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Optimizing Field Operations: Leveraging Smartphone Data for Effective Progress Tracking and Construction Project Management

Atefeh Mohammadpour, Ph.D., P.E., PMP

LEED AP BD+C, OSHA Outreach Trainer

Department of Construction Management, California State University, Sacramento

Overview of the Project

The project aimed to enhance project management in the construction industry by developing an application that collects and analyzes workers time and location data. This application seeks to improve efficiency, productivity, and resource allocation.

Background of the Project

Effective project management in the construction industry relies on measuring workers' efficiency and productivity. By doing so, project managers can make informed decisions, allocate resources more efficiently, enhance project outcomes, and promote a continuous improvement. Traditionally, efficiency and productivity have been measured through manual observation. Workers' time on various tasks is recorded using methods such as manual time sheets or field reports. Daily reports then provide detailed information on the tasks performed, the amount of work completed, challenges encountered, and overall progress.

Significance of the Project

Development of the application

- Collects time and location data using GPS, Wi-Fi, and the internal clock of smartphones.
- Installs on both Android and iOS smartphone models.

Improvement in field operations

- Provides real-time information of field operations, providing informed decision-making and efficient resource allocation.
- Measures workers efficiency and productivity, leading to improved task management and overall project outcomes.

Cost and time savings

- Reduce the need for manual data collection, paperwork, and administrative tasks, resulting in cost savings.
- Increase projects profitability due to these efficiencies.

Enhancement of safety and quality

- Improves safety by real-time reporting and monitoring.
- Enhances construction quality as issues are addressed on time by maintaining standards.

Increased worker engagement

- Engages field workers more effectively with the project using the application.

Limitations and Challenges

- Data privacy and security are the main concerns, as workers may feel uncomfortable about constant monitoring, resulting in resistance.
- The adoption of new technology often faces resistance from those accustomed to traditional methods, requiring training.
- Technical issues such as device compatibility, the need for stable internet connections, and reliable device functionality pose additional challenges.
- The initial investment and ongoing maintenance costs for these tools can be substantial.
- Managing the vast amounts of data generated requires systems and skilled personnel.
- Integrating new tools with existing systems can also be complex. Digital tools may also lack the ability to capture qualitative insights and handle complex tasks, limiting their effectiveness.

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