

USE OF SITE ROBOTS IN CONSTRUCTION
M. R. KATPALLIWAR¹, A. G. KAWALKAR², K. A. LAD³, S. S. MISHRA⁴
¹*DIPLOMA students, Civil Engineering Department, G. P. Yavatmal, Maharashtra, India, meenalkatpalliwar1307@gmail.com*
²*DIPLOMA students, Civil Engineering Department, G. P. Yavatmal, Maharashtra, India, abhilashakawalkar@gmail.com*
³*DIPLOMA students, Civil Engineering Department, G. P. Yavatmal, Maharashtra, India, kushal37lad@gmail.com*
⁴*DIPLOMA students, Civil Engineering Department, G. P. Yavatmal, Maharashtra, India, mrayansh19@gmail.com*
ABSTRACT

Use of Site Robots in Construction are the latest inventions in the field of construction. Construction robots are autonomous floating devices capable of repairing or building the player's structure. This project reviews construction process and new emerging robotic technologies, all while keeping in mind the societal implications the new technologies may have. The study identifies and analyzes the benefits and limitations of a wide array of robotic applications. A roadmap and timeline are created to guide Mass port on how and when to implement the various robotic applications into their construction operations. The end result of this project could be extended to the construction industry as a whole. A few robots consists on the construction job site but the majority of robots used in fabrication in the construction industry are not on the job site. Instead they are used in building construction machinery, arc welding, metal components applying adhesives, and assembling doors and windows. The influencing factors which favour or hinder the development , market penetration and use of robotics and other forms of automation on construction sites were studied by the author and colleagues in the united states, Canada, japan, England, west Germany and Sweden from 1985-1987. Data collection was accomplished through extensive literature searches and interviews in each of country with key decision-makers, scientists, industry experts, and other pertinent persons. Although some differences exist from country to country, the following factors have a generally favourable influence the promise of increase productivity , quality and consistency; improvements in worker safety.

Keywords:-Scaffolding, Mobility, Repetitive, Forecast, Emphasized, Millennium.

1. INTRODUCTION

Robotics is the branch of the technology that deals with design, construction, operation and application of robots and computer systems for their controls, sensoryfeedback, and information processing. The word robotics was derived from the word robot, which was introduced to the public by Czech writer kraal Capek in his play R.U.R. (Rossum's universal robots), which premiered in 1921.the word robot comes from the Slavic word robota, which is used to refer forced labour. these technologies deals with automated machines that can take the place of humans, inhazardous or manufacturing processes, or simply just resemble humans. Many of today's robots are inspired by nature contributing to the field of bio inspired robotics. Robotic deals with the design, construction operation, and use of robots, as well as computer systems for the controlscensoring feedback and information processing



Fig:1 Site Robot

Application of robots in the construction industry performing various tasks is growing. Basic activities in building construction, and civil engineering projects Developed by robots are: positioning, connecting, attaching, finishing, coating, concreting, building, inlaying, covering Jointing, scaffolding, demolishing, tunneling, inspecting, and repairing elements. Japanese construction companies are research leaders in the development and application of robots in their construction projects.in the United States there is a

growing interest for the development of construction robots.

1.1 RESEARCH AND DEVELOPMENT

Employment of robots for performance of various production task in gaining an ever growing applications in the manufacturing industries. The number of robots employed in the US industries. The number of robots employed in the US industry grew according to [R10], from 200 in 1970 to 5000 in 1988. It is estimated by the American robot association that the number of robots in the US will reach 15000 in 1985, and 100000 in 1990. The growing employment of robots is accompanied by a considerable robots and development efforts in this area. According to [R10], research in robotics is carried out at the present in 20-25 academic research centers and government scientific laboratories, and the similar numbers of commercial enterprises. The volume of government sponsored research in robotics in the U.S. was about 20 million dollars in 1982 the investment in research of the private sectors was probe by even larger. This trend has not been reflected in the construction industry. The number of robots employed in the US construction is nil at present. Almost new funds are invested in research and development for possible

1.2 SOCIAL IMPLICATIONS

The objective need for any technological change, which may contribute towards and advancement of the building sector in terms of work productivity and quality, schemes to be more compelling in construction that in almost in any other industrial sector. This trend of the productivity is attributed by various sources to the aging of construction workers, decline in traditional working skills, and attendance of youth to move to more challenging and more convenient task.

The US labor department estimates that the labor force age 45-64 will grow faster; The labor force 25-34 years of age is projected to decline by almost 3 million, reflecting the decrease in births in the late 1960's. As a result, the average craft worker's age is 47 and continues to rise as fewer young men and women choose careers in construction. A change to new technology requires planning, education, participation, communication, and feedback. Displaced workers are generally given preferential treatment in this type of work, and retaining can also give workers opportunities in their careers.

For all those reasons, it seems that the prospect of automation, at least of some parts of the construction process is not only highly desirable from a general socioeconomic point of view but also perceived as such by the public and its various policymaking institutions.

The automation of construction work will require some changes in the composition of the labor force involved in them. Workers in charge of robotized construction tasks must be able to teach the robots, start them, monitor their work, and cope with various malfunctions of the robots and its material systems. The robotization process in construction will certainly be

application in future. The lack of active interest in robotization of the construction work is largely caused by the particular features of construction: the unique nature of every project, production moving from one location to another, divided authority over the process (between owner, designer and contractor) rugged environment and volatile market. These features have in fact always impeded the process of building in industrialization. Traditional "working" solutions were usually preferred over new ideas borrowed from other industrial fields. Since 1980, Japan's construction industry began to experience shortages of skilled laborers and decrease of productivity through research prototype development and repeated fields testing, the large Japanese contractors are gaining understanding of these strength and limitations of applied robotics systems. Each of the contractors spends approximately 1% of its gross venues on R&D activities. The amounts to about \$150mn each, on average per year. In Japan government develops rather than simply regulates, and like the construction industry itself, it makes few R&D initiatives. There is visible evidence that application of robotic systems, such as construction automation, is gaining momentum.

slow, gradual, and confined, at least initially, to large and well adaptable project.



Fig: 2 Site Robot

1.3 FUTURE FORMS OF AUTOMATION

It is well recognized that the unstructured, constantly changing environment of the construction site is one of the primary reasons that robotics and automation have been slow to develop. It has been suggested that construction technology has improved in an evolutionary fashion, and not necessarily in the same revolutionary manner as technology in other industries. It is logical to expect this evolutionary trend to continue. Barring minor breakthroughs in specific areas, the basic evolutionary progress will focus on automating and /or robotizing those tasks which can be clearly defined and systems – engineered. This evolution will take two paths: (1) integration into existing task; (2) total redesign of traditional methods to adapt them to robotics and automation.

The integration of robotics and automation into existing processes at least in part depending upon the uniqueness

or repetitiveness of the process. The higher functional levels, such as construction company organization and

1.4 ROBOT AND AUTOMATION DEVELOPMENT

It is encouraging that research and development efforts in the construction robotics and automation are progressing through out of the world, despite the generally discouraging economic climate and the change-resistant nature of the construction industry major efforts under way Japan, United States, Israel and other

CONCLUSION

Through their experiences, the Japanese construction companies have found that robotics technology has improved productivity, quality, Safety, work conditions, environment, and reduced Construction time, labor, hard work and costs. Productivity and quality in single-tasks robots has Successfully being achieved when a specific work is repetitive. However, due to limitations of robots and the complex environment where construction Industry is developed, additional work force is still Necessary reducing productivity. In automation Construction, productivity promises to increase Because of better integration among tasks. Reducing the hard work, robots improve in general Safety in the work place. Because activities are Confined within the building facility in automated Building construction systems, noise and dust are Reduced contributing to a healthier work Environment. Although overall reduction in labor is not Apparent, because it is still necessary to complete Work inaccessible by robots, it is expected a Reduction of labor using automated construction Systems. Once the automated building Construction system be refined and used more Repeatedly, it is expected a reduction in Construction time and costs. In the United States, construction companies Continue to

project plan, are unique for each project.

countries, and are the subject of several of the presentations at this conference. Included are technologies linking the construction process with CAD/CAM, AGVs and intelligent robots for high hazard tasks such as firefighting and underwater welding, repetitive tasks robots for paintings, cleaning or fastening, etc.

be reluctant in using construction Robots. According with Skibniewski and Kunigahali, concerns for short-term profits, fierce Competition among contractors, and lack of top Management commitment to technological change Are often cited as primary obstacles to the rapid Introduction of robots in the construction industry In the United States.

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