TiDiT

The past, present and future of digital twins

The ITEA project TiDiT (Timeline-Driven Digital Twin) will improve the existing digital twin (DT) market with an open-source platform and customisable modules for timeline-driven decision-making and situational awareness. This will allow users across all domains to easily answer 'What Now?', 'What If?' and 'What Next?'.

Addressing the challenge

Digital twin technology benefits businesses by reducing maintenance costs, preventing unexpected breakdowns and enhancing cost-effectiveness. However, the current market falls short due to a lack of timeline-driven DTs that enable users to analyse their physical system's past, present and future states based on their defined or real-time engineering data. Other issues include the complexity of DT modelling, dynamic behaviour and quality attributes and the need for better data management and more flexible interaction options. Additionally, collaboration between digital twins is hindered by a lack of vendor-agnostic solutions, while development costs are typically excessive for SMEs.

Proposed solutions

TiDiT will offer a solution in the form of a timeline-driven DT-as-a-Service that enables better business decision-making. With the TiDiT Platform, users will be able to monitor their system's current state, use digital twin data to analyse the future state and, when necessary, simulate the behaviour of physical elements, processes or people. This data-based prediction capacity will be enhanced by TiDiT's general DT data repository and shared knowledge model, while artificial intelligence and machine learning solutions will be integrated to boost decision-making capabilities. Users will also be able to observe their DT behaviour in real time and in 2D or 3D environments through the development

of visualisation features for the platform. Finally, thanks to cloud integration and an interoperability manager, TiDiT will enable communication and therefore collaboration between DTs. These innovations will be demonstrated with customised modules for two use-case scenarios: Smart Production and Elderly Care.

solutions to be tailored at a business and domain level, supporting the uptake of TiDiT in virtually any field. Such an approach will prevent vendor lock-in, create opportunities for new business models and enable new players to enter the global DT market. This is expected to grow from around USD 9 billion in 2023 to approximately USD 65 billion by 2030 at an annual growth rate of around 30%. However, most existing products belong to organisations outside of Europe and are unable to provide a comprehensive, timeline-based approach. In the longer term, there is thus significant market potential for the TiDiT Platform and its
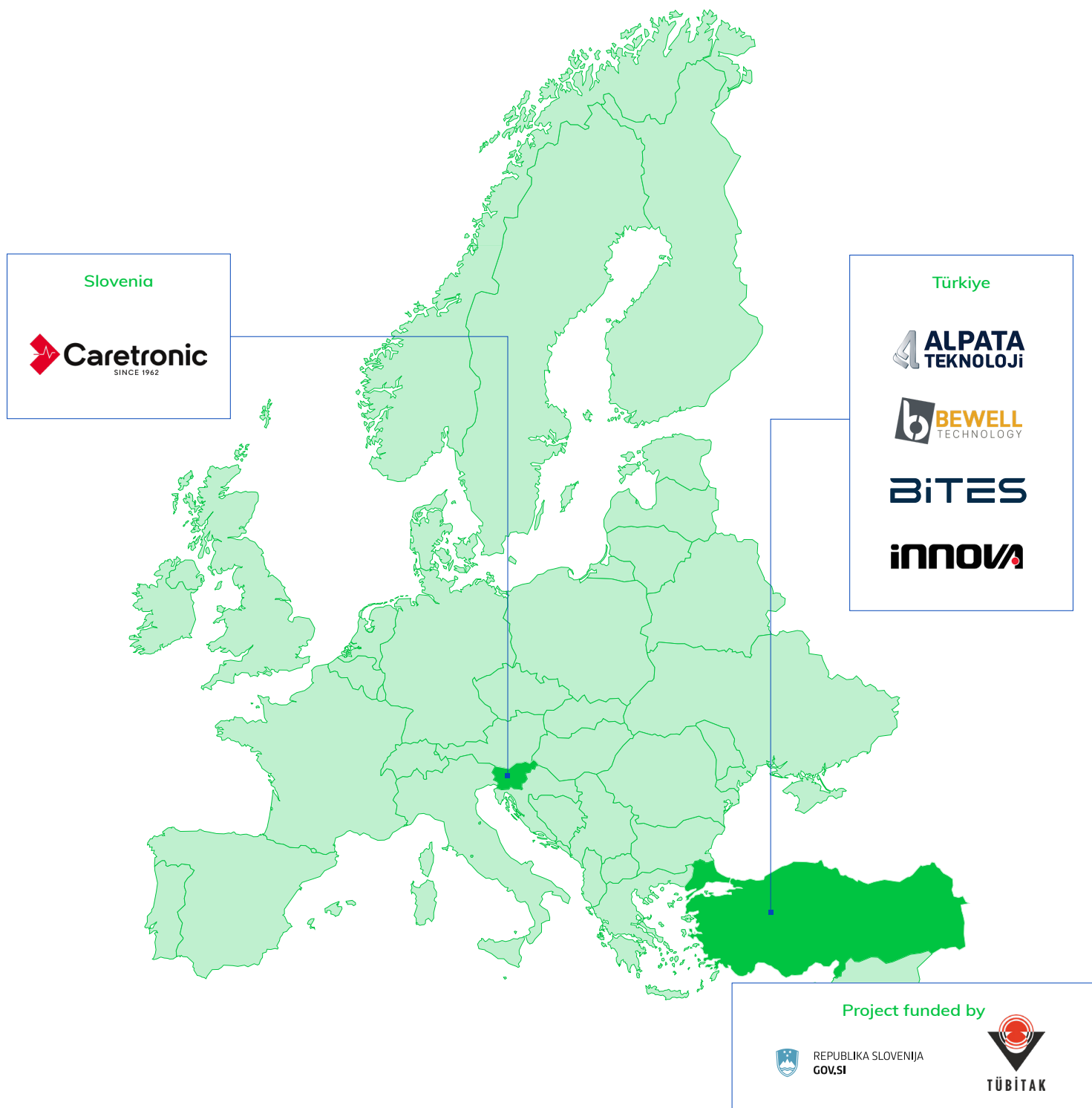

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Projected results and impact

TiDiT intends to release its platform as open source, whereas the customisation and domain-specific modules will be provided as an 'as-a-service' model (such as a low-cost subscription). This will enable businesses – particularly SMEs – to reach, implement and utilise the platform more easily than its competitors and will help the project to achieve a 30% reduction in DT development and deployment time. It will also allow

emerging community to enhance the competitiveness of Europe and support the democratisation of DT knowledge across the continent.

Slovenia

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