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Digital Twin: Genetic Algorithm in Technology

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Abstract: *DIGITAL TWIN is used to get the best outcome of the result in industry, other researcher had presented much idea which was typical but here we present a paper on digital twin which will be most useful in the upcoming smart generation with the help of genetic algorithm for the best outcome. Digital twin is the 'living object' of the physical that represents the asset memories and group consciousness which gathered interest in a short time. As before the digital twin technology is just used to know how that the process of the object or entity will be success in the most particular field, but now if the digital twin is implemented with genetic algorithm then the confusion in the several processes will be sought out to get the perfect result in every field, where this kind of technology is the key for the mysterious success of all industries.*

I. Introduction

Digital twin is an extreme idea of virtual of a physical object. The comprehensive representation of digital of an each and every object that will act as an integral role in a digitalized objects life cycle. Genetic algorithm is a theme of algorithm's search with the principles of natural genetic which presents a solution to problems. When the genetic algorithm (GA) will be applied to digital twin instance; it will produce the best result among all the 3D plans or bill of material or bill of processes to manufacture the assets which are asserted in digital twin; whereas the digital twin has the capability of providing an information with the present analyzing report of every report.

II. Digital Twin

Digital twin is the representation of virtual and predictive twin which is to be manufactured or to be established or to be implemented which is used in the field of education, business, and agriculture, utility and in all industries. The digital twin connects the both physical based object or entity process and real time process object to get an authoritative digitalized of the entity before the process of every phase. With this kind of technology we are able to understand the step by step process of an object or entity.

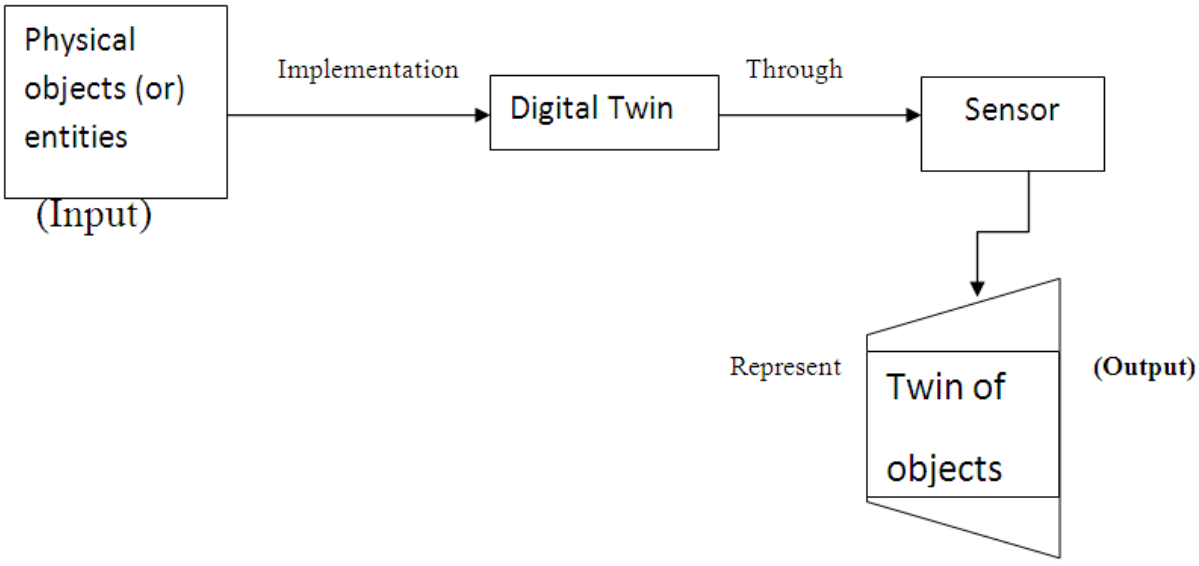


Fig: Process of Digital Twin

Genetic Algorithm

The term of Evolutionary algorithm is called as Genetic algorithm. The process of GA in the field of IT is same as the process of biological and natural selection which includes

- First:- Selection(fittest survival of random chromosomes)
- Second:- Cross over(mutation process in fittest chromosome)
- Third:- Evolution(arrival of new population)

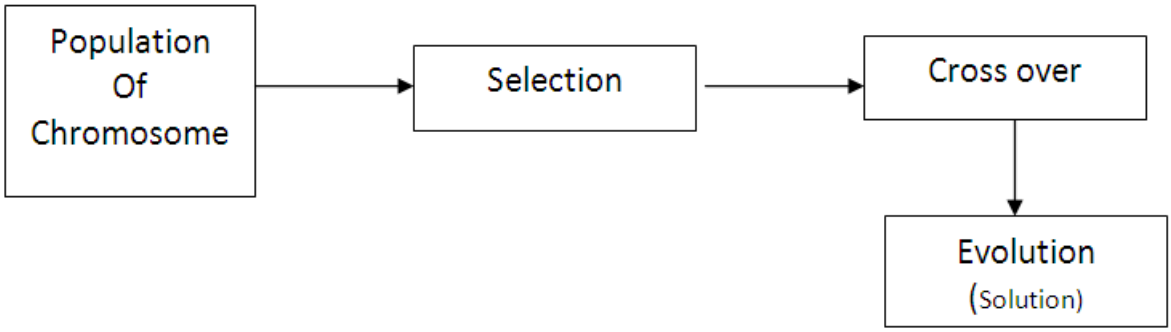
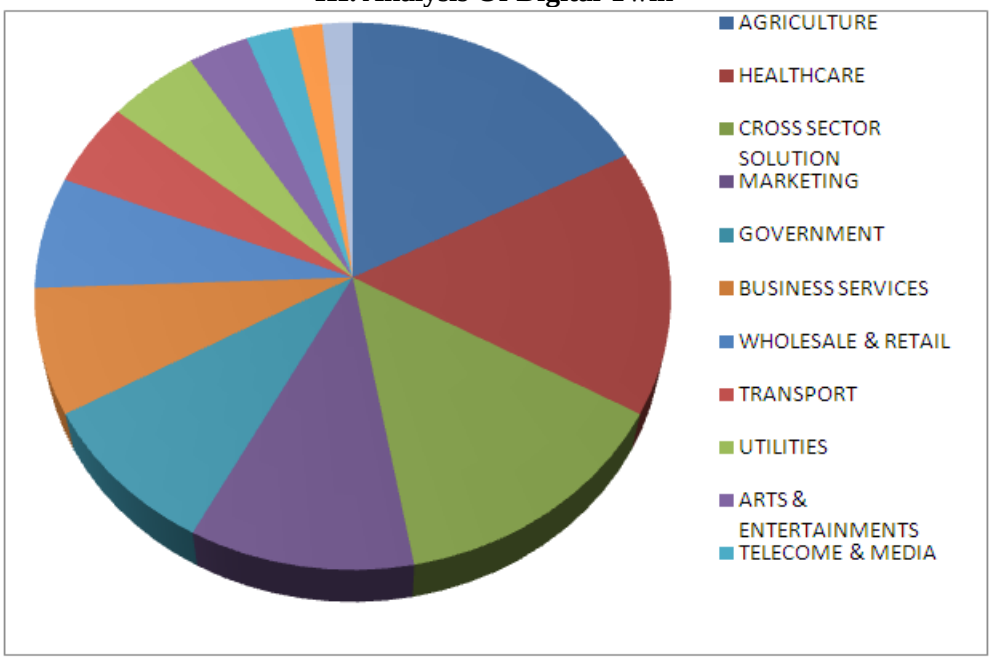


Fig: Process of Genetic Algorithm

In every step, the genetic algorithm selects an individual chromosome randomly among other population as a parent and those chromosomes which are selected are uses to generate the children as a next generation.
Selection step is known as the parent whereas the cross over step is the process of connecting two chromosomes to produce children and the evolution step is the arrival of the next generation's population.
With the help of above processes the genetic algorithm will give the best outcome as a result in the field of IT. Thus the genetic algorithm has been proven in the field of computer science and technology for generating a high performance of solution to the problems.

III. Analysis Of Digital Twin



the above given pie is the recent statistics of digital twin in respective fields which represents agriculture, healthcare and cross sector section uses digital twin more and more than all the other fields. When the genetic algorithm

Digital Twin With Genetic Algorithm

The genetic algorithm will be applied in digital twin technology if the digital twin is provided with one or more than one entity then the genetic algorithm will provide the best solution among all the process that is After establishing genetic algorithm to digital twin, when two or more process will be implemented in digital twin, with the help of simulation the process will be cloned and the genetic algorithm will extract the one process as a best outcome among other processes and the excess processes will be demolished.

Working Process Of Digital Twin

The sensor of digital twin technology connected to the physical object or entity then the number of collection of process will send to the digital twin and the interaction of this technology will optimize the performance of genetic algorithm which takes process to get the best of the process among them through regime of maintenance.

Advantages And Disadvantages

The genetic algorithm is low-cost efficient but the digital twin technology is not, so when this will be implemented in digital twin technology then the cost will be affordable and also it is a time sufficient or time saving technology which provides us the best outcome without any trouble causing. The excess processes will not be able to review again after the loading process is completed.

IV. Conclusion

Digital twin contain its own components, and this is the beginning of digitally presenting physical objects with the technology. In Digital twin technology the connection and link in physical system and virtual system comes under same way, thus this technology prevents from failure or demolish of the physical object through the representation of the virtuality which seems like that the working is going on in the real time process. With the help of this kind of technology the future of agriculture, education, health care, marketing, cross sector, government, utility and the industry fields will be in the form of success.

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