Project Controls EXPO
Melbourne, Australia

Project Controls Expo – 22nd November 2018
Melbourne Cricket Ground

Executive Eye:
Project Controls in the age of IoT

About the Speaker

Verghese Kochummen at Insynchro Australia Pty Ltd

- Over 15 years setting up Project Controls Applications
- Develop Project Control Process and Procedures
- Focus area on Construction Engineering and Transportation
- Principal Architect of Executive-Eye

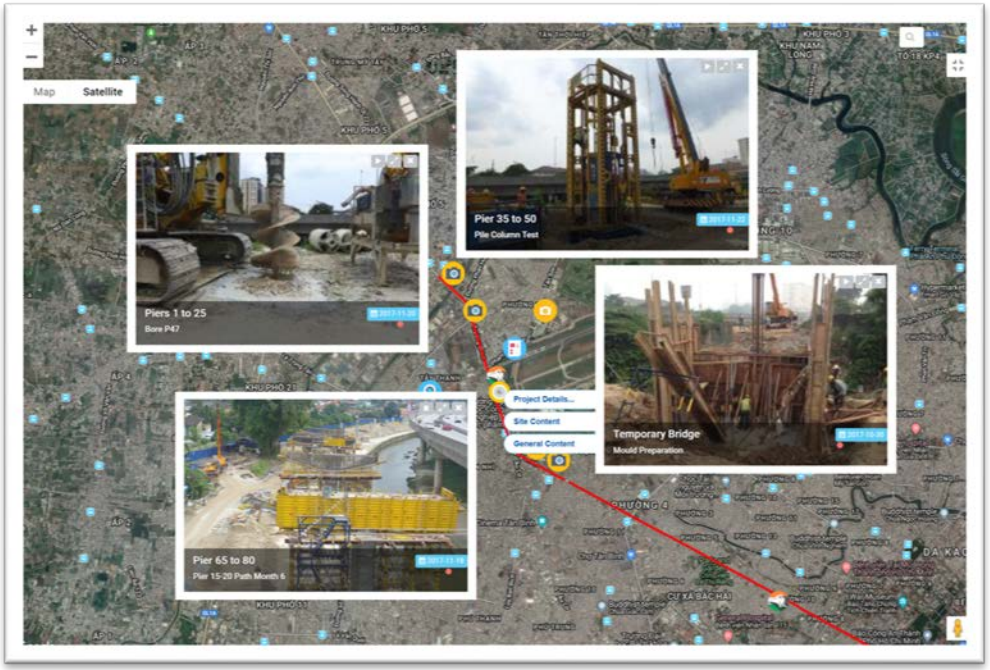
It's not technology that's hindering progress. It's Status-Quo!

Outline

- Levels of IoT Adoption for Project Controls
  - Photos
  - Videos
  - IP Cameras
  - Drones
  - Project Control Applications
- What's on the Horizon
  - Time Location Analytics
  - Automated Project Controls Data Collection

Levels of IoT Adoption for Project Controls – Site Photos

- Progress Photos
  - Standard Content for Progress Reports
  - Geo-spatial reporting canvas: photos tagged to GPS locations
  - Time-stamped to facilitate review of location progress from one reporting period to another



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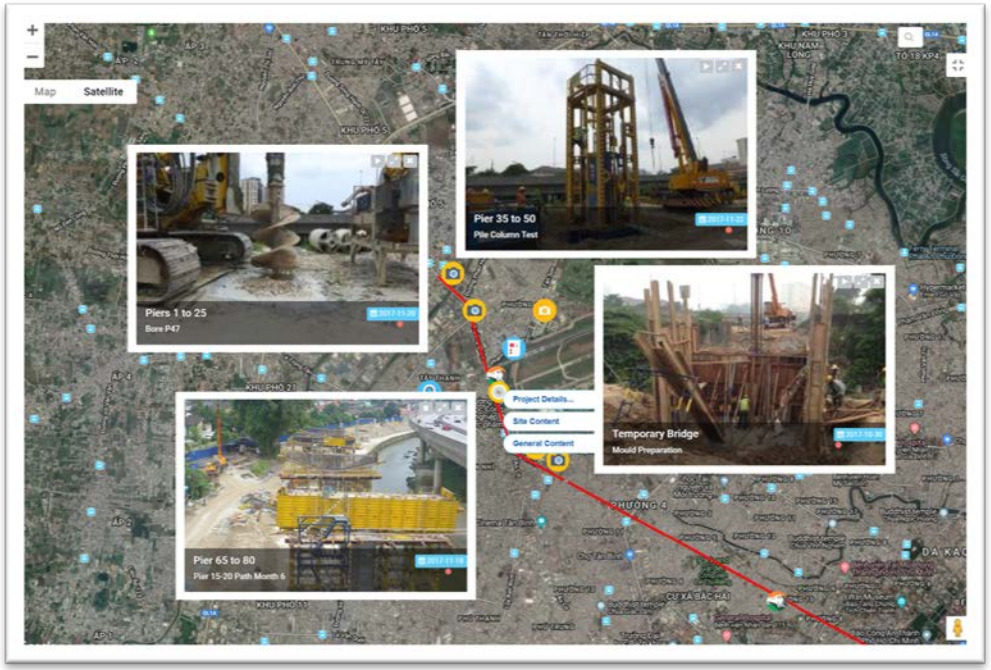

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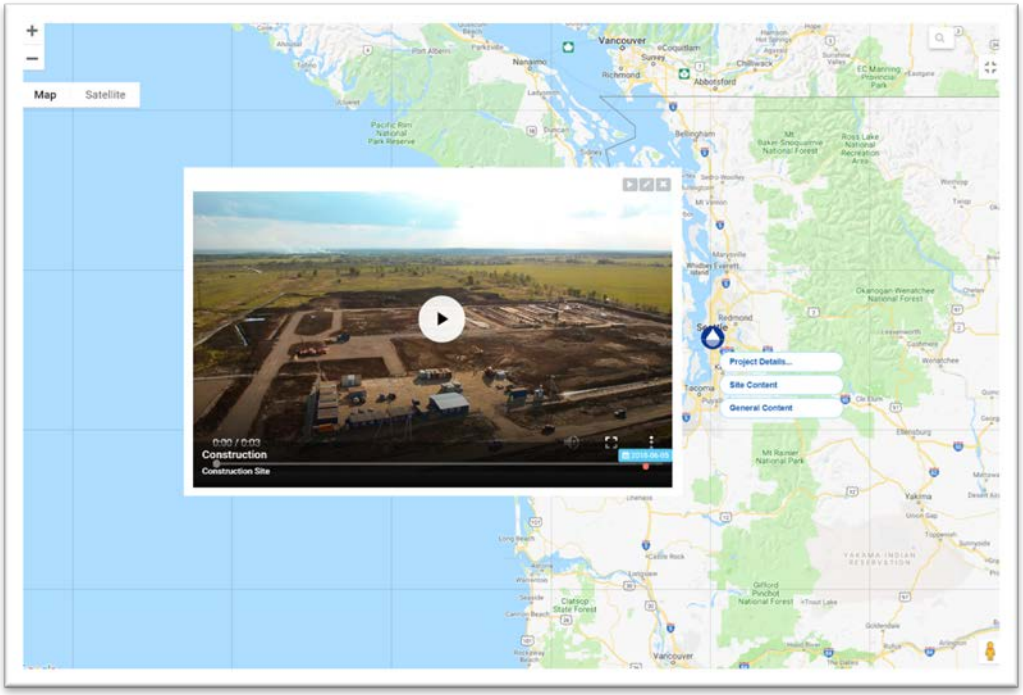
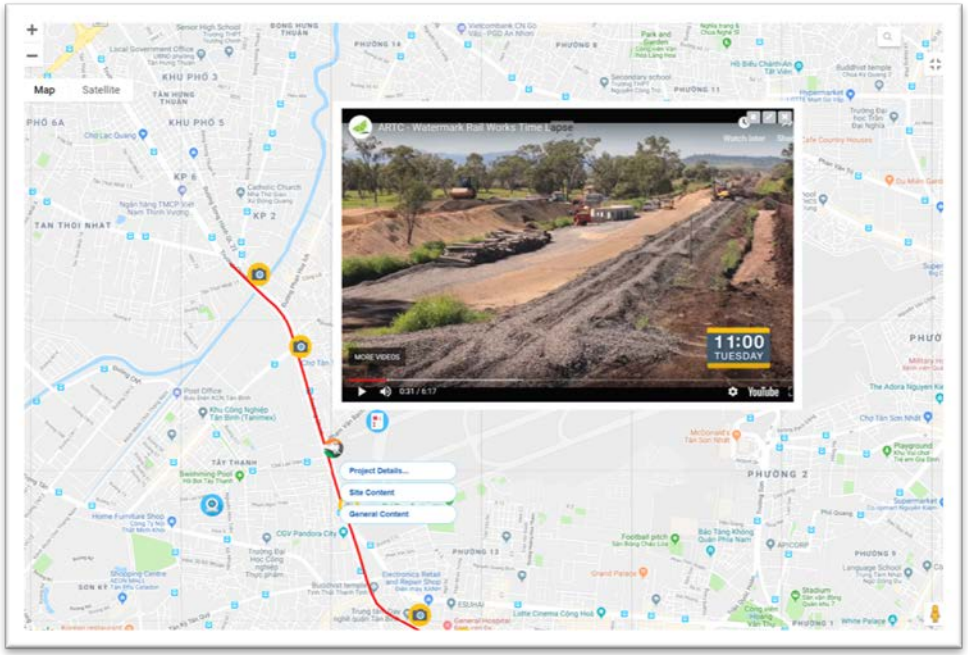
Levels of IoT Adoption for Project Controls – Site Videos

- Progress Videos
  - Captured from Mobile Phones, IP Cameras, Drone Feeds
  - Geo-spatial reporting canvas: photos and videos tagged to GPS locations
  - Time-stamped to facilitate review of location progress from one reporting period to another



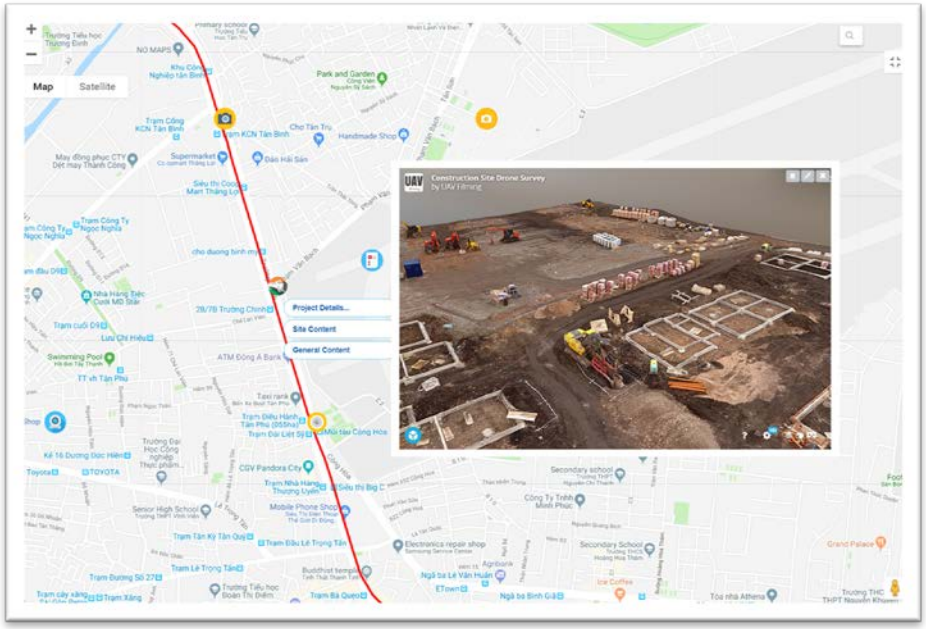
Levels of IoT Adoption for Project Controls - Timelapse

- Progress Timelapse
  - Captured typically using IP Cameras with Timelapse service
  - Geo-spatial reporting canvas: Timelapse videos tagged to GPS locations
  - Time-stamped to facilitate review of location progress from one reporting period to another



Levels of IoT Adoption for Project Controls – Reality Model

- Reality Models
  - Captured typically using Drones with Reality Model Rendering Service
  - Geo-spatial reporting canvas: 3D Reality Models tagged to GPS locations
  - Annotations / Plans to manage
    - Environmental Hazards
    - Site Storage Logistics



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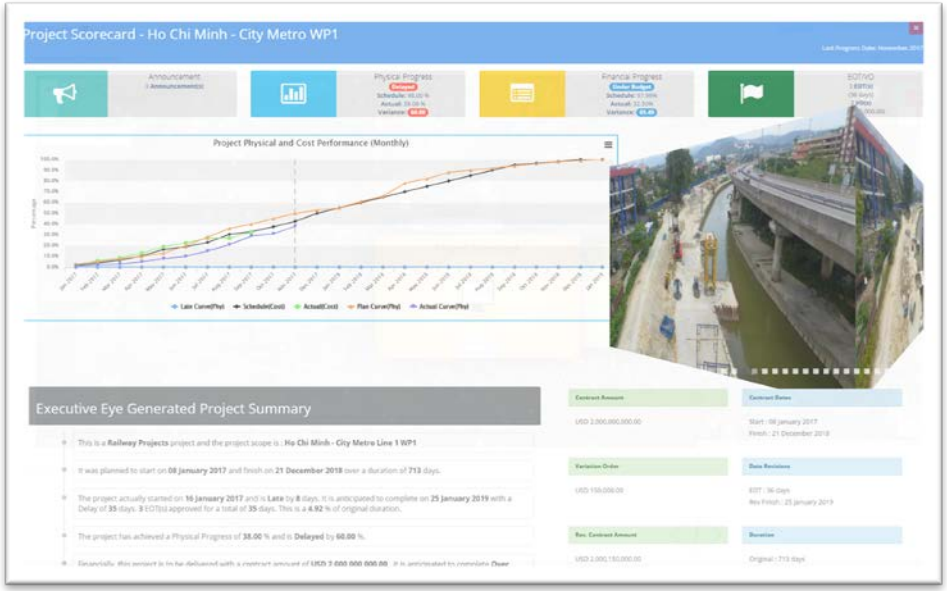
Convergence of IoT with Project Control Applications

- Verifying the version of Truth
  - Site Content +
  - Project Schedule +
  - Cost Schedule



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IoT Sensors and Smart Devices

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Levels of IoT Adoption for Project Controls – Weather Sensors

- Wireless Weather Station
  - Indoor/outdoor temperature, barometric pressure, relative humidity, wind speed, rain, wind chill and dew point
  - Solar Powered

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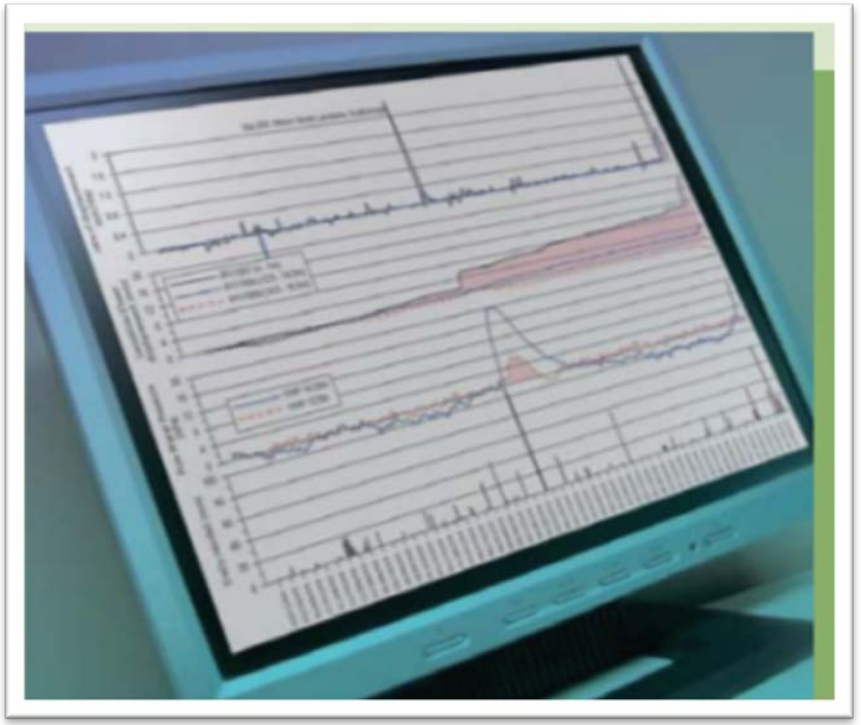
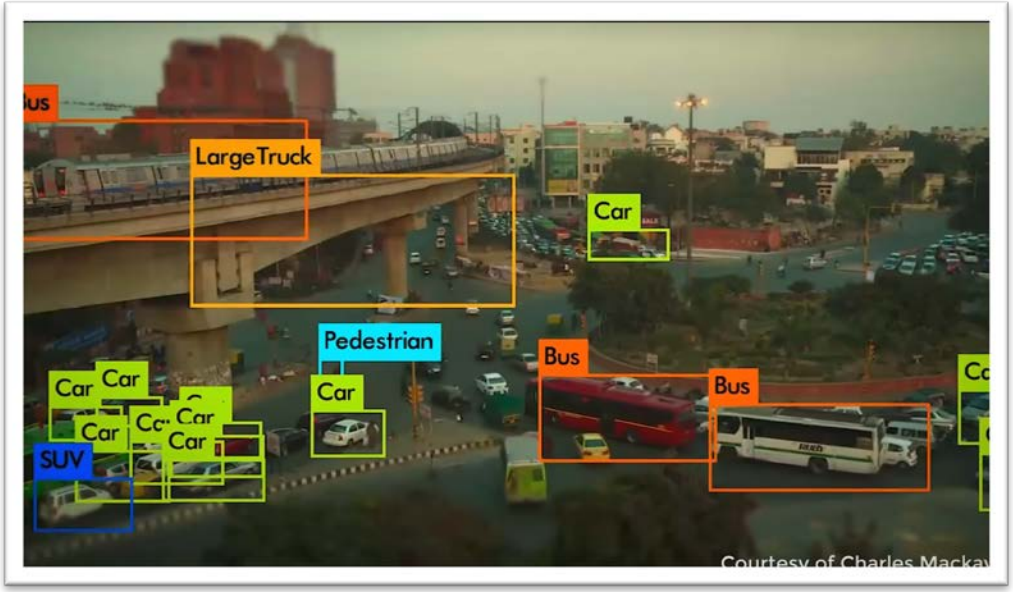
Levels of IoT Adoption for Project Controls – Failing Slope

- University of Wollongong (UOW) Smart Infrastructure Monitoring (SIM)
- Automated Continuous Real-time Monitoring (CRTM) platform
- Used By:
  - Mount Ousley Road by the RMS and
  - Sydney Trains



Levels of IoT Adoption for Project Controls – Site Equipment Detection

- YOLO (You Only Look Once)
- Object Detection
- Catalogue of Objects
- Realtime Detection from Drone Feed or IP Cam



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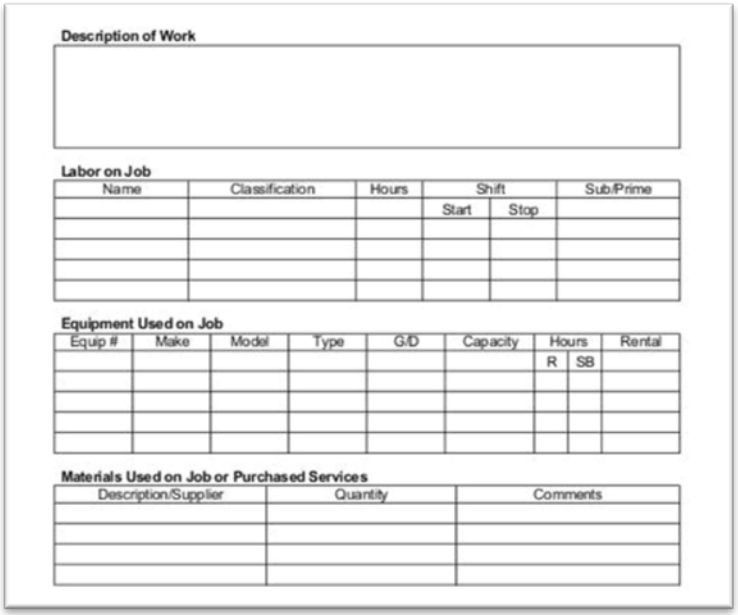
Levels of IoT Adoption for Project Controls – Smart Devices & Supporting Technologies

- Smart Equipment / Tools
  - Wireless Activation / Deactivation based on Permit Expiry
  - Excavators with GPS Progression Outputs
  - Real-time tracking of planned productivity vs actual
- Other Key Enabling Technologies
  - RFID
    - Materials on Site Tracking
    - Asset Identifier (Pier ID, Floor No, ..etc)
  - VR / AR
  - Collaboration Tools

Benefits - Daily Site Reports

- Automated Data Collection for Daily Site Reports
- Reduced Labour Effort
- Reliable / High Integrity



Description of Work

Labor on Job

Name	Classification	Hours	Shift		Sub/Prime
			Start	Stop	

Equipment Used on Job

Equip #	Make	Model	Type	G/D	Capacity	Hours		Rental
						R	SB	

Materials Used on Job or Purchased Services

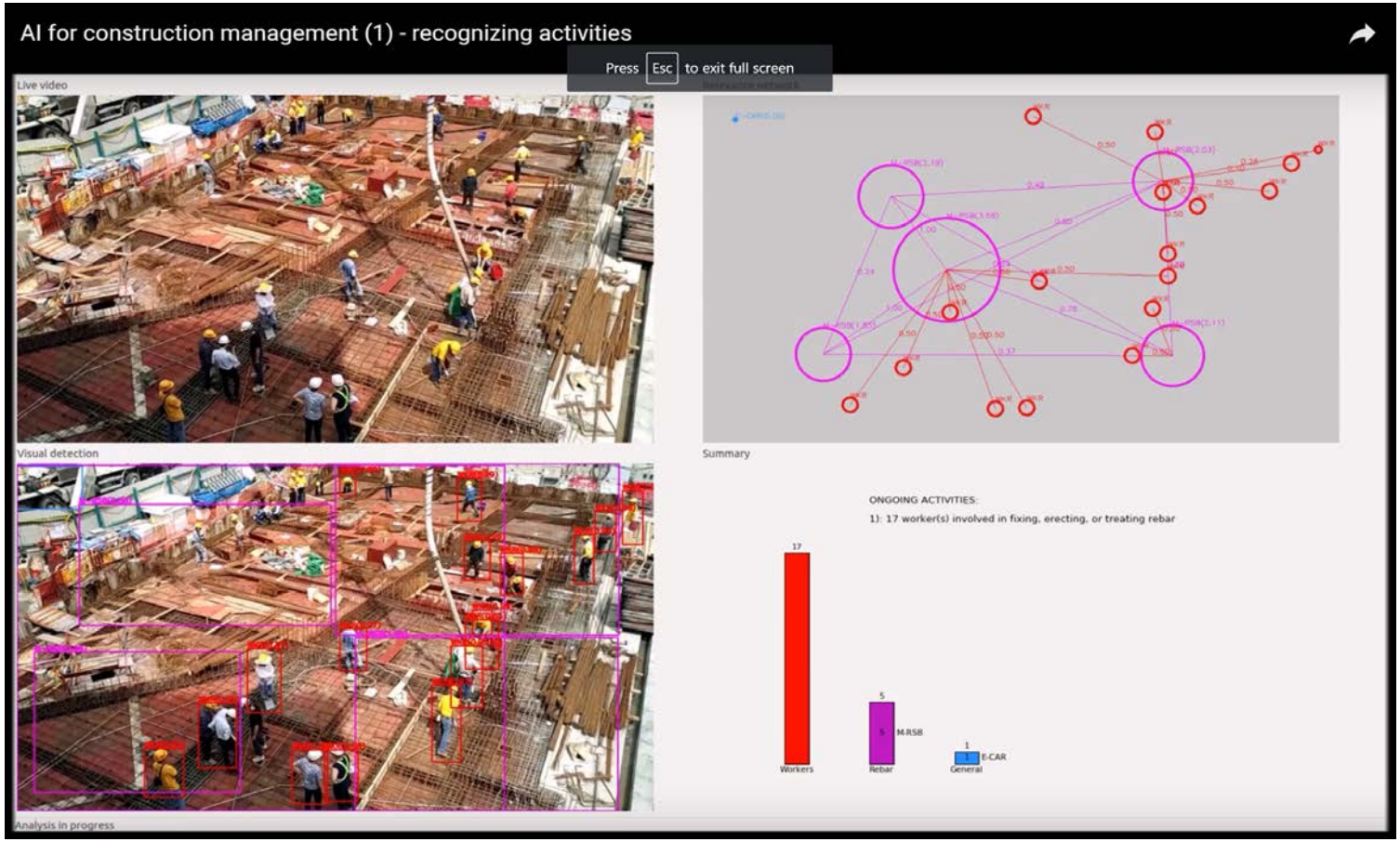
Description/Supplier	Quantity	Comments

Benefits - First Level Progress Reporting

- Setup:
  - Each Pier tagged with RFID Marker
  - Each Pier has standard Components (Parts) built sequentially
  - YOLO catalogue of Pier Construction Stages based on Components Deployed

- Progress Reporting
  - Drone feed picks up
    - RFID to determine Pier ID
    - YOLO determines stage of Pier component completion
    - Updates P6 Interim Schedule
    - Scheduler reviews Progress Report with Project Schedule and Piers with Completion Detected Today
    - Compare against site reports for verification

Benefits - Machine Learning and AI



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Contextualizing IoT for Project Controls

- **Executive-Eye**
  - Aggregate content from diverse set of repositories
  - Published on single canvas
  - Opens up content without native application installations
  - Convergence of context with Site Content and Project Control Applications such as P6 or MS Project
  - Visualized within Geospatial Canvas
  - Available on iOS and Android

What Will Project Teams Be Doing?

- Value-Adding the Value Chain
  - Collaborating
  - Capitalizing on Opportunities
  - Limiting Exposures on Risks
  - Faster Reaction to Alerts
  - Reduced Time and Cost
  - Increased Quality