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FILE TRANSLATOR FOR MULTI-DIMENSIONAL DESIGN MODEL – A SMARTMANUFACTURING APPROACH

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ABSTRACT

The Information Technology era has significantly altered the modus operandi for transferring statistics, as well as the manner and nature of "things". Information technology for transfer of statistics has proven to be vital for all products. The product functions to expand the appreciations to embedded instruments, and processors of products function to develop a product cloud, which is capable of storing data and analyzing the product data. This system permits the swapping of statistics among the product, the maker, the final user, its operating environment and other products or systems. Connectivity technologies are fundamental to smart manufacturing, and, therefore, their development and implementation are essential. This technology helps to link various products. However, because of the considerable usage of unstructured information coming from IoT and Big Data, an entirely new technology structure is essential to manage the huge flow of information within an enterprise. The foremost focus in smart manufacturing is considered a futile exercise in manufacturing, because it strives to encompass all stages of the product manufacture process. The objective of the development of smart manufacturing is to utilize huge data with advancement in computational intelligence, expertise, and production of higher quality goods.

KEYWORDS: Constructive Solid Geometry (Csg), 3d, Iot, Big Data, Xml

INTRODUCTION

Manufacturing is proposed to be a system with external dynamics as a factory from which an industrial ecosystem has developed. The evolution of smart manufacturing encourages creativity and uses data and information obtained during the life cycle of the product. The ultimate objective for creating a tech-based manufacturing process is to develop the ability to respond rapidly to changes in demand; however, these changes should not have a great financial impact to the firm and should also limit the damage to the environment. The concept must consider the entire life-cycle of a product, wherein products are designed for efficient production and recyclability. This concept demonstrates a striking example for a sample manufacturing control system with inter-connectivity of data analysis, computing and automation. Smart manufacturing allocates phase, time and place to gather evidence regarding the manufacturing process, elaborates on the form essential for entire industrial supply value chains, complete product lifecycles, as well as manifold industries such as small, medium and big initiatives. The formation of practical and commercial infrastructure would enable the development and progress of smart trade systems across the entire industrial ecosystem. Former definitions for advanced manufacturing enterprise considered it to be intensified application of advanced intelligence systems that facilitate speedy manufacturing of new products, with dynamic response to product demand, including real-time optimization of manufacturing production and supply value chain nets. The awareness of smart manufacturing is manifested by a display of smart works, which include exchange and usage of the systems, multiple state-run live showing and imitation, computational intelligent mechanism, accessibility, and invention of safety and interrelated sensors. Numerous schemes apply data and information to program the product's entire life cycle. These initiatives intend to develop flexible manufacturing processes that are sensitive to any change in demand. However, these ideas should not have a major financial impact to the firm and neither to the setting. These practices expedite the flow of information across all professional functions inside the enterprise. In addition, the initiatives manage the connections to providers, customers, and other shareholders outside the initiative. 3D epitomizes information in several applications such as medicine, structural engineering, the automobile industry and cultural heritage preservation.

EXISTING SYSTEM

Preservation of 3D data entails basic understanding of 3D data characteristics, 3D file formats and viewing software. Our chief objective is to comprehend the information loss brought about by 3D file format conversions, which is accomplished with any of the software packages designed for viewing and converting 3D data files. To compute the information loss quantitatively, the most popular tactic is to rank the characteristics of 3D data sets and design metrics for scoring 3D file conversions. This technique is dependent on the reasons contributing to the preservation of 3D models. For example, if the 3D model enclosed a 3D simulation of a crime, then the scene information would be ranked higher than the appearance and geometry of the individual objects. Similarly, if the 3D model was being conserved for the future users of the model, which might require them to replace a part of the object being modeled, then the ranking of 3D data characteristics would abide by the order of geometry, appearance and scene. This technique also presents possibilities to build 3D models of wild fire, where the appearance of flames would have higher preservation priority than the geometry and scene, because the appearance can provide the information regarding the burning object. The following table illustrates the ranking approach, which is urged ahead by the part replacement application. However, a major drawback is that conversion utilities would often disregard physical appearance characteristics when converting between 3D file formats, and would instead assume the order of priorities to be geometry, appearance and scene. Once the categories of characteristics were ranked, the ranking of individual characteristics would follow, with simultaneous mapping of the presence or absence of characteristics before and after 3D file format conversions. However, one must be cognizant of not only the information loss but also the feasibility of conversions during the entire course of process. Under circumstances when conversion is possible, a tradeoff between storage requirements and information loss should materialize. Most3D formats also include information for convenient editing of 3D models. This is usually noticed in the context of Constructive Solid Geometry (CSG), which is commonly employed for constructing CAD models from a set of primitives. The loss of the constructive sequence and/or the primitives during file format conversions affects further editing capabilities. Although this loss might not cause hindrances while preserving the appearance of the model, it can prove to be an obstacle to those wishing to edit the model in the future.\

Table 1

Format	Geometry				Appearance				Scene				Animation
	Faceted	Parametric	CSG	B-Rep	C	M	I	B	L	V	T	G	
3ds [8]	√	√			√	√	√	√	√	√	√		
igs[9]	√	√	√	√	√						√	√	
lwo[9]	√	√			√	√	√	√					
obj[7]	√	√			√	√	√	√				√	
ply [3]	√				√	√	√	√					
stp[10-14]	√	√	√	√	√							√	
wrl[1, 8]	√	√			√	√	√	√	√	√	√	√	√
u3d [4]	√				√		√	√	√	√	√	√	√
x3d [5]	√	√			√	√	√	√	√	√	√	√	√

PROPOSED SYSTEM

The foremost focus in smart manufacturing is considered a futile exercise in manufacturing, because it strives to encompass all stages of the product manufacture process. The objective of the development of smart manufacturing is to utilize huge data with advancement in computational intelligence, expertise, and production of higher quality goods. The Information Technology era has significantly altered the modus operandi for transferring statistics, as well as the manner and nature of "things". Information technology for transfer of statistics has proven to be vital for all products. The product functions to expand the appreciations to embedded instruments, and processors of products function to develop a product cloud, which is capable of storing data and analyzing the product data. This system permits the swapping of statistics among the product, the maker, the final user, its operating environment and other products or systems. Connectivity technologies are fundamental to smart manufacturing, and, therefore, their development and implementation are essential. This technology helps to link various products. However, because of the considerable usage of unstructured information coming from IoT and Big Data, an entirely new technology structure is essential to manage the huge flow of information within an enterprise. The redesigning of the manufacturing structure, redefining its limits, and new skills are indispensable for software development, systems engineering, big data analytics, and online security initiative. Any up gradation attained through novel research, training and applicability of modern techniques and methods is a step towards smart manufacturing. This is a continual process; as amendments are constantly required, to meet the needs contemporizes and enable the activities, pertaining to the current scenario. To handle such tasks, a new File Translator for Multi-Dimensional Design Model have been developed, which will be a step towards Smart Manufacturing. Several designers wish to create a new design model to save file extension (.neutral format). For example, IGES saves in the form of (wrlextention). This is the digital data that is in VRML format as STEP (Standard Exchange of Product), which may be used for storage into repository, that is, cloud or database. The chief setback in viewing Multi-Dimensional models (3D or above dimensions) involves the transfer of the models in VRML format, as shown in Internet Explorer, MS-Word and Power Point Presentation, which is universal and comprehensible by any user. To resolve this issue, we propose to develop a 3D xml-based File Translator Interface program for cloud data storage through web page communication and visualization. This program would help to test product development system using smart manufacturing approach.

CONCLUSIONS

Applicability

This study would benefit small-scale companies for implementing a new advanced attempt of XML-based 3D Model File translator. This technology is highly cost-effective and improves communication between small, medium and large companies. Integration of communication would ensure smart manufacturing, which ultimately results in reduction of product development time. This approach may easily replace the 3D model and concurrent engineering. In conclusion, the finding would assist researchers to identify the areas for the application of Big Data and Smart Manufacturing.

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