

Study program documentation Bachelor's Degree in Management and Data Science at TUM Campus Heilbronn

Part A
TUM School of Management
Technical University of Munich

General information

- Organizational assignment: TUM School of Management
- Title: Bachelor's degree program Management and Data Science at the TUM Campus Heilbronn of Technical University of Munich
- Degree: Bachelor of Science (B.Sc.)
- Standard study period & credits: 6 semesters and 180 Credits
- Form of study: Full time, attendance course
- Admission: Aptitude assessment procedure (EFV) for Bachelor's degree program Management and Data Science
- Start date: Winter semester 2024/25
- Language: English
- Additional information: The program is offered entirely at the TUM Campus Heilbronn .
- Responsible for the study program: Vice Dean Academic and Student Affairs,
Prof. Dr. rer. pol. Jürgen Ernstberger
ernstberger@tum.de

Academic Program Director,
Prof. Dr. rer. oec. Michael Stich
michael.stich@tum.de
- Contact person
For this document: Academic Program Director
Prof. Dr. rer. oec. Michael Stich
michael.stich@tum.de
- Status from: 01.10.2023

Table of contents

1 Study program objectives.....	3
1.1 Purpose of the degree program	3
1.2 Strategic importance of the degree program	4
2. Qualification profile	8
2.1 Knowledge and understanding	9
2.2 Use, application and generation of knowledge	9
2.3 Communication and cooperation.....	10
2.4 Academic self-image and professionalism	10
3 Target groups	11
3.1 Target group	11
3.2 Prior knowledge	11
3.3 Target numbers.....	12
4 Requirements Analysis.....	13
5.1 External Competition Analysis.....	16
5.2 Internal Competition Analysis.....	17
6. Structure of the degree program.....	20
7 Organizational connection and responsibilities.....	26
8 Developments in the degree program.....	30

1 Study program objectives

1.1 Purpose of the degree program

The objective of the Bachelor's degree program in Management and Data Science (BMDS) at the TUM Campus Heilbronn is to train and holistically qualify responsible graduates who can effectively solve economic and social problems at the interfaces of business administration and digital technologies. The focus here is on entrepreneurial challenges arising from the generation, availability, and use of data (data science).

The digital transformation of the economy and society has been the defining technological development since the turn of the century. It affects all areas of business and requires both far-reaching changes and completely new developments of business models and processes. This development is being driven in particular by data that can be generated, made available and used in unprecedented quantity and quality, which requires economic and social decision-makers to take a closer look at data science.

Internalizing data science skills is also of the utmost importance in the academic education of future decision-makers - especially managers who will be responsible for making decisions to achieve the global sustainability goal. While in the past, technical skills were particularly indispensable at business interfaces (e.g. for heads of development and production departments), data science aspects are increasingly permeating all areas of business, making it almost impossible to imagine management without data science skills in the future. As a result, traditional boundaries between company departments are disappearing and an interdisciplinary data stream is increasingly determining all business processes, the value creation of companies and, in many cases, even the core elements of the business model.

The BMDS at the TUM Campus Heilbronn addresses this profound change and qualifies internationally and interdisciplinarity oriented students for management tasks in times of digital change. The focus here is on the importance of personal, corporate, and social data, which can hardly be overestimated, and how this can be used for the benefit of people, companies, and society. In terms of the Sustainable Development Goals (SDGs), the potential utilization of technologies and data in the ecological field (e.g. in climate protection) is no less important.

In contrast to classically designed degree programs in the field of business informatics, business science content is not added to the study program as supplementary modules, but data science aspects permeate all BMDS modules. A strong mathematical foundation and several basic computer science courses enable BMDS students to attend elective modules at the TUM School of Computation, Information and Technology at the TUM Campus Heilbronn.

In this respect, the BMDS offers a fully-fledged management education in which all traditional business management learning content (e.g. accounting, logistics and marketing) is learned and reflected upon in the context of data science. Here, decisive technological developments (e.g. artificial intelligence, big data and machine learning) are holistically classified from the perspective of technology designers and users along economic (e.g. cost-benefit considerations), social (e.g. changing job profiles) and ethical standards and criteria (e.g. compatibility with fundamental rights and promotion of the SDGs).

The BMDS offered by the TUM School of Management at the TUM Campus Heilbronn. The city of Heilbronn, with TUM Campus Heilbronn as an integral and driving academic component, is a growing center for theoretical and practical research and development in the field of Data Science. The close proximity to the internationally leading TUM School of Computation, Information, and Technology, to application-oriented institutions such as the Ferdinand-Steinbeis-Institute Heilbronn and the Fraunhofer Innovation Center Heilbronn and, last but not least, to the future Innovation Park for Artificial Intelligence Heilbronn creates a unique environment for the successful establishment of the BMDS in Germany and probably also throughout Europe.

Another special feature of the location of the BMDS at the TUM Campus Heilbronn is the particularly high density of innovation-driven global companies in and around Heilbronn. While some of the companies based there are well-known to the general public (e.g. Audi, Bechtle and the Schwarz Group), most of the companies in the region are rather unknown (hidden champions) despite their importance for Germany as a business location and for international value chains. The BMDS and these medium-sized companies benefit from this feature of the Heilbronn location. The BMDS addresses the specific characteristics and challenges of (family-run) medium-sized companies in all study phases (e.g. in introductory law modules and the project study at the end of the study program) and offers various specialization options in this area.

1.2 Strategic importance of the degree program

The TUM School of Management offers a comprehensive portfolio of Bachelor's, Master's and postgraduate degree programs that put the idea of lifelong learning into practice, and thus fulfill the mandate of the Bavarian Higher Education Innovation Act to open up study and continuing education opportunities. In accordance with the strategic orientation of the TUM School of Management, all programs provide international management education at the interface of economics, engineering, life sciences, natural sciences, and technical sciences (including medicine) with a strong entrepreneurial component and orientation. In line with the TUM Sustainable Futures Strategy 2030, the teaching and study programs offered by the TUM School of Management contribute to the education of responsible decision-makers, which promotes the achievement of the sustainability goals set by global society in general and by TUM itself.

The aim of the courses and study programs offered by the TUM School of Management is to provide graduates with a holistic, scientifically sound, and internationally oriented management education combined with an understanding of engineering, life, natural and technical sciences to enable them to take on responsible tasks in business and society. This goal is promoted by the diverse commitments of the professors at the TUM School of Management in scientific, social, and entrepreneurial committees that deal with important decisions in science, society and business. Secondary memberships of professors in other schools underpin the interdisciplinary orientation of the TUM School of Management.

The content of the study programs varies depending on the different admission requirements and the individual educational background of the students. The study programs at the TUM School of Management can be divided into three categories:

- Interdisciplinary management programs with a focus on engineering, life, natural and technical sciences and sustainability: These include the BMDS (TUM Campus Heilbronn), Management and Technology (TUM Campus Munich) and Sustainable Management and Technology (TUM Campus Straubing) and the Master's programs Consumer Science (TUM Campus Munich), Finance and Information Management (TUM Campus Munich), Management and Digital Technology (TUM Campus Heilbronn), Management and Technology (TUM Campus Munich) and Sustainable Management and Technology (TUM Campus Straubing).
- Programs that provide basic management training for students with a first degree in natural sciences and/or engineering (usually a Bachelor's degree): The Master's programs in Management (TUM Campus Heilbronn and TUM Campus Munich) fall into this category.
- Continuing education programs: In the part-time Executive MBA programs for experienced professionals with management responsibility, participants are developed into effective and responsible managers by expanding their knowledge, expanding their skills, and developing their personality. In addition to general and company-specific certificate programs, this category includes the various tracks of the Masters in Management and Innovation (TUM Campus Heilbronn and TUM Campus Munich).

The BMDS at the TUM Campus Heilbronn is in line with the vision of the TUM School of Management to play an internationally prominent role at the interface between management and technology. The overarching goal of all Bachelor's degree programs at the TUM School of Management is to provide an undergraduate, well-founded, international, and interdisciplinary management education that always includes a technological component as an integral part. This enables graduates to take on demanding and responsible tasks in the economy and society of the future. The BMDS at the TUM Campus Heilbronn corresponds with the focus of teaching at the TUM School of Management and - alongside the Bachelor's degree program in Management and Technology (TUM Campus Munich) and the Bachelor's degree program in Sustainable

Management and Technology (TUM Campus Straubing) - forms the main pillar of the Bachelor's degree program portfolio of the TUM School of Management (see Figure 1).

	MUNICH	HEILBRONN	STRAUBING
Bachelor's Programs	Bachelor in Management & Technology (B.Sc.)	Bachelor in Management & Data Science (B.Sc.)	Bachelor in Sustainable Management & Technology (B.Sc.)
Master's Programs	Master in Management & Technology (M.Sc.)		Master in Sustainable Management & Technology (M.Sc.)
	Master in Consumer Science (M.Sc.)		
	Master in Finance & Information Management (M.Sc.)	Master in Management & Digital Technology (M.Sc.)	
Young Professional Program	Master in Management (M.Sc.)	Master in Management (M.Sc.)	
	Master in Management & Innovation (M.Sc.) Double Degree HEC	Master in Management & Innovation (M.Sc.) TUM Track	
Executive MBA programs	Executive MBA (MBA)*		
	Executive MBA in Business & IT (MBA)*		
	Executive MBA in Innovation & Business Creation (MBA)*		

Figure 1: Study programs offered by the TUM School of Management: Bachelor programs (dark blue), Master programs (grey), Master programs with work experience (light blue) and paid Master programs with work experience (green).

The TUM Campus Heilbronn, which started its studies in the winter semester 2018/19, offers the TUM School of Management and its students an ideal environment for intensive research, joint learning, and the realization of innovations. The TUM Campus Heilbronn, where the TUM School of Computation, Information, and Technology has also been represented with the Bachelor's degree program Information Engineering since the winter semester 2020/21, is located at the Bildungscampus Heilbronn, which is financed, designed and administered by the Dieter Schwarz Foundation (DSS). The Bildungscampus Heilbronn is a unique project that brings together a wide variety of educational institutions locally and offers a lifelong and life-phase-oriented learning spectrum (including early childhood education, kindergarten, school, university, further education and research institutions).

As the first university in Heilbronn, the TUM Campus Heilbronn plays a formative role in the education and research sector and contributes to the long-term development of the Stuttgart region, which includes the Heilbronn-Franken region¹. According to the current EU Regional Innovation Scoreboard², this region is one of the most innovative geographical units in Europe. Within the state of Baden-Württemberg, the Heilbronn-Franken region is characterized by a consistently high innovation dynamic.³

The BMDS fits into this multifaceted educational institution and addresses two central concerns of the DSS and the Heilbronn educational campus - teaching skills for the digital age and focusing

¹ European Parliament and European Council. 2003 Regulation on the establishment of a common classification of territorial units for statistics.

² European Commission. 2019 Regional Innovation Scoreboard 2019.

³ Agree. 2018. Monthly Statistical Issue Baden-Württemberg: Innovation Index 2018: Districts and regions in Baden-Württemberg: Development of innovation potential over the past 10 years

on family-run SMEs. The BMDS at the TUM Campus Heilbronn is also in line with TUM's mission statement of being an entrepreneurial university. Numerous contents of the course deal directly and indirectly with digitalization and innovation. In addition, a central concern of the BMDS is to awaken and promote the entrepreneurial spirit of the students.

The BMDS fits into the "family" of Bachelor's degree programs at the TUM School of Management. While some central design principles (e.g. proportion of technical subjects, elementary importance of project work and research orientation of all compulsory modules) are retained, the BMDS differs from the related Bachelor's programs in particular due to the penetration of the management modules with technical aspects and applications. Data science is not only taught as part of a block of corresponding computer science courses but is an integral part of all management modules. A higher proportion of quantitative modules allows students to participate in the course portfolio of the TUM School of Computation, Information, and Technology. All courses are specifically designed to meet the needs of family businesses.

The BMDS is interdisciplinary in nature. The course offers the opportunity to meet the social challenges outlined above by overcoming established disciplinary boundaries, which in many cases have made the development and above all, the implementation of solutions more difficult or prevented them. In this way, the BMDS prepares students for an immediate career entry as well as for a related Master's program in business administration. Within the TUM School of Management, the Masters Program in Management and Digital Technology (TUM Heilbronn) and the Masters Program in Management and Technology (TUM Munich) provide the best opportunities.

2. Qualification profile

The qualification profile on which the BMDS is based corresponds to the requirements of the Qualifications Framework for German Higher Education Qualifications (HQR - Hochschulqualifikationsrahmen) in accordance with the resolution of February 16, 2017 of the Conference of University Rectors and Ministers of Education and Cultural Affairs. The qualification profile of the BMDS can be defined on the basis of the following requirements of the HQF:

- Knowledge and understanding,
- Use, application and generation of knowledge,
- Communication and cooperation as well as
- Academic self-image and professionalism.

The formal aspects according to HQR (in particular admission requirements, duration and degree options) are explained in sections 3 and 6 as well as in the corresponding subject examination and study regulations.

The BMDS lasts three years and comprises 180 credits. It is a fully-fledged first degree that qualifies students for employment in a wide range of professions. The program effectively prepares students for a generalist position (e.g. for a commercial career in an industrial company in times of digital transformation) as well as for a specialized position at various interfaces between business administration and data science (e.g. for a developer position in the field of marketing, which requires a solid basic understanding of data science possibilities and processes). In line with the orientation of the TUM School of Management at the TUM Campus Heilbronn, students acquire skills in the intersection of management and data science, especially in the context of family-run and medium-sized companies.

The BMDS also has characterized by a strong international orientation. The skills acquired are universally applicable and qualify students to work for newly founded and established companies and institutions in Germany and abroad. Regulatory and institutional issues are generally explained on the basis of family-run and medium-sized German companies and the transferability to foreign or internationally active companies is discussed. The degree of international orientation of the BMDS degree program can be individually intensified by taking suitable elective modules. In addition, the BMDS prepares students for in-depth management-oriented Master's degree programs.

The BMDS is designed to be research-oriented, and all modules contain a direct reference to current developments in business and data science research. These are presented in an application-oriented manner. Sustainable management, responsibility for entrepreneurial decisions, ethical aspects of entrepreneurship, shaping the digital transformation and entrepreneurial spirit are core contents that are addressed and promoted in all elements of the BMDS.

2.1 Knowledge and understanding

Graduates of the BMDS have a broad knowledge and critical understanding of the central entrepreneurial processes and fields of activity and have acquired skills in the necessary methods of business administration. They are familiar with the relevant German and international legal standards and various concepts of documentation and accounting. Entrepreneurship concepts, including fundamental psychological and behavioral aspects, are just as much a part of the curriculum as the basics of entrepreneurship, strategy development and the development of young companies. Graduates will be able to examine the ethical dimension of situations and alternative courses of action, and make informed, responsible decisions. Basic types of corporate strategies and the fundamentals of employee motivation, teamwork and communication in a business environment are just as much a part of the curriculum as fundamental mathematical and quantitative skills, the basics of empirical research and sound skills in classic areas of business administration such as financing, investment, logistics, marketing, production and strategy.

In line with the focus on data science, students receive a solid mathematical foundation (in particular differential and integral calculus, systems of equations and probability theory) and have basic knowledge in the relevant areas of applied computer science (e.g. database management, machine learning and programming). Graduates learn the context-specific handling of large amounts of data in a variety of business administration and quantitative modules (e.g. management and use of balance sheet and stock market data in the Accounting module). This knowledge provides a solid understanding of digital technologies and processes, as well as the ability to critically discuss and consider the advantages and disadvantages of providing and using data and digital innovations.

2.2 Use, application and generation of knowledge

Graduates of the BMDS are able to apply established and innovative methods of business administration and economics as well as social and behavioral sciences in entrepreneurial and private decision-making situations. A solid theoretical foundation (e.g. in Principal-Agent Theory, Institutional Economics, Decision and Game Theory) also enables them to grasp the "economic content" of a problem, to describe it appropriately and to derive a research question from it. Graduates will also have a broad range of skills related to data science, so that they can assess the availability or generatability of data that is useful for the statistical investigation of the research question and, if necessary, carry it out. Mathematical-quantitative skills can be used to derive predictions and specific recommendations for action.

In addition, BMDS graduates are able to conduct application-oriented studies on scientific and operational issues and develop solutions for complex tasks as part of a team. They are able to transfer and apply terms, concepts and methods from business research and the field of data science to business practice. They are able to help shape new digital technologies - in particular data-driven innovations such as artificial intelligence, big data and machine learning - evaluate them multi-dimensionally and assess their potential business application. Graduates can also use

these innovations independently to develop solutions and use them effectively, e.g. when designing new business models and developing a business plan or corporate strategy.

2.3 Communication and cooperation

Graduates of the BMDS have intercultural skills and work successfully and respectfully with people from other cultural backgrounds. They are able to objectively reflect and take into account different perspectives and the interests of other participants in conflicts and projects - especially at the interface between technology and business administration. In addition, they interact responsibly with others and find appropriate solutions which they can explain convincingly to specialists and representatives of other disciplines on the basis of their well-founded theoretical knowledge.

Graduates are able to use new digital technologies to support project teams with different specializations in finding and developing solutions. They can use digital technologies to adapt operational communication channels. Graduates can act as mediators, especially at the interface between management and technology, as they have acquired a critical understanding of both worlds and can, therefore, understand and assess the different perspectives and interests of the respective specialist representatives (engineers, managers, etc.). Graduates of the BMDS at the TUM Campus Heilbronn can be employed in internationally operating companies and international teams immediately after graduation because of studying the degree program in English.

2.4 Academic self-image and professionalism

Graduates of the BMDS take ethical aspects into account in all decisions and are able to work on projects with determination and perseverance. They have the competence to set themselves work and behavioral goals and to achieve these goals on the basis of a self-developed schedule. In addition, graduates can recognize their own strengths and weaknesses and set their own priorities in their work. They are aware of the implications of entrepreneurial decisions and reflect on their professional activities against the background of social and ethical responsibility.

The BMDS enables graduates to develop a diverse, interdisciplinary, modern and technologically oriented professional self-image. They are familiar with the core aspects and implications of digital transformation and can understand, critically reflect on and actively shape processes in the field of data science in a future-oriented manner (design thinking). They are familiar with the approaches, necessary decision-making principles and implementation processes of business economists as well as those of computer scientists in the field of data science and can adequately take them into account in their own decision-making and actions.

3 Target groups

3.1 Target group

The target group for the BMDS are high school graduates and professionally qualified students from Germany and abroad who have analytical skills, a high affinity for mathematical and quantitative approaches and can communicate complex chains of argument in a clear and understandable way. In addition, applicants should show a strong interest in economic, social and technical issues (especially in the context of digital transformation). A basic aptitude for dealing with digital technologies (especially highly data-based innovations) and the ability to critically scrutinize these technologies and their consequences is a prerequisite. The simultaneous development of these skills is essential in order to master the interwoven management (with a focus on entrepreneurship and family-run/medium-sized companies) and technology dimension of the BMDS (with a focus on data science) in both quantitative and qualitative terms.

3.2 Prior knowledge

An independent aptitude assessment procedure ensures that applicants for the BMDS have mathematical-logical skills, their problem-related application to issues at the interface of management and data-based technologies (data science) as well as clear and precise decision-making skills.

The suitability of an applicant for the BMDS is assessed in the first stage of the aptitude assessment procedure on the basis of the grade point average of the university entrance qualification and the grades in particularly relevant school subjects (in particular computer science, mathematics, physics as well as economics and law). After the first stage, applicants are either immediately admitted to the BMDS or, depending on their score, invited to an individual selection interview with a professor.

The BMDS is taught entirely in English and the coursework and examinations are generally completed in English. Applicants must, therefore, demonstrate a sufficiently high level of proficiency in English (e.g. through an established English language test).

3.3 Target numbers

The BMDS replaces the Bachelor's degree program in Management and Technology at the TUM Campus Heilbronn. Since its establishment in the 2019/20 academic year (210 applications) until the 2023/24 academic year (816 applications), consistently high growth rates have been recorded. An approximately constant acceptance rate of around 50% of admitted applicants reflects the high attractiveness of the preceding Bachelor's degree program.

Based on the target figures for the Bachelor's degree program in Management and Technology at the TUM Heilbronn campus, the annual target figure is 150 students per BMDS cohort ("final expansion stage" of the Bachelor's program). Until the necessary infrastructure at the Heilbronn educational campus and sufficient awareness of the BMDS (especially among the relevant group of potential first-year students) is achieved, smaller cohorts can be expected for the first year of the program and some subsequent years.

In the original planning of the Bachelor's program in Management and Technology at the TUM campus in Heilbronn, a proportion of 20% international students was expected. This proportion has already been significantly exceeded in the first cohorts, so that a significant proportion of international students can also be expected for the BMDS. The proportion of international students in the Bachelor in Management and Technology at the Heilbronn campus is 58% for the winter semester 2022/23. 41% of the students are female.

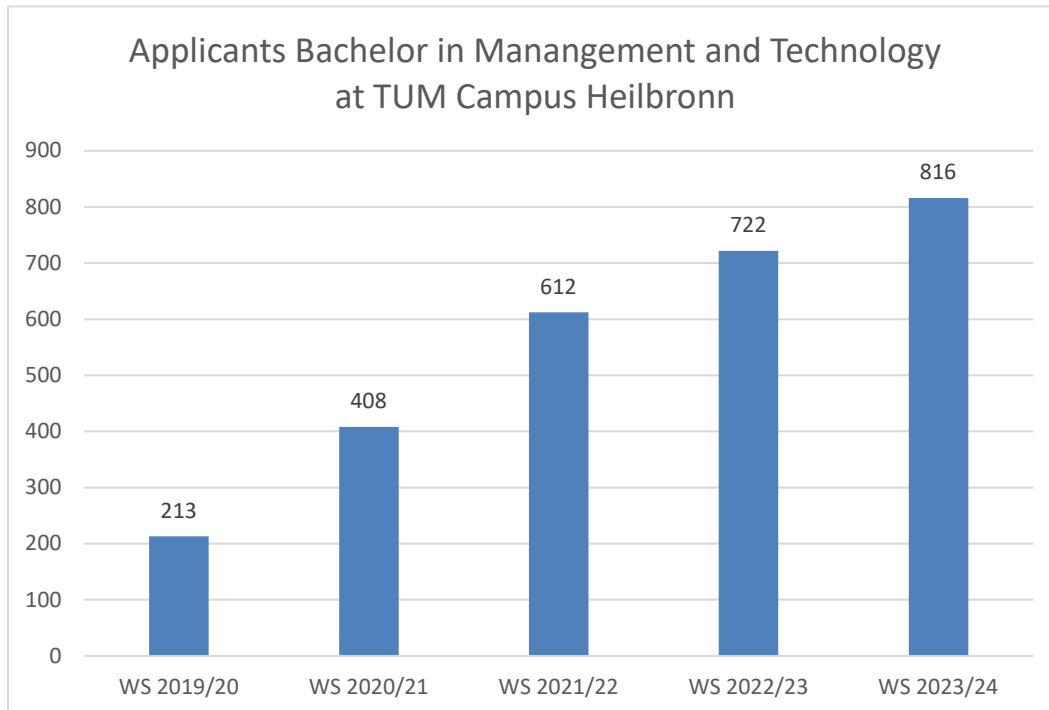


Figure 2: Development of applicant numbers for the Bachelor's degree program in Management and Technology at the TUM Campus Heilbronn

4 Requirements Analysis

The BMDS prepares students for direct entry into a career as well as for further master's studies. Since the BMDS can be studied entirely in English, it is open to German and international high school graduates. At the same time, the program contributes to the expansion of the TUM brand in the international environment, as graduates with an interdisciplinary profile are very popular with internationally oriented companies and renowned management consultancies. The interdisciplinary education in natural sciences, engineering and economics is an ideal prerequisite for entrepreneurship.

The ability to work, mediate and move confidently at the interface between the two business-relevant areas of management and digital technology is a major competitive advantage for employees. This is regularly confirmed: The importance of studying at this interface has been emphasized in the past by both the company representatives of the cooperating companies of the TUM Career Service Center and the members of the Advisory Board of the School of Management. In the meetings of the Advisory Board, the Board members emphasize the importance of hiring graduates with a basic knowledge of business administration and a technical understanding of digital technologies to be able to fill positions in innovation-intensive business areas such as research and development and to make the knowledge gained economically usable. In addition to their suitability in terms of content, graduates of the BMDS are also employable in internationally operating companies immediately after graduation thanks to the possibility of completing their studies in English.

Surveys of graduates of the TUM-BWL bachelor program at the TUM campus in Munich confirm the attractiveness of TUM-BWL graduates on the job market. As a result of the excellent career opportunities, about 25% of the graduates enter the job market directly upon completion of their studies, and three-quarters of these 25% have an employment contract with their future employer prior to graduating. In addition to direct entry into various specialist areas (e.g. accounting, controlling, finance, R&D or marketing departments of companies or other organizations), it is also possible to join a trainee program (rotation in various specialist areas) or the consulting sector. On average, 60% of graduates who enter the job market directly work in an interface position between management and technology.

Ultimately, with the promising combination of management and data science, the BMDS offers a specialization option that should better prepare graduates for the demands of the modern work environment. The specialization builds a strong technical and methodological knowledge in the fields of mathematics and computer science. The focus here is on ensuring that this knowledge is relevant for use in both corporate groups and medium-sized companies. The conditions of global competition are changing rapidly in the digitalized world - regardless of the size of the company. In addition to the innovations in all business areas due to digitalization, this also includes the influence of trends such as Industry 4.0, the Internet of Things and data-driven innovations such as artificial intelligence, big data and machine learning, to name just the most important. To remain competitive, companies therefore need qualified graduates who are

familiar with these trends, understand how the technology works and can also respond appropriately to the business challenges of the global market. In a survey of the largest family businesses in Germany, around 43% of companies stated that the main obstacle to digitalization is a lack of employee knowledge in this area⁴. A study on the qualification requirements in SMEs in the context of digitalization also identified a high need for qualification in terms of technical and scientific knowledge as well as management and company organizational aspects of digitalization.⁵

As part of Horizon Europe⁶, the European Commission has defined six global challenges that Europe's industrial competitiveness is currently facing. These are:

- Health
- Culture, creativity and inclusive society
- Civil security for society
- Digitalization, industry and space
- Climate, energy and mobility
- Food, bioeconomy, natural resources, agriculture, and the environment.

These challenges will also largely define the respective national and international labor markets and economic sectors. A key factor here is the successful development and use of technology as a whole and digital technologies. In transportation, for example, algorithms are used to automatically calculate the best transport and supply routes in order to handle larger freight and smaller deliveries more efficiently. Modern agriculture relies on drones to better monitor growth in the fields and forecast weather changes in advance. Mathematical tools for data analysis are used to model plant growth and make optimal decisions to optimize yields and achieve sustainability goals. The finance and insurance industries are increasingly incorporating technologies such as blockchain, artificial intelligence and deep learning into existing processes to track transactions, draw up contracts and assess investments. Technology-based solutions will continue to be developed at breakneck speed in all of these areas and industries and will increasingly change economic sectors. In order to meet this trend and the associated challenges with appropriate expertise in the field of digital technology and management, appropriately trained specialists are needed. This shows once again that the skills and abilities of graduates are in high demand and future-oriented on both national and international markets.

In the Heilbronn-Franken economic region, the demand for graduates who can demonstrate this interface competence is particularly high. The Heilbronn area is home to numerous, mostly technology-oriented companies, particularly many family-run small and medium-sized enterprises (SMEs), which regularly generate more than a third of the total turnover of German companies and are therefore of great economic importance⁷. According to the study "Project

⁴ Institute for SME Research Bonn. 2017. The largest family businesses in Germany: Company survey 2017: Digitalization

⁵ Innovation Office Skilled workers for the region. 2018. Thinking digitalization ahead Identifying the training needs of SMEs and securing skilled workers for the region in the network.

⁶ European Commission. 2021 Horizon 2020: The EU Research and Innovation Program.

⁷ Federal Ministry for Economic Affairs and Energy. 2019. SME economic engine: Facts and figures on German SMEs.

Future: Heilbronn-Franken 2020", these companies have a very high potential for innovation. This is because they can only maintain their excellent position in international competition through the increased use of new technologies and the expansion of their product range. This is precisely where the need for (highly) qualified employees lies, which according to the study can be seen as a central weakness of the Heilbronn-Franconia region.⁸ Compared to well-networked large companies, there is also an increased demand and need for information, knowledge and technology transfer in the field of digitalization. As the local economy is facing the challenges of digital change, real-life case studies can be discussed directly by students with company representatives in the lessons. This ensures a strong link between science (at a top international level) and practice in the training of entrepreneurial talent.

In summary, the employability of BMDS graduates is very high. By providing management skills, the opportunity to specialize in the area of small and medium-sized enterprises (SMEs), the combination of all management modules with data science, experience in dealing with other cultures, and the explicit promotion of English language skills, graduates of the BMDS at the TUM Heilbronn Campus are prepared for activities in companies of various sizes, market orientations, and industries.

In general, the BMDS prepares graduates in terms of content and methodology for a further Master's degree in Business Administration. Graduates are also well prepared for the Master's program in Management and Digital Technology in Heilbronn, as this Master's program continues the same principle as the Bachelor's program, i.e. business administration with a focus on digital technologies. Graduates of the BMDS at the TUM Campus Heilbronn can also continue their studies in the Master in Management and Technology at the TUM Campus Munich. There they have the opportunity to study the basics of a second engineering or natural science subject ("minor"). They can also specialize in economics and law at the master's level. Alternatively, graduates of the BMDS have access to the "Master in Consumer Science" (formerly "Master in Consumer Affairs") in Munich and the "Bioeconomy" Master's program at the TUM Campus Straubing.

⁸ Heilbronn-Franconia Chamber of Industry and Commerce. 2002 Project Future: Heilbronn-Franken 2020.

5 Competition Analysis

5.1 External Competition Analysis

The digital transformation is omnipresent and has motivated various educational institutions in Germany to further develop or redesign existing study programs accordingly. In Germany, a large number of different bachelor programs are offered that focus on education at the interface between business and technology. Most of these programs focus on computer science and natural sciences, while business content is taught as a minor or as a related practical aspect. Typical programs such as Business Informatics, Industrial Engineering and Business Mathematics have business components of less than one-third of the credits. Examples include the following bachelor programs at German universities:

- Business Informatics (University of Hohenheim)
- Business Informatics (University of Mannheim)
- Industrial Engineering (Karlsruhe Institute of Technology) with Civil Engineering and Environmental Sciences, Chemical Engineering, Electrical Engineering and Information Technology, Computer Science, Mechanical Engineering and Process Engineering as optional technical specializations
- Industrial engineering (Rheinisch-Westfälische Technische Hochschule Aachen) with civil engineering, electrical power engineering, mechanical engineering and materials and process engineering as optional technical specializations
- Industrial engineering (Technical University of Darmstadt) with civil engineering, electrical engineering and information technology and mechanical engineering as optional technical specializations

In contrast to these established programs, the BMDS offers a full-fledged management education in which students acquire all the core skills required for a business management role, always learned, and reflected in a data science context. The focus of the BMDS is on management skills for designing data-based business models and processes.

Although it is possible to take a limited number of technical electives in almost all Bachelor's degree courses in business administration at German universities, study programs with a clearly defined business administration focus that intersect with a specific technical field tend to be the exception. One example of a management degree course with a technical focus is the Bachelor's degree course in Business Administration with a Technical Qualification at the Technical University of Kaiserslautern. In this program, students must acquire general skills in a technical field (including electrical engineering and computer science) in parallel with a comprehensive range of business skills. The Bachelor's degree course in Technically Oriented Business

Administration at the University of Stuttgart follows a similar and geographically close concept. The targeted delimitation and the scope of the business administration course content is similar to the BMDS. However, this degree program is geared towards engineering challenges, while the BMDS prepares students across schools for management challenges in the context of digital transformation.

Within Germany, the Bachelor's degree course in Digital Management at Clausthal University of Technology probably comes closest to the concept of the BMDS, in which management content can be studied in combination with data science skills and IT skills. The differences to the Bachelor's program in Digital Management at Clausthal University of Technology are the smaller connection to family businesses, the lower number of electives, only 12 credits as opposed to 30 in the BMDS, and the absence of a project study where students can apply their skills in practice. The BMDS is, therefore, much more individualized, practice-oriented and closer to the companies in the Heilbronn-Franken region.

Based on the very good experiences with the previous Bachelor's program in Management and Technology with a focus on Digital Technologies at the TUM Campus Heilbronn, it is expected that the BMDS at the Heilbronn location will be attractive for ambitious applicants from outside Germany. Since the BMDS is taught entirely in English and the first-year students are brought up to a common entry level through preliminary courses (including mathematical and social science skills), it can be assumed that the additional entry barrier for international prospective students is comparatively low. However, the international attractiveness is also due to the unique combination of business administration and data science, which corresponds to the core competence of the TUM and can, therefore, also contribute to attracting students with this strong brand. In addition, the program offers a wide range of electives and, as described in Chapter 4, is linked to important societal challenges that can be addressed through effective collaboration between management and data science. BMDS students should be able to apply their knowledge not only to solving specific business problems but also to solving societal challenges. Since the course is taught in English, it will certainly attract a much larger number of international applicants in the future and should thus contribute to the TUM School of Management's vision of being an internationally visible business school at the interface between management and technology. Not only in Munich, but with Heilbronn also outside of Bavaria.

5.2 Internal Competition Analysis

TUM offers several Bachelor's degree programs at the interface between economics and engineering, life sciences and natural sciences. These are in particular the following four Bachelor's degree programs:

- Information Engineering (TUM School of Computation, Information, and Technology, TUM Campus Heilbronn)
- Management and Technology (TUM School of Management, TUM Campus Munich)

- Mechanical Engineering with a focus on Mechanical Engineering and Management (TUM School of Engineering and Design, TUM Campus Munich)
- Sustainable Management and Technology (TUM School of Management, TUM Campus Straubing)
- Business Informatics (TUM School of Computation, Information, and Technology, TUM Campus Munich)

The three Bachelor's degree programs offered by other TUM schools at the interface to computer science and mechanical engineering have a fundamentally different structure and contain less than 15% modules in management. In this respect, the students of these Bachelor's programs complete a mirror-image counterpart to the BMDS, as they offer a fully-fledged education in certain areas of computer science or mechanical engineering flanked by management content. These programs are therefore not in competition with the BMDS, but offer a complementary program for students with different interests and skill profiles.

The Bachelor programs at the TUM School of Management are very similar to the BMDS, especially with regard to the basic concept and the content of the courses. Just as the BMDS takes advantage of the unique expertise and opportunities in the field of data science at the TUM campus in Heilbronn, the unique profiles of the other two programs also result from their integration into other TUM campuses.

The Bachelor's degree program in Management and Technology at the TUM Campus Munich offers students the opportunity to acquire skills in a technical and scientific field of their choice (so-called technical subject with 42 credits; optional fields: Chemistry, Computer Engineering, Electrical Engineering and Information Technology, Computer Science, Mechanical Engineering and Medicine). While all students must complete the same portfolio of foundation courses (in particular with regard to the compulsory business and quantitative modules), the focus is therefore exclusively on the chosen technical subject; there is, therefore, no focused preparation of students for the respective technical subject (e.g. computer engineering and computer science). In contrast, all elements contained in the BMDS (in particular the aforementioned compulsory modules) are geared toward the field of data science and data science issues are included in all modules in a context-specific manner. The BMDS has a stronger quantitative foundation component, which enables BMDS students to successfully participate in courses in the field of Data Science at the TUM School of Computation, Information, and Technology at the TUM Campus Heilbronn. The cross-school mix of participants and the ability to study entirely in English promote the integration of the TUM Schools in terms of content. The BMDS is thus a study program consistently tailored to issues and challenges in the intersection of business administration and data science, while the Bachelor's program at the TUM Campus Munich offers qualifying perspectives in certain technology areas in addition to basic management skills. In addition, the program profiles are clearly differentiated by the infrastructure at the TUM campuses in Munich and Heilbronn, the size of the cohorts and the significantly better supervision ratio at the TUM campus in Heilbronn.

A different approach was taken for the Bachelor's program in Sustainable Management and Technology at the TUM Campus Straubing. While some of the core courses are largely the same as the bachelor's program at TUM Campus Munich, great care has been taken to ensure that all elements of the program are aligned with TUM Campus Straubing's focus on sustainability and renewable resources. Students are specifically prepared for the issues and challenges associated with these areas. The bachelor program is offered in English. The main difference between the Bachelor of Science in Sustainable Management and Technology at the TUM Campus Straubing and the BMDS lies in the clearly different content. Aspects of corporate sustainability are also addressed in the BMDS, but at the TUM Campus Heilbronn the focus is on the social and governance dimension of sustainability, while at the TUM Campus Straubing the focus is clearly on the environmental dimension. This means that there is no significant overlap or risk of cannibalization with this course within the TUM School of Management.

6. Structure of the degree program

The undergraduate BMDS comprises six semesters and consists of the following sections (see Figures 3 and 4):

- In the **first-four semesters**, students are familiarized with business administration (39 credits), economics (12 credits), law (6 credits) and quantitative basics (27 credits) as well as technical basics in the field of data science (42 credits). All courses are compulsory modules.
- The **fifth semester** comprises the individually arranged project study (12 credits) and three elective modules (18 credits). It is designed as a "mobility window" and gives students the opportunity to study abroad for a semester.
- In the **sixth semester**, two further elective modules (12 credits), a module on Communication and Intercultural Competencies (6 credits) and the Bachelor's thesis (12 credits), consisting of a scientific paper and a Bachelor's colloquium, are planned.

Semester	Section	Credits
1 - 4	Fundamentals of Business Administration (39 credits)	84
	Fundamentals of Economics (12 credits)	
	Fundamentals of Law (6 credits)	
	Quantitative basics (27 credits)	
	Technical basics (Data Science)	
5 Mobility window	Project Study (12 Credits)	30
	Electives (18 Credits)	
6	Bachelor's Thesis (12 Credits)	30
	Communication and Intercultural Competencies (6 Credits)	
	Electives (12 Credits)	

Figure 3: Structure of the Bachelor's degree program in Management and Digital Technology

Semester	Module					Credits
1	MGTHN0131 Accounting Required Exam 6 Credits	MGTHN0132 Business Case Study Required Presentation 3 Credits	MGTHN0140 Calculus for Management Studies Required Exam 9 Credits	MGTHN0133 Entrepreneurship and Family Enterprise Required Exam 6 Credits	CIT-Neu Data Science for Management Studies I Required Exam 6 Credits	30
2	WIHN0219_E Investment and Financial Management Required Exam 6 Credits	MGTHN0141 Linear Algebra for Management Studies Required Exam 6 Credits	MGTHN0143 Probability Theory for Management Studies Required Exam 6 Credits	MGTHN0144 Programming for Management Studies Required Exercise performance 6 Credits	MGTHN0134 Strategic and International Management Required Exam 6 Credits	30
3	CIT-Neu Data Science for Management Studies II Required Exam 6 Credits	MGTHN0135 Marketing Required Exam 6 Credits	MGTHN0137 Microeconomics Required Exam 6 Credits	MGTHN0145 Quantitative Modeling Required Exam 6 Credits	MGTHN0142 Statistics for Management Studies Required Exam 6 Credits	30
4	MGTHN0139 Business Law for Family Enterprises Required Exam 6 Credits	WIHN0261 Empirical Research Methods Required Exam 6 Credits	CIT-Neu Data Science for Management Studies III Required Exam 6 Credits	MGTHN0138 Macroeconomics Required Exam 6 Credits	MGTHN0136 Operations and Supply Chain Management Required Exam 6 Credits	30
5 Mobility window	MGTHN0147 Project Study Required Exam 6 Credits		Elective Management Choice 6 Credits	Elective Management Choice 6 Credits	Elective Technology (Data Science) Choice 6 Credits	30
6	MGTHN0148 Bachelor's Thesis Required Bachelor's Thesis and colloquium 12 Credits		MGTHN0146 Communication and Intercultural Competencies Choice 6 Credits	Elective Choice 6 Credits	Elective Choice 6 Credits	30

Figure 4: General curriculum of the BMDS

The BMDS uses various forms of teaching and learning to achieve the competencies outlined in the qualification profile. The cohort-wide required modules in the **first four semesters** are generally offered as lectures with accompanying exercises and, if necessary, optional tutorials. Exceptions are the Business Case Study module, which is delivered as a case study, and the Programming for Management Studies module, which is delivered as a series of exercises. Students demonstrate that they have acquired these skills through a module examination, for which the Examination and Academic Regulations of the BMDS provides a wide range of examination procedures and forms. The following non-technical foundation courses are required:

- **Business fundamentals:** The modules (i) Accounting, (ii) Business Case Study, (iii) Entrepreneurship and Family Enterprise, (iv) Investment and Financial Management, (v) Marketing, (vi) Operations and Supply Chain Management and (vii) Strategic and International Management provide an introduction to the core areas of business administration and entrepreneurial processes. In line with the orientation of the BMDS, aspects of data science are classified and discussed in a context-specific manner in these modules.
- **Fundamentals of Economics:** The modules (i) Macroeconomics and (ii) Microeconomics must be completed as a solid foundation for understanding individual economic activity, international trade and macroeconomic phenomena. The 12 credits obtained in this way increase the flexibility of graduates in their choice of further master's studies and support a sound general knowledge of economics and society.
- **Legal basics:** The Business Law for Family Enterprises module outlines the legal framework for German companies and entrepreneurs, with a particular focus on corporate and contract law. The module also introduces students to legal techniques that can be applied to other fields and areas of law. The bridge to data science is built through topics such as data protection and copyright law.
- **Quantitative foundations:** Compared to other Bachelor's programs at the TUM School of Management, the BMDS has an extended quantitative compulsory area that enables students to participate in compulsory and elective modules of the TUM School of Computation, Information, and Technology. The program includes (i) Calculus for Management Studies and (ii) Linear Algebra for Management Studies as general mathematical introductions and (iii) Empirical Research Methods and (iv) Statistics for Management Studies as introductions to quantitative business research.

While aspects of data science are included in all business modules in a context-specific and targeted manner (e.g. collection and management of financial data in SAP systems as part of the accounting module), the basic technical training in data science takes place in parallel to the quantitative foundation courses. The quantitative and technical foundation courses are coordinated and build on each other.

- **Technical basics (Data Science):** Basic skills in data science and applied information are taught in the modules (i) Data Science for Management Studies I and (ii) Programming for Management Studies, which provide a broad overview of tasks, fields of activity and procedures. The method modules (iii) Probability Theory for Management Studies and (iv) Quantitative Modeling qualify students for the theory-based and practical modeling of decision-making problems, taking into account non-deterministic events, which are equally important in business decisions and the design of software solutions. The modules (v) Data Science for Management Studies II and (vi) Data Science for Management Studies III complete the technical foundation and introduce students to core areas of data science - efficient storage and availability of data and automated data-based decision-making.

The **fifth semester** consists of three elective modules and the project study. These modules offer greater flexibility than the core courses in terms of the amount, type and timing of coursework and examinations. In addition, there is freedom of choice in the content of the **elective modules** and a high degree of flexibility in the choice of the project study. In this respect, the fifth semester is particularly suitable as a **mobility window**. However, the freedom of choice for the five elective modules is limited by the following three conditions:

- At least two elective modules must be from the field of business administration.
- At least one elective module must be from the technical field (data science).
- At least one elective module must be completed with a written scientific paper and an accompanying presentation.

The TUM School of Computation, Information, and Technology and the TUM School of Management at the TUM Campus Heilbronn and the other campuses are working on a continuous expansion of the broad and diverse elective module portfolio. The available elective modules allow for a more general or specialized competence profile. In particular, elective modules on family entrepreneurship and the special challenges of family businesses are offered. The close support of the student advisory service ensures that students can plan the direction of their studies within the BMDS with foresight. The elective modules are mostly offered as lectures with accompanying exercises and as seminars. Small group seminars are a special opportunity for students to work intensively and closely with professors on practical issues using scientific methods. The focus is always on the application of specialized knowledge.

The fifth semester includes the **Project Study** Module, in which students work in groups of two to five to apply theoretical knowledge to real entrepreneurial challenges. The project study module can be started relatively flexibly between the end of the fourth and the beginning of the sixth semester and usually lasts three to six months. Cooperation partners from business practice, research-related institutions or socially relevant institutions accompany the project study individually. The supervising professor of the project study forms the bridge to the academic training and ensures intensive support throughout the entire project study period. The project study should not only result in solutions for research or for the participating company, but also in cooperation and relationship networks for a later career entry or other connections for the students completing the project study as well as for their fellow students. The Project Study enables graduates to develop solutions to both academic and practical problems. Previous feedback from the TUM Campus Munich shows that the Project Study has been very well received by the project partners. Students also see the Project Study as an important and enriching element of their studies, which also promotes teamwork, social and personal skills.

The final **sixth semester** includes two additional elective modules (see fifth semester). In addition, as part of the **Communication and Intercultural Competencies** module, students must demonstrate soft skills related to the overall profile of the Management and Data Science program. Possible examples are business planning, conflict management, rhetoric, language courses and negotiation training. The BMDS concludes with the **Bachelor thesis**, which consists

of a scientific paper and a corresponding Bachelor's colloquium. In the scientific paper, students must demonstrate that they have internalized the central theoretical, conceptual and methodological skills of the BMDS and that they are able to work on a clearly defined scientific question independently, systematically and in accordance with the requirements of ethical research. In the Bachelor colloquium, students must demonstrate that they can convincingly summarize the research question, the implementation, and the conclusions of the scientific report and that they can competently answer technical questions and questions from related subject areas. In particular, the Bachelor's thesis serves as proof of the graduate's ability to continue on to a master's program.

Semester	Module					Credits
1	MGTHN0131 Accounting Required Exam 6 Credits	MGTHN0132 Business Case Study Required Presentation 3 Credits	MGTHN0140 Calculus for Management Studies Required Exam 9 Credits	MGTHN0133 Entrepreneurship and Family Enterprise Required Exam 6 Credits	TBA Data Science for Management Studies I Required Exam 6 Credits	30
2	WIHN0219_E Investment and Financial Management Required Exam 6 Credits	MGTHN0141 Linear Algebra for Management Studies Required Exam 6 Credits	MGTHN0143 Probability Theory for Management Studies Required Exam 6 Credits	MGTHN0144 Programming for Management Studies Required Exercise performance 6 Credits	MGTHN0134 Strategic and International Management Required Exam 6 Credits	30
3	TBA Data Science for Management Studies II Required Exam 6 Credits	MGTHN0135 Marketing Required Exam 6 Credits	MGTHN0137 Microeconomics Required Exam 6 Credits	MGTHN0145 Quantitative Modeling Required Exam 6 Credits	MGTHN0142 Statistics for Management Studies Required Exam 6 Credits	30
4	MGTHN0139 Business Law for Family Enterprises Required Exam 6 Credits	WIHN0261 Empirical Research Methods Required Exam 6 Credits	TBA Data Science for Management Studies III Required Exam 6 Credits	MGTHN0138 Macroeconomics Required Exam 6 Credits	MGTHN0136 Operations and Supply Chain Management Required Exam 6 Credits	30
5 Mobility window	MGTHN0147 Project Study Required Report 6 Credits		MGTHN0059 Negotiation Seminar Elective Scientific report 6 Credits	MGTHN0056 Seminar Innovation and Entrepreneurship: Innovation management in Family Enterprises Elective Scientific report 6 Credits	MGTHN0066 Business Ethics in the Digital Age Elective Exercise performance 6 Credits	30
6	MGTHN0148 Bachelor's Thesis Required Scientific elaboration and Bachelor colloquium 12 Credits		MGTHN0146 Communication and Intercultural Competencies Elective 6 Credits	MGTHN0065 Conducting Empirical Research in Finance Elective Scientific report 6 Credits	WIHN0038 Business Analytics Elective Scientific report 6 Credits	30

Figure 5: Exemplary curriculum of the BMDS

The procedure outlined above and the contents of the BMDS were checked for **actual study ability** (e.g. ensuring that modules that are related or build on each other are arranged in a plausible time sequence) and that the workload is distributed appropriately and evenly over the six semesters of study (30 ECTS each). In order to ensure the best possible academic feasibility, the TUM School of Management has developed typical schedules for each semester and attached them to the Program Documentation Part B. If this ideal schedule cannot be fully implemented, the program management will immediately look for a solution and inform the students of these changes as early as possible. Such semester-by-semester adjustments and additions are particularly likely in the case of elective modules, which are particularly responsive to current developments and, therefore, more dynamic. Students will be informed of the available electives and their modalities before the start of the lecture period.

7 Organizational connection and responsibilities

The BMDS is offered and administered by the TUM School of Management. The curricular components of management, economics, law, project study, communication and intercultural competence, business electives and the Bachelor thesis are offered and administered by the TUM School of Management at the TUM Campus Heilbronn. The curricular components of the technical foundations and electives are offered partly by the TUM School of Computation, Information, and Technology and partly by the TUM School of Management. In particular, the TUM School of Computation, Information, and Technology at the TUM Campus Heilbronn offers the compulsory foundation courses Data Science for Management Studies I, Data Science for Management Studies II and Data Science for Management Studies III.

Overall responsibility for the BMDS lies with the current Vice Dean Academic and Student Affairs of the TUM School of Management, who may be supported by the Office of the Dean of Studies of the TUM School of Management. Furthermore, the responsible Academic Program Director (APD) is responsible for the BMDS at the TUM Campus Heilbronn.

The responsibility for examination matters lies with the Bachelor Examination Board for the BMDS of the TUM School of Management, on which professors from the TUM Heilbronn Campus are represented. In the case of applications for recognition of examination achievements within the BMDS, the module supervisors submit an assessment, which is presented to the Bachelor Examination Board of the BMDS of the TUM School of Management for a decision. Within the TUM School of Management, an independent Aptitude Assessment Committee has been formed for the BMDS. This committee is responsible for the proper implementation of the aptitude assessment procedure.

Information about the program is made available to the public on the TUM School of Management website. Internal information about the program is communicated via TUM Online. In the following, the central activities are listed, and the current directors are named:

- General Academic Advising: TUM Center for Study and Teaching
Department of Academic Advising and School Programs (Information and counseling via hotline and Service Desk for prospective and current students)
studium@tum.de
0049 (0) 89 289 22245

- Academic advising: TUM School of Management
Program Management, Martin Semjank
studentcounseling_heilbronn@mgt.tum.de
0049 (0) 7131 26418607

- Advice on study abroad and Internationalization: TUM Global & Alumni Office (central)
globaloffice@tum.de

International Office
TUM School of Management (decentralized)
internationaloffice_hn@mgt.tum.de
0049 (0) 7131 26418606

- Women- and Equal Opportunities Office: Representative of the TUM School of Management,
Dr. rer. pol. Christian Feilcke
christian.feilcke@tum.de

Deputy Representative
TUM School of Management
At the TUM Campus Heilbronn,
Prof. Dr. rer. oec. Michael Stich
michael.stich@tum.de

- Counseling for barrier-free studies: TUM Center for Study and Teaching,
Service center for disabled and chronically ill prospective and current students (central)
handicap@zv.tum.de
0049 (0) 89 289 22737

TUM School of Management (Decentralized),
 Sandra Lütkemeyer
sandra.luetkemeyer@tum.de
 0049 (0) 89 289 25086

- Application and enrollment: TUM Center for Study and Teaching,
 Application and Enrollment Department
 (Application, Enrollment, Student Card,
 leave of absence, re-registration and de-registration)
studium@tum.de
 0049 (0) 89 289 22245

- Aptitude assessment procedure: TUM Center for Study and Teaching,
 Application and Enrollment Department (central)
 TUM School of Management, Admission Management
 (decentralized),
 Tanya Göttinger
admission_heilbronn@mgt.tum.de
 0049 (0) 7131 26418703

- Contributions and scholarships: TUM Center for Study and Teaching,
 Department Contributions and Scholarships
 (Scholarships and semester fees
beitragsmanagement@zv.tum.de

- Central examination matters: TUM Center for Study and Teaching,
 Central examination matters,
 Final documents, examination certificates,
 degree certificates

- Decentralized examination Administration: TUM School of Management, Grade Management,
 Annette Rank von Bronk and Ulrike Zerrahn
studentcounseling_heilbronn@mgt.tum.de
 0049 (0) 7131 26418 604

- Examination Board: Bachelor Examination Board
 TUM School of Management
 Prof. Dr. jur. Philipp Maume (Chairman)
 Dr. rer. pol. Christian Feilcke (Secretary)

- Quality management
- Study and teaching:

University Department of Studies and Teaching
(central)
Vice Dean Academic and Student Affairs
(decentral),
Prof. Dr. rer. pol. Jürgen Ernstberger

Quality management officer (decentralized),
Tanya Göttinger
tanya.göttinger@tum.de
0049 (0) 7131 26418703

Organization Quality Circle (decentralized),
Martin Semjank
martin.semjank@tum.de
0049 (0) 7131 26418607

Evaluation officer (decentralized),
Edo Octavianus
edo.octavianus@tum.de
0049 (0) 89 289 25849

Coordination module management (decentralized),
Sonja Kopf
sonja.kopf@tum.de
0049 (0) 89 289 25075

8 Developments in the degree program

The BMDS will be completely redesigned for the start of the winter semester 2024/25. Nevertheless, there are historically grown connections with several Bachelor's degree programs at TUM Campus Heilbronn and TUM Campus Munich, which are summarized below.

The "TUM-BWL" program was first offered at the TUM Campus Munich in the winter semester 2001/02. Initially offered as a diploma program with 240 ECTS credits, it has been part of the TUM School of Management's portfolio since the winter semester 2008/09 as a Bachelor program in Technology and Management-oriented Business Administration. The options available to students in the business science and technology elective area were successively expanded in the following years. In particular, the requirement that electives could only be chosen from one of the TUM School of Management's departments was lifted in the winter semester 2016/17. Since then, this Bachelor's degree program has offered the opportunity to acquire a generalist or a specialized qualification profile.

One year after the opening of the TUM Campus Heilbronn, the program "TUM-BWL" was transferred to the newly created campus in the winter semester 2019/20. The program was renamed to "Bachelor in Management and Technology, with Digital Technologies" in 2020 and is now offered at the TUM Campus Heilbronn (with a technical semester at the TUM Campus Munich). Due to the strong growth of the TUM School of Computation, Information and Technology and the TUM School of Management at the TUM Campus Heilbronn in recent years, there is now the opportunity to establish the BMDS as a fully English-taught Bachelor's program at the TUM Campus Heilbronn starting in the winter semester 2024/25.

Internationalization as a declared goal of the TUM has a concrete impact on the BMDS curriculum. On the one hand, an extended mobility window opens up new opportunities, but also offers the possibility that a one-semester stay abroad should be the rule within the BMDS.