Health~Holland

MedTech International Publication

The state of affairs of the MedTech sector in the Netherlands anno 2023.

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1. Introduction

MedTech is a collective term for products and systems (both hardware and software) used for the diagnosis, prevention, monitoring, treatment, or relief of diseases. Throughout literature, there are many different definitions for Medical Technology (MedTech), which illustrates the complexity of the landscape that we are working in. Table xx below provides an overview of the various definitions of MedTech, according to key global and European players in this field.

Stakeholder	Definition
World Health Organization (WHO)	The application of organized knowledge and skills in the form of devices, medicines, vaccines, procedures, and systems developed to solve a health problem and improve quality of lives.
International Medical Device Regulators Forum (IMDRF)	Any instrument, apparatus, implement, machine, appliance, implant, reagent for in vitro use, software, material, or other similar or related article intended by the manufacturer to be used, alone or in combination, for human beings for one or more of the specific medical purposes.
European Commission	Any instrument, apparatus, appliance, software, implant, reagent, material, or other article intended by the manufacturer to be used for human beings for the purpose of diagnosis, prevention, monitoring, treatment, or alleviation of disease.
United States Food & Drug Administration (FDA)	An instrument, apparatus, implement, machine, contrivance, implant, in vitro reagent, or other similar or related article, including any component, part of accessory, that is intended for use in the diagnosis of disease or other conditions in the cure, mitigation, treatment, or prevention of disease.
MedTech Europe	Any products, services or solutions used to save and improve people's lives.

The definitions of MedTech range from all-encompassing, such as that of MedTech Europe, to more specific, such as that of the FDA. To be clear, this publication does not have as an objective to be an academic exercise to arrive at a general MedTech definition, but rather to understand what types of companies exist and how we can better support them.

To complicate matters more, oftentimes various organizations focus on specific domains within MedTech, rather than supporting the sector in its entirety. Table xx provides an overview of the main domains within MedTech

Domain	Definition
Diagnostic Imaging	This domain focuses on technologies and equipment for medical imaging, such as X-ray, magnetic resonance imaging (MRI), computed tomography (CT), ultrasound and nuclear medicine.
Medical Devices	This domain encompasses a wide range of devices used in medical settings, including surgical instruments, monitoring devices, implants, prosthetics, hearing aids respiratory devices, and infusion pumps.

Wearable Devices	These are devices designed to be worn by individuals to monitor various aspects of their health and well-being, such as fitness trackers, smartwatches, glucose monitors, and sleep trackers
Telemedicine and Digital Health	This domain involves the use of technology to enable remote healthcare services, including teleconsultations, remote patient monitoring, mobile health applications, electronic health records, and health data analytics
Healthcare Information Technology (IT)	This domain focuses on the use of IT systems, software, and infrastructure to manage and improve healthcare delivery, including electronic medical records, hospital information systems, health data interoperability, cybersecurity, and health informatics.
Therapeutic Devices	This domain includes devices used for therapeutic purposes, such as medical lasers, rehabilitation equipment, insulin pumps, dialysis machines, radiation therapy devices, and drug delivery systems.
Assistive Technologies	These technologies are designed to assist individuals with disabilities or limitations, including mobility aids, hearing aids, visual aids, communication devices, and assistive robotics.
Biotechnology	This domain combines biology and technology to develop innovative solutions for medical applications, such as genetic testing, gene therapy, tissue engineering, regenerative medicine, and personalized medicine.

Each of these domains often has a differentiated export plan that requires different types of support. These types of support will be analyzed in this publication to better understand how to support the sector as a whole.

Innovative medical technology is a cross-sectoral theme where societal challenges and key technologies (including digitalization) come together. The Netherlands has a prominent position in this field. Various perspectives, such as Health~Holland, Holland High Tech, Top Sector ICT, and Dutch Digital Delta, are working to strengthen the innovation power and ecosystem of medical technology in the Netherlands. Although much is already happening in this field in the Netherlands, an analysis of the playing field is needed to provide the basis for a united approach for the MedTech environment and to utilize international opportunities and strengthen the position of Dutch MedTech internationally.

1.1 Objectives and results MedTech International

For an optimally functioning MedTech value chain, international cross-pollination of innovation, technologies, and market access is essential to increase the earning capacity of small and medium-sized enterprises (SMEs) in the Netherlands and abroad. MedTech innovations that result in a finished product (medical device) find their customers (often through distributors) in healthcare providers (hospitals, clinics, elderly care institutions), pharmacies, or through reimbursement systems (insurers) and purchasing organizations of healthcare institutions. MedTech technological innovation (such as AI, nanotech, photonics, smart design, etc.) find their way to the market in finished products of others (original equipment manufacturers, OEMs, such as Medtronic, Stryker, Philips, Siemens, GE, etc.). Both groups seek access to international networks and innovative ecosystems to accelerate their market entry and realize

(international) exploitation. However, the information needs are often different (i.e. legal and regulatory framework, reimbursement system, functioning of the healthcare financing system, investment programs, policy priorities) because the entry to the (international) markets follows a different path.

Individual activities are currently often shaped from a specific (innovation) technology, application area, organization, or regional focus. For more impact and results, a stronger cohesion and innovative internationalization approach are needed. The objective of the MedTech International publication is to sketch the Dutch MedTech landscape and its regions and to provide recommendations on how to strengthen and accelerate the internationalization of Dutch Medical Technology, with the United States as case.

1.2 Background & Reasoning for MedTech International

While international export opportunities for MedTech companies are often mentioned as a focus area for many players in the MedTech landscape, the international approach to capitalize on the Dutch potential is not yet sufficiently developed within the ecosystem. Many actors in the MedTech innovation ecosystem, particularly companies, are active in the steps from prototyping to production but are less involved in export or internationalization. Various initiatives are being undertaken to internationalize MedTech, but they reflect the (still) fragmented Dutch ecosystem, lack sufficient coherence, and are (mostly) too traditionally focused on export promotion rather than internationalization throughout the entire value chain, from (fundamental) research to export.

The internationalization strategies of the top sector Life Sciences & Health (LSH), Health~Holland, and the High Tech Systems and Materials (HTSM), Holland High Tech, the Action Program '*New opportunities for the LSH top sector,*' and the efforts of the top sector ICT in the health domain (particularly the Dutch AI Coalition) provide, the tools to further strengthen and accelerate the internationalization approach for Dutch MedTech companies along the entire value chain.

The growing global demand for medical technology creates an opportunity to increase the earning capacity of the Netherlands. The production of medical technology in the Netherlands amounts to EUR 6.7 billion annually, and the wholesale trade of medical articles, which also includes MedTech wholesale, generates an additional EUR 32 billion in revenue each year. Research in biotechnology and health, which also encompasses some research in medical technology, produces an additional EUR 1.5 billion annually.

Currently, the full potential of MedTech export is not being realized. To do so, one must effectively understand and involve the private sector. It is therefore necessary to look beyond (fundamental) research and innovation. The interest and need lie primarily in the (international) marketing and applicability of innovations at higher TRL levels (6&7). Moreover, the chain from research to product development and eventual sales is inherently international.

To better understand how to involve the private sector, the first step is to better understand the private sector and the challenges they are facing. The goal is to make sense of the complex landscape, with a focus on MedTech internationalization support. This will lead to recommendations to improve the collaboration within the system, thereby improving the success rate of Dutch MedTech companies.

2. MedTech companies & development partners in the Netherlands

2.1 Archetypes of MedTech companies & development partners

In the field of MedTech, there are several archetypes or categories of stakeholders involved in the ecosystem. These archetypes help to categorize companies and stakeholders based on where they play a role and intervene in the MedTech supply chain. These stakeholders play different roles and contribute to various aspects of the MedTech industry. An overview of the most common archetypes in the Netherlands will be presented here.

- **Suppliers** are companies or entities that provide various components, materials or services to support the production or functioning medical devices and technologies. They can supply raw materials, specialized components, equipment, packaging materials, or other necessary resources to medical device manufacturers. Suppliers play a crucial role in the supply chain and ensure the availability of essential inputs for MedTech production.
- **Technology developers** are entities for individuals involved in the research, design, and development of new technologies or innovations in the medical field. They focus on creating novel solutions, often leveraging advancements in engineering, electronics, software, or other technical domains. Technology developers work on improving existing MedTech or creating entirely new technologies to address unmet needs in healthcare.
- **University spinoff**, also known as spin-out companies, are commercial entities that emerge from universities or research institutions. These companies are formed to further develop and commercialize innovative technologies or intellectual property originating from academic research. University spinoffs in the field of MedTech often leverage cutting-edge research and collaborate with academic institutions to translate scientific advancement into practical applications or technologies.
- **Original Equipment Manufacturers (OEMs)** are companies that design, develop, and manufacture medical devices or equipment. They are responsible for the entire production process, from concept and design to manufacturing and distribution. OEMs may develop their own products or collaborate with technology developers or university spinoffs to bring innovative medical devices to market. They often have their own brands and supply healthcare providers.
- **End-product manufacturers (medical device manufacturers)** are companies that specialize in assembling, integrating, or packaging various components or technologies into a finished MedTech solution. They may source components from suppliers or collaborate with OEMs, technology developers, or university spinoffs to create a final product. End-product manufacturers ensure that the technology meets the required specifications, regulatory standards, and quality control measures before they are distributed to healthcare providers or end-users.
- **Software manufacturers** focus on developing software applications or platforms specifically designed for the medical field. They create software solutions that support MedTech companies, enhance data analysis, enable electronic health records (EHRs), provide clinical decision support, or facilitate telemedicine and remote patient monitoring. Software manufacturers play a crucial role in the digital transformation of healthcare and the integration of technology into medical devices and systems.
- **Contract manufacturers** are companies that specialize in manufacturing MedTech solutions on behalf of other companies. They provide expertise in the production, quality control, and regulatory compliance. Contract manufacturers work based on specifications provided by the OEMs or end-product manufacturers.

- **Service providers** in the field of MedTech offer a range of services to support various aspects in the industry. These services can include:
    - Maintenance and repair
    - Calibration and testing
    - Consulting and regulatory support
    - Training and education
    - Logistics and distribution

  Service providers play a vital role in supporting the broader ecosystem of MedTech by offering specialized services that enhance the functionality, usability, compliance, and lifecycle management of MedTech solutions.

Figure 1 provides an overview of where each archetype plays a role in the MedTech supply chain. Many of the stakeholders play a role throughout the supply chain, such as OEMs and suppliers. Technology developers often become end-product manufacturers once their technology has been developed far enough to be able to bring it to the market. However, oftentimes, their technology is already 'scooped up' by OEMs if it seems to be a promising solution for the future.

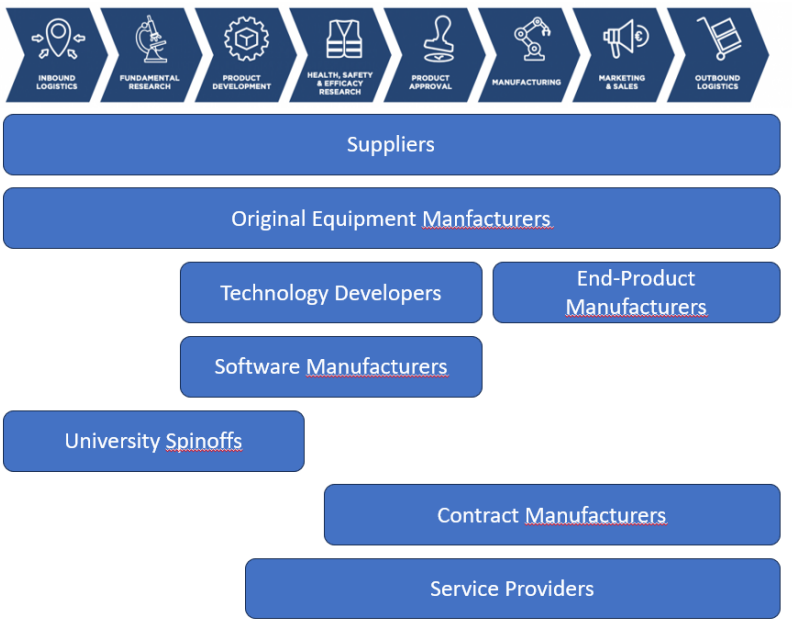

Figure 1 Overview of the MedTech supply chain

The Netherlands houses many Technology Developers as well as Suppliers, as shown in Figure 2. Together, these two groups represent about 70% of stakeholders in the Netherlands.

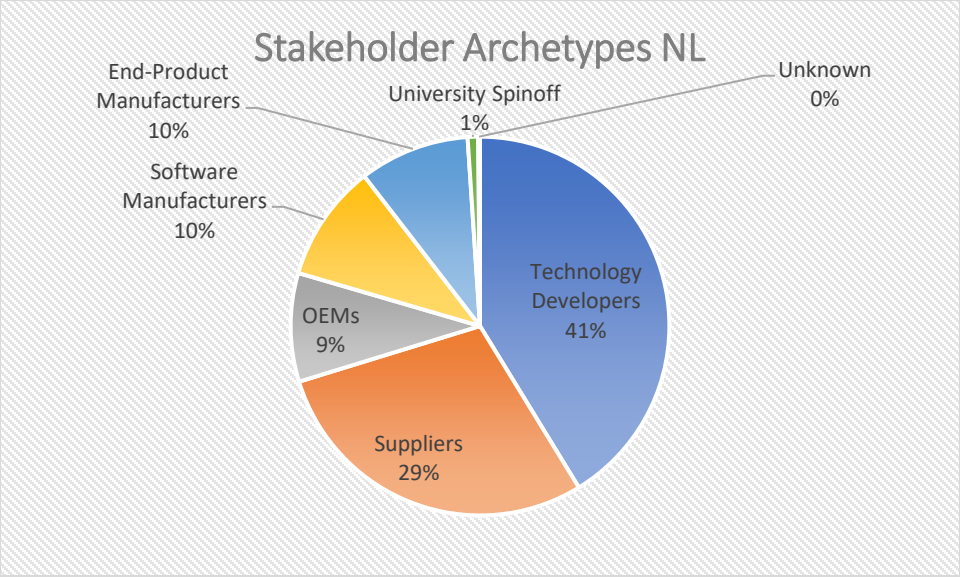

Figure 2 Stakeholder Archetypes in the Netherlands

While these archetypes have been created to help classify stakeholders into the various groups, many stakeholders do not fall into one single category. For example, Baat Medical, a Dutch MedTech company that provides full-service support to obtain and maintain market approval for medical devices, can be categorized as both a contract manufacturer and a service provider. Oftentimes, end-product manufacturers are companies that produce and market their technologies themselves, as well as working with OEM'ers to implement their technologies into their portfolio as well. While this categorization of archetypes helps to create a certain classification and grip of the various actors in the MedTech landscape, the fact that it is hard to categorize stakeholders into one single archetype illustrates that the landscape is diverse, complex, and overlapping.

2.2 Archetypes of application areas for MedTech

The field of MedTech encompasses various application areas where companies develop and deploy their technologies to address specific healthcare needs. Some common archetypes of application areas are described in this section.

- In-hospital application:
    - **Diagnostics and imaging**: MedTech companies develop technologies and devices used for diagnosing and imaging various medical conditions. This can include medical imaging systems (e.g. X-ray, MRI, CT scanners), diagnostic tests (e.g. laboratory analyzers, point-of-care devices, and image-guided interventions.
    - **Surgical and interventional systems**: this archetype includes companies that develop technologies and systems for surgical procedures and interventions. Examples include robotic surgery systems, surgical navigation systems, minimally invasive surgical tools, and interventional devices used in cardiology, radiology, and other specialties.
- In-patient application:
    - **Therapeutic devices and equipment**: companies in this archetype focus on developing medical technology and equipment used for therapeutic processes. This can include implantable devices (e.g. pacemakers, artificial joints), therapeutic equipment (e.g.

infusion pumps, dialysis machines), and rehabilitation devices (e.g. prosthetics, assistive devices).

- Home healthcare & prevention application:
    - **Monitoring and remote patient care**: medtech companies in this archetype develop technologies and devices for monitoring patient health and providing remote care. This can include wearable devices (e.g. fitness trackers, continuous glucose monitors), remote monitoring systems, telemedicine platforms, and mobile health applications.
    - **Digital health and health IT**: companies in this archetype focus on digital health technologies and health information technology solutions. This includes electronic health records (EHR) systems and health data analytics.
    - **Home healthcare and remote monitoring**: companies in this archetype focus on technologies and devices that enable healthcare services to be provided in a home setting. This can include monitoring devices, home-based equipment, and telehealth solutions tailored for home healthcare.
- Elderly and rehabilitative care application:
    - **Rehabilitative and assistive technologies**: this archetype includes companies that develop technologies and devices to assist individuals with disabilities or support rehabilitation processes. Examples include mobility aids, adaptive technologies, and rehabilitation robotics.

These descriptions provide a clearer understanding of the different application areas within the field of MedTech, showcasing the diverse range of technologies and solutions being developed to address specific healthcare needs. However, here again, there is difficulty to place stakeholders and actors into one single category according to application areas. Often rehabilitative and assistive technologies are also technologies that implement monitoring and remote patient care. Surgical and interventional systems also incorporate an element of therapeutic devices and equipment. One should realize that while stakeholders often fall into a specific category with regards to application area, that is not the case for many MedTech companies. Each application area, however, often has a different end-user, financier, business-model, etc. This, again, shows the complexity of the landscape and that there is not a one-size-fits-all model for MedTech stakeholders to support their expansion activities.

2.3 MedTech companies

The MedTech landscape in the Netherlands is diverse and dynamic, encompassing a wide array of companies (Vo-Tech, 2020). These include startups, small and medium-sized enterprises (SMEs), and established industry leaders. Dutch MedTech companies operate in sectors such as medical devices, diagnostics, digital health, telemedicine, AI-driven solutions, and more. They offer innovative products and services that address critical healthcare challenges and enhance patient care.

Dutch MedTech companies are highly active on the international stage, consistently seeking opportunities beyond national borders. Their international mindset is driven by the country's small domestic market and a desire to tap into global markets. These companies actively engage in cross-border collaborations with international partners, including healthcare providers, research institutions, distributors, and investors.

Collaboration is a key driver of success for Dutch MedTech companies. They work closely with various stakeholders to drive innovation, validate their technologies, and expand their reach. Dutch MedTech companies often partner with renowned research institutions, academic medical centers, and hospitals.

These collaborations provide access to clinical expertise, real-world data, and validation opportunities, helping to accelerate product development and adoption. Furthermore, Dutch MedTech companies excel in public-private partnerships. They actively collaborate with government, research institutions, and industry stakeholders to actively collaborate to foster innovation, drive research and development, and accelerate the adoption of new technologies. These collaborations often involve partners, such as Health~Holland, to bring together academic institutions, healthcare organizations, and businesses to address societal challenges and drive economic growth in the LSH sector. Collaborations are coordinated on both national and international scale. Public-private collaboration also facilitates regulatory compliance, market access, and reimbursement processes, with Dutch MedTech companies working closely with regulatory bodies and healthcare insurers to meet standards and secure reimbursements.

When internationalizing, Dutch MedTech companies employ diverse business models tailored to their specialization and goals (further analyzed in section 4.1). Some focus on developing and manufacturing medical devices or diagnostic tools, while others offer software-based solutions or telemedicine platforms. Business models can range from direct sales to healthcare institutions or distributors, technology licensing to other companies, or software-as-a-services (SaaS) models.

Dutch MedTech companies excel in several areas due to their strong technological capabilities and focus on healthcare innovation. Notably, they demonstrate expertise in medical imaging and diagnostics, offerings advanced imaging technologies for early disease detection and accurate diagnosis. Dutch companies also make significant strides in digital health, leveraging AI and data analytics to optimize healthcare workflows, improve patient monitoring, and enhance treatment outcomes. Medical devices represent another strong suit for Dutch MedTech companies. They specialize in developing innovative, safe, and patient-centric devices, including surgical instruments, implants, and prosthetics. Moreover, Dutch MedTech companies showcase proficiency in remote patient monitoring, telemedicine, and eHealth solutions, contributing to the digital transformation of healthcare delivery.

3. Dutch MedTech goes international

International expansion is a key objective for many MedTech companies seeking to tap into global markets. The Netherlands, with its advanced healthcare system and thriving MedTech industry, serves as an ideal hub for stakeholders, including small and medium-sized enterprises (SMEs) to explore various market entry strategies. This chapter will provide an overview of the different international market entry strategies for MedTech companies, briefly showcasing specific examples of Dutch stakeholders collaborating with international partners.

3.1 Archetypes of internationalization / market entry strategies

Direct exporting

Direct exporting involves selling products or services directly to customers in the target market. This strategy allows companies to maintain control over the distribution process and establish direct relationships with customers.

Advantages of direct exporting model	Drawbacks of direct exporting model
Maintaining control over the distribution process and customer relationships	Requires substantial investment in market, distribution and logistics. Often requires a local office in each target market, with local personnel
Higher profit margins by eliminating intermediaries	Potential challenges in understanding and complying with diverse international regulations and standards
Flexibility in adapting marketing and sales strategies to different markets	Limited knowledge and customer insights

The timeline for direct exporting typically involves establishing distribution channels, local partnerships, and market entry strategies, which can take several months to several years to establish, depending on the complexity of the target market and regulatory requirements.

Case Study: Zivver's Direct Exporting Model

Zivver, a Dutch MedTech company specializing in secure communication solutions for healthcare organizations, has successfully implemented a direct exporting model to expand its market presence in Germany. In Germany, Zivver collaborates with Universitätsklinikum Essen (University Hospital Essen), one of the largest medical centers in Europe. The partnership enables Zivver to offer its secure communication platform to the hospital's healthcare professionals, ensuring the privacy and integrity of sensitive patient information.

The direct exporting model allows Zivver to maintain control over the distribution process and establish direct relationships with customers. By eliminating intermediaries, Zivver can ensure the seamless delivery of their secure communication solutions while maintaining high-quality standards. Moreover, Zivver's exporting strategy provides the company with a competitive advantage by offering tailored solutions to meet the specific needs and regulations of the German healthcare market. This targeted approach enhances customer satisfaction and builds trust with healthcare institutions.

Zivver. (n.d.). Retrieved from https://www.zivver.com/

Joint Ventures and Strategic Alliances

A joint venture or strategic alliance is a collaborative partnership formed between two or more companies to leverage their respective expertise, resources, and distribution channels to achieve shared objectives and mutual benefits. It involves pooling resources, sharing risks, and combining complementary strengths to pursue opportunities in the market.

Advantages of joint venture/strategic alliance	Drawbacks of joint venture/strategic alliance
Access to local market knowledge, distribution channels, and established customer base	Potential conflicts in decision-making, management, and cultural differences
Sharing resources, expertise, and risks with partners	Sharing profits and control with partners
Accelerated market entry and reduced time-to-market	Complex negotiation and agreement processes

Establishing a joint venture or strategic alliance involves identifying suitable partners, negotiating terms, and developing collaborative agreements, which can take several months to several years to establish, depending on the complexity of the partnership and the legal requirements.

Case Study: LeQuest's Strategic Alliances in Germany and the United States

LeQuest, a Dutch MedTech company specializing in simulation-based training programs for medical devices, has successfully formed strategic alliances with partners in Germany and the United States. Through these collaborations, LeQuest has expanded its market reach and established a strong presence in these countries.

In Germany, LeQuest has formed a strategic alliance with Siemens Healthineers, a global leader in medical technology. This partnership allows LeQuest to integrate its simulation-bases training programs with Siemens Healthineers' medical devices, empowering healthcare professionals to effectively and safely operate these devices in various clinical settings. Furthermore, in the United States, LeQuest has established a strategic alliance with Medtronic, a renowned medical technology company. Together, they provide simulation-based training solutions for Medtronic's extensive range of medical devices, enabling healthcare professionals to enhance their proficiency in device usage and improve patient outcomes.

These strategic alliances with Siemens Healthineers and Medtronic enable LeQuest to leverage the partners' expertise, resources, and distribution channels. By combining LeQuest's simulation based training programs with the partners' medical devices, the alliances create a comprehensive solution that addresses the critical need for effective device training in healthcare settings. The strategic alliances also provide benefits to the partners involved. Siemens Healthineers and Medtronic enhance their product offerings by incorporating LeQuest's training programs, ensuring that healthcare professionals can maximize their potential of their devices, ultimately leading to improved patient outcomes.

LeQuest. (n.d.). Retrieved from https://www.lequest.com/

Licensing and Distribution Agreements

A licensing/distribution agreement is a contractual arrangement in which a company (licensor) grants another company (licensee) the right to manufacture, market, and distribute its product or services in a specific geographic region or market segment. The licensee gains access to the licensor's intellectual property, brand, and expertise while assuming responsibilities related to (a combination of) production, distribution, and/or sales.

Advantages of licensing/distribution agreements	Drawbacks of licensing/distribution agreements
Rapid market entry by leveraging existing distribution networks	Potential loss of control over product quality, brand reputation, and customer relationships
Access to local market knowledge and customer base through partners	Dependence on the partners' capabilities, commitment, and market performance
Lower investment and reduced operational complexities	The need for effective contract management and intellectual property protection

Negotiating and finalizing licensing and distribution agreements can take several months, including due diligence, contract negotiation, and regulatory compliance processes.

Case Study: Tover's Distribution Agreement with Eugeria

Tover, a Dutch MedTech company specializing in innovative rehabilitation technologies, has successfully established licensing and distribution agreements with international partners, enabling them to expand their market presence globally.

In Canada, Tover has established a distribution agreement with Eugeria, a Canadian distributor specializing in elderly care and rehabilitation services. Through this partnership, Eugeria has acquired the rights to distribute Tover's rehabilitation technologies across their network of elderly care facilities in Canada. The partnership between Tover and Eugeria was so successful that they decided to expand their partnership so that Eugeria also became Tover's distributor for the United States, thereby covering all of North America.

These distribution agreements provide Tover with a significant advantage in accessing the Canadian and American markets. By partnering with an established organization such as Eugeria, Tover gains immediate access to their networks, eliminating the need for building distribution channels from scratch. Furthermore, these agreements allow Tover to benefit from their partners' market knowledge, customer relationships, and existing infrastructure. Eugeria possesses a deep understanding of the rehabilitation sector in both Canada and the United States, ensuring that Tover's technologies are effectively introduced and promoted in these markets.

Tover. (n.d.). Retrieved from https://www.tover.com/

Research Collaboration and Innovation Networks

A research collaboration is a cooperative effort between organizations, typically academic institutions and companies, to conduct joint research activities aimed at advancing knowledge, developing new

technologies, or solving specific scientific problems. Collaborating with international research institutions, universities, and innovation networks fosters knowledge exchange, research collaboration, and market entry opportunities for MedTech companies.

Advantages of research collaborations	Drawbacks of research collaborations
Access to cutting-edge research, expertise, and resources	Complex coordination and alignment of objectives among multiple stakeholders
Validation of products and solutions through scientific studies and clinical trials	Potential delays in research timeline and regulatory approvals
Increased credibility and market acceptance through collaboration with renowned institutions	Intellectual property and knowledge-sharing concerns

Research collaborations and innovation networks involve establishing partnerships, defining research objectives, securing funding, conducting studies, and commercializing products, which can span several years.

Case Study: UVSmart's Research Collaborations in Germany and the United States

UVSmart, a Dutch MedTech company specializing in UV disinfection technologies, has engaged in a research collaboration with New York University (NYU) Langone Health, a leading academic medical center in the United States. This collaboration aimed to investigate the efficacy of UV-C light in eliminating pathogens and improving infection control practices in healthcare environments. As part of the research project, UVSmart and NYU Langone Health initiated a joint research project focused on assessing the impact of UV-C light on various surfaces and equipment commonly found in healthcare settings. The researchers from UVSmart work closely with the experts at NYU Langone Health, utilizing their knowledge, resources, and state-of-the-art facilities to conduct rigorous experiments and studies.

By collaborating with NYU Langone Health, UVSmart gained access to a wealth of clinical expertise, research infrastructure, and cutting edge technologies. The partnership allows UVSmart to align their UV disinfection technologies with the latest scientific findings and clinical guidelines. Furthermore, the research collaboration with NYU Langone Health enhances UVSmart's credibility and reputation within the healthcare industry. Working alongside esteemed researchers and healthcare professionals at NYU Langone Health provided validation and recognition, establishing UVSmart as a trusted partner in the fight against healthcare-associated infections.

However, research collaborations also present challenges, such as coordinating research activities, managing data sharing and confidentiality, and aligning research objectives. UVSmart and NYU Langone Health addressed these challenges through effective communication, close collaboration, and clear agreements that outlined the roles, responsibilities, and intellectual property rights of each party.

UVSmart. (n.d.). Retrieved from https://www.uvsmart.nl/

Incubators and Accelerators

An incubator or accelerator can provide valuable support to MedTech companies by offering resources, mentorship, and access to networks and funding opportunities. These programs can help MedTech companies accelerate their growth, refine their business models, and navigate the complex landscape of the healthcare industry, ultimately increasing their chances of success. In return, these organizations often ask for a share of company stocks that is in line with the investment that they do in the company.

Advantages of incubators/accelerators	**Drawbacks of incubators/accelerators**
Access to mentorship, industry expertise, and networking opportunities	Competitive environment within the incubator or accelerator
Accelerated product development and market entry	Limited access to resources and support after the program ends
Exposure to potential investors, partners, and customers	The need for active participation and commitment to program requirements. Often those on the founder-level need to invest months of their time in the program

Participating in incubators and accelerators typically ranges from a few months to a year, depending on the program duration and the readiness of the company's product or solutions.

Case Study: Syntho's Participation in the Incubator Program at Cedars-Sinai Healthcare

Syntho, a Dutch MedTech startup that specializes in AI-generated synthetic data for clinical trials and medical research, recently participated the accelerator program at Cedars-Sinai Technology Ventures, an affiliation of the Cedars-Sinai Medical Center, a renowned academic medical center in Los Angeles, California. Through this accelerator program, Syntho gained access to a wide range of resources and support. They received dedicated office space in the accelerator facility, allowing them to work in a collaborative environment surrounded by other healthcare innovators and experts. The program provided Syntho with mentorship from seasoned professionals who offered guidance and expertise in areas such as product development, regulatory compliance and commercialization strategies.

One of the significant benefits of participating in the incubator program was the access to Cedars-Sinai's extensive network of clinicians, researchers, and industry partners. Syntho had the opportunity to collaborate with healthcare professionals and scientists at Cedars-Sinai, allowing them to validate and refine their synthetic data in real-world clinical settings. Additionally, the accelerator program provided Syntho with educational workshops and seminars, covering topics such as healthcare regulations, intellectual property protection, and market access. These learning opportunities equipped Syntho with the necessary knowledge to navigate the complex landscape of the healthcare industry and make informed business decision. Participating in the accelerator program also opened doors to potential funding opportunities. The program helped Syntho connect with investors and venture capitalists who were specifically interested in supporting innovative healthcare startups. This exposure increased Syntho's visibility and credibility in the investment community.

Syntho. (n.d.). Retrieved from https://www.syntho.ai/

4. MedTech in the Netherlands

The Netherlands is home to a thriving MedTech industry that plays a significant role in advancing healthcare. The industry is comprised of a diverse range of companies, including manufacturers of medical devices, software developers, and healthcare service providers. With a strong focus on innovation and collaboration, the Netherlands has become a hub for cutting-edge medical technology solutions.

The Dutch MedTech industry is driven by a highly educated workforce and a robust research and development infrastructure. Many of the leading universities in the Netherlands offer programs in biomedical engineering and related fields, providing a steady stream of skilled professionals to the industry. In addition, the country has several renowned research institutions and centers of excellence, such as the Delft Bioengineering Institute, the Erasmus Medical Center, and the TechMed Centre at the University of Twente, which contribute to the development of new medical technologies. One of the key strengths of the Dutch MedTech industry is its collaborative approach to innovation. Public-private partnerships, stimulated by the Topsector for Life Sciences & Health, Health~Holland, are common, with companies, universities, and research institutions working together to develop new technologies to bring them to market. This approach has led to the creation of several successful MedTech clusters, such as the Medical Delta cluster.

In recent years, the Dutch MedTech industry has focused on developing solutions in areas such as digital health, medical imaging, and personalized medicine. Companies such as Philips, a global leader in healthcare technology, have been at the forefront of these developments. Philips has invested heavily in R&D, particularly in the areas of artificial intelligence and data analytics, to create innovative solutions that improve patient outcomes.

However, the MedTech industry in the Netherlands also faces some challenges. One of the biggest challenges is the highly regulated nature of the industry. MedTech companies must navigate a complex and constantly evolving regulatory landscape to ensure that their products meet strict safety and efficacy standards. This can be a time-consuming and expensive process, particularly for smaller companies with limited resources. Access to financing is another challenge for MedTech companies in the Netherlands. While there are several sources of funding available, including government grants and venture capital, it can be difficult for smaller companies to secure the resources they need to develop and commercialize their product. Finally, the COVID-19 pandemic has highlighted the importance of resilience and adaptability in the MedTech industry. Companies must be able to quickly respond to changing market conditions and new demands from healthcare providers and patients. This has led to increased focus on digital health solutions and remote monitoring technologies.

While the Netherlands is a small country, it is characterized by a strong presence of regional pride. The MedTech industry is no exception. In the section below, the support landscape in the Netherlands and its regions will be characterized and analyzed.

4.1 National stakeholders and initiatives

The Netherlands is home to a host of national support organizations and initiatives, with the aim to develop and stimulate growth of the Life Sciences & Health industry in general, and the MedTech industry specifically. The support organizations provide a range of services and support to companies, including networking opportunities, access to funding and financing, and regulatory guidance.

4.1.1 Public stakeholders

Several public stakeholders in the Netherlands work to support the MedTech industry, including the Dutch government, the Ministry of Health, Welfare and Sport, and the Netherlands Enterprise Agency (RVO). These stakeholders works together to create an ecosystem that supports the growth and development of the industry.

The Dutch government, including the Ministry of Economic Affairs and Climate Policy, the Ministry of Education, Culture and Science, and the Ministry of Health, Welfare and Sport, provides funding for research & development projects in the MedTech sector, as well as support initiatives that aim to improve the regulatory environment for medical devices. Additionally, the Ministry of Health, Welfare and Sport plays a key role in ensuring that medical devices meet high safety and quality standards, and in regulating the use of these devices within the healthcare system. They do this in collaboration with the Dutch Healthcare Authority (NZa) and the Dutch National Institute for Public Health and the Environment (RIVM).

The Netherlands Enterprise Agency (RVO) supports the growth of the MedTech industry through a range of initiatives, including funding for research and development, support for startups and scaleups, and promotion of the industry both domestically and internationally.

These public stakeholders work closely with the industry itself to identify key challenges and opportunities, and to develop strategies to address them. They work closely with the trade organizations mentioned below to promote the interests of the industry and to identify areas where support is needed. Additionally, public stakeholders work with industry partners to develop innovative solutions to healthcare challenges, such as the use of artificial intelligence and data analytics in healthcare. They also provide support for the commercialization of new products and services, helping to connects startups and scaleups with investors and other sources of funding.

4.1.2 Topsectors contributing to the MedTech field

In the Netherlands, there are several topsectors that work in the field of MedTech, including Life Sciences & Health (LSH), Information and Communications Technology (ICT) and High Tech Systems and Materials (HTSM).

Health~Holland is the Topsector for the Life Sciences & Health (LSH) sector in the Netherlands and their aim is to stimulate innovation in the LSH sector throughout the Netherlands. Health~Holland provides funding, support and expertise to public-private partnerships that develop innovative medical technologies, with the goal of accelerating the development and commercialization of new healthcare solutions. The organization focuses on five key areas: prevention, diagnostics, treatments, cure and care, and personalized medicine. In addition, Health~Holland also plays an important role in promoting collaboration and knowledge-sharing across the LSH sector. The organizations organizes events and conferences that bring together researchers, companies, and healthcare providers to discuss the latest trends and developments in the industry.

Health~Holland has funded 160 projects focused on solutions in MedTech, ranging from fundamental to industrial projects. These projects can be found **here**. Most of these projects that are funded by Health~Holland are in the lower TRL levels (TRL 1 – 5).

Dutch Digital Delta (DDD) is the Topsector for Information and Communications Technology, and their aim is to strengthen the Dutch digital economy and accelerate the digital transformation of various sectors,

including healthcare and MedTech. DDD brings together a wide range of stakeholders, including government agencies, research institutions, and businesses, to collaborate on digital innovation projects and initiatives. In the MedTech field, DDD focuses on promoting the development and adoption of digital technologies that can improve healthcare outcomes and patients experiences. This includes initiatives to support the implementation of electronic health records, the use of artificial intelligence and big data analytics for diagnostics and personalized medicine, and the development of digital health solutions that can help prevent and manage chronic diseases.

Dutch Digital Delta has identified 4 societal challenges in which ICT plays an important role. One of these societal challenges is '**Health & Healthcare**,' where key enabling technologies and methodologies are identified and applied to contribute to affordable, accessible and high-quality prevention and care for all. In healthcare, big data, sensor technology and Artificial Intellignece are examples of key enabling technologies that also fall under the topsector Dutch Digital Delta.

Holland High Tech is the Topsector for High Tech systems & Materials (HTSM) and their aim is to stimulate research and innovation in the high-tech sector, including MedTech. The topsector brings together companies, universities, research institutes, and government organizations to develop and implement innovative technologies in areas such as nanotechnology, microsystems, and advanced manufacturing. The Topsector HTSM provides funding and support for research and development projects that aim to address societal challenges in areas such as healthcare. Holland High Tech supports the MedTech industry by providing networking opportunities for companies and researchers in the sector, as well as promoting the development and adoption of advanced manufacturing technologies that can benefit the industry.

Holland High Tech has identified '**Healthcare Technology**' as one of the focus areas where HTSM can play a role. Huge advances are expected in research and technology areas such as image-guided interventions, intelligent catheters, personalized medicine, biosensors, regenerative medicine, robotics, and (low-energy) electronics for secure communication and expansion of processing and memory capacity. Holland High Tech has written a **Healthcare Technology Roadmap** for 2018 – 2021 that outlined the primary applications and technologies that they focused on, the implementation strategies, and the partners needed to implement these technologies successfully.

These topsectors work together through various public-private partnerships, some of which are mentioned below. They collaborate on research and development, share knowledge and expertise, and provide funding and resources to support innovation in the MedTech industry, among others. By working together, they aim to create a supportive environment to thrive and develop new, groundbreaking technologies that can benefit patients around the world.

4.1.3 Public-private initiatives

Public-private initiatives is a strength of the Dutch MedTech ecosystem and bring together the expertise, resources, and networks of both the public and private sectors to address challenges and create opportunities in the industry. Through these partnerships, government entities, industry associations, research institutions, and companies collaborate to develop innovative technologies, promote market access, and foster a supportive ecosystem for the growth of the industry. By leveraging the strengths of both public and private entities, these partnerships can accelerate the development and adoption of new technologies, improve patient outcomes, and drive economic growth in the MedTech sector.

Health Innovation NL (HI NL) focuses on promoting innovation in the healthcare sector in the Netherlands. HI NL aims to stimulate collaboration and innovation across the healthcare sector, with a focus on improving patient outcomes and promoting the growth of the industry. In the MedTech industry, HI NL plays an important role in supporting the development and commercialization of new medical technologies. They provide funding and support to companies and other organizations that are developing innovative medical devices, diagnostics, and other healthcare technologies. HI NL also organizes events and conferences that bring together stakeholders from across the healthcare sector to discuss the latest trends and developments in the industry.

NL AICoalitie (NLAIC) aims to accelerate the development and application of artificial intelligence (AI) in the Netherlands. While the coalition has a broad focus on promoting the adoption f AI in various sectors, including healthcare, it has several initiatives that specifically benefit the MedTech industry. One of these initiatives is the AI for Medical Imaging Lab, which is a collaboration between NLAIC, Radboudumc, and Philips and aims to accelerate the development of AI applications for medical imaging. They also have a program called AI for Life, which focuses on the development of AI applications in the healthcare sector/ This program supports the development and validation of AI solutions for a range of healthcare challenges, such as disease detection and personalized medicine.

A working group for '**Healthcare**' has been set up by the NL AICoalitie. While AI is a generic technology that is ultimately applicable in all sectors, it is changing the work of healthcare professionals drastically and how we as a society deal with the health of our citizens and care about patients around the world. Within this working group, participants (public & private) work together to identify the most significant opportunities and challenges for AI in the field of healthcare, to strengthen partnerships and to work on a programmatic approach. The working group focuses on the following themes: ecosystem and matchmaking, need for data in health infrastructure and appointments system, COVID overview, citizen and patient participation, information and education of care providers and citizens, financial support, and case overview.

Smart Industry is a public-private collaboration that aims to make Dutch industry more competitive through innovation and digitalization, thereby contributing to the economic growth of our manufacturing industry. Through collaboration between the business community and governments in this program, a national network of 50 knowledge and testing centers have been established in five years, with more than 680 participating companies. This has given a significant boost to the application of digital technology in small- and medium-sized enterprises in the manufacturing industry[1].

4.1.4 Trade associations

Trade associations represent the industry of companies within the industry and advocate on their behalf. They provide a platform for companies to come together, exchange information, and discuss common issues and challenges. Trade associations work to promote and advance the industry, and often engage in activities such as lobbying for favorable regulations and policies, organizing events and conferences, providing educational and training opportunities, and promoting best practices. As the MedTech sector cuts across various industries, many different trade associations are a part of the complicated MedTech landscape.

[1] Smart Industry programma leidt tot regionale kennis- en testcentra met honderden bedrijven | Nieuwsbericht | Rijksoverheid.nl

Diagned represents the interests of diagnostic companies and promotes the development and use of diagnostic technologies in the Netherlands. Diagned offers a range of services to its members, including advocacy, networking opportunities, and market intelligence. The organization also works closely with other stakeholders throughout the Netherlands to promote the use of diagnostic technologies and to ensure that relevant policies and regulations are in place to support their use.

FHI represents the interests of technology companies, including those in the MedTech sector. FHI provides a range of services and resources to its members, including advocacy, market intelligence, training and development programs, and networking opportunities. FHI has a dedicated group called the FHI Medical Devices Group. This group represents the interests of medical device manufacturers, importers, and distributors in the Netherlands, and works to promote the development and growth of the MedTech industry in the country.

FMed is a branch organization for MedTech companies that provides support and services to MedTech companies in the areas of quality assurance, regulatory compliance, and risk management. FMed offers consulting, training, and auditing services to help companies ensure that their products and processes meet relevant quality and regulatory standards. FMed also provides a range of services related to CE marking, which include product classification, technical documentation review, and assistance with the CE marking process.

FME Gezondheid en Zorg (Health & Care) represents the interests of MedTech companies and organizations in the Netherlands. FME Zorg is part of FME, the Dutch employers' organization for the technology industry. FME Zorg provides a range of services and resources to its members, including advocacy, networking opportunities, market intelligence, and training and development programs. The organization works to promote the growth and success of the MedTech industry in the Netherlands through collaboration, innovation, and knowledge sharing. The FME Gezondheid en Zorg program connects companies within the healthcare chain, with the aim of improving healthcare. FME wants to promote innovation and use it to innovate in healthcare. For this purpose, FME brings together parties from the entire chain and has a membership base of 350 companies that provide solutions in the field of health and care. These companies range from startups and reputable SMEs to large international enterprises. Together, they offer a wide range of solutions for various healthcare situations, from home care with sensors and home automation to precision technology in the operating room.

High Tech NL represents companies in the high-tech industry, including those in the MedTech sector. Their mission is to support and promote the development of high-tech industries in the Netherlands. The organization provides a range of services to its members, including networking opportunities, knowledge-sharing events, and advocacy efforts aimed at promoting the interests of the industry to policymakers and other stakeholders. In the MedTech sector, High Tech NL plays an important role in promoting innovation and collaboration between companies and other stakeholders. Through its networking events and advocacy efforts, High Tech NL works to promote the growth and success of the MedTech industry in the Netherlands.

MedTech Nederland represents companies and organizations involved in the development, manufacturing, and distribution of MedTech in the Netherlands. Their mission is to promote the development and growth of the MedTech industry in the Netherlands. The organization represents the interests of its members to policymakers, regulators, and other stakeholders, and provides a range of services to support the growth and success of the industry. In addition, MedTech Nederland provides a

variety of other services to its members, including networking opportunities, training and development programs, and access to market intelligence and industry data. The organization also works closely with stakeholders in the healthcare industry, including healthcare providers, patient organizations, and research institutions.

Task Force Health Care is a nonprofit platform that aims to promote the Dutch Life Sciences & Health sector, including the MedTech industry, both nationally and internationally. TFHC provides a platform for collaboration between its members and works to facilitate networking, information exchange, and business development opportunities. The organization also promotes Dutch expertise and innovation in the LSH sector through various channels, such as trade missions, conference and workshops. Additionally, TFHC provides support to its members in accessing international markets and partnerships through its extensive network of international partners and stakeholders. TFHC works closely with public stakeholders, such as Health~Holland and the Ministries of Economic Affairs and Health, Welfare and Sport.

4.1.5 Other organizations

Techleap.nl is a nonprofit organization that aims to help the Dutch startup ecosystem scale up and grow. While Techleap.nl focuses on startups in general, it has specific programs and initiatives that support the MedTech industry. One such program is the Soft-Landing program, which helps Dutch MedTech startups expand their operations internationally and connect with potential customers, investors, and partners in other countries. Through the program, Techleap.nl provides startups with valuable resources and support, including mentorship, coaching, and access to funding opportunities. Scale-up coaching is another service that can help MedTech companies to scale up their operations and reach new levels of growth. TechLeap.nl's Rise program is an intensive program to provide guidance to promising tech companies looking to expand their business internationally. Rise Batch #5 was focused on Healthtech scaleups and included MedTech companies such as Ancora, LeQuest, NewCompliance, and Founda Health.

Dutch Basecamp helps Dutch startups and scaleups expand internationally and grow their businesses. The Globaliser program is an initiative that provides Dutch MedTech startups and scaleups with access to international markets, resources, and support. Through the program, Dutch Basecamp offers services such as market research, business development support, and mentorship from experienced entrepreneurs and investors.

4.2 MedTech in the regions

While there are many support organizations functioning at a national level, the MedTech landscape in the Netherlands is characterized by regional fragmentation, with each of the different regions organizing various activities and providing support for companies within their own jurisdictions.

Three main hubs for MedTech in the Netherlands have been identified – Medical Delta, Eindhoven, Twente and Medical Delta. Each of these regions are prominent in the field of MedTech in the Netherlands and have distinct characteristics and strengths.

1. Eindhoven region: Eindhoven is known for its expertise in technology and innovation, particularly in high-tech systems and materials It has a strong presence with a focus on areas such as medical devices, smart health solutions, and wearable technologies. Eindhoven is home to the High Tech Campus, a hub of research and development, where numerous MedTech companies and startups

collaborate with academic institutions and research centers. The region's strengths lie in the development of cutting-edge technologies, miniaturization, and integration of complex system.

2. Twente region: The Twente region, centered around the city of Enschede, is known for its expertise in the field of health technology and medical devices. It has a strong focus on areas such as telemedicine, remote monitoring, eHealth and personalized healthcare solutions. Twente has a history of collaboration between academia, industry, and healthcare providers, with the University of Twente playing a significant role in research and innovation. The region's strengths lie in developing technology-driven healthcare solutions, including wearable devices, health sensors, and digital health platforms.
3. Medical Delta region: The Medical Delta region, encompassing Rotterdam, Leiden, and Delft, is known for its strong collaboration between universities, medical centers, and industry partners. It brings together expertise from various disciplines, including MedTech, BioTech, and healthcare. Medical Delta's focus is on fostering innovation and collaboration to address societal challenges in healthcare. The region emphasizes areas such as medical imaging, robotics, and interventional technologies, and rehabilitative and assistive technologies.

While these are the primary MedTech clusters in the Netherlands, MedTech initiatives are also taking place in other areas in the Netherlands, which will be mentioned as well, such as Amsterdam and Utrecht.

4.2.1 Eindhoven region

Eindhoven is the birthplace of Royal Philips, the largest and most successful MedTech company in the Netherlands. This has played a significant role in the development of Eindhoven as one of the most prominent MedTech hubs in the Netherlands. Philips has invested heavily in R&D activities in Eindhoven, which has contributed to the overall innovation ecosystem in Eindhoven. Philips has also sought out partnerships with local institutions, such as the Eindhoven University of Technology (TU/e) and other research organizations. Being one of the largest employers in the area, Philips has played a significant role in talent development, working closely with educational institutions and influencing the academic programs given at these institutions. This talent development is also seen in the rise of MedTech spinoffs and startups, coming from both TU/e and from Philips itself. Philips has supported innovation through initiatives such as Philips' Innovation Services and its High-Tech Campus in Eindhoven.

The presence of Philips has clearly influenced the areas within MedTech in which Eindhoven has excelled. The following areas within MedTech are the strengths of the Eindhoven region:

- Medical imaging & diagnostics: The region's expertise in areas such as photonics, electronics, and imaging algorithms has enabled the development of advanced imaging systems, including X-ray, ultrasound, magnetic resonance imaging (MRI), and optical imaging. Eindhoven's strengths lie in the integration of imaging modalities, image processing, and the development of innovative diagnostic tools and algorithms.
- Digital Health and Healthcare IT: This encompasses areas such as telemedicine, remote patient monitoring, electronic health records (EHRs), health data analytics, and health informatics. Eindhoven's strengths lie in the convergence of medical technology, data analytics, and software development, leading to the creation of connected health solutions and platforms that enhance patient care, improve efficiency, and facilitate personalized medicine.
- Wearable Devices and Sensors: The region's expertise in materials science, flexible electronics, and sensor development enables the creation of innovative wearables for monitoring vital signs, tracking health parameters, and delivering personalized healthcare. Eindhoven's strengths in this

area lie in miniaturization, sensor integration, and the development of user-friendly, comfortable, and accurate wearable devices.

- Robotics and Surgical Technologies: The region's strengths in mechatronics, precision engineering, and robotics enable the development of robotic-assisted surgical systems, surgical simulation tools, and surgical planning software. Eindhoven's expertise in this field lies in the combination of robotic technologies with imaging, haptics, and artificial intelligence to enhance surgical precision, minimize invasiveness, and improve patient outcomes.
- Rehabilitation and Assistive Technologies: The region's strengths in biomechanics, robotics, and human-machine interfaces contribute to the development of prosthetics, exoskeletons, rehabilitation devices, and assistive technologies for individuals with disabilities or injuries. Eindhoven's expertise lies in creating advanced, customizable, and user-centric solutions that promote mobility, independence, and quality of life.
- Smart Healthcare Infrastructure: The region focuses on innovative solutions for hospital management systems, healthcare logistics, patient flow optimization, and ambient assisted living. Eindhoven's expertise lies in leveraging technology, data analytics, and connectivity to create intelligent and efficient healthcare environments that enhance patient care, resource utilization, and operational efficiency.

Philips has actively participated in the MedTech ecosystem in Eindhoven and has supported the development of various support organizations, such as industry associations, innovation hubs, and other collaborative initiatives. Below provides an overview of the key support organizations and their roles in the region of Eindhoven.

Support organizations in the Eindhoven region

Brainport Development plays a crucial role in supporting the MedTech industry in the Brainport Eindhoven region and the Netherlands as a whole. They facilitate collaboration among businesses, research institutions, healthcare providers, and government organizations to foster a thriving MedTech ecosystem. Brainport Development offers essential business support services, such as market analysis, funding identification, regulatory guidance, and intellectual property protection, to MedTech companies. They actively assist in internationalization efforts, helping companies identify global market opportunities, establish international partnerships, and navigate foreign regulatory frameworks. The agency also collaborates with educational institutions to develop relevant programs and internships for talent development in the MedTech sector. By ensuring a skilled workforce, Brainport Development contributes to the industry's growth, innovation, and competitiveness. Overall, they play a vital role in supporting and promoting the success of the MedTech industry in the region, both nationally and internationally.

The **MedTech Hub Brainport**, created by Brainport Development, serves as a platform where MedTech pioneers work on smart health solutions globally. It combines technological expertise with companies' abilities to develop innovative applications for healthcare. The MedTech team of Brainport Development takes various initiatives within the MedTech Hub to strengthen the position and earning power of MedTech SMEs in the region.

Brainport Industries plays a crucial role in supporting the MedTech industry in the Brainport Eindhoven region and beyond. As an association, it serves as a platform for collaboration and knowledge exchange among MedTech companies, fostering a strong and integrated supply chain ecosystem. Through this collaborative approach, Brainport Industries facilitates joint innovation projects, enabling companies to

leverage each other's expertise and resources to drive technological advancements in the MedTech field. Additionally, the association actively promotes best practices and operational excellence, helping MedTech companies enhance their competitiveness and efficiency in manufacturing and production processes. Furthermore, Brainport Industries actively engages with research institutions, educational organizations, and government bodies to create an environment that supports the growth, innovation, and global reach of the MedTech industry in the region. Through its collective efforts, Brainport Industries plays a vital role in nurturing and advancing the MedTech sector in the Brainport Eindhoven region.

Medizintechnik NL, an initiative of Brainport Industries, is a dedicated group of Brainport Industries member companies that work together to support companies active in healthcare and life sciences in Germany with innovative solutions and manufacturing expertise. The aim of this initiative is to strengthen each other and secure and expand the MedTech and Life Science industry in Europe.

The **Brabant Ontwikkelingsmaatschappij (BOM)** is a regional development agency that focuses on, among other sectors, the MedTech sector in the region. As a development agency, BOM actively fosters the growth and innovation of the MedTech sector by providing various forms of support. Firstly, BOM offers financial support and investment opportunities to MedTech companies, helping them secure the necessary capital for research, development, and commercialization of innovative medical technologies. Additionally, BOM provides business development services and expertise to MedTech startups and scale-ups, assisting with market analysis, business planning, and access to networks and collaborations. Moreover, BOM plays a crucial role in facilitating collaboration between MedTech companies, research institutions, and healthcare providers, promoting knowledge exchange, joint projects, and innovation. By providing these comprehensive support services, BOM contributes to the development, competitiveness, and success of the MedTech industry in the Brabant region.

One of the key areas that the BOM provides support for is '**A Healthy Future**,' where their focus is on future-proof advances in the world of healthcare and improving everybody's life and wellbeing. BOM contributes to this by working with businesses in the fields of personalized treatment, digital healthcare, and key technology applications, such as photonics, nanotechnology, and robotics. The BOM is also focusing on medical robotics and has even published a whitepaper on the topic and the region. See a summary of this whitepaper below.

The **High Tech Campus** in Eindhoven is a key supporter of the MedTech industry in the region. It serves as an innovation hub that fosters collaboration and knowledge exchange among MedTech companies, startups, researchers, and entrepreneurs. The campus offers top-notch facilities and research infrastructure for developing cutting-edge medical technologies. It also hosts industry events, conferences, and networking opportunities to facilitate connections and collaborations within the MedTech community. Furthermore, the campus provides a wide range of support services such as business development programs, mentoring, and access to funding, which aid MedTech companies in their growth and commercialization efforts. The High Tech Campus plays a vital role in driving innovation, promoting collaboration, and nurturing the success of the MedTech industry in Eindhoven. Notably, one of its strategic areas is 'Health and Vitality,' focusing on products and services that improve quality of life and promote healthier lifestyles.

Whitepaper BOM | Breakthrough in Medical Robotics: From Surgical Tech to Care Robots

Recently, the BOM wrote a **whitepaper about Medical Robotics**. This white paper highlights the Brabant region in the Netherlands as a leading tech hub and a significant driver of technological innovations, particularly in the field of medical robotics. Brabant's ecosystem benefits from a highly educated population and collaboration between various companies and institutions. The region houses numerous robotics suppliers and programmers, making specialist components easily accessible and promoting local manufacturing. Brabant's focus on collaboration allows businesses to work together, pool resources, and accelerate technological innovations in medical robotics, which often require complex expertise.

The white paper presents key figures for MedTech in Brabant, showcasing its prominence in the Netherlands. It highlights Brabant's expertise in medical imaging analysis through the Medical Image Analysis group (IMAG/e) at Eindhoven University of Technology, which supports clinicians and collaborates with medical robotics developers for image-guided applications. The region excels in surgical robotics, with companies like Microsure, Preceyes, and Eindhoven Medical Robotics developing cutting-edge robotic technologies for super microsurgical procedures, retinal surgeries, and other complex operations.

Additionally, the white paper discusses care robots, such as SARA Robotics, aimed at assisting healthcare workers in caring for elderly populations. It emphasizes the collaborative nature of Brabant's ecosystem and mentions Breda Robotics, which connects students, teachers, innovators, and businesses to foster interest in robotics and automation careers.

The paper underlines the importance of a robust medical robotics ecosystem, which involves addressing technical, financial, and regulatory challenges. It showcases MTA Group as an organization that helps start-ups and smaller companies advance their medical robotics technologies from prototypes to series production, ensuring successful market entry.

In summary, Brabant's thriving ecosystem, technical expertise, and collaborative spirit make it a global leader in medical robotics innovation, with significant contributions in surgical robotics, medical imaging analysis, and care robots.

The **Eindhoven University of Technology (TU/e)** plays a crucial role in supporting the MedTech industry through its research, education, and collaboration initiatives. Firstly, the university conducts cutting-edge research in various MedTech fields, ranging from biomedical engineering to medical imaging and healthcare technologies. This research drives innovation and the development of new technologies that address critical healthcare challenges. Secondly, TU/e offers specialized educational programs in MedTech, equipping students with the knowledge and skills necessary for careers in the industry. These programs foster a pipeline of talented graduates who can contribute to the growth and advancement of the MedTech sector.

Additionally, TU/e actively collaborates with MedTech companies and industry partners, facilitating research collaborations, technology transfer, and joint projects. This collaboration allows for the translation of academic research into practical applications and commercialization of MedTech innovations. Moreover, TU/e's technology transfer office plays a role in supporting researchers and

entrepreneurs in protecting and commercializing their intellectual property. Overall, the Eindhoven University of Technology serves as a catalyst for MedTech innovation, providing research expertise, skilled graduates, collaboration opportunities, and technology transfer support to support the growth and success of the MedTech industry.

The **Eindhoven MedTech Innovation Center (e/MTIC)** is a collaborative initiative between the Eindhoven University of Technology (TU/e), the Catharina Hospital, and Philips. e/MTIC brings together academia, healthcare providers, and industry experts to drive advancements in MedTech. The center serves as a hub for cutting-edge research, fostering collaborations between researchers, clinicians, and industry professionals to address healthcare challenges and develop innovative solutions. e/MTIC provides access to state-of-the-art facilities, expertise, and resources that enable the translation of research findings into practical applications. By facilitating cross-sector collaborations and knowledge exchange, e/MTIC plays a pivotal role in accelerating the development and commercialization of MedTech innovations, ultimately benefiting patients and the healthcare industry.

4.2.2 Twente region

The Twente region in the Netherlands has emerged as a dynamic and thriving MedTech hub, renowned for its innovative research, vibrant ecosystem, and collaborative partnerships. Located in the eastern part of the country, Twente offers a conducive environment for the development and growth of the MedTech sector. With its strong academic institutions, research centers, and industry collaborations, Twente has become a hotspot for cutting-edge advancements in medical technology.

The MedTech sector in Twente is characterized by a rich ecosystem that encompasses a range of stakeholders, including academic institutions, research organizations, startups, established companies, and healthcare providers. The University of Twente, with its renowned Technical Medicine program and research expertise, serves as a key driver of innovation in the region. It collaborates closely with the Medisch Spectrum Twente (MST) hospital, ZGT hospital, and other healthcare institutions, facilitating translational research and real-world validation of MedTech solutions.

Twente's MedTech industry focuses on several key areas, leveraging its strengths to drive innovation and economic growth. These include:

- Biomedical Engineering: Twente has established itself as a center of excellence in biomedical engineering, combining expertise in fields such as biomaterials, tissue engineering, imaging, and sensor technologies. Researchers and companies in Twente develop novel medical devices, implants, and diagnostic tools that have the potential to revolutionize patient care.
- Digital Health and eHealth: The region has embraced digital health and eHealth solutions, leveraging its expertise in ICT, data science, and telemedicine. Twente excels in developing innovative platforms, wearables, and software applications that improve healthcare delivery, remote monitoring, and patient engagement.
- Robotics and Rehabilitation: Twente is at the forefront of research and development in robotics and rehabilitation technologies. The region pioneers advancements in exoskeletons, assistive robotics, and virtual reality applications that aid in rehabilitation, enhance mobility, and improve the quality of life for patients.
- Personalized Medicine and Imaging: Twente's MedTech sector focuses on personalized medicine and advanced imaging techniques. This includes the development of medical imaging devices,

molecular diagnostics, and theranostic approaches that enable targeted and individualized treatment strategies.

Twente's MedTech ecosystem benefits from strong collaboration between academia, industry, and healthcare institutions. It thrives on open innovation and knowledge exchange, with research organizations and companies actively partnering to accelerate technology development and commercialization. Incubators, accelerators, and funding agencies support MedTech startups and scale-ups, providing access to capital, mentorship, and business development resources. Below provides an overview of the various support organizations present in Twente.

Support organizations in the Twente region

The **TechMed Center** in Twente plays a pivotal role in supporting the MedTech industry through its interdisciplinary research and collaborative initiatives. As a dedicated research and innovation center, it acts as a catalyst for the development of cutting-edge healthcare technology and medical solutions. The TechMed Center fosters collaboration between the University of Twente, healthcare providers, industry partners, and other stakeholders, facilitating the translation of research findings into practical applications. By focusing on key areas such as medical imaging, personalized healthcare, robotics, and digital health, the center drives innovation, promotes entrepreneurship, and contributes to the growth and advancement of the MedTech industry in Twente.

Novel-T has established a comprehensive ecosystem of support services. As an innovation hub, Novel-T provides a range of resources and expertise to MedTech startups and scale-ups, fostering their growth and development. The organization offers mentorship, access to funding opportunities, and tailored business development programs to help MedTech entrepreneurs navigate the complex landscape of bringing their innovations to market. Additionally, Novel-T facilitates networking and collaboration by connecting MedTech companies with a diverse network of experts, researchers, investors, and potential partners, further accelerating their success in the industry. Through its holistic approach, Novel-T plays a vital role in nurturing a thriving MedTech ecosystem in Twente.

As a network organization, **Health Valley** connects innovators, entrepreneurs, researchers, and healthcare professionals in the eastern part of the Netherlands. It plays a key role in organizing events, conferences, and workshops that facilitate networking and knowledge sharing within the MedTech community. Health Valley provides a platform for MedTech startups and companies to showcase their innovations, access funding opportunities, and gain visibility. Additionally, the organization promotes collaboration between different stakeholders, including industry, academia, and healthcare institutions, to drive the development and adoption of cutting-edge MedTech solutions. Through its initiatives, Health Valley contributes significantly to the growth and advancement of the MedTech industry in the region. Health Valley represents the region of Enschede, Nijmegen, Oss and Eindhoven. This axis of connectivity is also known as the ‘Red Med Tech Highway’ and bundles all the necessary knowledge, expertise and entrepreneurial strength for innovation and business in the health sector. This is an area of top players in healthcare, science, technology, and business that stands for the integration of health & technology.

Kennispark Twente is a science park and innovation campus that provides cutting-edge facilities, research infrastructure, and expertise to support MedTech startups and established companies. It fosters a supportive environment, offers business support services, and facilitates networking opportunities for the MedTech industry. The park encourages collaboration between academia, industry, and healthcare providers, driving the development and commercialization of innovative MedTech solutions. With its

comprehensive support system, Kennispark Twente contributes to the growth and competitiveness of the MedTech sector in the Twente region.

In the first quarter of 2024, the **MedTech Factory** will be established at Kennispark in Enschede. This laboratory facility will combine state-of-the-art laboratories for (bio-)chemical development and production with technical workspaces and office space. It specifically targets startups and growing companies, providing them with access to the necessary resources and a wide range of laboratory services. The MedTech Factory fills the gap between spin-offs relying on limited university labs and companies ready to build or rent their own laboratory space and office building in commercial real estate.

Oost NL is an economic development agency that provides strategic guidance, financial support, and business development services to MedTech companies. They assist with accessing funding, navigating regulations, and connecting with relevant networks and stakeholders. Oost NL promotes collaboration between MedTech companies, research institutions, and healthcare organizations, fostering innovation and creating a thriving MedTech ecosystem. They play a crucial role in attracting investments, generating employment, and enhancing the competitiveness of the MedTech industry in the region.

Within Oost NL's focus on the '**Health**' subsector, **MedTech & Connected Health** is a key area of emphasis. These fields encompass technological innovations for early diagnostics, medical treatments & care, and remote digital applications. Examples include medical and care robotics, medical sensors/actuators, eHealth, and drug delivery systems. These innovations have the potential to lower healthcare costs, ease the burden on healthcare personnel, and improve care in people's living environments. Oost NL actively participates in various networks and initiatives related to MedTech and Connected Health. They are involved in the development of MedTech Twente, which aims to establish a renowned cluster of MedTech companies and knowledge institutions. Additionally, Oost NL is engaged in the Digital Health Hub, a comprehensive center dedicated to supporting digital health startups in the Arnhem-Nijmegen region.

4.2.3 Medical Delta region

The Medical Delta is a collaboration between universities, medical centers, and industry partners in and around the cities of Rotterdam, Delft, and Leiden. These three cities together have formed a hub of expertise and research in medical technology, biotechnology and healthcare, and the aim of this collaboration is to promote innovation and collaboration in the field of healthcare and life sciences. The main goals of the Medical Delta initiative is to accelerate the development and implementation of innovative healthcare solutions to societal challenges and the improvement of patient outcomes by fostering collaboration between researchers, healthcare professionals, and businesses.

One of the key expertise areas of the Medical Delta region is MedTech, with the initiative being particularly focused on several areas within MedTech:

- Medical Imaging and Diagnostics: Medical Delta emphasizes the development and application of advanced imaging techniques for diagnostics, such as MRI, CT scans, ultrasound, and molecular imaging. The region aims to improve the accuracy, speed, and non-invasiveness of medical imaging, enabling early detection and precise diagnosis of diseases.
- Robotics and Interventional Technologies: Medical Delta promotes the use of robotics and innovative intervention technologies in healthcare. This includes the development of robotic-assisted surgery systems, image-guided interventions, minimally invasive techniques, and smart instruments to enhance surgical precision, reduce invasiveness, and improve patient outcomes.

- Rehabilitation and Assistive Technologies: The region focuses on technologies and devices that support rehabilitation and enhance the quality of life for individuals with disabilities or chronic conditions. This includes the development of prosthetics, exoskeletons, smart wearables, and virtual reality systems to aid in rehabilitation, mobility, and independent living.

Support organizations in the Medical Delta region

Medical Delta is, as mentioned above, a collaborative network and partnership between key academic institutions, healthcare organizations, and industry in the Netherlands, specifically focused on the development and application of innovative medical technology. The Medical Delta supports MedTech companies within their ecosystem by organizing activities and initiatives, such as:

- Research & Development collaboration: facilitating collaboration between academic researchers, healthcare professionals, and industry partners to drive research & development in the field of MedTech.
- Funding and grants: providing funding opportunities and grants to support research projects and innovation initiatives.
- Knowledge exchange and transfer: acting as a platform for knowledge exchange and transfer between academia, healthcare professionals, and industry.
- Incubation and start-up support: supporting the growth of start-ups and emerging MedTech companies through incubation programs, mentorship, and access to a network of experts.
- Testbeds and living labs: facilitating the establishment of testbeds and living labs where MedTech companies can validate and evaluate their technologies in real-world healthcare settings.
- Networking and collaboration events: organizing networking events, conferences, and workshops to bring together the stakeholders within their ecosystem.

InnovationQuarter is the economic development agency for the province of South Holland in the Netherlands. Their focus is on stimulating innovation, supporting entrepreneurship, and facilitating the growth of businesses in this region, and does this for many sectors, including the MedTech sector. Their activities and initiatives include: funding & investment support, business development support, internationalization support (i.e. market intelligence, international market entry strategies, matchmaking, participation in international trade missions or fairs), access to network and collaboration opportunities, incubation and acceleration programs, and legal and regulatory guidance.

InnovationQuarter has created an innovation program focused on supporting the Health Tech ecosystem (**Innovatieprogramma ZorgTech**). This program facilitates promising HealthTech innovations to find their way into the healthcare landscape more quickly. In the ZorgTech Innovation Program, the focus is on three objectives:

1. Supporting companies in scaling their technological solutions in healthcare through innovation projects and other initiatives.
2. Strengthening the ecosystem in South Holland in terms of the development and implementation of HealthTech.
3. Developing a shared vision and agenda for HealthTech in the province of South Holland.

The ZorgTech innovation program works with various voucher rounds through which (financial) support can be obtained for the implementation of HealthTech innovation. So far, 23 projects have received a subsidy voucher with a value of up to €70.000 per project.

Yes!Delft is a prominent startup incubator and ecosystem based in Delft. It provides support and resources to technology-driven companies and entrepreneurs in various fields, including MedTech. With a focus on nurturing innovative ideas, Yes!Delft offers tailored incubation programs, access to state-of-the-art facilities, mentorship, and connections to investors and industry experts. Their aim is to accelerate the growth and success of startups by helping them develop their business models, refine their products, secure funding, and establish valuable partnerships.

Yes!Delft collaborates works in close collaboration **EIT Health**, which is a European network focused on driving innovation and collaboration in healthcare, to provide support for MedTech organizations within their ecosystem. In 2020, Yes!Delft hosted the **EIT Health Validation Lab**, which was a two-month pressure cooker that allowed aspiring MedTech entrepreneurs to validate their ideas, market potential and business model in order to launch in markets all over Europe. The program introduced these entrepreneurs to the European innovation ecosystem and helps them develop a network of peers, experts, and mentors. Yes!Delft continues to be a partner of EIT Health in order to support MedTech companies looking to launch their products or services.

Rotterdam Square is a campus organization for the Erasmus Medical Center, and are responsible for building the innovation ecosystem of the Erasmus MC campus by bringing together experts in healthcare, science and technology from academia and industry. Rotterdam Square was launched in March 2023 and is currently working on bringing together the HealthTech players in the region of Rotterdam. In 2024, construction will start on the Rotterdam Square campus, which will function as a landing place for companies and institutions wanting to collaborate with the Erasmus MC. Furthermore, Rotterdam Square helps to connect researchers and companies on a regional, national, and international level, organizing networking events, and supporting companies in creating promising partnerships. Rotterdam Square does this in close collaboration with the Municipality of Rotterdam, Invest in Holland and Health~Holland.

The **Erasmus MC Incubator** is a startup incubator located in Rotterdam, and is associated with the Erasmus Medical Center. It provides a supportive environment for innovative life science and health startups to thrive. The incubator offers a range of resources and services to its resident startups, including access to state-of-the-art facilities, mentorship, funding opportunities, networking events, and business development support. Through its extensive network of experts, investors, and industry partners, the Erasmus MC Incubator aims to accelerate the growth and success of startups in the life science and health sectors, fostering entrepreneurship and facilitating the translation of research into impactful healthcare solutions. The Erasmus Incubator works closely with the Erasmus Technology Transfer Office (TTO) and with Rotterdam Square to provide an interconnected ecosystem where MedTech startups can thrive and grow, both nationally and internationally.

The **Leiden Bio Science Park** (LBSP) is a prominent life sciences and biotechnology cluster located in Leiden. It is one of the leading science parks in Europe, dedicated to fostering innovation, research and entrepreneurship in the life sciences sector. The park is home to a diverse range of companies, research institutes, and educational institutions focused on areas such as biotechnology, pharmaceuticals, medical devices, and diagnostics. With its collaborative environment, state-of-the-art facilities, and strong connections to academia and industry, the Leiden Bioscience Park serves as a hub for knowledge exchange, scientific advancements, and the development of cutting-edge healthcare solutions. The park plays a vital role in driving economic growth, attracting talent, and accelerating the translation of scientific discoveries into practical applications that benefit society.

The LBSP is unique in many areas. Not only because of its scale and LSH focus, but also because the entire chain of drug development is present, from R&D to manufacturing, and there is close collaboration between public, private, knowledge, and research institutions (triple helix). Leiden focuses on diagnostics and technological innovations for drug development, with a strong emphasis on personalized medicine. Another strength is the facilities for (early) clinical research in regenerative medicine, recently strengthened by the Netherlands Center for the Clinical Advancement of Stem Cell and Gene Therapies (NecstGen). The lifestyle4Health initiative, involving TNO and LUMC, focuses on lifestyle as a medical intervention, alongside or instead of, for example, medications or surgery. And the rapid interaction between researchers and companies in the Pandemic Preparedness Platform offers opportunities, including the development of a coronavirus vaccine.

The **Leiden-Delft-Erasmus** (LDE) is a strategic alliance formed by three leading universities: Leiden University, Delft University of Technology, and Erasmus University Rotterdam. The alliance ais to foster collaboration and knowledge exchange across disciplines, promoting innovative research, education, and societal impact. LDE focuses on various thematic areas, including health, technology, and governance, where the universities pool their expertise and resources to address complex challenges. Through joint research projects, interdisciplinary programs, shared facilities, and collaborative initiatives, LDE seeks to create an ecosystem that drives innovation, entrepreneurship, and academic excellence in the region. Th alliance serves as a platform for cross-institutional collaboration, facilitating the exchange of ideas and fostering the development of groundbreaking solutions with societal relevance.

The LDE alliance focuses on a variety of societal themes, including 'Healthy Society' and 'Digital Society.' Healthy Society is a collaboration with Medical Delta that focuses on health and prevention and their strategy is culminated in the white paper 'Naar een gezonde samenleving voor iedereen,' which illustrates what steps need to be taken to create a healthier society and the role that technology can play in this. Digital Society is an initiative that aims to foster a better understanding of the societal implications of digital technologies and to contribute to responsible and sustainable digital innovations. While both LDE themes are important for the MedTech field, we recognize that this alliance focuses more on the research aspect, rather than the business aspect.

4.2.4 Other regional stakeholders

Amsterdam

The Amsterdam region focuses on the combined power of the Life Sciences & Health and Data Sciences / AI domains. As part of a thriving business ecosystem consisting of professionals and academics working at universities, healthcare companies, and municipal governments, they all share one common goal: improving health and healthcare. By combining their data and AI expertise with Amsterdam's renowned LSH infrastructure, **Smart Health Amsterdam** has established a strong network for data- and AI-driven innovation. Smart Health Amsterdam actively empowers a vibrant community collaborating on innovative healthcare solutions.

The city and the region are home to a growing number (over 300) companies within the LSH sector, Additionally, Amsterdam has several top institutes, including the hospitals of Amsterdam UMC, the Netherlands Cancer Institute (NKI) / Antoni van Leeuwenhoek (AvL), Sanquin, the Netherlands Institute for Neuroscience, and the European Medicines Agency.

Groningen

Groningen, with the University Medical Center Groningen (UMCG), the University of Groningen, and a wide range of LSH companies, is a strong player in the sector. The combination of leading research institutions, innovative businesses, and excellent education has created a vibrant LSH ecosystem around the city of Groningen, with Healthy Ageing as its core theme. The region forms a strong cluster in the field of MedTech due to the excellent cooperation between material research, clinical research, and the manufacturing industry.

The **NOM** (Northern Netherlands Development Agency) is the economic development agency that focuses on supporting companies in this region. Their objective is to stimulate growth, innovation, and investment in the provinces of Groningen, Friesland, and Drenthe. The NOM, as with other development agencies, helps to support MedTech companies by providing financial support, advisory services, and access to networks and collaborations.

South Limburg – Brightlands

In South Limburg, the University of Maastricht / Maastricht University Medical Center (UMC+), businesses, and government entities synergistically collaborate within a nationally and internationally anchored ecosystem that combines translational research, innovative infrastructure, and entrepreneurship. With the objective of generating maximum impact and effectively addressing societal challenges, with stakeholders aim to strengthen healthcare, valorization, and manufacturing towards 2030. To achieve this, thee patient-oriented themes have been defined for the short-term:

1. Strengthening Maastricht Imaging Valley – improving diagnostics
2. Scaling up the production infrastructure for regenerative medicine and cell therapy – making innovative therapies accessible to patients
3. The 'Concept-to-benefit' program – accelerating concept valorization.

In addition to these themes, there is a clear focus on connectivity. This involves connecting medical and societal domains in the context of 'healthy living,' integrating data streams through innovative data (re)use and cohort linking, as well as connecting talents to their future through the development and implementation of innovative, socially relevant educational concepts. **Brightlands**, the innovation campus in Limburg, and **LIOF**, the economic development agency of Limburg, play pivotal roles in facilitating this connectivity.

Nijmegen

Researchers at **Radboudumc** focus on current scientific health challenges and monitor emerging diseases of the future. At the **Noviotech Campus** in Nijmegen, knowledge, entrepreneurship, and innovation converge. Open innovation between researchers and entrepreneurs at the intersection of Health & High Tech leads to growth. This makes the campus an innovative hotspot for products and services that contribute to a better, healthier world.

The Nijmegen region emphasizes a Healthy Society approach, focusing on prevention and health promotion through knowledge development and improved access to care. With a value-driven perspective on healthcare and its contribution to quality of life, efforts are directed towards Value-Based Healthcare and meaningfulness. Enabling technologies and AI are used to develop new technologies that create a healthy society.

Oss – Pivot Park

Pivot Park is a campus within an LSH ecosystem in Oss. The park is home to over 5.000 individuals working in startups, fast-growing scale-ups, and various mature publicly listed companies. It facilitates growth by offering high-quality lab and office spaces with advanced R&D facilities, two GMP-certified pilot plants, and Ultra-High-Throughput Screening Center, on-site analytical support, and a well-equipped Open Access Laboratory. These offerings are complemented by several companies on Pivot Park that provides a wide range of essential pharmaceutical support services, representing different parts of the value chain.

The community at Pivot Park connects science with entrepreneurship and focuses on Drug Discovery & Development in immune-oncology and high-quality pharmaceutical production capacity. New buildings, including an incubator, are being developed, providing space for companies in need of production facilities.

Utrecht Science Park

Life Sciences research in Utrecht is interdisciplinary and combines fundamental, clinical, translational, and applied research from the University of Utrecht, University Medical Center Utrecht (UMCU), Utrecht University of Applied Sciences, Hubrecht Institute, Prinse Máxima Centrum, and innovative companies, along with joint educational programs.

The focus areas of the **Utrecht Science Park** with regards to MedTech are one healthy ageing and prevention, image-guided therapies, and human-centered Artificial Intelligence. Furthermore, real-life cohorts with advanced study possibilities are being established to achieve personalized therapy, particularly in oncology and cardiovascular diseases.

Wageningen

Wageningen University and Research (WUR) consists of two legal entities: Wageningen University and Wageningen Research. In this unique setting, academic knowledge and more applied research for citizens, institutions, and businesses seamlessly merge. This accelerates and facilitates dissemination and implementation. The campus strengthens this role, accommodating both R&D activities of major food industries (such as Unilever and Friesland Campina) and startups.

WUR collaborates closely with regional and academic hospitals (through the Food in Care alliance), regional health authorities (GGDs), and the National Prevention Agreement, as well as important international partners such as the Bill & Melinda Gates Foundation, FAO, WHO, and CGIAR. The overarching theme chosen for this region is "Nutrition and living environment in disease prevention and health," which focuses on the complex relationship between nutrition, health, prevention, and care. Additionally, "One Health" forms another important theme, encompassing broad, translational, and interdisciplinary research on infectious diseases, with a connection to the Emerging Diseases Campus in Lelystad.

5. Case Study: the United States

The MedTech industry in the United States stands at the forefront of innovation, where groundbreaking technologies and healthcare advancements are transforming patient care. For companies from the Netherlands seeking to expand their presence in the MedTech sector, understanding the landscape, identifying the latest trends, and recognizing areas of opportunity is essential. In this article, we delve into the dynamic MedTech ecosystem in the United States, highlighting the latest trends, key players, and avenues for growth that can pave the way for Dutch companies to thrive.

The MedTech industry in the United States is characterized by rapid advancements and evolving trends that shape its trajectory. Several key trends are currently influencing the sector. Firstly, digital health solutions are gaining significant momentum, driven by the increasing adoption of telehealth, remote patient monitoring, and wearable devices. These technologies facilitate improved healthcare access, personalized patient care, and more efficient monitoring of chronic conditions. Additionally, artificial intelligence (AI) and machine learning (ML) are revolutionizing MedTech by enabling sophisticated data analysis, early disease detection, and predictive analytics. AI-powered imaging, diagnostics, and treatment planning tools are enhancing precision medicine, leading to better patient outcomes. Furthermore, the convergence of MedTech with other industries, such as biotechnology and nanotechnology, is fostering the development of innovative therapies, targeted drug delivery systems, and personalized medicine approaches. This interdisciplinary collaboration is unlocking new possibilities for patient treatment and disease management.

The United States boasts a vibrant MedTech ecosystem, comprising a diverse range of companies, research institutions, and healthcare providers. Some of the prominent players in the industry include established multinational corporations like Johnson & Johnson, Medtronic, and GE Healthcare. These giants have a strong presence across various MedTech segments, driving innovation, and setting industry standards. Alongside the industry leaders, numerous agile startups and emerging companies are disrupting the MedTech landscape with their cutting-edge technologies and solutions. These startups often specialize in niche areas such as digital health, medical imaging, robotics, and personalized medicine. Their entrepreneurial spirit and focus on innovation contribute to the overall vibrancy and competitiveness of the MedTech industry.

Dutch companies seeking opportunities in the United States' MedTech market can capitalize on several factors. The Netherlands has a strong reputation for technological innovation, particularly in sectors such as life sciences, health, and high-tech systems. Leveraging this expertise, Dutch companies can offer unique solutions that address specific healthcare challenges in the United States. Collaborations and partnerships with local healthcare providers, research institutions, and industry stakeholders are crucial for success in the U.S. market. Dutch companies can bring their expertise in areas such as medical imaging, telehealth, eHealth platforms, medical robotics, and regenerative medicine to forge strategic alliances that drive innovation and market expansion. Moreover, the Netherlands' emphasis on a comprehensive, patient-centered healthcare approach aligns with the evolving healthcare models in the United States. Dutch companies can leverage this shared vision to offer value-based solutions that enhance patient outcomes, improve efficiency, and reduce healthcare costs.

The Roadmap for Life Sciences & Health 2020 – 2025 in the USA, which was established in public-private collaboration with, among other parties the Ministry of Health, the Netherlands Enterprise Agency, Health~Holland, and Task Force Health Care, pinpointed the regions of interest for which the government

will provide additional support and funding for the Life Sciences & Health sector. One of the focus areas for this Roadmap was 'Accessible Medical Technology.' Within this Roadmap, the main regions of interest for 'Accessible Medical Technology' are the areas of Boston & Minneapolis. Texas and California were also pinpointed as secondary regions of interest. Therefore, the scope of this case will be on the aforementioned region, with a more in depth analysis of Boston and Minneapolis.

5.1 MedTech in Boston

Boston, Massachusetts is a thriving hub of innovation and academic excellence, making it a prominent center for the MedTech industry. The city boasts a robust ecosystem that brings together world-class hospitals, renowned universities, cutting-edge research institutions, and a vibrant entrepreneurial community, creating an ideal environment for MedTech advancements. Leading institutions such as Massachusetts General Hospital, Brigham and Women's Hospital, and Boston Children's Hospital contribute to the city's reputation as a MedTech powerhouse. These prestigious healthcare providers collaborate closely with renowned research institutions like Harvard Medical School and MIT, fostering a culture of collaboration and innovation.

Boston as an international MedTech hub is further exemplified by institutions like Harvard University and MIT, which attract talent from around the world and facilitate the development of groundbreaking technologies. Boston's MedTech sector thrives on collaboration, with academia, healthcare institutions, and industry players closely interconnected. The proximity of these entities allows for seamless knowledge exchange and fosters partnerships that drive innovation and accelerate the development of novel medical technologies. Furthermore, the city has a vibrant start-up culture, with a robust network of incubators, accelerators, and venture capital firms supporting MedTech start-ups. This entrepreneurial ecosystem provides an avenue for innovative ideas to flourish and contribute to the growth of the MedTech industry in Boston.

5.1.1 MedTech trends in Boston

Boston, as a leading center for the MedTech industry, experiences several notable trends shaping the sector. These trends reflect the city's focus on cutting-edge research, innovation, and collaboration. Here are some of the main MedTech trends observed in Boston:

- Digital Health and Telemedicine: Boston has witnessed significant growth in digital health and telemedicine solutions. The city's MedTech companies are developing platforms and technologies that enable remote patient monitoring, virtual consultations, and personalized healthcare delivery. This trend has been further accelerated by the COVID-19 pandemic, highlighting the importance of telemedicine in providing accessible and efficient healthcare.
- Artificial Intelligence (AI) and Machine Learning (ML): Boston is at the forefront of AI and ML applications in MedTech. Innovations in AI-powered diagnostics, predictive analytics, and data-driven decision-making are revolutionizing patient care. Boston-based companies are developing AI algorithms to analyze medical images, identify patterns in patient data, and assist in treatment planning, leading to more accurate diagnoses and personalized treatment strategies.
- Robotics and Surgical Innovation: Boston's MedTech landscape is witnessing advancements in surgical robotics and innovative surgical techniques. Robotic-assisted surgery systems are being developed and utilized in various specialties, enhancing surgical precision and enabling minimally invasive procedures. This trend aims to improve patient outcomes, reduce complications, and optimize surgical workflows.

- Wearable Devices and Remote Monitoring: Wearable medical devices are gaining popularity in Boston's MedTech industry. These devices, ranging from smartwatches to biosensors, allow continuous monitoring of vital signs, activity levels, and chronic disease parameters. They enable early detection of health issues, promote preventive care, and enhance patient engagement in managing their health.
- Precision Medicine and Genomics: Boston's renowned research institutions and hospitals are actively involved in precision medicine and genomics research. This trend focuses on tailoring medical treatments to an individual's genetic profile, allowing for personalized therapies and targeted interventions. Advancements in gene sequencing technologies and bioinformatics are driving this trend, with Boston-based companies contributing to breakthroughs in genomics-based diagnostics and therapies.
- Data Analytics and Health Informatics: The abundance of healthcare data in Boston has led to an increasing emphasis on data analytics and health informatics. MedTech companies are developing innovative tools and platforms to leverage large-scale data analysis, improving clinical decision support, population health management, and patient outcomes.
- Regenerative Medicine and Bioengineering: Boston's strong biomedical engineering expertise has fueled advancements in regenerative medicine and bioengineering. This trend focuses on developing innovative tissue engineering approaches, 3D bioprinting, and regenerative therapies to repair or replace damaged tissues and organs. This field holds promise for personalized medicine and the treatment of chronic diseases.

5.1.2 Ecosystem players

The MedTech ecosystem in Boston is characterized by a diverse range of players, including world-class hospitals, renowned academic institutions, innovative start-ups, and established corporations. Here are some of the main players in the MedTech ecosystem of Boston:

- Hospitals and Healthcare Providers: Boston is home to renowned hospitals and healthcare providers that drive innovation in MedTech. Institutions such as **Massachusetts General Hospital**, **Brigham and Women's Hospital**, **Boston Children's Hospital**, and **Beth Israel Deaconess Medical Center** are at the forefront of patient care and collaborate closely with industry partners to develop and implement cutting-edge medical technologies.
- Research Institutions: Boston's MedTech ecosystem benefits from the presence of leading research institutions. **Harvard Medical School**, **Massachusetts Institute of Technology (MIT)**, and **Boston University** conduct pioneering research in areas like biotechnology, biomedical engineering, and medical imaging. These institutions contribute to the advancement of medical technologies and serve as catalysts for innovation.
- Start-ups and Entrepreneurial Community: Boston has a vibrant start-up culture, with numerous MedTech start-ups driving innovation in the ecosystem. These entrepreneurial ventures focus on areas such as digital health, medical devices, diagnostics, and therapeutics. Start-up incubators and accelerators, such as **MassChallenge** and **Cambridge Innovation Center**, provide support and resources to nurture these early-stage companies.
- Venture Capital Firms: Boston attracts significant venture capital investment in the MedTech sector. Venture capital firms, such as **Polaris Partners**, **Third Rock Ventures**, and **Flagship Pioneering**, provide funding and guidance to emerging MedTech companies, fueling their growth and innovation.

- Established MedTech Companies: Several well-established MedTech companies have a significant presence in Boston. These include companies like **Medtronic**, **GE Healthcare**, **Johnson & Johnson**, and **Philips Healthcare**, which have research and development facilities, collaboration initiatives, and corporate partnerships in the region. Their expertise and resources contribute to the overall ecosystem and provide opportunities for collaboration and innovation.
- Industry Associations and Networks: Boston's MedTech ecosystem benefits from the presence of industry associations and networks that foster collaboration and knowledge sharing. Organizations like the **Massachusetts Medical Device Industry Council (MassMEDIC)** and the **Massachusetts Biotechnology Council (MassBio)** provide platforms for networking, advocacy, and support for the MedTech community.
- Regulatory Bodies: Regulatory bodies, such as the **Food and Drug Administration (FDA)** and the **Massachusetts Department of Public Health**, play a critical role in the MedTech ecosystem by ensuring safety, compliance, and market access for medical devices and technologies. Collaborative engagement with these regulatory bodies is essential for MedTech companies in Boston.

The synergy among these players in the MedTech ecosystem of Boston enables collaboration, knowledge exchange, and innovation, driving the growth and advancements in the industry.

5.1.3 The Netherlands in Boston

As the Boston area is a priority region for the Life Sciences & Health Roadmap 2021 – 2025, various activities are being and have been organized to and with Boston. This past year, two missions have been organized, an innovation mission that took place in October 2022 (see Case Study below), and a larger economic mission that took place in June 2023. Furthermore, there is a longstanding partnership between the Netherlands and the Commonwealth of Massachusetts, with a focus on Life Sciences & Health, called the Transatlantic Life Sciences Partnership, as discussed in the textbox below.

Textbox: Transatlantic Life Sciences Partnership

The Transatlantic Life Sciences Partnership between Massachusetts and the Netherlands aims to strengthen collaboration in the life sciences sector to improve patients' lives. A Memorandum of Understanding (MoU) was signed during an economic mission from the Netherlands to Boston. The partnership promotes mutual understanding and facilitates global collaboration between life sciences communities. It seeks to foster growth in the life science ecosystems, support research organizations and companies, and organize activities across various sectors. The partnership's inception is linked to the legacy of Henri A. Termeer, a visionary and pioneer in the biotech industry, who emphasized biotechnology's role in serving patients. The Henri Termeer Legacy Program (HTLP) aims to continue his legacy by connecting aspiring entrepreneurs with mentors who share his dedication to patient-focused care.

Case Study: Emerging Technologies in Health – Innovation Mission to Boston

The Innovation Mission to Boston, United States, focused on Emerging Technologies in Health, took place from October 23 to October 28, 2022. The mission aimed to explore opportunities and developments in the MedTech sector in Boston, renowned as the global capital for life sciences and medical innovation.

Boston houses 18 out of the 20 largest biotech companies and all of the top 10 medical devices and product companies in the world. The medical sector in Boston is both substantial and highly advanced, with five out of the six top research hospitals in the United States located in the city.

During the mission, a design challenge was organized, enabling participants to collaborate with American partners to develop innovative ideas and initiate international collaborations. Simultaneously, the ADVAMED MedTech Conference, one of the largest events in the sector, took place in Boston. The mission targeted professionals in the MedTech sector, experts from various technical backgrounds in businesses, research organizations, and academic hospitals. These professionals formed multidisciplinary teams to develop collaborative projects, with organizations in Boston, focusing on sensoring, phototonics, artificial intelligence, bioinformatics, robotics, systems biology, nanotechnology, imaging, and organ-on-chip technology.

The mission's objectives included provided professionals the opportunity to showcase their potential as future partners to each other, fostering space for developing solutions that could lead to R&D collaborations. It also aimed to promote multidisciplinary thinking in the MedTech sector by bringing together different disciplines, sectors, expertises, and methods. Additionally, the mission sought to demonstrate relevant expdertise and technology to partners in Boston and facilitate finding R&D collaboration partners and business leads.

In practice, the Design Challenge was inspirational, however this is not the best approach when wanting to generate new business leads or partnerships. The ideas that came forth from the collaborations were well thought out, however, none of the Design Challenge groups decided to further act on these ideas to perhaps bring them to market in collaboration. The companies that joined this mission did receive a better perspective on how the MedTech sector is organized in Boston, but would have preferred more field visits throughout the program.

5.2 MedTech in Minnesota

MedTech in Minneapolis, Minnesota, has developed to become a region that fosters innovation, collaboration, and advancements in healthcare. The region is home to renowned medical institutions, including the Mayo Clinic and the University of Minnesota Medical Center, driving medical research and patient care. The collaborative research environment, exemplified by the University of Minnesota's Medical Devices Center, encourages interdisciplinary partnerships between academia and industry to translate research into practical medical technologies. Minneapolis cultivates an entrepreneurial spirit, supported by accelerators and incubators like TreeHouse Health and Medical Alley Association, which provide mentorship and funding opportunities for MedTech startups. The city has long been recognized as a hub for medical device manufacturing, housing major companies such as Medtronic, Abbott

Laboratories, and Boston Scientific. This concentration of industry leaders creates a collaborative environment for knowledge sharing.

Minneapolis benefits from a strong regulatory framework, with the U.S. Food and Drug Administration (FDA) having a local presence to support MedTech companies through the regulatory process. The region has seen a growing focus on digital health and data analytics, with companies leveraging telehealth, remote patient monitoring, and data analytics to enhance healthcare delivery and patient outcomes. Minneapolis attracts significant investment in the MedTech sector, with venture capital firms and angel investors actively supporting the growth of local startups. The supportive business environment, including incentives and grants, fosters innovation, entrepreneurship, and industry growth in Minneapolis' MedTech landscape.

5.2.1 MedTech trends in Minnesota

Minneapolis is experiencing several prominent trends shaping the MedTech industry in the region. These trends reflect the city's focus on innovation, technological advancements, and improving healthcare delivery. Here are the main MedTech trends observed in Minneapolis:

- Digital Health Solutions: Minneapolis is witnessing a rise in digital health solutions that leverage technology to enhance healthcare delivery and patient outcomes. This includes telehealth platforms, mobile health applications, and remote patient monitoring tools. These digital solutions aim to increase accessibility, improve patient engagement, and enable more efficient healthcare delivery.
- Medical Device Innovation: Minneapolis has a strong tradition of medical device innovation. The region continues to be a hub for the development of cutting-edge medical devices across various specialties. This includes advancements in implantable devices, surgical instruments, diagnostic tools, and wearable technologies. Companies in Minneapolis are driving innovations that improve accuracy, safety, and patient comfort.
- Data Analytics and Artificial Intelligence (AI): The integration of data analytics and AI technologies is revolutionizing the MedTech landscape in Minneapolis. By leveraging big data and machine learning algorithms, healthcare providers and MedTech companies can gain valuable insights, improve diagnostics, and personalize treatment plans. These technologies are also being used for predictive analytics to identify potential health risks and improve preventive care strategies.
- Remote Patient Monitoring: Minneapolis is witnessing a growing trend in remote patient monitoring, enabled by advancements in wearable devices and telehealth solutions. These technologies allow healthcare providers to remotely monitor patients' vital signs, manage chronic conditions, and provide timely interventions. Remote patient monitoring helps improve patient outcomes, reduce hospital readmissions, and enhance overall healthcare efficiency.
- Precision Medicine: The adoption of precision medicine is gaining momentum in Minneapolis' MedTech industry. This approach involves tailoring medical treatments to individual patients based on their genetic makeup, lifestyle, and other relevant factors. By using genomic information and advanced diagnostics, healthcare providers in Minneapolis are able to provide personalized and targeted therapies, leading to more effective treatments and better patient outcomes.
- Robotics and Minimally Invasive Surgery: Minneapolis is witnessing advancements in surgical robotics and minimally invasive surgical techniques. Robotic-assisted surgery systems are being used in various specialties, enabling greater precision, shorter recovery times, and improved

patient outcomes. The region's focus on robotics and minimally invasive surgery contributes to advancements in surgical techniques and patient care.

- Cardiovascular Technologies: Minneapolis is at the forefront of developing innovative technologies for cardiovascular and cardiological conditions, focusing on improving diagnosis, treatment, and management of cardiovascular conditions. This includes advancements in cardiac imaging techniques such as echocardiography, cardiac magnetic resonance imaging (MRI), and computed tomography (CT) scans. Cutting-edge technologies like 3D printing and virtual reality are being utilized to enhance surgical planning and training for complex cardiac procedures. Additionally, there is a growing emphasis on the development of implantable cardiac devices, such as pacemakers, defibrillators, and cardiac monitors, with improved functionalities and wireless connectivity. These cardiological technologies aim to improve early detection, intervention, and long-term management of cardiovascular diseases, leading to better patient outcomes and enhanced quality of life.

5.2.2 Ecosystem players

The MedTech ecosystem in Minneapolis, Minnesota, comprises a diverse range of players, including renowned medical institutions, innovative start-ups, established corporations, research organizations, and supportive industry associations. Here are the main players shaping the MedTech landscape in Minneapolis:

- Medical Institutions: Minneapolis is home to prestigious medical institutions, such as the **Mayo Clinic** and the **University of Minnesota Medical Center.** These institutions drive medical research, patient care, and clinical trials, contributing to advancements in MedTech.
- Start-ups and Entrepreneurial Community: Minneapolis has a thriving start-up culture, with numerous MedTech start-ups fueling innovation in the ecosystem. These entrepreneurial ventures focus on developing novel medical devices, digital health solutions, and healthcare technologies, benefiting from the supportive start-up ecosystem and resources available in the region.
- Established MedTech Companies: Minneapolis hosts a significant presence of established MedTech companies, including **Medtronic**, one of the world's largest medical device companies. Other notable players in the region include **Boston Scientific** and **Abbott Laboratories**. These companies contribute to the ecosystem through research and development, manufacturing, and collaboration with other industry stakeholders.
- Research Organizations: Minneapolis benefits from the presence of research organizations and institutes dedicated to advancing MedTech. The **University of Minnesota** plays a crucial role, fostering interdisciplinary collaborations and innovation through initiatives like the **Medical Devices Center** and its cutting-edge research facilities.
- Venture Capital and Investment Firms: The MedTech ecosystem in Minneapolis attracts significant investment from venture capital firms and investment groups focused on healthcare. These entities provide funding and support to MedTech start-ups and emerging companies, fueling their growth and enabling innovation. Firms investing in MedTech include **Versant Ventures**, **SightLine Partners**, **Split Rock Partners**, **Three Fields Capital**, and **Cedar Point Capital**.
- Industry Associations and Networks: Minneapolis boasts industry associations and networks that play a vital role in fostering collaboration, advocacy, and knowledge sharing within the MedTech community. Notable organizations include the **Medical Alley Association**, which represents and

supports the local healthcare industry, and the **Minnesota Medical Association**, providing resources and advocacy for healthcare professionals.

- Regulatory Bodies: Regulatory bodies, such as the U.S. **Food and Drug Administration (FDA)** and state-level agencies, play a critical role in the MedTech ecosystem. These entities ensure compliance, safety, and market access for medical devices and technologies developed in Minneapolis.

5.2.3 The Netherlands in Minnesota

As the Minneapolis area is a priority region for the Life Sciences & Health Roadmap 2021 – 2025, activities and partnerships with Minneapolis are being developed. This past year, a MedTech mission to Minnesota took place in April (see Case Study below), where a Memorandum of Understanding was signed between ROM NL and MedTech Alley (see textbox below).

Case Study: The Netherlands meets Minnesota in MedTech (MedTech mission)

The Netherlands meets Minnesota in MedTech offered Dutch cimpanies in the MedTech sector the opportunity to explore the US (Minnesota) market. The program was organized by BOM, LIOF, OostNL, and the Dutch Consulate General in Chicago, and took place on 16 – 20 April 2023.

Participants gained insights into 'Doing Business in MedTech in Minnesota' through company visits to organizations such as Medtronic, Boston Scientific and Philips. Furthermore, networking events with US business partners and individual matchmaking was organized to gain these insights.

Insights that were gained during this mission was that Minneapolis is the place to be when it comes to cardiological and minimally invasive interventions. Furthermore, if the goal of the Dutch company is to have an exit and sell their solution or service to the big MedTech stakeholders (Medtronic, Philips, Siemens, etc.), is it important that these parties are brought to the table early on in your business development. If they see potential in your solution, they would like to opportunity to influence product and business development from an early stage.

Benefits of participating included coaching and preparation, new business leads through matchmaking, access to the Med Tech Minnesota ecosystem, pitching sessions, knowledge about reimbursement and FDA approval, networking opportunities with other Dutch companies, and the chance to build a sustainable relationship with Minnesota to strengthen Med Tech clusters in both countries over the next two years. The program successfully provided valuable opportunities for Dutch companies seeking to enter or explore the US market in the field of medical devices.

In practice, the visits were of a very high level, which was interesting for the participating companies. However, oftentimes the visits were centralized around the coinciding visit of the Minister of Health, which did not allow much time for the companies to speak with those from the Minnesota side. And, oftentimes, those sitting across from the Dutch companies were too high-level and were most likely not the best people from the organizations to talk to about business development.

Textbox: Memorandum of Understanding between the Dutch ROMs and Medical Alley

On 17 April 2023, Roberta (Bobbie) Dressen, CEO of Medical Alley, and Brigit van Dijk – van de Reijt, CEO of the BOM (Brabantse Ontwikkelings Maatschappij) on behalf of ROM NL, signed a Memorandum of Understanding (MOU) in the presence of Minister Kuipers of Health, Welfare, and Sport during the entrepreneurs' trip in Minnesota.

Medical Alley is an organization in Minnesota that focuses on the development and growth of the medical sector in the region. Through close collaboration with Medical Alley, the Netherlands aims to benefit from their knowledge and experience in medical technology and work together to further develop and expand the medical sector. The entrepreneurs' trip to Minnesota marks the beginning of this intensive collaboration.

Both Minnesota and the Netherlands have a strategic focus on medical devices and boast renowned ecosystems with a high level of expertise and complementary professionals. The entrepreneurs' trip is initiated and organized by the Brabantse Ontwikkelings Maatschappij (BOM) and the Consulate-General of the Netherlands in Chicago, in cooperation with Oost NL, LIOF, Trade & Innovate NL, and the Netherlands Enterprise Agency (Rijksdienst voor Ondernemend Nederland), closely collaborating with Medical Alley. This trip is part of a long-term Life Sciences & Health collaboration between the Netherlands and the United States of America.

The MOU is signed by the regional development agencies in the Netherlands (ROMs) to emphasize the national nature of this entrepreneurs' trip and jointly address follow-up actions on behalf of the Netherlands. The parties aim to shape the collaboration through this MOU and establish joint programs in the coming years.

The entrepreneurs' trip to Minnesota is attended by 17 MedTech companies from the Netherlands and American partners to share knowledge, business opportunities, and best practices. The initiative's goal is to strengthen the MedTech hubs in both Minnesota and the Netherlands, fostering collaboration, inspiration, and mutual visits. As part of this trip, visits to Philips, Medtronic, and Boston Scientific are scheduled—companies with significant footprints in both the Netherlands and Minnesota, eager to share their experiences.

5.3 Other MedTech regions of interest in the United States

5.3.1 Texas

Texas is a significant MedTech region due to its robust healthcare infrastructure, thriving life sciences ecosystem, and culture of innovation. Cities like Houston, Dallas, and Austin attract top medical professionals and researchers, while the state's supportive business environment and access to venture capital foster the growth of MedTech companies. Texas's universities and research institutions conduct groundbreaking studies in biotechnology, medical devices, digital health, and pharmaceuticals, driving the state's leadership in research and innovation.

The presence of a skilled workforce, favorable business environment, and a large and diverse market make Texas an attractive destination for MedTech companies and entrepreneurs. Collaboration between academia, industry, and government entities further accelerates innovation and technological

advancements. Texas's government actively supports the life sciences industry, providing grants and incentives, ensuring the state remains a dynamic and thriving hub for medical technology advancements and investments.

The main trends in Texas, with regards to the MedTech sector are:

- **Telemedicine and Digital Health**: Telemedicine and digital health solutions saw rapid adoption in Texas, driven by the need for remote patient care and access to healthcare services during the COVID-19 pandemic. Virtual consultations, remote monitoring, and digital health platforms became increasingly prevalent, enabling better patient outcomes and improved healthcare access.
- **Medical Device Innovation**: Texas has been at the forefront of medical device innovation, with numerous companies and startups developing cutting-edge technologies in areas such as wearable devices, surgical robotics, advanced imaging systems, and point-of-care diagnostics.
- **AI and Data Analytics**: The integration of artificial intelligence (AI) and data analytics in MedTech gained traction in Texas. AI-powered algorithms were used to analyze medical data, predict patient outcomes, and assist healthcare professionals in making more informed decisions.
- **Personalized Medicine**: Texas witnessed a growing emphasis on personalized medicine approaches, tailoring medical treatments to individual patients based on their genetic, molecular, and lifestyle characteristics. Precision medicine advancements opened new avenues for targeted therapies and improved patient outcomes.
- **Home Healthcare and Remote Monitoring**: Texas experienced a surge in home healthcare services and remote monitoring solutions, enabling patients to receive quality care in the comfort of their homes. Remote monitoring devices and connected health technologies played a crucial role in managing chronic conditions and reducing hospital visits.
- **MedTech Ecosystem Growth**: Texas continued to foster its MedTech ecosystem, attracting investments, startups, and research institutions to the state. Collaborations between academia, industry, and government entities supported the growth of the MedTech sector and encouraged innovation.
- **Regulatory and Policy Advancements**: The state's regulatory environment and policies concerning MedTech underwent adjustments to accommodate new technologies and streamline approvals, facilitating the introduction of innovative medical devices and solutions in the market.

The main ecosystem players in Texas are:

- **Texas Medical Center** (TMC): Located in Houston, TMC is one of the largest medical centers in the world, comprising several leading hospitals, research institutions, and healthcare organizations. It serves as a hub for medical innovation and research.
- **Dell Medical School and Innovation Center**: Part of the University of Texas at Austin, Dell Medical School and its associated Innovation Center focus on driving healthcare innovation and fostering collaborations between academia and industry.
- Medical Device Companies: Texas is home to various medical device companies, including global players like **Medtronic** and **Abbott Laboratories**, which have a significant presence and operations in the state.
- Research Institutions: Texas has prestigious research institutions such as **the University of Texas Southwestern Medical Center** (UTSW) and **Baylor College of Medicine**, conducting cutting-edge research in the life sciences and medical technology fields.

- Startups and Incubators: Texas nurtures a vibrant MedTech startup community, with numerous startups working on innovative medical technologies. Incubators and accelerators like the **Texas Medical Center Innovation Institute** support early-stage companies.
- Regulatory and Industry Associations: The **Texas Medical Device Alliance** (TMDA) and the **Texas Healthcare and Bioscience Institute** (THBI) are influential organizations advocating for the MedTech industry and supporting policy development. Additionally, the **Texas eHealth Alliance** plays a key role in advancing health information technology and digital health initiatives in the state.
- Healthcare Systems and Hospitals: In addition to TMC, other major healthcare systems and hospitals in Texas, such as **Baylor Scott & White Health** and **Memorial Hermann Health System**, contribute to the state's MedTech ecosystem.

Texas Medical Center (TMC) Innovation

A partnership is currently being forged between Health~Holland and TMC Innovation, in the form of a BioBridge MoU between the two parties. The textbox below goes into more detail about this partnership.

Textbox: BioBridge between Health~Holland and TMC Innovation

Currently, a Memorandum of Understanding (MoU) between Health~Holland and TMC Innovation, the innovation arm of the Texas Medical Center, is in the works and, if everything goes according to schedule, be presented and signed during the World of Health Care 2023 event, taking place on 27 September. This MoU is called the BioBridge.

This MoU aims to enhance cooperation and collaboration in advancing life sciences through commercialization, innovation, and research and development. The MoU establishes a general framework for cooperation, encouraging communication and direct contacts between partner institutions. The main areas of cooperation include innovation, research and development, commercialization, and education, with a focus on digital health, medical technology, and operational optimization for hospital services. The collaboration will be governed by an Executive Committee, and activities may include joint projects, exchange of experts, and participation in conferences and policy dialogues. The implementation plan will prioritize and detail areas of cooperation, promoting mutual benefits and expanding global reach.

5.3.2 California

California is a significant and influential MedTech region due to several key factors. The state is a global leader in innovation and research, particularly in the life sciences and healthcare sectors. With world-renowned research institutions, universities, and medical centers, California drives groundbreaking advancements in medical technology and life-saving therapies.

Its robust healthcare infrastructure, comprising top-tier hospitals and healthcare systems, provides an ideal environment for testing and adopting new medical technologies. Moreover, California hosts a concentration of MedTech companies, from startups to established industry leaders, with Silicon Valley standing out for its technology-driven approach to healthcare and medical advancements.

The state attracts a skilled and diverse workforce of healthcare professionals, engineers, scientists, and entrepreneurs, fostering a fertile environment for innovation. Encouraging collaboration between academia, industry, and government entities, California's culture of cross-disciplinary partnerships and knowledge-sharing accelerates the development and adoption of new medical technologies.

The state's robust venture capital ecosystem supports MedTech startups and innovative projects, attracting entrepreneurs and investors. California's supportive regulatory environment enables efficient approval and commercialization of medical technologies that meet safety and efficacy standards. With its diverse population and varied healthcare needs, California offers a unique and broad market for medical technologies, providing ample opportunities for companies to test and scale their innovations.

The state's emphasis on digital health and telemedicine further reinforces its position at the forefront of healthcare technology. Many of the MedTech innovations originating in California have a global impact, influencing the healthcare industry and improving patient care on an international scale. California's combination of innovation, strong healthcare infrastructure, access to talent, collaboration opportunities, funding support, and favorable regulatory environment cements its position as a leading and important MedTech region in the world.

The main trends in MedTech in California are:

- **Digital Health and Telemedicine**: California has been at the forefront of digital health and telemedicine adoption. The state embraced technologies that improve patient outcomes, enhance remote care, and increase accessibility to healthcare services, especially during the COVID-19 pandemic.
- **Wearable Devices and Remote Monitoring**: The use of wearable medical devices for remote patient monitoring and health tracking gained momentum in California. These devices allowed healthcare providers to gather real-time data, enabling proactive and personalized patient care.
- **AI and Data Analytics**: California witnessed increasing integration of artificial intelligence (AI) and data analytics in MedTech. AI-powered algorithms were used for medical imaging analysis, predictive analytics, and personalized treatment plans, enhancing diagnostic accuracy and patient care.
- **Precision Medicine**: California's focus on precision medicine continued to grow, with advancements in genetic testing and targeted therapies. Personalized medicine approaches tailored medical treatments based on individual patients' genetic and molecular characteristics.
- **Virtual and Augmented Reality in Medical Training**: Virtual and augmented reality technologies found applications in medical training and education, providing immersive learning experiences for healthcare professionals and students.
- **Robotics and Surgical Innovations**: California's MedTech sector saw developments in robotic-assisted surgeries and minimally invasive procedures. Surgical robots and automation technologies improved surgical precision, reducing patient recovery times.
- **Remote Patient Monitoring and Chronic Disease Management**: Remote patient monitoring solutions played a vital role in managing chronic diseases and providing continuous care for patients outside traditional healthcare settings.
- **Point-of-Care Diagnostics**: Point-of-care diagnostic devices and technologies gained popularity in California, enabling rapid and accurate testing at the patient's bedside or in outpatient settings.

- **Health Information Exchange and Interoperability**: California focused on improving health information exchange and interoperability to enhance care coordination and patient data accessibility among healthcare providers.
- **Patient Engagement and Digital Health Apps**: The state saw a rise in patient engagement platforms and digital health applications that empowered individuals to take an active role in managing their health and well-being.

The main ecosystem players in California are:

- **Cedars-Sinai Health Ventures**: Cedars-Sinai Health Ventures is the investment and innovation arm of Cedars-Sinai Medical Center in Los Angeles, California. It focuses on identifying and supporting innovative healthcare technologies and startups that have the potential to transform patient care and improve healthcare outcomes.
- **Kaiser Permanente**: Kaiser Permanente is one of the largest and most well-known healthcare providers in California. With a vast network of hospitals, medical centers, and physicians, Kaiser Permanente plays a crucial role in testing and adopting new medical technologies and innovations.
- **UCLA Health**: UCLA Health is a leading academic medical center associated with the University of California, Los Angeles (UCLA). It is known for its cutting-edge research and clinical expertise, making it an essential player in advancing medical technology and healthcare innovations in California.
- **Stanford Medicine**: Stanford Medicine, part of Stanford University, is another prominent academic medical center in California. It is renowned for its research and contributions to medical advancements, attracting top talent and supporting medical technology initiatives.
- **University of California, San Francisco** (UCSF): UCSF is a world-class research institution and medical school with a strong focus on healthcare innovation. It collaborates with industry partners and startups to drive advancements in medical technology and patient care.
- **California Life Sciences Association** (CLSA): CLSA is a trade association representing the life sciences industry in California. It plays a vital role in advocating for the MedTech sector, fostering collaborations, and supporting policy initiatives.
- **Biocom California**: Biocom is another influential life sciences trade association that represents and supports the MedTech industry in California, providing resources and networking opportunities for its members.
- MedTech Startups and Incubators: California's MedTech ecosystem is rich with startups and incubators working on innovative medical technologies. These startups contribute to the state's reputation as a hub for healthcare innovation.
- Venture Capital Firms: Numerous venture capital firms in California actively invest in MedTech startups and companies, providing critical funding and support for technology development and commercialization.

6. Recommendations for enhancing (international) collaboration and cohesion in the MedTech industry in the Netherlands

To enhance international collaboration and cohesion in the MedTech industry in the Netherlands, the following recommendations can be considered:

- Establish MedTech Clusters: Create designated MedTech clusters or innovation hubs that bring together companies, research institutions, healthcare providers, and government agencies. These clusters can foster collaboration, knowledge-sharing, and networking, leading to synergistic partnerships and accelerated innovation.
- Promote Cross-Sector Collaborations: Encourage collaborations between the MedTech sector and other related industries, such as information technology, data analytics, and materials sciences. Cross-sector partnerships can lead to novel solutions and accelerate the integration of cutting-edge technologies into medical devices and healthcare practices.
- International Networking Events: Organize international networking events, conferences, and trade missions that attract MedTech stakeholders from other countries. These events can facilitate knowledge exchange, business matchmaking, and the formation of international partnerships.
- Support Research and Development: Increase funding and support for MedTech research and development projects, particularly those with international collaboration elements. Joint research initiatives with international partners can lead to transformative discoveries and advancements in the industry.
- Facilitate Regulatory Harmonization: Work with international partners to promote regulatory harmonization and alignment, reducing barriers to market entry for MedTech products. Streamlining regulatory processes can encourage international companies to collaborate and invest in the Netherlands.
- Foster Collaboration with Academic Institutions: Strengthen ties between MedTech companies and academic institutions. Encourage the industry to collaborate with universities and research centers to leverage academic expertise, access talent, and drive innovation.
- Support Startups and Scale-ups: Provide targeted support and funding opportunities for MedTech startups and scale-ups with a global vision. Programs that assist companies in accessing international markets and mentorship from experienced entrepreneurs can be beneficial.
- Encourage Public-Private Partnerships: Promote public-private partnerships to address healthcare challenges and foster innovation. Collaborative projects involving government entities, industry, and academia can create a conducive environment for MedTech advancements.
- Promote International Talent Attraction: Develop initiatives to attract and retain international talent in the Dutch MedTech industry. Diverse talent from various backgrounds can contribute fresh perspectives and skills, leading to enhanced innovation.
- Showcase Success Stories: Highlight successful international collaborations and MedTech innovations from the Netherlands to inspire and encourage further partnerships. Recognizing achievements can raise the industry's profile and attract more international stakeholders.

By implementing these recommendations, the Netherlands can create a vibrant and cohesive MedTech ecosystem that embraces international collaboration, drives innovation, and positions the country as a global leader in the field.

Health~Holland
SHARED CHALLENGES, SMART SOLUTIONS

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