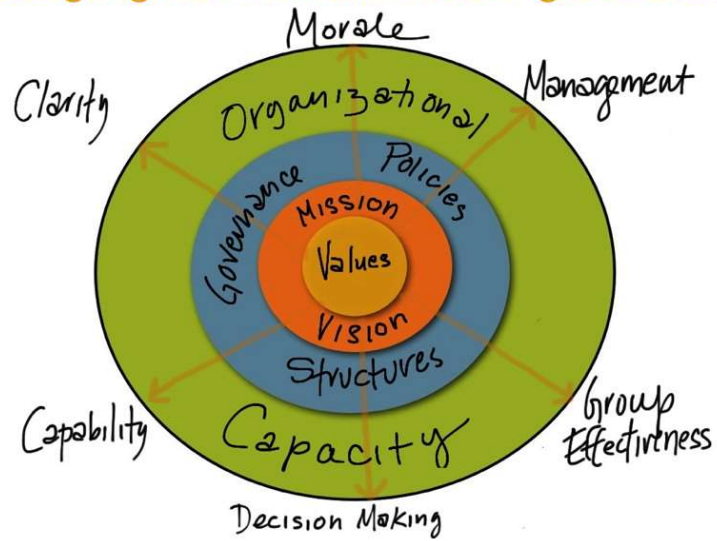


## Designing Your Environment for Agile Success

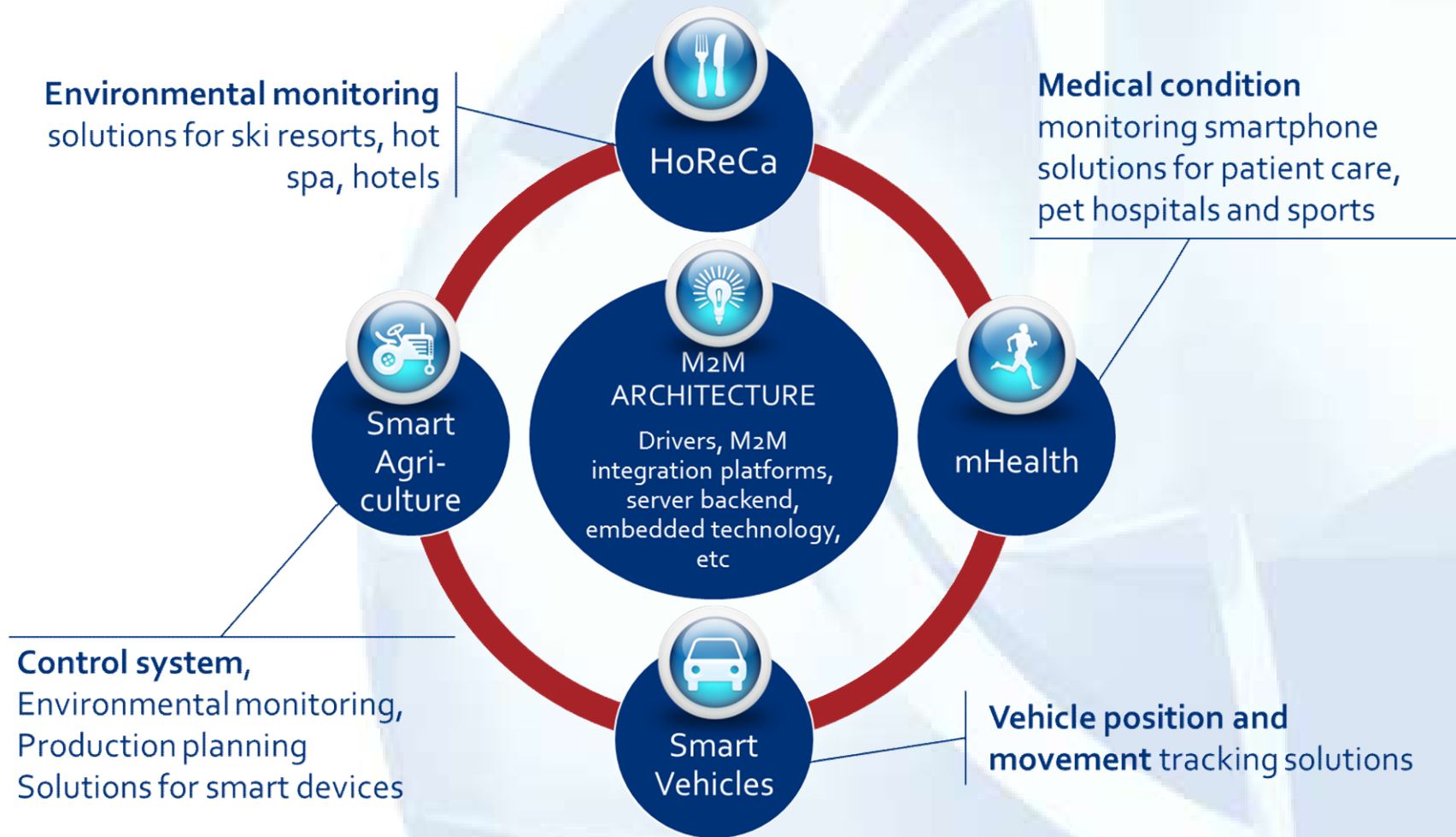


# Agilitás az Agráriumban

Modellek és use case-ek

Biró Attila | ITware

# M2M/IoT connected ITware



# IoT = (ahol) Internet ott Tárgyak (vannak)



*Vehicle, asset, person & pet monitoring & controlling*



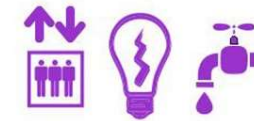
*Agriculture automation*



*Energy consumption*



*Security & surveillance*



*Building management*



*Embedded Mobile*

Internet of things

Everyday things get connected for smarter tomorrow



*M2M & wireless sensor network*



*Everyday things*



*Smart homes & cities*



*Telemedicine & healthcare*

# Why IoT is growing?

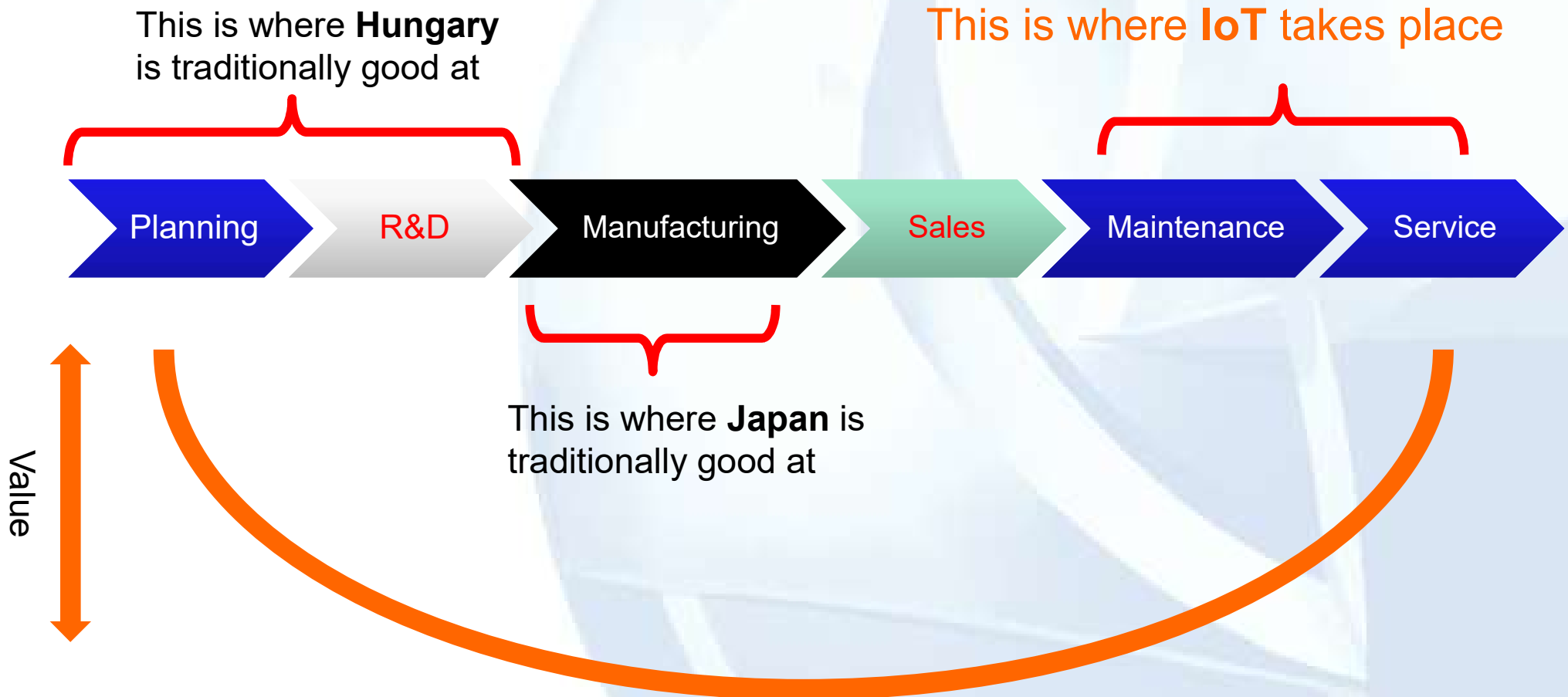
IoT is not about products and Technologies.  
It's **about Transition.**

So, Which Transition?



Trend toward **service economy**

# The IoT Smile Curve



# Planning a solution

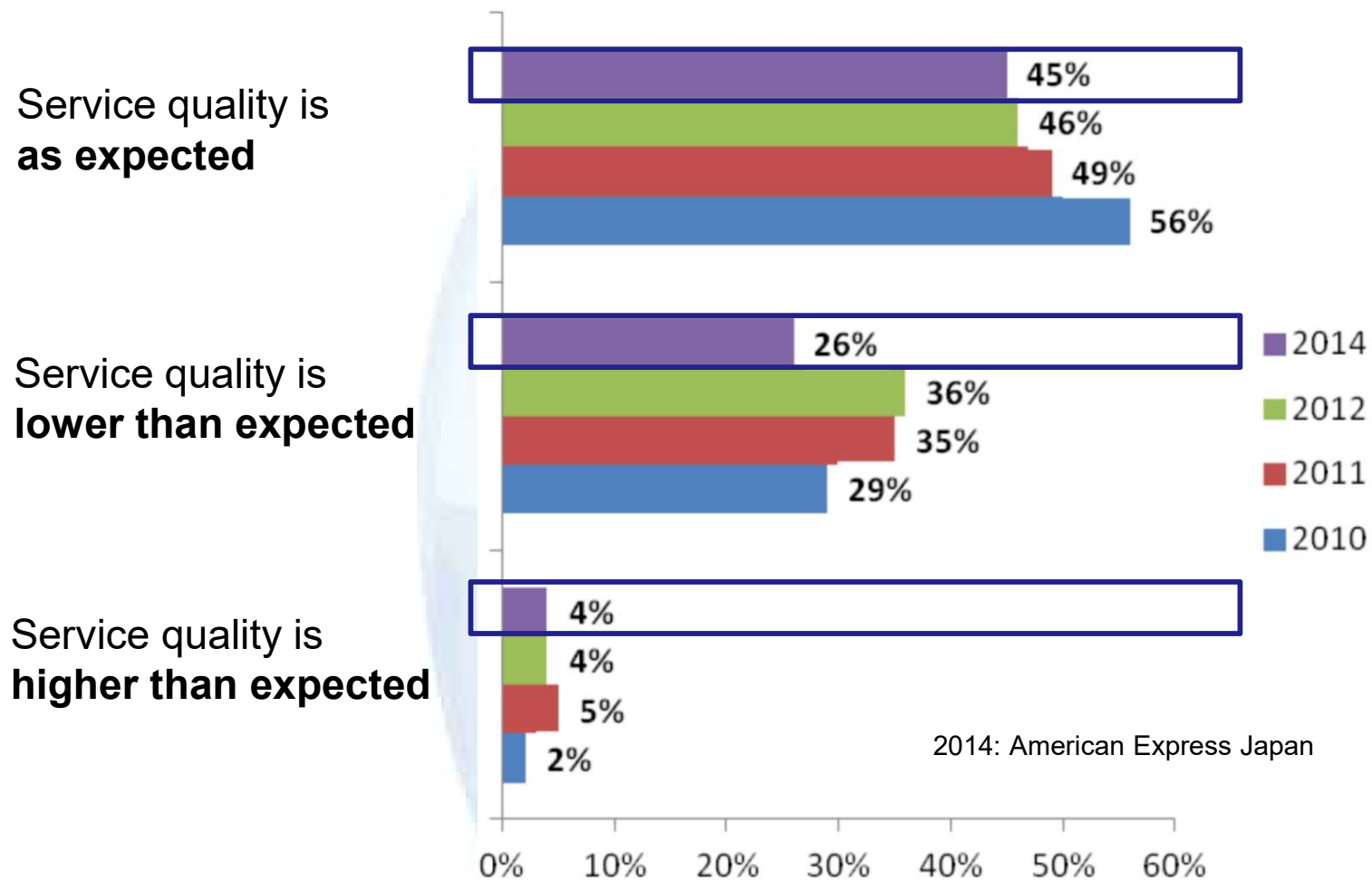
**HARD**



**EASY**

— Planning a solution

# High Expectation



# Important factor in service

What are the important factors in Customer Services?

	Japan	US	HU	Italy	HK
Productivity, efficiency	12%	33%	30%	27%	40%
Authority to make decision	15%	29%	23%	41%	13%
Politeness, kindness	26%	17%	15%	10%	26%
Human touch, relationship	28%	14%	19%	9%	11%
Reliable, professional	20%	7%	14%	13%	11%





# Reference Project **Hungary**

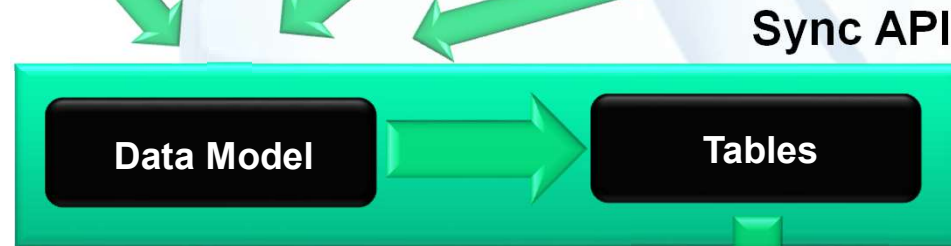
# Agronómia



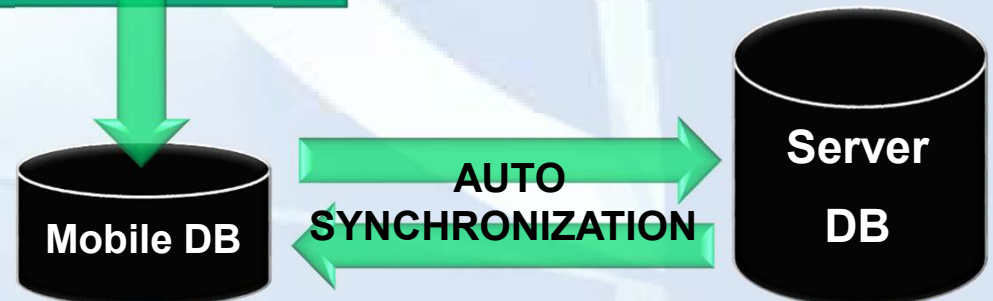
# Műszaki



# Szerviz



1. DEFINE MODEL
2. GENERATE
3. USE IN YOUR APP!



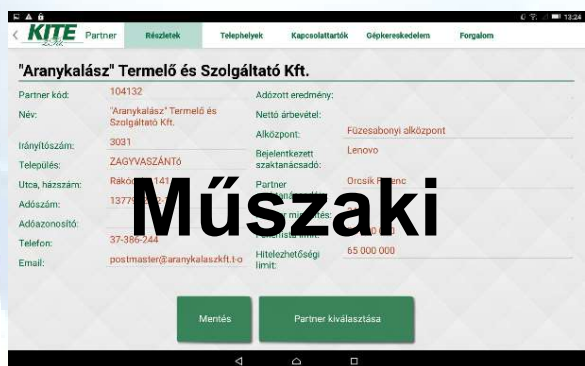
# Agronómia



# Műszaki

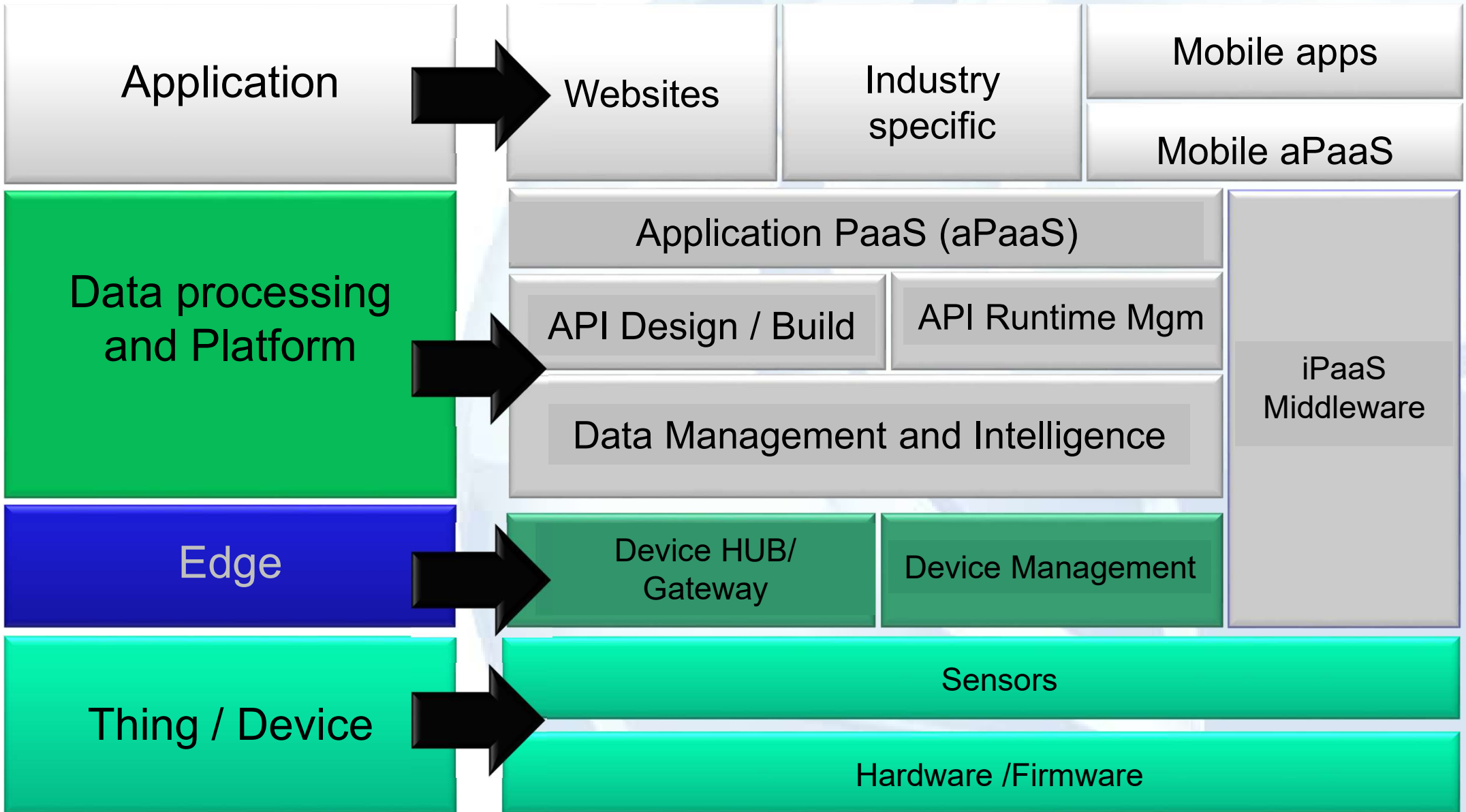


# Szerviz



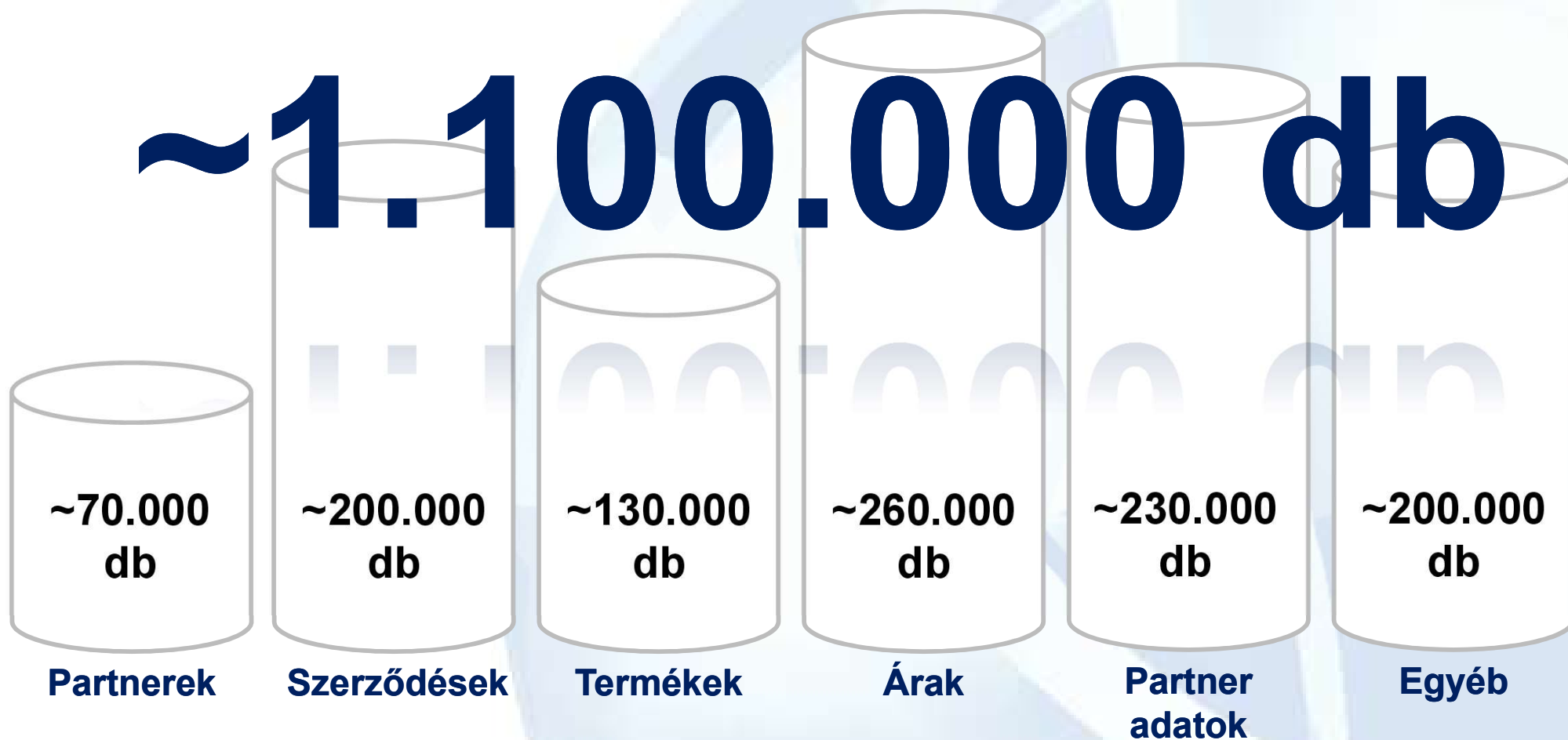
# The IoT Stack

...breaking down the IoT Stack



# Performance is important!

~1.100.000 db



More than 1 million records on **MOBILE!**

# Synchronize ~1 million record...

**~1.100.000**



**4 hours**

**<10 mins**

**1 hour**

**batchSQL**

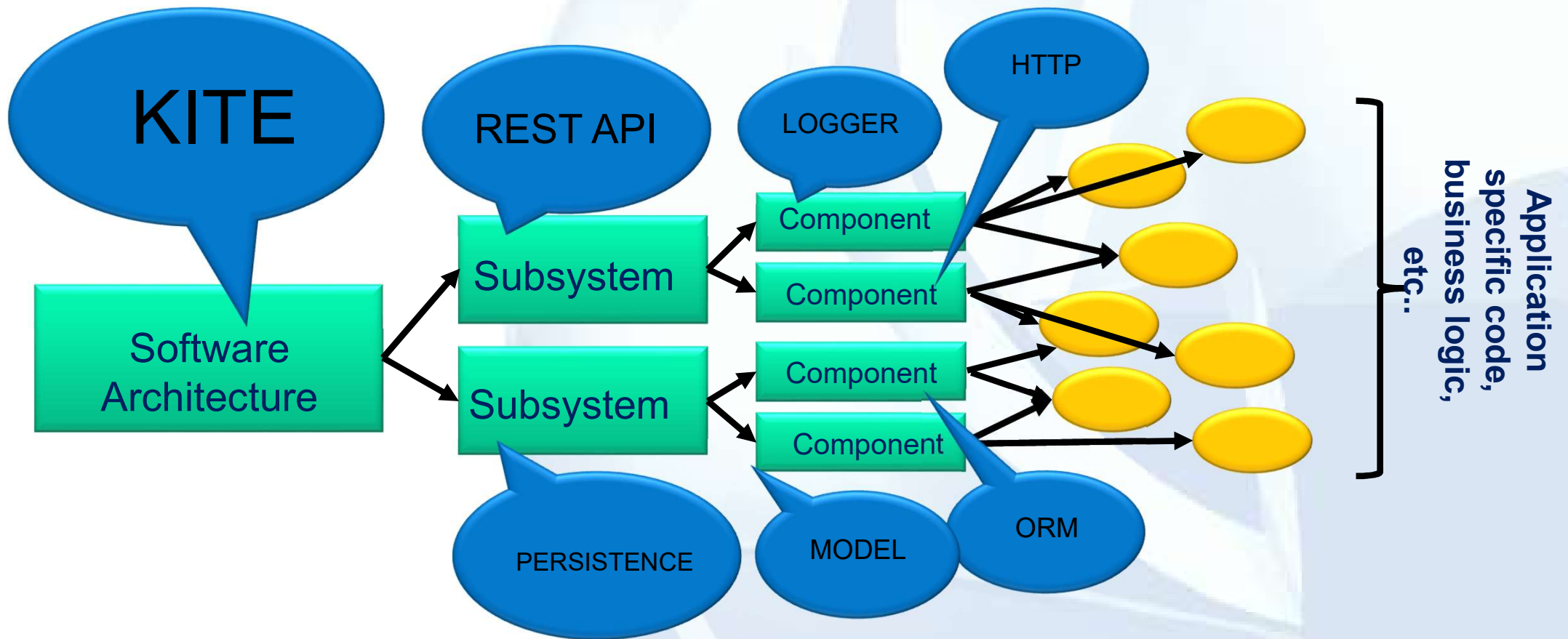
**gzip**

**streaming**

**Database (KITE)**



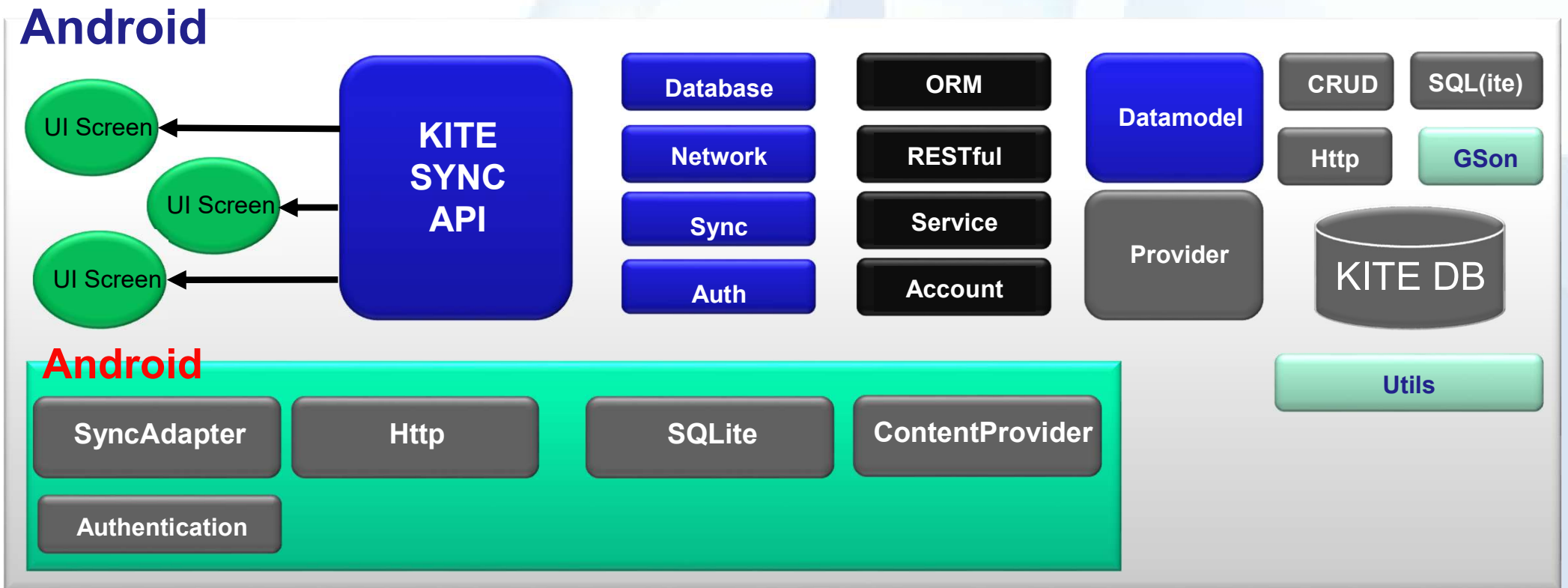
# Software Architecture



# ARCHITECTURE

A good architecture of the Synchronization API in the KITE's Android client application

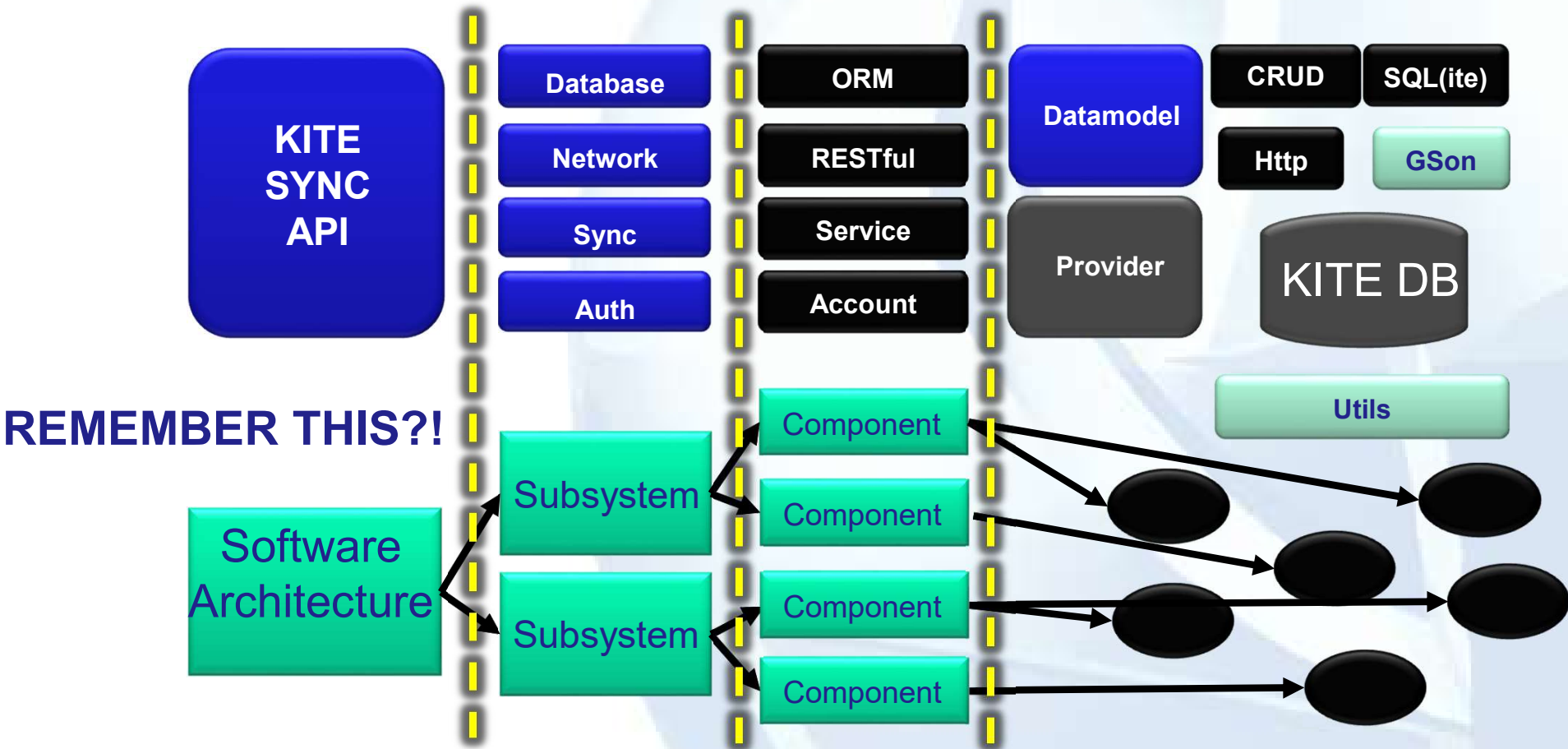
Step #1





# ARCHITECTURE

Step #2

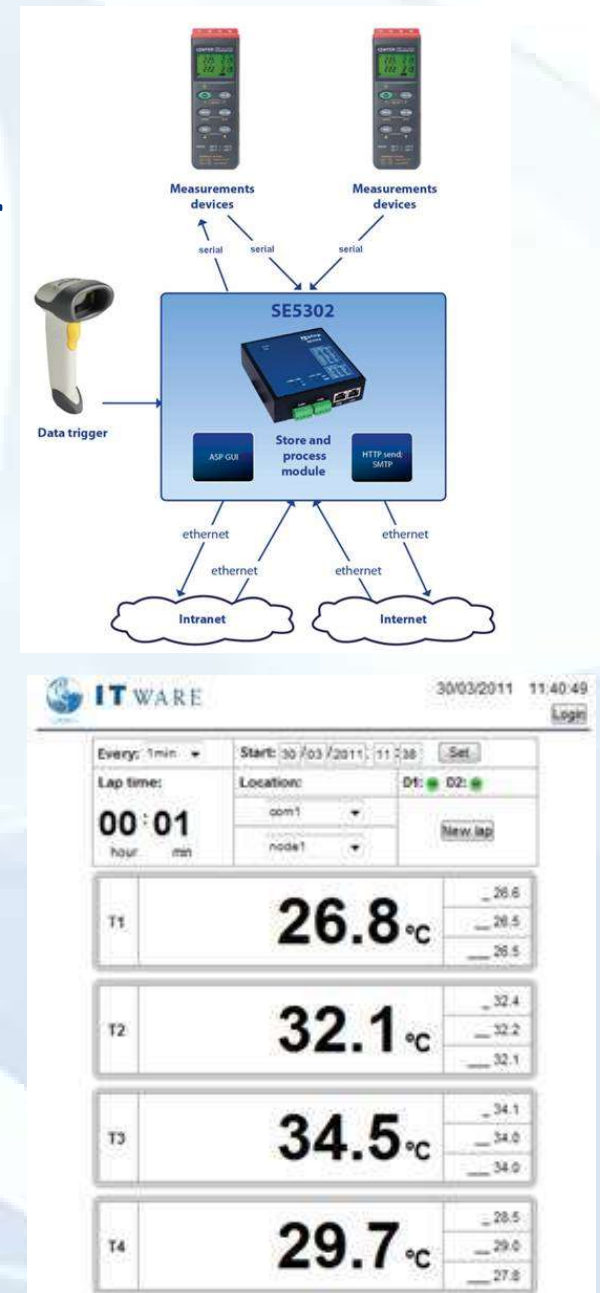




# Reference Project **Japan**

# Kojimori IaaS

- Innovative, **cloud-based remote data collection system DAQ**
- Configurable through a **web based interface**
- Measuring **devices at remote locations**
- **Accessible anywhere**, through the web
- Intelligent, continuous and **event-triggered reports**
- **Offline mode**
- Get collected data in JSON format
- **Secure encrypted data transfer.**
- HTTP and SMTP communication with remote server
- Stores read but unsent data in memory or on its flash drive.
- Support for **+50 different types of sensor devices** including the RTR-50 wireless sensor network
- **Flexible network configuration** (DHCP/Static IP, Dynamic/ Static DNS)



# Kojimori IaaS

**設定情報**  
LANコンバーターの設定情報より詳しく

製品名	SE5302
IPアドレス	192.168.0.181
MACアドレス	00:80:E9:0B:14:F2
デバイス名	two ports serial server
設置場所	BCenter
時刻 (YYYY/MM/DD)	2013/12/10 14:24:00
カーネルVer.	V2.4
AP Ver.	Thermo.EN. v2.98 Build date: Oct 16 2013
接続状態	<input checked="" type="checkbox"/> RS COM1 <input checked="" type="checkbox"/> RS COM2
モード	<input checked="" type="radio"/> Monitoring <input type="radio"/> Trigger-monitoring <input type="radio"/> Trigger driven
送信方式	<input type="radio"/> http post <input checked="" type="radio"/> SMTP <input type="radio"/> 無効
JSON	<input checked="" type="radio"/> Realtime <input type="radio"/> Monitoring <input type="radio"/> 無効

**設定情報**  
接続機器  
ネットワーク設定  
SMTP  
時刻設定  
セキュリティ

**メンテナンス**  
プロトコルのステータス  
最後の投稿の日付: 2013/12/10 14:19:07

プロトコル	ステータス	数
SMTP	成功	40
	エラー	0
HTTP POST	成功	0
	エラー	0
NTP	成功	1
	エラー	0
DNS	成功	2
	エラー	0

未送信のレコードのステータス

格納モード数	SMTP	JSON
フラッシュメモリ	27	3

経過時間: 00:00  
開始: 2013/12/10 14:24  
取得

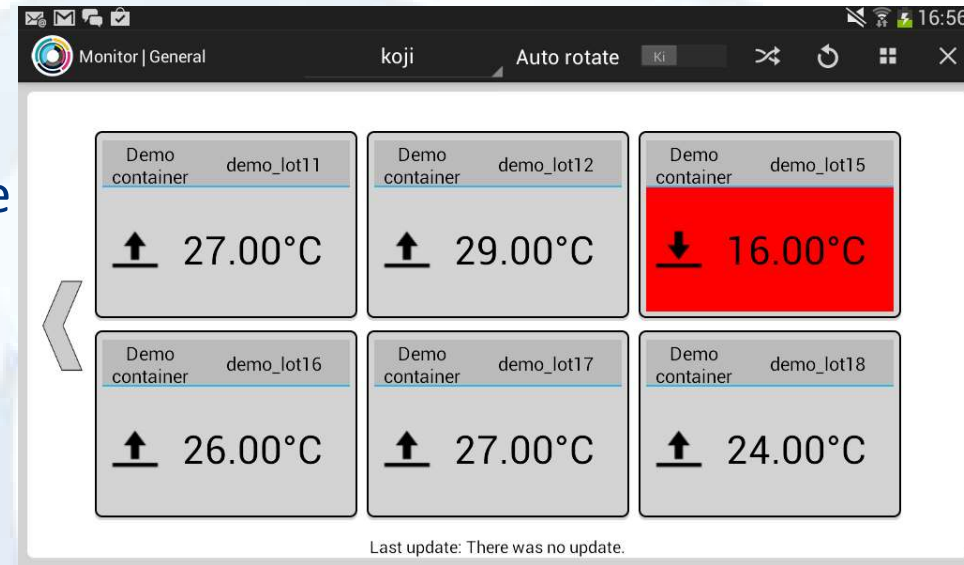
間隔: 1分  
経過時間: 時間 分

設置場所: BCenter  
DI1:  DI2:   
DO1:  DO2:   
com1  
Default no  
保存

温度	履歴
T1: 26.3 °C	_ 26.2 _ 26.2 _ 26.3
T2: 29.6 °C	_ 29.6 _ 29.6 _ 29.5
T3: 27.1 °C	_ 27.1 _ 27.1 _ 27.1
T4: -	- - -

# Kyowa (Japan)

- Monitoring **sake brewing** and controlling the production process
- **Sensors: temperature, humidity, alcohol level**
- **Measuring devices at remote locations**
- Accessible anywhere, through the web
- **Intelligent, continuous and event-triggered reports**



# Kamikatsu (Japan)

- **Simulates shiitake mushroom growing lifecycle**
- Measuring devices at remote locations
- Japanese market



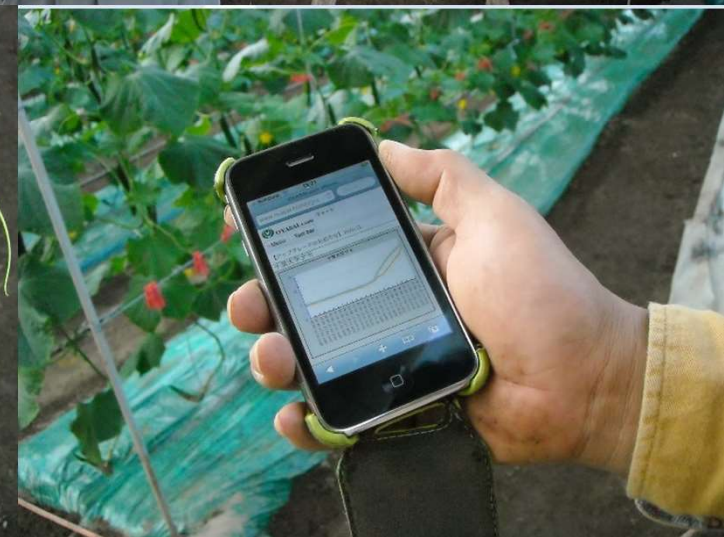
# Greenhouse, Vegetable growing, Japan

- Remote monitoring of greenhouse on smartphone/ tablet by owner
- Connected with web camera
- Measured values:
  - external and room T,
  - RH,
  - light intensity



IT WARE 30/03/2011 11:40:49 [Login](#)

Every: 1min	Start: 30/03/2011, 11:38	Set
Lap time: 00:01	Location: com1	D1: D2: <input type="checkbox"/>
hour min	node1	New lap
T1	26.8 °C	26.6 26.5 26.5
T2	32.1 °C	32.4 32.2 32.1
T3	34.5 °C	34.1 34.0 34.0
T4	29.7 °C	28.5 29.0 27.8





# Greenhouse Flower production, Japan

- Display of temperature on homepage
- Remote monitoring of greenhouse on smartphone/ tablet by owner
- Connected with web camera
- Measured values:
  - external and room  $T$ ,
  - $RH$ ,
  - light intensity



2012/02/28 08:30:57

**カーネーションの精華園**  
千葉県南房総市で花を作って半世紀 生活にお花を

[農園紹介](#)
[品種カタログ](#)
[卸・市場販売](#)
[産地直送便](#)
[お買い物方法](#)

IT WARE 30/03/2011 11:40:49


Every: 1min Start: 30/03/2011 11:38 Set

Lap time: 00:01 Location: com1 D1: D2: New lap

T1	<b>26.8 °C</b>	_ 26.6 _ 26.5 _ 26.5
T2	<b>32.1 °C</b>	_ 32.4 _ 32.2 _ 32.1
T3	<b>34.5 °C</b>	_ 34.1 _ 34.0 _ 34.0
T4	<b>29.7 °C</b>	_ 28.5 _ 29.0 _ 27.8

Temperature in the current House

No. 4 200 square meters 12月27日 06時23分 <b>10.1 °C</b>	100 square meters 12月27日 06時23分 <b>11.1 °C</b>	12月27日 06時23分 <b>6.8 °C</b>
No. 8 200 square meters 12月27日 06時23分 <b>12.2 °C</b>	Outside temperature 12月27日 06時23分 <b>4.9 °C</b>	Workshop 12月27日 06時23分 <b>6.4 °C</b>
No. 4 300 square meters 12月27日 06時23分 <b>9.1 °C</b>	No. 8 300 square meters 12月27日 06時23分 <b>9.0 °C</b>	12月27日 06時08分 <b>7.0 °C</b>

Powered by  **OYASAI.com**



# Food industry

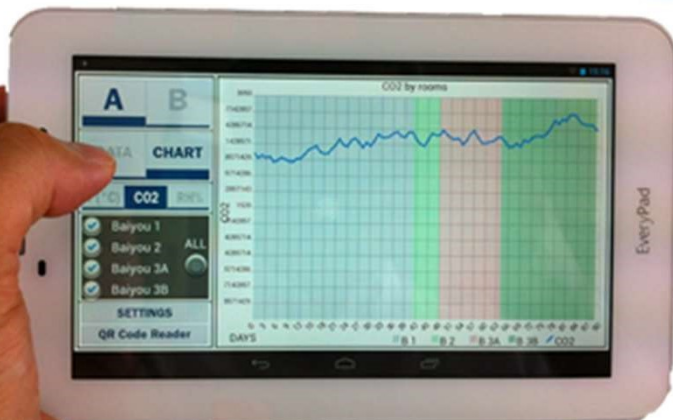
## Mushroom production, Japan

Remote monitoring of mushroom farm on smartphone/ tablet by owner  
(demo mushroom production planning tool available)

Connected with web camera

Measured values:

- external and room  $T$ ,
- Substrate  $T$
- $CO_2$
- $RH$





# Beverage production (eg. Sake)

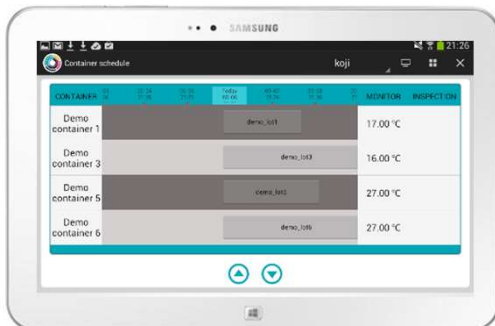
## Android tablet app

User firendly app to store data electronically and to support production planning, quality management and knowledge transfer with alert function.

### Dashboard



### Production scheduler



... and many other functions.

YK-90HT



Room and outside  
Temperature  
Humidity

WA 2017SD



Conductivity, TDS, \*any commercially available  
pH/ORP, Dissolved  
Oxygen



Cloud server

IP Camera\*



— suggested sensor  
- - optional sensor

# Food industry: alcoholic beverage (sake) production, Japan

- Remote monitoring of sake production on smartphone/tablet by owner.
- Connected with web camera
- Measured values:
  - *external and room T*,
  - *Substrate T*
- With supporting production planning system on tablet





# [JP] KOJIMORI | References



# Agricultural research

Measure various factors virtually any agricultural, food / beverage production processes to see effect of treatments and environmental conditions on crop performance and in end product quality.

Reach data on ready made charts or export it for further analysis.

Non stop, by automatic data monitoring.

Access all data on PC and on smartphones.





# [JP] KOJIMORI | Reference





Measure sounds, vibration, pressure, temperature of engineering machines, combine freely with other sensors to find ways

- To reduce tutoring time in technical education
- To improve working conditions (noise levels, etc)
- To design better machines and processes

by having a tight grip on machine performance 24hrs a day.

Reach all data on PC and on smartphones.

SL-4012



Sound levels

VB-8206SD



Vibration



PS-9302



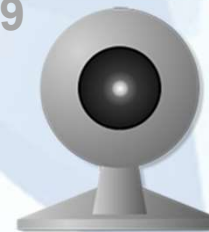
Pressure



Multimeter Temperature (-200 - + 1370°C)



IP Camera\*



*\*any commercially available IP camera can be integrated*



— suggested sensor  
- - optional sensor

### Tomato hydroponics experiment

#### Measuring

- Internal temperature
- Soil temperature
- EC
- CO2
- Humidity

connected with web kamera.

Displaying real time data and historical charts on homepage.

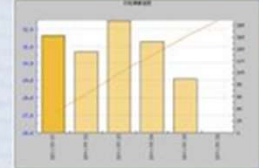
Using measured values to analyze experiment data.

### 養液栽培トマト ライブカメラ

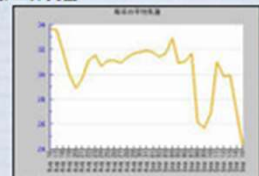
**農業基本データ**

ハウス気温	17.8℃
ハウス湿度	74.3%RH
CO2濃度	449.0PPM
水温	12.4℃
EC	8.8mS
株上幹温度	15.3℃


**基本データ**



**株上幹気温**



**ライブカメラ (全景)**




養液栽培トマトとは、土を用いずに水耕栽培（養液栽培）によって栽培されるトマトのことです。

その栽培過程で養液に塩を加えることにより、塩類ストレスを与え、高糖度のトマトを生産しています。

そのため、果実は小ぶりになりますが、その分、糖や養分などが凝縮され、甘いトマトになります。

**ライブカメラ (接写)**

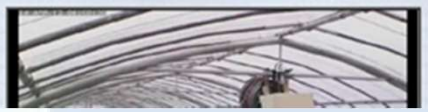


このライブカメラでは、養液栽培トマトの現在の様子を観察することができます。また左手の農業基本データは、現在の温度・湿度等を表示しています。

※育苗期間中は、水温・ECのデータは、現在のものではありません。苗作の栽培終了時のままとなっています。

養液栽培トマトのページへ

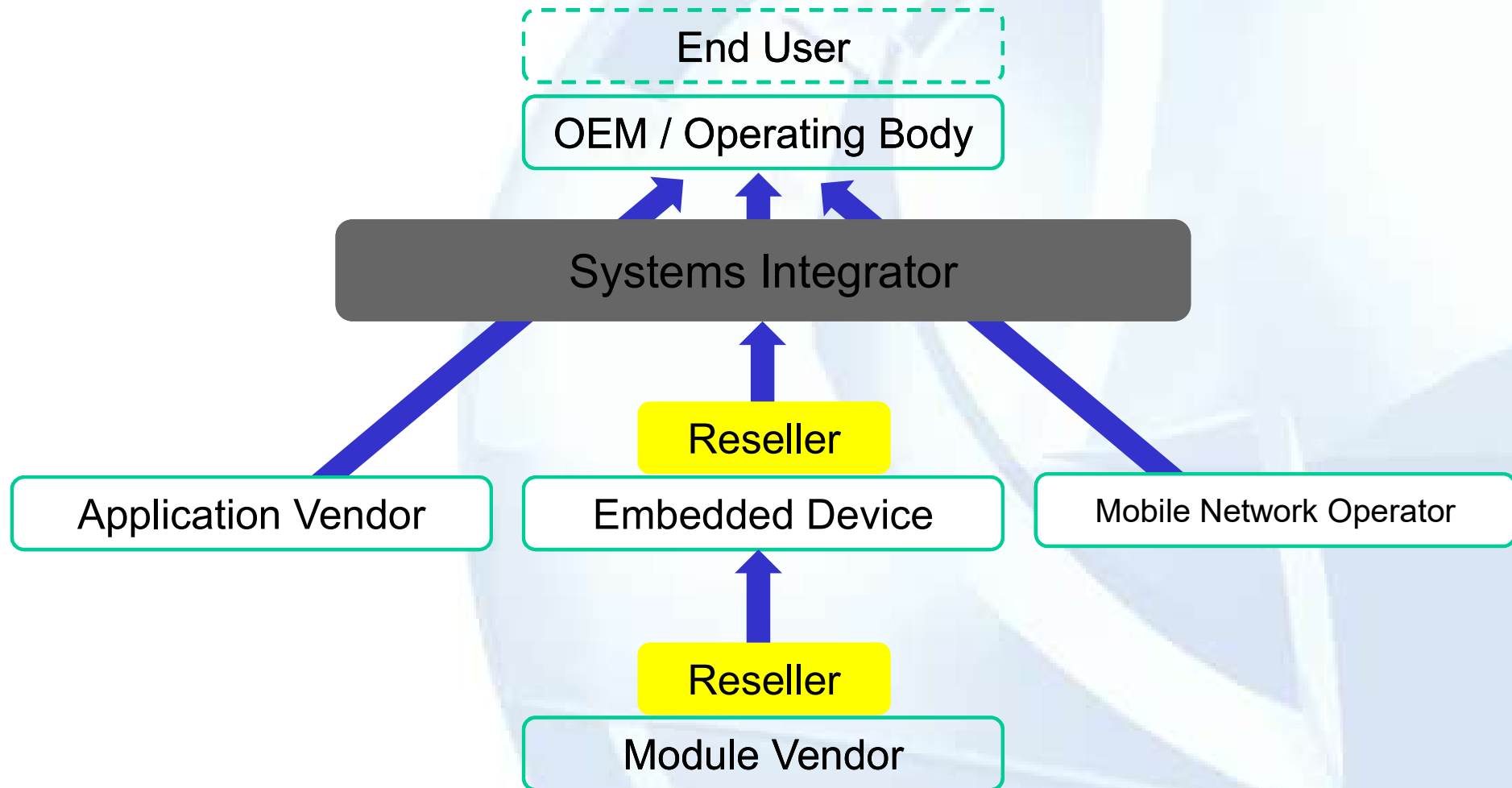
**生長記録ムービー (全景)**



生長記録ムービーでは、定植から収穫までの栽培管理、生長の記録を観ることができます。

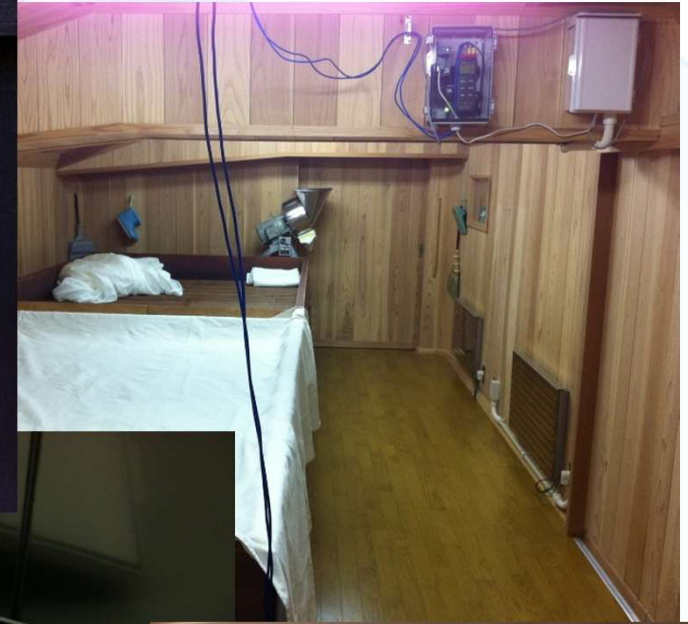
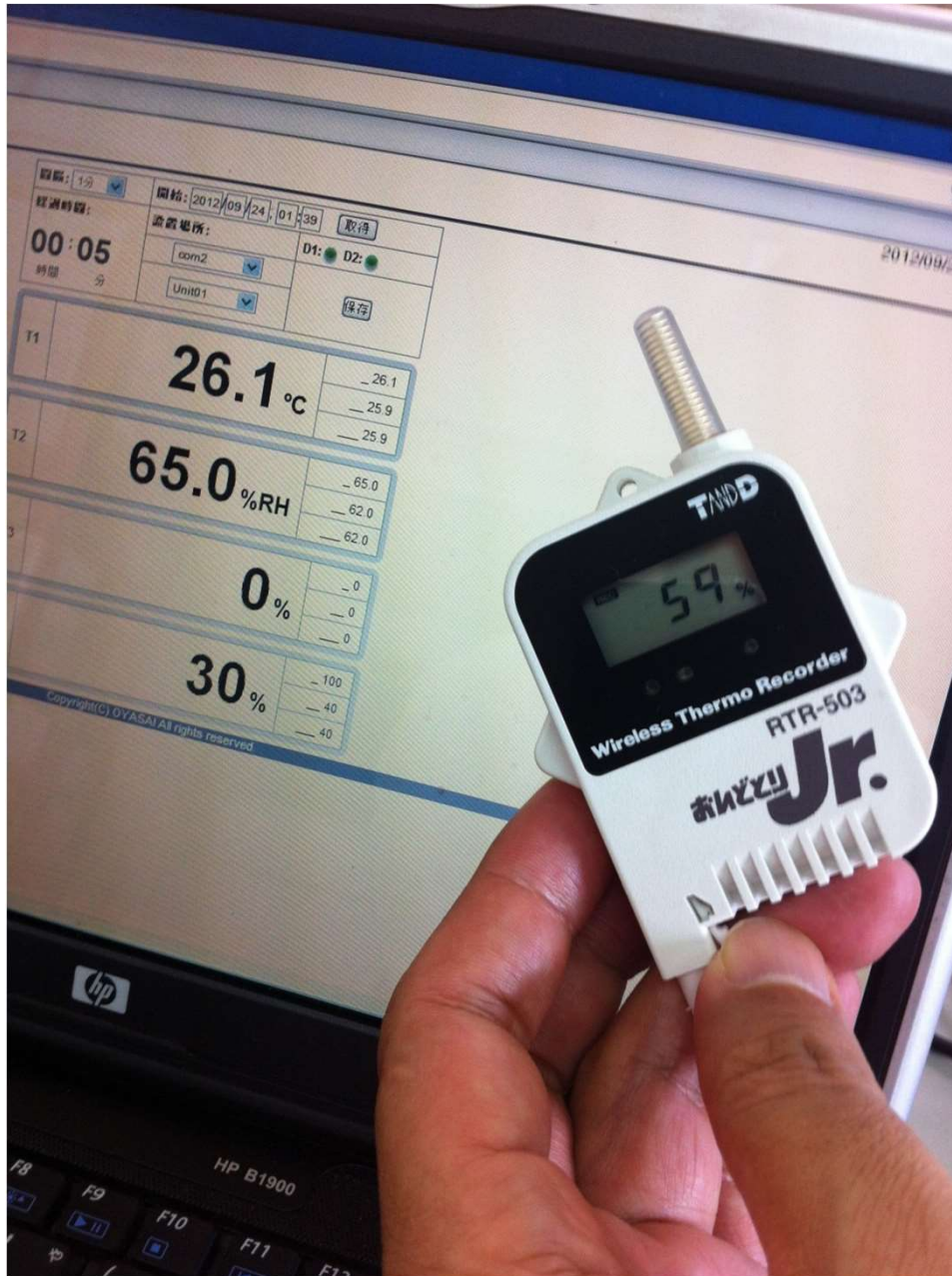
定植後から前口までの様子です。

# Supply Chain of IoT

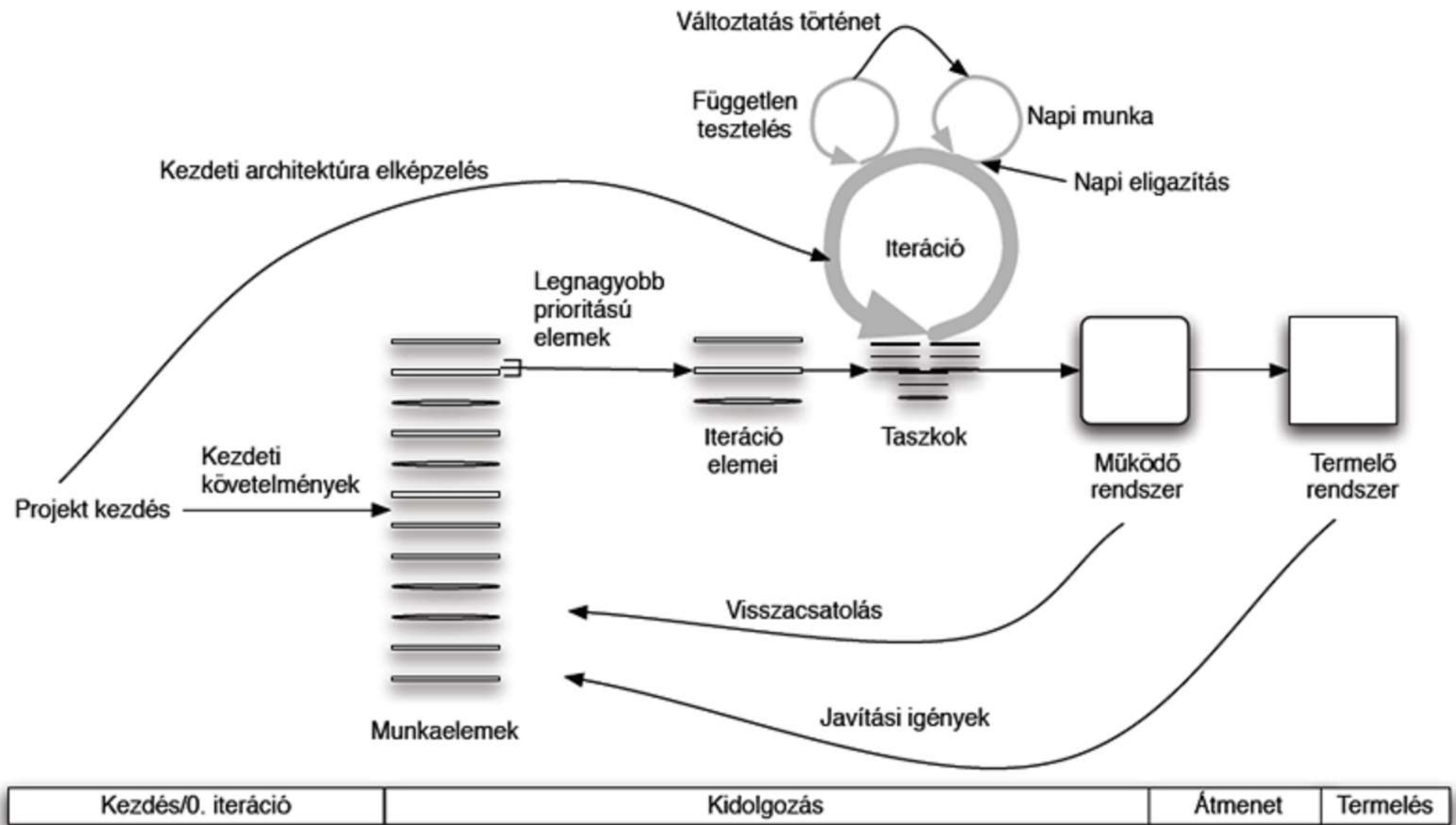




# KOJIMORI | Reference



# Összegzés: Agilitás az Agráriumban



Relations of Trust is a key to success

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Skype: biroka

<http://www.itware.hu>

