TRENDS IN CONSTRUCTION TECHNOLOGY – THE POTENTIAL IMPACT ON PROJECT MANAGEMENT AND CONSTRUCTION CLAIMS

IG NT

Construction Modeling Activity on Projects as Reported by General Contractors and Trade Contractors

BIM USES	GENERAL CONTRACTORS	TRADE CONTRACTORS
Crew Locations and Workforce Planning	14%	

John K unz and Martin Fischer, "Virtual Design and Construction: Themes, Case Studies and Implementation Suggestions," Stanford University Center for Integrated Facility Engineering (CIFE) Working Paper #097, Version 14, January 2012.

18. Steve Jones and Donna Laquidara-Carr, "New Survey Reveals How GCs, CMs and Subs Engage in BIM," *Engineering News-Record*, CBQ 16 ENR Contractor Business Quarterly, Summer 2016.

Penn State College of Engineering prepared a study investigating how linking sensors on structures and virtual models can better ensure the safety of construction workers on or around temporary structures. Monitoring of these temporary structures remains one of the largest safety concerns on job sites. The investigation concluded that CPS monitoring can promote safer construction and prevent failure of temporary structures through “virtual prototyping, data acquisition systems and communication networks.”

Two other examples of how new technology can enhance project site safety include the following.

- Spot-R – This is a small, belt mounted sensor that automates safety reporting on project sites. The sensor unit, combined with a wireless system, tracks worker movements and logs their activity data. The sensor utilizes an accelerometer, a gyroscope, and an altimeter to instantly recognize when and where a worker has fallen or stumbled. The sensor provides real time notification of hazards and injuries. This allows safety managers and superintendents to know where and when a safety incident occurred and logs all relevant data concerning each incident.[42]
- Intrusion Det ection Systems – The current intrusion detection system, Railroad Intrusion Detection System (“RIDS”Mbetto inser tojecognn(quisition s)15. 4.664 0 0 4.664 279.6128 466.654 Tm (42)Tj 0 TcS

Je Rubens tone, “Belt Clip Tracks Workers, Logs Safety Incidents to the Cloud,” *Engineering News-Record*, , Nov. 2, 2016.

43. Luk e Aba y, “Intrusion Detection System Protects Workers and Trains,” *Engineering News-Record*, , Sept. 14, 2016.

44. Innotas, “T he Project and Portfolio Management Landscape, 2016,” .

Rick Spenc e, “How these two women are bridging a gap between the construction industry and new technology,” http://business. nancialpost.com/entrepreneur/growth-strategies/how-these-women-are-bridging-a-gap-between-the-construction-industry-and-new-technology , Aug. 4, 2016.

46. Pam Kleineke, “Learn How Software Streamlines Operations for Busy Construction Companies,” , June 15, 2016.

47. David Puckett, “Settle-Now Proudly Welcomes the World to Something Truly New in Con ict Resolution,” , Oct. 18, 2016.

Industry Type

Commercial	66.2%
Transportation	22.6%
Residential	14.0%
Industrial	13.7%
Water/Wastew10 (t)15 (e)25 (w1n[(Indus)10 (14.)20 163 Troao163 Trt)15 (e)25 (w10 (t)15 (e)25 (w1n[(Indus10 (t)15(506.1	

Company Type

Contractor/Construction Manager	72.5%
Subcontractor/Material Supplier	19.0%
Architectural/Engineering/Design Firm	2.4%
Owner/Developer	2.2%
Government Agency	0.4%
Other	3.6%

Size of Companies

1-5 Employees	3.5%
6-20 Employees	7.5%
21-50 Employees	14.2%
51-100 Employees	15.0%
101-200 Employees	16.0%
201-500 Employees	19.8%
501-1,000 Employees	8.8%
Over 1,000 Employees	15.2%

Annual Sales Volume

Less than US$1 Million	3.5%
US$1-$5 Million	5.6%
US$6-$20 Million	14.5%
US$21-$50 Million	18.6%
US$50-$100 Million	15.6%
US$201-$500 Million	13.6%
Over US$500 Million	16.7%

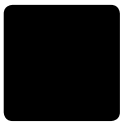
Daily Device Usage

Technologies Experimented With

Drones	20.7%
3D Scanners	10.2%
3D Printers	5.1%
Virtual Reality	4.9%
Augmented Reality	4.2%
Wearable Devices	3.6%
Other	2.9%
None	70.3%

APPENDIX A

CONTACTS



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