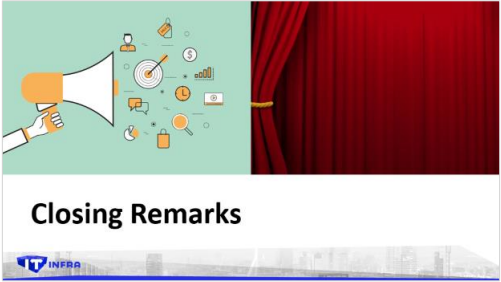


How Will Cloud, IoT, 5G & Edge Transform The Data Centre Workforce of Tomorrow?

Gepresenteerd door:

Bastiaan Janssen







Marco Economics & Global Market Trends

Macro Economics & IT/Datacenters FHI IT INFRA



5 years of
little growth
~1.5 – 2.5%
CAGR.
40% of this is
in one
country.....



B2B IT
industry has
hardly grown
over the last
5 years with
~0 – 1% CAGR



Consumer
IT growing
~20%...



IT & DC
managers
are under
constant
and ever
growing
pressure

world is changing fast...

Digital Disruption

NETFLIX

facebook

One of the largest content provider doesn't write content

SocietyOne

growing bank



Alibaba.com

One of the largest retailer owns no inventory



UBER

Largest taxi service provider owns no cars

write the app (99%)

Business and their future...

Over 50% of companies on the Fortune 500 list of the year 2000 don't exist anymore....



- Companies need to innovate but that's hard to do when revenue is not growing
- CEO tenure average only 4-5 years...
- Not much time to:
 - Grow revenue
 - Lower spend
 - Improve cash flow
 - Manage risk



The CIO's Role

- Tremendous pressure on CIO
- Global IT spending has been pretty much flat @ approx. \$3.5 Trillion
- 80+% of the IT spend in enterprises is on keeping the wheels turning i.e. only a small portion is spend on driving innovation
- CIO has to innovate with the same dollars of last year i.e. cut cost to invest
- Next 3-5 years
same spending expected to be flat or at best in line with GDP growth
 - Something must be taken away to innovate



Global Data Centre Trends



Shift in Enterprise Data Centres

- Less, or smaller, on premise data centres
- Many smaller and regional facilities consolidate into centralized 'premium' sites
- Capacity outsourcing to public cloud data centres, enterprises will increasingly turn to colocation and hosting providers
- SaaS/Cloud attracts customers with a need for driving down cost and increase speed of innovation
- IoT will lead to many regional aggregation data centres to support hyper scale data centres



Resilience

Traditional resilient infrastructure will change or be complemented due to new technologies and ever increasing demand for availability

- More sharing
- More active
- More replication
- More intelligent and software driven
- More distributed



Energy 'independence', distribution & storage

- Some data centre owner/operators are seeking more energy independence
 - Control over availability of energy
 - Green energy sources
 - Saving on energy cost
- Power distribution changes
 - Power conditioning / backup power can now be centralized or de-centralized
 - Never ending story of AC vs DC power
- Power storage
 - New power storage technologies are becoming more viable



Security

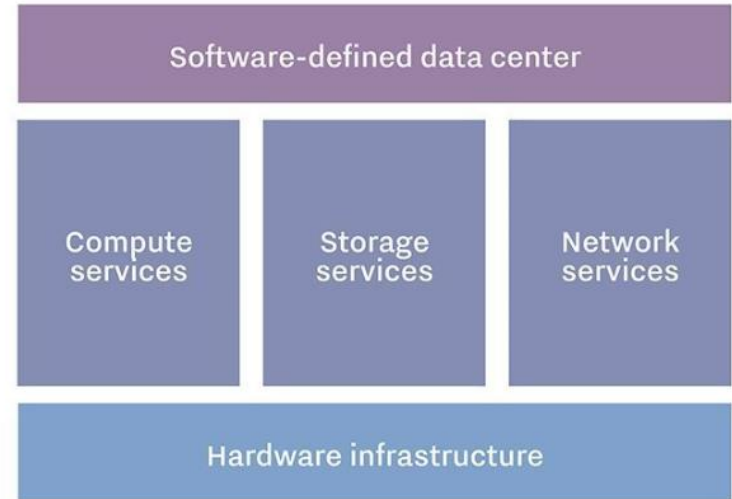
- Security stays high on the agenda
 - Risk management is high on the list
- IT Security becomes more challenging
 - IoT – Internet of Things
 - DDoS – Distributed Denial of Service
 - Ransomware
- Security of supporting infrastructure
 - BMS / Control Systems
 - Public/utility services



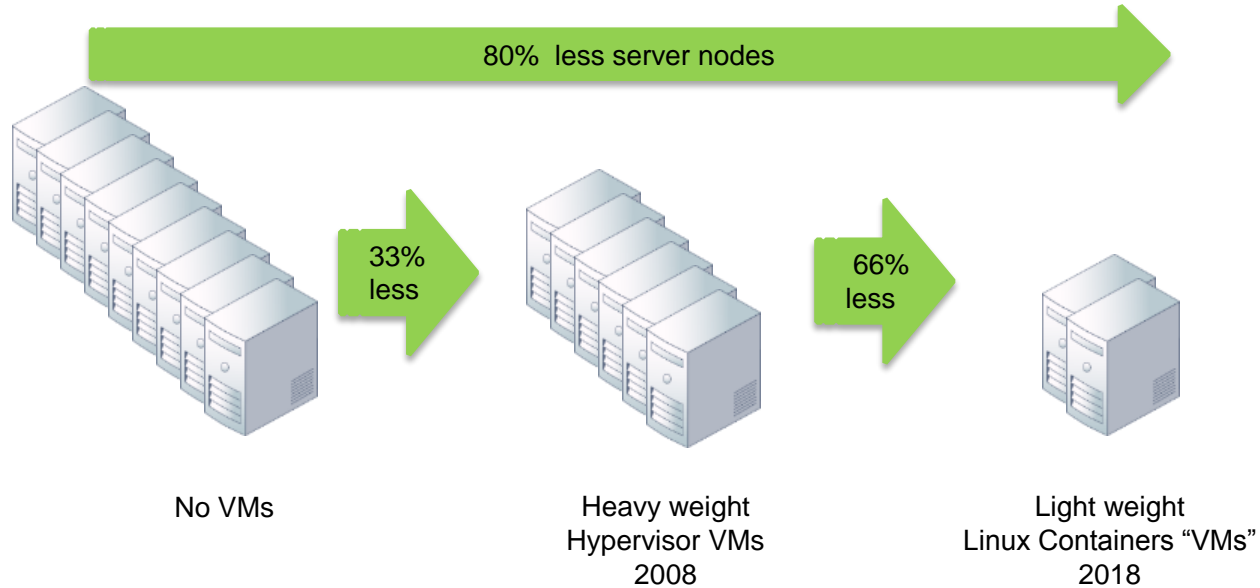
Software, software & software

SDDC – Software Defined Data Centres will dominate the future

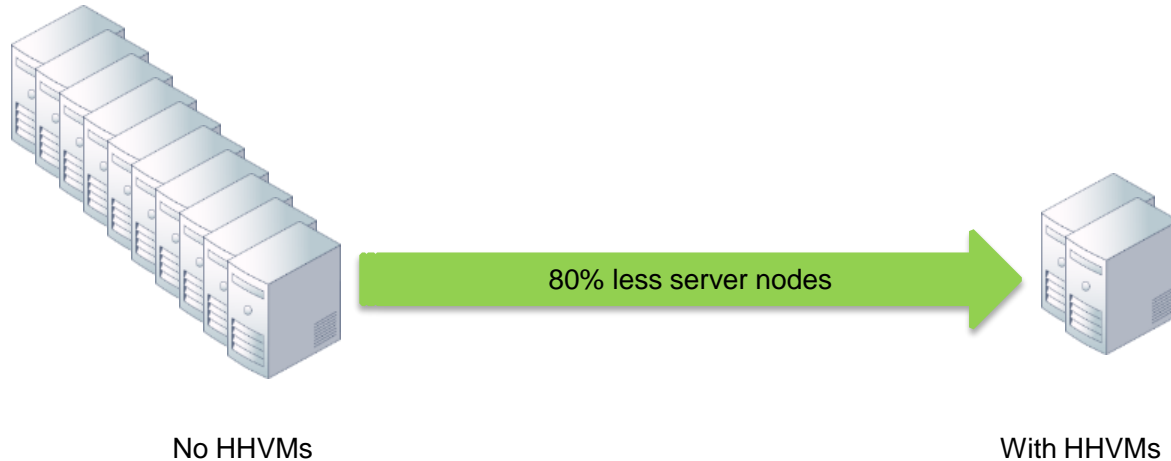
Components in an SDDC



Software eats hardware - Virtual Machines



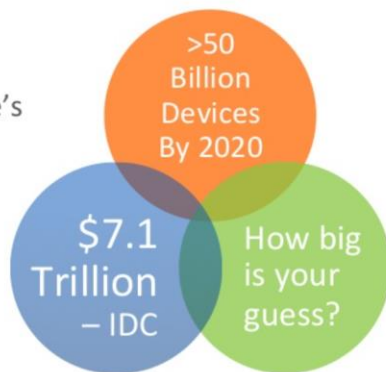
Software eats web servers - Hip Hop Virtual Machines & Hack language



IoT will be big....however...

“... those billions of smart, connected gadgets such as Google’s smart glasses... should generate a staggering **\$7.1 trillion in annual sales** by 2020.”

– IDC , June 2014



“Cisco’s Internet of Things Group (IoTG) predicts there will be over **50 billion connected devices** by 2020.”

– Cisco , November 2013

Nobody knows how big IoT really is going to be

- IoT is basically any device which connects to a network
- Often, but not always, requires low latency connection
- Might connect to local data processor (Edge data centre)

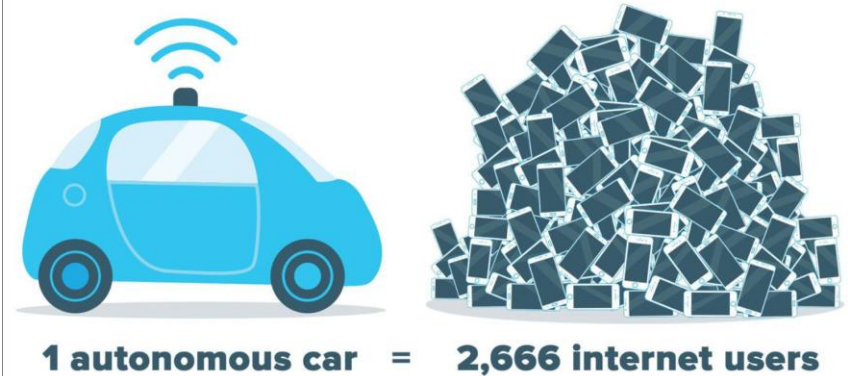
- 5G brings three new aspects to the table:
 - Greater speed (to move more data)
 - Lower latency (to be more responsive)
 - Ability to connect a lot more devices at once (for sensors and smart devices).

The autonomous vehicle



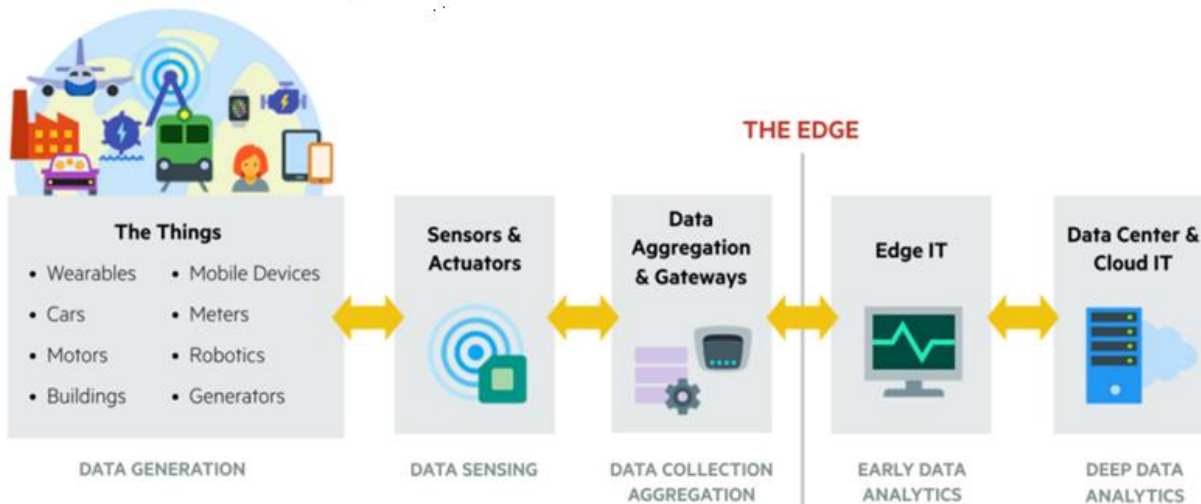
Autonomous car data vs. human data

In 2020, the average autonomous car may process 4,000 gigabytes of data per day, while the average internet user will process 1.5 gigabytes. That means...



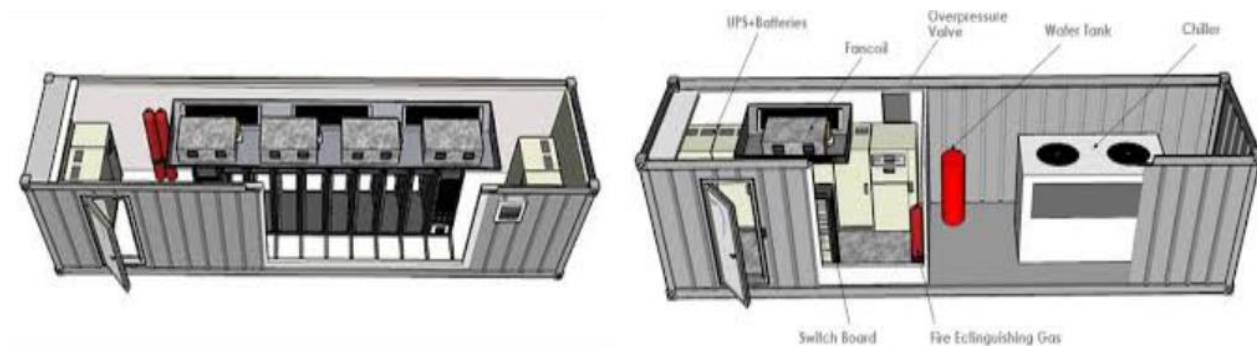
Edge Data Centres

- IoT and 5G networks are big drivers for Edge data centre environments



Standardization

- Standardization drives simplicity and drives down the time and cost to build data centres
- Large manufacturers are pushing standard solutions
- Started with containerized data centres



AI – Artificial Intelligence

- AI is going to be disruptive once the technology has been proven
- Google is experimenting (Deepmind project)
- University of Lancaster's Data Science Institute developed data centre AI software (REx)
- Intel® released programs for AI



Some Predictions

Enterprise data centres

By the year 2025, Enterprise on-premise data centres will decrease by 80%

	2016	2017	% Decline
# of DC's	4,575	3,873	-15.3%
Space (MMSF)	18.59	16.44	-11.6%
Spend (USD MM)	9,817	8,564	-12.8%

US-Market, IDC-Research

Application Development

By the year 2025, 100% of Application development and testing will be done in the Cloud

	2016	2017	%
% of companies using cloud for Application development	45%	52%	20%

Dimension Research

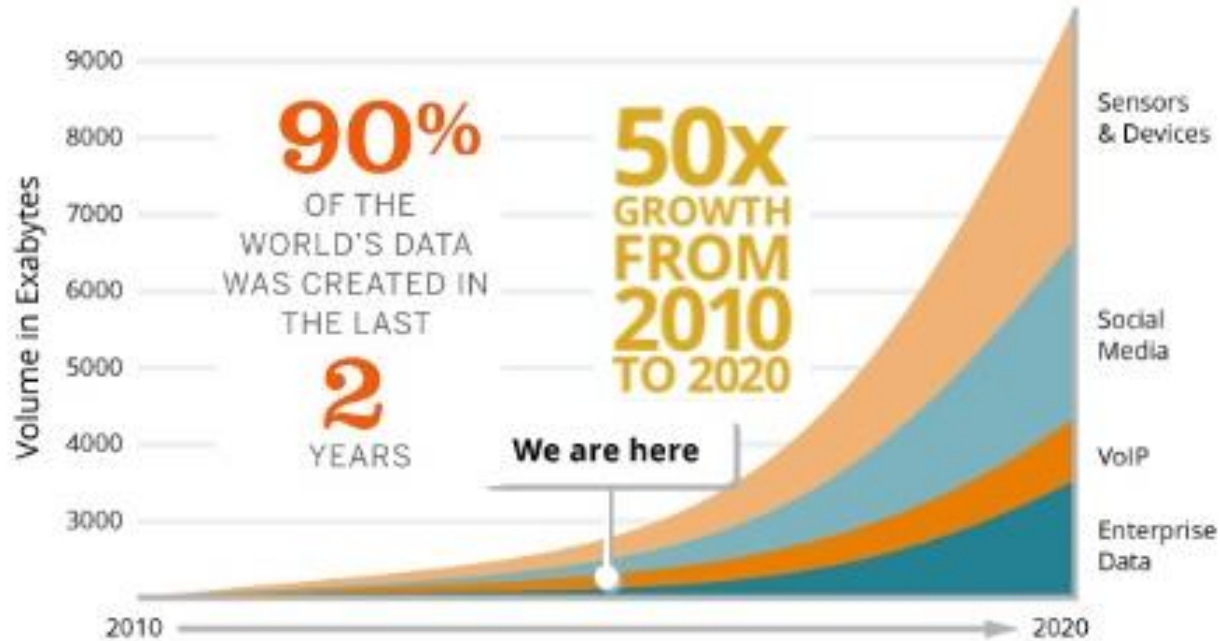
Application Deployment

By the year 2025, 80% of Application deployment will be in the Cloud

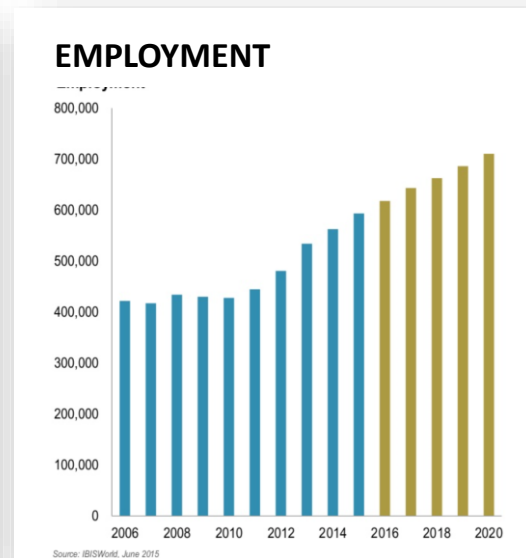
	2015	2017	2025
% of companies using cloud for Application development	14%	23%	87%

Voice of Enterprise Cloud

Exponential Data Growth



Data centre market growth



Investment in new DC 2014 -2017 CAGR 9.3%

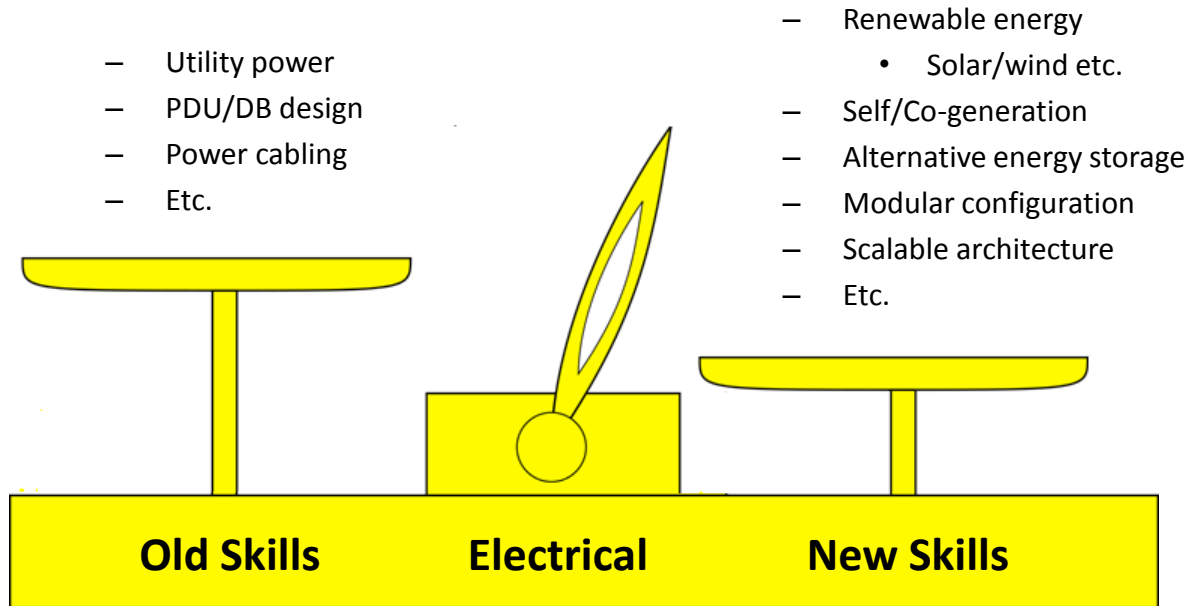


Transformation of Competencies

Challenges Facing Data Centre Personnel

1. What are the required skillset, knowledge & competencies for current and future job?
2. Which trainings provide me the right skillset, knowledge & competencies?
3. How to create a training plan for myself based on current & desired future job role?
4. How to convince my manager to receive the trainings which are beneficial for the company and me?

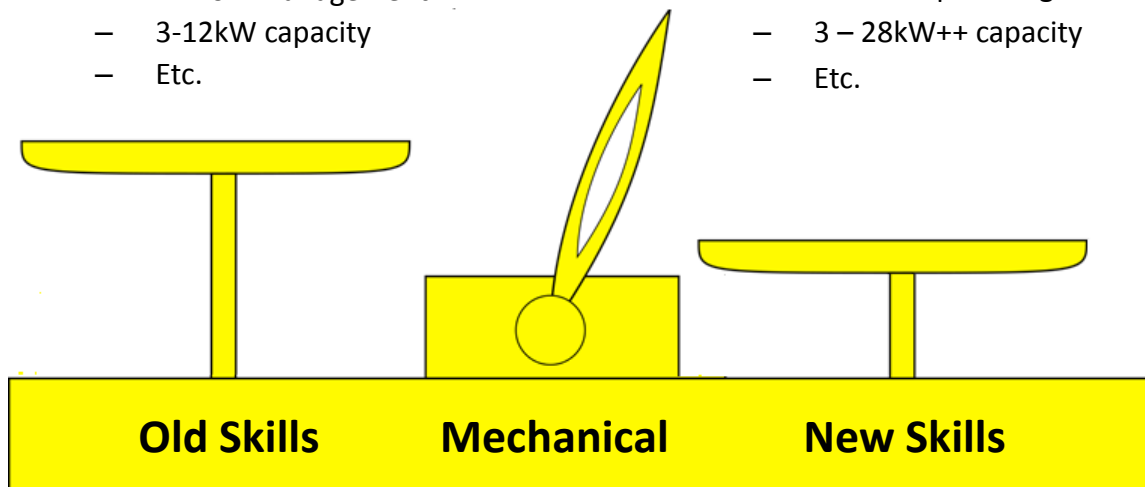
Competences Electrical



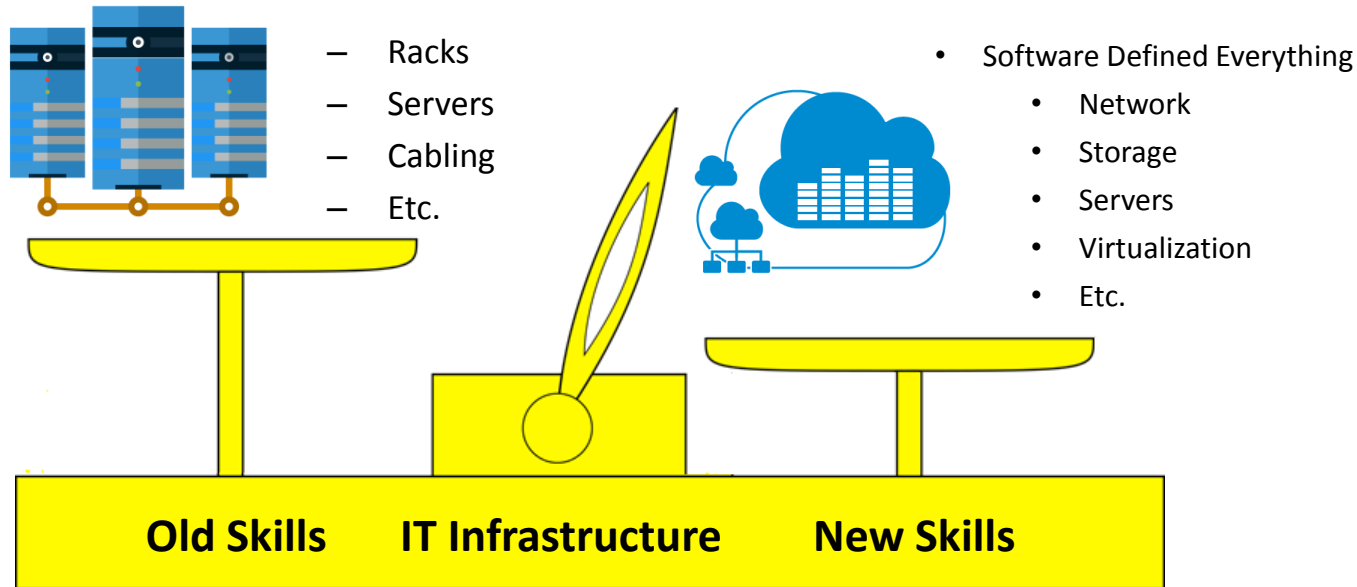
Competences Cooling

- Chillers
- HVAC/CRAC/CRAU etc.
- Hot/Cold aisle /containment
- Airflow management
- 3-12kW capacity
- Etc.

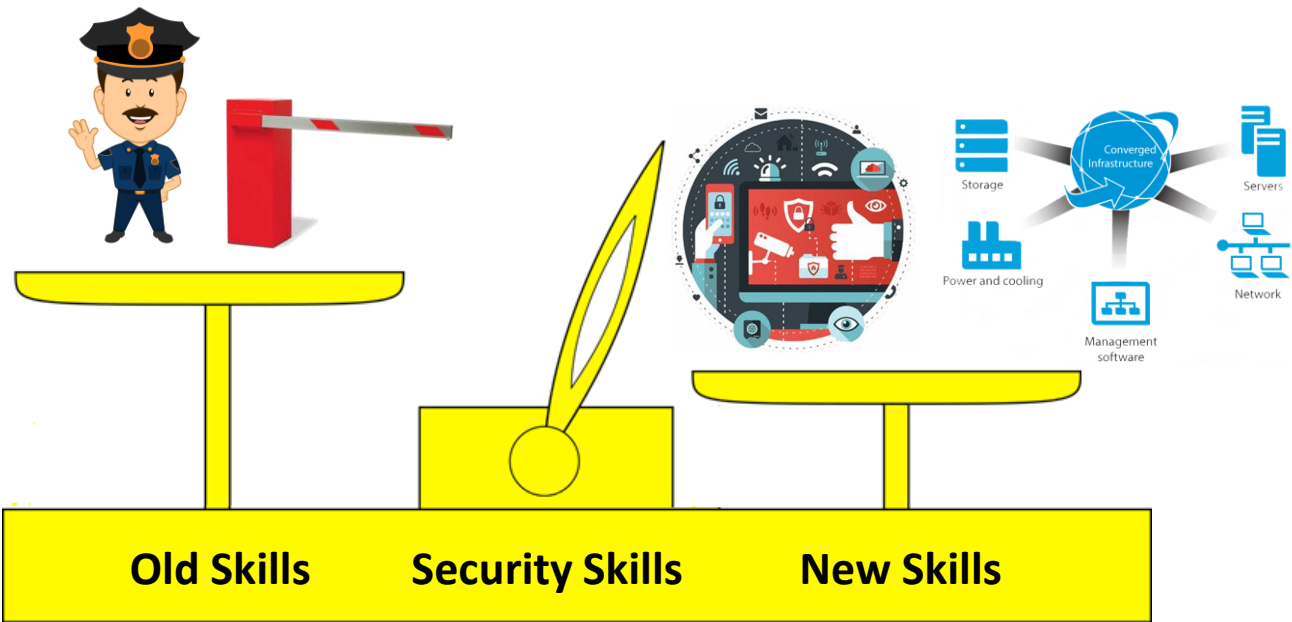
- “Free” Cooling
- Heat recovery
- Liquid cooling
- Direct chip cooling
- 3 – 28kW++ capacity
- Etc.



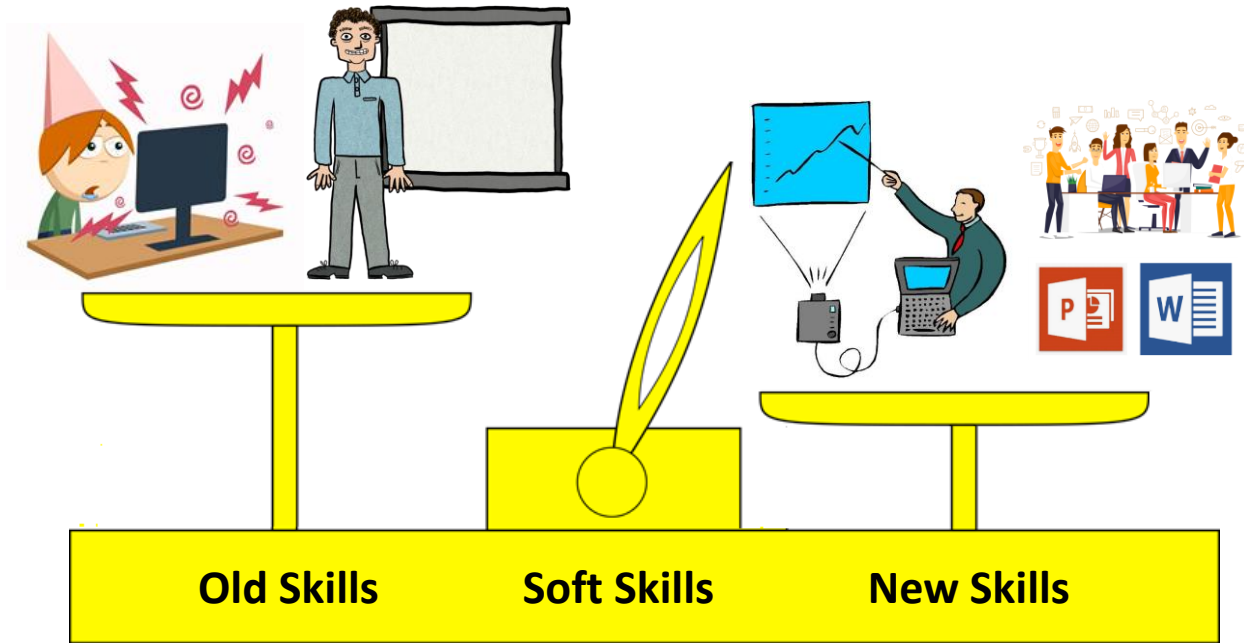
Competences IT Infrastructure



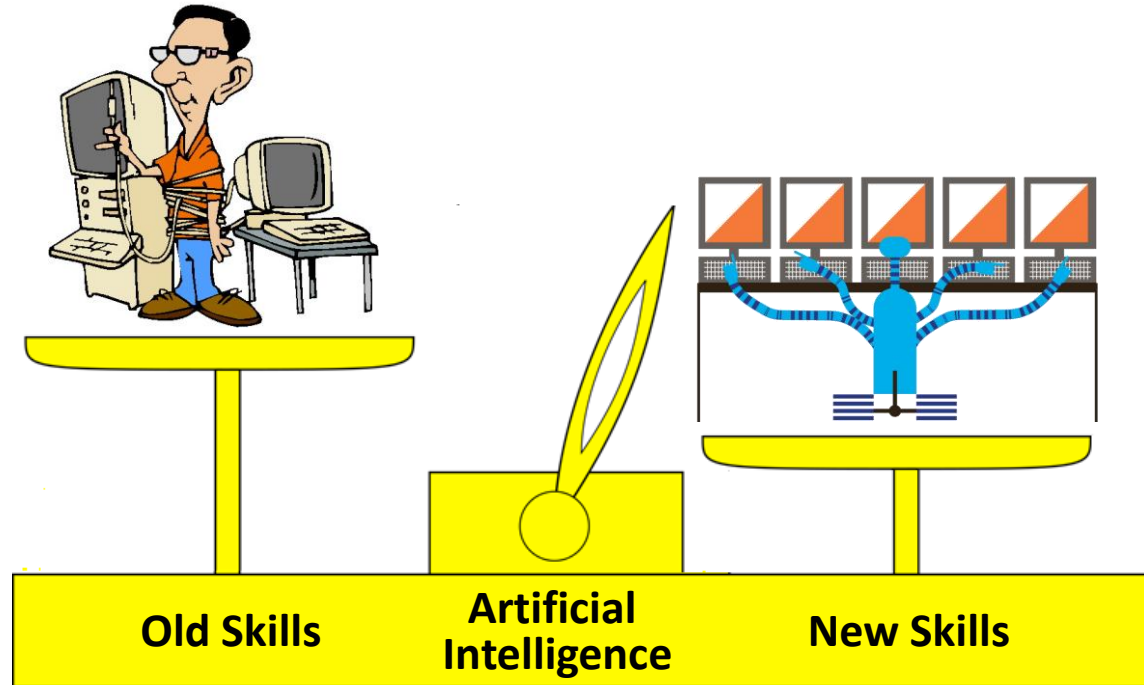
Competences Security



Competences Soft Skills



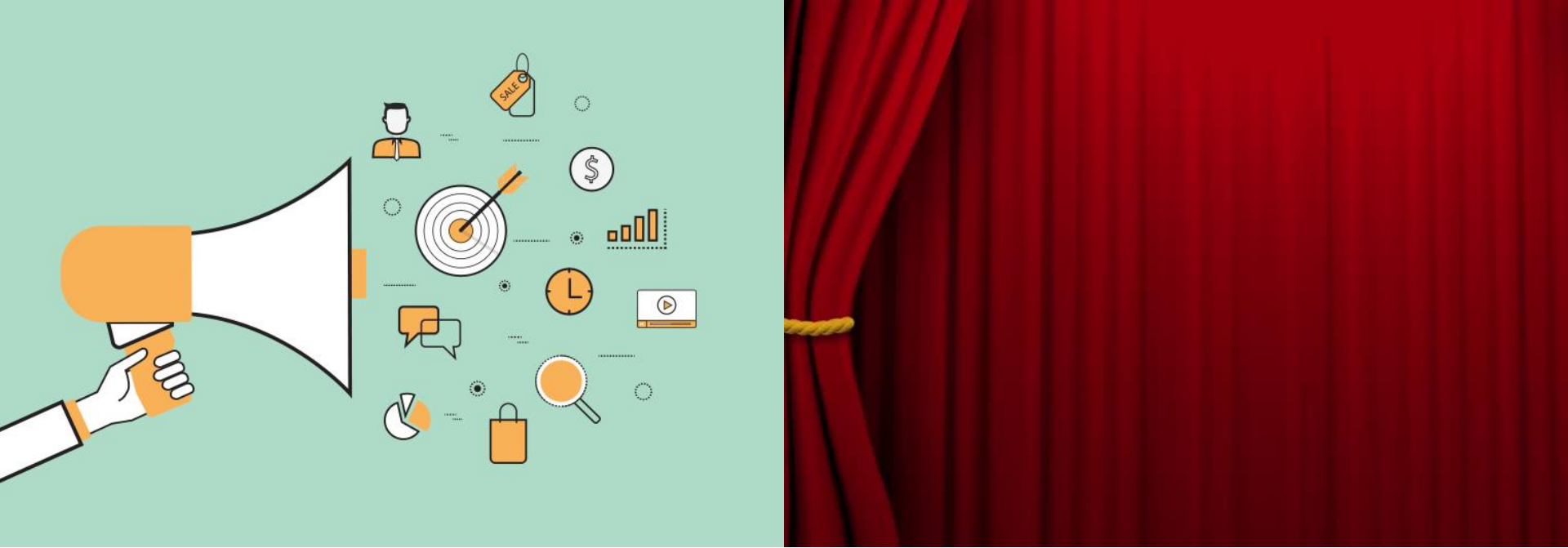
Competences Artificial Intelligence



The Future Is NOW!!!

1. Review your current and potential future job role
2. Include accountability/responsibility AND technology changes
3. Analyse current and future competence requirements
4. Define timelines
5. Find the right accredited courses
6. Create an appointment with YOURSELF!





Closing Remarks

Change Change Change

The world markets are changing and so is the IT and Data Centre market and at an ever increasing pace...

Business as usual doesn't exist!

1

Data centres...

Data Centre market is growing at a rapid pace but it moves from Enterprise to Commercial/Cloud/SaaS requiring additional competences

2

Embrace Change

There are only three ways to deal with change

1. Cry yourself a river
2. Reject/Ignore => You will LOSE
3. Embrace change and be part of change => You will WIN!



Prepare yourself for the future

The future starts now, the world is not going to wait for you....

1. Planning is everything
2. Set realistic goals
3. Stick with your plans

Remember.. Most strategies fail due to poor execution. Stop giving yourself excuses!!



Questions?



Dankjewel!

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