Market Insights and Dynamics

Building Automation Systems (BAS) = systems that serve to automate and oversee various building systems, including heating, ventilitation, air-conditioning (HVAC) and lighting

- 2023: global BAS market valued at appox. USD 88.4 billion
- Projected to grow to USD 155.9 billion by 2028 (CAGR of 12.0 %)

Key Drivers

- Energy Efficiency and Sustainability
  - Regulatory Push in Europe on energy efficiency directives
- Technology Advancements (AI, IoT, voice assistants)
- Urbanization and Infrastructure Development
  - Necessity for BAS in new infrastructure (Sustainable Urban Development)
- Increased Focus on Health and Safety
  - pandemic increased awareness for air quality and hygiene

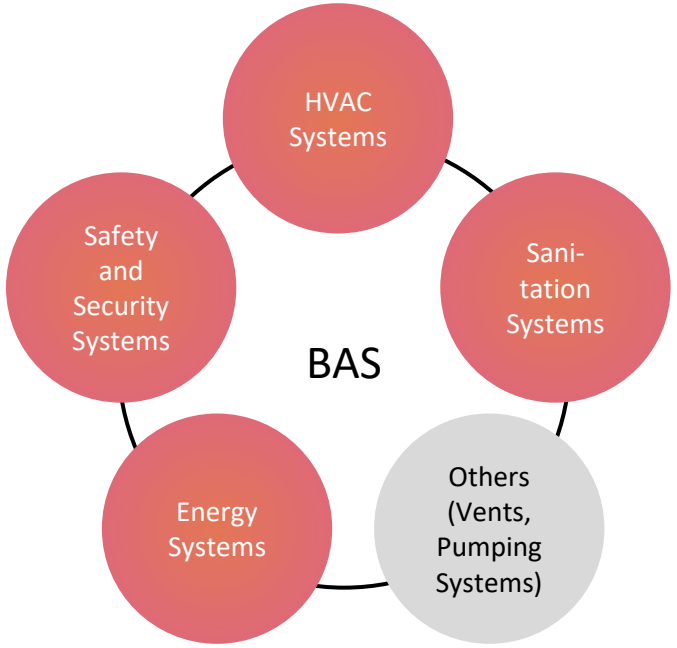
Challenges

- High initial costs
  - for implementation of BAS, particularly in existing buildings
- Complexity of integrating BAS with existing legacy systems and ensuring compatibility
- Cybersecurity Risks

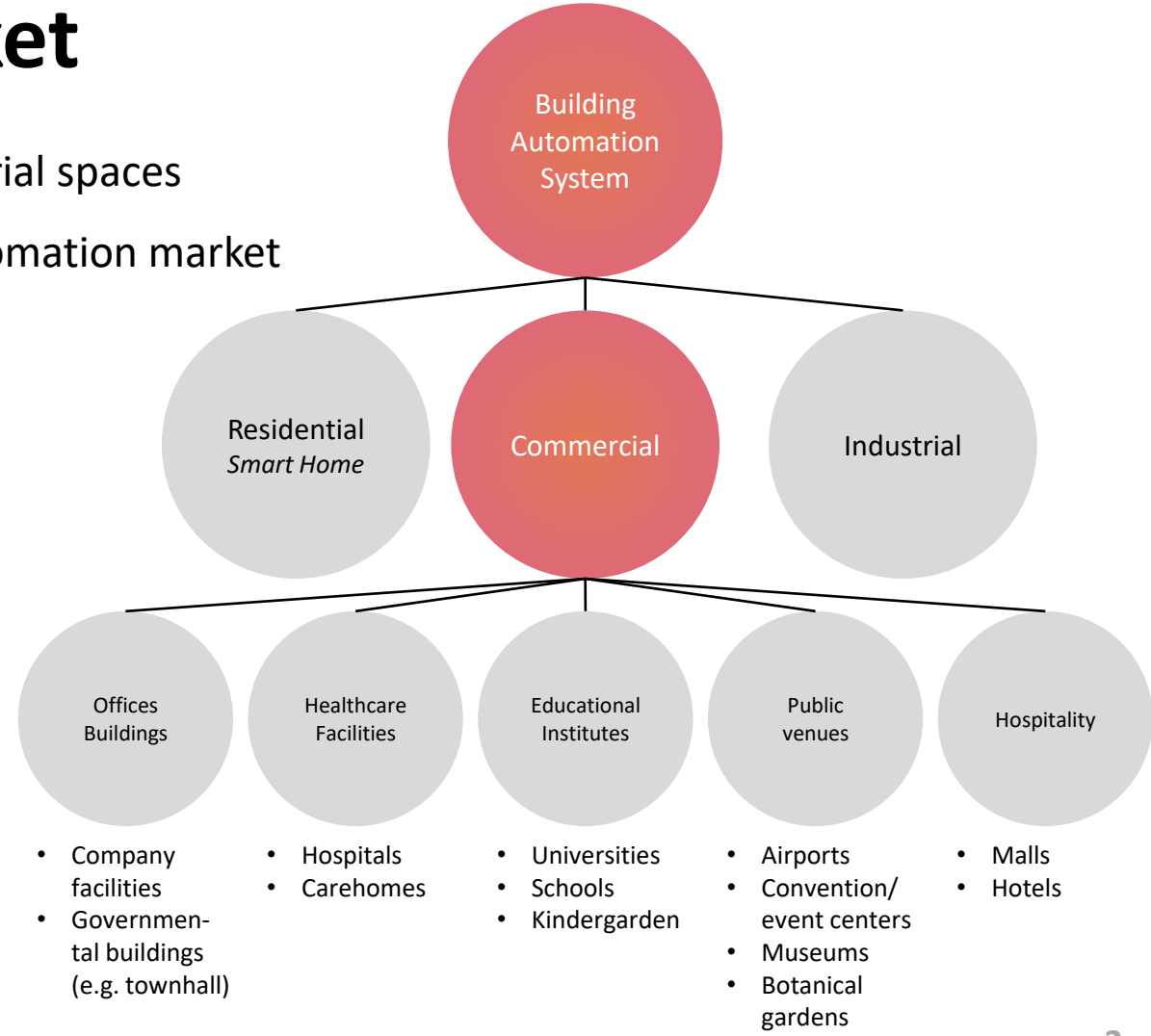
MarketsandMarkets. (2024, January 5). Building Automation System Market Size, Share, Industry Report, Revenue Trends and Growth Drivers 2030. https://www.marketsandmarkets.com/Market-Reports/building-automation-control-systems-market-408.html

Segmentation / Target Market

- Building Automation in commercial, public and industrial spaces
- Including on 4 main product types in the Building Automation market
- European Market as target market, focus on Austria



Market Segmentation by Product Type



Market Segmentation by Application

Use Case Definition

- Building Automation in commercial, public and industrial spaces

Offices Buildings

- Company facilities
- Governmental buildings (e.g. townhall)

Healthcare Facilities

- Hospitals
- Carehomes

Educational institutions

- Universities
- Schools
- Kindergarden

Public venues

- Airports
- Convention and event centers
- Museums
- Botanical gardens

Commercial buildings

- Malls
- Hotels

Use Case Hospital:
Characteristics of the Austrian Healthcare Sector

Healthcare spending in Austria $45.4 billion (10.4% of GDP) in 2019. Public payers cover 75% of the total.

Austrian healthcare system: 271 hospitals and clinics with approx. 64,800 available beds (7.4 beds/thousand population). Around 64% in general hospitals, 26.6% in specialized clinics and rehabilitation, 7% in sanatoriums or long-term care.

Local particularities

- Decentralized structure of the Austrian healthcare system: each federal state is responsible for the organization of healthcare, which can lead to regional differences
- Role of social insurance: social insurance is largest payer in the healthcare sector and has a major influence on the market

Trends on hospital market in Austria

- Privatization of hospitals: more and more hospitals are being taken over by private investors
- Specialization of hospitals in certain areas

Macroeconomic factors

- Demographic development: population is getting older and therefore demand for medical care is increasing

Statista. (2024). Krankenhäuser - Österreich | Statista Marktprognose. https://de.statista.com/outlook/hmo/krankenhaeuser/oesterreich
OÖG. (2024). https://www.ooeg.at/

P political

- **Healthcare Policies**: Prioritizing of healthcare infrastructure by national government (e.g. Austria's Health Reform 2028 invests in digitalization of healthcare facilities)
- **Regulations on Energy Consumption:** e.g. European Green Deal) → monitoring of energy consumption necessary
- **Covid-19 Pandemic**: increased governmental focus on hospital prepared-ness → increased funding for healthcare facilites incl. air quality management
- **Rooms classifications:** e.g. operating rooms classified as class 1a or 1b acc. to DIN 1946-4 require extremely low levels of germs
- **Medical environments:** HVAC systems e.g. testing and inspection required according to ÖNORM H6020

E economic

- **Demographic Changes:** Aging Population leads to higher demand for healthcare service → increase need for resources and hospital capacity.
- **Privatization Trend**: Growing trend of privatization possibly leads to changes in hospital operations and management (focus on profitability, efficiency)
- **Federal Responsibilities**: Decentralized healthcare system (federal states are responsible for managing healthcare services) → regional differences
- **Influence of Social Insurance:** Austrian social insurance system is primary payer for healthcare services → governmental influence over hospital operations, funding and scope of services provided.

S social

- **Demographic change (Silver Society):** aging population increases demand for healthcare services → demographic shift puts pressure on hospitals to enhance efficiency and patient care
- **Changing Patient Preferences - Holistic Care:** increasingly value of holistic care, which includes high-quality medical treatment + personalized and comfortable environment.
- **Focus on Patient Well-being:** Social expectations for high-quality healthcare are rising → patients expect a safe, comfortable environment.
- **Increasing use of smart products and increasing acceptance of AI:** Use of Smart Home / AI in private possibly increases awareness and acceptance.

T technological

- **Growing popularity of voice assistants:** mainly in B2C
- **Advancements in AI and Machine Learning:** allows real-time monitoring and predictions; enhancing hospital safety and efficiency.
- **Interoperability and Integration**: ability to integrate with existing hospital management systems → interface with Electronic Health Records (EHR) systems
- **Room Air Technology for Infection Prevention:** prevent postoperative infections (POI); systems must comply with regulations (e.g., DIN 1946-4) to ensure sterile environment
- **Ventilation Systems Compliance:** ÖNORM H6020 for use in medical environment

E environmental

- **Regulations on Environmental issues:** EU's Energy Performance of Buildings Directive (EPBD) requires that all new buildings meet strict energy efficiency standards.
- **Sustainable Healthcare Initiatives:** Hospitals are under pressure to reduce their environmental impact (e.g. set by EU's Green Deal)
- **Air Quality Control:** Maintain high indoor air quality in hospitals is essential, particularly in operating rooms and intensive care units → meet environmental standards.
- **Temperature Control Challenges:** Climate change poses challenges for maintaining optimal temperature control within hospital environments.

L legal

- **Data Protection:** by integrating AI, hospitals must comply with the Data Protection Regulation. Esp. because sensitive data is included, it is possibly better to run the program locally.
- **Medical Liability:** healthcare providers have a high level of legal responsibility for patients, including liability for medical malpractice.
- **Healthcare Regulations:** Compliance with DIN 1946-4 for operating rooms and ÖNORM H6020 for ventilation systems ensure necessary hygiene and technical standards.

Competitive Comparison

		NatéoSanté	Prana Air	TROX Austria	Airly	thinxtra	uHoo	Marchhart Air	CareConnect
AI and Automation	• LLM Integration	✗	✗	✗	✗	✗	✗	✗	✓
	• Medical Analyses / Recommendations	✗	✗	✗	✗	✗	✗	✗	✓
	• Automated Actions depending on Data	✓	✓	✓	✗	✓	✗	✓	✓
Monitoring & Measurement	• Real-time Air Quality Monitoring	✓	✓	✓	✓	✓	✓	✓	✓
	• Outdoor Air Quality Measurements	✗	✗	✗	✗	✗	✗	✗	✓
	• Energy Production/Consumption Monitoring	✗	✗	✓	✗	✗	✓	✗	✓
User Interface	• Report Generation	✓	✓	✓	✗	✓	✓	✗	✓
	• App	✓	✓	✗	✗	✓	✓	✗	✓
	• Chatbot	✗	✗	✗	✗	✗	✗	✗	✓
	›› primary use case	industry, offices, B2B solutions	air pollution	whole hospital	air pollution	medical environments	industry, offices	operating room	Public spaces, use case hospital
	›› additional info	Ab E^3 1.2	focus on public buildings		educating about Air Quality Index		Improve health and well-being	focus on air filtering	

Market Opportunities

- Untapped Market Segments
  - Air quality monitoring in hospitals (also public buildings in general) is expected to be an emerging market.
  - Current competitors focus on monitoring room climate (esp. in critical areas like operating rooms) and HVAC regulation; two identified competitors consider the energy consumption and production for whole facilites.
  - Technological advancements (AI, LLMs) and growing demand for energy management are key drivers for future grow.
- Innovation and USPs
  - Currently, there are no competitors on the target market who integrate LLMs, provide recommendations for users and have a chatbot enabling natural language communication.
  - Real-time Air Quality Monitoring, Report Generation and App are no USPs – less focus on these
  - Differentiation strategy
- Difficulties and barriers
  - Market entrance barriers due to regulations, medical environment (a.o. medical liability) and the decentralized healthcare system in Austria