

3rd Quarter 2019

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# bulletin

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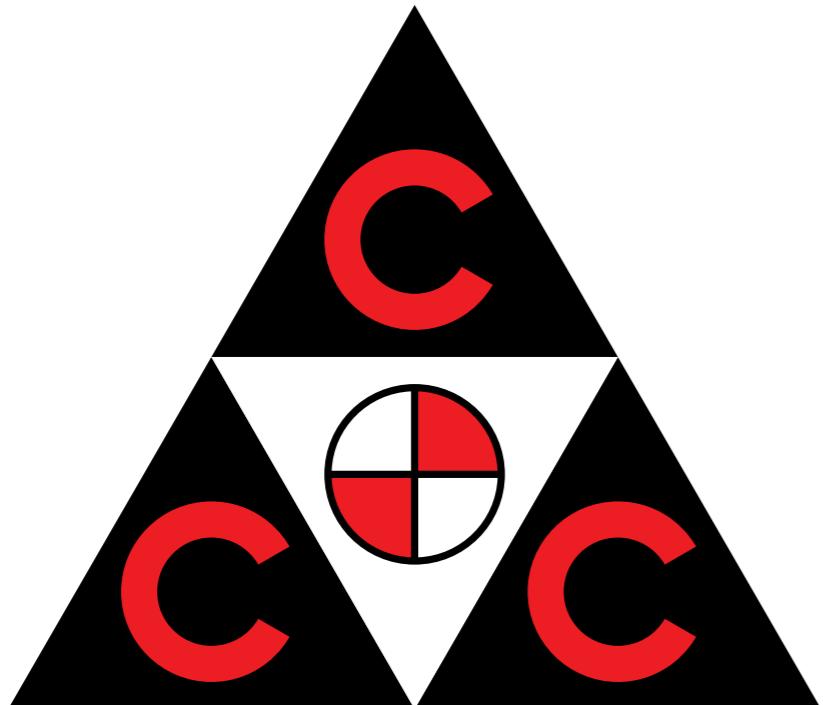
# READY TO FLY!

Abu Dhabi's New Midfield Terminal Building

Abu Dhabi's New Midfield Terminal Building



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### THE YEAR AHEAD

As we are starting 2020, let us focus on three topics which I believe are key for the success of CCC in the next 12 months:

1. We have to, quickly, and in an organized way, complete our existing projects in a cost-effective manner and work out a successful commercial close-out with our clients.
2. We have to choose the right type of projects to win, with positive cash flow projection and minimal risk, and focus only on good clients.
3. We need to empower the new leadership we have appointed to run CCC and support them in order to help them succeed.

I am confident that with your dedication, loyalty and hard work CCC will grow stronger and become more successful and profitable in the years to come.

# Process Monitoring, Measurement & Performance Evaluation

## Process Objectives & Measures

Having processes in place is a significant step, but an organization needs to know how well the processes are achieving objectives. Imagine if your car didn't have indicators for speed, distance, rpm or fuel gauge. This is the role of process measures, i.e. metrics.

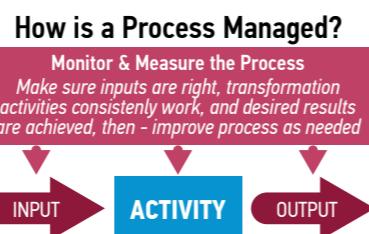
They can tell us whether targets for strategic objectives (e.g. financial metrics, market share metrics) as well as more tactical objectives (e.g. schedule metrics, production work metrics, employee metrics) are being met.



## Process Monitoring

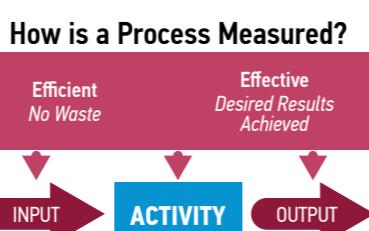
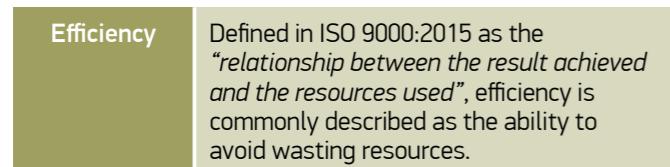
Similarly, organizational processes need to be monitored and measured methodically. The organization must ensure the results are valid and then analyze data and information to evaluate its own performance. ISO 9000:2015 defines performance as "measurable result".

In other words, the organization has to determine quantities, metrics (or status in general) in order to understand qualities about its own performance.



## Process Measuring

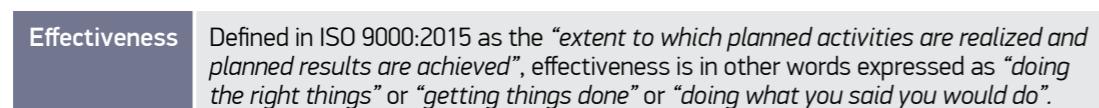
Key measures of any process are its "efficiency" and its "effectiveness". These measures act as indicators of the inputs and outputs of the process.



For example, measuring the actual hours expended for finishing works compared to the planned hours provides an indication of resource efficiency as a percentage.

All process inputs and outputs may be subjected to efficiency measurement, so we may use staff efficiency, equipment efficiency, materials efficiency, information efficiency, and so on.

It is, of course, possible to use resources 'efficiently' while being ineffective (or inversely 'inefficiently' while being effective); this is why performance efficiency improvement must be related to certain output objectives.



When something is deemed effective, it means it has an intended or expected outcome.

Aside from measuring inputs and outputs, sometimes it is also essential to perform in-process measurements, i.e. take continuous measurements during processing for optimal control. This is especially significant when processes are influenced by many parameters for example, taking all necessary measurements in the concrete batching plant during production of the concrete mix, or when using electronic guidance and control systems to aid equipment operators in their work.



## Process Monitoring, Measurement & Performance Evaluation

If process measurements are properly selected, they should be predictive of one another. For example, input measures should predict how well the process will function and in-process measures should predict the output measures. This is consistent with the overall theme: to improve outputs, we must improve the process. The output measures should then predict customer satisfaction. Otherwise, if there is a breakdown in this sequence of comparison and prediction, it must mean that appropriate measures in some area have not been identified.<sup>1</sup>

Linking the process output to its input is traditionally expressed by the "productivity" metric of the process.

Traditionally, productivity has been defined as the ratio of input/output, i.e. the ratio of the input of an associated resource (usually expressed in man-hours 'mhs') over real output units (in creating economic value). In the construction industry, the labor productivity is the physical progress achieved per man-hour (e.g. mhs per linear meter of conduit laid, or mhs per cubic metre of concrete poured).<sup>2</sup>

Productivity may be quoted as expected or actual, i.e. the 'budgeted' and the 'actual' productivity.

Commodity	PROJECT/COMMODITIES & PRODUCTIVITY (Sample)														
	Quantities			Budget Productivity Norm (Units/Unit)		Direct Man-Hour			Productivity Factor						
	This Period	To Date	Plan Actual	Plan	Actual	Budget	Actual	Variance	Budget	Actual	To Date	Actual	Actual To Date		
MINERALIZATION / TRENCHES / CIVILS															
General Earthworks	m3	2515432	23307	2442	237945	440254	01.16	402	348	21	30798	28132	254	0.82	1.11
Soil & Concrete Structures (Trenches, pits, Foundations, etc.)	m3														

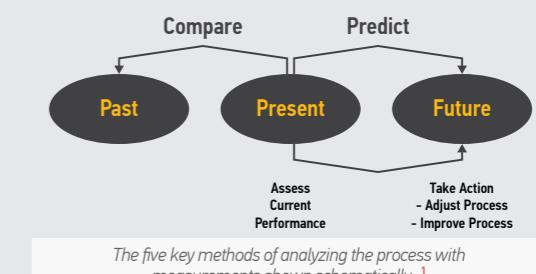
The Corporate Manual for "Productivity Factor Reporting" (CM-CSQM-002) describes how the 'Productivity Rate' is calculated for CCC Projects.

## Process Tracking & Analysis

Process measures are critical to the successful management and improvement of processes.

Process measurements tracked over time enable us to analyze the process in the following ways:

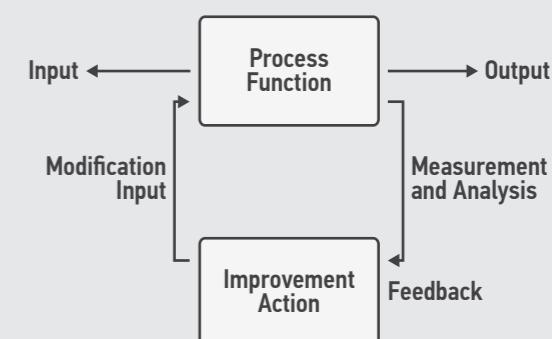
- Assess current performance levels.
- Determine if the process has shifted by comparing current performance to past performance.
- Determine if the process should be adjusted (minor changes).
- Determine if the process must be improved (major changes).
- Predict future performance of the process.



## Continuous Improvement of the Process Function

The process function (for example, construction) produces data, which are analyzed and provide feedback for action toward improvement. This is a continuous process and an integral part of quality management.

A note of caution regarding data accuracy: in construction because of the variable nature of construction work, the risks, hindrances, changes and variations must be accounted for during the project lifecycle (i.e. during estimation, mobilization, E/P/C work, completion phases) to



## Process Monitoring, Measurement & Performance Evaluation

ensure that what we are measuring is valid and that further analysis actually makes sense. As the saying goes, apples must be compared to apples.

### Measuring the Organization's Performance

Measurements should lead to key performance indicators (KPI) for the business or organization, including monitoring improvement over time. Value-addition requires the identification and elimination of all non-value-adding wastes, including wasted time.

The following quote captures some of the contemporary thinking on performance measurement.  
*"Measurement in world class organizations will be inextricably interwoven with strategic planning and continuous performance improvement. Performance will be viewed as a complex relationship between effectiveness, quality, efficiency, productivity, innovation, quality of work life and profitability."*<sup>3</sup>

### Corporate Procedures for Project Monitoring & Performance Evaluation & Improvement

For the Quality Management System, as specified by ISO 9001:2015, monitoring, measurement and analysis are key actions to evaluate:

- Conformity of products and services.
- The degree of customer satisfaction.
- The performance and effectiveness of the quality management system.
- If planning has been implemented effectively.
- The effectiveness of actions taken to address risks and opportunities.
- The performance of external providers (i.e. suppliers and subcontractors).
- The need for improvements.

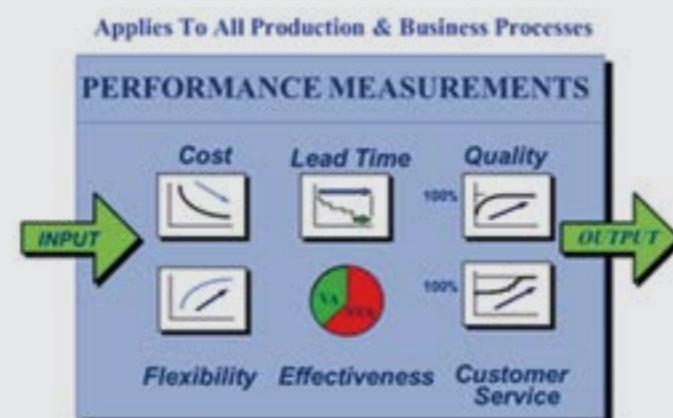
Within CCC, the following tools are used to evaluate and improve operational performance and effectiveness of the quality management system:

- Customer Satisfaction Questionnaire.
- Project Control Reports (Executive Weekly & Monthly Progress).
- Project QA/QC Monthly Reports.
- QMS Audits.
- Project Technical and Commercial Audits.
- Project Operational Excellence Balanced Scorecards.
- Supplier Performance Evaluation Reports.
- Subcontractors Performance Evaluation Reports.

Additionally, the following sources of information and activities have a role towards improvement:

- Close-out Reports.
- Lessons Learned.
- Risk Management.
- Analysis of Data.

These tools are described in detail in procedures QMP-MOA-018 "Quality Performance Evaluation & Improvement" and QMP-MOA-022 "Project Monitoring" of the Quality Management System.



## Process Monitoring, Measurement & Performance Evaluation

### Digitization: Online Reporting

Some of the latest in-house IT developments are related to improving the speed and transparency of project monitoring. Among other CCC applications and platforms designed and built towards this goal, there are currently in operation:

IT Resources (platforms & applications)	Performance Evaluation Tools
iSurvey	Customer Satisfaction
VBC CSQ Dashboard (online*) & Executive Dashboard	Project Control Reports (Executive Weekly & Monthly Progress)
VBC QM Dashboard (online)	Project QA/QC Monthly Reports
VBC QM Dashboard (online)	QMS Audits
VBC CSQ Dashboard	Project Technical and Commercial Audits
iSurvey	Project Operational Excellence Balanced Scorecards
MAXIMO (Suppliers database*)	Supplier Performance Evaluation Reports
MAXIMO (Subcontractors database*)	Subcontractors Performance Evaluation Reports
VBC CT Dashboard	Close-out Reports
Famous KM	Lessons Learned
iRisk	Risk Management
Various incl. PROJMON, TALISMAN, e-PMS	Analysis of Data
* under development	

### References:

ISO 9001:2015, "QMS Requirements" & ISO 9000:2015, "QMS Fundamentals & Vocabulary"

1. Hoerl, R., Snee, R.D., "Statistical Thinking", 2012
2. Dozzi, S.P., AbouRizk, S.M., "Productivity in Construction", NRCC-37001, 1993
3. Sink D.S., "The Role of Measurement in Achieving World Class Quality and Productivity Management", 1991

# Leading Construction at the Abu Dhabi Airport's New Midfield Terminal Building

## Revolutionizing Construction with the Aid of BIM Technology

### Introduction

Construction companies are facing huge barriers and challenges in BIM adoption. There is no clear guidance or best practice studies from which they can learn and build up their capacity for BIM use to increase **productivity, profitability, efficiency, quality**, and to attain competitive advantages in the global construction market to achieve the targets in environmental **sustainability**. There is no debate that BIM has revolutionised construction to the extent that it has become an essential technology in ensuring the success and efficiency of mega-projects; however, the implementation of BIM continues to be a major challenge, and CCC has set a massive precedent by successfully using BIM in the Abu Dhabi Airport's new midfield terminal building.



Figure 1 - 75000 tonnes of steel structure, central processor at departure level with 180 m to 309 m arches maximum span with the backstay.

### Purpose

This article aims to share a comprehensive systematic implementation, evolution and innovative role of BIM's contractual obligation on the Midfield Terminal Building (MTB). The MTB Project is part of technologies adopted in mega-projects, demonstrating the efficiency achieved towards a lean construction practice, which implements six intricate modules of EPC contract. The six modules comprise:

1. Construction.
2. Baggage Handling System (BHS) Design & Construction.
3. Equipment/System Manufacturing & Installation Works.
4. Defect Liability Period (DLP) Operation & Maintenance Services Contract.
5. Special Systems O&M Services.
6. BHS Systems O&M Services.

It will soon become apparent that BIM encompasses all components of EPC and maximises transparency of the project's progress.

## Leading Construction at the Abu Dhabi Airport's New Midfield Terminal Building

### Design Strategy and Methodologies

The design and engineering of the building has been carried out with the utmost due diligence. Following a rigorous peer review with six world-leading airports and a consultation with all involved stakeholders, Abu Dhabi Airport Company (ADAC) finalised the design of the MTB to ensure that the utility of the building delivers the required state-of-the-art facility in an efficient and financially viable framework. The construction of the 700,000 m<sup>2</sup> main terminal building, which will have an initial capacity of 27–30 million passengers per year with options for this to double in capacity to 60 million passengers, will be one of the world's largest and most architecturally iconic structures.

With this ambition, however, comes a burden of immense complexity. Six months before the award and in parallel to the tender phase, the BIM team took the initiative to build a fully digital 3D Model of the complex building that had guided the winner JV (CCC, Arabtec & TAV) to extract over 135 different Value Engineering items (VEs) and drop the price—by almost \$270 million—of a \$3 billion project during the tender phase.

Upon receiving the award, BIM had softly landed on site by a robust mobilisation plan, effectively laying out a clear vision of the project's construction baseline schedule. This plan was achieved by extracting Key Performance Indexes (KPI) from digital engineering quantifications of over 45,000 giant activities, with enormous amounts of entangled interfaces, including physical, functional, organisational, contractual and resources interfaces.

To continue guiding such a complex site, BIM had to first revise the project's benchmarks by updating the tender models to first match the contract references, then further inject the changes generated from IFC (Issued for Construction documents) that exceeded 14,000 drawings, 400 specifications, and more than 13,000 BOQ items.

In fact, the sum of data would seem insurmountable without the active record of BIM. For example, simultaneously and during construction, the complete infrastructure model of site wide MTC was built to drive all excavation works, existing surface utilities, underground utilities and spider web MEP services/embeds and provisions. The latter had been considered as an on-built situation of the first phase of completed piling works, amounting to an astonishing total of 7,425 piles, and grading works which housed the various support facilities for the new Midfield Terminal Building.

The harmonious Federated Model of MTC was managed by BIM to drive the early external activities on site that are interrelated to over 66 MEP hosted systems. Finally, these systems were topped by a fuel network and a 400Hz system at the taxi/airside in addition to temporary auxiliary activities.

The MTC Federated Model was kept current by continuous updates via digital readings of the total stations' coordinates survey, a 4.7km<sup>2</sup> plot contoured by two active runways. Laser scanners were also utilised at Midfield Terminal Complex to guide transition handover of internal/external activities.



Figure 2 - MTC federated model with project infrastructure & underground utilities/dashboard

## Leading Construction at the Abu Dhabi Airport's New Midfield Terminal Building

It is important to note that several events occurred concurrently throughout this process. For example, the Organization of Information Requirements (OIR) for 55 BIM site engineers and over 180 subcontractor's BIM engineers followed the BIM Execution Plan, or BEP. Next, Asset Information Requirements (AIR) governed 2.2 million construction assets, topped by 100,000 maintainable assets. Furthermore, Electronic Data Interchanges (EDI) were initially tailored, then updated, and mapped for over 66 different industries and packages on board during the project lifecycle and were published and shared with project stakeholders including 65 giant subcontractors, 35 consultants and more than 1650 manufacturer/suppliers who are dealing with almost 4000 different materials.

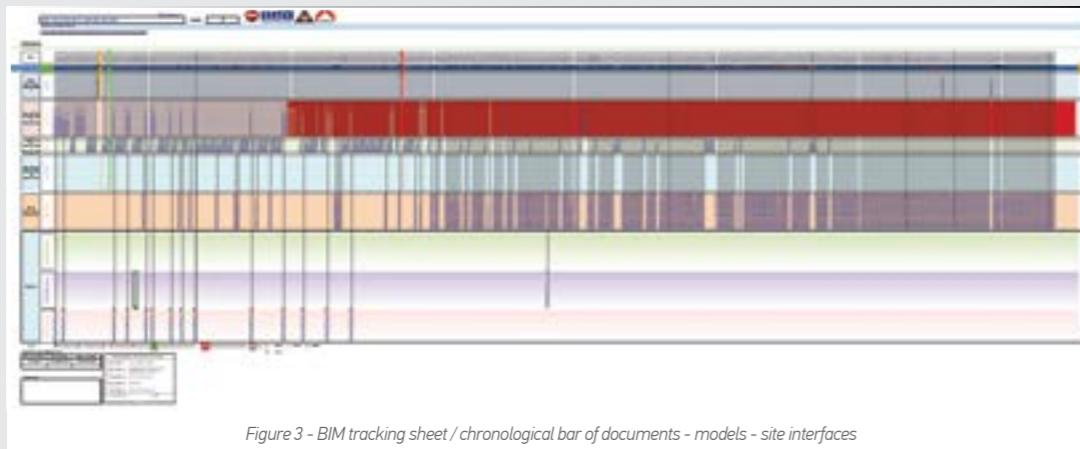


Figure 3 - BIM tracking sheet / chronological bar of documents - models - site interfaces

All the above requirements were dynamically governed under a Gigantic BIM Document Interface Management System (DIMS) stemmed by at least 199 million records of BIM. Collectively, these were built to communicate to the BIM Common Data Environment (CDE) that automatically tackles all progressive models in various Levels Of Developments, (LOD's), project scope, packages, project activities, key interfaces, design changes, variation orders (VO's), Value Engineering Items (VE's), Time Impact Analysis initial reports (TIA's), disruption analysis, BIM QA/QC six nested modules, four successive stages of Data Drops of Facility Management, and BIM Digital Transmittals & Techno-commercial reports.

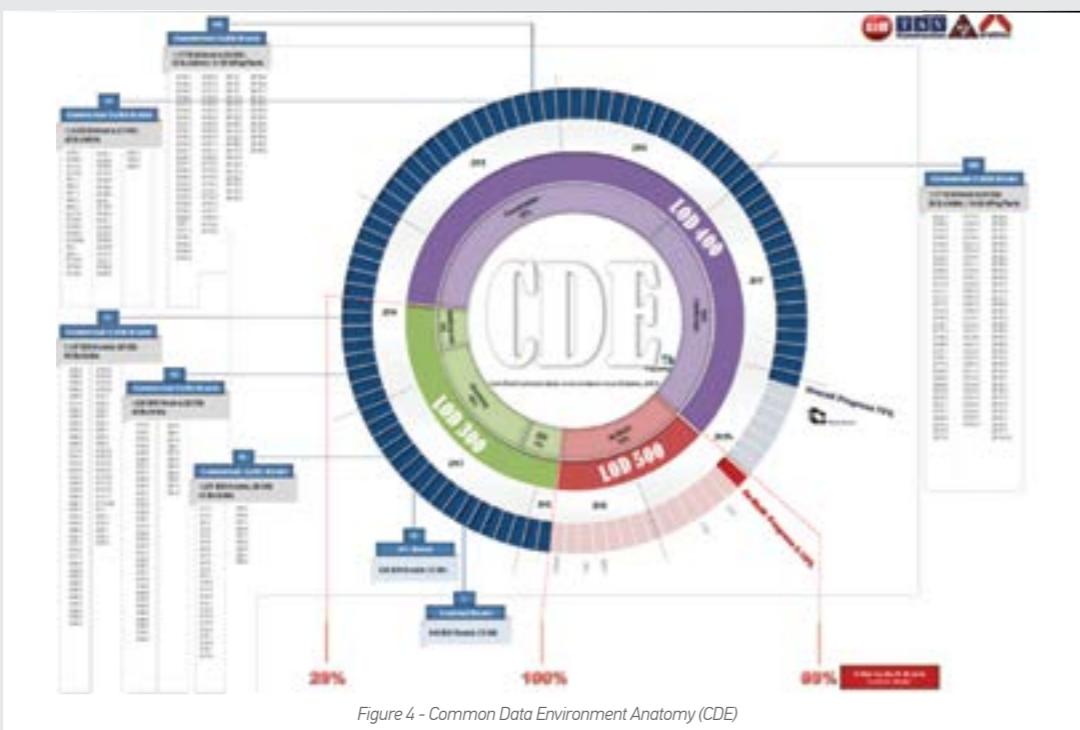


Figure 4 - Common Data Environment Anatomy (CDE)

## Leading Construction at the Abu Dhabi Airport's New Midfield Terminal Building

### Challenges and Achievements

BIM Soft landing was not that soft but interestingly paved with speared challenges starting with enlightenment campaign from:

#### I. Change Management Program

Change Management Program shifting old school paradigm to the digital era, talking BIM to Field and vice versa within a full collaborative seamless controlled environment sounded Chinese for most of the stakeholders, then to interpret such digital language to suit every execution module is even harder to believe from their point of view. BIM Roadmap with supportive Design, Coordination, Construction, Fabrication, Erection and Handover practical workflows in CDE played the role of a fluent interpreter for every interval during the project life cycle.

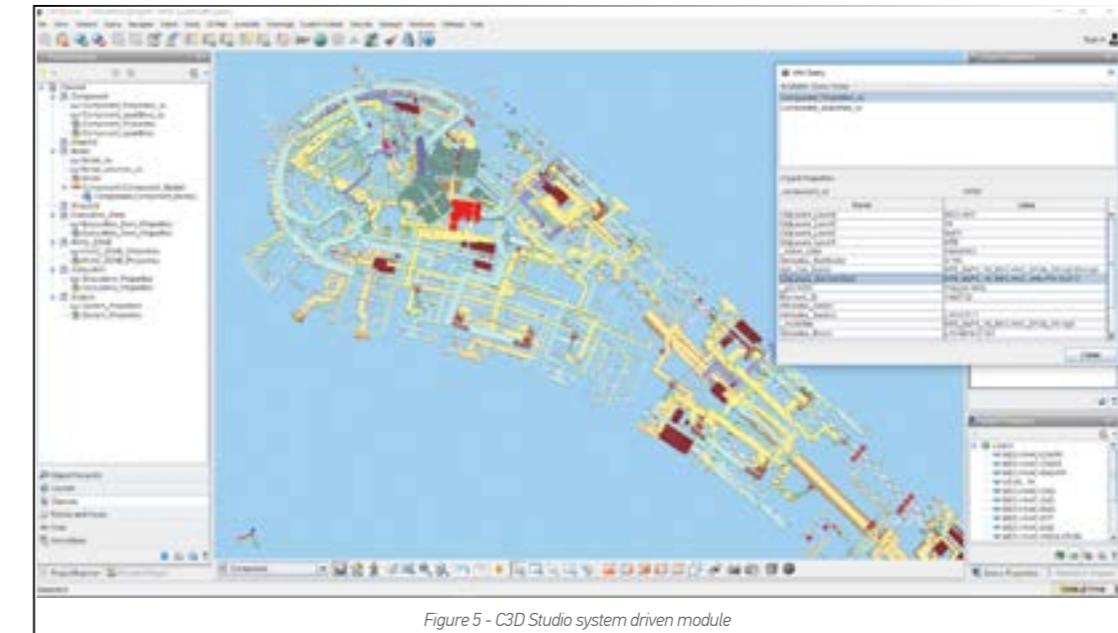


Figure 5 - C3D Studio system driven module

#### II. BIM Well-Structured Infrastructure starting by Membermarks

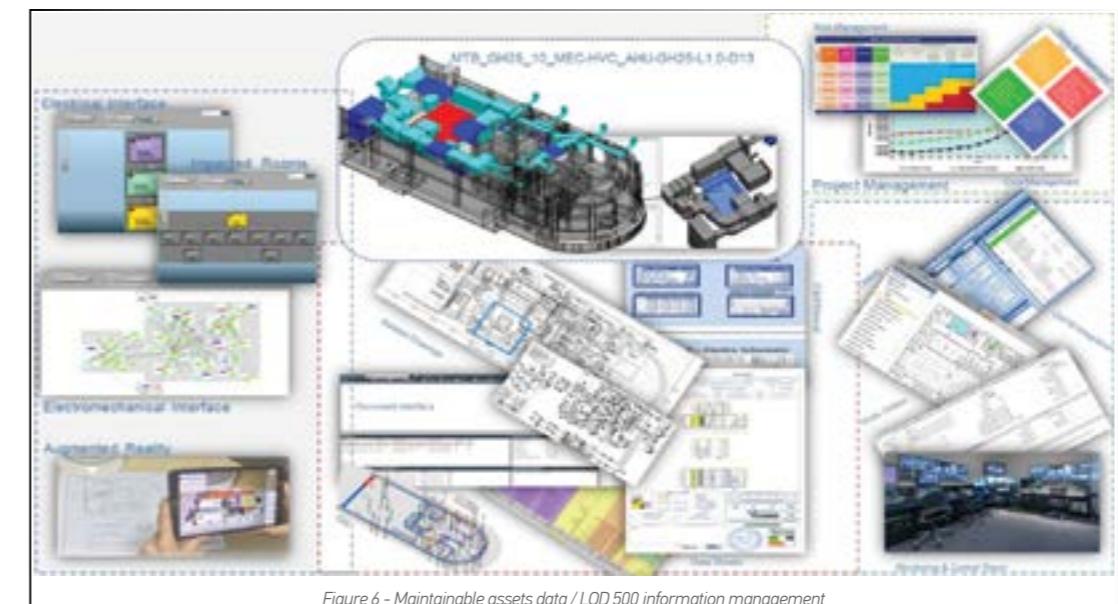


Figure 6 - Maintainable assets data / LOD 500 information management

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BIM Well-Structured Infrastructure starting by Membermarks that are built on project Work Breakdown Structure (WBS) combined with element Tag of every construction element existed to drive perfectly all project controls systems on board i.e. C3D Atlas, C3D planner, C3D Studio & Scenario browser, Room Tracker, C3D Model Deviation and so on, steering all construction assets (>2.2 millions) and their associated interfaces within seven levels that are identifying location, trades/systems, execution time, object unique industrial identity and finally the operation level on site.

The full scope of the Membermark is established based on the contractual guidelines and the expected resulting product.

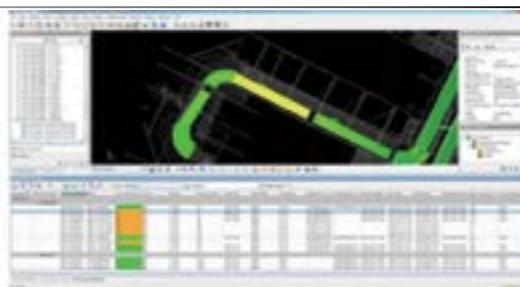
The flow of data starting with the IFC through Bulletins provides a clearer view of the identification of the Object Code and any changes resulting from RFI's, Design, and Material Data provided by SCs, which is fully integrated in the tagging and reporting processes in addition to the vendors' equipment and fitting lists and early spare parts lists.

Further enhancements are performed reflecting the actual construction conditions in addition to the final equipment and spare parts lists.

Adding higher industrial levels of attributes that are necessary for the fabrication and installation sequence. Dealing with comprehensive O&M data sets COBIE (Construction Operation Information Exchange) including SPIE (Suppliers Property Information Exchange and ELIE (Equipment Layout Information Exchange).



Figure 7 - C3D BHS readiness for commissioning BIM driven interface



### III. BIM Resources, Technology, Processes and Policies

#### Building the BIM Team

The recruitment and training of the BIM Project Team had commenced in October of 2011 for more than 55 young skilled architects and engineers coming from three different continents almost one year before landing on the project. BIM Athens Academy played a huge role in enhancing their



Figure 8 - BIM resources / tasks distribution dashboard

## Leading Construction at the Abu Dhabi Airport's New Midfield Terminal Building

capabilities and stretch their skills in collaboration, communications, knowledge, experience, responsibilities, commitment and leadership within a practical environment at various Construction BIM Driven sites all over the world.

The seamless collaborative BIM Controlled Environment has bridged any cultural gap and has eliminated most barriers between BIM MTB Multinational Team coming from Palestine, Egypt, Lebanon, Greece, Turkey, UK, Australia, Canada, UAE, New Zealand and Malaysia, promptly opening all layers of professional communications with a global project supply chain.

Within the technology limitation back in June of 2012, BIM had to secure the enormous invaluable data, user management, certify the proposed hardware, and software that suited the project modules, duration, quality and stakeholders' day-to-day operations. BIM has taken the lead on the custody of diversified data format, data structure, versions and on/off field BIM Networking.



Figure 9 - Day-to-day coordination workshops & managing changes



Figure 10 - BIM coordination modules & models' evolution within CDE



## Leading Construction at the Abu Dhabi Airport's New Midfield Terminal Building

The BIM Technology Plan had to support first the organisation operational functions by early defining the requirements for the platform to be selected in proportion to project size, complexity and the requirements of an ambitious client. BIM also had to develop process maps for the information exchange, and process steps between each of the project departments and stakeholders involved, which have continuously evolved during the project various intervals. Total systems optimisation of BIM has come to interrogate the existing processes between BIM JV and supply chain. BIM has aligned the process, technology and supply chain working practices in order to optimize the opportunities for success and has delivered aligned project objectives. BIM has

reviewed the appropriate technologies i.e. Geographic Information System (GIS); Digital Modelling and Fabrication (DMF); laser scanning, 3D printing, Virtual Reality (VR)/ Augmented Reality (AR) and so on, that underpin successful outcomes, always considering robustness, reliability and the need to invest (hardware/software/IT), including measurement of ROI.

### The BIM Theatre

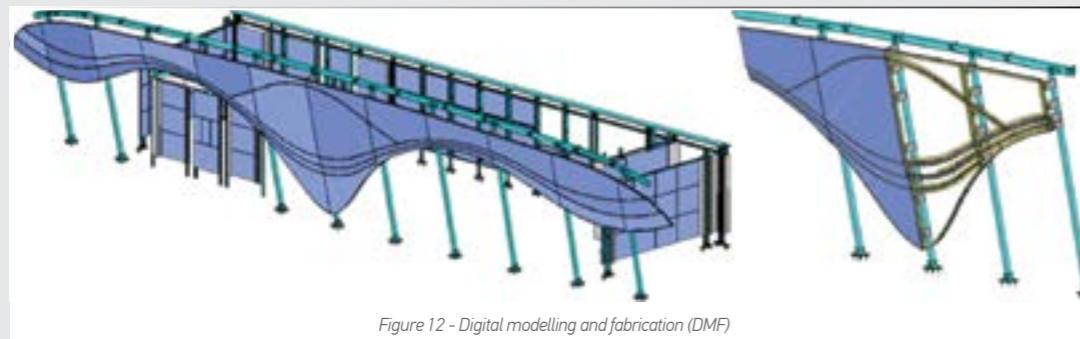
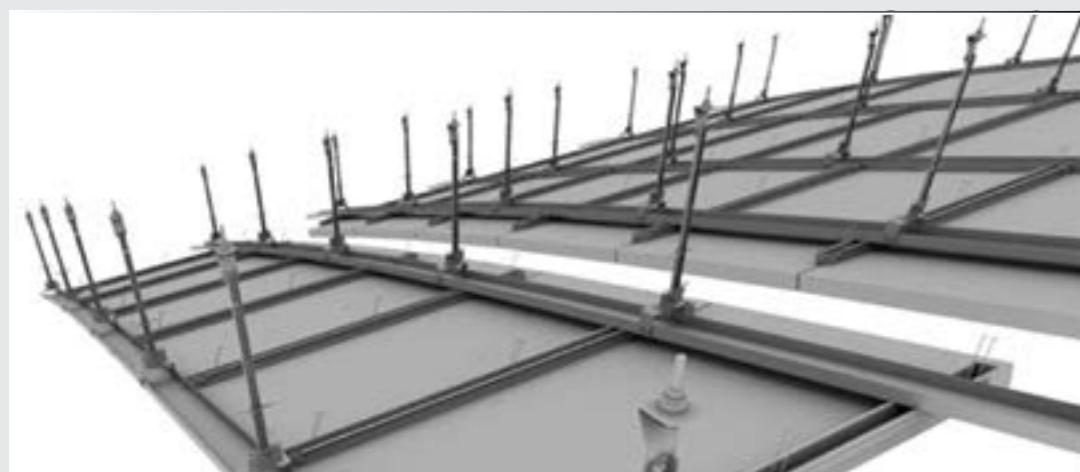


Figure 12 - Digital modelling and fabrication (DMF)



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### Collaboration interactive video wall

The massive interactive video wall of 2.5m x 3.5m at the BIM Theatre played a fruitful role to align stakeholders on broadband vision.

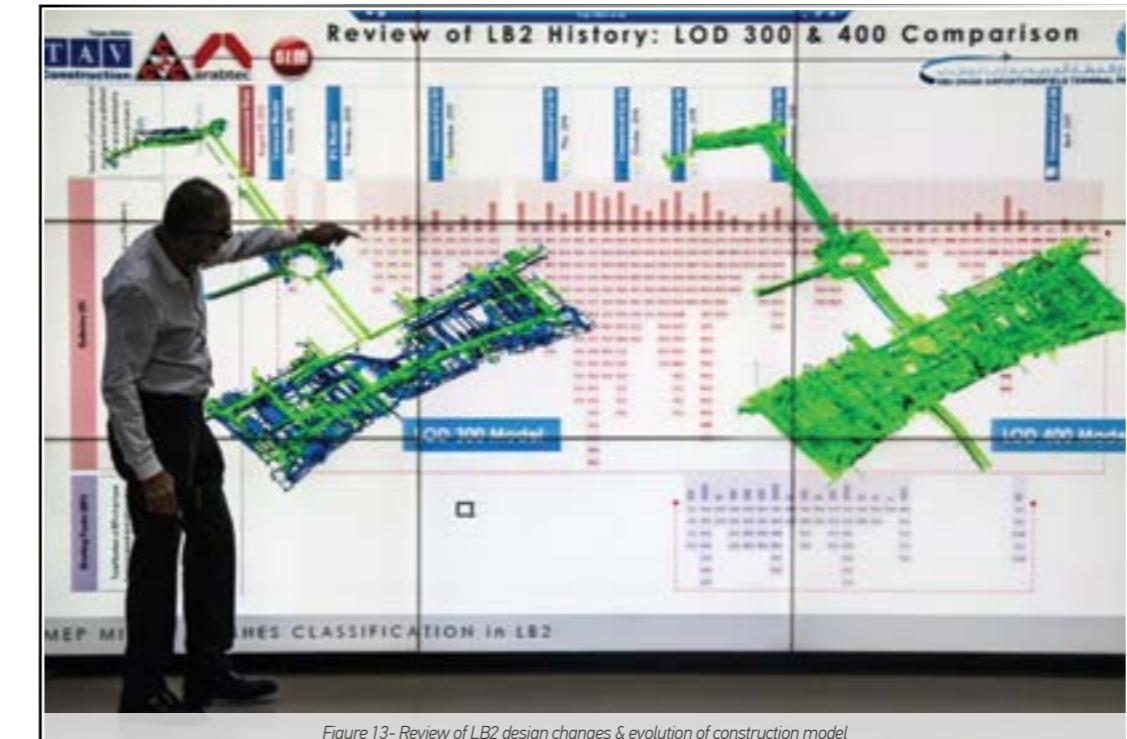


Figure 13- Review of LB2 design changes & evolution of construction model

Governance and Information Management's role is to issue BIM Information standards and protocols that have been established according to the information requirements of MTB Project and how that information is managed through the life of any construction or maintainable asset. BIM Policy has extended to Building project standards, Risk and Insurance, Project guidelines & Contracts, and Ownership of Deliverables that started by 14,468 LOD 300 Models consisting of 1900 Tender models+ 1830 Contract models+ 2388 IFC Issued For Construction models +8350 Bulletin



Figure 14-Interactive BIM workstations with video walls (BIM theatre)



Figure 15 - BIM roles during MTB project lifecycle

Design models that record the successive design changes, in addition to 4740 LOD400 models the sum of construction, fabrication and Briefing Packs models excluding the 2665 final LOD 500 As-Built models to close a total sum of 22,000 Various Models occupying > 3.5 TB on ProjectWise (CDE) and driven by +90GB Data Base of massive project information and records.

## Leading Construction at the Abu Dhabi Airport's New Midfield Terminal Building



### CCC's Awards for the Exceptional BIM Implementation at MTB

**“** The Be Inspired Awards 2013 October 29th - 31st, London, UK

- “Innovation in Comprehensive BIM” Award
- Finalist in the category “Innovation in Construction” **”**

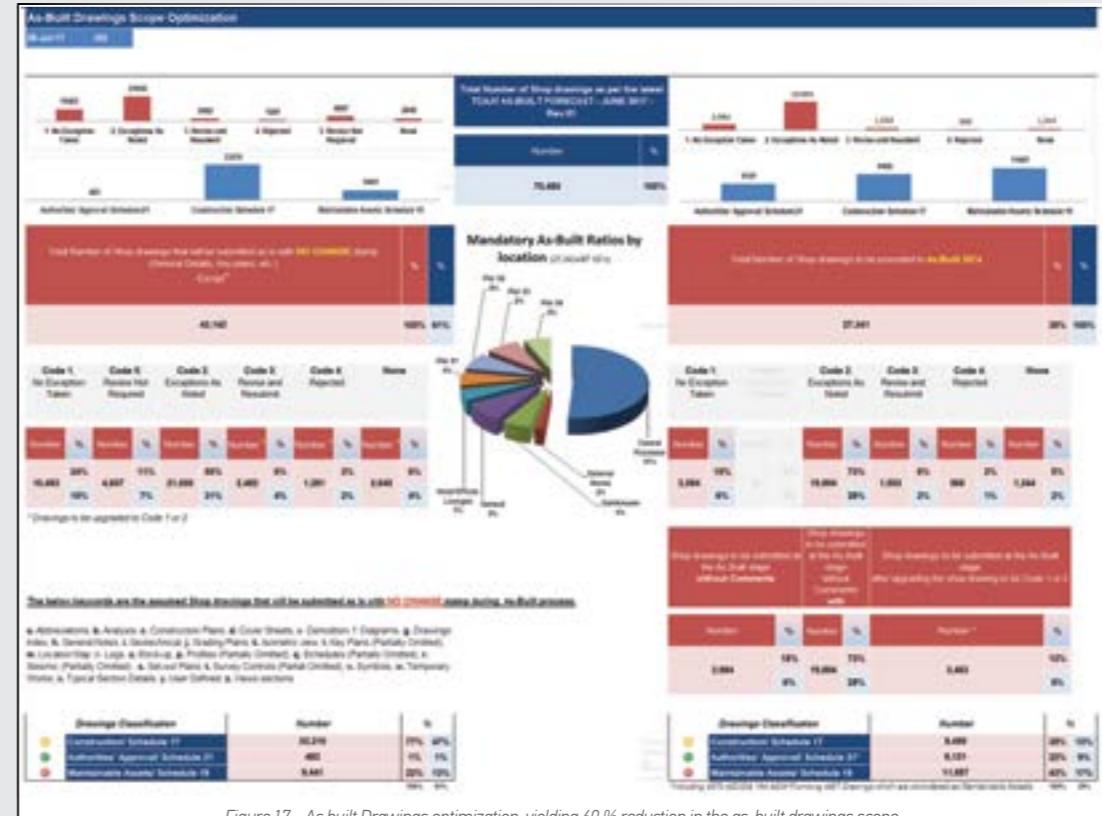
#### IV. Managing Design Changes

Budget, time frame, size, location, scope, quality, stakeholders, and communications are all horrific challenges to be faced by BIM but managing the Design Changes have turned BIM to an invincible monster. BIM has driven the design changes within three different approaches: I- Value Engineering Modified Design VE II- Bulletins of design changes, of additions, omissions, completion and others III- Briefing Packs BP of forecasted design changes to be developed based on as-built site conditions. All three modules have been managed electronically by BIM engines via digital customized dashboards that were tailored on MTB to register, evaluate, monitor and report the changes within less than 24 hours.

Batches of IFC revisions, specifications and EI Engineer Instructions were automatically inspected by BIM Engines to techno-commercially update TCAJV and their alliances for further necessary actions to be taken. BIM has managed more than 320 batches of design changes which have inflated the original 14K IFC Drawings up to 111k due to revisions. Shop drawings have been affected accordingly to increase from 60k SD up to 772k – almost seven times revisions - for the same reasons.

BIM has taken over the full operation of managing the changes once received in 2D documentation then left it to 3D commercial models to be examined versus construction schedule in 4D time simulations along with 5D cost analysis models with quantities and unit rates. The whole above systematic process was followed by fruitful optimization of shop drawing production, digital red line marked up drawings and As-built/Handover phase.

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### BIM Jackpot

**“** 60% of As-built scope was optimized and purged within non-graphic information at LOD500 Models. **”**

#### V. As built Drawings optimization, LOD500 Models, Non-Graphic Information, Data Drops and Handover to FM

Due to the enormous amount of shop drawings that has exceeded 92k and over than 772k count of revisions, the client has approached BIM to optimize the final amount of as-built drawings required to operate the building by taking advantage of the LOD500 models and non-graphic information associated to 2665 models.

BIM has taken the lead and succeeded in transforming the manual RLM extraction and production of ABT DWG's to an autonomous BIM operation since early January 2017 that has encouraged ADAC FM to accept BIM Proposal to digitally produce and link the core SD Packages associated to contract package, authorities and the end user of daily O&M operation. That is why BIM could compress and optimize the as-built scope by 60% allowing the project to focus only on the 40% high quality digital production of 32k ABT DWG's supported by capsules digital index/ tracker for each.



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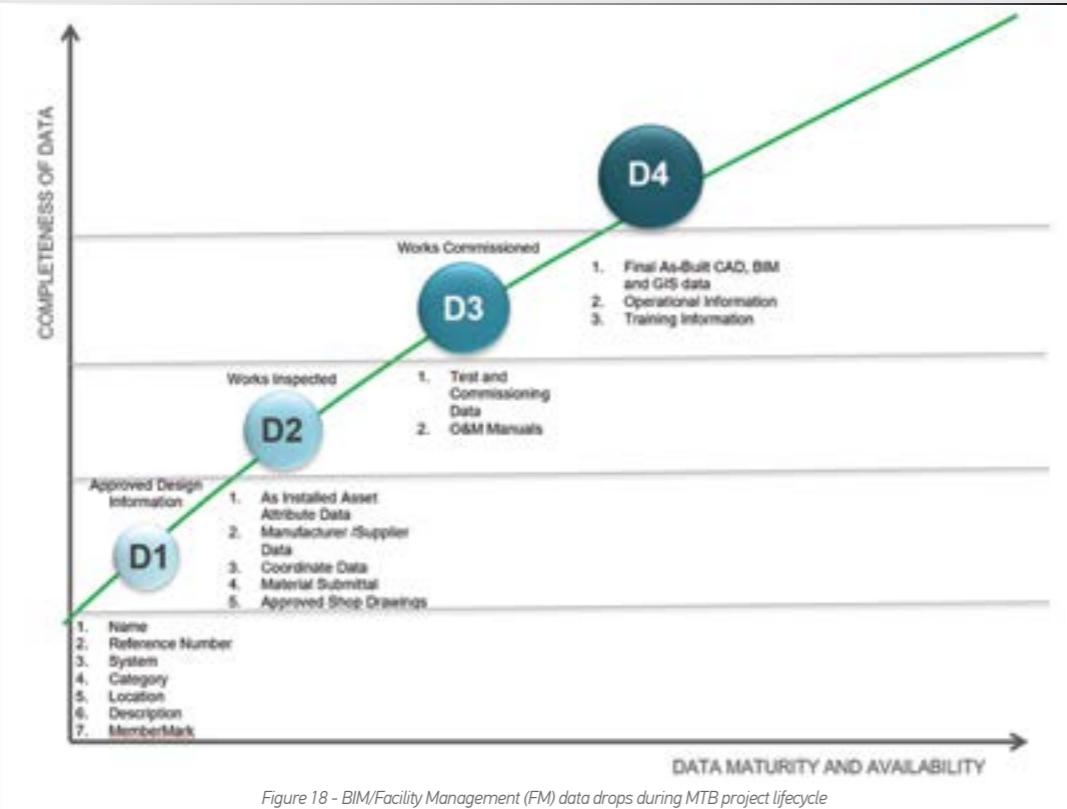


Figure 18 - BIM/Facility Management (FM) data drops during MTB project lifecycle

Category	Document Requirements	Category	Document Requirements
Construction Data	Design Information Resource Submittals Approved Shop Drawings Approved As-Built Drawings (2D) Approved As-Built Drawings (3D) Static Yield Information Shop Log	General Section Facility Specific Information Product Specific Information PPM Requirements Operations Procedures No Inspection Intervals United States Mass System User Manuals Systems Specific Training Training Details National Safety Data Sheets Causes and Effects Documents (PLA & Security Systems) Technique Inventory	NAACP Study Inspection regime (written scheme) for Pressure Systems Water Systems Risk Assessment and outcome of tests inspections Scheme of inspections for PMS, Lifa, Excavations and Trenches Scheme of inspections for lifting & storage equipment Confined Space Register Hazardous Criticality Assessment Main Isolation Points (Name, Description, Use) Technical Work Instruction (TWI) Standard Operating Procedure (SOP) Emergency Operating Procedure (EOP)
Test and Commissioning Data	Commissioning / Commissioning records Asset Integrity Test (Compressed gas cylinders data of insulations & fits (e.g. the coil & suppression systems)) PSS, LIF, Excavation & Lifting Equipment Certificate of Inspection Water Quality Certificate (ISO compliance) Bacteria and Fungi certificates (to be compliant on Legionella, E. Coli & Pseudomonas) Showers and Tap Temperature Tests (within range) Water Tank Inspection certificates Drinking Water Quality Tests Integrated System Testing (other systems)	General Information (Name, Type Name, Classification, System, Description, Manufacturer, Location Name, Inspection Date, Warranty Information, Warranty Expiry Date, Model, Serial Number, Product Code, Quantity, Manufacturer) System Information (System Name, Description, Sub-System Name, Classification, Components) Floor Information (Level Name, Description, Elevation, Height, Classification) Space Information (Room Name, Number, Description, Function, Level Name, Classification) Zone Information (Zone Name, Classification, Room Number) Contact Information (Name, address, email, phone number, Classification)	
Asset Data			

Table 1 - Maintainable assets data drops breakdown

## Leading Construction at the Abu Dhabi Airport's New Midfield Terminal Building

Data Drops came in four successive modules aligned with BIM/ Site progress starting by approved design information and further Document/ Data sets requirements for the following phases of construction, inspected works, commissioned works up to as-built works as listed and detailed above & hereunder.

I. Approved Design Information	II. Works Inspected	III. Works Commissioned	IV. As-Built Works
<ul style="list-style-type: none"> <li>Name</li> <li>Reference Number</li> <li>System</li> <li>Category</li> <li>Location</li> <li>Description</li> <li>Membermark</li> </ul>	<ul style="list-style-type: none"> <li>As Installed Asset Attribute Data</li> <li>Manufacturer /Supplier Data</li> <li>Coordinate Data</li> <li>Material Submittal</li> <li>Approved Shop Drawings</li> </ul>	<ul style="list-style-type: none"> <li>Test and Commissioning Data</li> <li>O&amp;M Manuals</li> </ul>	<ul style="list-style-type: none"> <li>Final As-Built CAD, BIM and GIS data</li> <li>Operational Information</li> <li>Training Information</li> </ul>

### VI. BIM 4D / Planning

The construction schedules revisions' credibility at high level were boosted by BIM cost loading on over than 48,000 activities that were dropped by 15% (to 39,000 only) due to the omission on voided scope or merged activities that were over considered at initial baseline. Fluctuation in construction activities turned to be BIM driven within clear 4D simulation on construction models where every construction trade, system, subsystem and product is uniquely identified and linked to Primavera Schedule.

Cost loaded activities based on electronic engineering quantities extracted from BIM Models have steered Key Performance Indexes (KPI's). In addition, actual progress was surveyed from site by digital BIM and uploaded to C3D Planner to extract project monthly EV's Earned Values.

BIM also was the engine behind the six months sprints to avoid/recover possible delays on site and eliminate unnecessary floats. BIM Role was underlined in physical, functional, organisational, contractual and resources interfaces between the 39K activities.

BIM superiority has glowed in driving solely five major construction backbone baselines on MTB.



Figure 19 - Second Sprint Planning - 200 Days 4D Model Simulation

Most of these activities: logistics, construction sequences, and methodologies, have been driven by BIM 4D Models.

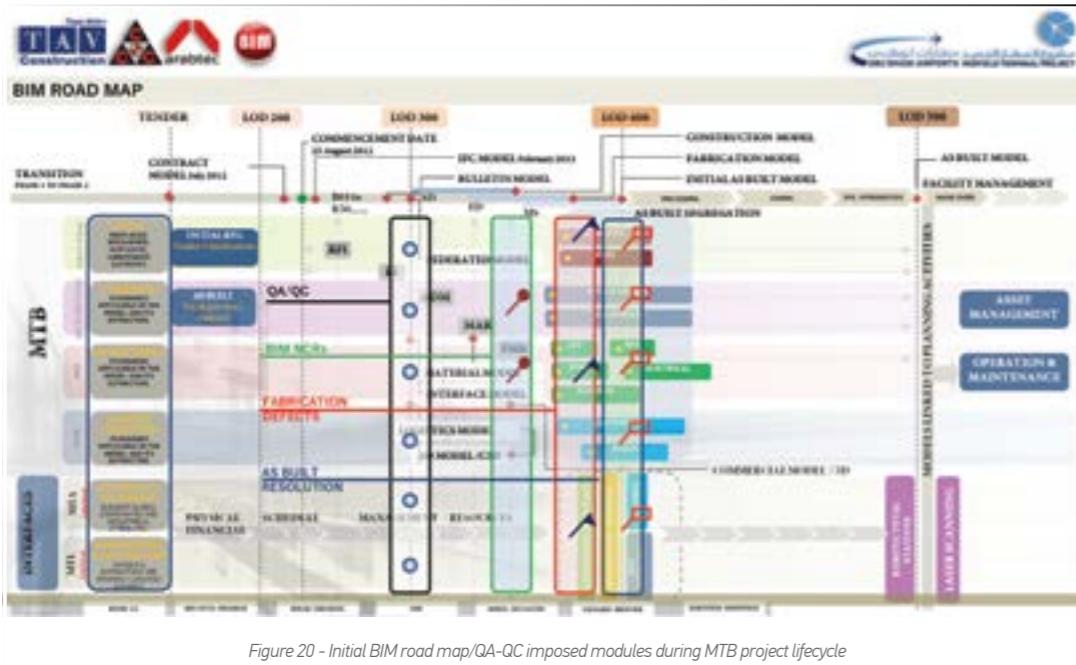


Figure 24 - Main Facade of MTB project during construction

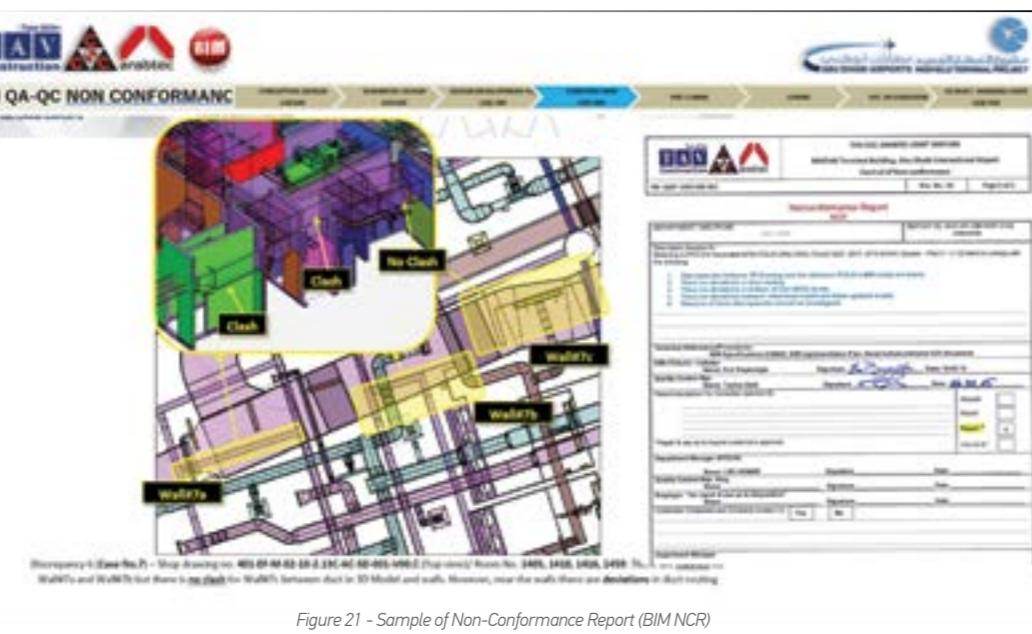
## Leading Construction at the Abu Dhabi Airport's New Midfield Terminal Building

It is worth mentioning that the critical path was examined continuously and governed by MEP BIM Room trackers that have been intricately linked with wild air and sensitive architectural materials on MTB.

## VII. BIM QA/QC Alliance

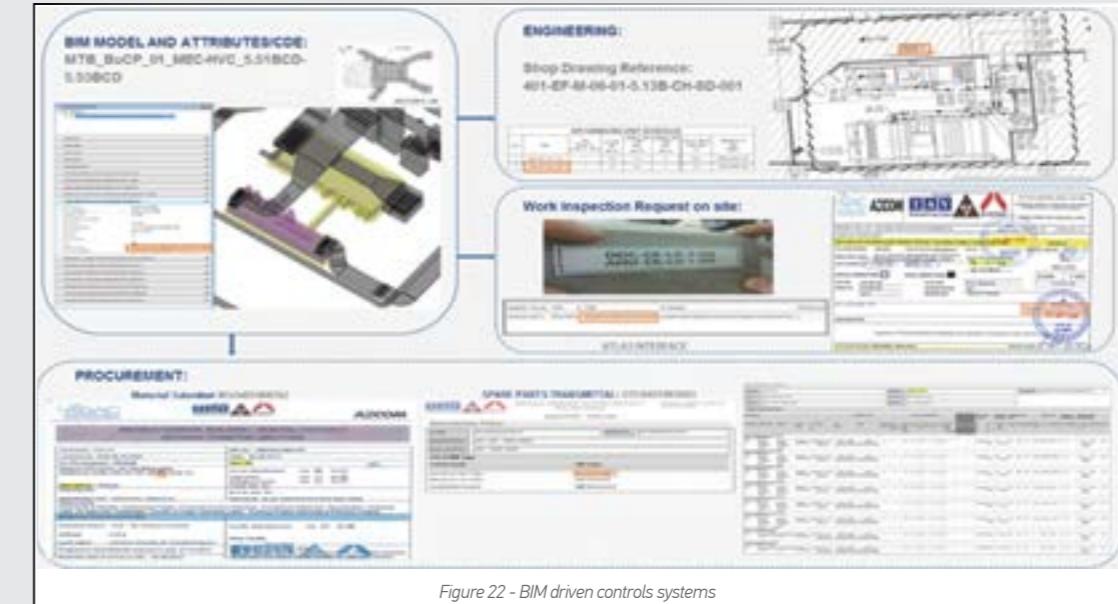


BIM has played a pioneer role in enhancing the QA/QC process on site by first examining the shop drawings conformity with frozen LOD400 coordinated models' geometry, and BIM Membermarks. Making sure that coordinated models have been updated by injecting total station coordinates, Work Inspection Requests (WIR's) and frequently have been examined versus recent laser scanners' point clouds at complex areas. If any site deviation or fabrication violation has been detected on site, BIM Engineer jointly with QA/QC Alliance Team have the authority to mitigate the responsible subcontractor via NCR Nonconformance Report supported by a mitigation plan of all necessary actions to meet project requirements & design intent. BIM has monitored similarly every activity on site



*Figure 21 - Sample of Non-Conformance Report (BIM NCR)*

## Leading Construction at the Abu Dhabi Airport's New Midfield Terminal Building



*Figure 22 - BIM driven controls systems*

including the MEP Provisions, Openings and Embeds that have been uniquely tagged and thoroughly monitored via a dedicated BIM Dashboard.

The BIM QA/QC internal modules exceeded six modules of visual inspection, checking standards, interferences, element validation, accuracy and tolerance, along with management and integration to boost models' quality and information credibility during the project life cycle. These operations were strictly applied to every construction/fabrication or handover phase.

VIII. BIM Commercial Role

As mentioned previously and during tender phase BIM has not only played a pioneer role of value engineering studies but also has stretched the boundaries to enhance, improve and tackle over than 135 VE's even finding more VE's during construction.



*Figure 23 - BIM disruption of design changes digital dashboard*

## Leading Construction at the Abu Dhabi Airport's New Midfield Terminal Building

BIM has been the supportive partner for commercial divisions including AECOM & ADAC who is responsible for tackling all changes either coming from site Field Change Request (FCR), Engineer Instructions (EI) or design changes casted in a digital dashboard of DB exceeding 120 million records. All digital Material Take Offs (MTO) have been extracted from LOD300 Commercial Models that are continuously updated and maintained by chronological order on ProjectWise showing the project quantities evolution (starting from contract BOQ till present).

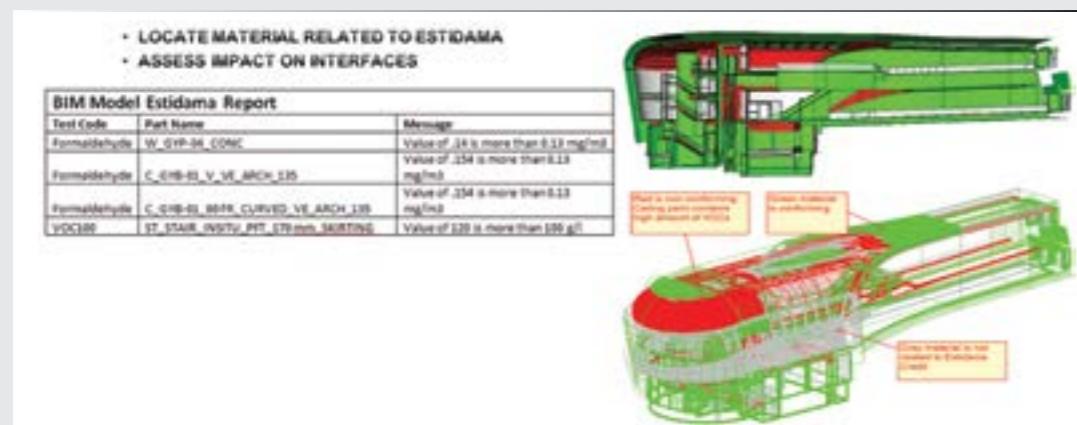
BIM has certified the quantities claimed by various subcontractors on board for every scope, entitlement or Variation Order.

BIM has kept supporting commercial division in various modules of design change bulletins process, Briefing Packs, Variation Orders and all Time Impact Analysis and Disruption claims supported by 5D Models & Non-Graphic Information in additional to Digital Chronological Bars associated to project records and documents at VBC.

### IX. Request for Information Reduction

BIM has defeated the conventional RFI Process and knocked it down to 1/6 that resulted from a close thorough coordination within open BIM seamless controlled environment. The harmony of coordination between stakeholders was systematically driven by BIM skilled architects and engineers 24/7 within four well-defined workstreams in junction with the engineer and client.

### X. BIM/Sustainability



### BIM/ESTIDAMA Achievement

**“ BIM has succeeded to manage the recycling 1,040,437 m<sup>3</sup> aggregates ”**



## Leading Construction at the Abu Dhabi Airport's New Midfield Terminal Building

BIM has allowed better utilization of existing stockpiles, eliminating purchase and transportation on site of backfilling material, better coordination of earthwork and maximum use of existing temporary access ramps and equipment for filling, facilitating reporting for QC due to clear and exact tagged areas, finally achieving two Credit Points in ESTIDAMA.

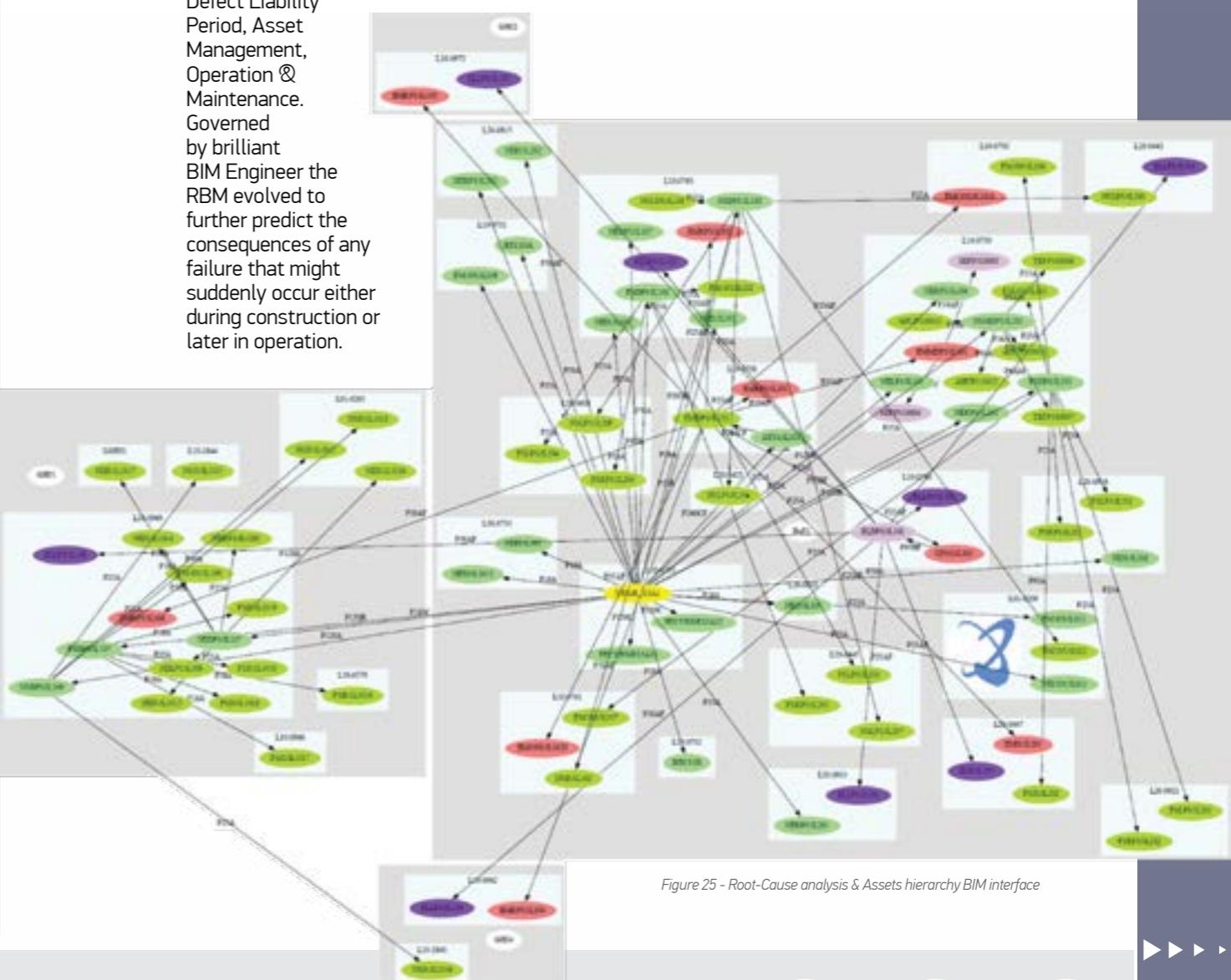
### XI. DMF (Digital Modelling and Fabrication)

BIM LOD400 Models were utilized to drive particular industries up to digital fabrication i.e. steel structure, glass works, false ceiling metal panels and arches' cladding when digital scripts had been written to model 2000 FD for MTB false ceiling of > 250,000m2. Digital fabrication models had drove 7000 steel fabrication drawings (FD) production of > 75,000 steel tonnage up to cutting lists and CNC machines. Similarly for the glass panels, LOD 400 fabrication models were produced by BIM Driven FD within an autonomous fabrication process for almost 40,000 glass panels including various MEP/ Fixations provisions and physical assembly interfaces on each panel erected on site.

### XII. Hierarchy Tree/ Root Cause & Consequences

BIM Automated root cause analysis, what if scenarios and cause and effect matrix extracted from Rule Based Models (RBM) built on the design logic of implementing the MEP Single riser diagrams for each system to the extent of dependencies and interferences that have taken BIM To a new era of dealing with emergency situations on site during project lifecycle i.e. Testing & Commissioning, DLP

Defect Liability Period, Asset Management, Operation & Maintenance. Governed by brilliant BIM Engineer the RBM evolved to further predict the consequences of any failure that might suddenly occur either during construction or later in operation.



## Leading Construction at the Abu Dhabi Airport's New Midfield Terminal Building

Each response was encapsulated by information pumps which will trigger RBM to drive the end user within pre-calculated intensive pockets of knowledge towards an efficient route of decision.



*"The Best Way to Predict the Future is to Create It"*  
Abraham Lincoln

CCC

S. EL KREIDL

## CCC's President, Engineering & Construction, Visits Egypt

Egypt



On July 28, 2019, Samer Khoury visited Egypt for a meeting with high officials to discuss the way forward on many issues and potential projects in Egypt. Accompanied by Waleed Salman, Regional Managing Director Operations in UAE & Palestine, Mr. Khoury had a full day's agenda, starting his visit at the Area Office in New Cairo with Jamal Bahlawan, Managing Director Africa, to discuss the progress of current projects in Egypt and the rest of Africa.



Mr. Khoury later met with high officials in the country where he was welcomed and received warmly. The meeting was a great success where many issues were discussed regarding projects and the way forward in the region. Later in the day Mr. Khoury and companions met with Egypt Area Senior staff over lunch at the Four Seasons Hotel. A speech on the future of CCC was made by Mr. Khoury where he discussed a promising recovery plan for oil and gas projects in Mozambique, Nigeria and Qatar. As for Egypt, high quality buildings and civil projects are foreseen. The lunch was concluded with a memorable group photo of all attendees.

Mr. Khoury and Mr. Salman also visited the City Center Almaza Project (CCA) in the company of Hazem Kayyali, Project Director and Jamal Bahlawan. 33% of the total built up area of the project's Taking Over Certificates has been issued. The project will be handed over on time in September 2019.



The day was concluded with a meeting with Hassan Allam, H.A Construction CEO, where they discussed the CCC and HAC Joint Venture status and the many coming projects in El Dabaa on the north coast, Carbon Holding in El Sokhna, El Hamrawein Power Plant and the JV's future projects with EMAAR Masr.

CCC

CCC



DR. M. SHAMI

## Value Engineering Course

Egypt



This course was organized by the CCC Training & Development Department and was held at the CCC Cairo Area Office on October 14-15, 2019.

Guests of honor present where Jamal Bahlawan, Hisham Abd El-Rahman, Hossam Atallah and Ms Nancy Ammar.

Ten Professional Development Units (PDUs) from the Project Management Institute (PMI) in the US were earned.

Implementing value engineering (VE) techniques in CCC projects should result in enormous cost benefits. VE helps to solve complex design and construction problems and to identify and eliminate unwanted costs, while improving project functions and quality. It's a creative process that involves design changes, sources of alternative materials, innovative method statements, besides other issues that will certainly lead to higher productivity, higher quality, and to lower overall completion cost.



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AREA NEWS

AREA NEWS

DR. M. SHAMI

## Proper Management of Subcontractors Workshop

UAE



This workshop which was organized by the CCC Training & Development Department was held at the Park Rotana Hotel in Abu Dhabi on August 26, 2019.

Seven Professional Development Units (PDUs) from the Project Management Institute (PMI) in the US were earned.

Because a large portion of our projects' scope is performed by subcontractors, the workshop subject of subcontractor management and control has a strategic impact on CCC's business outputs and outcomes (at the macro level) besides it impacts on our projects (productivity-wise and profitability-wise) at the micro level in our operations. The need for more vigilance and pro-activity in the way we manage subcontracts in all phases, from estimate to post-award and execution to closeout was underlined.



This initiative was a group effort and special thanks go to our expert speakers, Hanna Ghawi, Eimert Los, and Fiorenzo Mastromattei for their excellent presentations. Many thanks also to Firas Hijazi, Wassim Mikati and Zahi Saba for their superb on-line presentations from the Athens Office. Emmanuel Koukourakis and Basel Eshtewy provided really good material and in-depth support. Ziad Bishouty was our guest of honor who shared his expertise with everyone and addressed the critical success factors of subcontractor management at CCC. Zahi Ghantous and Zahi Saba are to be thanked for their overall support of this initiative.

Finally, we want to thank UAE Area Management, HR, and Services for their tremendous help and collaboration.

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CCC



UAE

AREA NEWS

## Emotional Intelligence Course

DR. M. SHAMI



This course was organized by the CCC Training & Development Department and was held in Abu Dhabi on August 27, 2019.

Seven Professional Development Units (PDUs) from the Project Management Institute (PMI) in the US were earned.

This course included some insightful discussions and participants exhibited a high level of professionalism. It is to be hoped that the emotional intelligence knowledge imparted will have a lasting positive impact on their careers and life in general.

Special thanks go to UAE Area Management, HR, and Services and EPSO Management for their kind assistance.



CCC

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DR. M. SHAMI

## Contract Formation, Administration & Closure Course

UAE



AREA NEWS



This course was organized by the CCC Training & Development Department and was held at the Park Rotana Hotel in Abu Dhabi on September 18-19, 2019.

Fourteen Professional Development Units (PDUs) from the Project Management Institute (PMI) in the US were earned.

CCC Leaders/Expert Guest Speakers were: Dr. Manar Shami, Manager, Training & Development, Zahi Ghantous, Assistant Vice President, Construction Support (Mechanical), Leslie Charles Forster, Manager, Contracts, Sevag Panossian, Senior Legal Advisor, Richard Stevely, Manager, Contracts, SQM and Philip St John Green, Vice President, Oil & Gas Operations.

Course materials included case studies, sample reports and other CCC industry best practices and lessons learned.

33 senior CCC staff from Abu Dhabi attended the course.

Many thanks go to the UAE Area Management, HR and Services for their continued assistance and collaboration.

**CONSOLIDATED-CONTRACTORS COMPANY S.A.L.**  
Wardha Center, Al Maryah Island, P.O. Box 50001, 12991  
**Project Management Institute**

**CCC TRAINING DEPARTMENT**

**"CONTRACT FORMATION, ADMINISTRATION, AND CLOSURE"**

Course Number: 2794-0987-117  
Total Professional Development Units (PDUs) to Be Earned: 14  
CCC is a Global Registered Education Provider (R.E.P.) # 2794

**CONSOLIDATED-CONTRACTORS COMPANY S.A.L.**  
An Innovative 5-Day Training

Date: Wednesday & Thursday, September, 18 & 19, 2019  
Location: Park Rotana Hotel (Cardas Room), Abu Dhabi, UAE

St. Mary's Beach Avenue, Training & Development, LLC  
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Case Studies, Sample Reports, and Other  
CCC Industry Best Practices & Lessons Learned

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## The Ramadan Campaign

To you, our generous donor,

We wish to say a big “**THANK YOU**” for your continued support in this year’s 5th consecutive Ramadan fundraising campaign.

The total amount reached was \$90,000 which the CCC owners matched to make \$180,000. These funds will go towards the following worthy causes:

1. Relieving and assisting Syrian refugees in Greece with medical or educational aid, through local NGOs.
2. Continuous support of the Education for Employment NGO to scale-up its operations in Gaza and Jerusalem. The EFE with its unique model for the creation of employment that better adapts to the real needs of businesses by value-added training (<http://www.efe.org/>).
3. Continuous support of the Al-Nayzak organization in establishing an innovation park in East Jerusalem as an incubator for youths and small/medium enterprises. Al-Nayzak is an award winning Palestinian educational NGO. (<http://www.alnayzak.org/>).

Although this year the amount collected was less than the amount collected in 2018 (which was US\$ 124,000.-) the significance of it is very important, as always.

We don’t have to be millionaires to make a significant difference. Just as every drop in the ocean counts to form a vast water mass, even small donations have the potential to drastically improve an individual’s quality of life.

The knowledge that you are helping others is hugely empowering and in turn can make you feel happier and more fulfilled, as well as being the perfect opportunity to make a difference in the world.

Without your kindness, support and generosity this project would not have been possible.

Thank you...

CCC

## Dr. Virginia Bodolica

Chairholder of The Said T. Khoury Chair of Leadership Studies

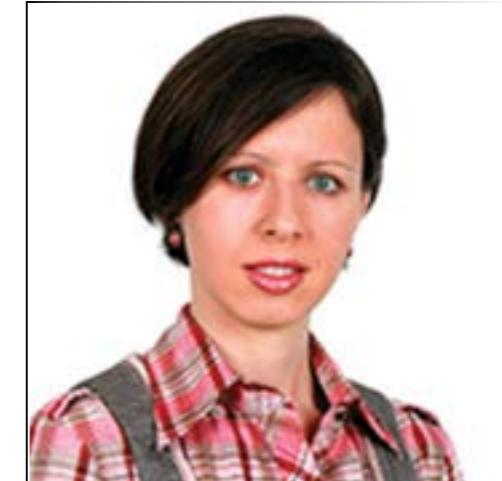
**Q:** You are the Chairholder of The Said T. Khoury Chair of Leadership Studies at the American University of Sharjah. What does your role involve and how do you view it?

**A:** My role involves a mix of synergistic activities that aim to disseminate knowledge about leadership. I cover a number of areas including: undergraduate and graduate teaching, research and scholarly production, outreach efforts through workshops, seminars and executive education programs, engagement with alumni and the academic and professional communities, guest speaking events with corporate leaders, and other relevant endeavors that strengthen the relationship between the university and the business world.

The way I view my role and responsibilities is captured in the logo that was recently developed for The Said T. Khoury Chair of Leadership Studies. It reflects on the key values that are actively promoted by the Chair donor the Khoury family (inclusiveness, diversity, youth engagement and empowerment) and the way I envision leadership in today's constantly evolving corporate world: real actions and interventions that are influenced by valuable research insights and have practical relevance.

**Q:** You have lived, studied and worked in Europe, North and Latin America and the Middle East. From your personal experience, how are gender matters approached across the world? Is the gender dialogue advancing?

**A:** I have witnessed a broad variety of ways and techniques to tackle gender issues across various levels: individual, organizational, and national. Some countries embrace a more extensive approach, whereby the purposeful failure to address gender imbalances is considered an offense and a threat to societal justice. Other nations espouse an evolutionary stance, taking it step by step and implementing policies that seek to



gradually close the gender gap. Finally, in some other states of the world, the gender dialogue is only starting to be framed and is currently in its infancy stage.

When I lived in Canada, one of the key areas of concern for legislators was closing the gender pay gap across all levels of the organizational chart. Apart from monitoring their gender pay gap and instituting procedures to eliminate discrepancies, organizations also implemented other measures, such as flexible and family-friendly work arrangements. When I worked in Latin America, a historically unprecedented period for the continent as three of the largest economies, (Argentina, Brazil and Chile), had female heads of state I acquired an insider view on how gender matters were approached. When I first came to the Middle East, I remember that one of the first gender metaphors that I came across while reading The National was “concrete ceiling”, extending on the usual “glass ceiling” metaphor and alluding to all those barriers that prevented women from successfully advancing professionally.

After more than a decade in the UAE, the progress made is significant! The local labor market provides many professional opportunities to well-educated female applicants and even male-dominated jobs



THE SAID T. KHOURY  
CHAIR OF LEADERSHIP STUDIES

CCC

**Dr. Virginia Bodolica**  
Chairholder of The Said T. Khoury Chair of Leadership Studies



(such as computer engineering) have become more receptive to women. At AUS, we have more and more female students whose knowledge, talent and skills find valuable application in various areas of the economy.

Overall I can say with certainty that gender dialogue is advancing all over the world, although at different pace and speed, and we are yet to see more progress.

**Q: Your expertise includes corporate governance, family business and human resources. What is the importance and relevance of gender diversity in these fields?**

Regarding corporate governance, legislators and government officials presently seek to identify viable mechanisms to promote women participation in corporate boards of directors. In the specialized literature, boards of directors of modern corporations are described as predominantly "male, pale, and

stale". Since the decisions made by corporate directors are strategic in nature, affecting all the members of the organization they govern, it is critically important to secure an effective decision-making process at the board level. A relevant and viable starting point for achieving board effectiveness is through heightened gender diversity.

The benefits women bring to the boardroom have been well-researched: from bringing diversity of thought, to challenging taken-for-granted assumptions and balancing out contradictory perspectives. Often, female board members trigger fruitful debate among directors by asking unexpected and unconventional questions. This in many cases, represents the key ingredient for unlocking untapped potential and boosting agile thinking.

Family businesses in the Arab world are one of the most important contributors of wealth and growth in the region. Being also recognized for their respect towards cultural



**Dr. Virginia Bodolica**  
Chairholder of The Said T. Khoury Chair of Leadership Studies



heritage and traditions, they represent an ideal organizational setting where female family-related members can fully realize their potential and professional aspirations. For example the UAE proudly shares the successful story of Dr. Raja Easa Al Gurg, a respected businesswoman across the Middle East and internationally.

**Q: What message would you like to send to all the women who work at CCC across the different countries?**

Today's world is changing, our society is constantly evolving, new realities are emerging, and the prevailing gender perceptions that formerly impeded leadership opportunities for women are fading away. All over the world, we can see that women are making progress not only in certain previously inaccessible for them professions, but also in top management posts and roles. For instance, 2019 is the year when the Fortune 500 list includes more female CEOs than ever before and the share of female representation on the board of directors of these corporations has almost doubled over the past decade.

I would like to send a message of positivity, good will, self-confidence, and determination to all the women who work at CCC across the different countries. The world around us is full of challenges, but it all depends on how we see them and how we manage to turn them around so that they become opportunities. Believe in your forces, continue exploring and questioning, push your curiosity beyond limits, invest in your future, stand out, come forward and ask! To put it in Andy Irwin's words, "Don't be afraid to be amazing!"

In conclusion, I would like to take this opportunity to express, once again, my deepest and sincerest gratitude to the Khoury family for their confidence, trust and support for The Said T. Khoury Chair of Leadership Studies at AUS. I am looking forward to conducting many impactful activities and identifying mutually beneficial avenues for collaboration between the Chair and CCC in the months and years to come.

#### MILESTONES

- Born in the Republic of Moldova
- 1998 Bachelor's degree in International Economic Relations, Academy of Economic Studies (Moldova)
- 1999 Master's degree in European Political and Administrative Studies, College of Europe (Poland)
- 2001 Master's degree in Business Administration, Université de Nantes (France)
- 2006 PhD (Doctor of Philosophy) in Strategic Management, HEC Montréal (Canada)
- 2005 Assistant Professor of Compensation Management at the Université de Québec en Outaouais (Canada)
- 2006 Consultant, Executive Education Instructor and Workshop Facilitator in Governance, Strategy and Innovation (various countries)
- 2007 Assistant, Associate and currently Full Professor of Management, American University of Sharjah (UAE)
- 2013 Visiting Associate Professor of Strategic Management, ESE Business School (Chile)
- 2019 Chairholder of The Said T. Khoury Chair of Leadership Studies, American University of Sharjah (UAE)

**Contribution to CSR Initiative**

CCC staff are encouraged to come up with ideas and activities related to CCC's CSR initiatives including Going Green and community involvement events. Please send your ideas, initiatives and achievements to the CSR-CCC email address [csr@ccc.net](mailto:csr@ccc.net).

**CCC Employees Raise Funds for Good Causes, Oman**

CCC Oman and staff members raised funds to support the missions of Al Rahma Association for Motherhood and Childhood, and the Early Intervention Center for Children with Disability Organization.

While the Al Rahma Association's mission is to help less fortunate families across all governorates of the sultanate by providing them with the necessary financial and non-financial support, the Early Intervention Center for Children with Disability provides rehabilitative, social, psychological and therapeutic services to children with disability.

The President of the Al Rahma Association and the President of the Early Intervention Center for Children with Disability were invited to CCC's Area Office to receive the donation upon which they expressed their sincere appreciation to CCC's management and staff.

**CSR Projects and Initiatives****The Project to Improve the Living Conditions of the People of Mulinda Community is Well Underway, Mozambique**

<https://www.facebook.com/wateraidmoz/posts/1201168423399438>

The project which aims to provide access to clean and safe water, as well as promoting hygiene behavior change to 146 families living in Mulinda Community, is well underway.



Delivered in partnership with WaterAid, the project started in May 2019 and the drilling for water has been completed. WaterAid is in the process of assessing the water flow rate and water quality to confirm the installation of the borehole and to ensure that people are drinking safe water.

In addition, a water committee was formed and trained to manage and maintain the borehole. WaterAid has also identified and trained community activists on hygiene promotion techniques. The activists, through their door-to-door household visits to promote good hygiene practices, have started to see positive results as families have started undertaking good hygiene practices, such as building their own latrines, dish racks, installing hand wash facilities, and placing garbage pits.

By the end of the project the population of Mulinda will no longer need to rely on getting their water from the polluted Muchimazi River which is the only available water source. The river is not only located four kilometres away from the village, but is also very unclean as it is being shared with cattle, used for drinking, bathing and washing clothes; a situation which is conducive to the breakout of water-borne diseases such as cholera and dysentery.





## Corporate Volunteering Program

### CCC's Volunteers are Making a Difference...

CCC's Volunteer Program ... Simply Because We Care

Corporate philanthropy comes in many forms: CCC embraces volunteerism as a way to give back to the communities where it operates and to provide an outlet for its employees to volunteer their time for the causes that are near and dear to them. Through the Volunteering Program, CCC's social impact makers, its volunteers, are making a difference, and are positively and genuinely impacting their local communities.

**CCC is proud of its volunteers for joining thousands of other volunteers around the world to help those in need.**



### CCT Employees Reach Out to Autistic Children and Youth, Beirut, Lebanon



CCT Volunteers joined the Autism Awareness Association's (AAA) summer 2019 camp activities for children and youth aged between 9 and 25. The volunteers accompanied the children in their outdoor activities in various locations, and interacted and played with them.

The volunteers were given a briefing session about autism and its challenges and how it affects a person's communication abilities, educational development and social skills.



They were informed that families frequently mistake autism to hearing loss due to their lack of awareness about the disorder.

One of the main goals of the association is to increase awareness of autism among the Lebanese society. All volunteers had a rewarding volunteering experience. Junior Software Developer, Nadin Hachem, said:

"I would definitely repeat this experience with AAA because I felt that people having autism are misunderstood, and that they should be included more in the community."



### CCC Employees' Second Visit to Al Jalila Children's Hospital, UAE

On June 27, 2019 six CCC volunteers spent a couple of hours entertaining the children at Dubai's Al Jalila Children's Specialty Hospital.



## Corporate Volunteering Program

### Thank You Sharjah Volunteers for Your Contribution to Humanity...

Sharjah, UAE



On September 12, 2019 four Sharjah based employees Wassim BouKhzam, Yaser Dahle, Ahmad Shehadeh and Abdallah Alghwairi ventured to assist children with special needs in their classroom activities at Manzil Center.

This volunteering activity was organized by CSR Coordinator, Ms. Dana Mahboobeh with the center which offers a variety of activities such as art, cooking, jewelry making and more. In just two hours of their time the volunteers assisted the teachers in support of the classroom program and as guided by the teachers.

Manzil caters to 42 students with cognitive disabilities with a total staff of 27 making it a highly qualitative center with low student to staff ratio. CCC is proud of its four volunteers for joining thousands of other volunteers around the world who are helping those in need. Volunteering work gives these compassionate people a chance to use their time and skills to make a real difference in the lives of the vulnerable and disabled people. All four volunteers expressed their satisfaction and willingness to repeat their rewarding volunteering experience.



## Corporate Volunteering Program

### CCC Employees Run for the Cure of Breast Cancer



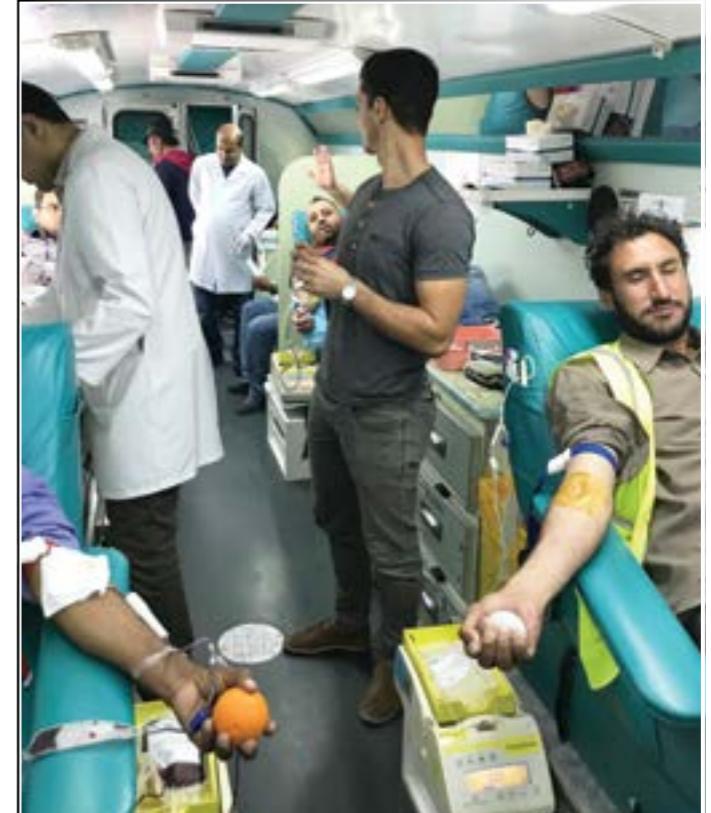
On September 29, 2019, 92 CCC employees joined 44,000 people of all age groups in down town Athens to run for the cure of breast cancer. The annual Race for the Cure fundraising event was organized by the Hellenic Association of Women with Breast Cancer "Alma Zois" in collaboration with the Susan G. Komen Organization. The Panhellenic Breast Cancer Association will use the proceeds to help raise public awareness, promote prevention and early diagnosis of the disease and support those who are currently living with breast cancer.

### Three Blood Donations Events in the UAE

Three blood donation days were organized by CCC in the UAE in which project staff braved the needles to save lives. The first was organized by EPSO in partnership with Abu Dhabi Blood Bank, Sheikh Khalifa Medical City and was held on December 5, 2018. 56 blood bags were collected and for the fifth time in a row, CCC received a Certificate of Appreciation from the Abu Dhabi Blood Bank for its continuous support of this life saving initiative.

The blood donation day was repeated at CCC's Al Zahia Project in Sharjah on April 1, 2019 and was organized in cooperation with the Ministry of Health and Prevention in Sharjah.

The third one was held in Dubai on August 9, 2019 in cooperation with the Dubai Blood Donation Center in which 39 employees participated.



### Family Fun Afternoon for CCC Staff Members in Abu Dhabi



On September 27, 2019 CSR organized a family day for CCC Abu Dhabi staff members and their families. 35 employees and their families spent an afternoon at the Freestyle Sports Club where they carried out various fitness activities, including playing football, basketball, and play station. The staff members had the opportunity to compete against each other, and intermingle over snacks and refreshments. The goals of the initiative were to enhance collegial relationships between staff members, as well as encourage them to adopt a healthy lifestyle.



### Employee Welfare

### CCC Football Team Wins the Corporate Union Championship, Oman



CCC's football team participated in the Corporate Union Championship Tournament which took place during Ramadan. After winning the semi-final game held on May 28, 2019 against Shapoorji Pallonji team, CCC qualified for the final game against Sohar Bank.

The final match was held on May 29, 2019 under the patronage of His Excellency Hamad Ben Khamis Al Amri, the Undersecretary of the Ministry of Manpower. It was a tough game and neither of the teams managed to score during the allocated

time. After going to the penalty shots CCC won the championship with a 4-3 score. To mark the victory, the Oman Area Management invited the team to a celebratory dinner.

Currently CCC Oman football team is preparing themselves for the 2019 Oman Corporate League which started on August 18, 2019. The winner in this tournament will qualify to play in the International Socca Federation which will be held on October 12-20, 2019 in Crete, Greece.



## Employee Welfare

**Celebrations, Joy and Entertainment at the Riyadh Metro Project, Saudi Arabia**

## Employee Welfare

**Celebrating Ramadan in Oman**

To celebrate the holy occasion of Ramadan and to create a collegial atmosphere between employees, Oman's Area Management held two Iftars for employees and their families to celebrate this holy occasion and to create a good social relationship between the employees.

The employees were divided into two groups by department. The first group Iftar was held on May 19, 2019 and the second one on May 21, 2019, both of them at the Golden Tulip Seeb Hotel.





## Engagements and Marriages

Sabir Ali Khan Afghan (HSEO KAIA) is delighted to announce his marriage to Mayana Tabassum Khanam on October 31, 2019. The wedding took place in Kadapa, Andhra Pradesh, India.



## Baby Boys

Rabih Shraiteh (MRPC, Algeria) and his wife Rinrada Nuliang are pleased to announce the birth of their second child, **Rami**. He was born on June 9, 2019 in Lebanon. All the family and friends are very happy with the new arrival.

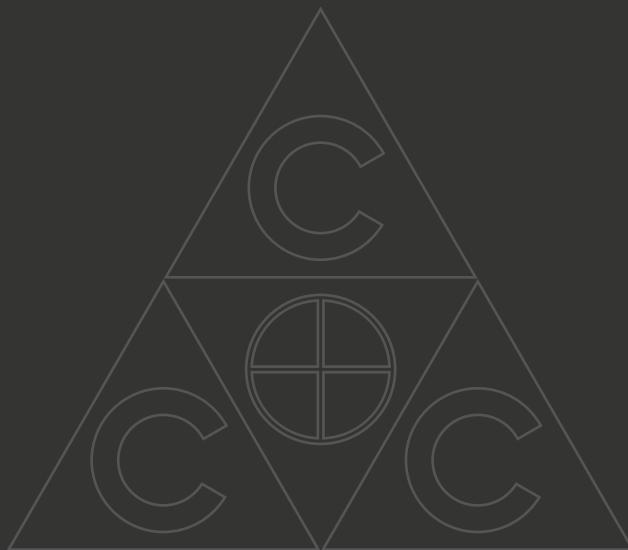


## Baby Girls

A cute little princess called **Amaira** was welcomed by Esmila Fernandes (Area Office, Kuwait) and her husband Andrew Pinheiro on May 12, 2019.



CCC



**EDITORS** | Samer Khoury  
Zuhair Haddad  
Nafez Husseini

**PUBLIC RELATIONS** | Samir Sabbagh

**PRODUCTION** | Jeannette Arduino  
Nick Goulas  
Georgia Giannias  
Alex Khoury  
Samer Elhaj

**CCC BULLETIN** | P.O. Box 61092  
Maroussi 151 10  
Fax (30-210) 618-2199 or bulletin@ccc.net  
see The BULLETIN on line at [www.ccc.net](http://www.ccc.net) -> News & Media -> Bulletin

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