

**Costs and risks of
wide area M2M application
implementations**



Micro*tronics*_{at}

What does “wide area M2M” stand for?

“M2M” ... **“internet of things”**: automatic information exchange
from machine to machine

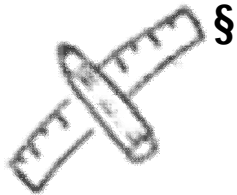
“wide area” ... communication distances similar to a MAN or larger.

Acc. to IEEE 802-2001: at least an area of “..a larger geographical area than a LAN, ranging from several blocks of buildings to entire cities“ and „...covers a broad area i.e. whose communications links cross metropolitan, regional, or national boundaries“

Typical requirements?

- § **Large number of remote devices**
- § **Low data volume per month**
- § **Alarm features, system health supervision** communication, devices, servers
- § **Devices have a dynamic behaviour** Individual devices are added to or removed from the system
- § **Central user interface**
- § **Bidirectional communication**
- § **Long term over-all system stability**

Cost & risk factors – One-off



§ Development

- § Missing the timeline, delayed launch
- § Increasing development costs
- § Missing the requirements, especially the performance demands



§ Initial setup

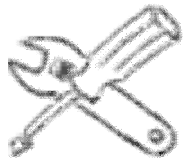
- § Installation of central system
- § Central hardware and network infrastructure
- § Software licences



§ Roll out per device

- § Procure SIM card and required access codes
- § Organize the infrastructure (power supply, keys for rooms/cabinets)
- § Local setup and mounting of the device
- § Setup a device on the system
- § Production costs per device

Cost & risk factors – Running costs



§ Maintenance, service, warranty

- § **Maintainability** ... M2M applications usually undergo later-on
 - Bugfixing
 - Improvement, functional extensions
 - Adaption to new technologies
 - Automatic updates of servers and devices (OTA)
- § **Service of devices** ... easy exchange of devices without programming work and data-loss (e.g. regular calibration)
- § **Long-term reliability of hardware** ... avoid warranty claims
- § **Reliability of software** ... avoid software bugs using proven middleware
- § **Server maintenance**



§ Infrastructure

- § **Device/Server communication**
- § **Server infrastructure** and communication



§ Users

- § **Usability, acceptance** ... training, hotline support
- § **Risk of mal-operation** ... due to complex systems
- § **End-User skills & training costs**
- § **Administrator skills & training costs** ... Skills required for put into operation of devices and regular maintenance work

Microtronics m2m system

- § **Fully developed system – ready to go**
- § **Easy start-up with existing personnel**
- § **Automated installation processes**
- § **Geographic coverage** (global application)
- § **Communication protocol** (low data volume)
- § **SIM cards / SIM provider** (managed over the system)
- § **User interface** (configuration by enduser)
- § **Long battery lifetimes – long service intervals**
- § **Low IT requirements – very high scalability**

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