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Big Data Governance on Digital Twin Technology for Smart and Sustainable Tourism.

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Big Data Governance on Digital Twin Technology for Smart and Sustainable Tourism

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Why Digital Twin?

1 Technology developments related to Big Data, Internet of Things (IoT), Artificial Intelligence (AI), and Machine Learning (ML) allow transformation and rapid innovation in tourism sector.
→ real time, fast, various format→ decision making

2 Empowering statistics office to be more agile, relevant, and adaptive with current technological development toward better data provision for policy-making process.

Big Data sources on sustainable tourism

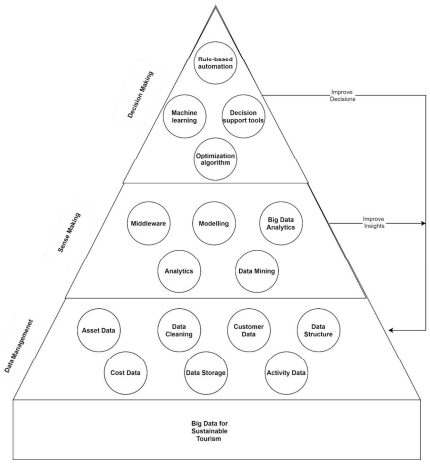
1.Mobile Positioning Data
2.User Generated Content (UGC)
3.Social Media
4.Website
5.Images/Satellite images
6.Communication System
7.Financial Transaction
8.Sensors
8. Advertisement (online)
9. Geo-tagged or geo-location data
10. Humidity, wind speed
11. Business process-generated data
12. Apps/tools implemented in smart tourism
13. Others

Objectives

✓Propose the potential use of Digital Twin technology on smart and sustainable tourism,
✓ Propose the use of documentation frameworks on architecture decisions to govern digital system and the use of Big Data,

Digital Twin technology: a virtual image, which defines the comprehensive physical and functional characteristics of the product's entire life cycle and can transmit and receive product information

Conceptual Framework: Digital Twin



Conceptual Framework of Digital Twin on Smart Sustainable Tourism

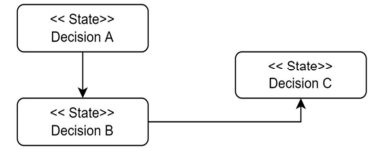
Big Data Governance

Documentation frameworks on architecture decisions to govern digital system and the use of Big Data

1. Decision details viewpoint

- **Name**: A short name of the decision.
- **Activities** : A state of the decision on Architecture Framework
- **Problem/Issue**: The issue addressed by the decision
- **Decision**: The outcome of the decision or solution.
- **Alternatives**: The alternative solutions considered when making a decision
- **Arguments**: The reason behind the decision
- **Related decisions**: All decisions that have a relationship to the decision.
- **Governing system**: Laws and regulations governing the actors, both technological and non-technological
- **Decision-makes/actors**: The actors involved in the decision-making process.

2. Decision relationship viewpoint



3. Standard operating procedure

Actors	Actor 1	Actor 2	Actor 3
Process involved	Activity 1	Activity 2	Activity 3
Information required (law and regulation)	Information A	Information B	Information C

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Files/Uploads

Big Data Governance on Digital Twin Technology for Smart and Sustainable Tourism
Poster--Governing Digital Twin for Smart and Sustainable Tourism

Brief Description

As one of the emerging concepts in artificial intelligence (AI), machine learning (ML), and the Internet of Things (IoT), Digital Twin (DT) technology can predict system responses before they occur.

DT can be described as a virtual representation that defines the comprehensive physical and functional characteristics of the life cycle of a product.

DT applications have been implemented in many sectors, including smart cities.

Considering the rapid growth of new ICT applications in the tourism industry, and the digitisation through IoT, we suggest that DT has the potential to be implemented in smart and sustainable tourism.

By utilising Big Data source (such as: Mobile Positioning Data) and other supporting resources, stakeholders will be able to create a virtual representation of a relevant region both by analysing the flow of visitor activity and by determining the impact of their geographic and temporal patterns on other aspects and policies as a leverage on the use of Big Data for statistical products.

We also believe that the use of Digital Twin technology can empower National Statistics Office to be more agile, relevant, and adaptive with current technological development toward better data provision for policy-making process.

However, we are also aware that compliance with regulations and communication among stakeholders such as data scientists, data analysts, statistician, data engineers, managers and business analysts have become important issues for DT software systems when it comes to supporting organisational purposes.

Therefore, we propose both a conceptual framework for DT on smart and sustainable tourism, and a documentation framework for architectural decisions as a recommended way of governing such systems, the use of Big Data, and statistical business processes.

This documentation framework provides benefits that shape how each stakeholder communicates and interacts using the system whilst adhering to rules and regulations to ensure trustworthiness, accountability, and transparency.

By combining the realm of political science, software engineering, and statistics, we expect to provide a contribution on the Big Data Governance both for academic-setting as well as the decision-making process.

Abstract

As one of the emerging concepts in artificial intelligence (AI), machine learning (ML), and the Internet of Things (IoT), Digital Twin (DT) technology can predict system responses before they occur. DT can be described as a virtual representation that defines the comprehensive physical and functional characteristics of the life cycle of a product. DT applications have been implemented in many sectors, including smart cities. Considering the rapid growth of new ICT applications in the tourism industry, and the digitisation through IoT, we suggest that DT has the potential to be implemented in smart and sustainable tourism. By utilising Big Data source (such as: Mobile Positioning Data) and other supporting resources, stakeholders will be able to create a virtual representation of a relevant region both by analysing the flow of visitor activity and by determining the impact of their geographic and temporal patterns on other aspects and policies as a leverage on the use of Big Data for statistical products. We also believe that the use of Digital Twin technology can empower National Statistics Office to be more agile, relevant, and adaptive with current technological development toward better data provision for policy-making process. However, we are also aware that compliance with regulations and communication among stakeholders such as data scientists, data analysts, statistician, data engineers, managers and business analysts have become important issues for DT software systems when it comes to supporting organisational purposes. Therefore,we propose both a conceptual framework for DT on smart and sustainable tourism, and a documentation framework for architectural decisions as a recommended way of governing such systems, the use of Big Data, and statistical business processes. This documentation framework provides benefits that shape how each stakeholder communicates and interacts using the system whilst adhering to rules and regulations to ensure trustworthiness, accountability, and transparency. By combining the realm of political science, software engineering, and statistics, we expect to provide a contribution on the Big Data Governance both for academic-setting as well as the decision-making process.