



Edge Computing and Smart Devices in Healthcare

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Healthcare Market Drivers



Key current healthcare market drivers include consumer experience, digitization, and workforce population.

Consumer Experience

Patients are more actively involved in healthcare and expect transparency, convenience, access, and personalized products and services.

Digitization

Effectiveness in storing and accessing data and cybersecurity are now more important than ever to streamline healthcare delivery and control risks.

Workforce Population

A widening demand-supply gap requires improved working conditions, innovative technologies, and new incentives to attract next-generation talent.

Edge Computing Market Drivers



Current edge computing market drivers include mobile and Internet of Things (IoT) applications, cloud limitations, and computing architecture.

Mobile and IoT Applications

There has been exponential and expected future growth in these applications for low-latency and high-performance platforms to process large amounts of data.

Cloud Limitations

Cloud limitations such as costs, performance, security, and more create economic and scalability issues that affect the current market.

Computing Architecture

There has been an observed rise in microservices and cloud deployments that calls for improvements in the topology of applications.

Intersection of Edge Computing and Healthcare



Accessibility and growth are central to the growth of smart healthcare technology; edge computing has considerable potential in driving these factors.

Drivers

Impact

Key Advantages

Latency

- In computationally expensive operations, edge computing improves efficiency.
- Generally optimizes **cost of data analysis and energy use**—long-term benefits.

Data Protection

- A survey of CIOs of Hospitals revealed that over **52%** have **privacy/other concerns about cloud computing/storage**.
- Edge computing is a viable alternative.

Processing

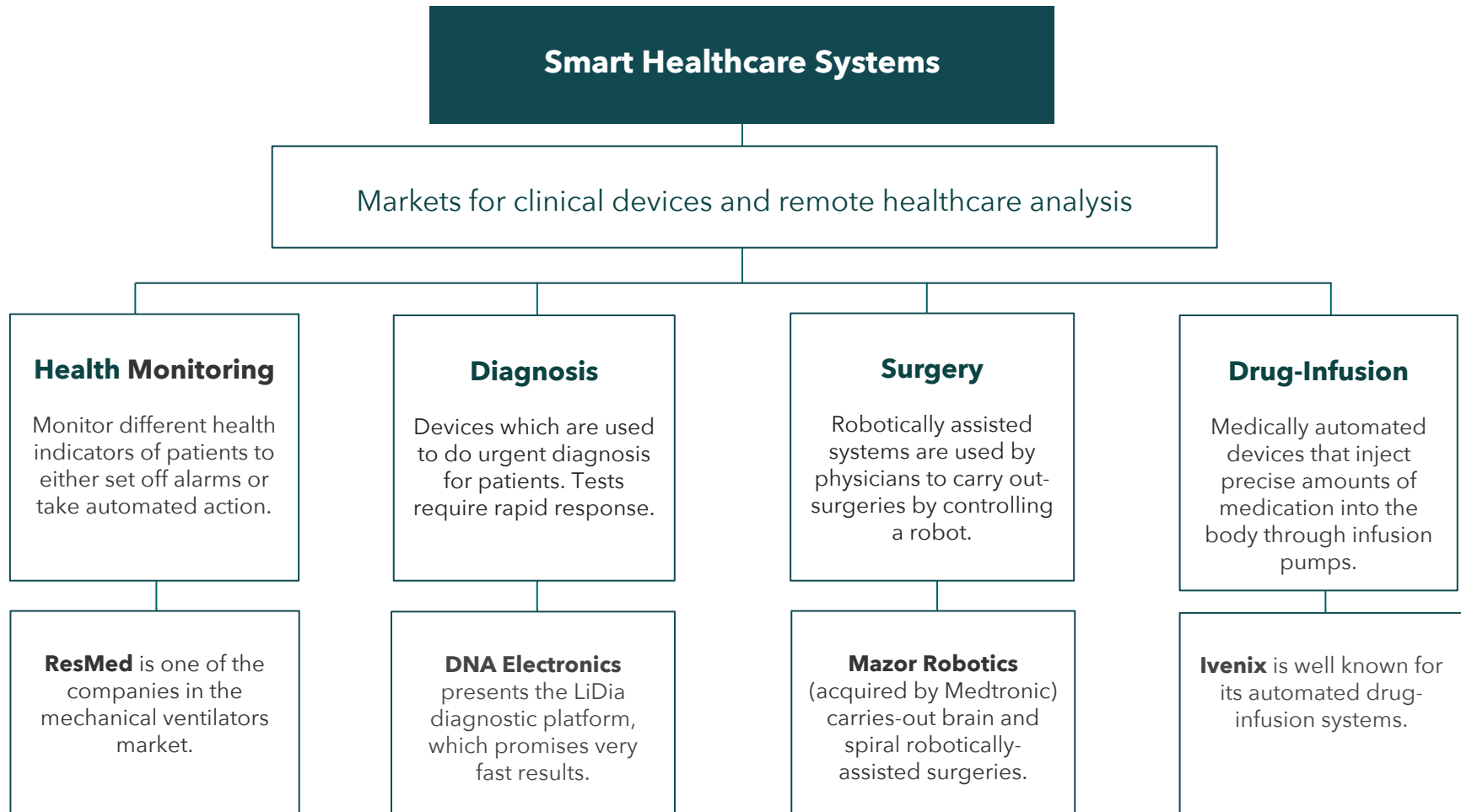
- Can be constructed more reliably than cloud; **improves accessibility**.
- Especially appealing to developing countries with limited cloud bandwidth.

Processing high volumes of data is a key concern for healthcare technology, especially **regarding expanding clinical tech worldwide under various environments**. Edge computing can play a key role to that end, as it does not share the same limitations as cloud. As the market continues to grow with new biotech and health tech startups, hardware companies have **new avenues of collaboration to create an end-to-end chain** for novel healthcare devices.

Edge Computing in Healthcare



Smart devices and **edge-based computing driven by FPGA[†] hardware** offer immense advantages over a wide range of healthcare technologies in clinical markets.



[ResMed](#), [DNAe](#), [Medtronic](#), [Ivenix](#)

[†]Field-programmable gate array (silicon circuit hardware).

Connecting Smart Tech/Edge Computing to Healthcare

End-to-end markets for edge computing in healthcare can be connected by building partnerships between FPGA/device hardware companies and healthcare/biotech firms.

Case Study: *Intuitive Surgical and Xilinx*



Leading the robotically assisted surgeries market (RAS), **Intuitive Surgical holds 88.8%** of its share.

Since 2003, it has worked with Xilinx, who provides FPGAs to the robot's systems.

A commonality shared between health-care centered technology firms is their **partnership with companies developing FPGAs and AI/Smart-device solutions**. These begin early in the firms' lives and are intended for the long term.

Generating a Connection with Healthcare Firms

Approaching **new firms and startups** in biotechnology, bio-engineering, and clinical tech is a viable strategy. Such firms tend to have significantly less grounded relationships with other companies and as such would be more open to creating **lasting partnerships with tech providers**.

As hardware companies such as Intel, Altera, etc. are already well-established, it is in their interest to reach out to new companies for partnerships.

Producing Relevant Hardware

Tech hardware providers can identify hardware pieces that are generally used by developers of efficient smart healthcare/clinical devices—a prominent example being computer-on-modules (COMs), which are used in some drug-infusion systems, monitoring systems, and others.



Example of a user of Altera's chips to develop COMs.

[Informa Pharma Intelligence](#)

The Future of the End-To-End Ecosystem

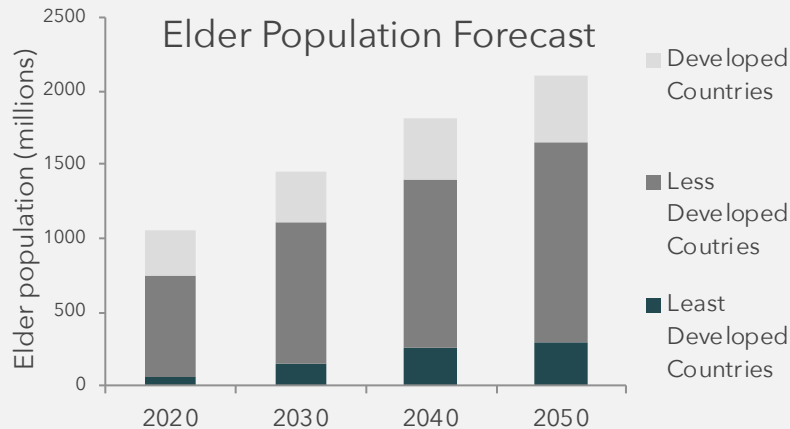


Developed countries already have a robust ecosystem for the sale of FPGAs, smart hardware, and computing technology to healthcare companies.

International Markets

Immediate Forecast: In the next 3-5 years, hospitals and clinics in the developed world will be **more willing and able to embrace edge-based solutions.**

The Long Term: Significant growth in the elderly populations of less developed countries and the countries' need for solutions with reliable processing power (as they sometimes have limited bandwidth access) will make their markets very strong.



[UN Population Report 2019](#)

