**INTRODUCTION**

According to the latest statistics from the World Health Organization, about 930 million people worldwide are at risk of falling into poverty due to out-of-pocket health spending of 10% or more of their household budget [1]. Currently, there is a surge in improving the healthcare situation and a myriad of developments are ongoing in the healthcare sector with respect to Artificial Intelligence [2]\_[4], Big data [5], [6], and in other spectrum. Though, it is not something that can be assuaged outright, whereas the real problem is not in the slow advancement of the technology, rather the mishaps in real life, e.g., adverse events, late diagnosis, etc [7]. DT can bring an immediate alteration in the healthcare sector from its root by incorporating analysis, predictive measurements, decision making paradigm, and data collection [8].

There are some notable developments in the healthcare sector incorporating DT. Martinez-Velazquez *et al.* [9] have developed a cardio twin based on the heart that can mitigate the risk of any Ischemic heart disease. Barbiero *et al.* [10] have proposed a general framework to provide a panoramicview over current and future physiological conditions. However, the recent developments in DT for the healthcare sector, have some drawbacks from the perspective of data sharing, storage, and access control [11]. Also, without any proper framework, collecting a large amount of data haphazardly will cause a disarray which will perpetuate when involving other data transformation techniques [12]. For these reasons, it is a prominent task to decide in which way DT will perceive which healthcare data from which dimensions [13]. To solve these problems, we propose a structured mathematical data model to collect the patients' data in a systematic and prede \_ned way so that a cluster of acute information about a physical patient and its surrounding environments can be accumulated while they are at the hospital. With the proposed data model the patient can be individually identified as well as the patient portfolio can be concocted with the clinical data.

It is often reported that people show a lack of concern regarding the security of the health data which leads to integrity and confidentiality breaches [14]. Around 881 breach reports have been recorded within the last 24 months and are under investigation by the U.S. Department of Health & Human Services [15]. Therefore, to effectively solve this problem, a system is needed that can store and keep data securely with proper structure. Moreover, around 60% of the counties in the world have the capacity to review the progress and performance of the healthcare systems and around 59% can use data to drive policies and planning for the health sectors [16]. To cover these wide distributed nationwide healthcare sectors, having the mentioned potentials, a distributed network can be implemented by enforcing a distributed storage facility without any central governing authority [17]. For this reasons, the block chain technology can be integrated with DT to accumulate this insurmountable health data in a structured and distributed way with adequate security properties. In a block chain based DT system for healthcare, block chain renders the services of collecting intricate and diverse data immutably with proper access and sharing mechanism, on the other hand, DT provides proper data analysis, aggregation, prognosis, and representation services which are conducive to build a proper healthcare DT. To mitigate these issues, in this article, we present a concrete mathematical model for patients' clinical data and then propose a block chain based Healthcare Digital Twin system based on the presented data model.