

Smart Buildings Challenge



Challenge Submission

Please use the following slides to make your submission to the challenge

Use this PowerPoint template to submit your proposed concept for the challenge

Fill out each slide from the following, using the appendix for additional material

Additional inputs (OPTIONAL):

- PoC (Proof of Concept) Results
 - Optional, but very desirable
 - Include high-level overview in PPT, with link to your repo
- Video Material
 - Only if it has direct relevance to the challenge (no generic product videos)
 - Please provide links to video in this PPT

Smart Center Vision

aedifion and Thing-it propose a solution that is:

1. **Highly specific** to use cases with synergies on using the same platform 2+3 AND
2. Based on a **broad and flexible platform** to adjust to a variety of other use cases AND
3. Fits into the larger picture for
 - a. Additional field level connectivity
 - b. Cloud data connectivity
 - c. Enhanced data aggregation and processing
 - d. Centralized workload management

We propose a specific solution and a flexible platform for future needs.

About your Team

- Company name(s): aedifion & THING TECHNOLOGIES
- Submitter name(s) and e-mail addresses: Fdorner@aedifion.com, klaus@thing-it.com
- Link(s) to company home page(s): www.aedifion.com, www.thing-it.com
- Please select which SBC Use Case your team is supporting:
 - Smart Space Flow Analytics
 - Smart Metering in Multi-Tenant Commercial Buildings
 - Smart Automated Building
 - Smart Building Cockpit
- In case of a cross-company team submission:
 - Thing-It: Smart Building Platform, including Connectivity & Process Management
 - aedifion: Energy Optimization including Connectivity, Interoperability & Energy Analysis

Solution Design: Business Perspective

Provide a brief description of your proposed solution from the business perspective (use multiple slides, if needed):

- How will the solution be developed, sold and supported?
 - The solution is based on existing products of aedifion and Thing-it, which provide the majority of functionality needed. The development required is to integrate the solutions according to the use case and that development has largely been completed as part of the challenge contributions so far.
 - The solution will be sold as additional module for all aedifion and Thing-it customers through the companies' existing sales channels and supported via standard support. In many cases a system integrator is the face to the customer.
 - The solution is ready for customer pilot production and in use already
 - Monetization as Software-as-a-Service
 - 1 License = 1 Building, size of building defines pricing

Solution Design: Business Perspective

Provide a brief description of your proposed solution from the business perspective (use multiple slides, if needed):

- How would the fully deployed solution create value for participants in the ecosystem?
- Use Case 2:
 - Technical Management
 - Real-time, fine-grained insight into current and historic consumption at arbitrary detail to identify optimization potential and measure results of implemented optimizations.
 - Time saving and error reduction by automating reading of metering data.
 - Anomaly detection to identify issues faster and allow faster remediation.
 - Commercial Management
 - Automated meter readings and data transport to downstream systems, e.g. via ECE BI or direct SAP interface.
 - Ability for higher frequency of metering-based utility cost invoicing.
 - Tenant
 - Increased transparency into utility costs.
 - Reduced utility cost.

Solution Design: Business Perspective

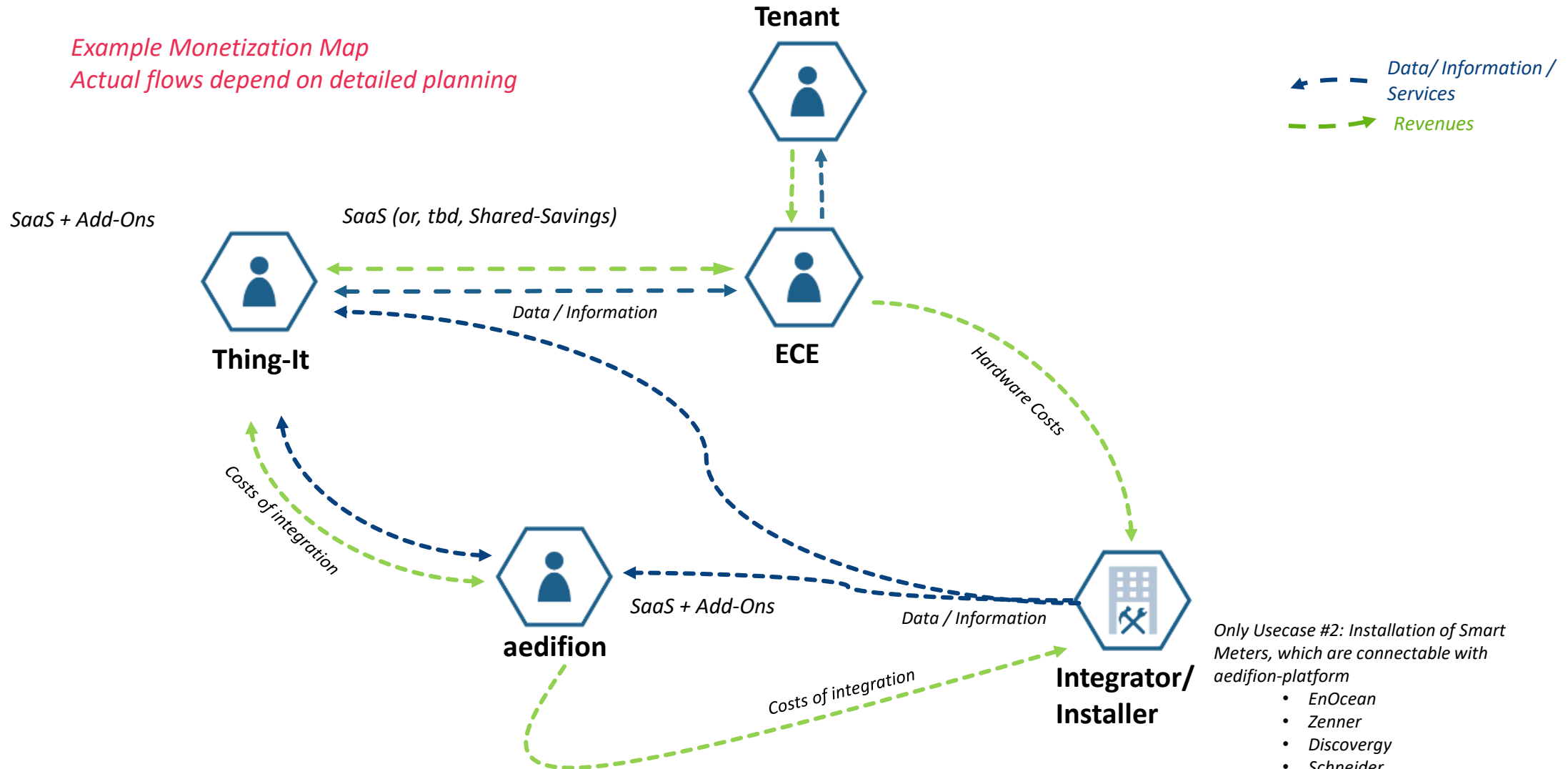
Provide a brief description of your proposed solution from the business perspective (use multiple slides, if needed):

- How would the fully deployed solution create value for participants in the ecosystem?
- Use Case 3:
 - Technical Management
 - Constant automated analysis of high consumption components in the center and highly specific optimization suggestions, fault detection on technical building equipment, additional forecasting of system behavior possible
 - Process management to ensure recommendations are being followed-up, integrated with overall center technical workload management.
 - Full mobile / location independent access to building automation data.
 - Quick to implement with automated BACnet scanning and AI supported datapoint classification.
 - Commercial Management
 - Better service to tenants increases attraction of center.
 - Tenant
 - Reduced utility costs, increased sustainability.

Solution Design: Monetization Map

Source: Bosch Business Model Builder

Example Monetization Map
Actual flows depend on detailed planning



Only Usecase #2: Installation of Smart Meters, which are connectable with aedifion-platform

- EnOcean
- Zenner
- Discovery
- Schneider
- ...

Solution Design: Business Perspective

Provide a brief description of your proposed solution from the business perspective (use multiple slides, if needed):

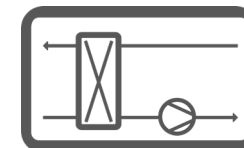
- IP: How will the IP created in the ecosystems be dealt with?
 - Each solution is developed and maintained by the respective company for generic products which are market ready
 - The customer receives licenses with a temporary, non-sublicensable right of use for the respective building/plant

Solution Design: Differentiation

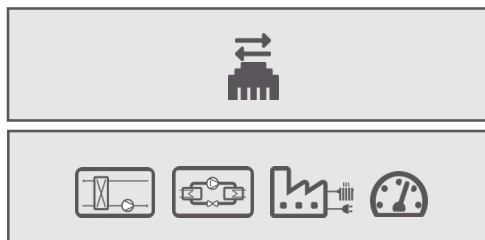
- Differentiation -- how would your proposed solution differentiate itself from others in the market?
 - Our proposed solution is highly specific to the use cases in scope, while at the same time providing the full flexibility of a general-purpose smart building / IoT platform.
 - Offering the same technology stack for use cases 2 and 3 creates an overall simplified architecture for field connectivity, data processing, and connectivity to upstream systems. It also allows to better implement each of the use cases.
 - It is testament to our understanding of use cases 2 and 3 that we choose to apply for both of them together which was encouraged and open to all contestants.
 - We are unaware of any other solution in the market offering both aspects. Competitors are either
 - specific to the energy metering and/or optimization, but not able to extend beyond this use case OR
 - generic and extensible but lack the ability to provide highly specific energy optimization.
 - Additional differentiators:
 - High level of automation including use of AI
 - Ease of setup
 - Plug-and-play proven
 - Open Interfaces
 - Combines expertise in Real Estate (Thing-it) and Energy Systems Technology (aedifion)

Use Case 2: Added Value

- ☑ Combining Smart Meters, plants and engineering domain knowledge
 - Meters and the respective energy consumption can be added to plants, to create further value
 - Additional meta tags for each plant
 - Additional input parameters for automated analysis'
 - Adding several plants to their one respective meter to match the energy consumption of a specific consumer group precisely
 - Example:
 - Pump was mapped and tagged (Usecase #3)
 - Meter (e.g. EnOcean) and pump were matched
 - Energy intake of pump rises over time
 - Analysis detects rising energy consumption
 - Exemplary fault:
 - Bearing of pump wallowed out
 - Exemplary recommendation:
 - Bearing has to be replaced
 - Having specific metering data for a consumer group also allows to validate and confirm improvements actually reduce energy consumption.



Step 1: Gateway (Once per Center)



- Install gateway computer in center and connect to building automation network and internet.
- Perform e.g. a BACnet scan to collect meta data and send it to the cloud.
- Connect to any other desired data sources.
- Track all datapoints and send all data to the cloud.

Step 2: Classification (Once per Center)



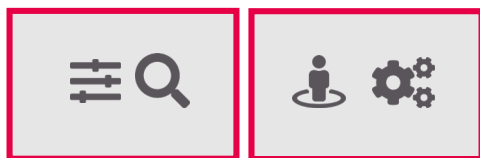
- a. Automated analysis of data points into components.
- b. Technical Managers approve / review analysis and provide additional data for components.
- c. Technical Managers identify the location of respective components in BIM.

Step 4: Automated Analysis (Ongoing)



- a. Monitor data and automatically run hundreds of analysis'.
- b. Identify "red", "yellow", "green" situations and generate specific recommendations.
- c. Create a process with a checklist task for each "yellow" and "red".

Step 5: Optimization (Ongoing)



- a. Receive issue as worklist entry / checklist
- b. Visualize relevant live and historic data
- c. Track progress of work done via process management

Solution Design: Technology

■ Technology Overview

- Describe your proposed solution from a technology perspective, listing key technologies used
- Deployment models:
 - Cloud (Shared or Dedicated)
- Highlight use of emerging/deep tech:
 - IoT – Connects all “Things” in the respective building, additional sensors and plants connectable, starting from the field layer
 - AI
 - AI-based classification service, fault detection and prediction to save resources
 - Stream processing to correlate and aggregate data as it streams in
 - Optional ability to add neuronal networks with arbitrary inputs from data streams to predict outcomes

■ System dependencies

- Is the solution system agnostic in general?
 - Yes
- Mobile: App required?
 - Neither use case requires an app, but both benefit from it – especially use case 3 with the mobile checklist and data insights.
- Describe potential hardware dependencies (backend, field components)
 - Usecase #2: Smart Meters (IP- or MQTT-ready, e.g. Zenner, Discovergy, Schneider, EnOcean, LoRA, ...)
 - Usecase #3: No new dependency, BACnet enabled building automation exists at Ettlinger Tor and is a requirement.

Solution Design: Deployments and Data Handling

- How flexible is the platform basis?
 - Usable for use cases #2 AND #3 simultaneously as well as for future use cases.
 - Full smart building solution, including IoT framework, flexible data processing, workflow, end user app with smart office and smart FM features.
 - Same technology as for Europe's most intelligent office building, the cube berlin
 - Open architecture allows flexible integration of upstream and downstream systems.
 - Large network of existing hardware and software partners which grows constantly.
- How complex is the installation of hardware?
 - Plug-and-play connection (correct firewall settings given) of the edge device, installed by our or client staff in less than a day.
 - Installation of necessary hardware for use case 2 (meters) depends on choice of hardware by ECE.

Contributions to the Smart Buildings Challenge

- Please describe the contributions your team has made to help building the challenge community, e.g.
 - Participation in challenge-related activities
 - Participated in every workshop
 - Participated in the evening event in Munich
 - Refinement of use cases
 - Helped to refine the usecase on the first event in Hamburg
 - Cross-company team building
 - Collaboration between aedifion & Thing-It
 - Advertising the challenge to other start-ups
 - Usecase-specific discussion with other startups
 - Promotion of challenge activities on social media
 - Repost of TloTA Medium blog post by our network, ABE e.V.
 - Post regarding third workshop
 - Active liking of related posts