

TechMed Research

Research on Healthcare by Personalized Technology



1 Introduction

The University of Twente reorganizes all its research to be embedded within the Faculties. Some of this research, however, crosses the boundaries of the faculties. To stimulate multidisciplinary research, the University has decided to develop new institutes that facilitate this. Health is such a multidisciplinary area where a large number of research groups, technical as well as social sciences, have research applications. By combining the disciplinary expertise from different groups we can define new research areas, learn from each other and have a larger impact on society.

The objective of this document is to sketch the outlines of the new institute on health. One of the goals of the institute is to reach outside of the University and to create excellent working relations with clinical partners, industry and funding agencies. Together with the already existing disciplinary expertise, this will then be the backbone for the ultimate goal of the institute, which is to stimulate the generation of new, successful, externally funded, research projects.

The new Technohal building will form the heart of the new Technical Medical Centre, in which the majority of the health related activities of the University of Twente will be embedded. This Technohal includes most of the TechMed.Centres educational facilities and some of the research laboratories and will host the support for specific issues related to medical research and education. The TechMed.Centre is the portal and public face to society of health related research at the University, it has a coordinating role in this and it will serve as a meeting place for students, teachers, researchers and external partners. The new institute, with the provisional name TechMed.Research, will be part of this. It is emphasized that TechMed.Research can benefit from the various opportunities in the TechMed.Centre, the educational programs in Health (TechMed.edu) and its facilities (TechMed.infra).

To the reader: This document addresses a number of issues related to the primary goals of the institute and the embedding in the University. Essentially, this is a design process, and this document reflects the outcome of that process, given the severe time restrictions. Usually, a design process takes several iterations, so this document should be considered as work in progress. Even after implementation, experience may require adaptation of the original plan, which should be made clear in regular evaluations.

1.1 Background, trends in global healthcare

“Europe faces rising and potentially unsustainable health and care costs, mainly due to the increasing prevalence of chronic diseases, to an ageing population requiring more diversified care and to increasing societal demands. Health research and innovation also face new challenges as a result of new research paradigms and methodologies in line with increasingly complex medical and health challenges, including increasing awareness of the influence of external environmental factors.”

European Commission, Horizon 2020, Work Programme 2018-2020

The proportion of global population aged above 65 years old is increasing more rapidly than other age groups and its growth is expected to accelerate in the coming decades. Such demographic changes pose several challenges to the healthcare systems, for example, as the labour force might not suffice to respond to the demands of the aging population. For example, it is estimated that the proportion of population in EU-27 aged between 15 and 64 will decline from 67% in 2010 to 56% in

2060. Additionally, the share of the population aged above 65 is expected to increase from 17% to almost 26% in 2030, and almost 30% in 2060. Improved prevention, diagnosis and treatment of diseases is one of the main drivers for life expectancy.

With aging come inherent biological changes that often lead to functional impairments or chronic diseases. On the other hand new treatments improve the survival rate of specific diseases such as cancer or cardiovascular diseases, but is not always curing the patient, as a result of which more diseases end up as a chronic disease. The systematic review from Marengoni and colleagues suggests that at least 55% of the older population suffers from 2 or more chronic diseases simultaneously, and this proportion can even reach 98%. These numbers are increasing: in the Netherlands, the proportion of people aged above 55 with four or more chronic diseases increased 300% between 1985 and 2005. In 2015 more than 50% of the total population in the Netherlands had at least 1 chronic disease.

The World Health Organization defines 4 key strategies to cope with the burden of chronic diseases: (1) promotion of healthy behaviours, (2) prevention of premature deaths and avoidance of unnecessary disability, (3) treatment with the available knowledge, and (4) provide appropriate care to every individual in need. Healthy lifestyles, such as physical activity and healthy eating, are key factors in all the steps abovementioned, in both prevention and management of chronic diseases.

The costs related to healthcare are rising rapidly on a global scale. Recently, the Dutch RIVM predicted in their ‘Volksgezondheid Toekomst Verkenning’ that the total healthcare spending will double between 2015 and 2040. Two-third of this increase is caused by developments in medical technology and growth of welfare, by which life expectancy is increased, but with more (chronical) diseases to be treated and thus increased healthcare costs. One-third is caused by a greying and growing population.

In the western world, we see a number of trends in the perception of how the healthcare system should function. People would like to be in control when dealing with their health situation, preferably in their home environment with growing emphasis on quality of life instead of life duration. They like to be treated and diagnosed as individuals and are willing to invest in their health (i.e. adapt their life style) in order to prevent health issues (Table 1). People want to stay independent longer, and the government stimulates this because it helps reducing the costs of healthcare when people are less hospitalized.

Table 1. Trends in Healthcare

Personalized Prevention Quality Local Empowered	<i>Instead of</i>	One size fits all Cure Quantity Centralized Paternalistic
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Technology plays a major role in personalizing the healthcare system. For example, better instruments allow for a more accurate, individual diagnosis. Miniaturization allows us to develop sensors that monitor the patient’s condition and disease progression, often from a distance in

eHealth applications. Targeted drug delivery reduces the patient's burden and increases effectiveness in various chronic diseases. Robotic support systems enhance people's capacities and compensate for reduced functionality. 'Big data' techniques allow to include environmental issues for even more personalized diagnosis and treatment. The technological expertise, present at the University of Twente, together with the social, organizational and environmental knowledge gives us the opportunity to address scientific healthcare problems from a nano scale to a global scale and everything in between. Ideally, new personalized solutions will lead to actual prevention or cure of diseases, improving quality of life and reducing healthcare costs.

1.2 Vision

TechMed.Research focuses on technological solutions that improve personalized healthcare related to a clinical perspective. Some issues related to that may be purely technical or scientific in nature, but we explicitly want to make an impact in society. We aim at applications that eventually are applicable in a hospital or a home care situation improving healthcare and boosting the economy. This essentially translational research will be an important aspect of the institute (and does not exclude fundamental research), which matches the increasing requirement for valorisation from funding agencies.

For this reason, it is clear that we have to build on strong relations with clinical partners, industry and funding agencies, which often take years before they pay off. We need to involve them in our decision process when defining new projects, to monitor running projects and to stimulate spin-off activity. In this vision, technology is a tool to reach a better healthcare system. In order to make it a success, we need to understand its effect on people, organizations and society before we implement it. Similarly, we need to understand the role of the environment in the personal health.

The technical faculties will be able to provide the technological basis (although not exclusively) for the research at the institute. Most research is already in place and there is no need to make large shifts in this respect. The organizational and societal basis will be provided by the faculties BMS and ITC. In principle, the institute is open for any research group that is willing to contribute significantly and willing to work on the goals of the institute.

(Note: ITC was previously not involved within MIRA, but is working to develop a research chair for global health systems. This is an important contribution to understand the impact of the (global) environment on one's personal health and how techniques for big data can contribute to analyse an individual situation.)

The vision is

Improving healthcare by personalized technology

Technology is a tool to enable high-quality health care. Not only for diagnosis and treatment, but also for improving the quality of life and to stimulate independent living.

We strive to have a significant impact on society, both by scientific excellence as well as by linking fundamental research to clinical applications, from the nano to the global scale. Ultimately, we bring our technology to the clinic or to the home environment. For this purpose, it is imperative to have close working relations with clinical and industrial partners.

1.3 Mission

TechMed.Research

We innovate personalized healthcare by technological solutions

2 Outlines TechMed.Research

2.1 Grand Challenges

Health plays a prominent role in various plans for shaping the future. To mention a few:

- UN global goals: Good Health and Well-being (3rd position)
- H2020 Goals: Health, Demographic change and Well-being
- Bohemia Rapport on Health Goals (future H2020):
 - *Better care: Improved disease prevention, control and patient care delivered*
 - *Better health: Planet and lifelong human health delivered*
- OECD technology and innovation outlook: Health, inequality and well-being
- WEF: 4th industrial revolution – maximizing human wellbeing by fusing physical, digital and biological worlds

Technology plays an evident role in keeping healthcare assessable and affordable. The mission of the institute implies strong relations with healthcare providers and industry. The University of Twente has an advantage here, because we are strong in several technological areas and we have the expertise to evaluate its impact at the personal, organizational and societal level.

2.2 Strengths

The expertise of TechMed.Research is spread over the disciplines and faculties and combined in different research domains as in figure 1. There already are a lot of initiatives crossing faculties. The predecessor of TechMed.Research, MIRA, consisted of roughly the same technological groups. These are extended with additional contributions from the faculties BMS and ITC to cover the entire range of the translational research.

Some facts and figures for MIRA:

- 275 fte, turnover 25 M€.
- Scientific output 2016: 43 PhD theses; 431 articles with average impact factor of 4,6; Over 3000 citations.
- Awards in the past 6 years: 3ERC advanced, 1 ERC consolidator, 2 ERC starting; 10 Veni, 5 Vidi, 2 Vici.

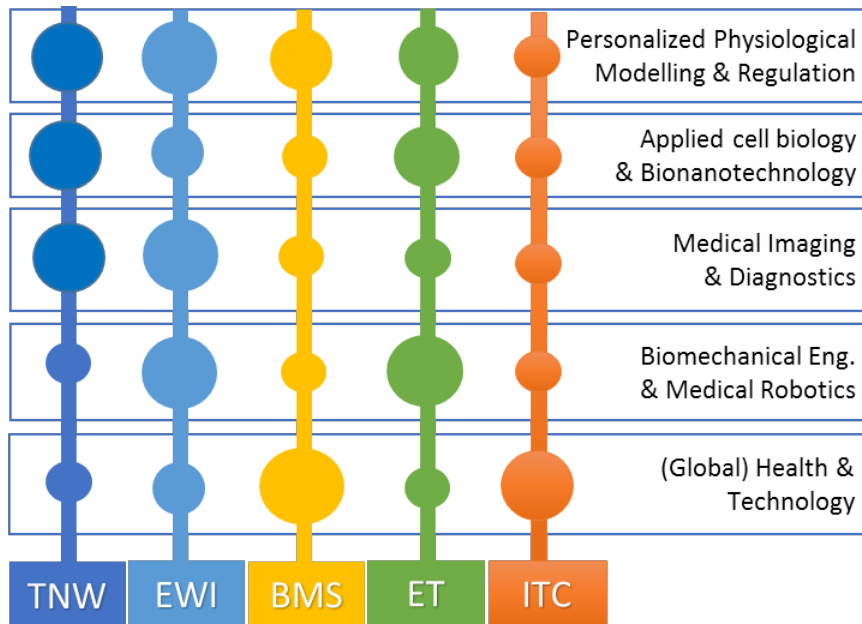


Figure 1. Research domains in TechMed.Research, with a hint of the contribution of each faculty to each of the domains.

Table 2 shows the expected PI's involved, based on past involvement and expressed interest. A PI is defined here as a full or associate professor allocated to one of the TechMed.Research groups. Some clustering of groups may still take place, depending on faculty policy. Also, clustering may exist between faculties, as is the case in the Centre for Healthcare Operations Improvement and Research (CHOIR) on health logistics. The adjunct and full professors with an appointment larger than 0,5 fte are counted here in the core team. This is the basic group from which the senior PI's should be selected (in a Wyss-like structure of the institute). The clinical professors in general have an appointment smaller than 0.4 fte, but provide essential links to the outside medical world.

Table 2. PI's in TechMed.Research

Faculty	Group	# PI	core team	# PIclin
TNW	AMIA, AST, BMPI, BST, CNPH,CRPH, DBE, MCBP, MNF, NBP, NIM, POF	28	12	5
EWI	AA, BIOS, BSS, MMS, RAM, SOR	15	7	2
BMS	IEBIS, HTSR, PHT	10	4	2
ET	BE, EFD	9	4	1
ITC	Vacancy Global Health			
		62	27	10

It is stressed that participation in the new institute is not limited to these groups. Again, the institute is open for any research group that is willing to contribute significantly and willing to work on the goals of the institute.

2.3 External Partners

Extensive collaboration with external partners is key for boosting innovation in healthcare. The University of Twente already has a strong network and track record of successful collaborations with a wide diversity of external partners and organization. These partners vary from SME's to the big medtech industry, from regional hospitals to international university medical centres, from local to

national governments or advisory boards and from funding organizations and scientific societies to charities and patient organizations.

The University has established long relations with all University Medical Centres and with several large hospitals in The Netherlands. Collaboration within this clinical network is strongly supported by the numerous clinical internships of the Technical Medicine program (see figure 2). All internship projects are supervised by clinicians and scientific staff from the UT. In addition to this internship network, formal research partnerships are in place with the academic medical centres RadboudUMC, UMCU and UMCG, the regional top clinical centres MST and ZGT and with rehabilitation Centre het Roessingh. Next to that, there are (formalized) collaborations with more specialized hospitals, like centres for rehabilitation and the Dutch cancer institute. In order to stimulate new connections with the strategic partners, the UT launched several seed funds / voucher programs the previous years such as Pioneers in Healthcare (with MST, ZGT, Menzis and as of 2017 also Deventer ziekenhuizen and Saxion), Turbo (with RadboudUMC) and a postdoc program with UMCU/JU. The goal of these programs is the stimulated collaboration and the increase the capabilities to attract future funding for these research lines.



Figure 2. Clinical internship partners of the University.

Besides the collaboration with clinical sites, partnerships with medtech companies is crucial for bringing real solutions to the international healthcare market. The list of industrial partners is already large and includes large to very large companies (Philips, Siemens, Medtronic, GE, etc.), a lot of regional companies (ten Cate, Demcon, Baat, Hankamp, Panton, Holland Innovative, Unitron, UNeedle, etc.). But perhaps the real strength is in working with the numerous start-ups and SME's, of which a lot of them originate from the University (currently about 50% of the new spinoffs is in medtech).

The UT also collaborates with a lot of other research institutes and -centres. Examples are the strong representation within the Dutch IMDI Cores where the UT is leading or participating in CMI, SPRINT, Neurocontrol and CCTR. On the regional level a good example of collaboration between a broad

range of partners is the recently launched initiative called 'Vitaal Twente'. As we are living in a growing internationally oriented environment, the UT could be proud of its international partnerships with renowned institutes such as IRCAD/IHU in Strasburg, the Wyss institute and the MGH hospital in Boston, and a wide range of strong research connection with top research groups at MIT, Yale, Sunnybrook, Kings College, etc.

As a knowledge institute the UT has a pivotal role in the Ecosystem of the region Twente and Eastern-NL (Gelderland + Overijssel). It has tight connection with organization such as Novel-T, Health Valley, OOSTNL, HIP, WTC Twente. Novel-T is considered as the central meeting place for the industrial ecosystem in the region Twente, where Health Valley has the role to stimulate (inter)national visibility for the entire region of Eastern Netherlands.

Last but not least, there are a lot of connections to regional and national governments, national and European funding agencies, health care funds / charities focusing in a wide variety of diseases and/or organs and of course with the Dutch topsectors LSH & HTSM.

Although the network is already strong and a key asset of the UT, a structured approach and policy to maximize the value that can be captured from this network and the numerous partnerships could be improved. This will be one of the priorities of the new TechMed.Research Institute support office.

2.4 The acquisition engine¹

In consideration of the increasing importance of external opportunities for funding, the expertise and quality of the TechMed.Research groups and the variety of possible external partners, an important mechanism in the institute is the so-called *acquisition engine* tool – which in the long term should justify the institute. This bottom-up tool is additional to the initiatives the institute employs, which are more top-down.

The acquisition engine aims at providing support to the researchers in their external funding endeavours, covering the entire acquisition chain: from identification of the relevant funding initiative to support on the Grant Agreement preparation phase.

A leading scenario that we intend to realize with the acquisition engine is the following:

An UT ambassador attends meetings, workshops and has due to his excellent network a lot of incoming information on upcoming calls, programs and policies. In many, he participates himself contributing to roadmaps. When home, he discusses the information with the acquisition engine support staff (AMS), who will then look at the concrete possibilities and find out details.

Then a call to the partners is sent out about the call by AMS and a meeting is set-up. At this meeting, the call is discussed in detail and reflected towards the offer the partners can jointly make. A decision is made whether to start a proposal making and who will be involved, as well as a schedule when what has to be finished. The writing team will be actively supported by AMS with advices, reading material, a database with old proposals for inspiration, etcetera.

Some important principles in this trajectory are “no free ride” meaning that the participants have to be active and comply with the scheme made. A second principle is to “share efforts and rewards”.

¹ Based on ideas and documents written by H. Hermens and M.L. Carosso

As the TechMed.Research institute has no hierarchical connection to its researchers, it must seduce the scientific staff to connect and external parties to collaborate and provide funding. In other words: the new institute should provide added value for the researchers within the TechMed.Centre's research domains. So, the acquisition engine will consist of a comprehensive approach to the external funding, that combines ad hoc events and workshops, format meetings, database and internal support from the UT, as described in the following:

- Ad hoc events and workshops: funding acquisition requires awareness on the existing possibilities, specific skills on writing proposals, addressing the challenges of the calls and knowing the strategy of funding institutions.
 - Proposal writing workshops. These events will provide researchers with the capability to improve their participation in funding initiative, share their experience and expand their knowledge on funding initiatives and strategic positioning groups, as described in section . Experts from relevant institutions (i.e. National Contact Points for H2020) will be invited to also provide their guidance, advice and training for specific funding programmes.
 - Proposal development workshops.
- Database(s) with project examples: list of successful submissions by PI's, evaluation reports and reviewers' s remarks are a precious source of information for improving existing proposals and/or inspiring new or follow-up ones. Detailed information should be retrieved by contacting the PI's (no full proposals in database).
 - The Database will therefore collect and organize all available information of granted projects that belong to the researchers involved in the program, taking into account the IP of the authors.
- Internal support:
 - TechMed Office: general support office for the TechMed.Research institute.
 - SBD & EU Office: support on the acquisition chain and project management.
 - Novel T: support on Exploitation, IP, Patents and innovation/opportunity recognition and valorisation.
 - LISA : support on the Data Management.

2.5 How to link to the grand challenges

Several organizations are working on calls for research proposals to solve aspects of the grand challenges. One of the tasks of the new institute will be to decide where to hook up, and to identify which PI should be involved in this. We are too small to cover all initiatives, so a priority list should be made. A first selection is made in table 3 (the short list). It should be noted that this list is not inclusive, there are several other initiatives, for example related to NWO, charity funds etc.

The combined strategic council of the institute will prioritize this list, and define actions to be taken to improve representation of the institute in these organizations.

Table 3. Organizations defining the agenda on the grand challenges (short list)

ETP (European Technology Platform)	
1	NanoMedicine
2	Robotics
NWA (Nationale Wetenschaps Agenda)	
3	Regeneratieve geneeskunde: game changer op weg naar brede toepassing
4	Gezondheidszorgonderzoek: preventie en behandeling
5	NeuroLabNL: de werkplaats voor hersencognitie- en gedragsonderzoek
6	Personalized medicine: uitgaan van het individu
EIP (European Innovation Partnership)	
7	Active and Healthy Ageing
JPI (Joint Programming Initiative)	
8	More Years, Better Lives
9	Alzheimer and other Neurodegenerative Diseases

3 Strategic Programs

The technological expertise is linked to societal challenges at three levels (figure 3):

- **Technology for early detection of diseases**
 - o Molecular diagnostics
 - o Medical Imaging
 - o Personalized Medicine & big data
- **Technology for targeted treatment of diseases**
 - o Image Guided Treatment & Robotics
 - o Molecular Therapeutics (e.g. organ-on-a-chip, regenerative medicine, targeted nano medicine)
- **Technology for improved independency & remote care**
 - o Personalized eHealth technology
 - o Wearable technology (e.g. sensors, robotics, bio artificial organs)

In each level, strategic programs are being developed. It is evident that in order to make impact in society, the input from research on health technology assessment, value based health care and ethics should be included at each level.

3.1 Program initiatives 2017-2021 & budget

In table 4 a general outline for the requested budget is presented. The main initiatives and activities for 2019 and further will be defined in 2018 by the strategic council of TechMed.Research. The future outlook will always be a rolling forecast of activities and budgets, as this should be based on actual and relevant developments both internally (scientific successes, new talents, etc.) and externally (new opportunities or programs, new collaborations, etc.). In principle, from any research domain new program initiatives can be developed.

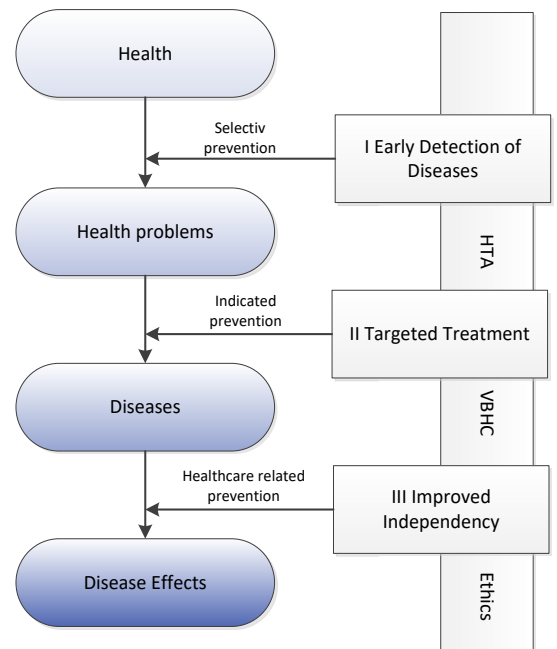


Figure 3. Strategic programs

Table 4. Program initiatives 2017-2021 & budget

		(all budgets in k€)									
		2017		2018		2019		2020		2021	
1.	Community Building	TNW	CSB	TNW	CSB	TNW	CSB	TNW	CSB	TNW	CSB
1.0	TechMed office costs: Event(s), workshops, Magazine, PR (website & documentation), stands/sponsoring *			84		84		84		84	
1.1	Samenwerkingsverbanden, lidmaatschappen en subsidies *			85		85		85		85	
1.2	EFRO project activities (HTKT & TechMed proeftuin). Organizing thematic (network) events and symposia aligned with strategic programs and focus area's to enhance visibility and improve internal & external collaboration	0		0		0					
2. Executing Power											
2.0	Scientific Director, Business Director, Medical Director, TechMed Office staff, incl offices & overhead costs *			630		630		630		630	
2.1	<i>TOPFIT program</i> : development of a broad TechMed program covering the biggest part of the focus areas, initiated by UT and RadboudUMC. Goal is to develop a strong TechMed program based in Eastern NL supported by the provinces of Overijssel & Gelderland (and ultimately also the german border region) and get it on the priority lists of the topsectors LSH, HTSM		65		150		150		150		150
2.2	<i>Personalized eHealth Technology</i> plan (Hermens), further development & implementation		60		75		75				
2.3	<i>Image Guided Treatment & Robotics</i> (vd Kooij, Stramigioli, Misra): considerable potential for growth, strong EU position & highly relevant upcoming calls, strong UT knowledge base, industry is pushing. Province is willing to co-invest in a business developer → attract support capacity a.s.a.p. and start with developing program and prepare for big EU calls (digital hubs, lighthouse healthcare).		50		75		75		50		
2.4	Initiate first activities for focus areas of the strategic program ' <i>technology for early detection of diseases</i> ', preparing them to kickstart end of 2018/early 2019.				75		75		75		75
2.5	Targeting Non-Dilutive US funds: e.g. NIH, DoD, NSF, private foundation. The UT hardly uses the opportunity to attract US funds for its research. Figures demonstrate that about 1000 projects worth 1.4B\$ are funded annually in non US countries based on scientific quality. Plan: approaching a consultancy organization specialized in attracting US funds (e.g. Freemind				100		100		50		

	group) that can help attracting funds and by doing so developing own UT knowledge & expertise.										
2.6	Specific targeting of Dutch health care funds: e.g. KWF, Hartstichting, longfonds, hersenstichting.										
2.7	Improving insight in national & EU funding opportunities and relevant calls.										
2.8	Improving lobby & relevant network of UT researchers, especially related to bigger EU programs			50		50		50		50	
2.9	Support Kwartiermaker INS Health (Koopman)	50									
2.10	Stimulating/supporting ERC Synergy grant Bioartificial Organs (Stamatialis)	50									
2.11	Development & (virtual) positioning of TechMed.Infra as the primary Strategic Research Infrastructure of the UT's TechMed Centre. Attracting external users, improving facility sharing and enhancing visibility to target future funds from NWO (middel)groot roadmaps and relevant EU funds.			25							
3.	Impuls for Scientific Staff										
3.1	Sustaining and further developing (strategic) partnerships with hospitals, running & monitoring seed fund programs Pioneers in Healthcare/TURBO/UMCU, improving UT's capability to attract external funds from these partnerships		80	480	80	480	80	480		200	
3.2	<i>Personalized eHealth Technology</i>			150		150		150			
3.3	<i>Image Guided Treatment & Robotics</i>			150		150		150			
3.4	<i>technology for early detection of diseases</i>					150		150		150	
4.	Big instruments										
4.1	<i>TOPFIT</i> , matching budget, ~10 PhD's					500		500		500	
4.2	Continues stimulation of (new) strategic programs and focus area's										
X.	To be allocated										
x.x	To be allocated by New Scientific Director TechMed.Research			150		45		195		680	
	TOTAL budget	275	879	1480	879	2000	879	2000	799	2000	
* Please note that the total "MIRA" budget of 799 k€/year that is added to the TNW budget is needed for (i) support of the day to day interdisciplinary research activities and thus partly needed to fulfil the former MIRA duties and for (ii) supporting the executing power of the new TechMed.Research institute in relation to its activities for attracting additional research funds.											

4 Governance

We aim at a *lean-and-mean* governance of the institute, well embedded in the TechMed.Centre. The institute should be externally oriented, focused on the contents of the research, with a primary task to generate external funding. The TechMed.Centre is responsible for facilitating and stimulating the general day to day research & education in the disciplines of biomedical engineering, technical medicine and health sciences.

4.1 Governance of the institute

Given these observations and assumptions, we propose the following governance:

- The institute has a **management team** consisting of:
 - Scientific Director (chair)
 - Business Director

The management team handles all day-to-day business for running the institute, and is supported by 1 FTE (senior) secretary. The management team meets on a weekly basis.

- The institute has a **strategic council** consisting of:
 - Scientific Director (chair)
 - Business Director
 - Medical Director
 - Research domain leaders/representatives (5x)
 - All program leaders of the institutional strategic programs (2-3x)

The strategic council is responsible for defining the strategic plans for the institute given its mission and goals, and based on information exchanged between its members (note that each research fellow is assumed to be member of an external agenda-setting body or committee). The research domain leaders/representatives represent the five core TechMed.Research domains (fig. 1), preferably representing all faculties. The council initially meets on a two-monthly basis, this may change as needed. The business director is assumed to be the linking pin to SBD.

- The institute has a **program council** consisting of:
 - Business director (chair)
 - Program leaders or -managers of the institutional strategic programs (2-3x)

The program council is responsible for ensuring that associated programs run smoothly when it comes to, for example, acquiring external funds.

- The institute is represented in the Management Team of the TechMed Centre by:
 - Scientific Director
 - Business Director

4.2 Embedding in the TechMed.Centre

The TechMed.Centre combines all activities of the University on health related subjects. It is responsible for facilitating and stimulating the general day to day research & education in the disciplines of biomedical engineering, technical medicine and health sciences. This includes shared lab facilities, post-graduate courses, discipline specific support on medical ethical issues, health research data management, valorisation of both research and education, portal functions to external parties and coordinating the general partnerships with hospitals and companies etc.

The research is linked to the educational programs as in figure 4. In principle the council of participating chairs ('disciplineraad' or 'kamer van hoogleraren') could be consulted for advice on matters related to research or education.

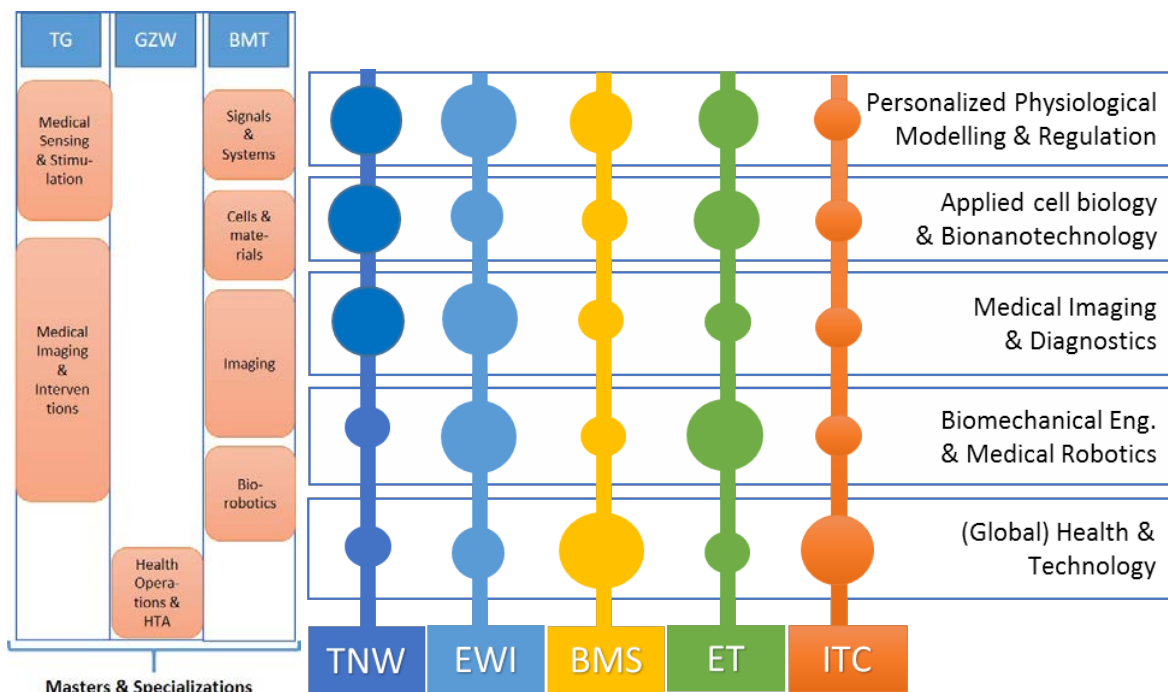


Figure 4. Education and Health in the TechMed.Centre

The total structure of the TechMed.Centre is reflected in figure 5.

- The TechMed.Centre has a **Management Team** consisting of:
 - Scientific Director and Business Director, representing the research institute
 - Educational Director representing the educational programs
 - Managing Director in charge of the facilities, valorisation & the TechMed.Centre business administration
 - Medical Director representing the medical aspects and translational character of research and education & the core clinical partnerships
 - Research Domain Leader / Representative, representing the 5 Research Domains

The management team meets every two weeks. To ensure a solid embedding in the university structure, a representative of each faculty board is included in the extended management team of the TechMed.Centre. This extended management team meets twice a year.

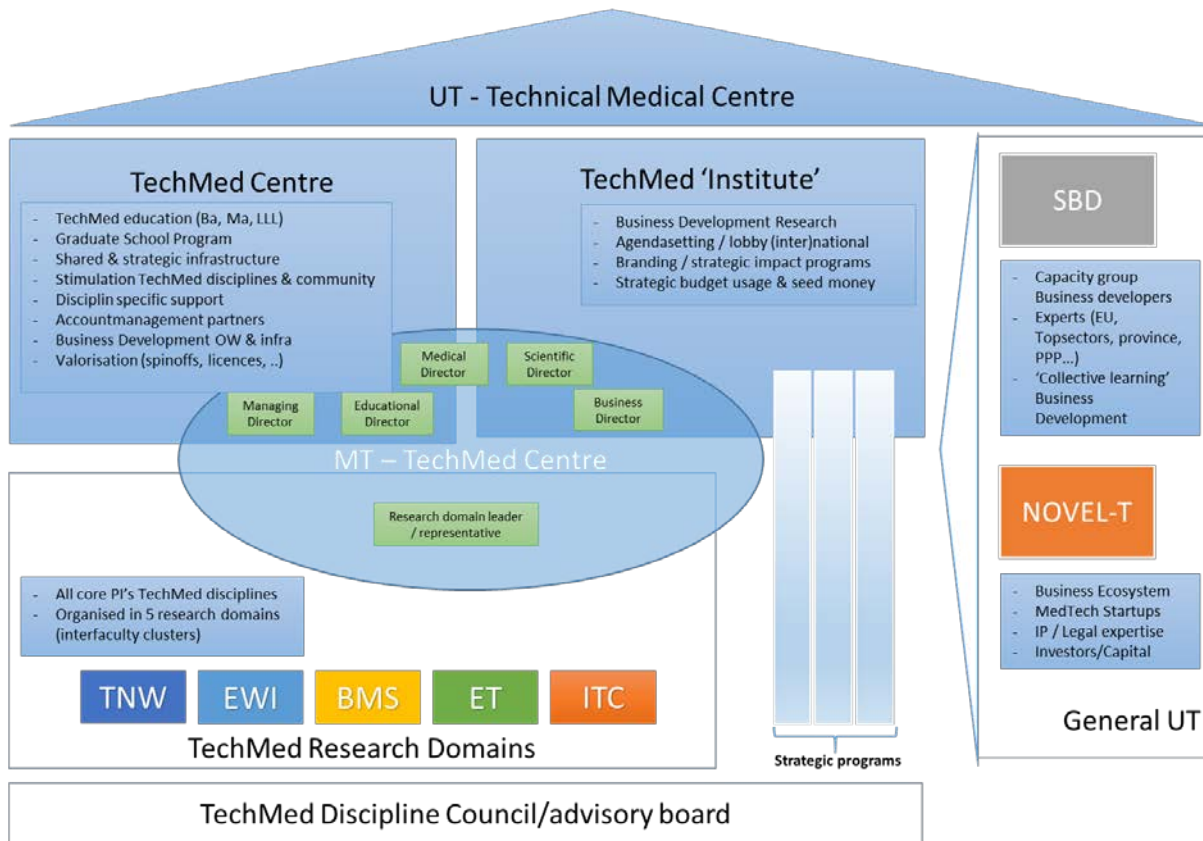


Figure 5. Proposed structure of the TechMed Centre.

The TechMed.Centre has a **TechMed office** that supports the management of the TechMed.Centre and the TechMed.Research Institute in the execution of its tasks. This office is a virtual integration of the existing TechMed support team within TNW and the MIRA office.

The INS part of the TechMed Office will be steered by the Business Director and will focus on the goals and tasks of the institute: growing the research business, attracting more external funds and running the strategic programs to obtain these goals.

The TechMed.Centre part of the office will be steered by the Managing Director and will focus on the day to day support of the TechMed research and education, including its infrastructure and discipline specific support related to research with human subjects & medical devices, animal experiments and health research data management.