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Report on Upgraded Unit

Work Package 2

Enhancing research management and administrative skills of ODTÜ MEMS

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0 INTRODUCTION

This document thoroughly outlines a detailed workplan, a strategic roadmap designed to enhance and strengthen the capabilities of the “Strategy Development and Research Management Unit” at ODTÜ MEMS. This unit, set to excel in MEMS, specifically in microfluidics and organ-on-chip domains, is firmly committed to leading-edge research, promoting innovation, and fostering collaborative efforts. The upgraded unit plays a crucial role, ensuring ODTÜ MEMS' prominent position not just nationally but as an international centre of excellence.

The organizational structure of the "Strategy Development and Research Management Unit" at ODTÜ MEMS is presented in the hierarchical chart below, where the unit operates under the supervision of the centre manager. The unit is comprised of the unit head, Ender Yıldırım, and three experts, namely Gamze Kozanoğlu, Gizem Özdemir, and Pinar Demirekler Burat.

Ender Yıldırım received PhD degree in Mechanical Engineering at Middle East Technical University (METU). He worked as a postdoctoral researcher at Leiden Academic Center for Drug Research at Leiden University on developing microfluidic technologies particularly for organ on a chip application. He involved in several research projects on applications of microsystems in life sciences and on development of novel microfabrication methods. He is also a faculty member of Mechanical Engineering Department at METU, and is leading the Micromanufacturing Laboratory in the same department.

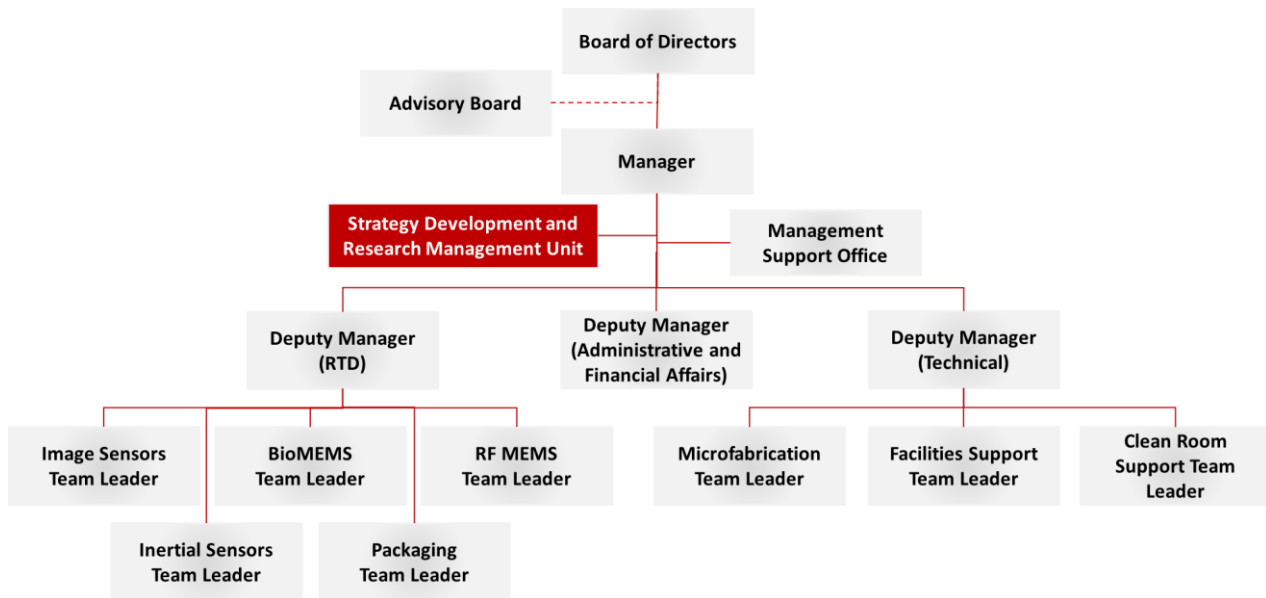
Ms. Gamze Kozanoglu has BSc degree in Business Administration and MSc degree in European Integration at METU. She is an expert in management of EU Horizon Programme Projects, as being the former Legal and Financial National Contact Point - NCP (FP6) at TUBITAK-NCO (The Scientific and Technological Research Council of Turkey – National Coordination Office) between 2004 and 2006, and being responsible with several FP6 projects conducted by TUBITAK. Since 2007 she has worked in management of FP7, H2020, Horizon Europe projects. She has also experience in regional development support programmes and related projects. She is working as the project expert in the Strategy Development and Research Management Unit.

Ms. Pinar Demirekler Burat worked at TUBITAK FPs National Coordination Office as the BIO NCP (FP7) after completing the MSc studies in Food Engineering Department of METU. She was involved in the management and preparation of FP6, FP7, H2020, and Horizon Europe projects. She is also highly experienced in management of projects under other national and European R&D funding programmes. She is working as the project expert in the Strategy Development and Research Management Unit.

Gizem Özdemir has experience in project coordination and management, graduating with a degree in Knowledge Management from Başkent University in 2008. From 2009 to 2023, she excelled as a Projects Coordinator at Bilkent University's Ultrafast Optics and Lasers Laboratory, overseeing a diverse range of projects funded by TÜBİTAK, the EU, and industrial partners, including the successful completion of two ERC projects. Since September 2023, she has been contributing her expertise to the ODTÜ MEMS, coordinating BioMEMS projects.

This "Report on Upgraded Unit" serves as evidence of the continuous efforts directed towards enhancing the “Strategy Development and Research Management Unit.” It encompasses the strategic vision, detailed planning, and dedication invested to propel ODTÜ MEMS to higher levels in research, innovation, and

international collaboration. This workplan serves as a dynamic document, a roadmap guiding the institution towards sustained excellence and a future marked by impactful contributions to the field of MEMS.



1 OVERVIEW

The OrChESTRA project highlights the urgent requirement for a well-organized system within ODTÜ MEMS. This system aims to carefully pinpoint strategic research topics, providing a clear roadmap for redirecting research initiatives and guiding researchers effectively. The main objective is to improve the overall impact and effectiveness of ODTÜ MEMS in the field of MEMS-related areas. To accomplish this strategic necessity, specific goals have been carefully identified:

- **Strengthening Collaboration:** Foster stronger ties with academia, industry, public organizations and other research institutions to accelerate knowledge transfer and innovation in a synergistic environment.
- **Streamlining Processes:** Optimize administrative procedures related to research, development, innovation, and project management.
- **Strategic Positioning:** Position ODTÜ MEMS at the intersection of cutting-edge technologies and industry sectors. By identifying strategic niches, ODTÜ MEMS impact can be maximised.
- **Market Intelligence:** Leverage data-driven insights to identify strategic opportunities for MEMS utilization. Understanding market trends and industry needs is crucial for targeted innovation.
- **Capacity building /Guidance for researchers:** Offer support and guidance to researchers, helping them develop their skills in MEMS related technologies. By focusing on researcher development, ODTÜ MEMS aims to create a better environment for innovation and progress within the center.

These aims serve as guiding principles, steering research endeavors toward topics of strategic significance. By aligning research initiatives with these identified priorities, ODTÜ MEMS seeks not only to enhance its research output but also to elevate its stature as a key player in cutting-edge research and innovation within

the broader landscape of MEMS and associated disciplines. Targeting these aims, several seminars and workshops were organised.

2 SEMINARS AND WORKSHOPS

A comprehensive initiative unfolded through the organization of six seminars and one workshop, all carefully designed as part of the work package focused on "Enhancing research management and administrative skills of ODTÜ MEMS." This strategic effort aimed specifically at improving the proficiency of the "Strategy Development and Research Management Unit" at ODTÜ MEMS. These thoughtfully curated sessions and hands-on workshops played a crucial role in imparting advanced research management and administrative skills, establishing a strong foundation for the unit's improvement and ensuring its essential role in guiding ODTÜ MEMS towards greater research excellence.

On the significant day of July 24, 2023, a trio of impactful seminars unfolded, each exploring vital aspects of research development. Led by distinguished experts, Can Dinçer (UFR), Hans Wyss (TU/e), and Wolfgang Eberle (IMEC), the series covered "Presentation Skills," "Scientific Writing," and "R&D Grants." These focused sessions were carefully crafted to provide invaluable guidance to ODTÜ MEMS' researchers, especially those in the early stages of their research journeys. The seminars served as a guide, shedding light on effective ways to communicate research findings while also offering insights into navigating the complex landscape of funding opportunities, thereby strengthening the research capabilities within ODTÜ MEMS.

The image displays three slides from a seminar series. The top slide, titled "My first talk ever..." with the IMTEK logo, shows a person at a podium. The bottom-left slide, titled "Purpose and match", lists reasons for seeking grants and funding, categorized into "Resource side" and "Results side", with a central "RESULTS" circle. The bottom-right slide, titled "General tips: trick for a good storyline", provides advice on presenting data, such as using two parts to establish a point and then using the second part as a proof.

The fourth seminar, held on October 19, 2023, and facilitated by Wolfgang Eberle (IMEC), focused on "Collaboration Models & Ways to Maintain Relations." This insightful session aimed to enrich ODTÜ MEMS researchers' understanding of effective collaboration frameworks and strategies for sustaining fruitful relationships in research endeavours.

The image shows a seminar slide titled "Why and how to collaborate with others?". It features a diagram with a single person icon on the left and a group of people icons on the right, connected by a path. The text "You'll never walk alone ..." is written in the middle. The slide also includes a source attribution at the bottom: "Source: Musical 'Carousel', 1945. ... Sung by Liverpool F.C. supporters ... cited by many".

The fifth seminar, held on November 6, 2023, was conducted by Konstantinos Mitsakakis (UFR) on "Project Management." This session was tailored to streamline and enhance the processes involved in managing research projects at ODTÜ MEMS, providing valuable insights to optimize project efficiency and success.



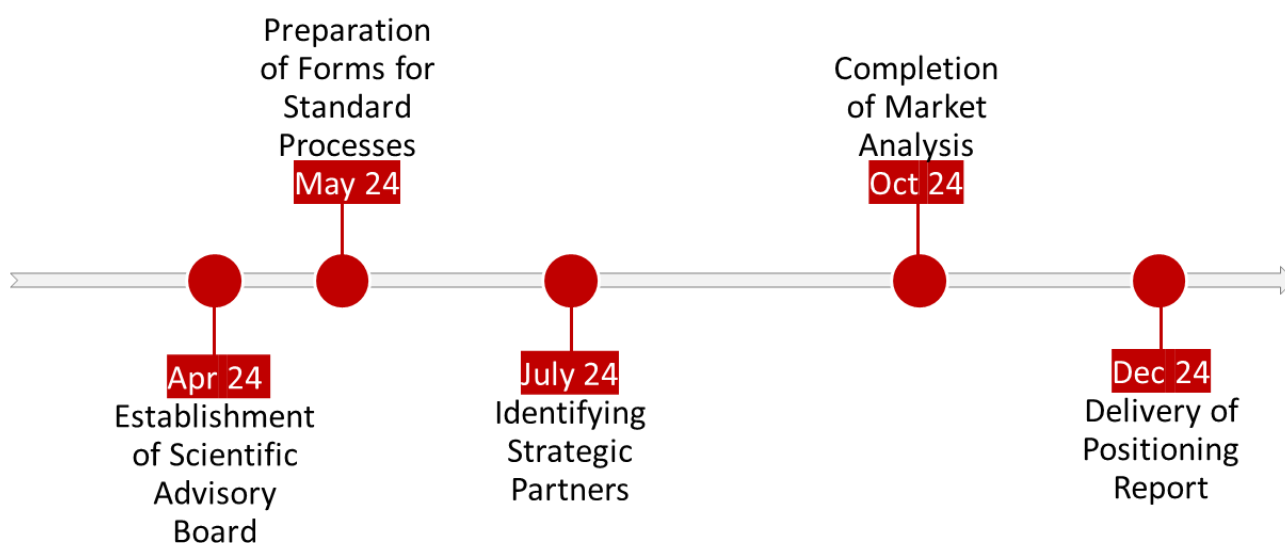
Following a series of online seminars, Wolfgang Eberle (IMEC) added value to ODTÜ MEMS with the sixth seminar on January 29, 2024, during his extensive three-day visit. The seminar, titled "Business plan preparation, IPR and technology transfer, IP valuation and portfolio management, and Spin-off mechanisms," was carefully designed to further refine the technology transfer skills of the upgraded unit. Eberle's visit went beyond seminars as a crucial workshop unfolded on January 31, 2024. This coincided with his presence, offering a unique opportunity for in-depth discussions. The workshop focused on discussing the 2024 workplan for the enhanced "Strategy Development and Research Management Unit" and exploring the strategy development practices implemented at IMEC.

This collaborative session served as a platform for exchanging insights and aligning objectives for the upcoming year. The dynamic discussions not only facilitated a comprehensive understanding of the strategic landscape but also played a crucial role in shaping the finalized workplan for 2024. Wolfgang Eberle's visit made a lasting impact on ODTÜ MEMS, enhancing not only the technological transfer capabilities but also making a significant contribution to the strategic development and collaborative synergy within the upgraded unit. These events highlighted ODTÜ MEMS' commitment to continuous improvement and its unwavering pursuit of excellence in research management and strategy.



3 OVERVIEW OF THE WORKPLAN OF THE STRATEGY DEVELOPMENT AND RESEARCH MANAGEMENT UNIT

The Strategy Development and Research Management Unit team established a workplan to target the specific aims of strengthening collaboration, streamlining processes, strategic positioning, and market intelligence. Briefly the workplan includes establishing a scientific advisory board, preparation of standard forms, forming a strategic partnership, and market analysis. Below is a presentation of the work plan, displaying the milestones along a timeline.



3.1 Scientific Advisory Board

The main goal is to create a respected Scientific Advisory Board (SAB) consisting of esteemed academics already affiliated with ODTÜ MEMS. Currently, ODTÜ MEMS has 11 academics, representing a range of fields such as medicine, pharmaceutical sciences, chemistry, physics, and engineering, from diverse universities in Turkey as affiliates (list of affiliated academic are available at <https://mems.metu.edu.tr/en/academics>). These affiliated academics are designated to become inherent members of the scientific advisory board. This Board will be a key source of expert guidance, playing a crucial role in reviewing research directions and ensuring alignment with current global trends. In a collaborative manner, the Board members will be essential to the consultation process, particularly when a project is proposed by a researcher at ODTÜ MEMS. Their insights will be sought to provide valuable opinions on the proposal's alignment with the institution's overarching strategies.

The formation of the SAB brings significant advantages for ODTÜ MEMS. Firstly, it will enhance the quality of research by incorporating diverse expertise and perspectives. Secondly, fostering interdisciplinary collaboration becomes more straightforward with the collective wisdom of the Board. Lastly, the institution's reputation is set to rise, benefiting from the credibility and eminence associated with the distinguished SAB members. This strategic move is not just about guidance; it's about creating an environment of excellence and international relevance within ODTÜ MEMS.

3.2 Preparation of Forms for Standard Processes

In our commitment to simplify processes for ODTÜ MEMS researchers, we are introducing standardized forms to ensure a smooth and efficient workflow.

The simplified "Invention Disclosure" form enables researchers to promptly disclose their innovations. This disclosure undergoes a pre-evaluation by the Intellectual Property Rights (IPR) commission, established by the scientific advisory board, before being processed for filing, ensuring a quick and organized approach to protect intellectual property.

The "Project Proposal" form introduces a standardized template that speeds up the evaluation and allocation of resources for proposed projects. This consistency not only improves efficiency but also ensures a thorough and standardized evaluation process and overall planning for the availability of resources.

The "Event Participation" form sets guidelines for researchers attending meetings, conferences, and training programs. By reviewing this form, researchers are guided to actively participate in events aligned with the overarching strategies, enhancing networking opportunities and facilitating knowledge exchange. Through these standardized procedures, ODTÜ MEMS aims to foster a culture of efficiency, innovation, and strategic alignment within its research community.

3.3 Strategic Partnership

To develop strategic partnerships with business entities, our focus is on identifying potential collaborators across various sectors, including industry, startups, and established companies. This initiative complements our existing partnerships, expanding the range of collaborative possibilities. By identifying suitable collaborators, our goal is to facilitate joint projects, leveraging complementary expertise to promote innovation. This collaborative approach ensures active engagement with partners to understand their strategic needs, allowing ODTÜ MEMS to align research initiatives with current industry challenges. As a result, this strategic alignment sets the stage for joint efforts in creating system-level platforms that effectively address crucial gaps within industries, fostering a mutually beneficial relationship that drives innovation and meets the evolving needs of the market.

3.4 Market Analysis

In the pursuit of "Data-Driven Insights," the focus is on the careful collection and analysis of trade data, business intelligence, and current market trends. This thorough approach enables the identification of emerging sectors and the strategic identification of growth opportunities. The goal is not just to gather information but to distill actionable insights that can inform decision-making.

In the realm of "Strategic Products," the methodology involves prioritizing projects with a keen focus on market demand. Central to this is exploring where MEMS (Micro-Electro-Mechanical Systems) technologies, the key asset of ODTÜ MEMS, can have the most significant impact and create substantial value. This strategic alignment ensures that initiatives are not only innovative but also meet the dynamic needs of the market, fostering sustainability and relevance.

The decision-making process is underpinned by the principle of "Merit-based Information." Each project undergoes a thorough assessment of its potential impact on ODTÜ MEMS, its eco-system, and its collaboration partners, enabling informed decision-making. This approach empowers the careful allocation

of resources, directing efforts and investments toward endeavors with the highest potential for success. In essence, by combining data-driven insights, strategic product prioritization, and merit-based decision-making, a path is created that is not only informed but also purposeful and forward-looking.

3.5 Positioning Report

In examining the "Current Landscape," our focus is on thoroughly looking at ODTÜ MEMS' position across various technologies and industry sectors. This examination aims to find gaps and areas for improvement within our organization. At the same time, creating a comprehensive "Strategic Roadmap" becomes crucial, outlining practical steps to enhance our influence. The main goal is to bridge the gap between our research efforts and the changing needs of different industries.

Looking forward, the broader perspective involves a careful examination of the intersections among ODTÜ MEMS' technologies, including electrochemical sensors, pressure sensors, inertial sensors, and image sensors. This exploration aligns strategically with identified clusters in Pillar 2 of the Global Challenges and European Industrial Competitiveness of the Horizon Europe Programme. These clusters include health; civil security for society; digital, industry, and space; climate, energy, and mobility; as well as food, bioeconomy, natural resources, agriculture, and the environment. By navigating these intersections, ODTÜ MEMS aims to strengthen its standing within the technological landscape and contribute significantly to addressing global challenges and advancing European industrial competitiveness.

In shaping ODTÜ MEMS' strategic position, a comprehensive approach is necessary. This involves a thorough consideration of the current situation, including a detailed analysis of market dynamics, technological trends, and our internal capabilities across various sensors. Beyond internal evaluations, external perspectives play a crucial role. Insights from industry partners offer valuable opinions, providing information on collaborative opportunities and industry needs.

Furthermore, a nuanced approach is taken by aligning our strategies with global and national documents that outline future trajectories. By syncing our objectives with overarching global and national strategies, we ensure that ODTÜ MEMS not only adjusts to the changing landscape but also actively contributes to broader socioeconomic goals. This multifaceted strategy, involving internal strengths, external insights, and global-national alignment, strategically positions ODTÜ MEMS to navigate the intersections of technology and industry, promoting innovation, competitiveness, and societal impact.

4 CONCLUSION

The improvement of the Strategy Development and Research Management Unit is a crucial factor for the ongoing success of ODTÜ MEMS. This strategic upgrade goes beyond just making operations better; it represents a significant shift towards actively aligning with the changing needs of the industry. By fostering a mutually beneficial relationship between academic research and industrial requirements, ODTÜ MEMS ensures not only its relevance but also increases its ability to create meaningful innovations.

The updated unit aims to boost MEMS research and innovation to new heights. Collaboration becomes a central focus, closing the traditional gap between academia and industry. This cooperative approach not only speeds up the application of cutting-edge research into practical uses but also establishes ODTÜ MEMS as an

active player in the quickly evolving technological landscape. The upgraded unit emphasizes building strategic partnerships, actively seeking industry input, and using market insights to guide research efforts. This comprehensive strategy not only strengthens the institution's position but also creates a flexible environment capable of adapting quickly to emerging trends, ensuring that ODTÜ MEMS stays at the forefront of technological advancements and continues to contribute significantly to global innovation.