IEN02 Context & Contextualizing
Why We Need it in Information 4.0
Industry 4.0 and beyond

- Contributing digital technologies

Technologies that act as levers

3 Mega trends
- AI everywhere,
- Transparely immersive experiences
- Digital platforms

http://www.gartner.com/newsroom/id/3784363
The Connected Factory in Action

Where is Information?

Efficiency

Link Information & Operational Technology
Bridge the gap from data center to control room to collaborate and share best practices and common goals between manufacturing and IT.

Optimize Assets
Identify where your people, equipment, works in process and finished goods are in real-time. Adjust the schedule and inventory on the fly.
Information in this highly technological environment

- **Molecular** – no documents, just information molecules
- **Dynamic** – continuously updated
- **Offered** rather than delivered
- **Ubiquitous**, online, searchable and findable
- **Profiled** automatically

- **Spontaneous** – triggered by contexts
What is a context?

The circumstances that form the setting for an event, statement, or idea, and in terms of which it can be fully understood.

— Oxford Dictionary

A matrix of perceivable, observable, programmed, predicted parameters, events or intents that define an information response request.

— Information 4.0
Why do we need to bother?

- Everything is becoming user-centric
- Technology is more and more capable of identifying us and will drive context determination
- The arrival of AI everywhere will accelerate prediction
- Technology itself will produce more and more information
AI everywhere

software
algorithms in decision making

rule-based decision making

boolean data (yes or no)

each condition fulfilled then activity 1
else activity 2

Examples:
- phone notification
- time- or threshold-based alarms
- simple pattern matching

every programmer

data science types

statistical reasoning

numerical data allowing for curve fitting

Examples:
- extra- and interpolation
- outlier detection
- predictive maintenance

complex systems specialists

machine learning

classification tasks

arbitrary data that needs to be abstracted into numbers

Examples:
- identification of relevant features from large input datasets
- quality control using various metrics

artificial intelligence

dynamic adaptation to novelty

autonomous selection of best methodology when presented with arbitrary data

Examples:
- autonomous vehicles
- human-like conversational skills
- intelligent digital assistant
The ambition

• We are at a unique point in the convergence of information and technology
• The goal is providing a unique information response tailored for us as individuals in a context and just that
• It is then about prediction of what we need next

• This process is contextualization
  – It is about understanding what technology will do
  – An information model adapted to respond
  – The two worlds working together
Context prediction

• Stephen Sigg:
  – Sensors know elements of each person’s context

http://ambientintelligence.aalto.fi/projects.html
Emotion detection
Let’s imagine a simple example

- One-day tour with a diverse group of people

Detectable elements:
- **Identity, Time, Activity, Constitution** (biological and emotional), Environment

Persona
1. Expert
2. Curious
3. Distracted

Observable time & space

Purpose
- Process
- Activity
- Intent
Let’s imagine a simple example

- **Getting there**

I am ready to leave now for Saqqarah, then Dashour with two friends. It should take 1 hour 15 minutes to get to Saqqarah in current traffic.

I see you have been there several times before; What level of information do you want?

Expert

Can you tell me about your 2 friends Dominique @+33623456789 and Gilles @+33656789111

OK, I see they have not been there before, should I contact them?

Yes

... INFO: The Unas pyramid is open today until 11am so maybe you might want to start there.

OK, get the texts and their translations ready for when we are in front.
Let’s imagine a simple example

• Once there

Check out the restaurant on the way in – it has good reviews
Want to reserve for lunch?

No, take us there

... 

Karim, the site inspector you know is near the Djoser pyramid – want to call him?

No

...

Start with the Unas pyramid?

Yes

...

Find and call Karim now
Let’s imagine a simple example

• Once there

Want to know the ancient name?

Yes

Iounou
It means ‘white walls’

Why?

Turn around and look at the walls near the entrance.

They are made of very smooth limestone blocks. When first constructed, it is believed that it must have been extremely shiny and white.

Where did the stone come from?

Look out across the river. The stone comes from limestone quarries about 10km away.
Let’s imagine a simple example

• Once there

Here’s a list of interesting places to look at nearby
Technology changes content experience

• blippar.com example
  – Augmented recognition
  – Open access ontology
  – Taxonomical navigation

What we need to do

• Work with designers of contextualizing technologies
• Negotiate the interaction model
• Train new mindsets in information design
• Adapt of fit our existing tools
• Build the bridges to fill the gaps
Next steps

• Information Energy 2018 – new format
• Consortium project on contextualization
• Consortium project on molecularity

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