation of individual series production solutions in accordance with the lean production method.

The transition from prototype to series production sometimes takes more than a single step. Launch management experts at the Innovation Factory assist in coping with intermediate steps.



Lighthouse Project e.GO Life

Electric City Car

e.GO Life is a compact electric car for urban traffic with a competitive total cost of ownership compared to traditional combustion engine vehicles.

Affordable Second Car

This second lighthouse project after the electric StreetScooter once again demonstrates the electromobility competence available in Aachen and the success of the Innovation Factory. e.GO Life specifically targets the small batch segment for second and third vehicles. Wherever possible, its construction utilizes components readily available from automotive suppliers to minimize costly proprietary developments.

Low-Cost and Safe

The space frame of the e.GO Life comes with thermoplast paneling, which keeps the necessary production facility investment at a moderate level. Discussions with customers have shown that passive and active safety are important acceptance criteria. e.GO Life effortlessly fulfills both those criteria.

Series production of the vehicle is done at the newly constructed factory in the eastern part of Aachen and addresses all challenges posed by the high-wage country Germany.

Lighthouse Project e.GO Mover

Autonomous Mobility Platform

Inner cities in particular face challenges from stricter laws on air pollution and increasing traffic density.

Clean Solution

The European Union is about to sue Germany for non-compliance with statutory requirements. German administrative courts are asserting pressure on regional authorities to come up with meaningful measures to fight particulate pollution.

That is where the e.GO Mover comes into play, a universally expandable and deployable electric mini bus that can be equipped for local public transport, as well as for private and commercial cargo transport duties. It will be gradually equipped with travel assist functions up to level 4, which will no longer require a human driver. This kind of automation with parallel networking will create completely new on-demand mobility solutions for the future and will – particularly in urban high-traffic areas – play an important role as an eco-friendly traffic medium.

Teamwork for Technical Progress

e.GO Mover is developed and produced in a joint venture of e.GO Mobile AG and ZF Friedrichshafen AG in Aachen. ZF provides the necessary sensors, ZF ProAI as a central computing and control unit, the electric motor, as well as other components like axles, brakes and the steering unit.

e.GO Digital GmbH, the digitalization business unit of e.GO Mobile AG, identifies digitalization potential and develops relevant data-based services in the form of successful industry apps.

Lighthouse Project Silent Air Taxi

Small Electro-Hybrid Aircraft

Mobility plays a central role in our society – professionally as well as privately. Individual transport, which still mainly means an own car, continues to grow in importance.

Mobility of the near Future

Individual mobility and public transport on the ground and in the air – especially in urban areas – is quickly reaching its limits. The society's need for flexible, as well as affordable mobility increases in a way that goes beyond the abilities of existing traffic media like cars, trains and charter flights.

The Silent Air Taxi will relieve the strain on key public and private transport means, while at the same time shortening individual travel times. The developers are on the brink of realizing their vision of a marketable product in creating a quiet and low-cost small aircraft for the medium altitude airspace with a required range of 500 km.

The aim here is to guarantee efficient and low-cost batch productions up to 1,000 units of the small aircraft to ensure market penetration.

Acceleration

The Innovation Factory – in the Fast Lane

The product and service development of businesses gets the wherewithal to change into the overtaking lane at the Innovation Factory. The new route towards fast and lean solutions is just a phone call away.

Aachen Is Open to Everyone

A good conversation – as with so many things in life – is the best way to start getting active at the Innovation Factory. We invite anyone interested to RWTH Aachen Campus to get a personal impression of its unique ecosystem. Once you have been there, you will be able to answer many questions yourself.

And if you want to give your project a flying start at the Innovation Factory and decide to send a developer team to Aachen, you will know very quickly that you have made the right decision.

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