Developing Killer Apps for Industrial Augmented Reality

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Abstract

Human world are surrounded with the products manufactured by different industries.Each industry is unique in its own way and the requirements of the industry are different form one other. This difference in requirements leads to a new challenge that creates the need of specialization of technical solutions for every industry. Every industry concerns themselves with other in the fields of design, commissioning, manufacturing, quality control, training, monitoring and control, and service and maintenance. Augmented reality gives the industry a platform to develop virtual models according to their areas of interests and help them to visualize the designs with the stable view of the real world.

Index terms—

1 Introduction

he idea of Augmented Reality was started in late 1960's by Ivan Sutherland's experiments, but did not acquire its fool gain as a technical felid sector till early 1990's [1]. For the first time Augmented Reality application for industries was developed in the year 1990 by David Mizell along with is colleagues at Boeing [2]. After this application development the Augmented Reality had undergone a series of development and came into usage by many industries.

German Federal ministry of education has sponsored the research organization for the development of IAR i.e. Industrial Augmented Reality to increase the development and production and services known by the German acronym ARVIKA **??**3]. Formation of R&G group in every institute for studying and developing the technology related to the industry is the primary goal of ARVIKA.

There are many research works conducted on IAR technology such that it meet the end to end requirement of the industries. Each industry is unique in its own way and the requirements of the industry are different form one other. This difference in requirements leads to a new challenge that creates the need of specialization of technical solutions for every industry. Every industry concerns themselves with other in the fields of monitoring and control, commissioning, manufacturing, design, quality control, training, and service and maintenance.

2 II.

3 Design

Augmented Reality developers proposed many alternate solutions for design and develop the virtual Author ? ?: IV B.Tech ECM, K L University, India. e-mails: yuvananelakonda@gmail.com , pvlakshmiuma@gmail.com. Author ?: Associate Professor, Department of Computer Science & Engineering, K L University, India. e-mail: nvkr@kluniversity.in. reality instruments which failed to prove the AR superiority. The design developed must be realistic with high quality and good rendering without any lag or misalignment that dramatically affects the idea of design. Using AR the cost of investment reduces which gives an added advantage of improvising the designs. AR application must be developed to compare the quality and efficiency to virtual reality or augmented virtually.

4   III.

5   Commissioning

During the process of designing and development the designer and the building crew may be from different industries which results in ambiguity of the design and to avoid this by maintaining an original design. The AR is not used for financial advantages related to quality payment and delivery but also to have a flexibility of creation of a virtual design before setting the product for a life time use.

6   IV.

7   Manufacturing

The first AR application developed in 1990 at Boeing aimed at producing a prefabricated guidance boards. This AR application uses the optical device Head Mounted Display (HMD) and computer. But this idea later was not accepted by the final user. Even the ARVIKA projects have the equivalent solution which has failed in final stage. The only manufacturing accepted by the final user is called as AR welding gun.

V.

8   Quality Control

Instead of technologies like laser or camera only IAR techniques for the quality control are suggested by ARVIKA **??**3]. Let us consider Benz R&D who built a system for detecting the dents on a crash tested car. But it was proved that instead of 3D recreation it is better to compare it on simulation.

9   VI.

Training VR system without allowing virtual area to be accessed by the user is the main advantage offered by IAR training application. This application allows the training system to check different issues like safety are depending on the environment. At present the solutions exist only in prototypes which are not yet allowed into the market.

10   VII.

11   Monitoring and Control

Technologies such as CAD, VR, and advanced visualization are widely used for design and development procedures for different industries. New installations are often online based model which are fully virtual and visualized and evaluated. The online designs are developed and stored in the cloud.

The solution proposed for the problems are not measurable and they usually deal with identification but not the main problems of connecting database. The final solution is virtual designs and monitoring and controlling are integrated and used by mobile application which is a long term and a difficult goal. For designing 3D models for monitoring the data using mobiles we use Framatome ANP.

Siemens and Framatome aims to develop 3D models and Argument Reality Visualization, communication and speech based interaction which provides end to end solutions. The interaction between the system and the user is done through mouse or pen or speech based [4]. The real time automation and monitoring are observed in the mobile using Wireless communication. IAR as a technology started with the creation of CyliCon-Industrial Augmented Reality software solution. This software helps the user to create a virtual pipeline which reduces the need for complete. AR allows the users to reconstruct the designs virtually depending on their area of interest and imagine the models within the stable view. According to the industrial customers requirements some important industrial drawings are integrated in CyliCon was further developed and formed a new product called as coregistered orthographic and perspective image [5,6]. Co-registered orthographic and perspective images allow the user to create new reconstruction algorithms, which reduces the need of calibration [7,8].

Combining the solutions with Cylicon and co-registered orthographic and perspective images the user can develop a new solutions for mobile Augmented Reality visualization and data access which helps in locating the users in large industrial environment.

The latest development is done by joining Framatome and SCR allow the users captures the active display and relate the images to already existing preacquired 3D data. The Framatome uses the user to estimate the cameras and overlay the 3D data. The SCR at Siemens CT-PP4 Division considers industrial drawings for estimating the camera augmentation. In the two situations the interactive overlay which allows the user to directly access the image.

12   VIII.

13   Service and Maintenance

Service and maintenance deals with the connection of database where the application used in the industry access it. All the research works performed went in vain by just producing demonstrating prototype. These prototypes

are often developed on kill the application that is at hand which has no scaling capacity for large number of parts. The present maintenance gave a flexibility of selection of spare parts and allowing the real time operations by using remote system which optimizes the work to maximum extent. IAR must develop which adds additional features to support user interface.

14　J e XIV Issue VII Version I

Developing Killer Apps for Industrial Augmented Reality AR technology is used for maintaining and repairing the vehicles and other products by creating a virtual model of the design and developing the virtual design. This helps the R&D department in finding the necessary outputs for the problems faced by the institute.

15　IX.

16　Conclusions

Killer Augmented Reality application would provide a most accurate solution that traditional approach which wins the favour of many different users and creates large benefits in the aspect of finance. The R&D must make sure that any IAR solution must contain three different aspects in order to become a commercialized application. They are:

? Ease of access. The user must find the application easy and friendly for usage. ? The design outputs must be scalable. The owners and designers can easily reproduce and distribute. ? It should provide most accurate and equivalents so that the user feel it reliable. [1]
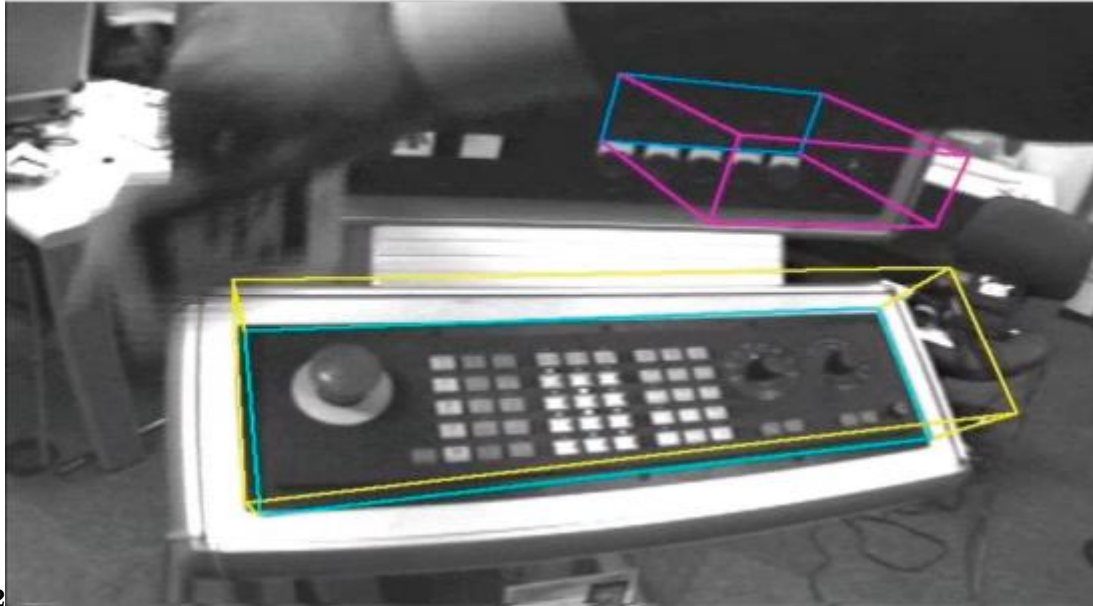

Figure 1: Fig 1 :

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Figure 2: Fig. 2 :

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