

Business Case for Digital Twins

This business case was prepared by **Barteld Braaksma and Anna Mitriaieva**, and is submitted to the HLG-MOS for their approval.

Type of Activity			
<input type="checkbox"/>	New activity	<input checked="" type="checkbox"/>	Extension of existing activity
Proposed Modernisation Group(s) for Activity			
<input type="checkbox"/>	Applying Data Science and Modern Methods	<input checked="" type="checkbox"/>	Blue Skies Thinking
<input type="checkbox"/>	Capabilities and Communication	<input type="checkbox"/>	Supporting Standards
<input type="checkbox"/>	<i>Other:</i>	<i>Name of proposed group or unknown if not clear</i>	
Purpose			
<p>The purpose of the Digital Twins proposal is to investigate what is happening under the broad umbrella of the 'Digital Twins' concept, where and how the official statistics community could contribute and if international standardisation of relevant new notions could be useful.</p> <p>A Digital Twin in this sense is a digital (2D or 3D) description of the physical world. Such a description may serve as a basis to run models or generate scenarios. The added value of statistical data seems obvious. Human actors as well as companies and institutions can be placed in the Digital Twin environment and their interaction (either at aggregate or individual level) with the physical environment can be studied. Techniques like microsimulation and agent-based modelling can be applied in addition to many other analytical tools. Game engines like Unity can be used to visualise a Digital Twin environment.</p> <p>There are clear links to various policy areas with a spatial component (e.g. SDGs, mobility, COVID19 spreading (see here), ...). Applications areas range from local (city) to global (world-spanning) level. The European Union has for example launched the Destination Earth initiative which focuses on climate change.</p> <p>In the research world there is a lot of work going on in the area of Digital Twins. It may be fruitful to liaise with stakeholders from this world.</p>			
Description of the activity and deliverable(s)			
<p>This project has three main work packages that aim to cover the three aspects mentioned in the purpose description above.</p> <ul style="list-style-type: none"> - Work package 1: Stocktaking of existing initiatives and relevant partners. It may be worthwhile to connect to such existing initiatives, or liaise with key players, from an official statistics perspective and find out how we can contribute. In particular it may be useful to connect to the geospatial community. - Work package 2: Use cases for statistical data and methods. Both real data and synthetic data may be useful. A plethora of methods may be applied, including AI/machine learning methods and visualisation techniques. A specific role of statisticians could be to keep an eye on quality aspects and warn for wrong interpretation of results, given the data and methods used. - Work package 3: Standards and architecture for statistical Digital Twins. A main benefit of Digital Twins is that they enable the creation of reusable and interconnected environments. This WP looks into relevant standardisation and architectural aspects, possibly with a link to geographical standards. 			

Alternatives considered

There is an opportunity cost of not exploring the potential of this rapidly emerging field.

How does it relate to the HLG-MOS vision and other activities under the Group or HLG-MOS?

Collaboration under the HLG-MOS makes it easier to get our common statistical voice heard stakeholders and to show the value of official statistics in an innovative way. The concept of Digital Twins is not specific to a single country region and the way data can be used is in principle agnostic of country specifics. Some applications are already by nature international. Therefore it is useful to explore the topic together as a statistical community. This applies in particular when it comes to the definition of standards.

Proposed start and end dates

Start: Commenced July 2022

End: December 2023