The future of operational excellence through technology, AI, IoT, ML & AR/VR

St Petersburg, October 18th 2018

Operation Excellence

Operational Excellence is about providing high quality service that meets or exceeds client expectations, or more importantly, fulfils SLA requirements.

Today this is provided by ensuring:

- Good Data Centre design
- Standards based installation best practice
- Comprehensive Integrated System Testing
- Robust operational procedures and maintenance strategies

People

Data Centre Operational challenges

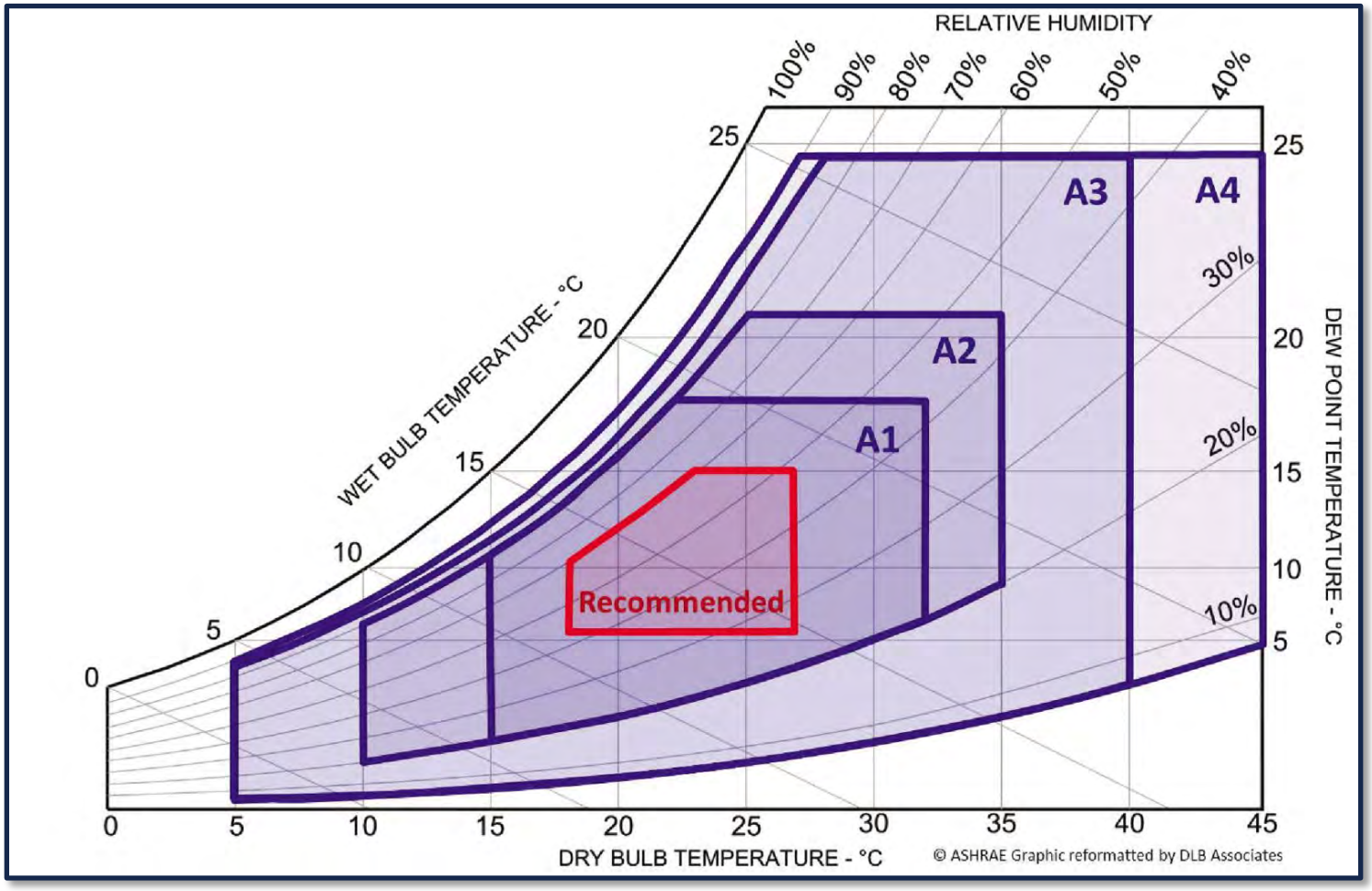
There are many ongoing challenges facing the data centre manager, with tighter SLA's, high availability expectations and of course the constant drive towards greater efficiency.

With ASHRAE TC 9.9 pushing for higher inlet temperatures and IT departments (and customers) kicking back because of perceived higher failure rates (X factor table), there is a constant battle.

If we want to achieve true efficiency, then we have to eliminate the cooling, we can only do that if we allow higher inlet temperatures, so something has to give!

Data Centre Operational challenges

- ASHRAE TC 9.9 2011 Class A1- A4



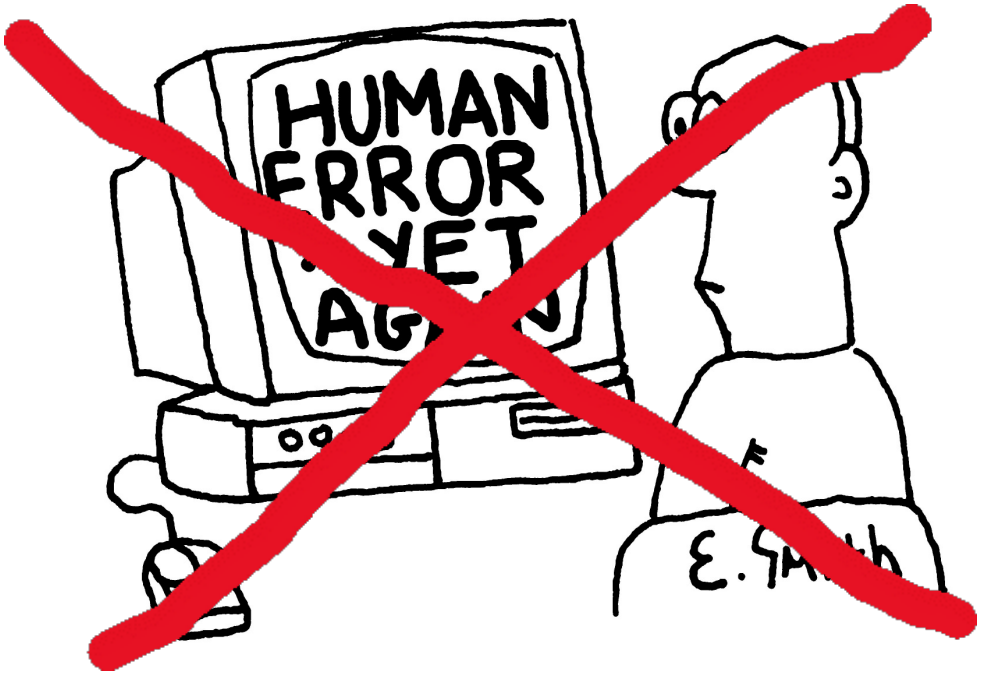
Data Centre Operational challenges

	Work Load*		
Work/ rest regimen	Light	Moderate	Heavy
Continuous work	30.0°C (86°F)	26.7°C (80°F)	25.0°C (77°F)
75% Work, 25% rest, e	30.6°C (87°F)	28.0°C (82°F)	25.9°C (78°F)
50% Work, 50% rest, each hour	31.4°C (89°F)	29.4°C (85°F)	27.9°C (82°F)
25% Work, 75% rest, each hour	32.2°C (90°F)	31.1°C (88°F)	30.0°C (86°F)
* Values are in °C and °F, WBGT.			

Table published by OSHA that provides guidance on the duration that a worker is expected to perform her duties before taking a break

People out

The only way to achieve the operational environment that will allow for maximum efficiency is to create a ‘People Out’ scenario



DCIM

For many years now we have been told that all of our problems will be solved if we implement DCIM.

We have many vendors supplying their version of DCIM, but we don’t have a clear definition of what DCIM actually is.

If I asked 5 different vendors I would get 5 different answers!

DCIM

- What does the ‘M’ actually stand for in DCIM?

Data Centre Infrastructure Measurement

Data Centre Infrastructure Monitoring

Data Centre Infrastructure Management

We need more!

In order to ‘Manage’ the Data Centre we need to have the machines to get smarter, or more precisely, ‘We’ need to get smarter about how we use the machines.

We need to use technology to run the technology!

There are many technology advances that we need to be incorporating into the Data Centre to make it smarter:

- Robotics
- Artificial Intelligence
- Machine Learning
- Internet of Things
- Augmented and Virtual Reality

Robotics

Is there a place for robots in the Data Centre?

There are many reasons to keep people out of data centres, with Security and the ‘Human Error’ risks being at the top of the list.

The data centre space is ripe for automation and we have already started to automate some of the computer room activities.

There are already robots deployed in floor cleaning, environmental monitoring & data collection and even robotic fibre patch/repair systems.

This list is surely set to grow!!

IoT

The ‘Internet of Things’ thing, is not new, certainly not for the Data Centre.

We have had the ability to talk to CRACs, UPSs, Chillers, Generators, Batteries and PDUs for years, we just never got round to doing so before!

We have IT equipment capable of telling us all sorts of useful information, such as the internal temperature of a server, we only need to ask!

But we still insist in adding sensors to the outside of the rack to get a different value?

Machine Learning

A term originally coined by Arthur Samuel in 1959 during the development of IBM’s Computer Checkers game.

What is Machine Learning?

Machine learning is a field of computer science that uses statistical techniques to give computer systems the ability to "learn" (e.g., progressively improve performance on a specific task) with data, without being explicitly programmed.

Source Wikipedia

In short, it is about the machines monitoring, analysing and then predicting outcomes

AI

Some people think that Artificial Intelligence is simply a term used to describe something that hasn’t been done yet!

Optical Character Reading was once considered AI

As was Speech Recognition, and Autonomous cars

These are all part of the same sphere of computer science

But there is much more !!!

Major AI players

- Google – DeepMind
- IBM – Watson
- Amazon – Alexa, Lex, Polly, AML
- Microsoft – MSR AI
- Tencent – YouTU Lab
- Alibaba – Tmall, Genie
- Facebook – FAIR programme
- SAP – Leonardo

Baidu, Alibaba & Tencent (BAT) plan to make AI a $1 Trillion industry by 2030

AI in the data centre

Companies such as Litbit, headed up by CEO Scott Noteboom, are focusing on AI/Machine learning to address specifically operational support in the Data Centre market.

Many of the Data Centre product supply companies are now investing in smart technologies to improve the predictive capabilities of the equipment they are deploying.

We may now be finally getting to the ‘People Out’ scenario that is needed to reduce the risk that humans present!

But we are not there yet!

And until that happens……..

Virtual and Augmented Realty

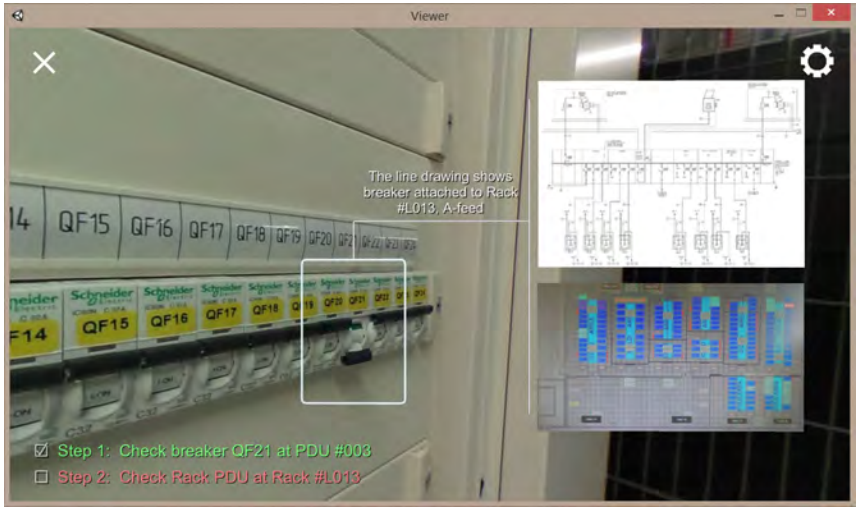
VARceti has developed a suite of VR and AR products that are designed to help develop comprehensive training programmes within the Mission Critical environment.

These products effectively build a flight simulator for your Data Centre which allows you to literally ‘Crash’ the DC (virtually) then test your engineers ability to respond and recover the situation.

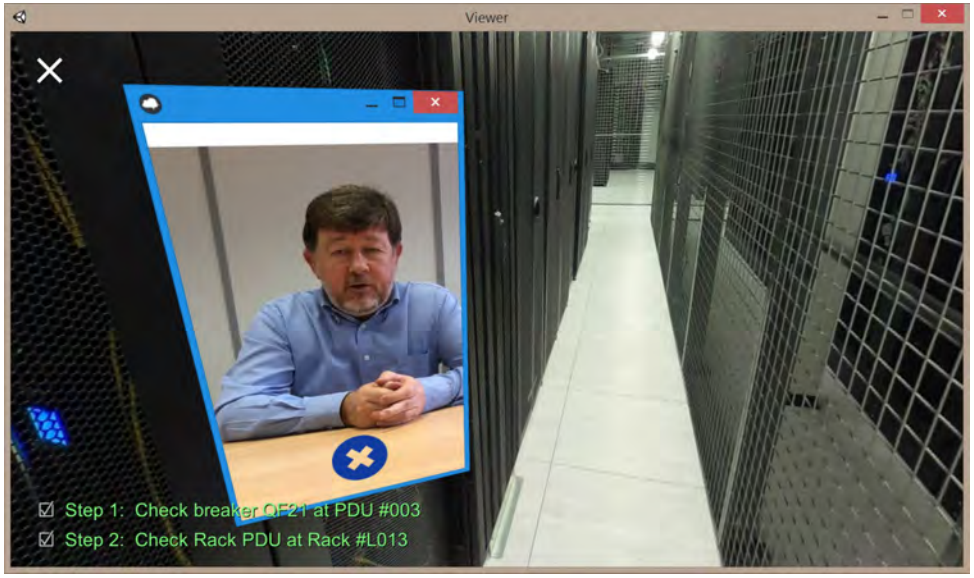
Any real life (and some not so real) scenario can be created to test the competence and confidence of the engineering support team.

The product can also be modified to be used for sales and marketing teams to learn about their DC or give client ‘Virtual’ tours

VR/AR


Viewer
The line drawing shows breaker attached to Rack #L013, A-feed
QF15
QF16
QF17
QF18
Step 1: Check breaker QF21 at PDU #003
Step 2: Check Rack PDU at Rack #L013


Viewer
Contact Person: John Doe
Tel.: +79151040755
Email: john.doe@xyz.com
Attached equipment
Server 0000
Server 1111
Server 2222
Server 3333
Server 4444
Server 5555
Server 6666
Server 7777
Server 8888
Server 9999
Rack #L013, A-feed power strip
Step 1: Check breaker QF21 at PDU #003
Step 2: Check Rack PDU at Rack #L013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Any questions?

Thank you for listening