Project acronym	B4B
Project full name	Brains for Building's Energy Systems
Grant No	MOOI32004
Project duration	4 year (Starting date May 1, 2021)

Use case **Almende**

Crownstone IPS for smart offices

Authors	Andries Stam, Duco Ferro (Almende)
Workpackage(s)	2 & 3
Results	3 & 6
Due Date	30-06-2025
Deliverable Status	Final

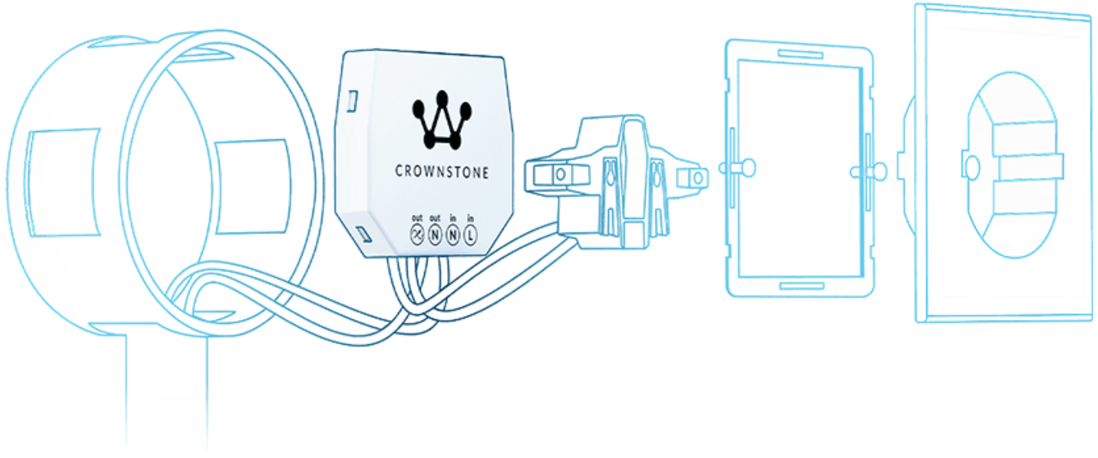
This project received funding from the Dutch Ministry of Economic Affairs and Climate Policy and the Ministry of the Interior and Kingdom Relations under the MOOI program.

Table of contents

1. **Executed activities**
2. Outcomes/results of these activities
3. Follow up: use of outcomes in the company's market activities

Our starting point: Crownstone

- Daughter company of Almende
- Smart “lustre terminal”
- Switching / dimming
- Power measurement
- Bluetooth mesh network
- Indoor localisation

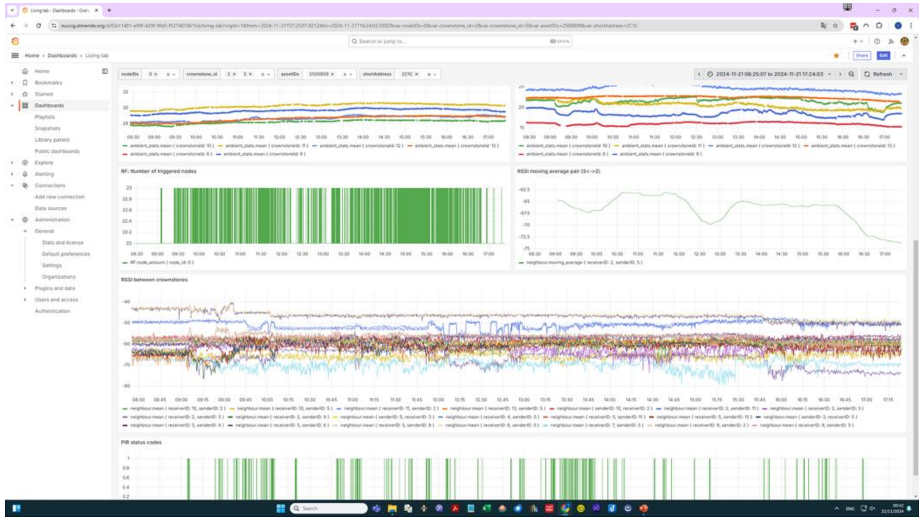


2021 – start of Brains4Buildings

- Daughter company Crownstone existed for a few years
- Focus on B2C - home automation
- “Your presence turns me on…”
- Tentative desire to investigate B2B opportunities
  - Smart offices?

Activities in Brains4Buildings

- Focus: Crownstone for smart offices
- Living lab @ Almende office
- Collection of indoor localisation data
  - 22 crownstones, 8+ people, 14+ months
- Collection of appliance power consumption data
  - Ongoing (delayed due to relocation)
- Additional experiments
- Analytics / Dashboard
  - Ongoing (focus for 2025)



Parallel Activities in other projects

- MicroApps
  - Run small applications inside Crownstone nodes
- Crownstone Hubs
  - Enable data collection and AI in the edge
- Integration of external sensors
  - CO_2, temperature, humidity, sound, etc.
- In-network localisation

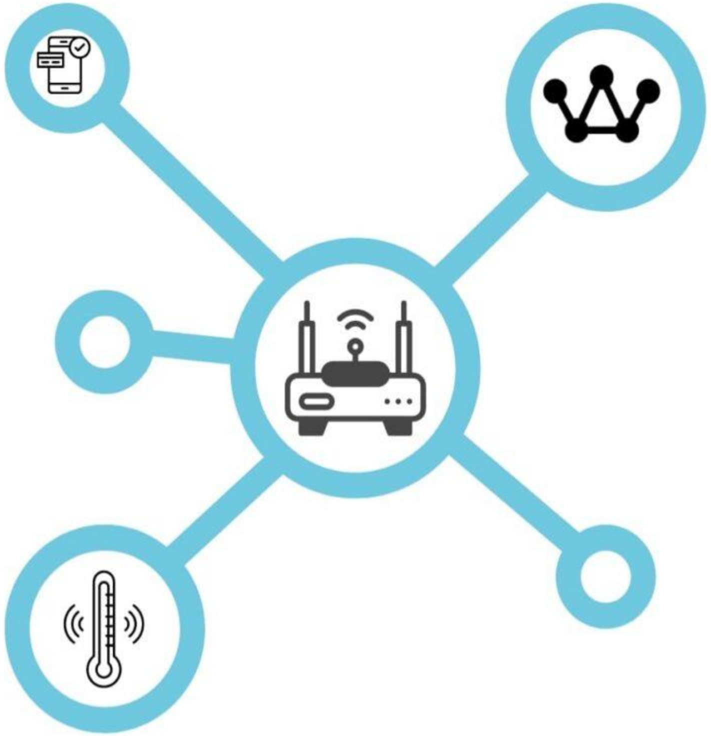
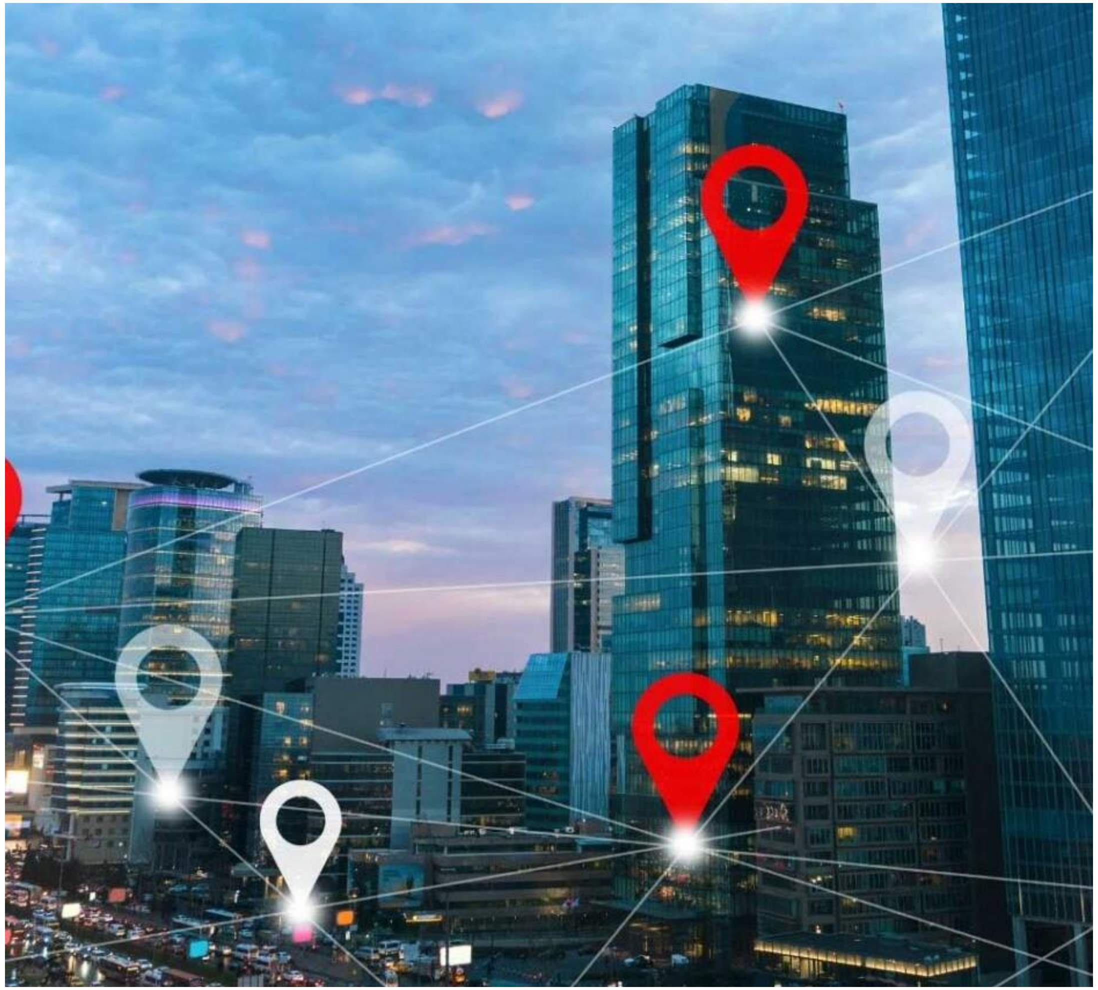


Table of contents

Outcomes of the Brains4Buildings activities



- Better articulation of the Crownstone B4B proposition
- Better understanding of the technical needs
- Clear way forward for R&D “mother” company Almende

- Tools for large-scale deployment and maintenance
    - Containerization
    - Better cloud-edge integration
    - Better automation of firmware updates
    - Easier deployment of MicroApps
- Smart office management tools
    - End User Management Dashboards
- Increased security and privacy demands
- End user functionalities
    - Appliance identification

Technology Development

- Distributed AI in the Crownstone network:
  - KDT project EdgeAI (https://edge-ai-tech.eu/)

- Containerisation and Orchestration:
  - Horizon Europe project CODECO (https://he-codeco.eu/)

- In-network Appliance Identification:
  - KDT project NEUROKIT2e (https://www.neurokit2e.eu/)

- Secure Identities + Secure Firmware Updates:
  - KDT project Resilient Trust (https://almende.com/projects/resilient-trust/)

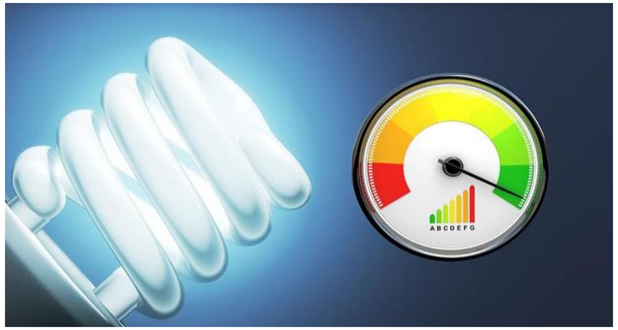
Table of contents

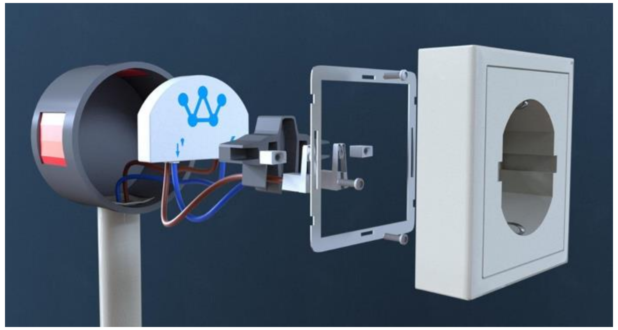
Business Development: Crownstone IPS

https://crownstone.rocks/

Focus on B2B service

- Since 2023 Crownstone is pursuing a B2B market approach.
- Current Crownstone app consists of two components :
    - 1) Indoor Positioning
    - 2) Energy Management
- Opportunity: indoor positioning service as an SDK

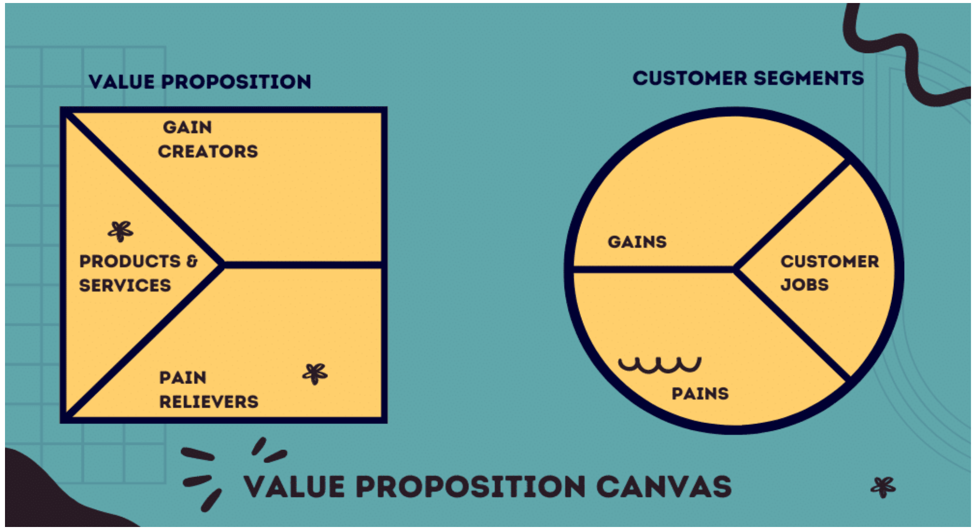




Value Proposition Canvas

- Pains:
  1. difficult to integrate & rollout indoor positioning in new or existing (software) solution.
  2. high effort to maintain localization network

- Gains:
  1. Looking for more reliable (accurate) localization
  2. Out-of-sight (safe)
  3. No batteries required (durable)

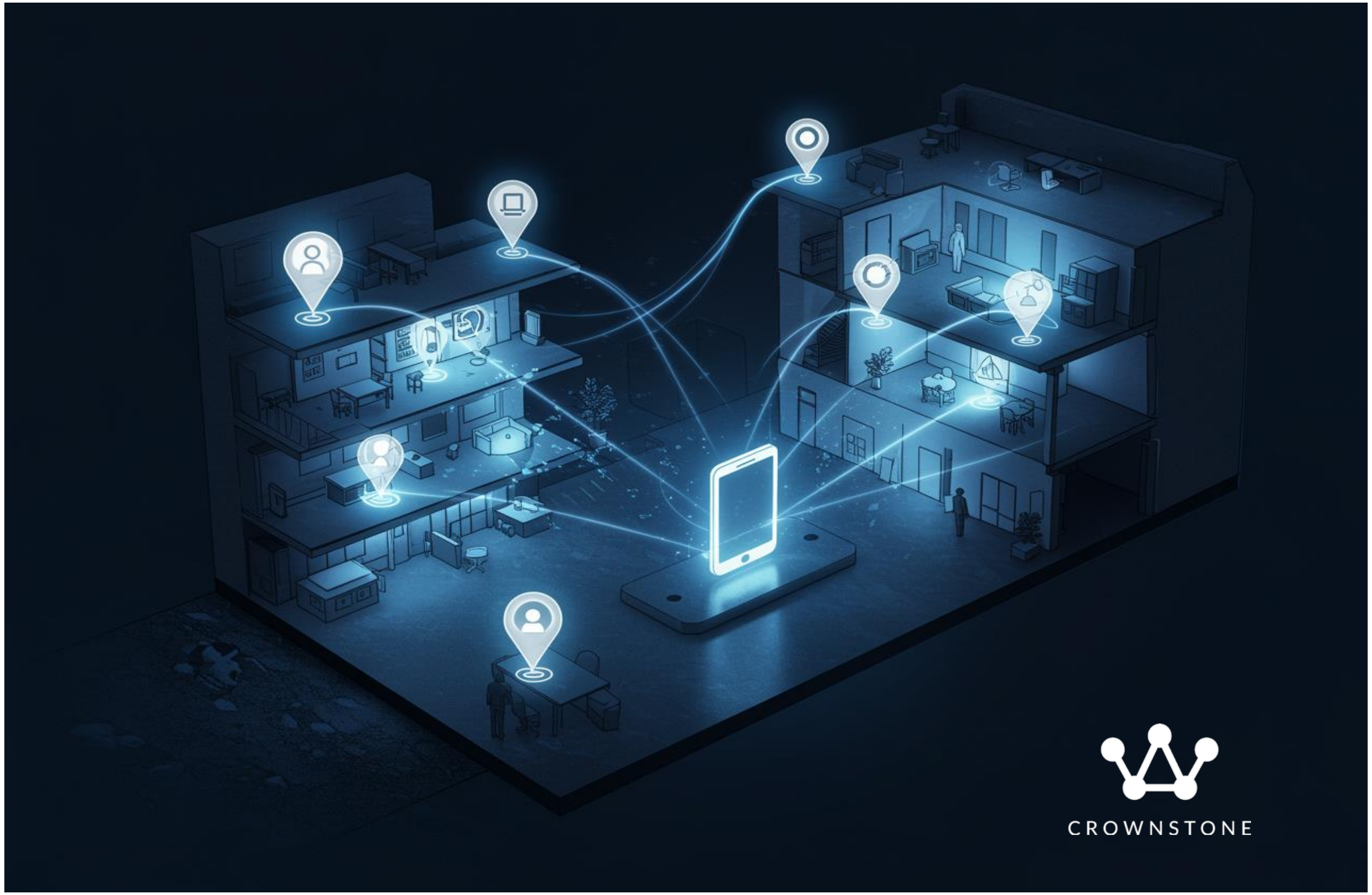


How we can help ?

We help software makers accurately locate objects and people inside a building with our easy-to-integrate indoor positioning system (IPS)

Easily add indoor localization to your app or product!

5 Reasons to choose Crownstone for your indoor positioning needs



1. Accurate room-level positioning

Our technology pinpoints locations down to the room level. It's like GPS, but for indoors!

2. Easy integration with SDK

Our SDK allows your application to be easily connected to our Indoor Positioning System.
Localization data can be communicated directly into your app via the SDK.

CROWNSTONE

3. Scalable solution

The system is designed to scale easily from small installations to enterprise-wide deployments, making it suitable for businesses of all sizes and allowing for growth over time.

4. No maintenance required

Crownstone's IPS is designed for simplicity and reliability, requiring no ongoing maintenance from users. It requires:

- No batteries
- No maintenance
- No visible hardware

5. Seamless integration with existing systems

Our system plays nice with existing systems. It grows with your needs. It's future-proof tech!

BRAINS 4
BUILDINGS