SEMINAR
September 25, 2019
9am-4pm
Sheraton Oman Hotel

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MEFMA
Middle East Facility Management Association
جامعة الشرق الأوسط لإدارة المرافق

ENGIE Cofely

QBG
Facilities Management
WELCOME ADDRESS

Sheikh Abdulaziz Al Hosni

MEFMA Board Member
Vice Chairman & Group Managing Director, Qurum Business Group (QBG)
Integrated Facilities Management & Energy Management

Marwan Abou Raad
Country Operations Manager (Oman)
ENGIE Cofely
Outsourcing is more than just maintenance or FM

- **Drive Change**
  - Service is about selecting the right FM partner to optimise your non-core operations
  - Focus on low maintenance costs negatively impacts on whole cost of ownership
  - Work as a team to raise standards & optimise assets

- **Investment**
  - Trust your FM partner to support your non-core business activities
  - Engage with your FM partner on long term ROI, not short-term cost cutting

- **Sustainable**
  - Client and/or FM partner strategise & invest in smart technology, asset retrofits, international standards
  - Objective: Optimise OPex (O&M/Energy) & CAPex (Life cycle)

- **Trust**
  - Develop a sustainable strategy focused on reliability and efficiency of energy systems and asset life cycle
FM is about Asset Management
Operating systems = efficiency and innovation

- Lifecycle plan
- Forward Maintenance Plan
- Condition monitoring
- Stock Control
- Customer Satisfaction
- Logistics Performance
- Health & Safety
- Environmental Performance
- Employee Welfare
- Performance Report
- Financial Management
- Auditing & Benchmarking

CAFM System

- Asset Verification and Tagging
- Onsite Helpdesk 24/7
- Condition and Compliance
- Asset Management
- Audits
- Performance Management
Tailor performance dashboards to your needs
Make use of proven technology = Mobility
Carbon emissions is a focus for everyone.
Smart Building Technology is the future of any industry

- **FDD Platforms**: Fault Detection & Diagnostics
  - Pre-set database faults
  - Root-cause analysis
  - Detailed Reporting

- **SMART CAFM**: Mobility Solutions
  - Increased efficiency
  - Real-time reporting
  - Dynamic dashboards

- **Data Acquisition**: Big Data Analytics
  - (M)SaaS Data Analytics
  - Statistical analysis
  - Performance trending

- **AI Technology**: Machine Learning
  - Automated diagnostics
  - Prioritizes opportunities
  - Cost, comfort and impact

- **Energy**: Energy Driven FM
  - Operational Control
  - Optimised Operation
  - Zero CAPEX

- **IoT Technology**: SMART Maintenance
  - True condition based maintenance
  - Real-time Asset-level information
  - Reduced maintenance impact

- **BIM**: Asset Management
  - Real-time integration
  - Asset Life Cycle Costing
  - True lifecycle integration

- **Open Data API**: System Integration
  - Open Protocols
  - Remote monitoring
  - Scalable

- **Drone Technology**: Building Inspection
  - Façade / Roof Inspections
  - PV Solar Inspections

**Smart Building Technology is the future of any industry**
Case study: An investor/developer long term partnering with ENGIE on delivering an integrated service aimed at optimizing whole cost of ownership and marketing an A class asset.
ENGIE’s Strategy in 1’30
THANK YOU!
4th Industrial Revolution in Facilities Management

*Presented by:*
Vijayshankar Kavasseri
*Operations Director - Facilities Management*

QBG Facilities Management
What are the various Industrial Revolutions?

The first three industrial revolutions transformed our modern society. **Three** advancements defined each Industrial revolution

- the steam engine
- the age of science and mass production
- the rise of digital technology

The **fourth industrial revolution** is the current and developing environment in which disruptive technologies and trends such as the Internet of Things (IoT), robotics, Virtual Reality (VR) and Artificial Intelligence (AI) are changing the way we live and work.
Smart Sensors are Revolutionizing Facilities Management

The first industrial revolution brought power and lighting to buildings, the second revolution gave them mechanical control and processes, Industry 3.0 gave building managers the ability to centralize tasks through CAFM and streamline many of the standards. Through the Internet of Things (IoT), Industry 4.0 is building links between buildings and their systems, appliances, devices, and even other buildings..

- Reduce costs
- Reduce risk
- Improve the occupant experience
Smart Monitoring of critical assets and environments enables an effective response to crisis, and a seamless move from reactive to condition-based maintenance. This is now available with a variety of service providers who are selling these services across the GCC and is part of the advanced wave of BMS solutions.

- **What are the benefits?** Assured business continuity, superior energy management and resource allocation, and the resolution of flaws in legacy systems. This also enables us to reduce and work on enhanced energy conservation. E.g.- Light sensors, load differentials, running of assets and increased down time leading to enhanced asset life cycle of capex equipment. Reactive to Predictive Maintenance
- **How would it work?** Smart sensors monitor a range of asset or environmental variables important to your primary activities, recording real-time data and generating alerts the moment issues occur.
Some Benefits

**Flood**
Instant alerts about potential damage to vital assets by leaks or flooding

**Meter**
Superior measurement and management of utilities: Electricity, water and gas

**Occupancy**
Record building usage to improve the utilization of space and energy

**Lux**
Analyze and control lighting to assure a cost-effective and productive workplace
Fluid Leak Detection System (FLDS):

Based on the recent analysis report, it was found that high raised buildings were mostly facing worst incidents on water leak in corridors, apartments that affects the building systems life span and with high rectification costs.

Recent reports confirms “Water leaks” as the most common defects which could impact more to building systems.

7 out of 10 incidents in a building are related to water leak.

To find an innovative solution to prevent / eliminate damages to building assets during leaks could be a great challenge for Engineers.
Fluid Leak Detection System (FLDS):
Fluid Leak Detection System (FLDS):

- Domestic water leaks
- Chilled water leaks.
- Fire sprinkler burst inside apartments.
- Washroom shattaf/shower head damages.
- FCU drain cap thread damages.
- Garbage room tap/pipe damages
FLDS Product Model:

LDS Sensor  Relay  Controller  Solenoid/Actuator Valve
FLDS Work Methodology:

1. LDS Sensor – Detects the water accumulation in corridors / apartment doors
2. Controller – Receives the signals from sensor/detector and commands the actuator valve to get close
3. Actuator / Solenoid - Newly installed actuators in water lines to prevent any damages to the building assets
4. Integration with existing network lines – communicates to BMS/control room.
In its simplest forms, IoT could be deployed as a centralized network and control scheme for what used to be disconnected systems and dumb devices such as:

- Lighting
- Refrigeration
- Smart Meters
- Fire Suppression Systems
- Security and Safety Alarms
- Appliances with Embedded Sensors/Software
- Central Heating Ventilation and Air-Conditioning (HVAC)
Smart Sensors are Revolutionizing Facilities Management:

• Sensors can be connected to HVAC systems, lights, doors, windows and buildings, and data from such sensors/devices can be integrated and analyzed to understand how the utilization of each device could be optimized. Installations could benefit from up to 25% energy savings through proactive energy management programs for example.

• The Internet of Things (IoT) is ushering in new possibilities for building integration and allowing for the emergence of truly intelligent buildings. The IoT makes it possible to understand what is happening within every component of a building and for building-automation systems (BAS) to optimize performance of the smallest part. The IoT even enables BAS to anticipate problems and make necessary adjustments to avoid failures, resolving issues before occupants are impacted.

• ISS, a leading FM service provider, decided to use IBM's Watson IoT platform to manage its portfolio of 25,000 buildings worldwide. ISS and IBM would integrate and analyze data from the devices and sensors embedded into buildings, including doors, windows, chairs, meeting rooms, dispensers, and air conditioning systems.
Smart Sensors are Revolutionizing Facilities Management:

- Monitor Stocks and Usage of Supplies in Restrooms* (large malls/Airports)
- Sensors and software applications can be used to monitor the usage of restrooms and supplies, making supplies management more efficient, scheduling cleaning activities, reducing overheads, as well as scheduling the requisition and approval supplies. Sensors in restrooms can also help in water management and preventive maintenance of fittings and pipes
- In a typical FM contract, daily operations consists of a team of custodians, maintenance and grounds staff traversing campus to address routine tasks, like emptying trashcans, changing light bulbs and repairing sprinkler systems. Technicians spend their days completing service requests and responding to emergency issues. These reactive issues waste valuable time and effort.
- IoT technology changes these processes significantly. Automated equipment, building systems, irrigation systems and more report when they need attention. Repair teams know exactly where to go and what to do before they leave the office.
Growth Trends Shaping Our Homes & Business:

Along with smart sensors and the IoT, Industry 4.0 is accelerating many other innovations. Take a look at this impressive list of creations, some of which you’ve probably already experienced at work or at home (or both):

- Artificial intelligence and virtual reality
- Augmented reality (i.e.: social media filters)
- Self-driving cars and public transit vehicles
- 3D printing
- Cloud data storage
- Big data and predictive analytics
- Cybersecurity
- Robotics
- Wearable and digestible devices for health monitoring
What does Industry 4.0 mean for the built environment?

Predictively solve issues
• The building itself can provide constant monitoring and reporting on critical infrastructure like elevators and escalators, allowing for predictive maintenance as well as remote diagnostics and troubleshooting.

Continually optimize the building
• Connectivity enables a consistently ideal living and working environment inside the building, while reducing costs and environmental impact through reduced energy consumption.

Use and refine networked systems for more energy efficient and smarter facilities
• Advanced building automation systems for HVAC, lighting, windows, smart ceiling fans, and even energy load management for appliances allow for almost total control over the building.
4 Ways Facility Management Teams Can Benefit From IoT:

- Enhancement of occupant interaction and workplace experience
- Optimizing service efficiency with Activity Based Services
- Taking maintenance to another level: from proactive to predictive maintenance
- Improve indoor environmental monitoring, employee well-being and productivity
Challenges of IoT:

With the number of devices being implemented, the traditional management model has to be the majority of the cost under the implementation.

Almost all the devices are being dealt with by non-technical people.

The IoT system needs advanced technology rather than the current traditional management network Systems.
Any Questions?
THANK YOU
The power of Emotional Intelligence

Dr. Yasmin Al Bulushi

Dean- Muscat College
Management Trainer-London Speakers Bureau
CEO – The Pause Consultancies
Emotional Intelligence is “the key to professional success”
Purple: 94.6°F – Relaxed

Blue: 93.6°F – Calm

Turquoise: 92.6°F – Relaxing

Green: 91.6°F – Engaged

Yellow: 90.6°F – Unsettled

Amber: 89.6°F – Tense

Black: 87°F – Very Tense
Emotions Drive people, People Drive Performance
Emotional Intelligence

= Head + Heart
working
together!

6seconds.org
Emotions • 80%

Facts and Information • 20%
Top Issues

Made with wordle.net, larger words are more frequent
Technical/Financial
29.50%

Emotional/Rational 70.50%
“How are people feeling at work?”

- commitment
- joy
- stress
- compassion
- confusion
- excited
- concern
- caring
- happiness
- excitement
- enthusiasm
- anxiety
- passion
- happy
- satisfied
- motivation
- motivation

Larger = more frequent. Made with wordle.net
Mood Matters

16X

26X
IQ determines 20-25% of business success

EQ determines 75-80% of business success
We help people excel starting here.
Why?

EQ

- Effectiveness
- Relationships
- Quality of life
- Wellbeing

© Six Seconds
Value of EQ

43x
- Pepsi Co. executives selected for EQ competencies generated 10% more productivity.
- L’Oreal High EQ sales people brought in $2.5 million more in sales.
- Sheraton increase in market share by 24%
Engagement Index: 33% The Starting Point
Project Design: Change MAP

Engage

- Team Vital Signs (TVS) for managers
- 1-day project launch + training

Activate

- Vital Team pilot projects with:
  - 3x progress meetings (1hr)
  - 3x team meetings (2hrs)
  - Distance learning

Reflect

- TVS post-test
- 1-day conference
Post-Program TVS Results

- **Motivation**: 95.7 -> 103.3
- **Teamwork**: 96.5 -> 108.8
- **Execution**: 93.9 -> 112.2
- **Change**: 99.2 -> 103.9
- **Trust**: 97.3 -> 108.6
From Engagement = 33%

Results

To Engagement = 70%
Francesco Blasi concluded:

"The lesson was precisely the approach used... it was great to see people utilize the method managing their employees too!"

Final Word:

Δ Plant Efficiency: +9.4%
Amadori Case

Individual Performance

Organizational Performance

Emotional Intelligence

Organizational Engagement
Higher vs Lower EQ

Highest 25% of EQ

- Objectives Score: 84.44
- Competencies Score: 81.65
- Performance Score: 84.01

Lowest 25% of EQ

- Objectives Score: 80.00
- Competencies Score: 76.67
- Performance Score: 80.39
Engagement & EQ

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<th>Santa Sofia</th>
<th>Teramo</th>
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Cesena
Santa Sofia
Teramo
The Six Seconds EQ Model
$R^2 = 0.59786$

59.7% of Performance
Brain Style
Brain Style
Brain Styles

Scientist  Inventor  Strategist  Deliverer

Visionary  Guardian  Energizer  Sage
**Brain Discovery Profile**

**Focus:**
Your brain is better at perceiving the emotions (vs. collecting rational data).

**Decisions:**
Your brain has a slight preference for risk-taking (vs. careful evaluation).

**Drive:**
Your brain likes pushing for practical actions (vs. planning for long term).

**Highest Scores**
- **Connection**
  - Sensing & mirroring others' emotions.
- **Proactivity**
  - Acting based on internal drive.
- **Problem Solving**
  - Inventing solutions to meet present needs.
- **Satisfaction**
  - Capacity to feel appreciation about one's life and efforts.

**Lowest Scores**
- **Design**
  - Expanding attention to create new potential.
- **Vision**
  - Seeing the long-term meaning.
- **Data Mining**
  - Filtering to assess key information.
- **Achievement**
  - Capacity to accomplish meaningful goals.

**Reflection:**
The brain can develop “apps” to access and use data—blending rational and emotional insight. Can you think of a situation where this capability has not been effective to help you solve problems? And situations where it has? How could you make this capability stronger?

Emotions drive people, and people drive performance. In what situations are your “Brain Takers” not reliable for creating results? How could you change this?

This profile was provided by Josh Friedman. josh@sixseconds.org

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**Brain Discovery Profile**

**For:** Sample Name (S1)

**Date:** Sample Execution Time: 19:21 (mm:ss)

**Notes:**

---

**Brain Takers**

**Highest Scores**
- Connection
- Proactivity
- Problem Solving
- Satisfaction

**Lowest Scores**
- Design
- Vision
- Data Mining
- Achievement

**Outcomes**

**Reflection:**
The brain can develop “apps” to access and use data—blending rational and emotional insight. Can you think of a situation where this capability has not been effective to help you solve problems? And situations where it has? How could you make this capability stronger?

Emotions drive people, and people drive performance. In what situations are your “Brain Takers” not reliable for creating results? How could you change this?

This profile was provided by Josh Friedman. josh@sixseconds.org
18 Apps

Focus

- Data Mining
- Modeling
- Prioritizing
- Connection
- Emotional Insight
- Collaboration

Decisions

- Reflection
- Adaptability
- Critical Thinking
- Resilience
- Risk Tolerance
- Imagination

Drive

- Proactiveness
- Focus
- Problem Solving
- Vision
- Design
- Entrepreneurship

The Brain Talent Profile www.6seconds.org/brain
Changing Talents

- Adaptability: +1.2%
- Reflection: +0.5%
- Design: +0.5%
- Collaboration: -2.8%
- Proactivity: -2.7%
- Risk Tolerance: -2.5%
Executive Summary

LVS – Leadership Vital Signs – is a multi-rater assessment providing focused feedback about your leadership and comparisons between your and others' perceptions. In this context, “leadership” is defined by the five components shown in blue on this graph.

The blue line shows your self-perception scores; the orange shows others’ perception. A line closer to the outside of the graph represents a higher score. Trust scores are shown in the central Trust diamond.

This data is shown in a bar graph on the following page.
Why artificial intelligence is learning emotional intelligence

Annual Meeting of the New Champions – September 2018
The Pause Consultancies
Leadership, management, quality and Education

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London Speaker Bureau  mariam@londonspeakerbureau.com
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Artificial Intelligence (AI) in Energy Saving

Sultan Al Bahri
CEO
Momkin
Ai for adaptable and sustainable buildings
40% of the world’s energy is consumed by buildings

OMR 70 Bln in heating and cooling costs per year (OMR 4/sqm year avg)

US Green Building Council
indoor air quality impacts performance

Taking a test in a room with high CO$_2$ results in 50% increase in mistakes
Indoor air quality impacts performance

Taking a test in a room with high CO₂ results in 50% increase in mistakes

HEALTH, WELLBEING & PRODUCTIVITY:
The impact of green buildings on people and profit, 2016
most HVAC systems are not up to the task

- Do not monitor T, Co2 and humidity in real time
- Require constant supervision by trained staff
- Proprietary and expensive upgrades and maintenance
Alternative??

Solar Power

Nuclear Power

Wind Power

Wave Power
MONITORING
CONSULTING & ANALYTICS
OPTIMIZATION
How it works

The solution turns buildings into strong environmental, economical and social assets. In one word: sustainable.

Thanks to new technologies that are noninvasive and easy to use we enable buildings to adapt in real time to people and climate, reducing energy usage by 30% and radically improving indoor comfort.

Our IoT energy retrofit solution "Energy Cloud" includes:

✓ Air quality sensors (wireless and battery powered)
✓ A platform that receives environmental data and through algorithms sends instructions to the existing systems
✓ wireless actuators installed in the heating and cooling systems

Our proprietary algorithms perform a fine tuning of HVAC systems in real time for maximum comfort and an average 30% savings.
Main Benefits

✓ Improved indoor comfort while lowering energy usage
✓ Smart retrofit: constant micro adjustments transform a static system into a highly dynamic and responsive one
✓ Seamless integration with any existing HVAC system, improving performance without disrupting the infrastructure
✓ Real time monitoring: air quality, energy and occupancy data allow a deeper understanding of the building and the business
✓ Reduced tear and wear on HVAC systems and extension of their overall lifetime
The easy to play solution for energy

General Architecture
Results

> 20% reduction of energy costs

> 90% time in comfort

Fast and safe installation
Thank You
FM CONSULTANCY –
When do you need it?

Eng. Ahmed B. Al-Eisa
Chairman & CEO
Engineering Systems Group
Engineering Systems Group Co.
Who is the FM Consultant ?!

A Firm / Individual that will put you in the right direction to ensure savings in sustainable asset’s improvements.
When...

- **Design and Construction Costs**: 20%
- **Operational Costs**: 65%
- **End of Life Costs**: 15%
Facilities Management Consultancy needs:

- Design Review from FM perspective.
- Construction & Handing over Review
Facilities Management Consultancy needs:

To maximize asset utilization we need to improve:

- FM Services
- Asset Business development
- Asset sustainability (O&M)
Facilities Management Consultancy needs:

Evaluation of the service provided by:

- FM contractors
- O&M operators
- Soft Services providers
- Vendors
- Best practice advisory (KPIs)
Facilities Management Consultancy needs:

Risk management
Facilities Management Consultancy needs:

- Infrastructure & Utilities Management optimization
Facilities Management Consultancy needs:

- Heritage and old facilities inspection and assessment
- FM polices, procedures & Manuals
- As-Built in 2D, BIM, 3D scanning
Facilities Management Consultancy needs:

One point of contact for your asset management
Facilities Management Consultancy needs:

Review, audit & advise:

- Planned Preventive (PPM)

- Soft Services Schedules
Facilities Management Consultancy needs:

Improve & upgrade asset management with technologies
FM Consultant = Sustainable asset investment

Thank you

Engineering Systems Group
LUNCH
COURTYARD RESTAURANT
IoT for Facility Management Industry

Eng. Orgun Oktem

Senior Manager Infrastructure Services

Oman Telecommunications Company SAOG
Istanbul Technical University, B.Sc. Civil Engineering

19 Years’ Telecom Industry Experience
- 3 Years in Turkey
- 16+ Years in Oman (14 Years in Omantel)

37% of Life Spent in Oman
New Omantel Head Office in Madinat Al Irfan
New Omantel Head Office in Madinat Al Irfan
Over 4,000 Omantel Facilities to Manage!!!
What is Facility Management for Businesses?
Facility Management is the effective and integral management of all facilities, thus enabling organizations to continuously meet their objectives and achieve an optimum feeling of well-being for people in their workplace.
The picture can’t be displayed.
Do You Know Where You Are On The Journey?
How can we benefit from Technology in Facility Management for:

- Reducing Costs
- Increasing Efficiency
- Maximizing Returns
- Optimizing Well-Being of the Employees?
One of the answers is

IoT (Internet of Things)
IoT?

The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.
What is IoT?

IoT stands for Internet of Things – something connected or simply ‘smart’ devices. Any device, appliance or gadget that is connected to the internet and can communicate with other devices without human intervention.

- **Fitness Tracker** that sends data on your daily activity to online servers, which could then be viewed on your smartphone.
- **Security Camera** that sends a feed to an online server so that you can view it on a smartphone, tablet, or another computer when away from home.
- **Smart Thermostats** that learn & adapt to your lifestyle, adjust temperatures in the premise for comfort or energy efficiency.
- **Smart Lighting** that can be set to switch on or off at certain periods, or that can be controlled remotely from a smartphone.
- **Smart TV** that can stream music, videos or photos from online services or other computers at home. It can also interact with other smart devices, for example, displaying content from baby monitors and security cameras.

If you’re using any of these connected devices, you’re already involved with the ‘Internet of Things (IoT)’.
What else can IoT do?

Internet of Things devices have an extremely broad range of applications across almost all industries. The sort of devices described above show how IoT can add convenience to our lives, automate time consuming activities, and ultimately offer us more control over the things we interact with every day.

Engineering
An IoT device in an engineering plant can alert maintenance personnel to an impending failure, averting a breakdown.

Security
A smoke or security alarm connected to the internet and can remotely inform someone that it has been triggered when they aren’t present.

Smart Cities
IoT is also considered to be fundamental technology for smart cities, including smart traffic signals that monitor usage and smart bins that signal when they need to be emptied.

Industry
Within an industry, IoT can be used for all sorts of processes, such as supply chain tracking or crop monitoring.

Healthcare
In healthcare, smart pills and connected monitoring patches are already available that offer the potential to save lives. Others gather important data – such as monitoring how much Parkinson’s sufferers shake. The activities of elderly or ill people can be tracked to detect dangerous anomalies, and people with heart disease can be monitored for abnormal heart rhythms.

These are just a few examples of how connected devices and the Internet of Things are set to shape our future.

The future is now.
How IoT devices work?

Connected devices typically connect to the internet through Wi-Fi or mobile network.

- Connected devices can talk to other related devices on the network and act on the information they get from one another.

- People can interact with the connected devices to set them up, give them instructions or access data, but the devices do most of the work on their own without human intervention.

- All of this is made possible by tiny, embedded mobile components that allow almost anything to become ‘connected.’

- They rely on the always-online nature of our home and business networks, and often process data online via cloud-based software where huge amounts of data from many different users can be analyzed together.

If you’re having a wireless network, you’re ready to be connected with the ‘Internet of Things (IoT)’
IoT Growth & Forecast: over 70 Billion Connections by 2020

Billion of Connected Things (IMS Consulting) ~20
Billion of Connected Things (GSMA, ITU, Gartner) ~25
Billion of Connected Things (ABI) ~30
Billion of Connected Things (Cisco, Ericsson) ~50
Billion of Connected Things (Morgan Stanley) +70

~20 ~25 ~30 ~50 +70
The **worldwide Internet of Things market** will grow from $655 billion in 2014 to **$1.7 trillion** in 2020.

Devices, connectivity and IT services will make up the majority of the IoT market in 2020 with more than **70%** of the total spend.

In 2020 there will be more than **50 billion** devices connected.
## Program: Worldwide Internet of Things Spending Guide by Vertical Market

Detailed Tech Category (All)
Use Case (All)
Region (All)
Country (All)
Tech Category 1 (All)

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<td>1,085,555</td>
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</tr>
</tbody>
</table>
**IoT Applications**

**Human**
- Devices (wearables and ingestibles) to monitor and maintain human health and wellness; disease management, increased fitness, higher productivity

**Home**
- Home controllers, security systems, safety systems, appliances, etc.

**Retail**
- Stores, banks, restaurants, arenas – anywhere consumers consider and buy; self-checkout, in-store offers, inventory optimization

**Office**
- Energy management and security in office buildings; improved productivity, including for mobile employees

**Industry**
- Places with repetitive work routines, including hospitals and farms; operating efficiencies, optimizing equipment use and inventory
IoT Applications

**Worksites**
Mining, oil and gas, construction; operating efficiencies, predictive maintenance, health and safety

**Vehicles**
Vehicles including cars, trucks, ships, aircraft, and trains; condition-based maintenance, usage-based design, pre-sales analytics, autonomous drive

**Cities**
Public spaces and infrastructure in urban settings; adaptive traffic control, smart meters, environmental monitoring, resource management

**Transport**
Includes railroad tracks, autonomous vehicles (outside urban locations), flight navigation; real-time routing, connected navigation, shipment tracking
How can IoT be applied to FM?
1. Smart Buildings

Sensor Controlled HVAC

Air conditioning/heating switched on at the optimum time based on the first booking in a meeting room to ensure the desired temperature is reached with minimal energy wastage.

Smart navigation (including emergency evacuation)

A smartphone app can guide an occupant to their meeting room or a colleague. In an emergency, room signage devices use information from smoke sensors to lead staff to safety.
2. Resource Management

Sensors on resources – rooms, desks, parking spaces, providing real-time data on space usage and availability

Staff can view hot desk and meeting room availability throughout the building from a reception kiosk or mobile app. Users can also search for the nearest available meeting room relative to their location or the location of their colleagues.

Embedded beacon in portable equipment

Mobile equipment such as projectors and laptops can be tagged so their location can be tracked within an estate and alerts generated if they move outside of the estate boundaries. The objects can also be easily found within a given space.
3. Workplace Wellbeing

Staff member chooses a work area based on preferences of natural light, climate, noise pollution and population density, based on other bookings and real-time occupancy data.
4. Health & Safety

- Sensors to identify risks in environmental elements such as a drop in air quality or noise pollution
- Sensors are placed on all staff so that all areas of the building where staff are operating have full environmental sensor coverage as well as enabling early warning alerts in that area.
- Sensors identifying physical risks such as over populated areas
- Flow sensors installed in the building to monitor population within a space as people enter and leave.
- Occupancy sensors provide data on user presence
- Emergency crews utilize live occupancy sensor feeds to identify if, where, and how many people are in danger areas during an incident.
5. Security

Occupancy sensors or personalized tags indicate the locations of individuals in a building.

Alerts triggered for unauthorized personnel in restricted areas as well as providing automated access for authorized personnel throughout an estate.

Surveillance systems are setup to send real-time alerts.

Especially for partially or fully automated remote facilities, real-time alerts are sent to the facility manager as sms for any security breach.

Applications in tandem with smartphones.

In case of emergency such as fire, emergency evacuation can be exercised for those people who haven’t reported into a refuge area.
6. Cleaning Services

Sensors on bins/containers

Real-time data on bin/container capacity to help schedule collection and cleaning requirements.

Sensors indicating which resources have been used and associated volumes

On a day, occupancy data indicates that only a 1/3 of the meeting rooms are used and therefore may need cleaning. The room signage and FM mobile app indicates whether the room needs to be cleaned or not.
IoT in FM?
IoT enables data to be gathered regarding how and when every space in a building is used thereby facilitating evidence-based decisions regarding space usage.

By providing better space management the FM professional can identify opportunities to release space or avoid allocating additional space where it is not needed.

Energy consumption can be regulated based on occupancy and provide real-time usage and efficiencies.

The monitoring of occupancy also extends to better asset and facilities management.

By knowing which areas have seen increased usage, optimum cleaning and maintenance activities could be scheduled.

By monitoring the condition of the assets and allowing them to self-monitor, we will know when an asset is due to fail and act before a failure.

Furthermore, by communicating with each other, assets in a system can warn other assets that they are going to fail and stop the process before it extends to the entire system.
Risk Reduction

From security cameras and sensors to implanted tags, physical security of a building is improved and augmented by the use of IoT.

The building can now see if there is a threat to its occupants or its fabric.

The systems in place can stop intrusions, notify the authorities and assist the occupants in evacuating the building using the safest and fastest route.

Paired with technologies like drones and robotics, security can be further improved and risks lowered.
Improved Well-Being

The use of sensors and smart building systems allows us to improve the well-being of the occupants by monitoring and adjusting the indoor environment in real-time to better meet their needs.

The environment can be easily adapted to the preferences of the occupants by continuously monitoring the temperature and humidity of the space.

Instead of having constant disputes about the temperature being too high or too low, clustered areas can be created that fit the requirements of the occupants.

Air quality can be monitored and altered to ensure the health and well-being of the employees and controlled lighting can help avoid strain and stress.

All this can be further enhanced by providing the occupants with suggestions on how to improve their health and well-being by monitoring their habits, such as how many hours they are active and how long they’ve been sitting at their desks.
Takeaway Question

Can you imagine what would be the impact of Artificial Intelligence (AI) + IoT on FM?

It’s tomorrow but tomorrow is today.
Thank You

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“Delivering FM strategy through collaboration”

Steve Cowgill
Account Director
ServExcel Model

- Culture Match Survey
- Informed Client Survey
- Customer Experience Survey
- Colleague Survey
Relationship Journey

Team Performance

FORMING

STORMING

NORMING

PERFORMING

Time
Responding to Change

- Global Market Change
- Business Strategy Change
- Solution Development/Decision making
- Design / Implementation/Reporting
- Client Governance
- Joint Steering Group
- Initiative Generation
- Ownership
- Service Provider
- Implementation
- Outcome Commitment

FM OPEX % REDUCTION
Relationship Maturity Journey

1\textsuperscript{st} Phase

2\textsuperscript{nd} Phase

3\textsuperscript{rd} Phase
Behaviours and Relationships

Empowered Partner - ‘in the same room’

- One Team
- Risk & Reward
- Innovation
- Constructive Challenge
- Does this fit the model?
- Have you considered?
- Why don’t we...
- We can do better
- How about...

We can do better
Behaviours and Relationships

- Traditional service contract
- Work towards compliance
- Information protection
- Goals & values different
- Commercial unknown
- Synergies difficult to achieve
- Compete for individual success
- Limited benefit from adding value
- No incentive to drive cost down

- Alternative Model (or a mixture)
- Work towards business needs
- Information sharing
- Goal & values aligned
- Commercial clarity
- Synergies easier to achieve
- Strive for win-win success
- Reward where value is added
- Incentivised to drive cost down
PANEL DISCUSSION
Single Service Contract v/s Total FM Contracts

Moderator: Sheikh Abdulaziz Al Hosni – MEFMA Board Member

Panelists:
- Asim Al Zadjali – Vice President (Customer Experience), Al Mouj
- Bala Kumar – Executive Director (FM & Staffing Solutions), QBG FM
- Miles Webb – COO, ENGIE Cofely
- Dr. Salim Al Riyami – Commercial Training Manager, Numo Institute for Competency Development (NICD)
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