

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

**Jnana Sangama, Santhibastawad Road, Machhe**

**Belagavi - 590018, Karnataka, India**



**Technical Seminar Report  
On  
“Digital Twin Technology”**

**Submitted in the partial fulfillment of the requirements for the award of the degree  
of**

**Bachelor Of Engineering  
In  
Computer Science and Engineering  
Submitted by**

**Prithviraj Patil (1JS19CS125)**

Under the Guidance

**Ms. K V Shanthala**

**Associate Professor, Department of CSE**



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Department of Computer Science and Engineering  
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**JSS ACADEMY OF TECHNICAL EDUCATION**  
**JSS Campus, Dr.Vishnuvardhan Road, Bengaluru-560060**  
**Department of Computer Science and Engineering**



**CERTIFICATE**

This is to certify that the technical seminar work entitled **Digital Twin Technology** has successfully carried out by **Mr. Prithviraj Patil (1JS19CS125)** in partial fulfilment for the award of the degree of Bachelor of Engineering in Computer Science and Engineering of the Visvesvaraya Technological University, Belagavi during the year 2023. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said Degree.

**Ms. K V Shanthala**

**Assistance Professor**

**Department of CSE**

**JSSATE, Bengaluru**

**Mrs. Swetha Kaddi**

**Assistance Professor**

**Department of CSE**

**JSSATE, Bengaluru**

**Mr. P B Mallikarjun**

**Professor & Head**

**Department of CSE**

**JSSATE, Bengaluru**

**Name of the examiners**

1. ....

2. ....

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**Prithviraj Patil (1JS19CS125)**

## **ABSTRACT**

Digital Twin technology is an emerging concept that has become the centre of attention for industry and, in more recent years, academia. The advancements in industry 4.0 concepts have facilitated its growth, particularly in the manufacturing industry. The Digital Twin is defined extensively but is best described as the effortless integration of data between a physical and virtual machine in either direction.

A digital twin has recently received considerable attention in various industry domains. The digital twin replicates physical objects (e.g., people, objects, spaces, systems, and processes) in the real world into digital objects in the digital world. It also provides various simulations to solve problems in the real world or to improve situational operations. Therefore, the digital twin is a convergence of various technologies, such as advanced machine-learning algorithms, data analytics, super-resolution visualization and modeling, and simulation. Because the digital twin is a complicated technology, a step-by-step implementation that includes many technology elements should be considered to create a digital twin model. In addition, technology elements were suggested for the presented implementation layers. Because the suggested technology elements include clear technology definitions, various application domains (e.g., energy, transportation, logistics, environment, manufacturing, and smart cities) can easily utilize the introduced implementation layers and technology elements according to the intended purpose. Furthermore, this paper describes the evolution of digital twins. Digital twin technology has evolved continuously since 2002, when the digital twin concept was first introduced. In the described evolution levels, we show the future aspects of digital twin technology, according to the technological evolution direction. Therefore, the digital twin model can be efficiently created by considering the evolution direction and future aspects by using the suggested digital twin evolution levels.

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