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An approach to develop video tutorials for construction tasks

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Abstract

Effective communication between parties involved in a project is always considered a vital factor for a successful project. The construction industry's driving workforce i.e. the workers on site is mostly reliant upon verbal instructions for task execution due to limited capacity and resources of contractors. The existing construction laborers are usually instructed verbally on the site which at times makes it more difficult for the low-skilled category workers to comprehend the task due to factors like less education and language related communication barriers. This reliance on human-variable verbal instructions causes ineffective communication which might lead to situations like inadequate productivity, workplace questions, rework and unsafe conditions on the site. In order to overcome the shortcomings lying under the typical verbal instructional methodology, studies have surfaced with the objectives to make human variable process uniform with written instructions alongside relevant construction drawings. However, this paper-based instructional methodology can also be less impactful among less-skilled construction workers due to their lack of knowledge and visualization capabilities about particular tasks. Instances of multiple languages in this globalized construction world also result in increasing communication barriers.

With an intention to make communication more effective with the on-site workers, the study proposes the formulation of visual task instructions with BIM innovation. This study presents a model for developing virtually animated video tutorials of construction tasks with an easy and comprehensible instructional content. These video based task instructions following how-to-do thematic design will create ease in elaborating sequential steps to workers for easy following on the ground.

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1. Introduction

Project success is mainly considered on the basis of its completion on time, under defined financial resources and quality meeting the standards [1]. However, to achieve this success, effective communication between all the stakeholders of a project is a critical [2]. Construction sector in this regard is no exception as well. The sector is also a home to various stakeholders where frequent collaboration is required to achieve the project objectives. The complex communication patterns in the sector have resulted in difficulty to achieve appropriate interactions between stakeholders [3]. On construction sites, problems like conflicts and low productivity are caused due to improper communication among construction workers [4]. Misunderstanding and lack of understanding are common instances that occur on a construction site due to language differences [5].

The construction stakeholders have for ages relied on verbal and paper-based workflows that focus on a single project discipline or function, and sequentially passing the outputs of decisions on to the next discipline. The on-site management of construction projects involves great amounts of paperwork, even for the case of a relatively small project. This isolated sequential process creates many barriers for effective collaboration and has often led to misunderstandings and errors. This very reason has resulted into a costly rework on the site. One such example which comes across is the methodology of delivering task instructions to construction labor on site. This typical method often fails to effectively communicate the target information to labor, needed to execute the task. To this date, various research studies have been found with focus mainly on construction communication at the design and management levels [6–9]. However, less emphasis has been given by the researchers to investigate the communication issues related to the task instructions for labors on site.

This study is focused on providing ways for improving the communication in task instructional approach used in the construction sector. The main objective is to propose an alternative instructional approach using Building Information Model (BIM) based video tutorials for instructing those labors who possess less skills, knowledge and education with regard to execution of a construction task. The presented model for developing BIM based visual task instructions will provide an opportunity to the field supervisors in explaining a construction task to low-skilled labors as they fit well with the scope.

2. Task instructional approach in construction industry

In construction, there is a broken communication link between the generation of information (generated by the owners, designers and contractors) and the end-users of such information (construction labors) [10]. According to [11], the contractors' limited resources and capacity persuade them to rely on old principles for implementing verbal instructional approach to instruct labors for tasks execution. As shown in Fig. 1, this reliance on human-variable verbal instructions besides poor quality of construction drawings, can lead to circumstances like workplace questions, rework, inadequate productivity and unsafe conditions on the site [12–14].

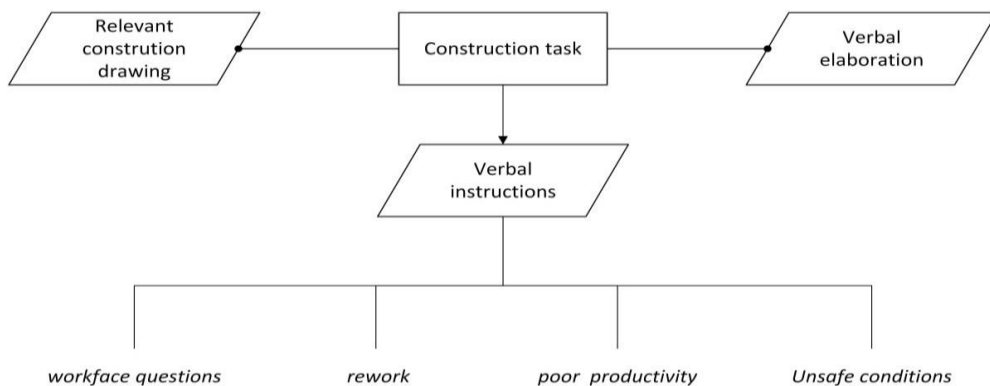


Fig. 1. Typical task instructional practice on construction sites

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