

Den kognitive bygning

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IoT Innovation Architect



Kim Escherich

IoT Innovation Architect

- Internet of Things
- Artificial intelligence
- Smarter Cities
- Buildings
- Construction Industry
- Traceability
- Emerging technologies
- Big data
- Analytics
- Supply chain
- Food systems
- Agriculture
- Innovation

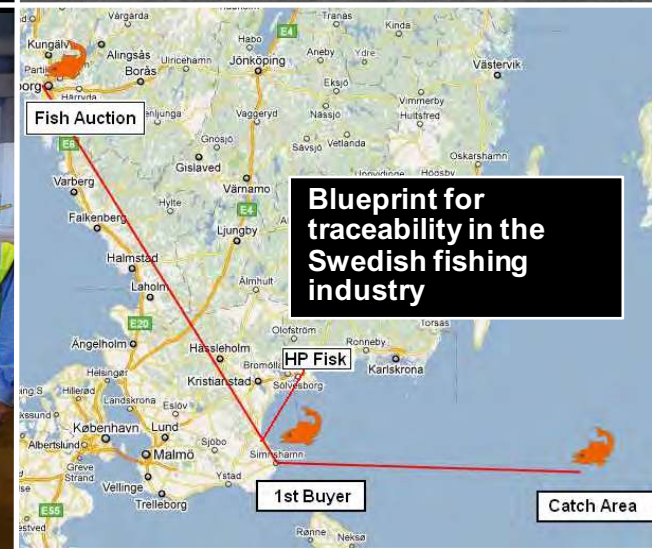


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www.internetofthings.dk



So what is cognitive?

käg-nə-tiv (*adjective*): of, relating to, or involving conscious mental activities (such as thinking, understanding, learning, and remembering)

Cognitive computing and cognitive based systems accelerate, enhance and scale human expertise by:



Learning and building knowledge,

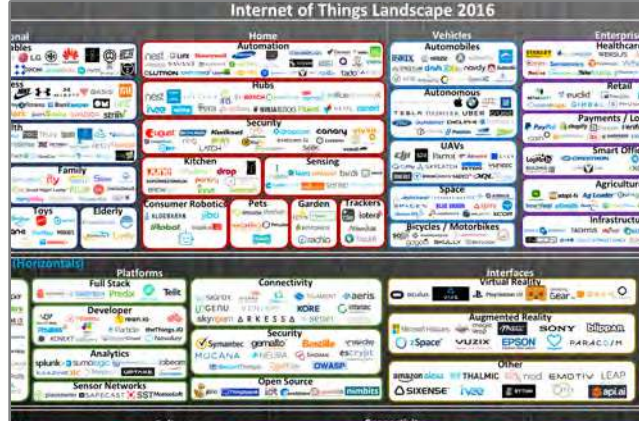


Understanding natural language, and



Interacting more naturally with humans than traditional programmable systems

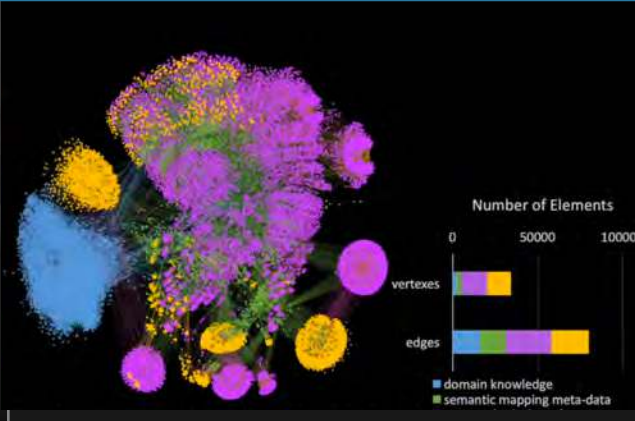
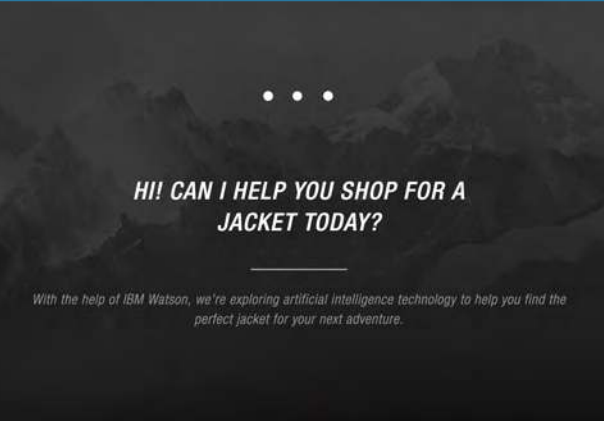
Trends



IoT & DevOps Platforms

New Ecosystems

BIM & Digital Twin



Human-computer interfaces

Analytics & AI

Innovation & Design Thinking

doritos

doritos

Source: Standard Cognition



DØRÅBNER ►

◄ DØRÅBNER

Usability?

Arken art museum, toilet doors

Personality Portrait

24378 words analyzed: **Very Strong Analysis**

Summary

You are a bit critical and excitable.

You are adventurous: you are eager to experience new things. You are authority-challenging: you prefer to challenge authority and traditional values to help bring about positive changes. And you are self-controlled: you have control over your desires, which are not particularly intense.

You are motivated to seek out experiences that provide a strong feeling of efficiency.

You are relatively unconcerned with both tradition and taking pleasure in life. You care more about making your own path than following what others have done. And you prefer activities with a purpose greater than just personal enjoyment.

[How did we get this?](#)

You are likely to _____

- ✓ be sensitive to ownership cost when buying automobiles
- ✓ have experience playing music
- ✓ like historical movies

You are unlikely to _____

- ✗ be influenced by social media during product purchases
- ✗ prefer style when buying clothes
- ✗ be influenced by brand name when making product purchases

Personality

Emotional range ▾

*% = percentile

86%

Openness ▾

83%

Introversion/Extraversion ▾

52%

Conscientiousness ▾

49%

Agreeableness ▾

1%

Consumer Needs

Practicality

*% = percentile

61%

Curiosity

57%

Liberty

33%

Structure

31%

Love

24%

Values

Stimulation

*% = percentile

34%

Achievement

17%

Helping others

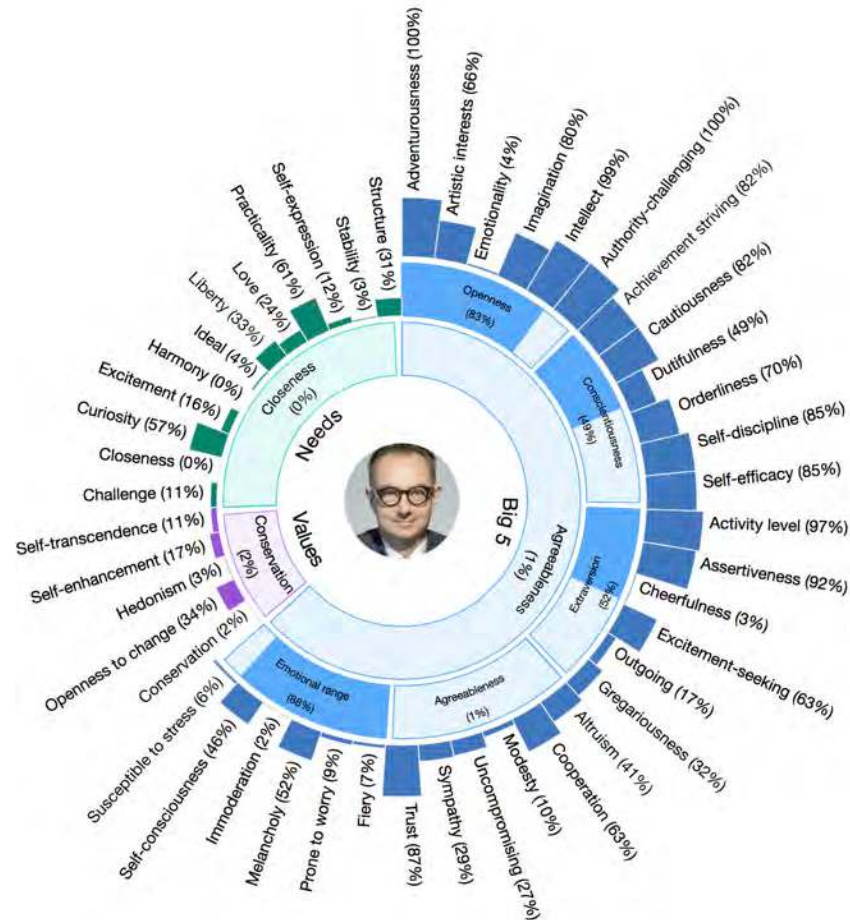
11%

Taking pleasure in life

3%

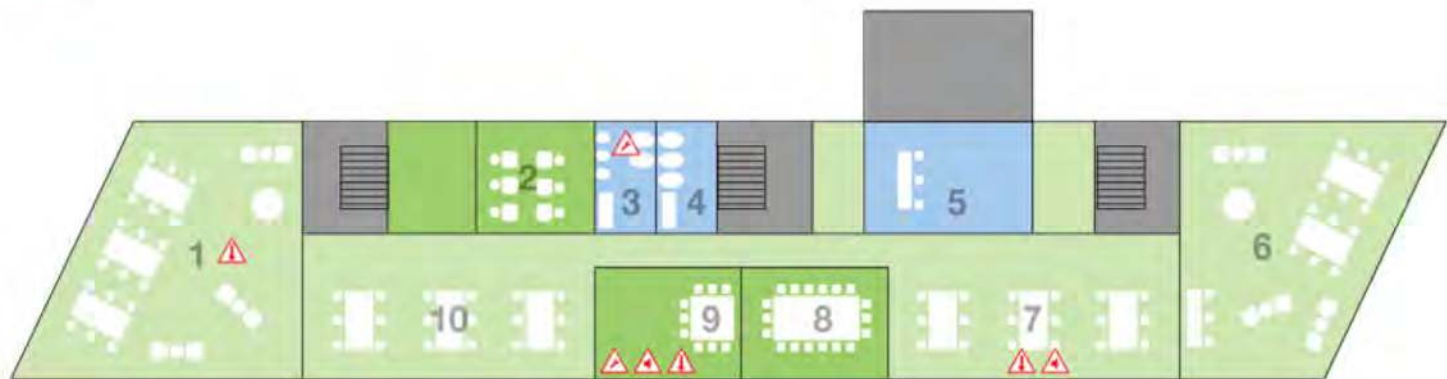
Tradition

2%





Your Input



● Show Furniture



Occupancy



Assets



Temperature



Lighting



Occupants

77/110 tenants

5 Visitors

Meeting Rooms

1 of 3 occupied since 9:00

Team Spaces

3 of 4 occupied since 9:45

Work Requests

Zone 9



High use area

HVAC

2 hours ago

Zone 9



High use area

Broken projector

8 hours ago

Tenant Sentiment

80% Reporting



70%*



10%*

Problem Areas

Zone 9

Current
25°Target
20°

Zone 9

High use area

23°

For 30min

Zone 7

25°
For 1hr

Light Composition

Current
500 luxTarget
500 lux

Stories

KONE ELEVATORS



< CHINA

NETHERLANDS >

COPENHAGEN, DENMARK



LIVE FEED

29-08-2017 | LOCAL TIME

KONE Elevator

13:04



Highly accurate landing on floor 10.

13:04

KONE Cloud

Check.



KONE Elevator

13:04



Floor 10. Doors open for 6.1 seconds.

13:04

KONE Cloud

Check.



KONE Elevator

13:04



Minimal sway while starting my way up.

13:04

KONE Cloud

Measured. Minimal.

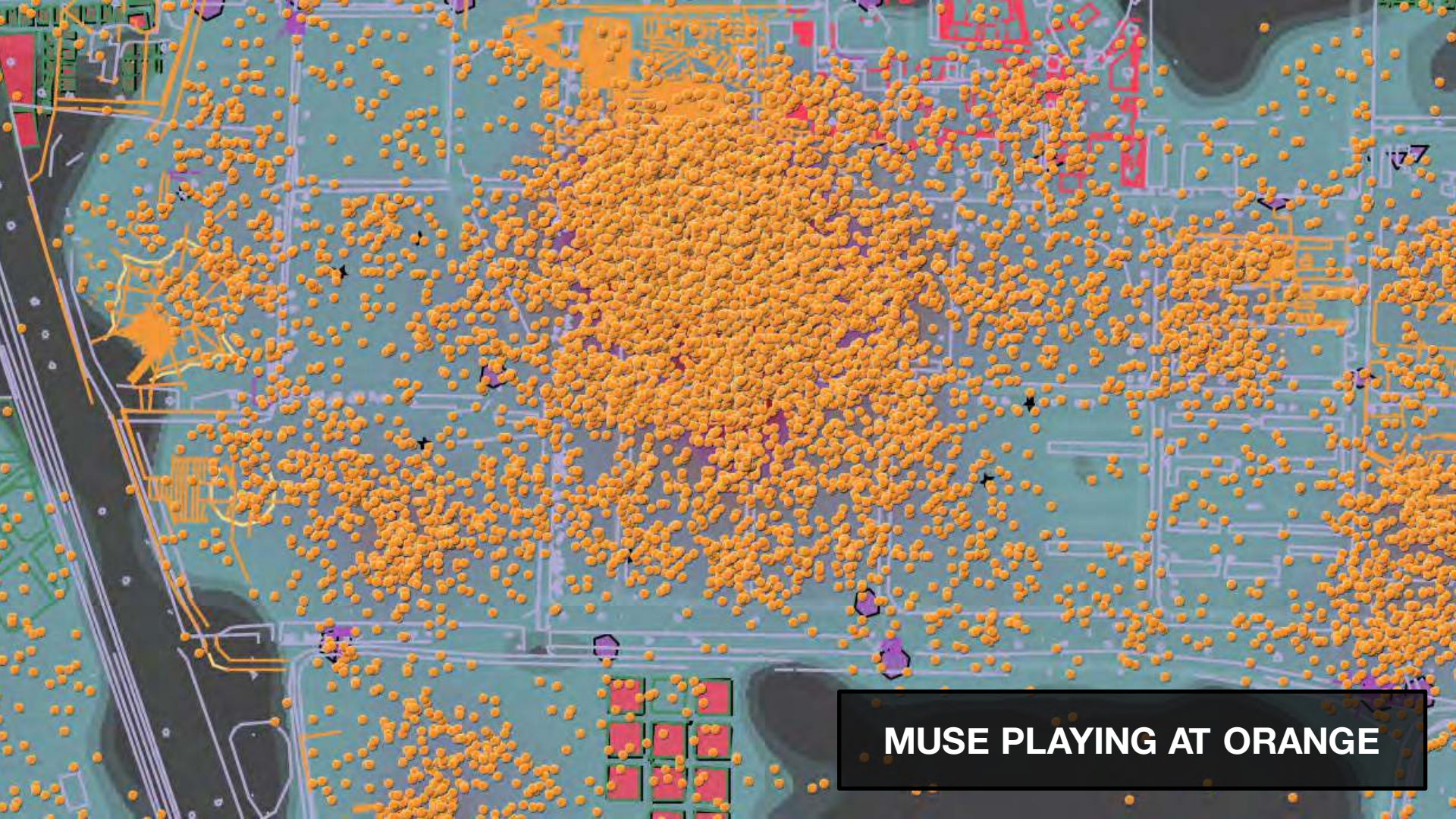


REAL TIME CONVERSATION

CONVERSATION HIGHLIGHTS



WHIRLPOOL



MUSE PLAYING AT ORANGE



ROSKILDE FESTIVAL - TOILET TRACKER

CONNECTED TOILETS FOR BETTER EFFICIENCY AND CUSTOMER SATISFACTION

IBM

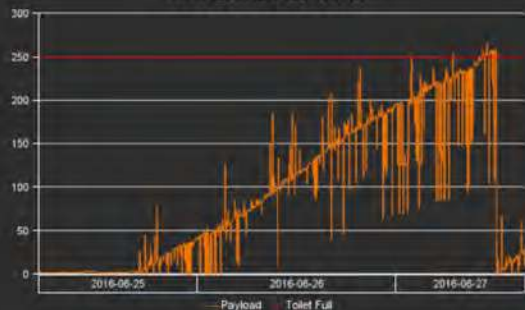
Jun 27, 2016 9:35:34 PM

CONNECTED TOILET 1

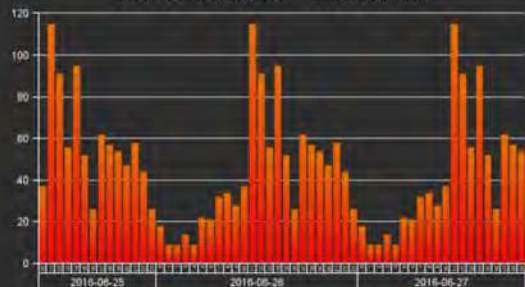
AREA G NORTH, NEAR STALLS

STATUS: OCCUPIED

PAYLOAD: 29.3 KG



VISITORS: 1,016 1H AVG: 42

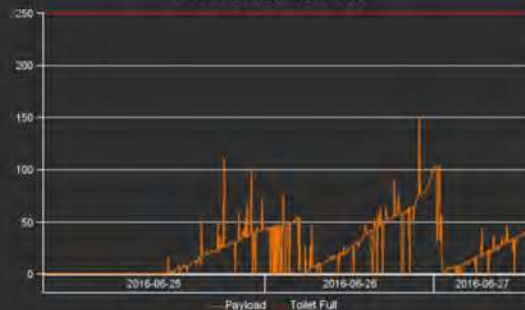


CONNECTED TOILET 2

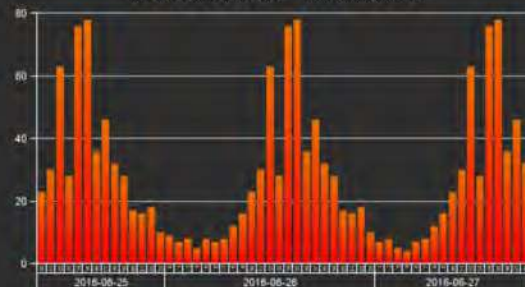
AREA K NORTH, NEAR TO K34

STATUS: UNOCCUPIED

PAYLOAD: 46.7 KG



VISITORS: 585 1H AVG: 24

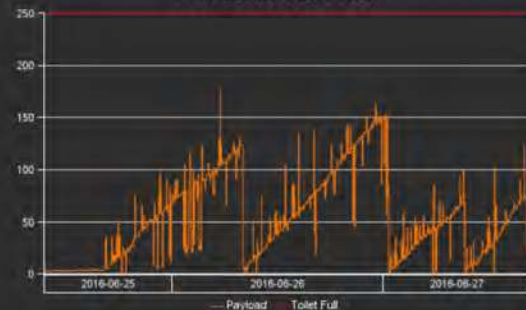


CONNECTED TOILET 3

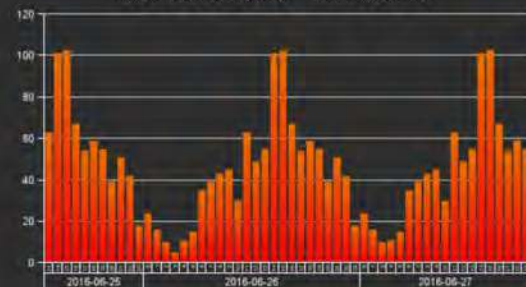
AREA E NORTH-WEST CORNER

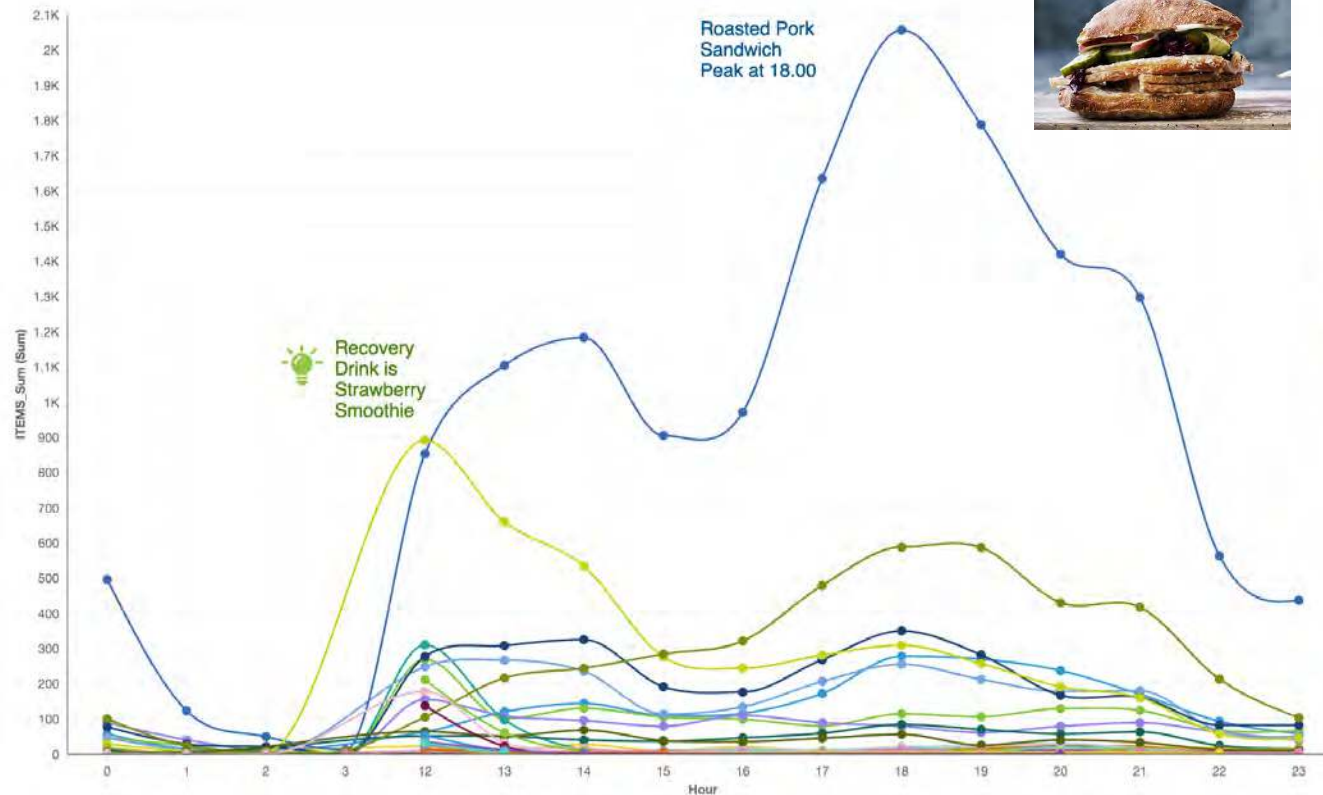
STATUS: OCCUPIED

PAYLOAD: 63.1 KG



VISITORS: 1,029 1H AVG: 43

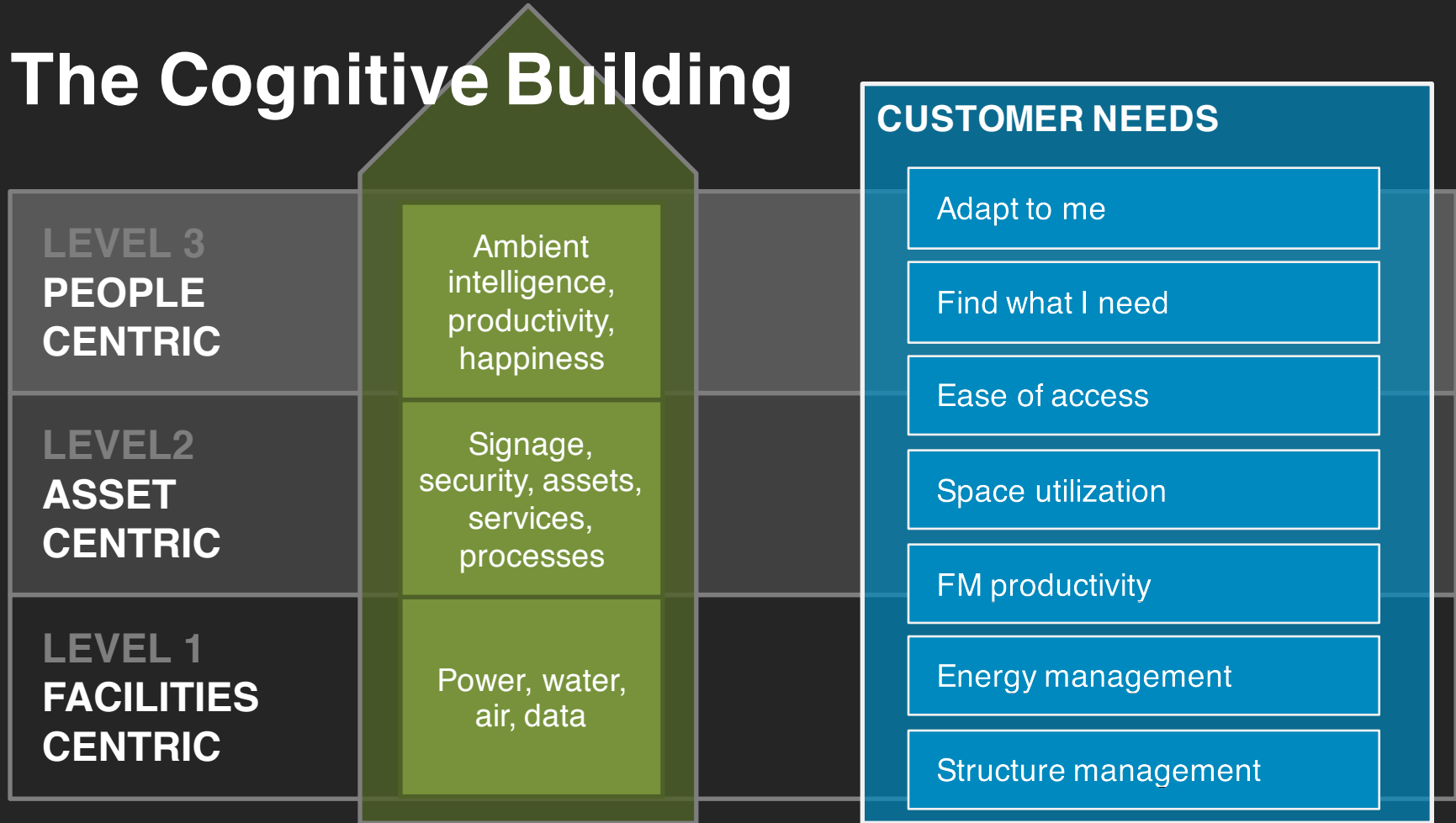




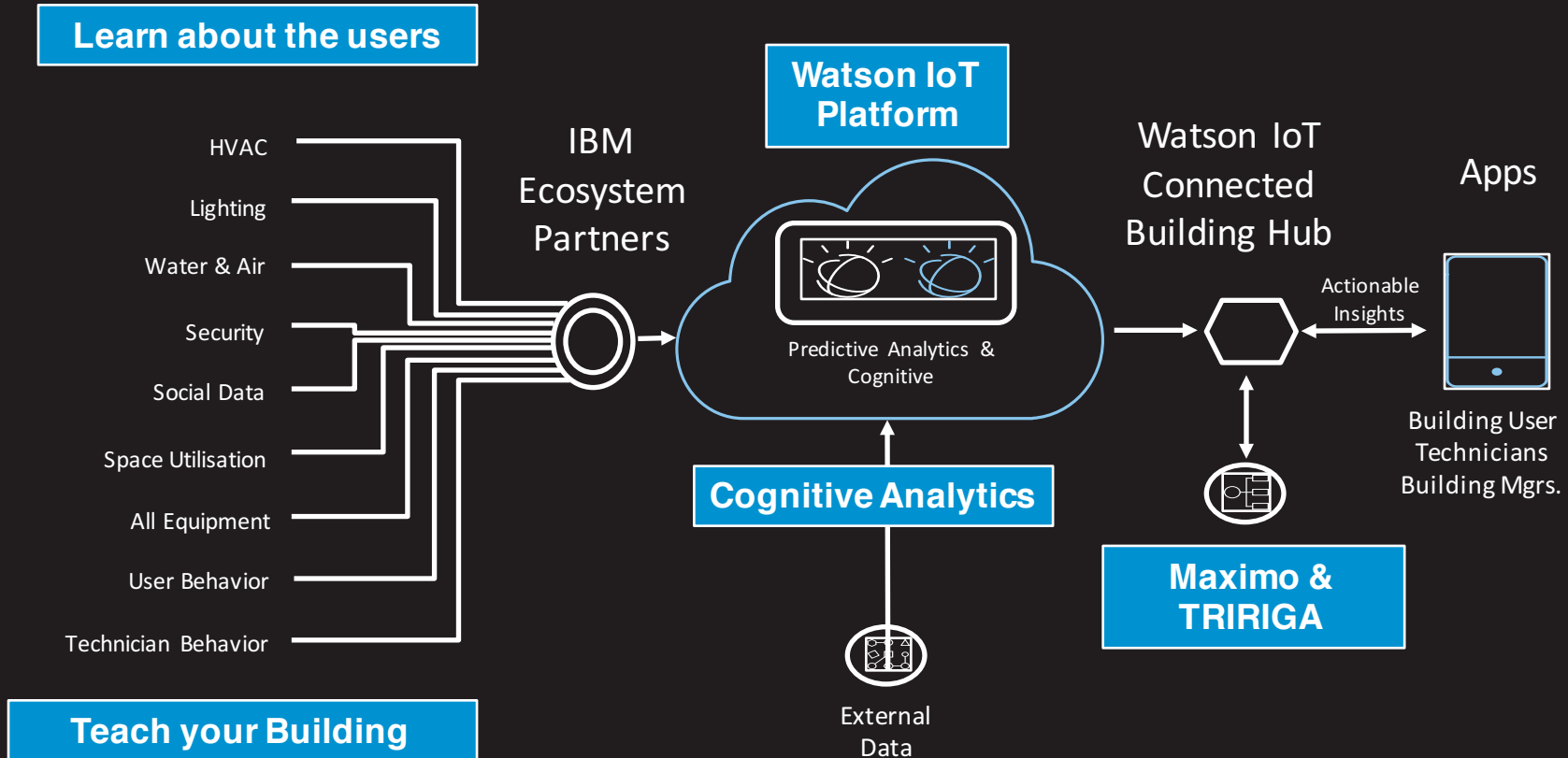
- TEXT
- Butter Chicken
 - Caffe
 - Chocolate Brownie
 - Chocolate Mousse
 - Kanelanum
 - Lemon Fromage
 - Light Chocolate Brownie
 - Delands Wheel Roll
 - Raspberry Cake
 - Rubarb Trifli
 - Salmon Sandwich
 - Sandwich of Rosted Pork
 - Spring Water
 - Strawberry Smoothie
 - The
 - Tuborg Draft Beer
 - Vegetarian Meal
 - Yoghurt with Rubarb
 - Cold Bowl
 - Aldried Pork
 - Bolt Egg
 - Croissant
 - Danbo Gheece
 - Extra Butter
 - Premium Cinnamon Roll
 - Raspberry Jam
 - Salmon
 - Tobirkes

The cognitive building

The Cognitive Building



Cognitive Building solution components

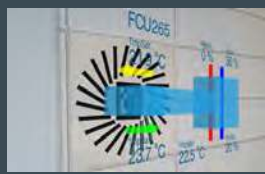


Connected Building Use Cases and Opportunities



DIGITAL ASSET LIFECYCLE

The manual input of data into a maintenance system for thousands of assets is a costly, error prone process.



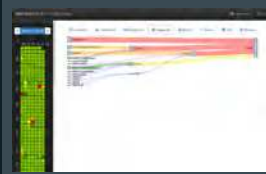
REAL TIME ASSET LOCATION

Finding assets and their relevant data is challenging, in particular when you are in the field.



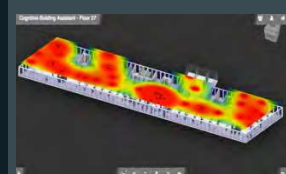
COGNITIVE ASSET HEALTH

Predictive and preventive maintenance are imminent to reduce operation costs, but, lack the required sensors.



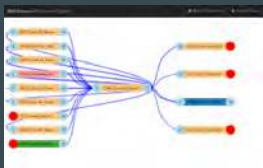
SELF-LEARNING ENERGY DIAGNOSER

Energy consumption has many influences and it is hard to detect and diagnose abnormal consumption.



COGNITIVE CONCIERGE

Guiding people to their rooms and answering their questions is a central element of hospitality.



SEMANTIC INSIGHTS

Analyzing thousands of IoT devices cannot provide meaningful insights without a semantic method.



FLUID SPACES

The lack of real-time occupancy information within a building inhibits effective energy and space performance.



MY COGNITIVE CAMPUS

Increase productivity of teams by providing a comfortable environment and easy navigation.



MY ARTEFACT

Maintaining the perfect environment for art galleries and museums is critical.



SCALABLE IOT PLATFORM

Cognitive Buildings require a highly scalable platform for data integration and analysis.

GETTING HERE

- Multi-modal transportation services
- Alerts before leaving home
- "Please be aware that we are serving fish in the restaurant" (and you are allergic)
- Remember your umbrella
- Car sharing with colleagues
- Pre-book work area (and you might decide to work from home)
- Various work-from-home-services

Weather integration | Transportcity integration | Cognitive HR analytics | IoT integration | Tririga integration | MobileFirst

ARRIVING

- Walking around guidance
- Pay for your parking in-app (guest)
- Issue mobile parking ticket
- Provide alternative parking
- Find me a parking spot (before arriving)
- Find my car

MobileFirst | IoT integration (outdoor/camera) | Tririga integration | Maps 3D | Cognitive advisory services

ENTERING

- Access control
- The concierge knows you and can notify
- The building knows you and can advise/notify
- Alternative authentication means, e.g. combination of smartphone and biometrics, face recognition, smart watch + pincode/fingerprint etc.
- Information services - app based
- Counting, crowd and pattern analytics
- Video surveillance
- Anomaly video analytics (security)

Biometrics | IoT integration | Sensoring | MobileFirst | Tririga integration | Video analytics | Video content management

WORKING HERE

- Locate my colleagues
- Who is in my working area today
- Status on infrastructure
- Find me an empty seat based on personal profile
- Optimise usage of office space
- Crowd and usage analytics

Indoor localization | IoT platform | Tririga integration | Cognitive Analytics | Big data analytics

DRINKING AND EATING

- Get today's menu at the restaurant
- How long is the queue right now?
- When is it optimal for me to eat?
- Nutritional information compared to personal health profile
- Order guest tickets
- Order takeaway based on preferences

Content management | IoT integration | Video surveillance | Partner integration | Cognitive

BEING HERE

- Get alerts and notifications on building app (smartphone or iWatch)
- Get around - office maps 2D/3D
- Order hot drinks
- Order light meal
- Check delivery situation on beverage machines
- Manage postal services via app and notifications
- Understand building usage and environment
- Align internal climate with outside
- Space management

MobileFirst | 2D/3D maps | IoT Platform | Legacy Integration | Tririga integration | Video analytics | Big data analytics

MEETING WITH OTHERS

- Physical meeting room displays
- Reserve meeting room
- Arrange spontaneous meeting (lets meet in 4 minutes in the cafe)
- Conference support app
- Booked but unused meeting rooms
- Meeting room outages / defects

Tririga integration | MobileFirst | Localisation services | Problem detection | Bookings

LEAVING

- Checking out
- Evaluating the day
- Find my car, bicycle or the path to the train station
- Heating the car
- Notifying the spouse

IoT integration | Partner integration | IoT integration | MobileFirst

COGNITIVE BUILDING TOUCHPOINTS



30-06-2016

ISS Turns to IBM Watson IoT to put the 'Human Touch' into buildings

Global leader in facility services taps insight from sensors and devices to create better, happier buildings.

ISS, a leading global provider of facility services, has signed a commercial agreement with IBM to use the power of Watson IoT to transform the management of over 25,000 buildings around the world.

Headquartered in Copenhagen, ISS is one of the world's largest private employers with over half a million staff managing everything from concierge to cleaning, catering to technical maintenance for thousands of high profile clients including Rolls-Royce, Nordea, Novartis, and Royal Air Force in the UK.

Through the new agreement, ISS will tap IBM's Watson IoT platform, consulting and advanced facilities management technologies to transform the services it provides to building owners and users around the world with the goal of making buildings more personalized, intuitive and user-friendly.

Working with IBM, ISS will integrate and analyse data from millions of devices and sensors embedded into buildings including doors, windows, chairs, meeting rooms, dispensers and air conditioning systems. Data will be uploaded onto IBM's Watson IoT cloud platform and cognitive computing technologies will learn from this data helping ISS optimise its services as well as furthering its understanding of how people use buildings, thereby creating new opportunities for innovation.



“ We are going to be
the world’s greatest
service organisation ”

ISS perspective on application of Big Data & IoT

Service delivery

WO triggered by usage

of visitors to the toilets

of people in the building

Predictive maintenance

Technical equipment

"Refill me"

Building usage

Space management

Occupancy (room and tables)

Benchmarking

Green building

Energy usage based on usage and weather

Benchmarking

Productivity and user satisfaction

Touch points

User touchpoints through out a day in the building e.g ISS Concierge app

COST

PURPOSE

EXPERIENCE

Touchpoints@ISS



The Power of the human touch

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TRIRIGA – IWMS



Customer Request Central (self service, way-finding, reservations)
Business Analytics (KPIs, BIRT, Watson Analytics)

Real Estate Management

Portfolio Planning
Site Selection
Transaction Management
Lease Administration
Lease Accounting
AR Tenant Tracking
Payment Processing
Client Requests

Project Management

Program Management
Fund Management
Scope Management
Cost Management
Schedule Management
Resource Management
Permit Management
Vendor Engagement
Procurement

Space Management

Space Management
Space Chargeback
Space Requests
Strategic Planning
Space Forecasting
Move Management
Personnel Provisioning
CAD Management

Workplace Resources

Reserve Meeting Rooms
Hot-Desking/Hoteling
Reserve Equipment
Reserve Vehicle
Catering
Visitor Management
Room Setups

Operations & Service

Contact Center
Service Management
Warranty Management
Preventive Maintenance
Facility Assessment
Security/Key Management
Inventory Management
Capital Planning
Resource Planning

Environmental & Energy Mgt

Impact Manager (Rules)
CO2 Emissions
Utility Tracking
Waste Disposal
Water Consumption
Green Opportunities Tracking
Environmental Certification

Shared/Common Data and Process Integration

Common Workplace Platform, Database & Documents
Internal/External Integrations, BIM/Revit, Bluemix (Assets/Rules)



Integration Platform and Services
BIG Data / Message Insight/IOT Foundations

