

The logo for ITC Tower Cranes features a stylized 'I' and 'C' on the left. The 'I' is a vertical bar with a small square at the top. The 'C' is a large, bold, white letter with a square cutout in the center. To the right of the 'I' and 'C', the word 'INTERNATIONAL' is written in a smaller, white, sans-serif font. Below 'INTERNATIONAL', the words 'TOWER' and 'CRANES' are stacked in a very large, bold, white, sans-serif font. At the bottom of the logo, the words 'CONFERENCE & RECEPTION' are written in a smaller, white, sans-serif font.

**INTERNATIONAL
ITC TOWER
CRANES
CONFERENCE & RECEPTION**

Mohamed Abouelezz

WOLFFKRAN

Derek Bourke

BAM International

A digital approach for successful jobsites and tower cranes
optimization

The buildings we create inspire us and reflect who we are as a society

-- unknown --



Burj Khalifa, Dubai
United Arab Emirates



World Trade Center
Bahrain



The Shard London,
United Kingdom



ACROS, Fukuoka Japan



Bosco Verticale, Milan Italy



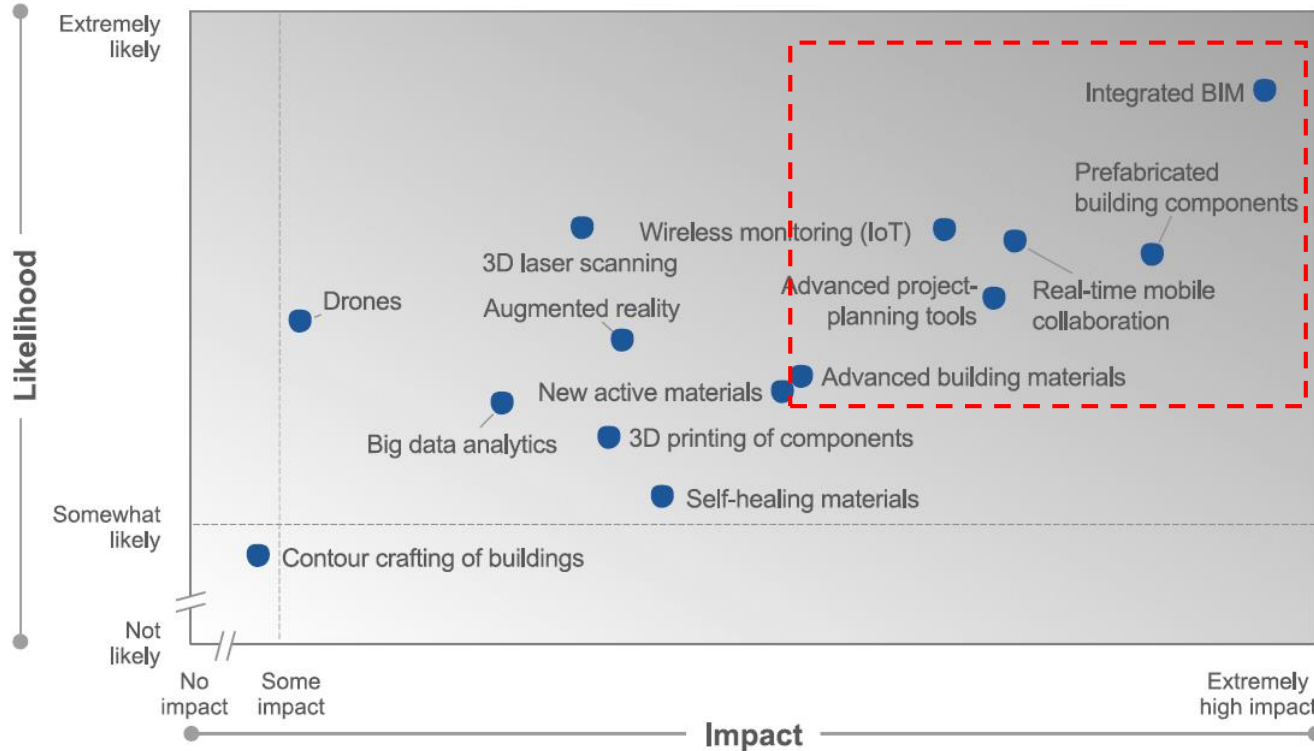
Mode Gakuen Cocoon
Tower, Tokyo, Japan



Shanghai Tower
China

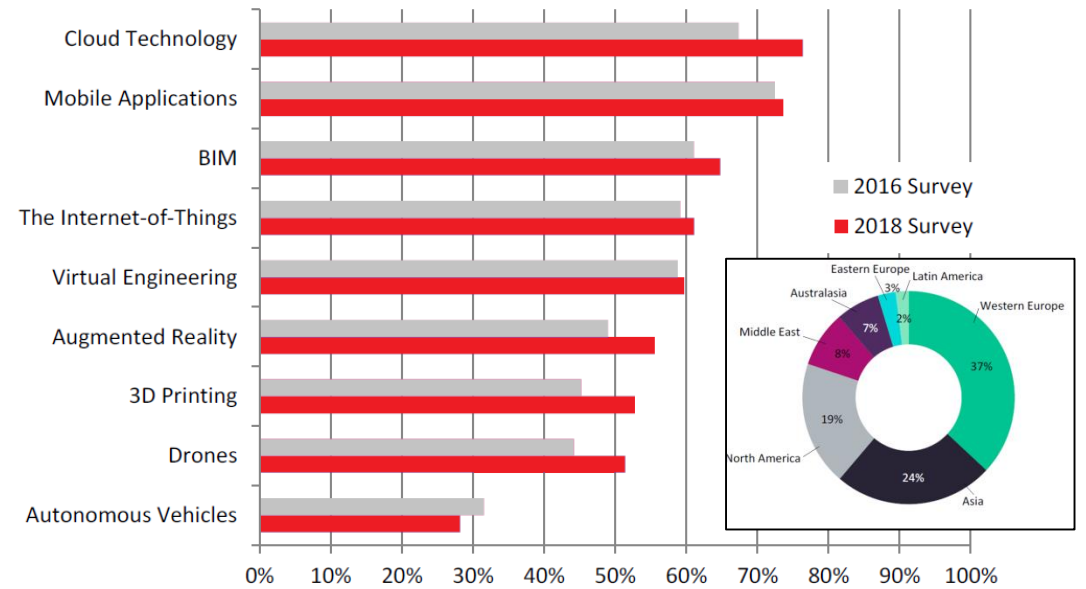
New Technologies in the Construction Industry

Current technological challenges facing tower crane manufacturer's



Source: Future of Construction Survey; World Economic Forum and The Boston Consulting Group

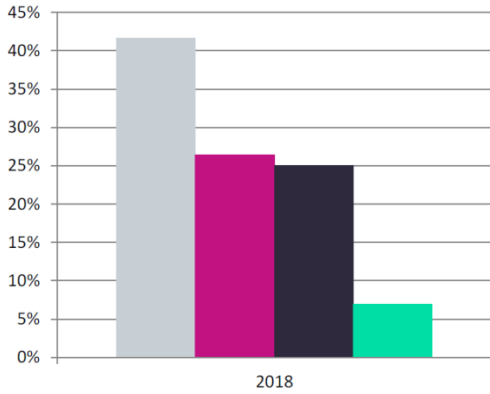
Investment Intentions in New Construction Technologies (% of total, 2016 and 2018 surveys)



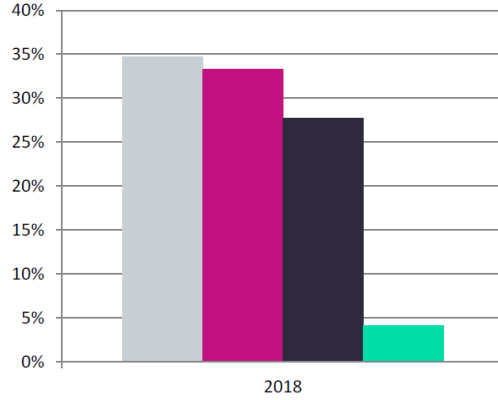
Source: GlobaData

New Technologies in the Construction Industry

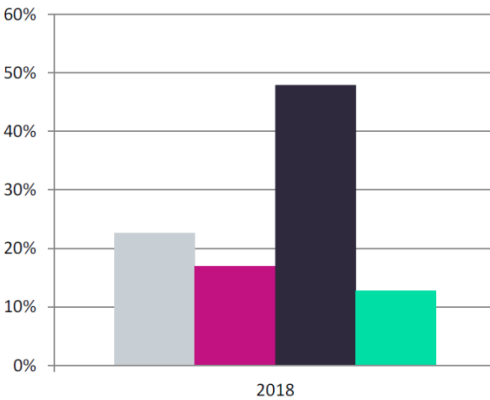
Drones



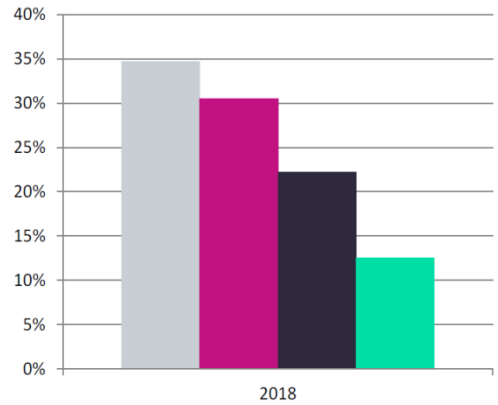
Internet of Things (IoT)



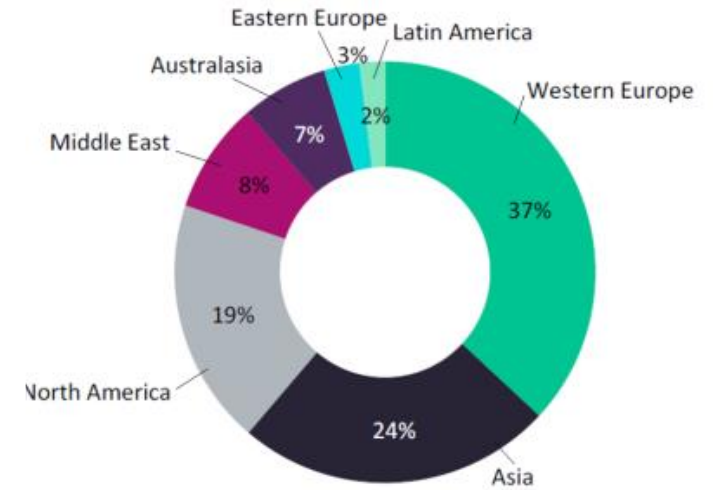
BIM



3D printing



- Not invested and no plans to invest
- Not invested but plan to invest within 2 years
- Invested, with further investment planned within 2 years
- Invested, with no further spending planned



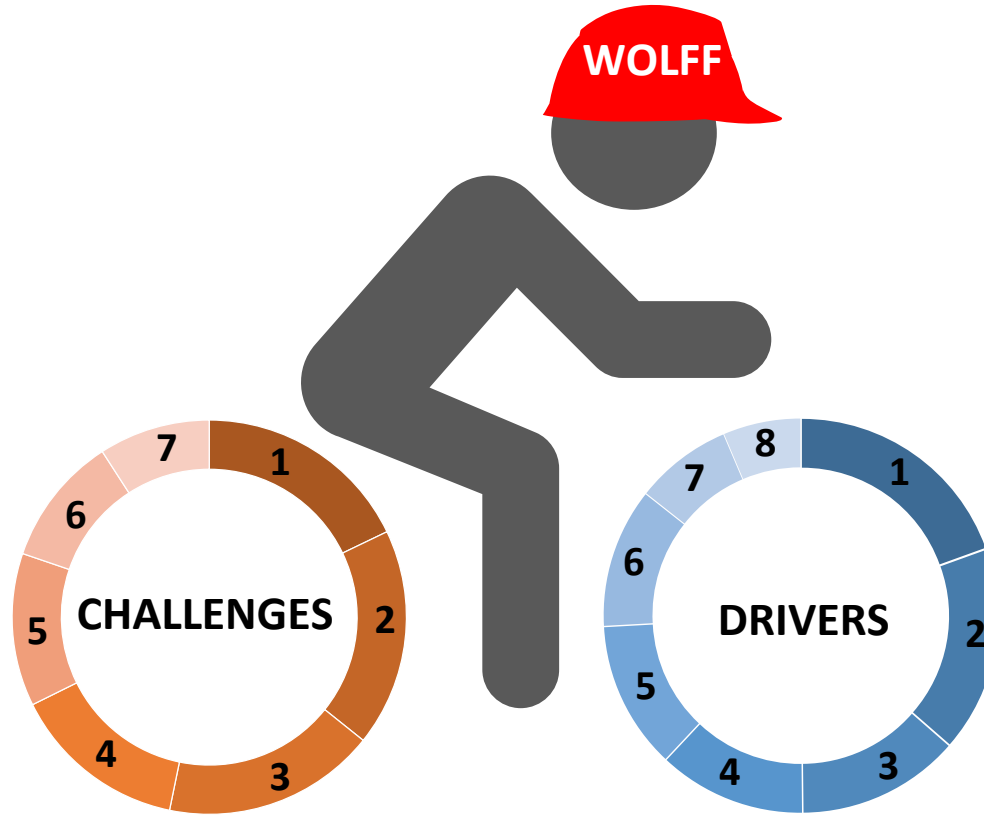
source: GlobalData



The world's first fully functional 3D-printed building in Dubai

Drivers and Challenges to New technology in the construction Industry

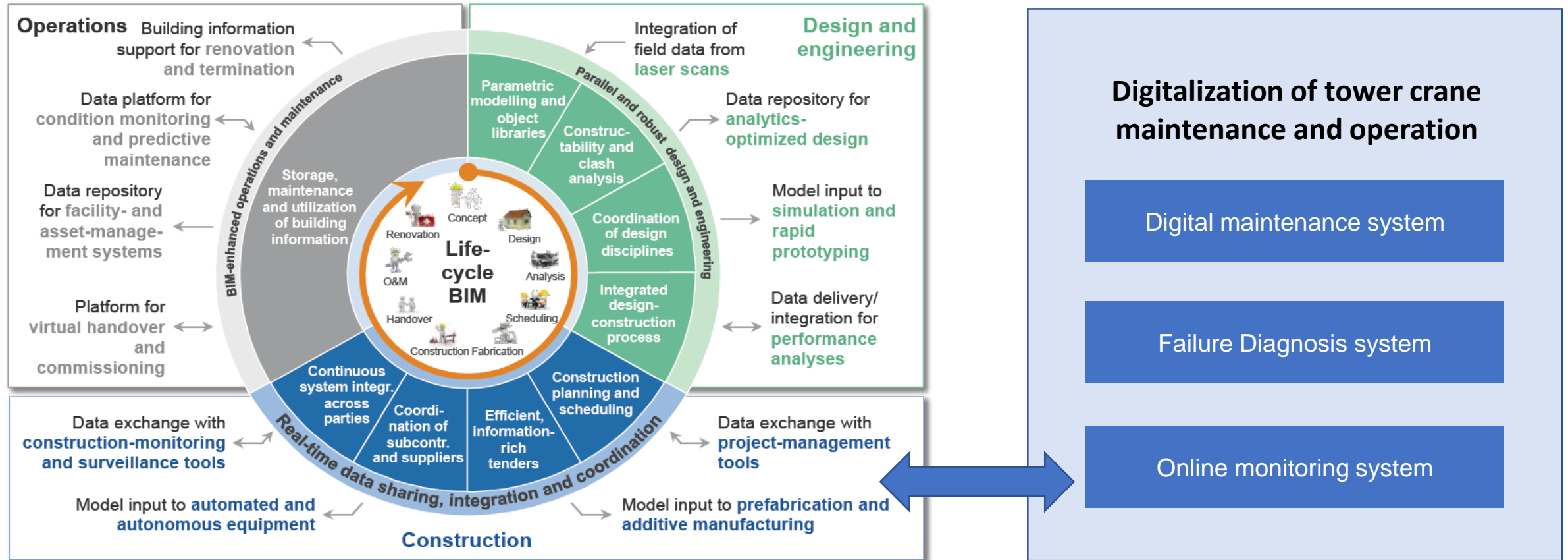
- 1 Cost
- 2 Limited ROI on the short term
- 3 Lack of sufficient skilled labor
- 4 Resistance of workers to adapt
- 5 Lack of financial resources
- 6 Lack of new technology awareness
- 7 Regulatory uncertainty



- 1 Improved productivity
- 2 Greater competitiveness
- 3 Improved ability to win contracts
- 4 Reduced construction costs
- 5 Faster construction time
- 6 Improved communication
- 7 Reduced material waste
- 8 Reduced delays

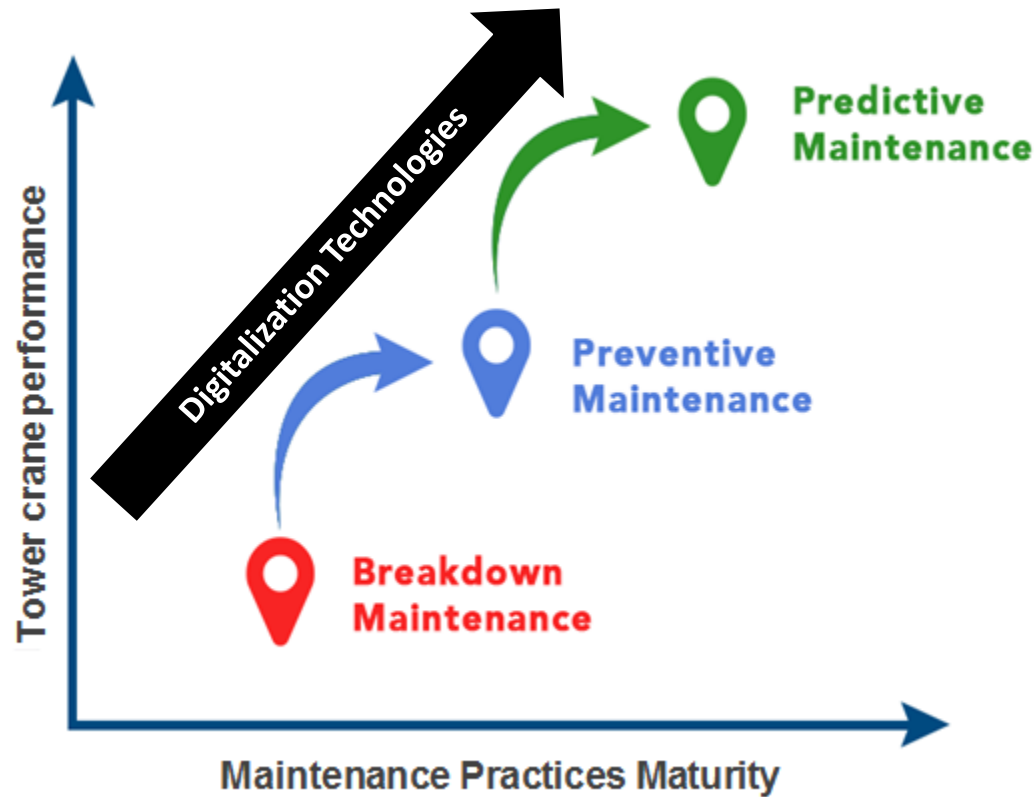
Drivers and challenges to investment in new technology
 (% of total, respondents selecting up to three barriers), 2018
 Data source: GlobalData

Lifecycle BIM and beyond



Source: Boston consulting group

Digitalization technologies and the evolution of tower crane maintenance



3. PREDICTIVE

Predictive maintenance services is based on monitoring the operating condition of the tower crane and can predict the life time of the machine or component by means of data analysis and improves reliability. Predictive maintenance services are triggered by the operating condition and a series of perceptive activities.

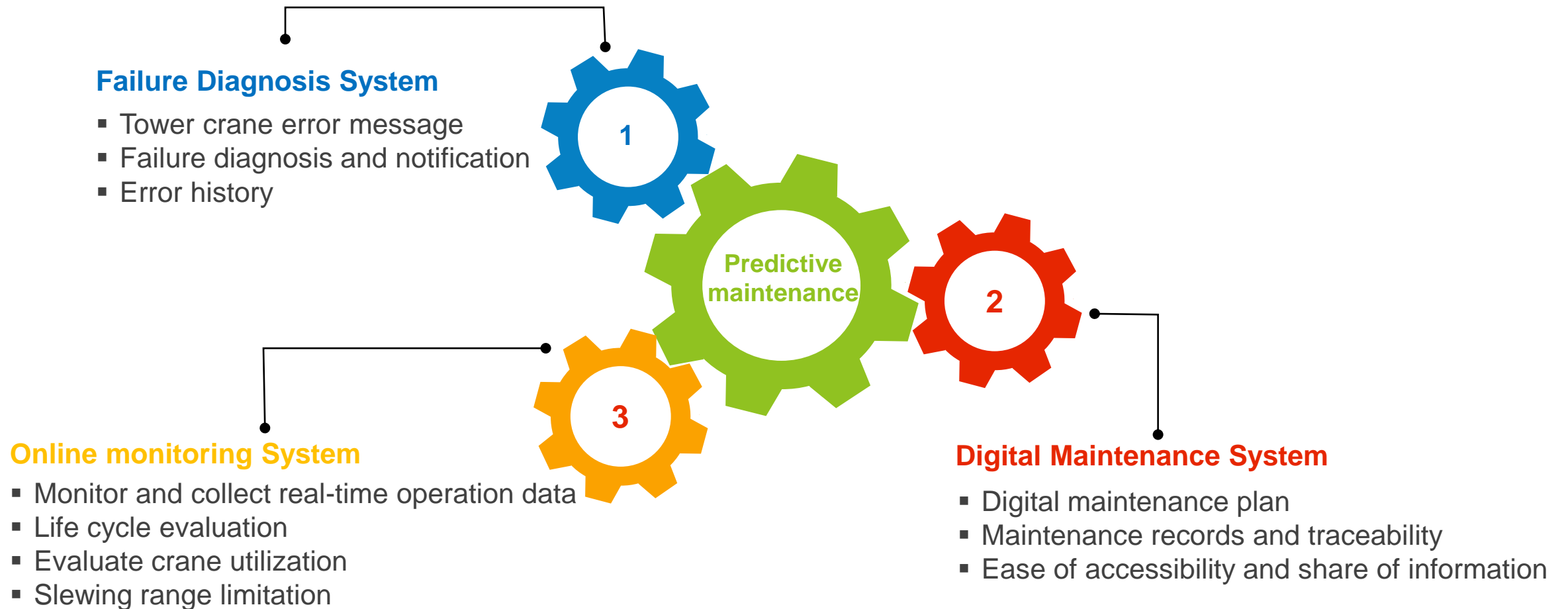
2. PREVENTIVE

Preventive maintenance services can minimize downtime, correct historical errors and reduce the inventory cost of work in process. Preventive maintenance services are triggered by scheduling a series of periodic reactive activities based on tower crane maintenance manuals.

1. BREAKDOWN

Breakdown tower crane maintenance services are triggered by machine or components failure, a series of random reactive activities, such as repair and replacement.

Predictive tower crane maintenance



BAMs Digital Construction Site Management System



Museum of the Future, Dubai
BAM International and BAM Ireland



Tower cranes: 2 x WOLFF 355B & 1 x WOLFF 8033.20





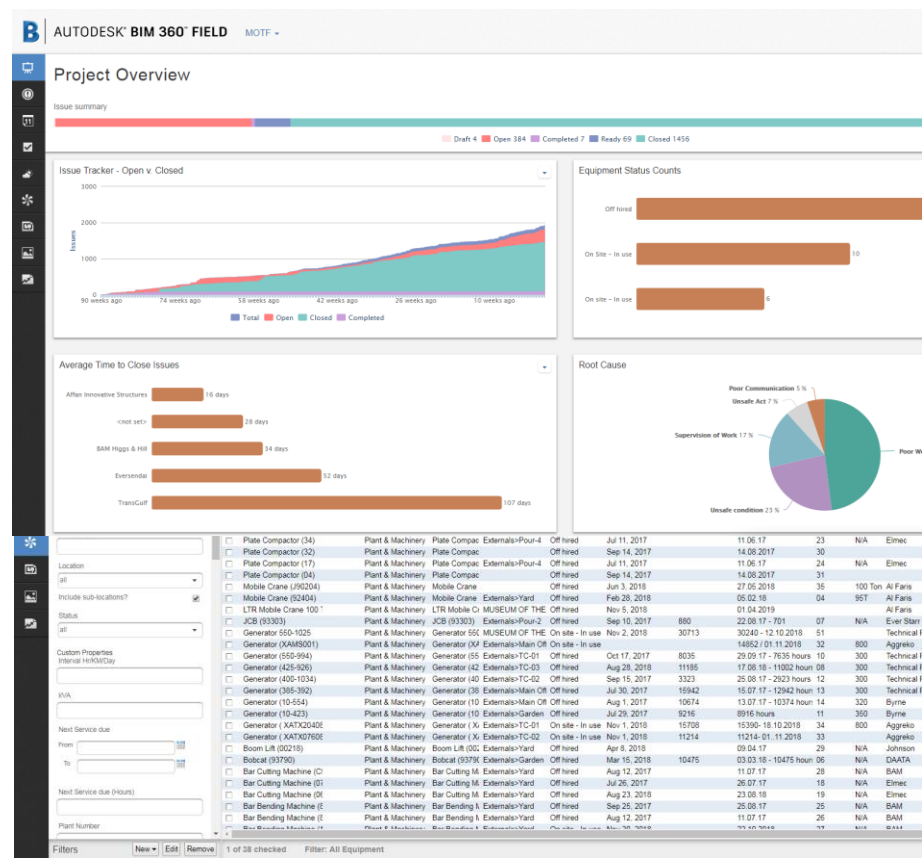
Functional Overview

BIM 360 Field - Mobile app



- 1 iPad app
- 2 Syncs with Web
- 3 Operates offline
- 4 View and capture information in the field

BIM 360 Field – Web based application



- 1 Web based accessible on any device
- 2 Permissions: Sub-contractor, Architect Client
- 3 Real time data
- 4 Reporting

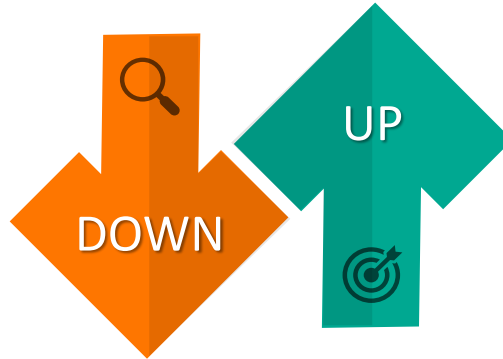
Objectives for using Digital Field Management

PAPER BASE CHAOS



VS

DIGITAL MANAGED ORDER



Manage Plant & Machinery

AUTODESK® BIM 360® FIELD MOTF > Equipment 89

Search [] Reset [] Close [] Add [] Edit [] Delete [] Print [] More Actions []

Filter: All Equipment

Name: []

Type: Plant & Machinery

Description: []

Location: all

Include sub-locations?

Status: all

Custom Properties: Interval Hr/KM/Day []

kVA: []

Next Service due: From [] To []

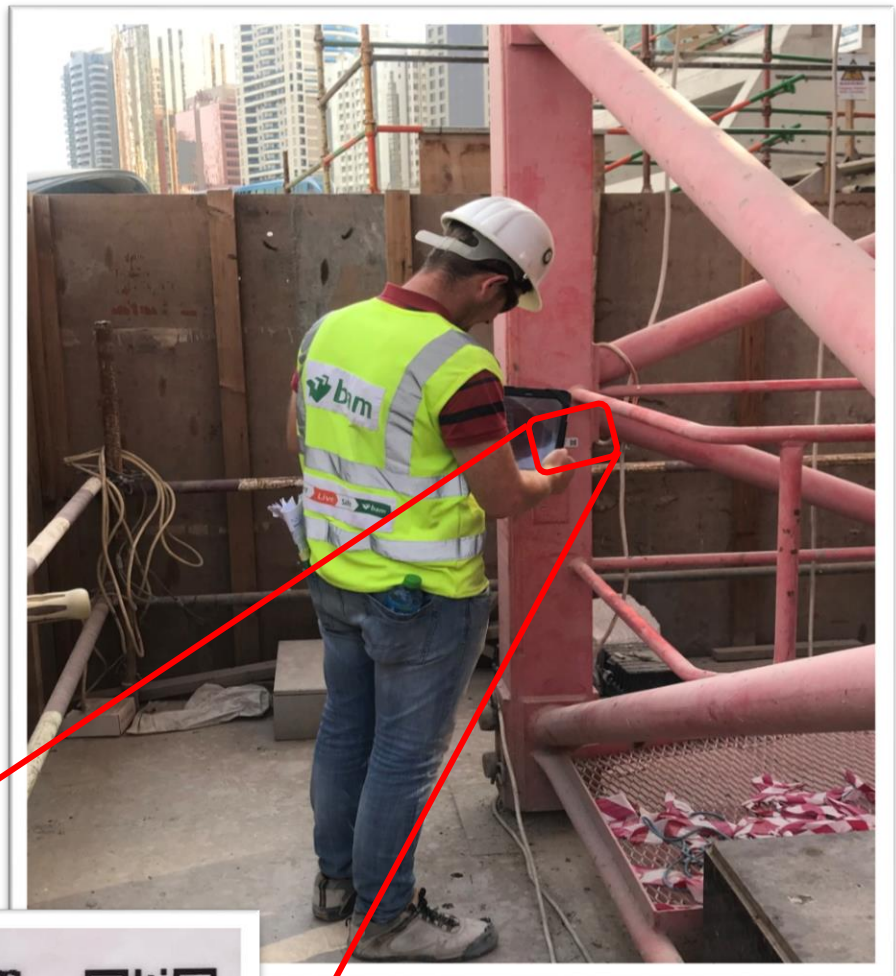
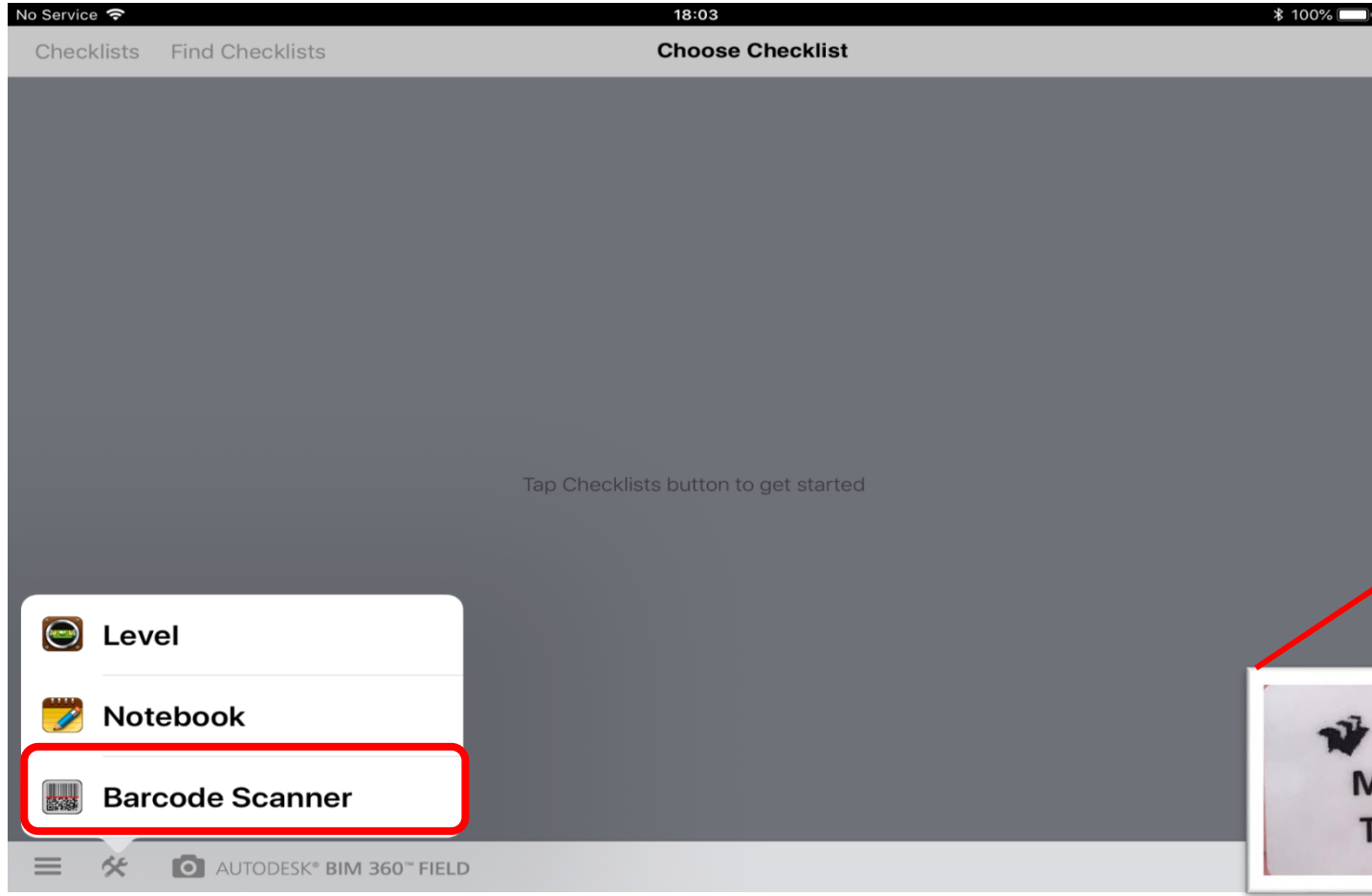
Next Service due (Hours): []

Plant Number: []

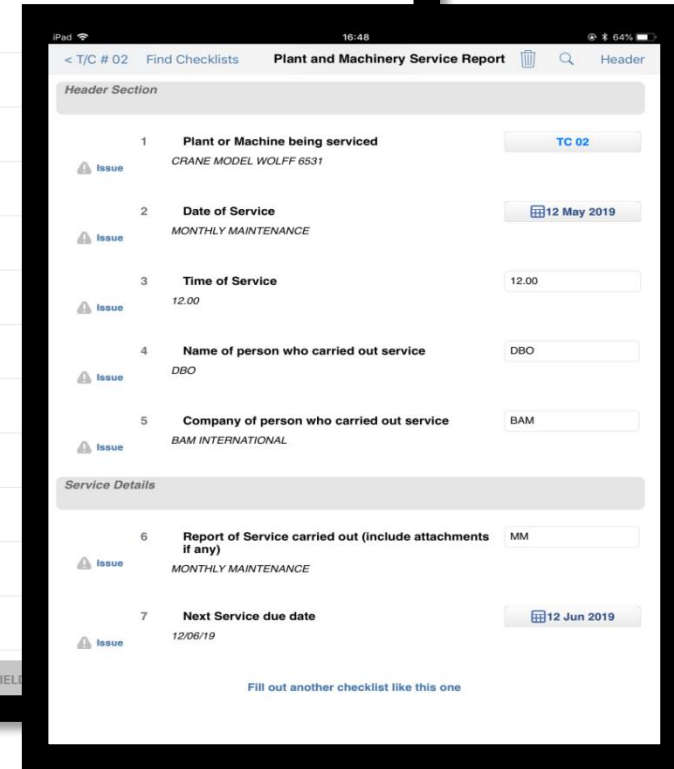
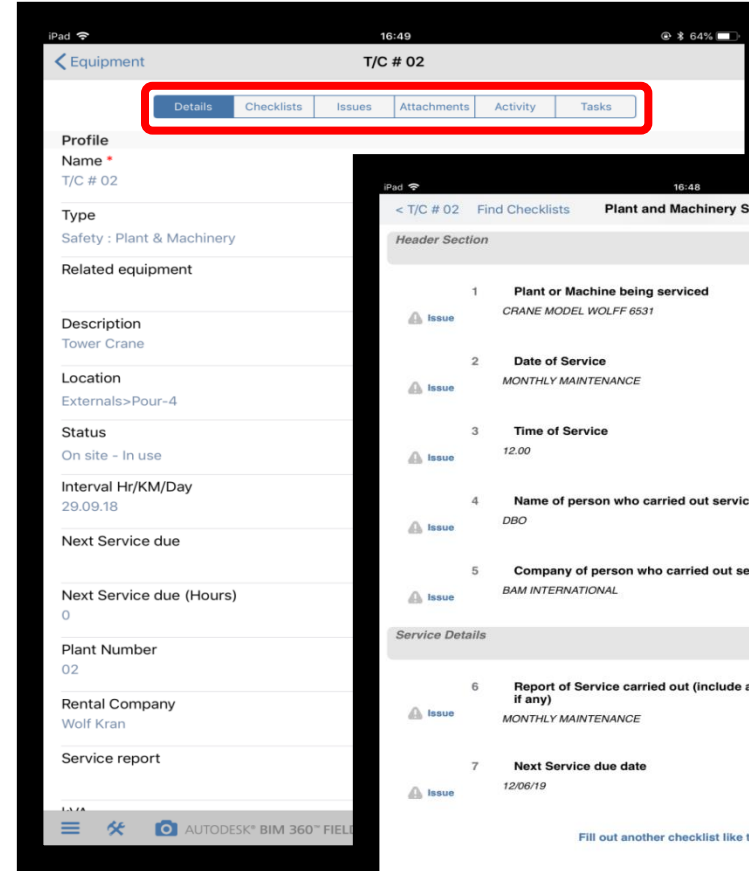
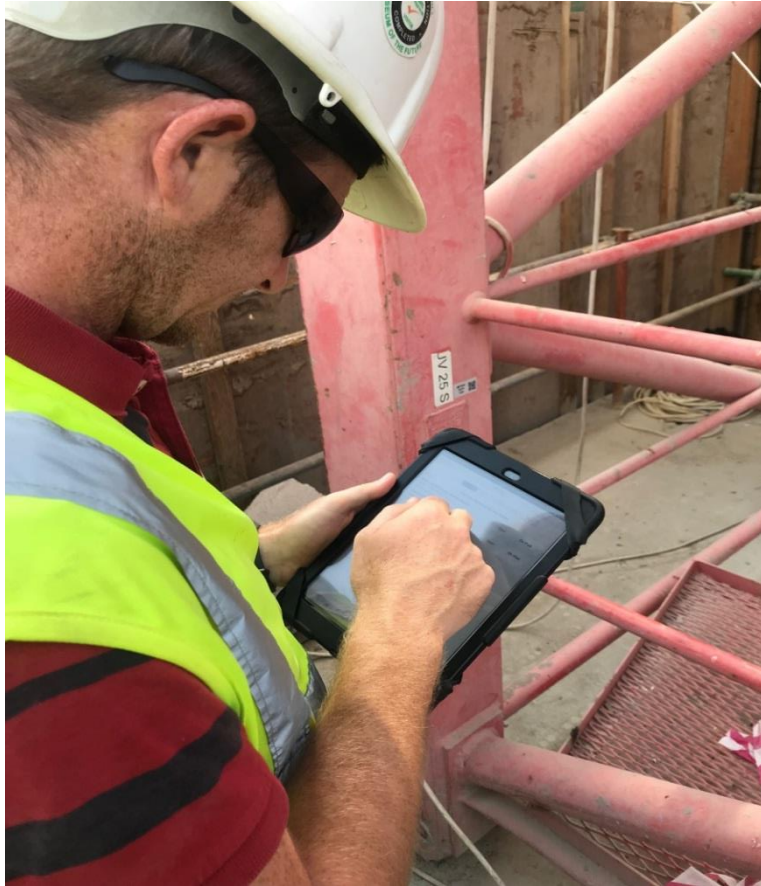
Name	Barcode	Type	Description	Location Path	Status	Next Service due	Next Service due (Hours)	Interval Hr/KM/Day	Plant Number	kVA	Rental Company	Date Created	# Issues	# Open Issu
<input type="checkbox"/> Welding Machine (7232)		Plant & Machinery	Welding Mach	Externals>Welding	On site - In use	Nov 12, 2018	11230	12.10.18 - 11230	09	0	BAM	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> Telehandler (40988)		Plant & Machinery	Telehandler (4	Externals>Pour-2	On site - In use	Sep 15, 2018	4950	17.08.18 - 4645 hours	05	N/A	Ever Starr	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> T/C # 03	MOTF-TC	Plant & Machinery	Tower Crane	Externals>Pour-7	On site - In use	Jun 12, 2019		10.10.18	03	N/A	Wolf Kran	10 Jul 2017 3:02 PM	0	0
<input checked="" type="checkbox"/> T/C # 02	MOTF-TC	Plant & Machinery	Tower Crane	Externals>Pour-4	On site - In use		0	29.09.18	02	N/A	Wolf Kran	10 Jul 2017 3:02 PM	2	0
<input type="checkbox"/> T/C # 01		Plant & Machinery	Tower Crane	Externals>Pour-2	On site - In use	Jun 12, 2019	0	26.09.2018	01	N/A	Wolf Kran	10 Jul 2017 3:02 PM	1	0
<input type="checkbox"/> Scissor Lift		Plant & Machinery	Battery Power	Internal>Level 2	On site - In use			16.02.2019			BHATIA BF	17 Feb 2019 8:51 AM	0	0
<input type="checkbox"/> Roller Compactor (31)		Plant & Machinery	Roller Compac	Externals>Pour-2	Off hired	Sep 14, 2017		14.08.17	21	02T	Elmec	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> Plate Compactor (35)		Plant & Machinery	Plate Compac	Externals>Pour-2	Off hired	Mar 24, 2018		13.02.18	22	N/A	Elmec	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> Plate Compactor (34)		Plant & Machinery	Plate Compac	Externals>Pour-4	Off hired	Jul 11, 2017		11.06.17	23	N/A	Elmec	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> Plate Compactor (32)		Plant & Machinery	Plate Compac	Externals>Pour-4	Off hired	Sep 14, 2017		14.08.2017	30			06 Aug 2017 10:44 A	0	0
<input type="checkbox"/> Plate Compactor (17)		Plant & Machinery	Plate Compac	Externals>Pour-4	Off hired	Jul 11, 2017		11.06.17	24	N/A	Elmec	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> Plate Compactor (04)		Plant & Machinery	Plate Compac	Externals>Pour-4	Off hired	Sep 14, 2017		14.08.2017	31			06 Aug 2017 10:42 A	0	0
<input type="checkbox"/> Mobile Crane (J90204)		Plant & Machinery	Mobile Crane	Externals>Yard	Off hired	Jun 3, 2018		27.05.2018	35	100 Ton	Al Faris	05 Dec 2017 10:09 A	0	0
<input type="checkbox"/> Mobile Crane (92404)		Plant & Machinery	Mobile Crane	Externals>Yard	Off hired	Feb 28, 2018		05.02.18	04	95T	Al Faris	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> LTR Mobile Crane 1001		Plant & Machinery	LTR Mobile Cr	MUSEUM OF THE	Off hired	Nov 5, 2018		01.04.2019			Al Faris	28 Nov 2018 1:28 PM	0	0
<input type="checkbox"/> JCB (93303)		Plant & Machinery	JCB (93303)	Externals>Pour-2	Off hired	Sep 10, 2017	880	22.08.17 - 701	07	N/A	Ever Starr	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> Generator 550-1025		Plant & Machinery	Generator 550	MUSEUM OF THE	On site - In use	Nov 2, 2018	30713	30240 - 12.10.2018	51		Technical F	28 Nov 2018 12:48 P	0	0
<input type="checkbox"/> Generator (XAMS001)		Plant & Machinery	Generator (XA	Externals>Main Of	On site - In use			14852 / 01.11.2018	32	800	Aggreko	06 Aug 2017 5:39 PM	0	0
<input type="checkbox"/> Generator (550-994)		Plant & Machinery	Generator (55	Externals>TC-01	Off hired	Oct 17, 2017	8035	29.09.17 - 7635 hours	10	300	Technical F	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> Generator (425-926)		Plant & Machinery	Generator (42	Externals>TC-03	Off hired	Aug 28, 2018	11185	17.08.18 - 11002 hours	08	300	Technical F	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> Generator (400-1034)		Plant & Machinery	Generator (40	Externals>TC-02	Off hired	Sep 15, 2017	3323	25.08.17 - 2923 hours	12	300	Technical F	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> Generator (385-392)		Plant & Machinery	Generator (38	Externals>Main Of	Off hired	Jul 30, 2017	15942	15.07.17 - 12942 hour:	13	300	Technical F	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> Generator (10-554)		Plant & Machinery	Generator (10	Externals>Main Of	Off hired	Aug 1, 2017	10674	13.07.17 - 10374 hour:	14	320	Byrne	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> Generator (10-423)		Plant & Machinery	Generator (10	Externals>Garden	Off hired	Jul 29, 2017	9216	8916 hours	11	350	Byrne	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> Generator (XATX2040E		Plant & Machinery	Generator (X	Externals>TC-01	On site - In use	Nov 1, 2018	15708	15390- 18.10.2018	34	800	Aggreko	08 Nov 2017 1:02 PM	0	0
<input type="checkbox"/> Generator (XATX0760E		Plant & Machinery	Generator (X	Externals>TC-02	On site - In use	Nov 1, 2018	11214	11214- 01.11.2018	33		Aggreko	10 Oct 2017 11:14 AM	0	0
<input type="checkbox"/> Boom Lift (00218)		Plant & Machinery	Boom Lift (00	Externals>Yard	Off hired	Apr 8, 2018		09.04.17	29	N/A	Johnson	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> Bobcat (93790)		Plant & Machinery	Bobcat (93790	Externals>Garden	Off hired	Mar 15, 2018	10475	03.03.18 - 10475 hour:	06	N/A	DAATA	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> Bar Cutting Machine (C		Plant & Machinery	Bar Cutting M	Externals>Yard	Off hired	Aug 12, 2017		11.07.17	28	N/A	BAM	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> Bar Cutting Machine (07		Plant & Machinery	Bar Cutting M	Externals>Yard	Off hired	Jul 26, 2017		26.07.17	18	N/A	Elmec	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> Bar Cutting Machine (06		Plant & Machinery	Bar Cutting M	Externals>Yard	Off hired	Aug 23, 2018		23.08.18	19	N/A	Elmec	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> Bar Bending Machine (E		Plant & Machinery	Bar Bending M	Externals>Yard	Off hired	Sep 25, 2017		25.08.17	25	N/A	BAM	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> Bar Bending Machine (E		Plant & Machinery	Bar Bending M	Externals>Yard	Off hired	Aug 12, 2017		11.07.17	26	N/A	BAM	10 Jul 2017 3:02 PM	0	0
<input type="checkbox"/> Bar Bending Machine (E		Plant & Machinery	Bar Bending M	Externals>Yard	On site - In use	Nov 20, 2018		23.10.2018	27	N/A	BAM	10 Jul 2017 3:02 PM	0	0

Filters: New [] Edit [] Remove [] 1 of 38 checked Filter: All Equipment Show: 2000 [] Previous []

Field Management – Checklists Using iPad with QR Code



Field Management – Checklists Using iPad with QR Code



Create Tasks – Reminders - Alerts

AUTODESK® BIM 360™ FIELD MOTF > Equipment > T/C # 02

Checklists Issues **Tasks** Attachments Comments History

+ Task Edit Void

ID	Name	Status	Description	Author	Assigned To	Responsible Company	Date Created	Scheduled For	Locations	Task Category

Added by Eoin Ryan, Phone: , created on Jul 12, 2017 at 2:34 PM

ID: 000057
 Name: JCB service due
 Task Category: Service Due
 * Description: JCB service due
 Responsible Company: BAM Higgs & Hill (+97143927277)
 Scheduled For: Jun 12, 2019 8:00 AM
 Locations: Externals>Pour-2
 Status: Open

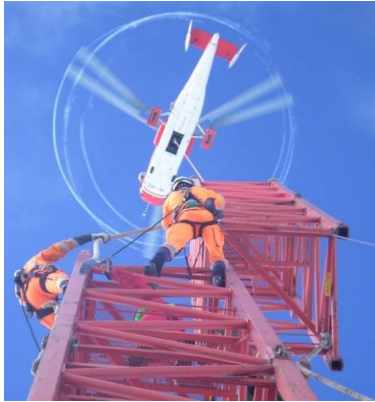
Assigned To George Moses

First Name	Last Name	Role	Company
George	Moses	Contractor, Photo Viewer	BAM Higgs & Hill
Syed Mohammed	Shahid	Contractor	BAM Higgs & Hill
Saif	Inamdar	Contractor, Photo Viewer	BAM Higgs & Hill
Biju	Koottala	Contractor, Photo Viewer	BAM Higgs & Hill
Dexter	Betantos	Inspector, Photo Viewer	Deemah Stone
Jeremy	Reynolds	Inspector, Photo Viewer	Plafond
Saiah	Johnson	Inspector, Photo Viewer	TransGulf
Anoop	S Prabhu	Contractor, Photo Viewer	BAM Higgs & Hill
Mark	Laverack	Contractor, Photo Viewer	BAM Higgs & Hill
Amila	Madhushankha	Inspector, Photo Viewer	TransGulf
Linson	Geevarghese	Inspector, Photo Viewer	Deemah Stone
Sangeeth	Vazhoor	Inspector, Photo Viewer	AI Nasr
Dirk	Van Der Ploeg	Inspector	BAM Ireland
Kamel	Shata	Contractor, Photo Viewer	BAM Higgs & Hill
New	Member	Contractor, Photo Viewer	BAM Higgs & Hill

Left sidebar: Profile Name: T/C # 02, Type: Plant & Machinery, Description: Tower Crane, Location: Pour-4, Status: On site - In use, Interval Hr/KM/Day: 29.09.18, kVA: N/A, Next Service due: Jun 12, 2019, Next Service due (Hours): 0, Plant Number: 02, Rental Company: Wolf Kran, Service report: [empty]

Full Service History Digitally Recorded

The screenshot displays the Autodesk BIM 360 Field interface. The top navigation bar includes the Autodesk logo, 'AUTODESK® BIM 360™ FIELD', and user information 'MOTF' and 'Equipment > T/C # 02'. The left sidebar contains a search bar and a filter panel with options like 'All Equipment', 'Name', 'Type', 'Location', and 'Status'. A central list of equipment items is shown, with 'T/C # 02' selected and highlighted in red. The right pane shows the 'Profile' details for the selected item, including fields for Name, Type (Plant & Machinery), Description (Tower Crane), Location (Pour-4), Status (On site - In use), Interval Hr/KM/Day (29.09.18), kVA (N/A), Next Service due (0), Plant Number (02), and Rental Company. A red box highlights the 'Attachments' tab in the top navigation bar. Below it, the 'Attachments' section lists three items: 'TC_02_Service_Report_06-08-2017.pdf', 'IMG_ffc9ab85-3de0-467f-9975-4856bbf49aaa.jpg', and 'IMG_5762b0a1-335b-4a25-b050-05b40ba491c9.jpg'. Each attachment includes a thumbnail, a 'Markup' button, a 'Download' button, and a 'Delete' button.



Thank you for your attention!

