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Note: According to Article 3, Section 2 of the German Constitution, men and women have equal rights. All terms designating male persons or functions in this report therefore apply equally to women and men.
## Abbreviations

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<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AG</td>
<td>special committee; task force</td>
</tr>
<tr>
<td>APSOs</td>
<td>General Academic and Examination Regulations</td>
</tr>
<tr>
<td>AR</td>
<td>Accreditation Council [accreditation]; also: Department of Architecture [TUM department]</td>
</tr>
<tr>
<td>BayHSchG</td>
<td>Bavarian Higher Education Act</td>
</tr>
<tr>
<td>BM</td>
<td>Admissions Management [Campus Management System]</td>
</tr>
<tr>
<td>BMBF</td>
<td>Federal Ministry of Education and Research</td>
</tr>
<tr>
<td>BV</td>
<td>TUM Department of Civil, Geo and Environmental Engineering</td>
</tr>
<tr>
<td>CH</td>
<td>TUM Department of Chemistry</td>
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<tr>
<td>CIO</td>
<td>TUM Chief Information Officer</td>
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<tr>
<td>CMT</td>
<td>Campus Management Team [TUM staff responsible for TUMonline maintenance and support]</td>
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<tr>
<td>CvL</td>
<td>Carl von Linde-Akademie</td>
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<tr>
<td>DAAD</td>
<td>German Academic Exchange Service</td>
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<td>DFG</td>
<td>German Research Foundation</td>
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<tr>
<td>DMS</td>
<td>document management system</td>
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<tr>
<td>EDU</td>
<td>TUM School of Education</td>
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<tr>
<td>EPP</td>
<td>TUM Academic Framework Guidelines</td>
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<tr>
<td>EPP</td>
<td>TUM Extended Board of Management [§7 GOTUM]</td>
</tr>
<tr>
<td>EV</td>
<td>TUM Department of Electrical, Electronic and Computer Engineering</td>
</tr>
<tr>
<td>EOV</td>
<td>Ernst Otto Fischer Award for Excellence in Teaching [prize awarded to research associates]</td>
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<tr>
<td>FA</td>
<td>committee [of experts]</td>
</tr>
<tr>
<td>FACM</td>
<td>Campus Management System Committee</td>
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<tr>
<td>FAPV</td>
<td>Examination Board</td>
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<tr>
<td>FAZPV</td>
<td>Central Examinations Management Committee</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>--------------</td>
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<tr>
<td>FPSO</td>
<td>Academic and Examination Regulations [programme-specific]</td>
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<tr>
<td>FSR</td>
<td>TUM Student Council</td>
</tr>
<tr>
<td>GOTUM</td>
<td>TUM Charter</td>
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<tr>
<td>GPR</td>
<td>Employee Council [representing all TUM employees]</td>
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<tr>
<td>HEP 2000</td>
<td>University Development Plan 2000</td>
</tr>
<tr>
<td>HISPOS</td>
<td>Examinations management module [QM software supplied by Hochschul-Informations-System GmbH]</td>
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<tr>
<td>HR</td>
<td>Human Resources</td>
</tr>
<tr>
<td>HRSL</td>
<td>Academic and Student Affairs</td>
</tr>
<tr>
<td>HRSL – Recht</td>
<td>Academic and Student Affairs – Legal Division</td>
</tr>
<tr>
<td>HSP</td>
<td>TUM Board of Management [§3 GOTUM]</td>
</tr>
<tr>
<td>HSR</td>
<td>TUM Board of Trustees [§9 GOTUM]</td>
</tr>
<tr>
<td>IC</td>
<td>TUM International Center</td>
</tr>
<tr>
<td>IDM</td>
<td>Identity Management [Campus Management System]</td>
</tr>
<tr>
<td>ITSZ</td>
<td>Corporate IT Systems and Services</td>
</tr>
<tr>
<td>KMK</td>
<td>Standing Conference of the Ministers of Education in Germany</td>
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<tr>
<td>KU</td>
<td>key user [Campus Management System]</td>
</tr>
<tr>
<td>LRZ</td>
<td>Leibniz Supercomputing Centre</td>
</tr>
<tr>
<td>LS</td>
<td>Chair [of...]</td>
</tr>
<tr>
<td>LVM</td>
<td>Course Management [Campus Management System]</td>
</tr>
<tr>
<td>MA</td>
<td>TUM Department of Mathematics</td>
</tr>
<tr>
<td>MCTS</td>
<td>Munich Center for Technology in Society</td>
</tr>
<tr>
<td>MED</td>
<td>TUM School of Medicine</td>
</tr>
<tr>
<td>mediaTUM</td>
<td>central document management and publication server</td>
</tr>
<tr>
<td>MM</td>
<td>Module Management [Campus Management System]</td>
</tr>
<tr>
<td>MPG</td>
<td>Max-Planck-Gesellschaft</td>
</tr>
<tr>
<td>MSE</td>
<td>Munich School of Engineering</td>
</tr>
<tr>
<td>MW</td>
<td>TUM Department of Mechanical Engineering</td>
</tr>
<tr>
<td>NC</td>
<td>numerus clausus [restricted admission]</td>
</tr>
<tr>
<td>OTRS</td>
<td>Open Ticket Request System [Campus Management System]</td>
</tr>
</tbody>
</table>
PH  TUM Department of Physics
PL  Academic Affairs Council
PV  Examinations Management Committee
QM  quality management
QSPV  Quality Standards for Examinations Management
REF  administrative unit
SG  TUM Department of Sport and Health Sciences
SPO  Academic and Examination Regulations
[Campus Management System]
SSZ  Student Service Center
STG – Dokument  degree programme documentation
STM  Student Management [Campus Management System]
StMWFK [formerly]  [until 10/2013] Bavarian State Ministry of Sciences, Research
[now] StMBKWK  and the Arts; [as of 10/2013] Bavarian State Ministry of
Education, Science and the Arts
SVP  Senior Vice President [TUM Board of Management]
TEC  IT Infrastructure [Campus Management System]
TGS  TUM Graduate School
TUM  Technische Universität München
TUTOR  Garching Tutoring System
VL  Academic Affairs Board
VP  Vice President [TUM Board of Management]
WI  TUM School of Management
WIMES  Trade Fair and Knowledge Management Office
WZW  TUM School of Life Sciences Weihenstephan
ZPV  Central Examinations Management
ZV  target agreement
Summary

Technische Universität München (TUM) has embarked on a long-term development strategy addressing the central scientific and technical challenges to modern society while simultaneously drawing upon the international academic talent pool to maximum advantage. In keeping with its public mandate, TUM is fully committed to its social responsibility and accountability, as evidenced by numerous wide-ranging measures such as its comprehensive quality management (QM) system. In implementing this system, TUM pays due consideration to external requirements while at the same time protecting the interests of its stakeholders.

TUM views quality management as the coordination and steering of all relevant factors affecting the quality of teaching and learning at the university. For this reason, our QM system has now incorporated resource management as well as the design of organisational structures and administrative workflows into TUM’s strategic concept, while also taking students’ role into account as co-producers of excellent higher education.

The success of our QM system is founded on the dedication of university personnel and students alike – as shown by the way they are recruited, supported, professionally fostered, and involved in decision-making processes. Our decentralised research institutions and service units are fully integrated into the key strategic planning processes, not only by means of regular participation in steering committees but also through their ongoing dialogue with the TUM Board of Management. By ensuring a steady flow of input for the continual refinement of intrauniversity processes, our QM system plays a pivotal role in streamlining the related tasks.

TUM sees quality management for academic and student affairs as a key contributing factor to the university’s capacity for innovation. As an entrepreneurial university, TUM is continually upgrading its academic framework – as shown by the revised Regulations for the Awarding of Doctoral Degrees, or the introduction of the Tenure Track system, for example. And in its role as a mediator of knowledge, TUM continues to champion the development of innovative instructional formats as well as the advancement of existing academic structures.

The following synopsis of TUM’s quality management system describes (1) the basic approach chosen by TUM to organise its QM system; (2) TUM’s overall strategy; (3) resource management at TUM; and (4) the core workflows relating to academic and student affairs. In addition, this self-evaluation report (5) details the special role of students at TUM, while also (6) summarising current QM results, as well as (7) outlining forthcoming enhancements to TUM’s quality management system.
0. **Technische Universität München: Facts & figures**

<table>
<thead>
<tr>
<th>Category</th>
<th>3 (+ subcampuses)</th>
<th>3 (+ subcampuses)</th>
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</thead>
<tbody>
<tr>
<td>Campuses</td>
<td>3 (+ subcampuses)</td>
<td>3 (+ subcampuses)</td>
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<tr>
<td>Buildings</td>
<td>411</td>
<td>411</td>
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<tr>
<td>Schools and departments</td>
<td>13</td>
<td>13</td>
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<tr>
<td>Integrative research centres</td>
<td>3</td>
<td>3</td>
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<tr>
<td>Central research institutions</td>
<td>6</td>
<td>6</td>
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<tr>
<td>Students</td>
<td>32,556 (as of 26.11.12)</td>
<td>35,165 (as of 17.10.13)</td>
</tr>
<tr>
<td>Women students</td>
<td>10,996</td>
<td>11,560</td>
</tr>
<tr>
<td>International students</td>
<td>5,868</td>
<td>6,913</td>
</tr>
<tr>
<td>First-year students</td>
<td>10,000 (as of 26.11.12)</td>
<td>9,933 (as of 17.10.13)</td>
</tr>
<tr>
<td>Women students</td>
<td>3,372</td>
<td>3,245</td>
</tr>
<tr>
<td>International students</td>
<td>2,479</td>
<td>2,621</td>
</tr>
<tr>
<td>Postgraduates</td>
<td>5,141 (2010/11 acad. year)</td>
<td>6,346 (2011/12 acad. year)</td>
</tr>
<tr>
<td>Women students</td>
<td>1,764</td>
<td>2,165</td>
</tr>
<tr>
<td>International students</td>
<td>935</td>
<td>966</td>
</tr>
<tr>
<td>Personnel</td>
<td>9,504 (as of 01.06.12)</td>
<td>9,827 (as of 01.06.13)</td>
</tr>
<tr>
<td>Research staff (incl. University Hospitals)</td>
<td>6,287</td>
<td>6,618</td>
</tr>
<tr>
<td>Non-research staff (not incl. University Hospitals)</td>
<td>3,217</td>
<td>3,209</td>
</tr>
<tr>
<td>Professors</td>
<td>478 (as of 01.06.12)</td>
<td>505 (as of 01.06.13)</td>
</tr>
<tr>
<td>Women professors</td>
<td>77</td>
<td>81</td>
</tr>
<tr>
<td>International professors</td>
<td>60</td>
<td>68</td>
</tr>
<tr>
<td>Degree programmes</td>
<td>161</td>
<td>154</td>
</tr>
<tr>
<td>Corporate start-ups (1990-2011) – ca. 11,000 employees</td>
<td>374</td>
<td></td>
</tr>
<tr>
<td>German Research Foundation (DFG) collaborative research centres (ongoing, incl. transregional collaborative research centres)</td>
<td>23; of these: 8 with TUM in the lead; 15 with TUM participating</td>
<td></td>
</tr>
<tr>
<td>ERC grants (31.10.2012) / Leibniz Award winners (2011)</td>
<td>24 / 14</td>
<td></td>
</tr>
<tr>
<td>TUM Budget 2011 (not counting University Hospitals)</td>
<td>€694.3m (in 2011)</td>
<td>€707.2m (in 2012)</td>
</tr>
<tr>
<td>Government subsidies</td>
<td>€364.1m</td>
<td>€378.3m</td>
</tr>
<tr>
<td>Third-party funding (incl. corporate, DFG)</td>
<td>€223.2m</td>
<td>€239.2m</td>
</tr>
<tr>
<td>Self-generated revenues (research, medical care, materials testing)</td>
<td>€44.8m</td>
<td>€60.2m</td>
</tr>
<tr>
<td>Tuition revenues</td>
<td>€17.2m</td>
<td>€29.5m</td>
</tr>
<tr>
<td>Fundraising (1988-2011)</td>
<td>€191m</td>
<td>€217.1m</td>
</tr>
</tbody>
</table>

*Table 1: TUM: Facts & figures*

1 Unless otherwise specified, these figures refer to the winter semester of 2012/13.
1. Quality management at TUM

Technische Universität München (TUM) views itself as an entrepreneurial university that serves as a strong, responsible partner to industry and society. In accordance with this role, our quality management initiatives are not limited to the search for optimal solutions within the framework of a state institution of higher education; rather, we are committed to extending and optimising the very framework itself – on a continual, proactive basis. Due in no small part to our innovative management strategies, we are front-line competitors in the international scientific arena.

Toward this end, we are regularly reviewing and refining our strategic objectives on the basis of our understanding of higher education management, which we see as an active steering process arising from our self-declared goal of systematically advancing the quality of our academic offering. As a university that lays claim to autonomy, TUM strives to legitimate this claim through its ongoing quest for excellence.

Quality management (QM) is an important tool enabling us to do justice to our educational responsibility and academic standards. Our QM system stipulates that all quality-relevant aspects of our organisation be steered and optimised in a goal-oriented manner. For this reason, all key elements contributing to quality at TUM are regulated by means of the "plan-do-check-act" (PDCA) feedback control cycle.

With regard to system accreditation, our QM system is centred on academic and student affairs, which TUM views as the core element of its daily operations. This area is symbiotically tied to our research activities, and addresses all joint consensual tasks. TUM aims to develop attractive, globally competitive degree programmes focusing on students and the quality of their academic training. This, in essence, is the primary objective that our QM system is striving to achieve.

1.1 TUM's quality management approach

TUM's quality management system rests on the premise that the primary task of academic and student affairs is to provide high-quality services. Unlike product quality, however, the quality of a set of services cannot always be ascertained or directly regulated; rather, it can often be evaluated only in terms of sub-criteria such as structures and workflows, potentials for improvement, or the ultimate outcomes of service provision. These aspects cannot be viewed independently of an organisation's responsibility and objectives. Furthermore, service quality does not depend solely on the service provider; rather, to a significant extent, it also hinges on external factors – i.e., the customer.
In keeping with our QM approach, we maintain that service quality can be steered by monitoring the following quality dimensions:

The **objectives** a university is pursuing, together with the **strategies** employed to reach these goals, determine the organisation’s **conceptual quality**. In general, universities define their objectives across a broad spectrum of areas which, in their entirety, reflect the institution’s public educational mandate. While this mandate is initially defined at the political level, universities and their stakeholders hold a responsibility of their own to interpret, implement, and live up to it. Thus, universities will commonly adopt these wide-ranging goals, adapt them to their specific requirements, and then translate them into a strategy that embodies their educational self-concept.

**Structural quality** refers to a university’s key organisational elements and their capacity for fulfilling the institution’s goals. This includes the quality and quantity of resources required to provide university services, including the number of staff employed and their qualifications, as well as the structural framework for university workflows.

Effective process design is a crucial determinant of whether resources will be utilised judiciously and in a goal-oriented manner – and is thus the chief pre-requisite for obtaining excellent results from the provision of services. For this reason, **workflow quality** plays a central role in university QM systems.

**QM evaluation results** constitute the basis for assessing a university’s overall performance, including the quality of its degree programmes and the qualifications of its postgraduates. Toward this end, TUM has established standards for determining the extent to which targets have been reached; it also singles out areas with room for improvement and provides points of reference for well-placed adjustments to its policies and objectives.

Within **academic and student affairs**, the student community represents the **external factor** shaping the quality of university service provision. In terms of service management, students can thus be considered "customers", even if they themselves, as well as others affiliated with the university, may object to this term (e.g., if *customers* is taken to mean *consumers*, which connotes a passive role that could be perceived as disparaging). In effect, however, the clients of service providers are active **co-producers** whose input is indispensable to the successful provision of a service on a sustainable basis. By treating students as customers of higher education, the university thus holds student interests at the focus of its daily operations, while at the same time paying due consideration to its other stakeholders (such as employers, the general public, etc.).
1.2 Areas of application for TUM's quality management system

Quality management systems are not developed from scratch; rather, they commonly emerge from the integration of pre-existing elements. After conducting a comprehensive analysis of the current state, we identified six areas of application within academic and student affairs where quality management measures were to be activated or promoted, with a consistent view to advancing our current QM approach:

Because of its strategic importance to academic and student affairs, we have now revised (1) our faculty appointment procedure. In addition, as the core element of our optimisation measures, we have redefined and outlined our degree programme life cycle. This cycle extends from (2) the design of new degree programmes to (3) their implementation, as well as (4) their evaluation, refinement, and/or cancellation. Furthermore, we have reinforced (5) our professional development programmes for TUM personnel, including instructional methodology training for teaching staff, in addition to upgrading (6) our reporting system.

The application areas for our degree programme life cycle were initially identified and tested via a pilot project conducted at three departments. Following rollout of the results, the model was implemented university-wide.

2. Strategic management

The conceptual quality of an organisation is chiefly determined by the quality of its strategic management – which, at TUM, constitutes the cornerstone of the university’s QM system. Comprising the TUM Board of Management (HSP) and the TUM Extended Board of Management (EHP), TUM’s strategic management sets down the university’s fundamental strategic orientation, goals, and scientific focal points, and drives their ongoing implementation. Among its primary tasks are to identify emerging areas of scientific research and the associated new degree programmes, and to prioritise the allocation of resources. The TUM Board of Management is where all steering processes converge: In addition to monitoring the success of current programmes, it prescribes supplementary measures as required. This ensures a closed-loop, executive management system involving all elements of the PDCA cycle.

2.1 Strategic positioning

As Bavaria’s only state-run university of technology, TUM is responsible for a wide range of degree programmes in engineering and the natural sciences. As early as its founding year (1868), TUM (at the time, still named Königliche Polytechnische Schule, i.e. Royal Polytechnical School) was subject to a state directive specifying its educational mandate: "...a complete theoretical training in
the skills required for the technical professions, consisting of a general education in those disciplines founded upon the exact sciences and graphic arts."

The final consequence of this comprehensive public mandate is a broad spectrum of technical and scientific fields currently taught at 13 schools and departments (with a total of 20 study programme divisions), as well as numerous centres for scientific research.

In light of TUM’s high-tech location, this mandate carries an inherent obligation to promote scientific and technological progress. With regard to research and teaching, TUM is centred on four principal areas: engineering, the natural sciences, medicine, and the life sciences. Complementary to each of these areas is our management training programme, which deals with the interconnections between business administration and technology.

Against the backdrop of increasingly tough challenges and global circumstances that are changing ever faster, TUM is continually reviewing and reinterpreting its role as a state-run university of technology. Thus, our educational methodology training programmes have been pooled at the TUM School of Education, for example, with the aim of nurturing instructional competencies in science and technology as a keystone for securing Germany’s future as an industrialised nation.

Furthermore, with a view to the responsibility of emerging technologies to society as a whole, the Munich Center for Technology in Society (MCTS) was established in an effort to foster the mutual understanding between the scientific community and the general public.

TUM has defined and published its primary goals in its mission statement (see TUM Mission Statement). Over and above these principles, the university has established an additional set of objectives in a further statement describing its self-declared vision of a continuously evolving culture of teaching and learning (see TUM Mission Statement: "Excellence in Teaching and Learning at TUM"). Both of these statements have emerged from a series of lengthy debates, and both are regularly being reviewed and amended.

With a focus not limited to Germany, TUM’s strategic goals also address the future of a globalised educational market. In the long run, excellent research and teaching can only be sustained at the international level. For this reason, TUM attaches particular importance to the internationalisation of its degree programmes.

At the same time, TUM recognises that to do justice to internationalisation means to embrace diversity. Welcoming otherness as a chance to counteract prejudice, even apart from the exigencies of globalisation and changing
demographics, represents a core element of the university’s self-declared vision. In its Diversity Code of Conduct (see TUM Diversity Code of Conduct), TUM outlines the pillars of its diversity strategy. This vision, too, has served as the point of origin of the “customisable degree programme” concept (see also Section 4.2.8) – a new element of TUM’s academic portfolio demonstrating the university’s respect for students’ individual circumstances, as reflected in the increasing flexibility of its curricula and conditions for studying.

2.2 Executive management structure

Having been prompt to take advantage of an experimentation clause provided by the Bavarian Higher Education Act (BayHSchG), TUM has established a management structure with executive capacities that gives due consideration to stakeholders’ interests. This structure has stood the test of government scrutiny, and was used as the basis for an amendment to the BayHSchG in 2006.

TUM’s central decision-making body, the TUM Board of Management (HSP), steers the university’s operational business, submits recommendations on academic affairs and faculty appointments to the TUM Senate and TUM Board of Trustees, and performs central tasks such as defining the policies governing TUM’s development, evaluation, and quality management programmes. The HSP currently comprises nine members: the President; the Senior Executive Vice President for Human Resources, Administration and Finance; and the senior vice presidents for the following areas: Academic and Student Affairs; Research and Innovation; Diversity and Talent Management; International Alliances and Alumni; and the Chief Information Officer. The president and the senior vice presidents are appointed by the TUM Board of Trustees. Further members of the HSP include the Vice President for Entrepreneurship and Intellectual Property and the Vice President for University Development and Planning. Additionally, the Gender Equality Officer regularly takes part in HSP meetings.

The TUM Extended Board of Management (EHP) is in charge of developing medium- and long-term strategies and bringing the objectives of TUM schools and departments into mutual agreement; additionally, it reviews and follows up on strategic considerations on a rotating schedule. The EHP comprises 25 members: the Board of Management, the Deans, the Gender Equality Officer, the Chair of the Deans of Studies, and the Chair of the Central Scientific Institutes and TUM Graduate School.

The TUM Senate is responsible for decisions relating to academic affairs, including statutory provisions issued by TUM, as well as proposals on the establishment, modification, or cancellation of degree programmes. Consisting of 11 members with voting privileges, this body comprises 6 representatives from the professorial staff; 1 representative each of the research/teaching associates and non-academic staff, respectively; 2 student representatives; the Gender Equality
Officer; and a non-voting representative of the Assembly of Doctoral Candidates.

The TUM Board of Trustees (HSR) reaches decisions concerning the University Development Plan as well as the establishment, modification, or cancellation of degree programmes. This board also rules on amendments to official documents such as the TUM Charter (GOTUM) (see GOTUM), and it appoints the president and the senior vice presidents to the TUM Board of Management. The TUM Board of Trustees currently comprises 16 members with voting power: the elected members of the TUM Senate plus 8 external members consisting of public figures from areas such as science, industry, culture, and the arts. Further non-voting attendees include the TUM Board of Executive Directors, the Gender Equality Officer, and representatives from the Bavarian State Ministry of Education, Science and the Arts.

Finally, the TUM University Council, comprising up to 25 external representatives from areas such as industry, government, culture, and the arts, holds an advisory function to TUM and its decision-making boards.

* The Gender Equality Officer holds an advisory function to the TUM Board of Trustees.
2.3 Strategy development

TUM's systematic strategy development has a long tradition. First documented in 2000, the University Development Plan (Hochschulentwicklungsplan, HEP) emphasises TUM’s commitment to the continual refinement and advancement of its strategy and policy objectives:

"TECHNISCHE UNIVERSITÄT MÜNCHEN continues to expand and develop its profile, which is centred on the natural sciences, technology, and medicine. The divergent self-concepts of each discipline, and the resulting diversity of curricular content and research methodologies, are crucial to our strong academic performance. Featuring a broad spectrum that covers theoretical foundations, experimental methods, and practical applications, our academic offering ensures that we are fulfilling our educational responsibilities while reinforcing our ties to industry and society. By continually focusing on its educational mandate, the university advances the sciences as a whole, while at the same time providing solutions to concrete, modern-day problems."

As to the implementation of TUM’s strategic objectives, HEP 2000 lists an initial set of partial goals and profile-building measures. In 2003, an interim report analysed the extent to which these targets had been met and/or readjusted for each TUM school and department. Based on these results, a restructuring programme entitled innovaTUM-2008 was launched in 2004, following suit on TUM’s degree programme reform project, which had included measures such as expanding the TUM Department of Informatics; establishing a School of Management with a TUM-specific profile; reorganising the TUM Department of Sport and Health Sciences (SG) into a single department; incorporating Forestry Sciences; and conducting a departmental overhaul in Weihenstephan. By the end of 2008, a total of 420 state-funded positions (representing ca. 10% of TUM staff) had been reallocated internally in a drive to fortify various TUM-specific pioneering fields. Following an evaluation conducted conjointly with reviewers from the German Research Foundation (DFG), these positions were redistributed across the university, resulting in an increase in specially designated posts in certain areas and corresponding reductions elsewhere. These restructuring measures were applied not only to research at TUM, but also to the associated teaching and administrative areas.

Furthermore, innovaTUM-2008 was instrumental to TUM’s success in the first and second rounds of the German Universities Excellence Initiative. As one of three universities that were the first to have their strategic plans endorsed in the third line of funding, TUM was able to build on its successes in the second round by acquiring grants scheduled to run through 2017. While the Excellence Initiative is focused on research, these subsidies are a boon to teaching as well: Over and above the spinoff effects generated by stepped up research efforts,
TUM’s degree programmes are likewise certain to benefit from the advancement of the university’s profile.

In conjunction with its University Development Plan, TUM’s long-term policy objectives have been reviewed and revised. With a view to the central challenges facing society today, projects were established and focal points defined covering the full range of TUM’s scope of action for the coming years:

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Consequence</th>
<th>TUM’s response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany is facing far-reaching demographic changes.</td>
<td>Germany is turning into a country of immigration, and must overcome its shortage of skilled professionals.</td>
<td>TUM has become an international university with a global presence; it continues to seek the best and the brightest, and to embrace the gamut of diversity.</td>
</tr>
<tr>
<td>Germany’s population is rapidly growing older.</td>
<td>Age-related disorders are on the rise (neuro-degeneration, cardiovascular disease, tumour disease).</td>
<td>Medical technology; CALA Research Centre; Clusters of Excellence: MAP and CoTeSys; Leading-Edge Cluster (Biotech) m&lt;sup&gt;4&lt;/sup&gt;; alliance partner in the national health research centres</td>
</tr>
<tr>
<td>Germany and Europe are lacking in natural resources.</td>
<td>Education, training, research. Renewable resources and the raw material “intellect” are both crucial to long-term viability.</td>
<td>Closing the value-added chain at its links: school – university – industry; shaping innovation processes: TUM School of Education, the Graduate School system, TUMentrepreneurship, among others</td>
</tr>
<tr>
<td>The world population is growing exponentially, particularly in the developing countries.</td>
<td>Housing, food, nutrition, and health pose top-priority challenges to scientific research.</td>
<td>Research focal points; sustainable planning and construction; plant biotechnology; water, food, and nutrition; preventive medicine</td>
</tr>
<tr>
<td>The sustainability of living conditions has become a central concern to humanity.</td>
<td>Climate, energy, and the environment will ultimately determine research priorities at the interdisciplinary interfaces.</td>
<td>Energy research focusing on regional, transnational networks: Munich School of Engineering; research on innovative mobility systems; transnational earth and environmental sciences</td>
</tr>
<tr>
<td>The global digital network interconnects information worldwide.</td>
<td>Fast, reliable, secure IT systems</td>
<td>“Advanced Computing” research cluster, affiliated with the Leibniz Supercomputing Centre (LRZ) Garching</td>
</tr>
</tbody>
</table>

Table 2: TUM’s long-range development plan
In this context, TUM's internationalisation and gender & diversity management initiatives will be playing a central role.

With regard to internationality – a core element of TUM’s fundamental strategic orientation both internally and externally – TUM has set down the following goals:

- To increase the proportion of English-language master’s programmes (from currently 29%) to 80% by 2025
- To boost international student quotas for the master's programmes (from currently 25%) to 40% by 2025
- To proactively recruit and retain top talents (from students to experienced professors to administrative staff)

Additionally, a university-wide project entitled “TUM.Global” has been initiated with the aim of promoting internationalisation at TUM.

As part of this project, TUM has established liaison offices in Beijing, São Paulo, Mumbai, and Cairo; a U.S. office is to follow. In addition to strengthening TUM’s international standing, these offices seek to attract outstanding students, doctoral candidates, postdocs, and professors, and to reinforce TUM's ties with other universities and employers.

In Brussels, TUM has set up a liaison office with the EuroTech Universities alliance where, conjointly with its partner universities (EPFL; Eindhoven University of Technology; and Technical University of Denmark, Copenhagen), the group’s common interests are being pursued.

Furthermore, TUM has launched a visiting professors programme in conjunction with a publicity campaign striving to heighten TUM’s attractiveness and promote internationalisation at the research, teaching, and student levels. Also, TUM's exchange programmes for students, researchers, and non-academic staff have been designed to support the institutions affiliated with TUM and to facilitate stays abroad (see Internationalisation Report 2006 - 2011).

And finally, TUM’s Gender & Diversity Management programme forms an integral part of our strategic activities. TUM is striving to become Germany’s most attractive technical university for women. Building on the positive trend established in recent years, the university seeks to boost its quota of international professors (from currently 12%) to 30% by 2025 and its quota of women professors (from currently 14%) to 25% by 2025.

In order to translate this strategy into well-defined action items, TUM schools and departments have entered into target agreements tailored to their individual requirements. In the medium term, these measures will be followed by a university-wide diversity audit covering all diversity aspects and target groups within TUM and regulating the applicable measures by means of feedback control cycles.
As to the implementation of its educational mandate, TUM is engaged in a continual dialogue with the Bavarian State Ministry of Education, Science and the Arts. By initiating discussions on the newly emerging areas of research and teaching at an early stage, TUM ensures that it can continue to pursue its strategic plan in accordance with its educational mission.

A further goal being pursued since 2002 concerns the quality of teaching conditions at the university: In this context, a project focusing on related issues (ExcellenTUM), which also explored the options for financing various further optimisation measures, ultimately gave rise to TUM’s new pre-requisites for the allocation of tuition fee substitution funds. With the introduction of these new stipulations, students are now required to share in the costs of these optimisation measures under certain circumstances.

3. Resources
As a state-run university, TUM is committed to making responsible use of the resources at its disposal. In addition to our unremitting efforts at optimising our resource management, this also entails an ongoing search for alternative funding options.

3.1 Human resources
In the final analysis, people are a university’s most important resource: The qualifications, dedication, and experience of its staff form the basis for sustainable development. Thus, TUM considers its recruitment and on-the-job training measures to be a key success factor in the competitive international market. Accordingly, the university is continually advancing its talent management programmes, with special attention to providing suitable development opportunities to all levels of staff, from professors to research/teaching associates to non-academic and technical personnel.

3.1.1 Professors
As of 2009, Bavarian universities are authorised to apply for the right to appoint faculty. Thus, TUM is now in a position to carry out faculty appointments on its own; in lieu of the State Minister of Education, TUM’s president is in charge of the appointment process. A staff of five Executive Advisors to Faculty Recruiting provides the requisite intensive support and ensures that faculty appointments are conducted in accordance with the pertinent regulations.
New faculty appointment procedure

As of July 2012, TUM’s faculty appointment procedure is underpinned by two new measures: the TUM Faculty Tenure Track and the TUM Faculty Executive Search. Both of these measures were introduced in order to internationalise the recruitment process.

The **TUM Faculty Executive Search** proactively identifies internationally qualified top talents through a systematic screening procedure; the successful candidates are appointed by means of headhunting.

The **TUM Faculty Tenure Track** has established a merit-based, tiered career scheme comprising the following levels: Starting with a short-term professorship (Assistant Professor), permanent employment is awarded after six years, followed by a promotion to Associate Professor and, finally, to Full Professor. Established in accordance with quality-oriented, transparent performance criteria, the purpose of this procedure is to facilitate the recruitment of younger first-time appointees, to promote personal responsibility and encourage early independence on the part of junior researchers, and to increase the percentage of women professors.

In order to generate tenure track positions, TUM has created a central pool of W2 posts equipped with sufficient resources for strengthening the areas that have been earmarked for expansion. With the Faculty Tenure Track, TUM has reached a fundamental decision specifying that, regardless of their employment status (i.e., short-term [W2] or long-term [W3]), all professors are afforded the same corporate rights and responsibilities; the difference between the two lies in their respective framework of resources. The Junior Professor (W1) category has been eliminated.

Additionally, various further optimisation measures – including a competitive entry package; a mentoring programme; annual performance reviews with deans and mentors; transparent evaluation standards; the Faculty Search and Evaluation Committees; and an interdepartmental Appointment and Tenure Board for comparative quality assurance – have been established in order to provide attractive framework conditions for research, along with reliable evaluation criteria. To prevent conflicts of interest, staff members who are participating in appointment and evaluation procedures are subject to TUM’s Faculty Recruitment Code of Conduct.

In recognition of its responsibility for nurturing young talents, TUM has established the **TUM Tenure Track Academy** as a means of supporting its assistant professors in setting up their scientific work (via measures such as tenure track, kickoff, and retreat). Furthermore, the university offers training in various interdisciplinary skills (including key competencies for specific target groups, or leadership coaching via individualised training programmes) as well as networking opportunities such as the Annual Tenure Track Assembly. In this way, TUM
provides comprehensive assistance to junior scientists in their orientation phase, as they begin to build career profiles and take on the role of brand ambassadors to the international scientific community, thus enhancing TUM’s global standing.

Tenure Track professorships with a focus on teaching – specifically, the TUM Teaching Scholar Track (involving research and teaching at a ratio of 1:2) – are forging new academic inroads by facilitating more flexible teaching loads as well as introducing a qualification scheme for the acquisition of teaching competencies. In this way, TUM actively contributes to qualifying its teaching staff for their instructional tasks on an individualised basis.

By offering part-time options (“part-time tenure clock extension”), one-semester leaves of absence for parents (“parent tenure clock extension”), and reduced semester loads, the TUM Faculty Tenure Track provides the requisite flexibility for family-friendly and diversity-oriented career management. Furthermore, in an effort to make the boundaries between basic research and its practical applications in industry more permeable, TUM awards one-semester Tenure Track Sabbaticals to staff intending to take up research fellowships abroad.

On a 4-year rotating schedule, these measures, in addition to our evaluation criteria and tenure decisions, are assessed by an international peer review panel, based on standards established by the Max-Planck-Gesellschaft (MPG). The results are analysed and evaluated by the TUM Extended Board of Management, where they are used as the basis for new strategic and operational recommendations which are then ratified by the TUM Board of Management and the TUM Board of Trustees.

Professional development

In addition to establishing quality assurance measures in conjunction with the Tenure Track system and introducing a mentoring programme, TUM has developed various further measures aiming to assist professors – whether newly appointed or already affiliated with the university – in polishing their instructional and personal competencies.

Toward this end, the New@TUM programme offered by ProLehre (the educational methodology training team at the Carl von Linde-Akademie) includes:

- A retreat for newly appointed professors
- Coaching for the new appointees, consisting of support in developing, planning, operating, evaluating, and revising their courses
- Seminars preparing habilitation candidates for appointment procedures

Over and above this orientation programme, the Carl von Linde-Akademie assists professors in developing their teaching competencies and styles by means of comprehensive, varied, and customisable modules.
Furthermore, our English Coaching Program, offered at the TUM Language Center, provides individualised consultations to professors and lecturers planning to teach in English. Additionally, the English Writing Center supports teaching staff in composing and editing English-language texts and publications.

*Incentives*

In recognition of outstanding performance on the part of its instructional staff, TUM has established awards for excellence in teaching, conferred at an annual event entitled "Teaching Day" (*dies legendi*, launched in 2011).

As a further incentive on top of research sabbaticals, the university has also been granting a "Semester's Leave for Teaching" since 2011. A one-semester sabbatical devoted to teaching, this award provides TUM professors with the necessary margin of freedom to redesign module content and create innovative instructional concepts, or to bring works-in-progress such as textbooks to completion and publication.

Additionally, TUM has inaugurated numerous further awards honoring exceptional teaching performance, including the prizes conferred at the departmental level as well as by the Bavarian State Ministry of Education, Science and the Arts (StMBKWK). The common goal of these incentives is to promote a culture of teaching and learning at TUM whose level of excellence is on a par with TUM's research achievements, while simultaneously enhancing the visibility of outstanding teaching staff and thus strengthening TUM's corporate identity.

**3.1.2 Researchers**

TUM's research/teaching associates (consisting of doctoral candidates, postdocs, associate lecturers, etc.) represent a further decisive determinant of the quality of teaching and learning at TUM. These staff members are hired by TUM schools and departments.

*Doctoral candidates*

The majority of our over 6,000 research and teaching associates are doctoral candidates. To promote the professional development of these junior scientists, **TUM Graduate School** (TGS), an interdisciplinary and international network serving as the umbrella organisation for TUM's postgraduate programmes, was established in May 2009.

With the aim of preparing doctoral candidates for a successful transition to responsible positions in industry and research, TGS offers a wide range of services, including training in interdisciplinary, extradisciplinary, and international competencies.

By means of the TGS *training programme*, the mentoring programme, binding supervision agreements, various gender & diversity measures, and personal advising, TUM assists doctoral candidates in the prompt and successful comple-
tion of their dissertations. As part of an agreement between TGS and the German Academic Exchange Service (DAAD), international doctoral candidates are also eligible for these services, regardless of whether they are TGS members.

The TUM Graduate Council, consisting of two representatives each of the postgraduate centres and one delegate to TUM Senate meetings, represents a further option (in addition to the Research Staff Assembly) enabling TUM’s research and teaching associates to participate in decision-making processes. All TUM doctoral candidates are invited to attend Graduate Council sessions.

Professional development

Over and above the programmes open to professors, all research/teaching associates are eligible to participate in further programmes and services, including the intrauniversity training programme offered by the Trade Fair and Knowledge Management Office (WIMES); the Erasmus staff mobility programme, run by the TUM International Center; and UnternehmerTUM, which provides services including support for corporate start-ups and established companies. These programmes, all of which are high in demand, help doctoral candidates develop a better understanding of the practical applications for their area of specialisation. Furthermore, in addition to providing opportunities for participants to hone their technical skills, they foster the development of extradisciplinary competencies.

Incentives

**Teaching awards** for research/teaching associates (including the Ernst Otto Fischer Award for Excellence in Teaching [EOF]) have been introduced with the aim of spurring researchers to intensify their dedication to their instructional tasks and of heightening the visibility of junior scientists engaged in teaching activities. Above and beyond the university-wide awards, numerous further teaching prizes are awarded by the individual TUM schools and departments as well as the departmental student councils.

3.1.3 Research management

Efficient research management – a key determinant of research and teaching quality – requires taut organisational structures. In recognition of the central importance of its research management staff, TUM has launched a programme designed to optimise the related administrative structures. At an initial strategy workshop held in 2010, ca. 60 management staff members from various administrative offices, schools and departments, Excellence Clusters, and postgraduate schools conducted an analysis of the current state, followed by a requirements analysis and a catalogue of proposals to the TUM Board of Management. Additionally, to investigate the specifics of research management in a university setting and to identify the preconditions for successful change management, the TUM School of Management (WI) established a professorship for "Research and Science Management" in 2011, focusing on the development of effective
leadership at universities. In this context, a new set of modules for management staff is now being offered university-wide, and there are plans for expanding and upgrading TUM’s talent management programmes.

3.1.4 Additional resources and services

In addition to the above-mentioned programmes, TUM has established further resources and contact points providing a comprehensive range of services for TUM staff at all levels in order to create an optimally productive working atmosphere.

These include:

- The TUM Services Directory, an intranet service platform with the following focal points: research and third-party funding; real estate management and telecommunications; IT services; media and university libraries; human resources; finances and accounting; legal matters; campus security; academic and student affairs
- TUM newsletters: the newsletter for TUM staff; various newsletters published by the TUM International Center, Corporate IT Systems and Services, the Alumni & Career Network, etc.
- Family services, including TUM on-site daycare; flexible, on-call childcare options available at short notice; childcare during the holidays; babysitting during university events; and personal advising for staff who are providing nursing care to family members
- The Munich Dual Career Office, offering dual career services (i.e., career support services for the spouses or partners of newly hired TUM staff) as well as integration services (consisting of support in matters pertaining to relocation to the Munich area on top of dual career considerations)

3.2 Finances

TUM’s budget (2011) is composed of ca. 56% government subsidies and 34% third-party funding. Self-generated revenues (from research, technical testing, etc.) amount to ca. 7%; public funds for higher education (i.e., tuition fee substitution funds) represent less than 3%. A large part of the budget is allotted to personnel costs. To accommodate rising student enrolments, the state of Bavaria has established an expansion programme featuring a target agreement providing for the allocation of additional funding to the state institutions of higher education; of these funds, TUM is currently receiving ca. €30m annually.

In recent years, TUM has succeeded in boosting its third-party revenues substantially; the resulting pool of overhead funds has enabled the university to better support various overarching tasks. Additionally, TUM has continually been applying for third-party subsidies for its teaching staff, thereby allowing new or complementary projects to be introduced in the area of academic and student affairs (see Section 4.2.8).
As of October 2013, TUM has been receiving public funds for higher education that are designated exclusively for improvements to the conditions for studying. These funds consist of state compensation for the tuition fees formerly collected from students; the previous tuition fee system was abolished in Bavaria at the end of the summer semester of 2013. From this revenue substitution funding, TUM was allotted ca. €20m towards its 2014 budget, 60% of which has been earmarked for tasks relating to the schools and departments and 40% for joint tasks (see also Section 4.2.7).

TUM's fundraising projects are geared towards the university's development goals; the funding thus generated constitutes a key element of the resources at TUM's disposal. From 1998 to 2011, TUM received grants amounting to ca. €191.2m, consisting of €46m from endowments, €47m from private donors, and €98m from industry. Examples of TUM programmes backed by these central fundraising projects include the Carl von Linde-Akademie, the ca. 36 endowed professorships, and the Germany Scholarship.

Established in 2010, the TUM University Foundation serves as a complement to TUM's project-related fundraising programmes: Donations to this endowment are used exclusively to build up the capital stock; the actual source of funding consists in the interest generated by this capital. TUM's principles and guidelines for fundraising management have been summarised in the TUM Fundraising Code of Conduct.

3.3 Management of the university infrastructure

The Munich region provides an excellent infrastructure for higher education and research. Located in downtown Munich, Weihenstephan, and Garching, TUM's three historically grown campuses comprise a total net effective area of 566,200 m². To cope with the increasing demands placed on its research and teaching premises, the university optimised its Real Estate Management in 2008 by measures such as central and departmental administrative offices and auxiliary property rentals. Since state funding for the expansion of institutions of higher education has not kept up with these demands, TUM has recently been resorting to newer financing models such as public-private partnerships (e.g., the "Neue Mitte Garching" campus project).

TUM's lecture halls and examination facilities, as well as ad hoc events or situations requiring supplementary facility support, are coordinated by a Delegate Officer from the TUM Extended Board of Management in collaboration with the central service units and departmental institutions (e.g., Academic and Student Affairs, the Student Service Center, and the departmental representatives). Additionally, the TUM twoinone programme, established by this Delegate Officer for the final cohort of German students with a "G9 Abitur" (i.e., those with an A-Levels qualification acquired after nine years of secondary schooling), has
enabled students to circumvent interim congestion caused by enrolment spikes occurring after the secondary school programme had been cut short by a year. The TUM twoinone programme, in turn, has enabled the university to put its facilities to more efficient use.

In recognition of the critical importance of TUM’s information and communications technology infrastructure as a mainstay for teaching and research, the position of Chief Information Officer (CIO), serving as a senior vice president and member of the TUM Board of Management, was established in 2001. The CIO is supported by the CIO/IO Committee, which coordinates the university’s IT infrastructure and is comprised of the CIO, the Director of Corporate IT Systems and Services, and a group of designated information officers (IOs) who manage information and communications for their respective school or department. The CIO meets regularly with student representatives – who have set up an "IO network" of their own – to discuss current IT issues, and attends Employee Council (GPR) meetings to address TUM employees' IT-related concerns.

Operated by the Bavarian Academy of Sciences and Humanities, the Leibniz Supercomputing Centre (LRZ) is the central IT service point for all institutions of higher education in the Munich area; in addition to university supercomputers and network connections, this centre coordinates all related IT services (with the exception of those utilised in administrative offices). In terms of personnel, facilities, and expertise, TUM and the LRZ are closely interlinked: The LRZ is a key contributor to the efficiency of research and teaching at TUM, and plays a central role in the stepwise implementation of TUM's vision of a "digital university", comprising four central areas (“Campus Management” [see also Section 4.2.5], “Research and Teaching”, “Infrastructure”, and “Organisation”) as well as a variety of central projects for the advancement of each of these areas.

Corporate IT Systems and Services (ITSZ) is where all of TUM’s IT services converge, including the departmental IT Service Groups. In addition to managing all interdepartmental communications relating to IT at TUM, this centre is continually expanding its services (which are listed in the TUM Services Directory). The related intraniversity information exchange is driven by IT newsletters, staff briefing sessions, workshops, and courses, as well as monthly ITSZ meetings. Furthermore, the centre has established a campus-wide system for reporting incidents and vulnerabilities that are relevant to IT security.

TUM’s University Libraries form a customer-oriented service entity supplying a wide range of academic literature not only to the TUM community but also to other research institutions, corporations, and private clients at the local and supra-regional level. Comprising 10 departmental branches at the TUM campuses, TUM’s library system features a total of 1.7m digital and print media items used by ca. 44,000 clients at a rate of 650,000 loans per year. As part of the continual advancement of its services, TUM libraries are now being certified according to
DIN ISO 9001 as of 2007. In view of the direct interaction between library staff and customers, the high degree of uniformity of library tasks and workflows, and the numerous opportunities for fine-tuning services on the basis of statistical data, DIN ISO serves as a suitable quality management approach that is especially warranted for this service area.

4. Management of the key workflows pertaining to academic and student affairs

TUM’s administrative workflows and expansion measures are continually being reviewed, readjusted, and refined. To adapt the pre-existing university structures to the provisions of the Bologna declaration, the relevant workflows were analysed, modified, and reorganised, along with the related IT infrastructure. Additionally, several new organisational structures, including the Academic Affairs Board (VL) and the Academic Affairs Council (PL), were established (in 2009 and 2010, respectively) with the aim of streamlining workflow management and raising the profile of this administrative area. As a result, decisions can now be reached faster and on the basis of a broader consensus.

The **Academic Affairs Board** coordinates all activities pertaining to academic and student affairs. Headed by the Senior Vice President for Academic and Student Affairs, this board is composed of the three Chairs of the Deans of Studies (representing each of the three TUM campuses), one representative of the research/teaching associates, two student representatives, and a delegate from the Degree Program Management Committee. The campus representatives report on the results of meetings held externally by the respective Deans of Studies, thus ensuring that all schools and departments are continually involved in the decision-making process in a timely manner.

The Academic Affairs Board appoints **task forces** on a flexible, ad hoc basis, in order to address current issues and report on the implementation of solution strategies for a variety of topics, including revisions to the Academic Framework Guidelines; the Regulations for the Awarding of Doctoral Degrees; the optimisation of examinations management workflows; module management; multiple choice regulations, etc. These task forces comprise academic staff from the schools and departments and central service units, as well as students with pertinent academic profiles and competencies. In addition to these task forces, various **special committees** charged with specific themes on an ongoing basis ensure a continual information exchange among the schools and departments.

The **Academic Affairs Council** presents a further opportunity for TUM schools and departments to participate directly in the decision-making process by providing a platform for extensive information exchange on fundamental issues. This council comprises the members of the Academic Affairs Board, all further
Deans of Studies, the Gender Equality Officer, and three student representatives.

In a move to pool the relevant administrative expertise, Academic and Student Affairs (HRSL) was established in early 2010. Headed by the Senior Vice President for Academic and Student Affairs, this unit is the internal and external point of contact for all enquiries concerning teaching and learning at TUM. In addition to evaluating and improving all administrative workflows concerning quality management, tuition fee substitution funding management, and legal enquiries (HRSL Legal Division) on an ongoing basis, this unit offers support and assistance on legal and Bologna-related issues concerning the establishment and modification of degree programmes, and continually reviews these programmes.

The Student Service Center (SSZ) is in charge of all central administrative services and workflows pertaining to students throughout the student life cycle.

Fig. 3: Core workflow management

4.1 Degree programme management
The core element of degree programme management at TUM is the degree programme development process, which facilitates the design of new programmes by defining the requisite steps, describing their modifiable aspects,
and depicting the applicable administrative structures. In addition to assuring the fulfillment of internal and external QM requirements, this process promotes subsidiarity in that the responsibility for operational degree programme management lies at the departmental level, while strategic planning is conducted in collaboration with the TUM Board of Management.

To support TUM schools and departments in the implementation of Bologna-related measures, Academic and Student Affairs has prepared a summary of the underlying standards (entitled "Academic Framework Guidelines"; EPP) which, together with the General Academic and Examination Regulations (APSOs), represents the administrative frame of reference for degree programme design.

TUM’s degree programme development process comprises two feedback cycles: In a first step, the school or department presents a brief **concept draft** describing the new programme’s **goals**, **requirements**, and **feasibility**, and enumerating certain formal aspects. After a preliminary evaluation by Academic and Student Affairs, the TUM Board of Management then decides whether the concept should be pursued further. This initial step ensures that concept drafts are appropriately pre-structured, while also providing reference points for the related discussions at the departmental level; it also enables decisions to be reached early on as to whether the programme’s thematic orientation is in line with the school’s or department’s objectives as well as TUM’s overall strategy. A series of in-depth feedback rounds is generally required to make certain that the programme design has been kept in close alignment with the pre-defined targets; in this context, Academic and Student Affairs may occasionally moderate goal definition workshops as necessary.

Next, the programme is worked out in detail – which, in addition to **curriculum development**, entails finalising the **degree programme goals** and **qualification profile**. Also, a **requirements analysis** is conducted to determine the anticipated demand on the part of prospective students and employers, and to assess the programme’s potential **competitive standing** as well as the extent to which it differs from existing degree programmes at TUM. Additionally, the school or department is required to: (a) define the programme’s structure and specify how the target skills and competencies are to be conveyed; (b) ensure "**studiability**", i.e., confirm that the programme can generally be completed within the standard duration of study; (c) provide an opportunity for students to study abroad; (d) delineate staff **responsibilities**; and (e) assure the availability of material and staffing **resources**.

Once the design and content have been finalised, the school or department prepares the **degree programme documentation**, consisting of a comprehensive synopsis including **module descriptions** and the **programme-specific Academic and Examination Regulations** (FPSO). For postgraduate degree pro-
grammes, a **calculation of costs** is also required. To assist departmental staff in preparing their documentation, Academic and Student Affairs has compiled a set of manuals describing the relevant regulations in detail.

At the departmental level, the **degree programme documentation** constitutes the starting point for new programmes, in effect representing a business plan whose primary purpose is to facilitate communication with third parties (such as decision-making boards and the Ministry of Education) and to serve as an intrauniversity planning tool. Whether used for the basic sciences, i.e., those not directly related to practical applications (such as physics), or for programmes geared towards specific professions (such as architecture), degree programme documentation is not to be understood as a static set of documents but rather as a means of allowing for further changes and of anticipating future requirements. Furthermore, this documentation – in particular, the qualification profiles and module descriptions – serves as the basis for the recognition of academic and study qualifications; the applicable regulations are detailed in a separate manual.

The primary aim of the degree programme development process is to implement Bologna-related objectives such as outcome-based teaching and to ensure that all courses of study are developed in alignment with degree programme goals and qualification profiles.

In addition to every newly established programme, all existing degree programmes are likewise subject to restructuring in accordance with the "Common Structural Guidelines" (for the German federal states) issued by the Standing Conference of the Ministers of Education in Germany (KMK). Thus, a full set of documentation, including module descriptions and the programme-specific FPSO, must be compiled for every degree programme currently in operation. All programmes relevant to the Bologna process have meanwhile been adapted to the KMK regulations. As a result of delays caused by mandatory evaluation rounds (conducted by various administrative units and the Ministry of Education) as well as the application phase, however, several of the most recent statutes have not yet taken effect.

In the second part of the feedback cycle, the final draft of the degree programme documentation is reassessed by Academic and Student Affairs, which continues to provide support and guidance on an ongoing basis. Among the aspects reevaluated at this stage are adherence to the formal stipulations (e.g., completeness of the document package) and the fulfilment of internal and external requirements (including those specified by the EPP, APSOs, BayHSchG, Accreditation Council [AR], KMK, etc.), with a particular view to the programme's logical coherence and plausibility. The results of this reassessment are summarised in a report for the TUM Board of Management.
Based on this draft documentation package, which includes statements from students and from the administrative units involved in designing and implementing the new programme (i.e., the SSZ and HRSL, including the HRSL Legal Division), the TUM Board of Management then decides whether to (a) submit the new proposal to the TUM Senate and the TUM Board of Trustees, (b) issue further stipulations, or (c) cancel the project.

Next, the TUM Board of Trustees reaches a final decision concerning the introduction of the new degree programme, and the TUM Senate rules on the pertinent statutes. With this ruling, the Senate confirms that the documentation now meets all applicable accreditation regulations; the confirmation date simultaneously represents the internal degree programme certification date. TUM deliberately avoids using the term "internal programme accreditation", because in addition to a programme's current focal points, accreditation, by its very nature, can only deliver a snapshot representation – whereas TUM’s QM approach, by contrast, is striving to provide a frame of reference for the continual quality enhancement of academic and student affairs.

For new degree programmes, the end result of TUM’s internal certification procedure is a conceptual certification (in accordance with conceptual system accreditation; see “Regeln für die Akkreditierung von Studiengängen und für die Systemakkreditierung”, p. 10). Additionally, in the case of amendments to statutes pertaining to programmes currently in operation, our Legal Division checks that all current specifications (i.e., regulations issued by the KMK, AR, etc.) have been met. As a rule, all degree programme proposals submitted to the TUM Senate have undergone prior evaluation. Failing this, the Senate will issue further stipulations as required and monitor their fulfilment.

At TUM, all degree programmes are subject to ongoing review and refinement, and any modifications requiring amendments to statutes are evaluated by the TUM Senate; in this way, programme certification is continually kept up-to-date. This process underpins our optimisation efforts at the departmental level, and ensures that our degree programme documentation is being improved at every step of the way. To reconfirm that all degree programmes, without exception, are being evaluated at regular intervals, a supplementary assessment of all programmes is conducted every five years, and adherence to the existing regulations is reconfirmed by the Senate. Since it is safe to assume that every degree programme will undergo revision within any five-year period, this intermittent comprehensive survey merely represents a double-check of the standard optimisation process.

At present, the concluding stage of TUM’s quality management system still consists in a request for final approval from the Ministry of Education – a step that, in a sense, represents a departure from our QM policy, which has been designed to render monitoring of this kind superfluous. Consequently, TUM is undergoing
system accreditation in the expectation that a successful result will release the university from the requirement of negotiating individual degree programmes with the Ministry on a case-by-case basis; instead, all relevant issues will be discussed in the course of the above-mentioned ongoing strategic dialogue between Academic and Student Affairs and the Ministry of Education.

The most important roles and responsibilities relating to the degree programme life cycle at TUM are illustrated by the following two graphics:

![Degree programme life cycle](image)

*Fig. 4: Degree programme life cycle (I): Roles and responsibilities*
Degree programme evaluations generally lead to varying degrees of modification; the resulting changes may extend anywhere from small adjustments to comprehensive redesign. In the latter case, a completely new programme often emerges, including cancellation of the previous programme; in fact, most cancellations occur for this reason (a further reason being insufficient student demand).

In the degree programme life cycle, the Deans, together with the Deans of Studies, are responsible for initiating cancellations, and the Department Council confirms the cancellation request. Next, the TUM Board of Management (HSP) decides whether to submit the request to the TUM Board of Trustees (HSR), which in turn reaches the final decision. In practise, this step is simple and fast: The school or department prepares an informal statement detailing the reasons for the cancellation, and the Board of Management decides whether to submit it to the Board of Trustees, together with a recommendation; the final decision lies with the Board of Management. Thus, the duration of the cancellation process is in effect determined by the Board of Trustees’ timetable.

**Fig. 5: Degree programme life cycle (II): Decision-making process**

### 4.2. Management of the conditions for studying

At TUM, the conditions for studying – including service aspects as well as students’ administrative concerns – are managed centrally by the Student Service Center (SSZ) as well as by designated departmental staff. The key service areas and processes are listed in the following table:
<table>
<thead>
<tr>
<th>Area</th>
<th>Processes</th>
<th>Organisational units (operative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student advising</td>
<td>Information, advising</td>
<td>• Student Advisory Office and Prospective Student Programs: Student Service Center (SSZ)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Departmental Student Advising (schools and departments)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• TUM International Center (IO)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• International Affairs Delegates (departmental offices)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Alumni &amp; Career Services</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Departmental career services (schools and departments)</td>
</tr>
<tr>
<td>Admissions management</td>
<td>Applications; aptitude tests; admissions and rejections; enrolment</td>
<td>• Enrolment processing (SSZ)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• University Application Service for International Students (Uni Assist)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Central service offices / departmental offices / programme management (schools and departments)</td>
</tr>
<tr>
<td>Student affairs management</td>
<td>Leaves of absence; re-enrolment; withdrawals; tuition fee substitution funding management</td>
<td>• Enrolment processing (SSZ)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tuition and Scholarships Office (SSZ)</td>
</tr>
<tr>
<td>Examinations management</td>
<td>Examination process coordination (incl. schedule and location planning; academic progress monitoring; recognition of academic and study qualifications; issuance and management of graduation documents)</td>
<td>• Examination Offices (at each of the three campuses)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Examination Offices / examination committees / degree programme management (at the departmental level)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Examination Coordination Offices (at each of the three campuses)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Examination Boards</td>
</tr>
<tr>
<td>Facility management</td>
<td>Room allocation; central and departmental allocation and scheduling</td>
<td>• Facility Allocation Committee (delegates from the schools and departments; Real Estate Management; Delegate Officer of the President)</td>
</tr>
<tr>
<td>Campus management</td>
<td>Campus Management System support process</td>
<td>• ITSZ: Key users; special committees; Campus Management Team</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• SSZ, in particular Process Management and Statistics: Key users; special committees</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• TUMonline designees (schools and departments)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Degree Program Management Committee</td>
</tr>
</tbody>
</table>

*Table 3: Service areas and processes*
For each of these processes, the Bologna reforms have led to far-reaching changes at TUM. The introduction of modularised, tiered degree programmes (bachelor's/master's) and of examinations to accompany modules (with the module and test forming a unit) pose challenges concerning content and management alike. Also, the new regulations carry significant ramifications for student affairs, particularly concerning admissions and enrolment as well as module and examinations management. Furthermore, TUM has had to contend with interim enrolment spikes (caused by the transition from nine to eight years of secondary schooling in Bavaria in 2011 and the abolition of the draft). And finally, the near-comprehensive introduction of aptitude assessment for bachelor's and master's programmes (via EFV and EV, respectively) and the increasing numbers of international student applications have had a further impact on the core service areas and processes.

4.2.1 Student Advisory Office

Throughout the student life cycle, a full spectrum of advisory services is available to TUM students, including orientation and initial-stage advising, as well as mid-programme mentoring. Student Academic Advising (an SSZ service) provides personal consultations to prospective and current students on a variety of topics including orientation enquiries, individual degree programmes, application and admission procedures, admissions criteria for applicants without a higher education entrance qualification, the transition from bachelor's to master's programmes, options for changing degree programmes, withdrawals from the university, and joint degree programme options. Content questions regarding degree programmes as well as mid-programme and vocation-related enquiries are handled by the Departmental Student Advising offices.

For exchange students, the TUM International Center (IC) serves as a further important contact point. Besides coordinating interuniversity relations, the IC advises TUM exchange students (including participants in the Erasmus, TUMexchange, partner university, and double degree programmes) on all organisational matters pertaining to their studies.

In addition, Alumni & Career Services supports students, doctoral candidates, and alumni with career planning and job applications, and addresses questions on current job market trends as well as employment opportunities in academic research and the corporate world. Over and above this centralised service, the schools and departments offer personal consultations on taking up employment as well as potentially suitable occupational areas.

The central and departmental student advising services at TUM are summarised in the following table:
<table>
<thead>
<tr>
<th>Target group</th>
<th>Student Advisory Office</th>
<th>Departmental Student Advising</th>
</tr>
</thead>
</table>
| Secondary school pupils | • General questions concerning academic studies  
• Introduction to TUM (presentation describing the university, including schools and departments, opportunities for studying, etc.) | • Degree programme content                                      |
| Orientation           |  |  |
| Prospective undergraduate students | • University entrance requirements  
• Admission requirements  
• Admission categories  
• Degree programme overview  
• Introduction to TUM (describing the university profile, schools and departments, opportunities for studying, etc.)  
• Decision-making support  
• Inquiries concerning professional areas of expertise and spheres of action | • Department-specific formalities (application folders, special requirements, aptitude test, additional pre-requisites, etc.)  
• Details on academic content and the usual course of study  
• Profile of the school or department and its degree programmes  
• Overview of required prior expertise in fields relevant to the course of study as well as key competencies and personal strengths  
• Decision-making support within degree programmes  
• Orientation support; overview of prospects in the academic job market; occupational profiles  
• Acquisition of key qualifications and supplementary competencies  
• Advising on internships, project work, etc. |
| Additional advising for prospective international students | • Application documents  
• Pre-requisites | • Recognition of academic and study qualifications |
| Initial stage                      |  |  |
| Prospective postgraduate students (domestic and international) | • Issues arising during a course of study that are unrelated to academic content  
• Formalities  
• Orientation inquiries  
• Overview of the master’s programmes  
• For students enrolled in a bachelor’s programme at TUM: opportunities for proceeding to a master’s at TUM (MasterTUM database) | • Content questions and organisational issues concerning degree programme planning  
• Curriculum planning and module scheduling assistance  
• Examinations advising  
• Qualifications check  
• Details concerning academic content and the usual course of study  
• Orientation issues; overview of master’s programmes  
• Overview of prospects in the academic job market; occupational profiles  
• Department-specific formalities  
• Overview of required prior expertise in fields relevant to the course of study  
• Acquisition of key qualifications and supplementary competencies: as with postgraduate students, in addition to the following supplementary advisory services:  
  - Advising on issues concerning related academic fields that will also be encountered in the new major  
  - Recognition of academic and study qualifications |
| Mid-programme          | • Available options |  |
| Students intending to change degree programmes |  |  |

Table 4: Central and departmental student advising

4.2.2 Admissions and student affairs management

In accordance with the student life cycle, TUM’s administrative services for students are subdivided into admissions and student affairs management. Admissions covers the workflows relating to applications, aptitude assessment, admissions or rejections, and enrolment, while student affairs concerns leaves of absence, re-enrolment, withdrawals, graduations, and tuition fee substitution.
funding management. For students, the smooth and uncomplicated operation of these workflows is essential to the well-focused pursuit and successful completion of their studies. As part of our optimisation measures, two manuals have been compiled detailing the pertinent workflows ("Bewerbung, Zulassung, Immatrikulation" and "Beurlaubung, Rückmeldung, Exmatrikulation") and providing the basis for ongoing review and monitoring by TUM departmental staff as well as the Student Service Center.

All of the above-mentioned workflows are supported by TUMonline applications. The legal framework is determined by the TUM statutes on enrolment, re-enrolment, leave of absence, and withdrawal or graduation, as well as the Academic and Examination Regulations (FPSOs) for each of the specific degree programmes, which enumerate the admission requirements and the applicable aptitude assessment regulations.

4.2.3. Module management

With the introduction of modularisation, a new set of workflows has emerged. To facilitate their implementation, a corresponding set of module management standards – the so-called module catalog – was compiled conjointly with departmental staff in order to define the mandatory workflows, related responsibilities, and corresponding TUMonline applications, with due consideration for the divergent allocation of tasks at the departmental level. Our module catalog is aimed at departmental staff, modularisation designees, degree programme coordinators, and the Deans of Studies.

The workflows documented in this catalog, which span the entire module life cycle, are illustrated by the following graphic:

![Module life cycle diagram](image)

**4.2.4 Examinations management**

As part of the reorganisation of student affairs management at TUM, the Quality Standards for Examinations Management (QSPV) have now been fully overhauled. A standardised, mandatory examination system has now been established at the schools, departments, and central scientific institutions, including clear-cut communication channels designed to facilitate inter- and intradepartmental collaboration. In order to subdivide the related workflows and to compile
guidelines for each sub-procedure, an "Examinations Management Process Committee" was set up, comprising TUM departmental staff, the Examination Offices, the Legal Office, and the IT and Quality Management areas.

The current tasks and responsibilities of the Examination Offices can be summarised as follows:

A. Compilation and publication of university-wide examination schedules for every semester
B. Examinations management (including scheduling; registration and withdrawal; medical certificates concerning withdrawals; supervision by invigilators; marking; and corrections to recorded marks)
C. Evaluation of examination results
D. Academic progress monitoring
E. Documentation of academic progress (including notifications of examination results; certificates and written confirmations; rankings)
F. Recognition of academic and study qualifications (including assessment and management of the credits recognised)
G. Mandatory internships (including recognition and management)
H. Theses (including supervision, evaluation, and management)
I. Graduation management and documentation
J. Adaptation of Academic and Examination Regulations (FPSO) to the specific degree programmes
K. Advising on legal matters pertaining to examinations

Established in succession to the "Examinations Management Process Committee", the Examination Board (FAPV) has compiled a full set of documentation pertaining to examinations management, including manuals on examination scheduling; legal issues concerning reviews of marked exams; and guidelines for writing diploma supplements ("Empfehlungen zur Prüfungsterminplanung", "Prüfungseinsichten – Rechtliche Anforderungen und Empfehlungen", and "Wegweiser zur Formulierung eines Diploma Supplement"). In addition to handling the related enquiries, this committee is also responsible for revising the existing guidelines on a continual basis in accordance with internal and external requirements.

Of fundamental importance to examinations management workflows has been TUM’s decision to introduce academic progress monitoring. While students are now permitted to repeat examinations ad libitum, they are nonetheless required to earn a minimum number of credits per semester. The new regulations stipulate that, at any point during a degree programme, the total number of credits accumulated must not fall short of the expected total (for that particular stage of the average duration of study) by more than two semesters. An early warning system goes into effect if students have fallen behind by at least 15 credits, thus ensuring steady feedback on their academic progress. The related directives are
contained in the Academic Framework Guidelines (EPP) and the General Academic and Examination Regulations (APSOs).

4.2.5 Campus Management System

TUM has applied university-wide optimisation measures to the workflows and organisational structures associated with all stages of the student life cycle, from initial enquiries to applications, admissions, enrolment, degree programmes, examinations, graduation, the awarding of doctoral degrees, and the Alumni Service. To provide optimal support for the related IT processes, the previous aggregate of IT systems was replaced by a single integrated campus management system. Introduced in 2008-2011, the TUMonline system is continually being advanced in close collaboration with the participating user groups. At present, TUMonline supports the following central areas: initial enquiries, applications, admissions, enrolment, degree programmes, examinations, and graduation.

During the go-live phase, each functional area of TUMonline was differentiated into key users (KU) and the Campus Management Team (CMT). Key users are responsible for tying their areas of expertise together as well as compiling user requirements and feedback (in their function as heads of special committees); they also prepare the documentation for all related processes and guidelines. Working closely with these key users, the Campus Management Team supplies the technical infrastructure for TUMonline in addition to handling the related support and maintenance issues.

This workflow ensures that user requirements and feedback are continually processed via the “plan-do-check-act” (PDCA) cycle: In general, users present their input to the designated special committee, and key users write up the new specifications, based on a requirements analysis (=plan). In collaboration with the service provider, the Campus Management Team then configures the new or modified application (=do); and finally, by means of user tests conducted during daily operations, all applications are reviewed (=check) and optimised (=act) on an ongoing basis.
From the students’ point of view, TUMonline offers a comprehensive spectrum of services: In addition to providing access to online applications for admission, curriculum overviews, and downloads of student documents (such as course materials, examination/course marks, and reviews of marked examinations), this system enables students to communicate more easily with teaching staff and fellow students, to register for and de-register from courses and modules, and to manage their tuition fee substitution funding accounts. For TUM teaching staff, TUMonline also provides services including overviews of course schedules, modules, and examinations; online applications for various administrative tasks; and direct e-mail communication with students, including automatic updates notifying students of changes to locations and schedules.

Over and above TUMonline, numerous additional IT systems have been set up in support of the workflows relating to academic and student affairs, including mediaTUM (the central server for documents and publications) and Moodle (the e-learning platform used university-wide). Furthermore, TUM’s IT services for students include laptop pools, campus software licences, a variety of electronic media, and personal online storage space with worldwide network connectivity.
4.2.6 Student Service Center

By means of various restructuring measures, the services offered by the Student Service Center (SSZ) have been subdivided into a Front Office (for face-to-face services and media) and a Back Office (for services not directly accessible to customers), with two levels of support: First-Level (for initial customer contacts) and Second-Level (for further processing by the individual service areas). Additionally, accessibility to these services is now classified as follows: open (available round the clock); limited (restricted to specific hours); secure (with separate access for customers and those awaiting service); and locked (not accessible to customers).

<table>
<thead>
<tr>
<th>Competence levels</th>
<th>Front Office</th>
<th>Back Office</th>
</tr>
</thead>
</table>
| First-Level Support | • Service Desk (limited)  
• Hotline (open; limited) | • Student advising and prospective student programmes (secure)  
• Housing search assistance (secure)  
• Examinations management (secure)  
• Tuition funding and scholarships (locked) | • Registrar’s Office (locked)  
• Examinations management (locked)  
• Tuition funding and scholarships (locked) |
| Second-Level Support | • Student advising and prospective student programmes (limited)  
• Housing search assistance (limited)  
• Examinations management (limited)  
• Tuition funding and scholarships (limited) | | |

Table 5: Customer service from the students’ point of view

As part of the implementation of these measures in all SSZ service areas, the TUM Service Desk – a drop-in centre staffed by personnel from the Registrar’s Office as well as the Student Advisory Office – was established at a central on-campus location. Additionally, a hotline was set up to handle telephone enquiries as well as incoming e-mails addressed to studium@tum.de (the initial e-mail contact point for prospective students). In 2011, the TUM Hotline processed ca. 48,000 e-mails and ca. 34,000 phone calls. While detailed questions are generally passed on to Second-Level Support, phone calls are forwarded not only to the applicable SSZ service areas but also to other central units and institutions such as the TUM International Center or the individual schools and departments.
Furthermore, TUM has recently begun digitalising student documents. By means of the new electronic archiving system, digital student data such as application documents can now be exchanged round the clock worldwide. As a result, the SSZ can dispense with the time-consuming process of forwarding applications to the schools and departments via regular mail for the next stage of processing.

4.2.7 Allocation of tuition fee substitution funds
As of October 1, 2013, TUM has been receiving so-called tuition fee substitution funding, consisting of state compensation for revenues formerly obtained through tuition fees. As with the previous tuition fee system, these funds are designated exclusively for improvements to the conditions for studying and teaching, both at the departmental level and university-wide.

In the schools and departments, these subsidies are being applied primarily toward the advancement of existing degree programmes, with a particular view to curricular expansion as well as improvements to the conditions for teaching (e.g., courses, extracurricular programmes, internationalisation, the university infrastructure, and e-learning); in certain cases, they may also be earmarked for newly established degree programmes. The measures to be financed at the departmental level are decided upon by departmental planning commissions, with students participating.

University-wide, these revenues may be allocated to several or all TUM schools and departments at one or more campuses; the beneficiaries include programmes with a particular focus on teaching, or measures aiming to optimise the conditions for teaching and learning. This funding category, which also covers construction and renovation projects, is administered by the TUM Extended Board of Management via a five-year plan compiled by a central structural commission on the basis of a set of proposals, with students participating.

Recommendations concerning individual schools and departments are forwarded by the respective deans to the TUM Board of Management, where the final decision is reached concerning departmental and university-wide proposals.

4.2.8 Third-party funding for academic and student affairs
As a key component of its efforts toward the advancement of academic and student affairs, TUM regularly applies for third-party subsidies and takes part in the requisite competitions, yielding a series of notable successes in recent years.

The project TUM: Lehre im Fokus (launched in connection with the "Exzellente Lehre" contest), for example, has introduced a broad spectrum of measures pertaining to the strategic orientation of academic and student affairs. Based on four core elements – structures and processes, individualisation, professional development, and incentives – these initiatives share the common goal of
promoting a continuously evolving culture of teaching and learning at TUM. In a subsequent phase, the related project proposals again met with success in the course of two follow-up applications submitted to competitions held by the Federal Ministry of Education and Research (BMBF).

A further example is the **TUM: Agenda Lehre** programme (sponsored by a federal grant entitled "Qualitätspakt Lehre"), whose strategic approach also hinges on the above-mentioned four core elements. This project is aimed primarily at improving the administrative workflows at the departmental level, through measures such as the following: The Deans of Studies are now being supported by the directors of their respective Academic Programs Offices, and the adviser-to-student ratio has been boosted via further appointments to scientific staff. Additionally, in an effort to tailor degree programmes to specific target groups, supplementary resources have been allocated toward the development of innovative academic formats as well as programmes offering greater flexibility in terms of duration of study. Also, the central scientific institutions are now complemented by an expanded teaching methodology training programme, in the expectation that the schools and departments will benefit even more from this enhanced palette of services.

The **TUM Individual** project (funded by the BMBF as part of an educational opportunity programme entitled "Aufstieg durch Bildung: Offene Hochschulen") is focused on *individualisation* in that it enables degree programmes to be adapted to the personal requirements of target groups such as qualified postgraduates in mid-career, seasoned professionals, and persons with family responsibilities. The related customisation measures are geared towards supporting these target groups by facilitating their entry to university; in addition, they promote the overall transition to more flexible degree programme models.

### 4.3 Evaluation of academic and student affairs

TUM's evaluation system, a central element of our QM initiatives for academic and student affairs, consists of an ongoing series of surveys carried out with the aim of systematically assessing and improving TUM's degree programmes and conditions for studying. By supplying a comprehensive set of information and feedback on relevant QM topics, this system furnishes the basis for far-reaching optimisation measures.

Toward this end, TUM regularly collects data on a variety of topics including individual courses and teaching staff, course and examinations management, student services including advising, and departmental profiles and administrative structures. The results are evaluated at **three levels:**

1. Individual courses / teaching staff
2. Degree programmes
3. Departmental strategy and administration
TUM's evaluation procedure is aimed at four feedback target groups: In addition to students, these include postgraduates and external experts from a wide range of professions; employers; and professional associations. To ensure data accuracy and validity, the survey process employs appropriate methods and instruments on a regular or ad hoc basis.

Developed in collaboration with student representatives and special designees responsible for degree programme design, assessment techniques, educational methodologies, and gender mainstreaming, TUM's evaluation system was discussed and finalised by the Academic Affairs Council and subsequently adopted by the TUM Board of Management.

The survey data is collected on a decentralised basis and reviewed at the departmental level by the deans for academic affairs, who are also responsible for the development and implementation of optimisation measures. Toward this end, quality circles have been established at the schools and departments, consisting of QM designees who meet with student representatives at least once per semester in order to analyse the cumulative survey results (along with additional data including key figures, feedback management, etc.) and identify areas for improvement. This ensures that all feedback undergoes prompt evaluation and enables the current "status" of degree programmes to be determined on a continual basis, thus serving to reinforce favorable developments early on and to preclude negative trends.
As a matter of principle, the results of these quality circle meetings are documented with a particular view to the following aspects:

- Quality circle minutes are required to provide a summary of the discussion content as well as the result, i.e., the catalogue of measures to be taken.
- The minutes are archived as part of the degree programme documentation.
- The consolidated evaluation results and the final decision (i.e., catalogue of measures) are published at the departmental level, usually on the intranet.
- The ensuing QM measures and their implementation are likewise monitored by the quality circles.

To ensure that QM measures are being implemented on a sustainable basis, additional feedback rounds are conducted with the TUM Board of Management as well as various additional decision-making boards:

- Quality circle results are presented by the schools and departments to the Senior Vice President for Academic and Student Affairs.
- The Senior Vice President for Academic and Student Affairs reports these results to the TUM Board of Management, which discusses their strategic significance.
- The results are also presented to various other central decision-making bodies (including the Academic Affairs Board and Academic Affairs Council).

The related Level 1 and Level 2 pilot projects were completed at the end of the summer semester of 2012. In the interim, three departments have been assessed by means of a peer review of research-and teaching-related aspects: The TUM Department of Mechanical Engineering (MW) underwent evaluation in 2011-2012, followed by the TUM Department of Architecture (AR) and the TUM Department of Civil, Geo and Environmental Engineering (BV), both of which were assessed the following year. A fourth, the TUM School of Life Sciences Weihenstephan (WZW), launched its evaluation process in 2013 as well, including a two-part rollout plan whose first phase was completed during the summer semester; the second is currently in progress.

5. Students

The quality of higher education is determined in large part by the calibre of its students. It is only through highly motivated and inquisitive learners who are well suited to their degree programme of choice – whether it be aimed at a particular profession or geared towards a scientific career – that truly excellent levels of competency can emerge.

It goes without saying that suitability and motivation are not static pre-requisites; rather, they will tend to fluctuate in the course of a student’s professional formation. For this reason, TUM’s administrative services cover the entire student life cycle – from initial enquiries, when pupils are seeking guidance concerning
particular programmes, through aptitude assessment, which cements their choice of degree programme, up to the establishment of an educational setting that spurs students' motivation. Striking a balance between well-placed academic demands and well-needed mentoring for students and teaching staff, TUM offers extradisciplinary programmes and complementary electives as further incentives for critical reflection. And by providing opportunities for student participation in decision-making processes, TUM aims to promote students' personal development while at the same time respecting their individual life circumstances.

5.1 Prospective student programmes

In an effort to reinforce TUM's networking activities at selected secondary schools, the university inaugurated a series of annual events for prospective students in 2004, including "Pupils' Day" (Schülerntag) and "A-Levels Day" (Abitag). Additional initiatives include visits to trade fairs.

With the establishment of the TUM School of Education (TUM EDU) in 2009, these activities were expanded and restructured even further. In an effort to advance teacher training and introduce innovative educational techniques, TUM EDU has also set up reference schools, school clusters, mentoring programmes for professors, and a research centre for advanced pupils with a strong interest in the natural sciences.

Concurrently with the founding of TUM EDU, an additional contact point for prospective students ("ExploreTUM") was established at the Student Advisory Office in order to provide secondary schools (including classes and individual pupils) with general information on studying at TUM. These measures have ultimately resulted in enhanced studiability as well as lower student withdrawal rates.

Further milestones were set by an initiative aiming to generate enthusiasm among pupils interested in the "MINT" subjects (mathematics, information technology, natural sciences, technology) and by several related projects tailored to girls and young women, such as the agency "Girls in Science and Technology". Together with ExploreTUM, this agency was incorporated into the Student Advisory Office in 2011, which was renamed "Student Advisory Office and Prospective Student Programs" in order to draw attention to these activities. In collaboration with TUM schools and departments, over 200 events for prospective students were held in 2011.

5.2 Aptitude assessment

TUM holds that anyone with the inclination and aptitude for university studies should have the opportunity to enrol on a degree programme. Nevertheless, in some cases, potentially qualified students are denied access to their desired programme because of their A-Levels results, since there is no way of
determining whether their marks were negatively impacted by their personal situation. Also, all too often, degree programmes are still chosen on the basis of insufficient information.

To assist prospective students in selecting their course of study, TUM has established **aptitude assessment** procedures for most bachelor’s (EFV) and master’s (EV) programmes. Additionally, the university offers three numerus clausus (NC) programmes as well as unrestricted access to several further degree programmes.

For the bachelor’s programmes, applicants are required to demonstrate their aptitude in a two-step procedure: In the first round, TUM evaluates the applicant’s university entrance qualification examination results, their marks in specific subjects and, in certain cases, their vocational qualifications. Depending on the outcome, the applicant is either admitted or rejected immediately, or invited to the second round, consisting of an interview that includes an assessment of their personal motivation.

For the master’s programmes, aptitude assessment is conducted along similar lines: In the first round, the marks earned in the bachelor’s programme, in addition to further written documents, are evaluated on the basis of a scoring system. In addition to the level of expertise acquired through the first degree programme, the cover letter is a central admissions criterion. Depending on the score attained, the applicant is either admitted or rejected immediately, or invited to the second round, consisting of a personal interview or written test.

Experience has shown that TUM’s aptitude assessment policy has heightened the university’s attractiveness and contributed to enhanced academic success rates. For this reason, TUM will continue to adhere to this process, despite the additional overhead involved and the restrictions increasingly being imposed by administrative courts.

### 5.3 Extratitdisciplinary programmes and services

Along with its degree programme curricula, TUM offers a wide range of extradisciplinary modules and training programmes for students and university staff. The **Carl von Linde-Akademie** (CvL), a privately funded academy integrated into the **Munich Center for Technology in Society** (MCTS), provides supplementary instruction in key extradisciplinary skills as well as training in a broad spectrum of teaching methodologies. With a varied curriculum featuring multidisciplinary courses at the Chair of Philosophy of Science, teacher training offered by the ProLehre team, numerous interdisciplinary competency courses, and a public lecture series, the CvL has also prepared extradisciplinary training modules that are available to all schools and departments.

The **Language Center** provides TUM students, staff, and alumni with opportunities for polishing their linguistic proficiency by means of semester-long courses...
in 15 foreign languages; additional options include in-depth training during semester breaks as well as modules and events relating to cross-cultural communications. Furthermore, students can practise on their own at self-study centres offering online modules at the Garching and Weihenstephan campuses.

At the hub of TUM's internationalisation stakeholders, the **TUM International Center (IC)**, headed by the Senior Vice President for International Alliances and Alumni, handles the key administrative tasks pertaining to TUM's internationalisation programmes, ranging from interuniversity exchange programmes to student exchange and integration activities.

In practise, internationalisation at TUM is being implemented at the departmental level: Each school and department has appointed an international student adviser charged with coordinating the internationalisation and exchange programmes (such as Erasmus) and liaising with the TUM International Center.

Additionally, the university's Corporate Administration is increasingly being involved in internationalisation processes – as shown, for instance, by TUM's service structure for prospective and current students, which is subdivided not by students' country of origin but rather according to their academic goals. As one example of an integration measure for international students who are getting started at TUM, the **TUMi** programme, conceived along the lines of an orientation programme, offers practical assistance in matters related to living and studying in Munich, while simultaneously giving students a chance to build peer networks.

Once students are underway with their studies, the **TUM Mentoring** programme offers guidance on a variety of questions over the course of an academic year. Launched twice yearly, in the spring and fall, this programme assists students and doctoral candidates with specific issues, while at the same time fostering their personal development. Mentoring is available to TUM students (from their third semester on) as well as doctoral candidates; the mentors are TUM alumni.

In addition to various other mentoring programmes offered at the departmental level, further related services include **mentorING**, tailored specifically to women students, and **Step Inside**, an initiative for prospective students offering a glimpse of day-to-day studies at TUM.

Aiming to nurture outstanding students and young alumni, the **TUM: Junge Akademie** programme provides in-depth coaching in specific disciplines as well as in the development of innovative ideas and approaches from an independent point of view; furthermore, this programme promotes peer exchange on a wide range of interdisciplinary themes affecting society as a whole, in addition to specific topics from the sciences, culture, and politics. Typically, bachelor’s students join during their third year and participate over a five-year period, the latter part of which comprises their master's programme and the "young alumni" phase, i.e., their first two years after leaving the university.
In an effort to promote entrepreneurial thinking and action among students, researchers, and working professionals, and to support corporate start-ups in implementing their business ideas, the UnternehmerTUM GmbH project offers a variety of formats ranging from individual lectures to comprehensive training programmes. Furthermore, the UnternehmerTUM Fund provides venture capital to budding technology firms showing high promise for international market success.

In support of TUM students, doctoral candidates, and alumni who are taking up employment and launching their professional careers, Alumni & Career Services holds information sessions on topics such as studying and working abroad, planning careers in various professional sectors, and handling assessment centres with poise and confidence. Students can attend these workshops in parallel with their module schedules.

In addition to the above-mentioned core programmes, numerous further services have been established at the departmental level in support of students’ personal development. As one example, the TUM Department of Mechanical Engineering (MW) has long been offering soft skills training at the Center for Management and Interpersonal Competency Training (Zentrum für Sozialkompetenz- und Managementtraining; ZSK). Also, the Garching Tutoring System (TUTOR) enables bachelor’s students to improve their teamwork, group moderation, presentation, and project management capabilities in a group setting, while master’s students who have assumed the role of tutors have a chance to build their leadership, instructional, and advising skills. Furthermore, most of the individual schools and departments offer similar tutoring programmes, some of which are backed by tuition fee substitution funding; all are continually being re-evaluated and optimised.

5.4 Student participation in decision-making processes

TUM attaches great importance to building a close, constructive alliance between students and their alma mater. In addition to the various discussion platforms established toward this end, TUM has traditionally made a point of fostering informal, ad hoc communication channels throughout the university.

At the formal level, students are accorded two seats each in TUM’s top-level decision-making bodies: the TUM Senate and the TUM Board of Trustees. Of these two student representatives, one (elected via direct vote in the University Election) has voting privileges; the second delegate (appointed by the TUM Student Council) holds an advisory function. Additionally, the Academic Affairs Council and the Academic Affairs Board each comprise two student representatives with voting power, and every special committee convened by the Academic Affairs Board has a student delegate participating. At the departmental level, student input can be submitted to the Department Council via the departmental student councils; also, depending on the school or department,
there are student representatives in further decision-making bodies such as the departmental committees for student affairs or the quality circles.

Furthermore, TUM’s policy on the allocation of tuition fee substitution funds (i.e., public funds received in lieu of tuition revenues) expressly provides for student representation: Even before the Bavarian Higher Education Act (BayHSchG) had established regulations to this effect, TUM statutes had already stipulated parity-based student co-determination concerning tuition fee allocation as a pre-requisite for the departmental allotment of these revenues. At present, students are represented (as delegates from departmental student councils or the TUM Student Council) in the tuition allocation committees at the departmental level.

In addition to these co-governance opportunities for students directly involved in decision-making boards and committees, TUM offers numerous platforms for peer exchange on matters extending beyond the scope of academic affairs: Organised by student representatives, the TUM Student Council (FSR), for example, provides a monthly forum for debate on current topics relating to teaching and learning as well as higher education policy in general. By inviting staff from the central service units and administrative offices (such as the SSZ, HRSL, etc.) to these meetings, students can glean first-hand information and expert input from university personnel, in addition to voicing their questions, feedback, and criticism.

In a further meeting held once per semester, student representatives meet with the president, with HRSL staff attending. Serving as a channel for opinion formation and direct information exchange between students and the TUM Board of Management, this meeting gives students a chance to present their concerns in person at the topmost level. The agenda is set by the students, and HRSL staff are in charge of the preparation and post-processing. The opportunity to request ad hoc decisions from the president facilitates problem-solving and expedites the related processes, thus contributing to student satisfaction. Additionally, student representatives have the option of meeting at least once per semester with the Senior Vice President for Academic and Student Affairs.

Over and above these formal contact platforms, specific questions can be addressed at any time to a designated HRSL staff member serving as a direct contact point for students and student representatives. Student enquiries generally pertain to a variety of topics ranging from the search for locations for student events, to financial issues, to more time-consuming matters such as questions concerning the current status of a particular project (such as “Introduction of the Semester Ticket”, for example). All queries can be submitted informally and unbureaucratically, and will receive prompt feedback and support.

By participating in decision-making boards and committees, students are not limited to formal agendas when conveying their concerns to members of the
TUM Board of Management, the central service units, or the deans of the schools and departments. And finally, our central feedback management system (see Section 6.4) lends a voice to all students, including those who are not actively involved in decision-making processes.

As highly esteemed collaborative partners to the TUM Board of Management, TUM students take part in the gamut of processes pertaining to university development. As one prominent example, the ExcellentUM project was launched to give students a chance to co-determine the allocation of tuition fee substitution funds, resulting in numerous student proposals concerning improvements to the conditions for studying. To facilitate the implementation of these ideas, student representatives concluded a contract with the TUM Board of Management on July 28, 2005 regarding the allocation of €500,000 in special funds from the university budget. This initiative, entitled Qualitätsoffensive StudiTUM I, was renewed in January 2008 by means of a follow-up programme (StudiTUM II).

6. Outcome quality

Using evaluation tools tailored to the items under investigation, the quality of learning outcomes at TUM is regularly assessed at various levels and from numerous different angles in order to glean a maximum of relevant data pertaining to QM steering issues. In the final analysis, the principal target of TUM’s educational services – and the ultimate outcome of all academic activities – are our postgraduates, of course. In view of the skills they have acquired at university and the competencies they have developed in the course of their careers, TUM postgraduates represent our single most significant source of information concerning QM topics. Nevertheless, the feedback loops between postgraduates and the quality-relevant parameters of our degree programmes are too lengthy to permit immediate follow-up in terms of strategic or operational fine-tuning. For this reason, certain intermediate steps in the QM process have been singled out as reference points and indicators for intervention. In addition, metadata such as information gathered for controlling purposes is used to identify trends and arrive at organisational steering decisions.

6.1 Alumni programmes

With its multifaceted alumni projects, TUM aims to build lasting ties between its postgraduates and the TUM community by nurturing the professional development of alumni throughout their careers and encouraging their lifelong participation in TUM activities. This strategy has emerged from our realisation that TUM networks can benefit not only junior professionals but also well-established alumni, particularly in terms of a career-oriented mutual exchange. Thus, young academics are now the starting point for TUM’s career advancement programmes, enabling postgraduates of all ages to experience the advantages of the international TUM alumni network on an intergenerational basis.
The Alumni & Career initiatives launched to date offer TUM postgraduates a broad spectrum of activities tailored to specific target groups and career phases, with an explicit emphasis on networking opportunities. From their inception, all projects are developed with the global alumni network in mind, and active involvement is solicited by measures such as inviting alumni to speak at conferences such as "Doing Your Doctorate Day", or by calling for alumni participation in events held by Alumni & Career Services, the "Juniors Meet Seniors" programme, and the "Alumni Kids Workshops", for example.

A primary goal of TUM's alumni network is to promote internationality by addressing postgraduates the world over (including German alumni working abroad). Thus, the English-language newsletter Alumni News, a newly launched print medium established in cooperation with the TUM International Center, is aimed not only at the global alumni network but also at international students who have not yet completed their studies at TUM.

A further core element of our alumni activities is the TUM Mentoring programme. By means of its target-group-oriented approach, this project has succeeded in reinforcing alumni's ties to the university and in sparking their enthusiasm for mentoring activities. At the initiative of alumni, the Juniors Meet Seniors programme, for example, was established to offer mentoring for exchange students during their stay abroad. Additionally, the "Alumni Open Doors" project gives young postgraduates a chance to visit experienced alumni at their workplaces, and provides access to places of interest that are normally closed to the public.

6.2 Controlling

To monitor the fulfilment of quantitative and qualitative goals, TUM employs an extensive controlling system in addition to the above-mentioned observation and evaluation tools. The academic controlling process is coordinated by TUM Controlling, Organization and Planning.

TUM's primary goal-oriented steering elements include:

- Internal and external target agreements
- Student admissions criteria based on aptitude and motivation
- Allocation of funds based on departmental performance and requirements
- Regular departmental evaluations through external experts

Controlling via target agreements

TUM has been using target agreements (ZV) since 1998, to great benefit: The ZVs between the TUM Board of Management and the schools and departments concerning internationalisation, for example, have led to a significant boost in the number of international students enrolled at TUM. Further agreements have pertained to the curricular restructuring project innovaTUM-2008 (see Section 2.3) as well as the objectives defined for the Gender & Diversity areas in the fall of 2012.
Additionally, the Bavarian State Ministry of Education, Science and the Arts (StMBKWK) has entered a series of bilateral target agreements with the Bavarian institutions of higher education, with the common goal of driving their capacity for innovation. Similarly to TUM’s internal contracts, these bilateral agreements categorically dispense with micro-management in favor of defining specific targets relating to university development and profile formation. The first contract (extending from 2005 to 2008) was followed by a further five-year agreement running through 2013 and delineating this innovation alliance in greater detail.

TUM has been making use of these target agreements to advance and elaborate upon the strategic goals outlined in its university development plan.

Among the targets TUM has identified as central to the enhancement of its institutional profile are the following:

- An innovation-based overhaul of the educational methodology training programme offered by the TUM School of Education
- The advancement of doctoral programmes run by TUM Graduate School
- The Munich School of Engineering (MSE), an Integrative Research Center

At the same time, TUM’s overarching goals pertaining to higher education include:

- Completing the transition to the bachelor's/master’s system
- Promoting gender equality
- Boosting graduation rates
- Establishing a quality management system

In accordance with its target agreement with the Ministry, TUM submits interim reports every two years, as well as a concluding evaluation. In a final step, the TUM Board of Trustees verifies the agreement’s success.

As an entrepreneurial university, TUM firmly adheres to performance-based resource management. With regard to our teaching curriculum, we have traditionally employed capacity utilisation statistics in conjunction with further self-monitoring instruments. In addition to conducting regular staff resource adequacy checks, we review teaching quality on the basis of our goal-oriented steering principle, in combination with various process-oriented monitoring and controlling methods.

TUM’s self-observation process includes a reporting and academic controlling instrumentarium comprising measures such as public image monitoring in terms of rankings and performance comparisons; benchmarking analyses on specific issues; and consultations with external experts. Taken together, these measures yield a complete overview of competitive steering information for TUM’s decision-making bodies. Additionally, TUM employs a well-structured, efficient, and expeditious faculty appointment procedure providing for administrative and
scientific quality assurance; toward this end, the president is supported by five Executive Advisors to Faculty Recruiting who ensure that faculty appointments are conducted in accordance with the pertinent regulations.

6.3 Reporting

An essential pre-requisite for the smooth and efficient operation of organisational workflows is a transparent, target-group-oriented communications policy. TUM is committed to sustaining a continual dialogue with its stakeholders, thus ensuring a steady flow of information among all involved parties within and outside the university. At the same time, this information flow enables TUM to draw upon external ideas and suggestions that can provide a fresh impetus to the university's development processes.

TUM's annual report to its government sponsor, the Bavarian State Ministry of Education, Science and the Arts (StMBKWK), provides a comprehensive overview of all ongoing university activities. Furthermore, as a standing guest of the TUM Board of Trustees, TUM's contact person at the Ministry, Dr Ulrike Kirste (of the Ministerial Division for Universities and Universities of Applied Sciences) is regularly furnished with first-hand updates on newly reached decisions and their implementation.

In addition to news reports addressing the TUM community (i.e., professors, staff, and students) via our Internet and intranet sites, a variety of newsletters is available to selected audiences. Furthermore, representatives from special interest groups (such as student representatives and delegates from the non-professorial teaching staff) can gain direct access to inside information by taking part in decision-making boards and committees at various levels (including the semiannual student meetings with the president, the Research Staff Assembly, the Department Councils, the Academic Affairs Board, the TUM Senate, the TUM Board of Trustees, etc.).

For the general public, the chief source of up-to-the-minute information on TUM is the Internet. TUM's homepage, published in German and English, covers a wide range of subjects (such as organisational matters, overall strategy, degree programmes, the various disciplines, professors' profiles, etc.) in addition to supplying regular statistical updates (such as TUM: Facts & figures) for a broad spectrum of target groups. Our Web content can be accessed worldwide, thus providing for maximum transparency and clarity vis-à-vis our global audiences.

6.4 Additional evaluation systems

In addition to the 3-level model used as the primary instrument for assessing TUM's core processes, several additional evaluation tools are currently being employed for academic and student affairs. Our feedback management system offers every member of the TUM community an opportunity to share ideas,
concerns, and comments, and thus to participate actively in the change management process for teaching and learning at TUM. Using an online form, students, applicants, staff members, and alumni can submit suggestions for improvements as well as complaints pertaining to all student concerns. By means of this platform, TUM ensures that all input that could be relevant to the university’s steering processes is captured, including data not collected by other means. To draw attention to this supplementary feedback channel, TUM annually confers the Academicus Prize to the three best suggestions for improvement submitted to this platform, which are awarded €500 each. In addition, TUM has established individual feedback control cycles tailored to specific measures and processes: Regardless of whether these processes pertain to project evaluations, Gender & Diversity measures, quality management for the central scientific institutions, or Tenure Track evaluations – TUM ensures that the fulfilment of its strategic goals is continually being monitored by means of customised evaluation tools.

7. Further refinement of TUM's quality management system

A well-designed quality management system, by definition, must include built-in measures for continual self-optimisation. In the course of its implementation, new insights will come to light; at the same time, the system must provide for sufficient flexibility to permit adjustments in accordance with fluctuating requirements and newly emerging alternatives.

In its current form, TUM’s QM system is still in its very early stages. For this reason, the processes launched and established to date will take time to stabilise while further optimisation measures are being explored – including additional supportive processes to be described and published at a later date.

The Campus Management System has been instrumental in streamlining the management of TUM’s degree programmes, student services, and the university administration. Our goal for the coming years is to investigate further areas of application for this system, to promote its ongoing expansion, and to make the most of its potential on a long-term basis – thereby easing the load on our central and departmental administrative staff while simultaneously generating high-precision data with an even stronger focus on specific process steering issues.

Furthermore, TUM’s quality management measures are being expanded into several new areas. Among others, outcome-based examinations will be one of our new focal points. Since contemporary education research did not offer a satisfactory point of departure, TUM is now tackling this issue through studies of its own: TUM education researchers have recently begun conducting preliminary empirical analyses on the current state of our examination processes from the
students' and lecturers' point of view. This project will serve as the starting point for follow-up research to be pursued in collaboration with TUM higher education specialists.

Additionally, in order to promote outcome-based principles throughout the practical teaching areas at TUM, a manual on constructive alignment has now been prepared. Moreover, our existing manuals on the Bologna reforms and their implementation are continually being reviewed and revised in accordance with our experience to date.

Following suit on our pre-existing QM activities, and based on our newly established administrative structures, TUM has now consolidated its Gender & Diversity programme and the related management processes by means of an internal diversity audit. As a consequence, the full range of diversity initiatives can now be planned and steered systematically for all TUM community target groups, while at the same time enhancing transparency and promoting the sensitisation required to foster a spirit of true diversity.

As shown by our initial round of departmental evaluations, a further top priority concerning our overarching objectives in steering the quality of teaching at TUM will be to hone our teaching strategies at the departmental level. As part of our forthcoming QM procedures, we intend to render our existing tacit QM strategies explicit, and to continue pressing ahead with systematic planning measures in our schools and departments.

The current goal of our QM activities is to reach a further milestone leading to the self-determination that represents our ultimate aim. In the area of academic and student affairs, TUM is seeking authorisation for full-fledged autonomy with regard to its degree programmes. While TUM's public mandate will continue to be safeguarded through our strategic dialogue with the Ministry concerning the fundamental parameters of our academic offering, it will be incumbent upon TUM to implement its programmes independently as a matter of direct responsibility. Ministerial approval for specific measures pertaining to individual programmes will thus no longer be required.

These aims notwithstanding, we are promoting the systematic refinement and further development of our existing QM goals on an ongoing basis. The ultimate goal of all of TUM's activities is to foster a culture of teaching and learning in which all involved parties, whether they be students or teaching staff, form a community that respects individual concerns while pursuing its joint quest for scientific insight. This vision is at the core of TUM's commitment to creating and sustaining a continually evolving "community of excellence".