Bridging Management and Technology

TUM School of Management
Strategy 2021

Bridging Management and Technology
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Message from the Dean

Welcome!

Our mission at TUM School of Management has always been to bridge the divide between management and technology. Since the foundation of TUM School of Management in 2002, we have done this in a number of pioneering ways. As a consequence, we have reached an enviable reputation as one of the leading business schools in Germany. This reflects an amazing development of scholarship as well as education in a rather short timeframe. Although being one of the younger business schools in Germany, we have quickly reached the top of prestigious rankings for both research and teaching.

Our research pushes at boundaries. The cutting-edge work done by our researchers combines state-of-the-art knowledge of modern entrepreneurship with thought leadership in a wide range of areas relating to management, engineering and the natural and life sciences. Yet we remain relevant for business. TUM School of Management is a natural partner for both business and research. Our Advisory Boards and our continuously growing network of corporate partners play key roles here, bringing together leading figures from the corporate world, academia and society to advise the school on strategic matters and to maintain promising cooperations in research, teaching and career issues.

Our current situation provides an outstanding base upon which we strive to move the school into a new era of excellence. This unique combination means that we attract outstanding students and academics from all over the world who contribute to our international standing and reinforce our global perspective.

The new strategic plan pursues great ambition. Building on the school’s areas of excellence we aim to become one of Europe’s leading management schools at the interface to engineering and science, contributing to solutions for grand societal challenges.

This strategy paper owes a lot to all participating parties without whom our vision and various related actions planned for the future would not have been possible. Students, as well as graduates, industry partners, directors, faculty and strategic advisors were involved in developing the new strategic plan. We thank everyone for providing important input to another pioneering challenge!

We would enjoy seeing the enthusiasm, commitment and will to work together that led to the development of our 2021 strategy rewarded by its successful implementation. Having TUM School of Management ranked as one of the best European business schools in 2021 would be the peak of our work!

Prof. Dr. Gunther Friedl
Dean of TUM School of Management

Vision

To become one of Europe’s leading management schools at the interface to engineering and science, contributing to solutions for grand societal challenges.

Mission

Grounded in TUM’s technological and entrepreneurial ecosystem, TUM School of Management educates responsible talent and pursues relevant research to advance innovation-based businesses and societies in Germany, Europe and the world.
Values

Responsibility and Integrity
We conduct research in line with the highest scientific and ethical standards and are committed to progress and innovation for improving people’s lives. We teach general management skills with an emphasis on technology, and in doing so, advocate the United Nations’ sustainability values of freedom, equality, solidarity, tolerance, respect for nature, and shared responsibility.

Passion for Excellence
We strive for excellence in our areas of research and publish our findings in order to create impact. We provide our students at all levels with a sound scientific education, not only to facilitate their starts in careers in business or in science, but also to improve their critical thinking so that they act responsibly in relation to society.

Entrepreneurial Attitude
We research entrepreneurship and innovation and integrate the results into the education of our students at all levels in order to enable our students to think and act entrepreneurially. We encourage our TUM colleagues, students, and doctoral candidates to found growth-oriented start-ups, and facilitate their successful development.

Curiosity and Openness
We encourage research beyond disciplinary, institutional, and national borders in order to open up new perspectives and generate novel research findings and ways to approach management practices. We develop talented individuals irrespective of gender, nationality, religion or belief, disability, age, or sexual orientation, and are determined to learn from our students’ cultures, experiences, and opinions.

Collegiality and Gemütlichkeit
We foster a climate of mutual interaction, help, and collaboration among students, faculty, and administrative staff. We cultivate an attitude of Gemütlichkeit – the Bavarian way of life – and a warm and friendly atmosphere within the school.
Executive Summary

TUM School of Management was founded in 2002 as the 12th of now 14 schools within the Technical University of Munich. Ever since its founding, our unique value proposition has been to pursue research and teaching at the interface of management and engineering or natural or life sciences.

Our proximity to other disciplines at TUM such as engineering and the natural or life sciences allows us to address technology-oriented research questions relating to management that would hardly be possible to pursue without the environment of a technical university. Currently, for instance, we are exploring markets for technology, identifying optimal dairy products and processing technologies, figuring out incentives for energy-efficient behavior at the workplace, conducting consumer analyses and studies on consumers' willingness to participate in community energy, assessing how digitalization influences work design, and documenting the individual and social consequences of demographic change. With their memberships in academies and board of directors, our professors have a major impact on important decisions in science, business, and society.

Based on our interdisciplinary approach to teaching, we educate future managers who speak the language of management experts as well as engineers and scientists. Many of these students are recruited by the numerous technology-based global players and small and medium-sized enterprises in the Munich metropolitan area. Grounded in the entrepreneurial environment of TUM under the strategic framework of TUM – The Entrepreneurial University, a considerable number of our graduates create start-ups in technology-based industries.

Many of our former participants in executive education now work in leading positions. We have prepared companies to face future challenges and helped them introduce new and modern types of leadership. We have developed new standards in executive education, such as the Certified Private Equity Analyst (CPEA).

In only ten years, TUM School of Management has achieved leading positions in national rankings such as the Handelsblatt ranking or the CHE ranking. Complementing these successes, our strategy of Bridging Management and Technology now aims to generate enhanced visibility at an international level. Our current efforts in research and teaching are accredited by the following institutions:

- EPAS: Bachelor’s in Management and Technology
- AMBA: EMBA, EMBA in Innovation and Business Creation, EMBA in Business and IT

In national rankings, we have achieved the following results:

- Top positions in the CHE Ranking for academic programs (Bachelor’s and Master’s in Management and Technology)
- Best German Business School in the Handelsblatt ranking for research
Societal Challenges

In the past five years, we have focused on growth and, more recently, the internationalization of teaching and research activities. In the next five years, we will face the opportunities and challenges of a rapidly changing world. Taking into account our observations in research, teaching and learning as well as executive education, we have identified three major social transformations that are most relevant for the school’s future activities:

1. Digitalization
2. UN Sustainable Development Goals (SDG)
3. Globalization

Digitalization
The influence of digital transformation is already felt in many areas of business and society, reflected in buzzwords like “Industry 4.0,” smart services and data, value chain disruptions and cloud computing. These developments are expected to lead to more efficiency, greater flexibility, and increased productivity, but they will also bring about a fundamental change in business models and processes. The transforming power of digitalization creates major challenges for almost all branches of industry and, at the same time, opens up new opportunities and prospects. Since Munich is the No. 1 location for information and communications technology (ICT) in Europe and the third-strongest location for ICT business in the world, local firms will profit accordingly. At the same time, global companies like Accenture point out that digitalization can also be a key tool for achieving the goals that the United Nations set out in its declaration “Transforming our world: the 2030 Agenda for Sustainable Development.” Digital solutions can reach people irrespective of location or income bracket as long as those people are online. Further, digitalization opens up new prospects for society: digital education and science as well as digital living environments create many new possibilities in the worlds of science and work.

“The digital transformation is one of the largest and most complex challenges that companies are facing today, and it will become the key strategic thrust for most CEOs. It also is a key task for the future of Bavaria. To stay relevant, companies, governments and individuals need to know where business technology is heading to, and make sure to stay on top of these sometimes rapidly shifting digital developments and trends.”
UN Sustainable Development Goals (SDG)
With the adoption of the 2030 Agenda for Sustainable Development on September 25, 2015, at the UN summit in New York, UN member nations decided on a pact on the world’s future. The 17 development goals in the agenda link the principle of sustainability with economic, ecological, and social development. The goals address all countries in the international community.

The 2030 Agenda aims to

- end poverty and hunger and reduce inequality;
- empower people, ensure gender equality, and good and healthy lives for all;
- promote prosperity for all and make lifestyles sustainable worldwide;
- respect the planet’s ecological limits (combat climate change, protect ecosystems and use them sustainably);
- protect human rights (ensure peace, good governance, and access to justice); and
- build a global partnership.

Participants who worked on the 2030 Agenda believe that “it is one of the most ambitious endeavors of our times.” Besides governments, civil society, and industry, academia and the general public are also asked to work together to achieve these goals.

Over the next few years, the automotive industry will change significantly. Future mobility will be autonomous, connected, electrified and shared. In this context, long-term thinking and responsible leadership will continue to be the foundation of a company’s success. It is all about creating sustainable solutions for the customer in alignment with the needs of our environment and society.
Globalization

Germany is an open economy with low trade barriers. In recent years, Germany has particularly benefited from the advantages of global markets. The Cologne Institute for Economic Research observed in March 2015 that “Germany is clearly one of globalization’s winners” and attested that just a few established, industrialized countries have had comparable success at turning globalization to their advantage. This also applies to the Bavarian economy, where exports and imports increased significantly by about 90% from 2000 through 2015, whereas the nominal GDP increased by just 49% over the same period as reported by the vbw (Bavarian Industry Association). The association points out that globalization has many positive effects on the Bavarian economy and strongly recommends making use of the advantages offered by globalization. These globalization effects will be reinforced by digitalization as it brings people, goods, and services together faster than ever before.

Moreover, globalization is felt especially in Munich, the capital of Bavaria. In 2015, Munich, the third-largest city in Germany, had 1.5 million inhabitants. The proportion of foreign nationals here – 27.6% – is one of the highest in Germany. People from a total of 180 countries live in Munich. Moreover, in 2015 the city registered 14.1 million overnight stays, 7 million of which came from abroad, mostly from the United States, Arab countries and Asia.

Further, the student body worldwide is becoming more and more internationally mobile. The OECD has documented that in 2013, more than 4 million students were enrolled in tertiary education outside their country of citizenship. Asian students – mainly from China, followed by India – represent 53% of international students enrolled worldwide. In absolute terms, the United States hosted the largest number of all international students (19% of the total), followed by the United Kingdom (10%), Australia and France (both 6%), Germany (5%) and Canada and Japan (both 3%). Together they received more than 50% of all international students worldwide.

As the pace of globalization continues to increase, new opportunities and challenges will arise for leaders and communities. One key to success in the global business network is to think globally and act locally. Global leaders can only play key roles if they are able to build that bridge.
**SWOT**

Bearing in mind our strategy slogan “Bridging Management and Technology”, we identified the following strengths, weaknesses, opportunities and threats:

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<tr>
<th>Strengths</th>
<th>Weaknesses</th>
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<tbody>
<tr>
<td>• Unique interdisciplinary positioning (management, technology and sciences)</td>
<td>• Being part of a public university limits the speed of decision-making and, in part, degrees of freedom</td>
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<tr>
<td>• Faculty with dedication to research and teaching</td>
<td>• Insufficient influx of applications from top students, doctoral candidates, postdocs, and faculty from abroad</td>
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<tr>
<td>• Strong international research and teaching network</td>
<td>• Gap between research (international, English) and teaching (still partly in German)</td>
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<tr>
<td>• Strong corporate network</td>
<td>• Large student cohorts</td>
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<tr>
<td>• Strong profile in entrepreneurship and innovation, strong center for innovation and business creation (UnternehmerTUM)</td>
<td>• Small alumni network</td>
</tr>
<tr>
<td>• Culture of change and modernization (new faculty tenure track, new programs)</td>
<td>• Very young school with an insufficient profile nationally and especially internationally</td>
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<tr>
<td>• Strong shared identity among faculty, students, and management</td>
<td>• Small alumni network</td>
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<table>
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<tr>
<th>Opportunities</th>
<th>Threats</th>
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<tr>
<td>• An “Excellence University” school, the Technical University of Munich’s strong brand</td>
<td>• Chilling effect through high cost of living in the Munich region</td>
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<td>• High attractiveness of Munich metropolitan region for working and living (industry, cultural institutions, recreational value) as well as internationally prominent science location (universities, Max Planck, Helmholtz, Fraunhofer institutes)</td>
<td>• The hiring process is heavily regulated and pay for top faculty is low compared with international standards</td>
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<td>• Bavaria’s progressive, reliable technology policy</td>
<td>• Increasing competition from international schools in Munich in particular in executive education</td>
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<tr>
<td>• Potential as one of Europe’s leading entrepreneurial universities</td>
<td>• Large student cohorts</td>
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Strategic Objectives

Digitalization, the UN Sustainable Development Goals, and globalization are the major transformational trends we want to address within the next five years. We strive to apply our research competencies to contribute to grand societal challenges. We want to educate our students to meet the challenges and threats posed by the digital transformation and make them more sensitive to issues related to sustainable development. We aim to exploit on a massive scale the possibilities digitalization offers for research, teaching, and learning. Consistent with these ambitions, we will continue, and even increase, our internationalization efforts.

We therefore strive to achieve the following strategic objectives:

I A strong research agenda with impact on the grand societal challenges
II An attractive and distinct portfolio of programs that addresses the interface of management and technology
III Careful, high-quality preparation of students for the future demands of societies and organizations
IV A further internationalization of TUM School of Management with respect to students, research, and outreach
V A strong profile for TUM School of Management in the international community

We aim to reach the following quantitative objectives:

- 4,600 (4,196) students
- 2,200 (2,012) B.Sc. | 2,000 (2,020) M.Sc. | 400 (164) Executive M.Sc./MBA
- 300 (250) scientific staff members (professors, postdocs, research and teaching assistants)
- 25% (12%) international students
- 2021 budget: €40.2 (32.5) million
  €4.0 (3.5) million third-party funding | €6.2 (3.0) million executive education | €30.0 (26.0) million state funded
- 2021: 25 (about 15) FT 50 publications annually
- 2021: 75 (45) corporate partners:
  advanced: 50 | premium: 20 | platinum: five
- 100 (86) partnerships with international universities

In italics: Facts and figures as of 2015
A Strong Research Agenda with Impact on Grand Societal Challenges

Set up New Interdisciplinary Centers
Research that contributes to finding solutions to grand societal challenges is a key aspect of our mission and vision. To follow this mission, we increasingly engage in interdisciplinary research projects, capturing different departments within the school and/or departments of other TUM schools. We will grow existing (Entrepreneurship Research Institute, Center for Entrepreneurial and Financial Studies, Center for Energy Markets, and Center for Life Sciences and Management) and establish new interdisciplinary centers (Center for Health Management and Center for Operations Research). Furthermore, we aim to establish a collaboration with the Leonard Obermeyer Center, an interdisciplinary center for digital construction.
Figure 2: Planned program portfolio at TUM School of Management through 2021

Executive Master
- Executive MBA (MBA)
- Executive MBA in Business & IT (MBA)
- Executive MBA in Innovation & Business Creation (MBA)

Several years of work experience

Professional Master
- Master in Management & Innovation (M.Sc.) – in development –
- Master in Supply Chain Management (M.Sc.) – planned –
- Master in Finance & Information Management (M.Sc.) / (Elite graduate program) – planned –

One year of work experience

Pre-experience Master
- Master in Management & Technology (M.Sc.) TUM-BWL
- Master in Consumer Affairs (M.Sc.)
- Master in Management (M.Sc.)

Bachelor
- Bachelor in Management & Technology (B.Sc.) TUM-BWL

New programs in the Bachelor’s and Master’s Program Management & Technology:
- Health Sciences
- Renewable Resources at Campus Straubing

Preferably, research projects should be realized within the frameworks of:
- The Excellence Initiative
- The German Research Foundation (Deutsche Forschungsgemeinschaft, DFG) with funding totaling an average of €750,000 per year
- Horizon 2020 (the EU Framework Programme for Research and Innovation) with a total grant volume of about €750,000 per year
- The German Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung, BMBF) with annual funding totaling about €500,000
- Other federal or state ministries with another €500,000 per year
- Industrial research with annual funding worth €1 million

Increase the Hiring of Faculty in Areas Reflecting Grand Societal Challenges

Our hiring policy is aligned with our focus on interdisciplinarity and addressing grand societal challenges. For this reason, we strive to hire faculty in the areas of operations and supply chain management (strengthening the new Center for Operations Research), agricultural and food business economics as well as environmental economics and agricultural policy (helping to get the new Center for Life Sciences and Management off the ground), digital finance as well digital marketing, digital innovation and law of digital goods, digital commerce and data protection (supporting the Center for Digital Technology and Management), management of demographic change (as part of the new Center of Health Management), and construction management (to aid the new Center for Digital Construction). With these nine new professorships, we will increase the number of academic staff from the current 250 to 300 by 2021 (professors, postdocs, and research and teaching assistants).

An Attractive and Distinct Portfolio of Programs that Addresses the Interface of Management and Technology

Expand our Existing Programs into Master’s Programs for Young Professionals

Our program portfolio covers an adequate amount of programs at the bachelor, pre-experience master, and executive MBA (EMBA) level. Currently, we do not yet offer any post-experience programs for young professionals with less experience than the typical EMBA student. To fill this gap, we are planning to introduce three young professional programs in collaboration with various international academic and business partners within the next five years. The following three programs will be highly specialized and will be taught in small cohorts:
- The Master in Management and Innovation is a double-degree program with HEC Paris and other international partners worldwide.
- The Master in Supply Chain Management will also be designed as a double-degree program and will focus on operations and supply chain management trends.
- We plan to take the lead by offering a second cohort in the Bavarian elite graduate program for the Master in Finance and Information.
We also plan to further expand our distance-learning formats by 2021. The planned technology specialization Renewable Resources will be established as a pilot and implemented as a separate track in the bachelor’s and master’s degree program Management and Technology. The track will be hosted by the Straubing Campus for Renewable Resources. Overall, we expect an average 4,600 students each year as well as annual revenues from our fee-based programs of €5.0 million by 2021.

Extend Tailored Training Formats for Globally Active Companies
For globally active companies located in Munich, we plan to offer programs that address the latest (technological or technology-driven) trends and provide solutions to these challenges that are inspired by TUM’s research activities. These programs can be offered in customized as well as standardized formats depending on the needs of the requesting companies. Our lecturers will be trained to deal with specific customer expectations, especially in the field of digitalization. We expect to earn annual revenues of €1.15 million from these programs by 2021.

Careful, High-Quality Preparation of Students for the Future Demands of Societies and Organizations

Achieve Better Teaching and Learning Results by Exploiting Technology-Enhanced Learning
We aim to implement more technology-enhanced learning (TEL) formats in our bachelor’s, master’s and EMBA degree programs to help our students gain a better and deeper understanding of the specific topics as well as support those unable to attend lectures. We will not only arrange informational events about the tools available, but we will also issue biannual requests for proposals to encourage the efforts of our lecturers. Besides improving classroom teaching and learning, we will make use of TEL to combine and integrate topics from various lectures.

Promote Responsible Engagement to Educate Thoughtful Leaders by Revising Teaching and Learning Formats
We want to provide our students with a set of competencies and skills we deem essential for their future careers as thoughtful leaders. We will expand our teaching formats in the bachelor’s and master’s degree programs to anchor interdisciplinary and international content as well as practical and social engagement in the curriculum. Research from our interdisciplinary centers dealing with grand societal challenges will be more strongly reflected in teaching. Furthermore, we will continue to develop our recently launched Case Writing Center, which specializes in cases at the interface of management and technology. We will further sensitize our students to produce good scientific work by asking them to sign a code of conduct. We will offer incentives and promote involvement in social projects, especially overseas. In our executive education programs, we will continue to include the latest research findings and focus on responsible and sustainable leadership.
Further Internationalization of TUM School of Management with Respect to Students, Research, and Outreach

Strengthen the International Character of our Faculty
We will continue to establish a more international environment within the school. When hiring new faculty, we will strongly focus on high-potential candidates from abroad. By 2021, 50% of our newly hired professors should be from abroad. Headhunting will take place at international conferences and through networking. For this reason we will promote more international research partnerships and increase the number of international researchers invited to the school. In addition, we aim to internationalize our doctorate program; to do this, we will expand the mobilization budget for our graduate school. International guest researchers will also teach more regularly as visiting lecturers in the doctoral program at TUM School of Management. We will establish a research excellence program that offers access to additional funding for international activities. By 2021, 25% of doctoral candidates should have spent some time abroad (at least four weeks) for research, and the number of doctoral students from abroad should increase from 15% to 20%.

Further Internationalize our Programs
We will further expand the inclusion of international content in the curriculum and anchor more international guest lecturers in course delivery from the current number of about nine per year to approximately 15 every year by 2021. We aim to attract 20% of a cohort from abroad for the bachelor’s program and 40% of a cohort from abroad for the pre-experience master’s programs. With regard to incoming exchange students from abroad, we will offer more places and aim to enhance our attractiveness for exchange students by offering selected modules in semester halves and exploring possibilities to provide more affordable accommodations. Furthermore, a new summer school will enable an intensive exchange of German students and students from abroad.

We plan to continue expanding the number of foreign placements available for our students from the current 348 places at 86 partner universities to about 400 places at 100 partner universities by 2021. We will increase the number of (joint) degree programs from the current four to six. Furthermore, we will expand the number of foreign internships, e.g., global internship programs with companies, global internships by completing project studies, and final theses or volunteering (e.g., AIESEC).

A Strong Profile for TUM School of Management in the International Community

Increase the International Visibility of TUM School of Management in the International Academic and Corporate Worlds
We aim to increase our efforts to become more visible within the international research community. To achieve this, we will continue to strive for peer-reviewed publications listed in FT 50. By 2021, we aim to publish an average of 25 articles annually in FT 50. Furthermore, we will make substantial efforts to apply for reputable grants and funding programs as well as provide our own research award for excellent research. We will increase the number of our strategic partnerships that are similar to EUROTECH. We will make significant use of articles, videos, and various communication channels to generate greater visibility and impact for our research results. We will encourage our colleagues to organize international scientific events. By 2021, we aim to organize about three of these research conferences per year. We will nominate deans of prominent international business schools to the TUM Advisory Board.

With regard to our corporate connections, we acknowledge that our strategy should gain more comprehensiveness and coherence in the future. For this reason, we will establish a corporate connections unit on the administrative level that deals with all corporate matters. We will support this strategy through a one-face-to-the-customer and a 360-degree approach. This information will enable us to design attractive cooperation packages for companies. We will extend our current school’s network of corporate partners from 43 in 2015 to 75 by 2021. New corporate partners will be recruited with a focus on internationally operating and foreign firms.

Position TUM School of Management as an Attractive Place for Students from all Over the World
We strive to be seen by firms as a business school that produces high-quality bachelor’s and master’s degree graduates, therefore we seek to attract well-educated applicants from all over the world for our tuition-free bachelor’s and master’s degree programs. We will particularly focus on the United Kingdom, the United States, and the People’s Republic of China as target markets because these countries are three out of five of Germany’s most important foreign trading partners. Actions will include implementing a targeted marketing strategy with recurring core messages communicated through a target-group-specific online marketing mix, events (fairs, online sessions), and the international corporate and alumni network. To further increase the attractiveness of studying at TUM School of Management, we aim to emotionalize student life for bachelor’s and master’s candidates through suitable events held throughout their student years and beyond. For this purpose, the Alumni Association of TUM School of Management will hold a number of special events. A more extensive engagement of our alumni will play a key role in communicating these messages. We seek to significantly expand our alumni network from the current level of about 1,500 alumni to about 3,000 alumni by 2021. To finance these events, we will turn to our corporate network to increase company funding earmarked especially for these events, aiming to obtain funds of up to €100,000 per year by 2021.

For executive education, we pursue a slightly different marketing approach. The overall goal within the Executive MBA programs is to achieve high group diversity, so we strive to attract participants from a large number of countries. We draw international candidates through online marketing (SEO, SEA), events (fairs, online sessions), and the international corporate and alumni network.
Conclusion

Our current vision outlines how we will work to become one of Europe’s leading management schools at the interface to engineering and science and contribute to solutions to address grand societal challenges. We are confident we can reach this goal by 2021 by rigorously pursuing our five strategic objectives and ten key actions.

Thanks

We are grateful for all the contributors and members of the many directing panels and boards of TUM School of Management for their active participation and support throughout the development of the strategic plan.

Many thanks to all students, as well as graduates, industry partners, directors, faculty, employees and strategic advisors. Your commitment, support, and involvement are critical to our success. We encourage you to further join us on our journey along excellence!