



Expression of Interest

Contact details

Country	Turkey
Name of the organisation	MOBILIB TECHNOLOGY INC.
Name of the contact	Advanced digital development tools to accelerate the development of software defined vehicles that enable zero-emission mobility (2ZERO Partnership) HORIZON-CL5-2024-D5-01-05
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Short description of the organisation

MOBILIB TECH a leading start-up providing unique solutions towards smart mobility and software defined vehicles, and targeting difficulties arose during the software-centric transformation of the mobility industry. Our current scope is to implement a vehicle-agnostic (vendor neutral software-defined) controller software (**MobiLib Platform**) which simplifies in-vehicle signals and bring them to vehicle independent development platform which provide a virtual interface/workspace with toolboxes and open-source libraries specifically designed for mobility applications.

The core team has more than 12 years of experience in communication/network protocols and automotive domain expertise. The team have deep expertise and knowledge in electronic system design and automotive specific development processes and has academic level knowledge of communication/network protocols. In addition, the team has nearly 15 years of experience in corporate attributes such as business development and project management and procurement. Details on co-founders and their skills are summarized as follows:

Olgun Hatiboğlu / Business & Operations Management: Bachelor's and M.Sc. degree from Middle East Technical University, 16 years of experience in business life as a team leader and manager in administrative areas such as supply chain, project management and business development in high technology automotive and defence industry companies such as ASELSAN and MİKES.

Mert Kadir Assoy / Technology & Product Development: Bachelor's degree from İstanbul Technical University and M.Sc. degree from Technische Universität Braunschweig in Electrical and Electronics Engineering. 13 years of experience as R&D team leader in leading OEMs such as AUDI AG/Germany and TOFAŞ-STELLANTIS/Turkey. Deep expertise in the automotive field on product development process, technology collaboration, sensor data processing, ADAS and safety control systems, vehicle E&E architecture and algorithm development.

Gökhan Seçinti / Firmware & Software Development: Bachelor, M.Sc., and Ph.D. degree from İstanbul Technical University Computer Engineering Department. Accomplished post-doctoral studies at Northeastern University located in Boston. Deep knowledge in the fields of computer science, computer networks, communication, and network protocols. Currently, Asst. Prof. in Computer Engineering dept. of İstanbul Technical University. Currently, he runs the management of "Ad-Hoc Networks and Systems Lab" in the faculty and benefits from the capabilities in the lab.

The MOBILIB R&D and Product Development teams are growing up with engineers from related technology fields and academic achievements, and the company's target is to grow-up the team up to 10 engineers by the end of 2024.

Thanks to the validation negotiations carried out in the scope of our development projects, we had a chance to meet and discuss with some leading OEMs and automotive sub-system manufacturers in Turkey. Some of these are OTOKAR (OEM/Heavy Duty & Commercial Vehicles), FORD OTOSAN (OEM/Passenger & Light Commercial Vehicle), BUYUTECH (Smart Camera Producer for Vehicles) and COMODIF (Telemetry Technology Developer and Service Provider). These companies express their interests to our certain projects and provide LOIs (letter of intention).

In addition to **MobiLib Platform**, we are currently working on ultra-wideband (UWB) based outdoor localization system developed specifically for mobility applications. We enlarged our industry relations and business network while conducting validation negotiations on this project as well such as Toyota Motors Europe (TME).

Specific skills related to the project

Indicate the specific skills and competence in relation with the *Advanced digital development tools to accelerate the development of software defined vehicles that enable zero-emission mobility (2ZERO Partnership) HORIZON-CL5-2024-D5-01-05* topic

Today's automotive industry is shifting towards software based transformation and the "rise of digital" is shaping the future of automotive. Softwarization is the new key enabler of rapid deployment and testing of high-level automotive applications in the era of software-defined everything.

In order to address difficulties arose during the software-centric transformation of the industry, we propose a "Software Defined Vehicle Application Development Platform (**MobiLib Platform**)" which simplify in-vehicle signals by pre-processing and bring them to vehicle-independent development platform which provide a virtual interface/workspace with useful toolboxes and open-source libraries specifically designed for mobility applications.

Major purposes of the proposed study/solution can be consolidated in three (3) main characteristics:

- Thanks to its pre-processing and filtering feature, our study will enable access to vehicle data (upon obtain of dbc mapping from local OEMs) without vendor specific tools. Moreover, it will provide data acquisition and analysis flexibility signal data through add-on sensors as well.
- Our study enables vehicular function development without any embedded automotive software knowledge and provides a virtual interface/workspace with preferred programming language. Thus, our study will reduce complexity and simplify the deployment process through easy-to-use attributes like drag and drop feature.
- Our product will have an open-source library where contributors from all disciplines will be able to share their own vehicular applications which will establish a basis for collaboration and contribution of creative ideas.

The team has more than 12 years of experience in communication/network protocols and automotive domain expertise. Especially, we have deep expertise on electronic system design and automotive specific development processes and have academic level knowledge of communication/network protocols which are the key domains to ensure the success of proposed solution and to be part of a similar project call. Our capabilities and technology solutions for mobility needs in the scope of subject call are as follows:

- System and Control Engineering for mobility applications
- Vehicle Dynamics Modelling and Controls
- Driving Algorithms
- Automotive Product Development
- Test case generation and Automotive Test Design
- Vehicular Network Communication and Network protocols
- Virtual Simulation

In addition, our proposed study is selected as a grand finalist among 654 ideas collected from all over the world in the Jumpstarter program of European Institute of Innovation & Technology (EIT) and awarded as 2nd in the final competition event.

Proposed activities for the project

Indicate which activities you would like to implement during the project

Today's automotive industry is shifting towards software-based transformation, however vehicular software eco-system still struggles with transition challenges. Due to the embedded nature and highly coupled architectures (hardware and software) of electronic assemblies, it is required to utilize high-cost tools and build specific expertise to make deployment which restrains contribution of creative minds and limits the number of developers. This directly slows down the pace of development for innovative mobility applications and increase time to market and engineering efforts. Additionally, software centric transformation of the industry reveals the demand for agile approach and the management of system security with an holistic approach.



Considering these challenges and market forces, we propose a vehicle-agnostic controller software tool which simplifies in-vehicle signals by pre-processing and bring them to vehicle independent development platform which provide a virtual interface/workspace with useful toolboxes and open-source libraries specifically designed for mobility applications.

Thanks to its pre-processing and filtering feature, our proposed solution will provide data acquisition and analysis flexibility through vehicle buses and add-on sensors. Furthermore, it enables vehicular function development without any embedded automotive software knowledge and provides a virtual interface/workspace. Thus, it will reduce complexity and simplify the deployment process through easy-to-use attributes like drag and drop features. Additionally, our product will have an open-source library where contributors from all disciplines will be able to share their own vehicular applications which will establish a basis for collaboration and contribution of creative ideas.

The capabilities of the proposed solution will include following benefits,

- It will provide ease of integration among the sub-systems/units supplied from different manufacturers and enable to control capabilities and functions from top-down and customize them (related use-case indicated in Appendix 2).
- Our study will facilitate the deployment of vehicle functions thanks to its signal simplifying process and attributes like read & write and drag & drop which significantly speed up deployment, integration and testing, so consequently decrease engineering efforts and time to market.
- As a handy tool which accelerates development and iteration, our study will enable the implementation of the agile approach to reach the goals such as product development in accordance with consumer needs and quick response to market demands.
- Thanks to data access features through vehicle and add-on sensors, it eliminates the need for high-cost specific tooling/toolboxes and embedded system expertise for SMEs and startups which directly contribute to the creation of new ideas in the automotive industry. Furthermore, our study will incorporate creative developers having insufficient automotive knowledge into the mobility value creation chain due to its open-source architecture and libraries and boost the pace of research & development.
- Our solution will provide the management of security requirements from top down, so system engineers will not be limited with EEAs particular level of security but be able to conduct all security operations through a single interface.
- In our software tool, we aim to integrate digital toolboxes to enhance capabilities in design, development, and testing. These toolboxes will encompass preassembled Electric Vehicle (EV) and Hydrogen fuel cell vehicle dynamics reference applications, comprising essential libraries with interfaces, data, models, and controllers.
- Even though basic operations of ECUs such as transmitting CAN signals, reading and writing are highly repetitive, these cannot be merged in a way that these resources would be utilized in an efficient manner. Our proposed solution and toolboxes will significantly reduce redundant efforts and carbon footprint originating from repetitive software development and dedicated hardware production for each task.

References

Previous research projects

Project acronym / starting date	Main objectives	Main activities	Role in the project
30.11.2023	Project presentation to European Institute of Innovation & Technology (EIT)	Pitching deck of the solution in the EIT Urban Mobility Grand Final. 2nd place was achieved in the Grand Final.	Project owner