

The Internet of Things

Early Experience

Dr. Cuno Pfister

Oberon microsystems AG

- A software engineering firm with a quirk:
Spinning off new companies
 - Esmertec in 1999 (IPO in 2005, now Myriad)
 - Yaler GmbH in 2011
- We support R & D teams in developing
«Internet of Things» products
 - Our core interest: software engineering and
systems integration from sensors to cloud
services and Web pages

The **Internet of Things** is a global network of computers, sensors and actuators connected through Internet protocols

We are particularly interested in
the *Web of Things*

The **Web of Things** consists of
RESTful Web services that
measure or manipulate physical
properties

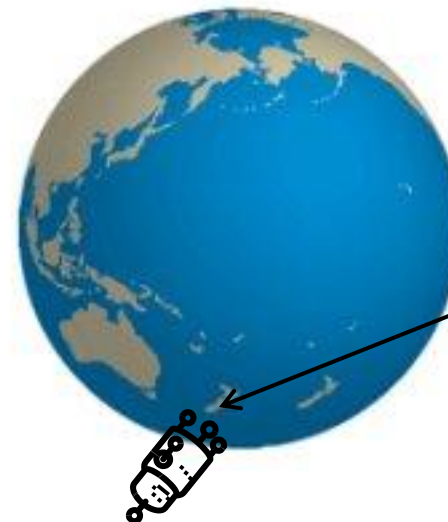
It Was 20 Years Ago Today...

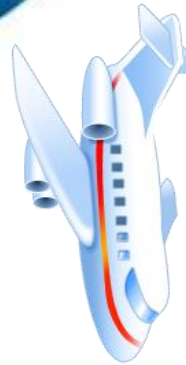
... well, roughly ...



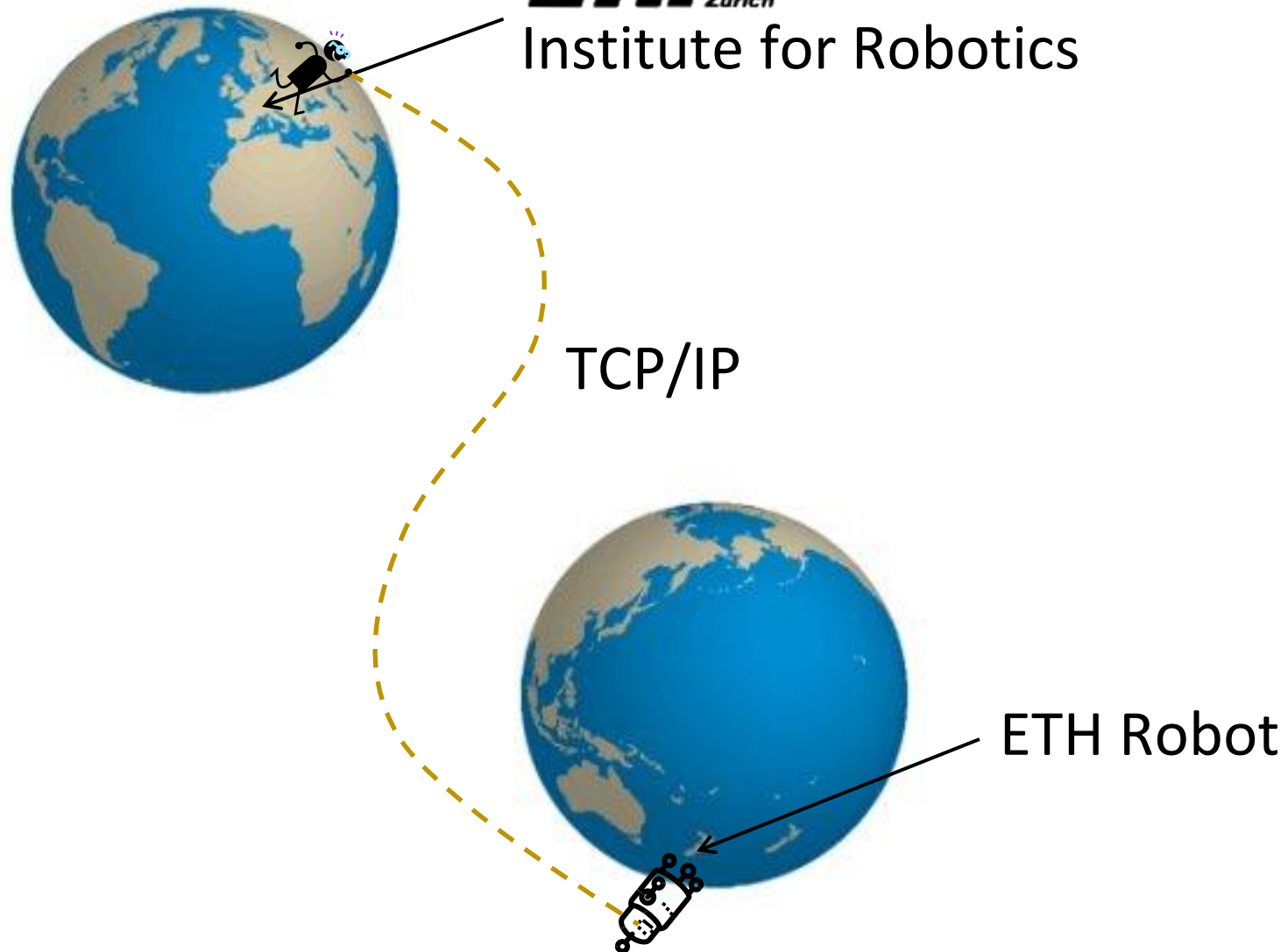
Robot controller with «primitive»
hardware (Motorola 68000), but
with a self-developed TCP/IP stack

Why TCP/IP, what an overkill???



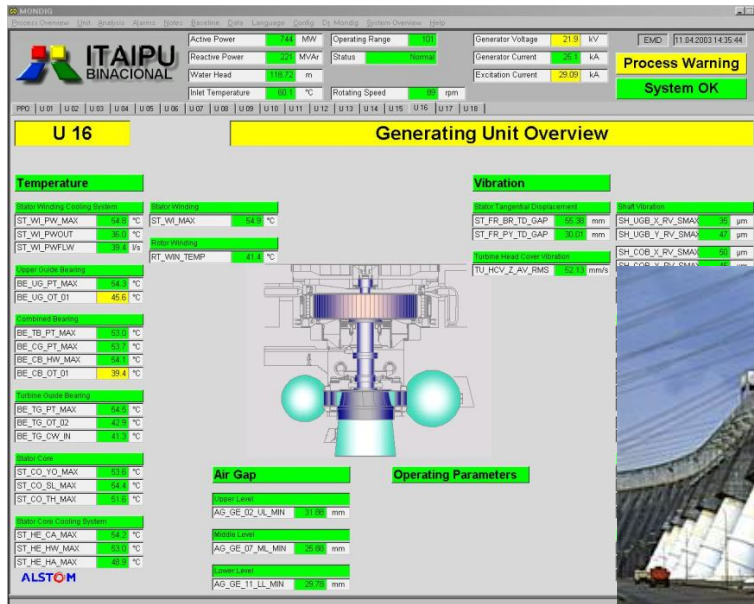


ETH Robot



It Was 10 Years Ago Today...

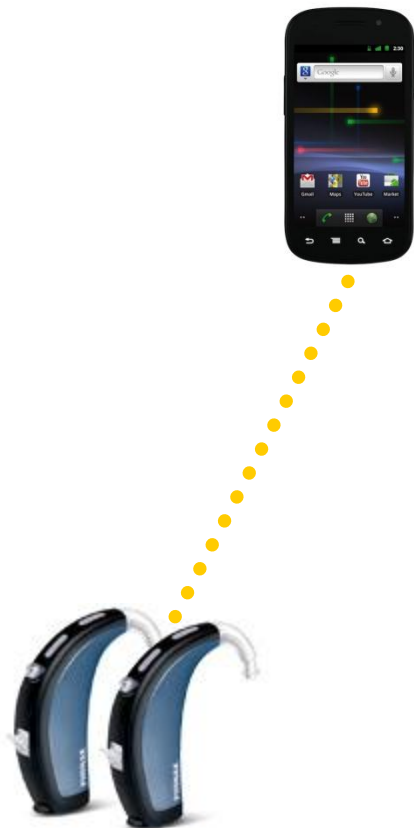
- Monitoring 10,000 sensor «tags» in a hydro-power plant in South America



This Is Today...

Remote Analysis of Hearing Aids

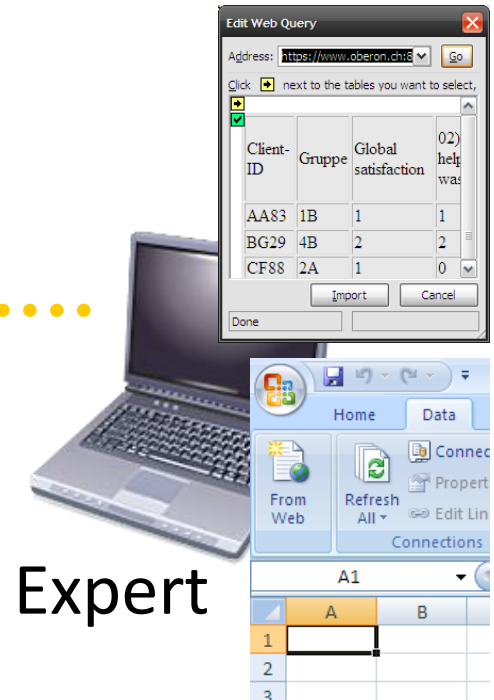
Hearing-Aid User



Internet

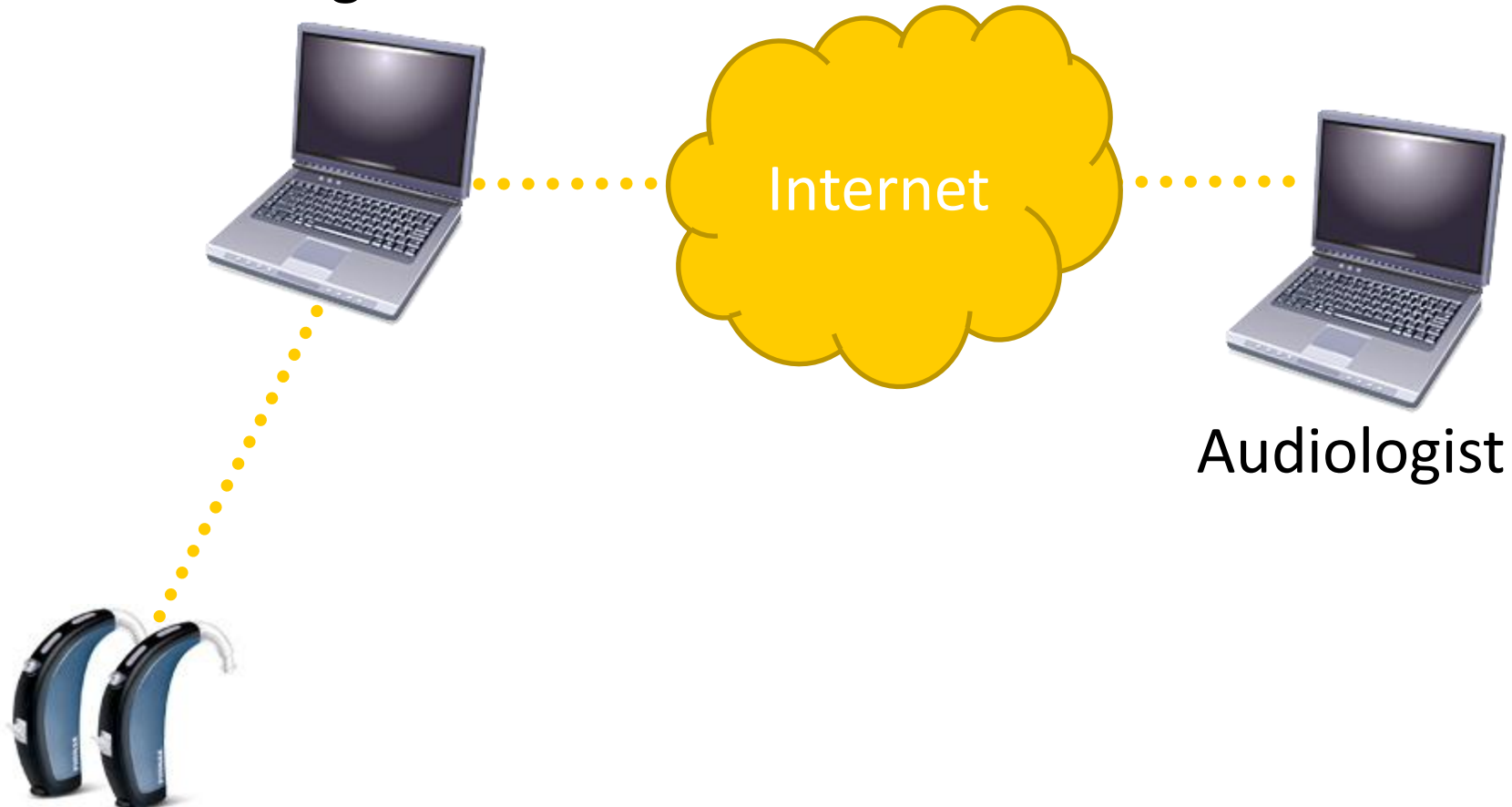


Storage Service



Remote Fine-Tuning of Hearing Aids

Hearing-Aid User



Some Lessons Learned

The Internet is Broken

- «Any computer can connect to any other computer on the Internet»
 - At least that's the theory (Internet architecture)
- In theory, theory and practice are the same, only in practice they aren't...
 - Firewalls, NATs
- See talk of Thomas

On Old Horses

- It is difficult to teach old horses new tricks
 - A challenge even in companies with an innovation culture (early adopters)
 - Better forget about brick & mortar companies
 - At least for the coming years
 - IoT often suggests new business models:
From selling a box to operating a service
 - IoT projects need to bridge gap between product development and IT operations

Danger Signs

- No vocal backing from CEO
 - Is sponsor too far away from the top?
- Client has not repeatedly failed with his own software projects
 - «A student can do this over the weekend»
 - «Here is the 1000 page specification, now leave us alone and just implement it, and pronto»
 - No management experience (and interest) in the typical problems that will arise

Some Old Horses Succeed

senseawareSM
powered by FedEx

Login

U.S. Patents pending for SenseAwareSM processes and systems.



When your shipment is vital, know its vital signs.

Introducing SenseAware, a multi-sensor device permitted by the Federal Aviation Administration to be used during flight on FedEx aircraft. It lets you monitor in-transit conditions — in near real time.



SenseAware combines an in-package sensing device with a comprehensive web-based information platform.

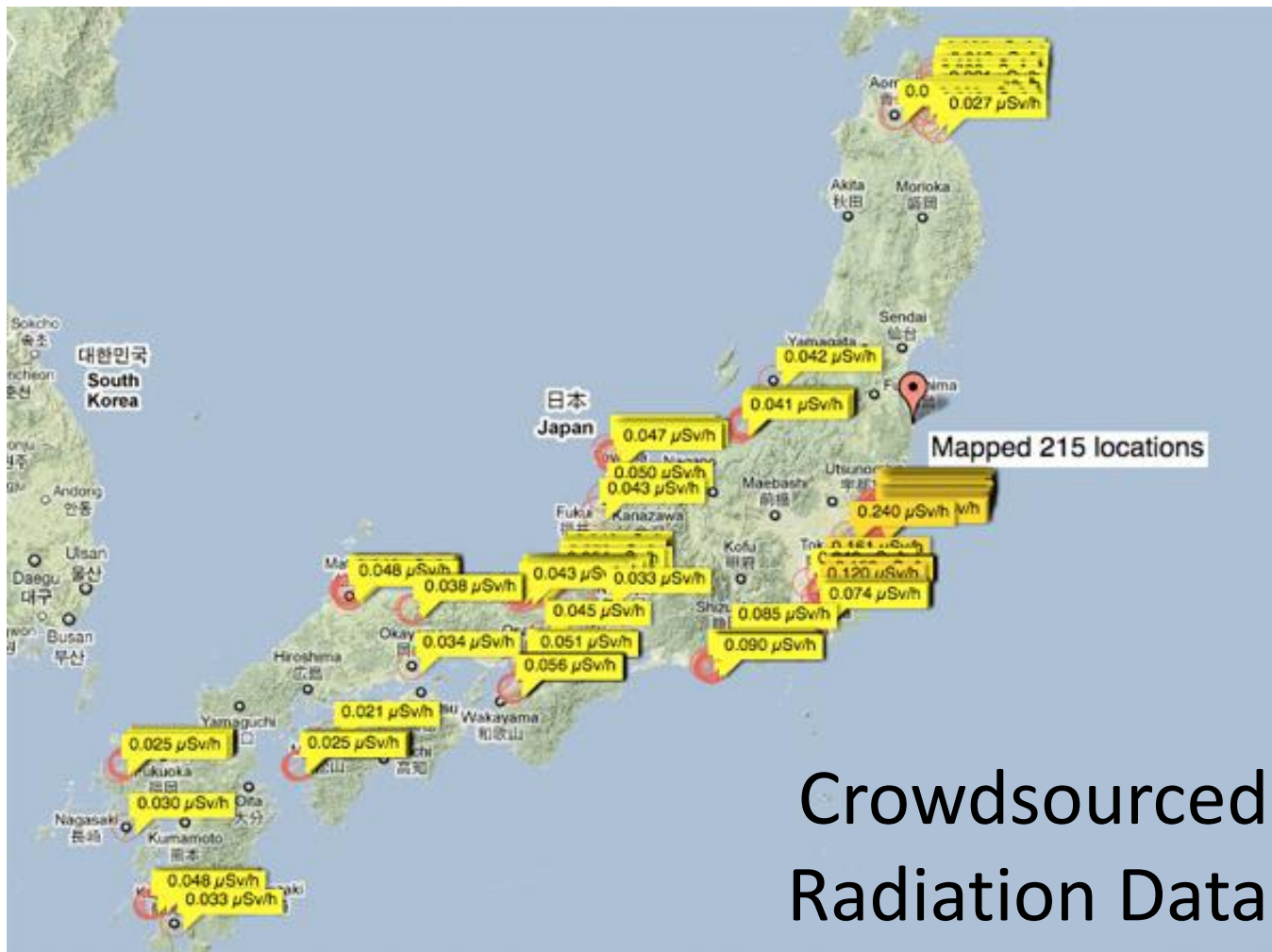


With SenseAware, you and your supply chain partners can share timely data about your critical FedExSM shipments.



This could be the beginning of a new age of collaboration and agility. Find out how you can be a part of it.

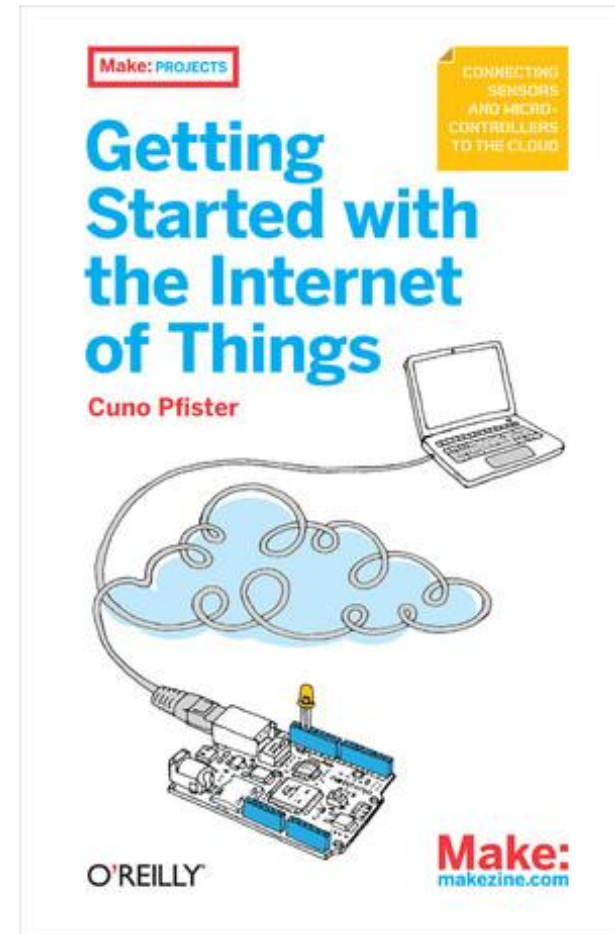
How About Young Horses?



Crowdsourced
Radiation Data

A Publisher's Opinion

«It is too early to address
professionals.
Let us first address *makers!*»



Corporations vs. Makers

Corporations

- Sticky business models
- Focus on bottom-line growth (cost cutting)
- Resources available
- Closed systems (IoT)



Makers

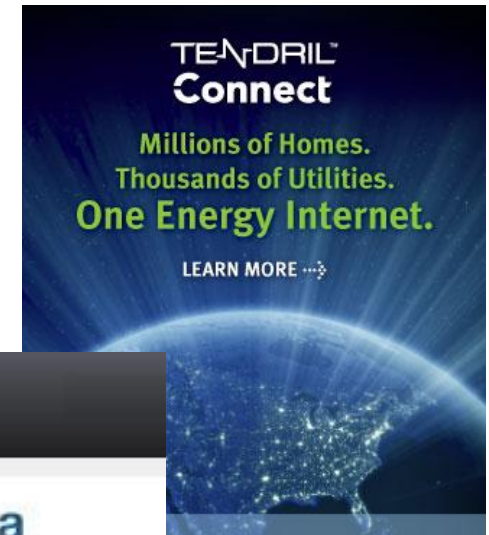
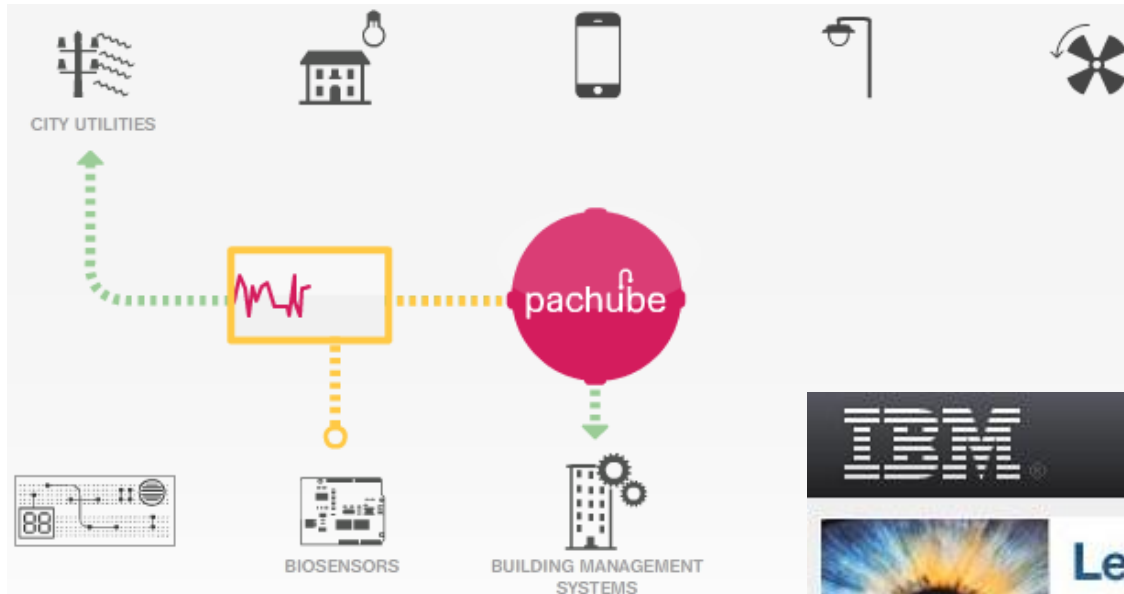
- No legacy business models
- Focus on personal growth (making things)
- Generate new ideas
- Low-cost HW and spare time
- Open systems (WoT)

Startups

- New business models (often: pay-per-use)
- Focus on top-line growth (new markets)
- Early adopters as customers
- Limited resources
- Market-testing of new ideas



Some IoT Startups



Yaler GmbH