IMPACTING HEALTH, SAFETY, AND PERFORMANCE WITH IOT-BASED BIOMETRICS

HOW TO UTILIZE THE INTERNET OF (MEDICAL) THINGS IN DEMANDING PROFESSIONS

EVALAN

Summary

Biometrics and the Internet of Things (IoT) have created new possibilities in healthcare, reshaping processes from doctor-patient relations to healthcare payment models. Their impact is spreading to other areas, including demanding professions, impacting safety and performance. While biometrics have been adopted in a wide range of fields, such as for authentication methods in the security sector, the focus in this whitepaper is on biometric monitoring: using biometrics to track and record physical characteristics. Think, for example, of measuring blood pressure, temperature, or even brain activity.

Adoption of biometrics has been fast and market experts predict growth rates to increase over the next decade, with the Internet of Medical Things (IoMT) and biometrics taking on a central role in healthcare and safety sectors. The implications for health care providers, patients, and professionals in physically demanding fields are significant.

In this whitepaper, we explain what IoT-based biometrics are and what they can do, outlining the current status of the market and the sizeable opportunity it represents. Looking at the present anxieties surrounding biometrics and how to respond to them, we suggest that now is the ideal time to move forward with your biometric solution. Following this, we discuss how IoT and biometrics are part of a revolution in healthcare, prioritizing efficiency, offering greater support to healthcare professionals, and transforming traditional payment models. Finally, we offer reflections on how to prepare and plan for your IoT-based biometric solution. We also present cases from our own practice, highlighting the role we play in the development of biometrics and the Internet of Medical Things.

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1. INTRODUCTION

The Internet of Things

In our world, connectivity is everything. With efficiency, innovation and data the buzzwords of the day, cutting-edge technology is being used to build a complex network of connections between devices, providing us with many kinds of real-time data – and changing the way we shop, work, sleep, exercise, and live.

This network, known as the Internet of Things (IoT), is a rapidly developing market:

- McKinsey estimates that it will hit an economic value of USD 11.1 trillion a year by 2025, equivalent to 11% of the world economy.[1]
- Mainstream adoption levels are rising, with the number of IoT-based smart homes increasing from 17 million in 2015 to 29 million in 2017.[2] Analysts estimate that in the US alone, the adoption of IoT-based smart home devices will hit a compound annual growth rate of 42% between 2017 and 2022.[3]
- IoT is quickly becoming central to our economy, our society, and our world.

Biometrics

In response to worldwide health and fitness trends, we are seeing a notable increase in the adoption of biometric devices. Biometrics monitor physical characteristics; think of a temperature sensor, for example. Beyond this, the integration of IoT has allowed for more sophisticated models, suitable for high-level healthcare. New technologies are faster and smarter, communicate wirelessly, and can track and record data with far greater accuracy than any current consumer wearable. With these revolutionary new tools for healthcare professionals, we can improve efficiency, keep up with social and economic trends, and most importantly, improve the quality of – or even save – people's lives.

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[1] *Unlocking the potential of the Internet of Things*, McKinsey Global Institute
[2] *The IoT as a growth driver,* McKinsey Global Institute
[3] *Mapping the Smart-Home Market,* Boston Consulting Group

A market showing robust growth

Around the world, the IoT-based biometrics market is thriving, offering a truly exceptional opportunity:

- Research suggests a compound annual growth rate of 22.9% for IoT-based biometrics, predicting a value of USD 70 billion between 2016 and 2025.[4]
- Mainstream adoption seems inevitable and will be further boosted by the worldwide growth of the health and fitness markets and the popularisation of wearable tech – currently 60% of the biometrics market.[5]

Within the healthcare sector, the use of IoMT, or the Internet of Medical Things, is spreading rapidly:

- Business Insider Intelligence estimated that 73 million IoT devices were installed in the healthcare sector in 2016, and forecasts an increase to 161 million by 2020.[6]
- Currently, 60% of US healthcare organizations use IoMT devices, and the total figure is predicted to rise to 20-30 billion by 2020.[7]
- The global healthcare sector will invest an estimated USD 410 billion into IoMT devices, services, and software by 2022, partly in response to pressing global concerns: a growing and aging population, rising medical costs, and rising patient expectations.[8]

By developing now, and staying one step ahead, you can make the most out of biometrics and IoMT to upgrade your healthcare or safety system.

'This connected health ecosystem of IoMT devices, when paired with the seamless integration of supporting online tools, is ushering in a new era of smarter patient care.'

Nick Ismail, editor of *InformationAge*[9]

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[4] *#BizTrends2019: Digital, data-driven biometrics*, BizCommunity
[5] *The global market for IoT healthcare tech will top $400 billion in 2022*, Business Insider Intelligence
[6] Ibid.
[7] *Internet of Medical Things, Forecast to 2021*, Frost and Sullivan
[8] *As healthcare costs rise and patients demand better care, hospitals turn to new technologies*, Business Insider
[9] *The future of home healthcare will rely on integrated service models*, InformationAge

2. BEYOND THE BUZZ: THE VALUE OF IOT-BASED BIOMETRICS

To understand the limitless possibilities of IoMT and biometrics, we need to understand what they can do. Simply put, biometric sensors convert physical phenomena, like a heart rate or temperature, into electrical signals, which can then be processed or transmitted and received wirelessly. IoMT solutions are built from these components:

- Biometric sensors for collecting data on individual characteristics
- Devices on which the data are presented to the (human) user
- A user interface, such as a Human Machine Interface (HMI), an Application Programming Interface (API), apps, text messaging or Excel sheets
- A wireless communication protocol, for example, Bluetooth, ZigBee, Lora, 3G or 4G
- A backend system, for example, a server, a database or the cloud
- A data processing and analysis tool, such as algorithms, machine learning or Artificial Intelligence

Current practice and examples

By utilizing these components in innovative ways, we can create new healthcare and safety systems. Here are three examples of how the industry is harnessing the power of IoT and biometrics to improve health and safety:

Keeping Firefighters Safe[10]
Since 2004, the National Fallen Firefighters Foundation (NFFF) have turned to biometrics to improve safety and survivability. The NFFF hosted the Firefighter Psychological Monitoring Technology Summit,

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[10] *Fire Technology: The Future of Wearable Technology*, Firehouse

collaborating with Skidmore College's SMARTER program, to reduce line-of-duty deaths through science, medicine, and technology. They discussed three areas:

- The use of wearable electrocardiogram devices to detect early signs of cardiac events after firefighting or training exercises;
- Using algorithms to estimate core temperature with the goal of reducing the risk of heat-related injuries and fatalities;
- Using low-cost, portable technology to monitor air contamination levels on fireground and in structures post-fire.

The ultimate goal? Use data to transmit real-time information to the incident commander, who can make critical decisions about the safety of a team. This increases the safety of firefighters, and consequently, saves lives.

Biometric Gloves in Formula 1[11]

In 2018, the Formula 1 integrated biometric devices to improve safety conditions within this dangerous, high-octane sport. With a 3mm thick biometric sensor stitched inside the racers' gloves, medical staff can remotely monitor the pulse rate and blood oxygen levels of racers.

With this data, medical staff will be able to ensure the safety of all drivers, lowering the risk of crashes by recognizing issues earlier. When a larger incident occurs, biometrics can make a difference. If crash debris or bulky equipment means staff cannot access the driver, medical staff will be able to track live data, ensuring the best

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[11] *Formula 1 plans biometric gloves for crash data in 2018*, Autosport

course of action. Using biometrics effectively improves safety in this hazardous setting, giving medical staff greater chances of success.

Monitoring Patients Remotely[12]

A new device is giving health professionals the ability to remotely monitor a patient's vital signs in real time. vMetricsTM, developed by NASA and sold by FlexLife, is a compact device which can measure a patient's heart rate, blood pressure, and temperature, among many other characteristics. The two-way system lets patients communicate with healthcare providers outside a hospital setting.

Real-time monitoring reduces the frequency and duration of hospital stays, reduces the strain on healthcare providers, and gives patients greater control over their health. By offering lower medical costs and better health care, biometrics, again, is creating new ways forward.

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[12] *NASA Technology Enables Better Patient Care*, NASA Technology

CONSUMER ELECTRONICS SHOW 2019 HIGHLIGHTS CONTINUAL DEVELOPMENTS IN BIOMETRICS

Wearable baby monitors[13]

Nanit, an American manufacturer of smart baby phones and monitors, introduced a new product at the event: Breathing Wear. The Breathing Wear camera reads the patterns on a Breathing Wear band to analyze and monitor the baby's breathing. By working with Nanit Plus, this data is sent to an app, which can be tracked by the baby's guardians.

Omron HeartGuide[14]

Omron presented HeartGuide at CES 2019: a wearable blood pressure monitor now approved for sale in the US. With a blood pressure cuff beneath a watch strap, the HeartGuide device offers accurate readings of the wearer's blood pressure. If prescribed to measure hypertension, this offers the patient greater freedom and the healthcare professional better data.

UrgoNight headband[15]

UrgoNight focuses on cultivating sleep quality with their new biometric headband. After recording individual data, the headband stimulates sleep rhythm, improving and promoting the production of brainwaves necessary for sleep. According to UrgoNight, the headband, available for 600 euros, will help users fall asleep faster and reduce waking in the night by 53%.

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[13] *CES 2019 update: digital health innovations from startups to Withings, Samsung and Philips*, smarthealth
[14] Ibid.
[15] Ibid.

Who benefits, and how?

Who benefits from the adoption of biometrics? Here are some of the groups that will gain from the implementation of biometrics and IoT:

Healthcare professionals and patients

For healthcare professionals, the integration of IoMTs and biometrics will have a major impact on all service aspects. They will have access to a wide range of accurate and real-time data through remote health monitoring, allowing earlier detection of risk factors, reduced reliance on individual intuition, and an overall increased treatment effectivity. The strain on hospitals will be drastically reduced, with fewer and shorter hospitalizations. Monitoring will cost less and produce far more accurate outcomes. In short, healthcare professionals have much to gain from the integration of IoMTs and biometrics.

Patients, too, will benefit. As well as drastically improving the quality of services provided, IoMTs will also change *how* this service is received. Patients can expect greater independence in managing their health, with less time spent in hospitals, thanks to the possibilities of remote monitoring. With higher quality service, payment methods are changing too: due to the large amount of data gathered, new personalized healthcare plans will offer increased result certainty; therefore, rather than paying for a service, patients will pay for an expected outcome (for more information, see *section V*). For all these reasons and many more, it is clear that adopting IoMTs and biometrics will enhance a patient's healthcare experience.

Professionals in physically demanding sectors

For those working in physically demanding fields, such as firefighters, athletes, and the military, biometrics provides life-saving benefits. For example, firefighters or the military will be able to prevent injuries or even fatalities by spotting risk factors earlier. Athletes and their staff will be able to track, and therefore elevate, their performance levels. By providing enhanced safety and performance levels, and reducing fatality rates, biometrics and IoMTs are a major boost to those working in physically demanding sectors.

Consumers

Consumers, too, have a lot to gain from IoMTs and biometrics. With cheap and reliable biometric monitoring, amateur athletes will be able to manage and improve their performance levels, while remaining confident of their safety. Consumers will be equipped to track their health levels while remaining in their own home. Even greater developments are possible: think of the integration of IoMTs and biometrics in public life, with the potential for the early detection of health problems, and the possibility for individuals to track their personal health on the fly. It's clear that biometrics and IoMTs offer almost everybody a better and healthier life.

3. UPTAKE AND BLOCKERS

What is hindering IoT-based biometrics uptake?

Despite the accelerated adoption of IoMT devices (see *Section I)*, many are still cautious about its application in healthcare and safety systems. Blockers can often discourage the implementation of new technologies, and in this section, we will explore these hindrances, and look at ways of moving past them.

Data protection

A considerable obstacle, and one of the most pressing social concerns of our time, is the widespread concern about privacy arising from the use of personal data. We can see daily evidence of the changing attitudes to data privacy in the age of Facebook, with many consumers showing a hesitancy to adopt IoMTs and biometric solutions. The question is clear: if healthcare professionals monitor and record detailed readings, what happens to an individual's data? Can they be leaked or hacked? It's easy to understand why this anxiety arises.

"Privacy is a major potential inhibitor of biometrics."

Merritt Maxim, principal analyst at Forrester Research, interviewed for *Healthcare IT News*[16]

While data security represents a challenge, there are ways to ease this tension. The most important thing you can do now is to earn the trust of your patients by setting up robust and user-friendly privacy and security policies, involving data encryption and authentication processes. Patients need to control their data, with clearly explained rights, and an awareness of who will see the data, and for what purpose. As we move forward, "ongoing technological advancements are expected to address these concerns and glitches in the near future owing to constant research and development" (Military Biometrics Market Report 2018[17]).

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[16]*Biometrics entering a new era in healthcare*, HealthcareITNews
[17] *Military Biometrics Market Report 2018: In-Depth Analysis of Production Demand and Consumption Growth Ratio by 2027*, MarketWatch

Fear of Technology

While many of us in the industry are obsessed with technology, for others, it can be unsettling. Fear of technology can be related to diminishing job security, further questions regarding data security, or just a preference for the human touch. These worries can often disrupt the process of adoption within healthcare (Creating Better Health Worker - Patient Interaction Using ICT[18]).

The best response to these fears is to present your employees with strong evidence that IoMT devices can reduce costs, improve efficiency, and lead to better outcomes for all involved – especially patients - all while demonstrating that they're easy to use. If necessary, offering training and support can alleviate the last of these concerns (Eight IoT barriers, Deloitte[19]).

Regulatory Standards

In response to developing technologies, new regulations often emerge that healthcare providers need to navigate. Changing guidelines were rarely a factor in traditional electronics, but in today's world, successful adoption depends on responding adequately.

While this challenge will vary with different kinds of technology and locations, there are general ways to diminish its impact. Organizations can build strategies designed to help them collaborate with regulators and their guidelines. Similarly, a collaborative approach with clients and patients can lead to direct responses to these regulations (Eight IoT barriers, Deloitte[20]).

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[18] *Creating Better Health Worker – Patient Interaction Using ICT; Design for Applicability and Acceptance,* ChiSparks2014
[19] *Eight IoT barriers for connected medical devices...and how to overcome them*, Deloitte
[20] Ibid.

Why should I embrace IoMTs and biometrics now?

We're convinced that IoMT devices are central to the future of healthcare and safety; whatever hesitations there are will be swept aside by the benefits it offers us. Here are some of the reasons why we believe that now is the time to embrace IoT-based biometric solutions:

Create new systems for improving health, safety, or performance

For healthcare providers, innovative technology can provide new ways of saving lives, and biometrics and IoMTs are no exception. In dangerous professions, such as firefighting, biometrics and IoMTs can reduce injury and fatality levels, while in physically demanding professions, new biometric solutions can help to improve performance (*see Section II*). Pioneering systems, such as data mining, live tracking, and machine learning have the potential to solve many real issues in public health, for example, preventing falls for the elderly by recognizing the warning signs earlier.[21] Another exciting example is the possibility of using breath monitoring for health screening, a low-cost way to detect risk factors, discussed in this [Ted talk by Julian Burschka](). The possibilities are endless: from sports to firefighting, and domestic life to public health, biometrics and IoMTs are revolutionizing health, safety, and performance systems.

Efficiency is essential

In our fast-paced society, efficiency is of paramount importance. As the healthcare sector faces rising costs, biometrics and IoMTs can help cut these costs and improve services. By monitoring and managing far more data than any one individual can, they can save time and resources. With home and remote monitoring, fewer and shorter patient hospitalizations will result in reduced pressure on hospitals. Overall, by reducing costs and raising performance levels, biometrics and IoMTs will increase efficiency.

Adapt to a changing world

We live in a dynamic, unpredictable world, with new technologies constantly remodelling how we live. By adopting biometrics and IoMTs sooner, rather than later, we can prepare for the future and help people transition from surviving to thriving. In societal terms, IoT-based biometrics offer vital answers to pressing global questions, like the growing and aging population, decreasing levels of public health, and increasing health spending. Furthermore, IoT-based biometrics offer a way of tapping into changing ways of consumption, revenue models, and consumer expectations (*see*

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[21] *June 2018: Evolving IoT Tech Enables Aging in Place,* ConnectedWorld

Section V). Adapting now will stop you from getting left behind, and make you a part of the exciting new developments offered by biometrics and IoMTs.

The development of IoT-based biometrics has triggered another major shift in healthcare: a change of consumer expectations and a resulting shift in payment models - from fee-for-service to paying for outcomes. We will explore this shift in the <u>next section</u>.

4. FROM PAYING FOR PILLS TO PAYING FOR OUTCOMES

The introduction of an interconnected healthcare system has radical implications for payment models. While today, you pay your healthcare provider for a service, hoping that it will succeed, in tomorrow's world, hope turns to certainty: you will pay for a definite outcome, dependent upon your data, and pay in proportion to the success as compared to your expectation. In other words, you will pay for health outcomes, not service volume.

Why does this matter? Here are a few key reasons:[22]

- It's already happening: in 2015, the United States administration began implementing value-based reimbursement for medical professionals, paying clinicians based on the level of care delivered, rather than the volume of services provided. Now, in 2019, the system is still gradually expanding, with the number of clinicians eligible for the Merit-Based Incentive Payment System (MIPS) up by 148,000. As this form of payment system becomes the norm, healthcare professionals need to be ready to adopt new practices to help them keep up.[23]
- To bring costs under control, new payment models hold healthcare providers accountable for the quality and cost of care they provide.
- Changes in payment models drive the adoption of new approaches to healthcare delivery, like home monitoring, data tracking, and IoMT solutions.
- In a consumer-driven world, transparent healthcare processes are inevitable.
- Asking for a service, receiving it, and paying for it – the basis of our consumer culture – is likely to become the standard in healthcare, too. The use of IoMT devices provides a large amount of data to increase the reliability of an individual's personal plan.

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[22] *Ahead of the Curve: Top 10 Emerging Health Care Trends*, AMCP Foundation
[23] *Exploring Changes to the Quality Payment Program in 2019,* Revcycle Intelligence

"A gradual, non-linear move from reactive medicine and treatment to the delivery of preventative medicine (...) means we will have cheaper, faster and more effective healthcare."

Future Agenda, *Accenture*[24]

Cases from our practice

How do we at Evalan view our role in these sectors? What do we do differently from other players? The key, stand-out feature of our IoMT work is that our solutions are purpose-built for a specific customer, made precisely for a unique function. To achieve this, we work in close collaboration with our clients, taking them all the way from early entry-level system to fully developed, cutting-edge IoMT solutions. As a high-level developer, we combine different technologies to create the optimum solution for the challenge at hand.

To give you an idea of what we do, here are two cases that illustrate how we have implemented IoT-based biometric solutions in healthcare and demanding professions.

ARMOR Heat Monitor[25]

In the military, heat exhaustion is a significant concern. To combat this, the Dutch army asked us to find an IoT solution and to take part in a technology project called ARMOR (Ambulant Registration of Military Operational Readiness System). In collaboration, we developed a heat stress monitor.

[24] *Future Agenda: Future of Patient Data*, Accenture
[25] *ARMOR monitors Heat Stress of Soldiers*, Evalan

The ARMOR Heat Stress Monitor is a wearable sensor that monitors heart rate and temperature. The data is streamed to an app accessed by the field commander, who can thus monitor the real-time heat load and physical strain index (PSI) of each soldier. If the figures hit dangerous levels, the app will notify the commander, who will intervene to prevent any injuries.

An asset for athletes, too

This technology has a broad range of possible applications: for example, athletes training for the Tokyo Olympics want to prepare their bodies for the hot conditions that are expected. To resolve this, athletes will train in a similar climate, while using wearable biometric devices. This means they will be able to monitor blood pressure and body temperature to understand how climatic differences impact their bodies, allowing the team to help maximize their performance at the Olympic Games.

To read more about the ARMOR Heat Stress Monitor, read this article on Evalan.com.

SensiStep[26]

After a serious injury, rehabilitation can be an arduous process. For a physiotherapist, it can be tough to gauge a patient's condition or the strain on his or her body simply from observations. Together with UMC Utrecht contacted us to help them find a solution no longer based on patients' feelings, but on accurate scientific data. The result: SensiStep – a real-time strain monitor designed to make the rehabilitation process safe and successful.

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[26] *Monitor load with IoT*, Evalan

SensiStep consists of a sandal with sensors, a wearable device, a tablet, and a web portal. Together, these components provide real-time feedback on the strain placed on a patient. With these precise data, a physiotherapist can give specific instructions to the patient. With more certainty comes more confidence in advice, and more confidence in the outcome (*see Section V*). SensiStep can help cut back recovery times, saving healthcare costs and improving the quality of life for patients.

"At a glance, I can see whether my patient exercises the right strain on the leg during and after the therapy."

Charlotte Klop-Gardeniers, physiotherapist at UMC Utrecht

For more information about SensiStep, visit the Evalan SensiStep webpage.

There are always innovative ways to apply IoMT, and we can help you find them. We thrive on designing and developing IoMT solutions in collaboration with our customer's needs and desires. Are you looking for a unique IoMT or biometric solution? If you are, get in touch with us today.

5. WHAT TO LOOK FOR IN YOUR IOMT SOLUTION

In order to make the most of the digital transformation in the healthcare and safety sectors, you need a solid plan. Here is what you need to consider when making a decision.

4 Things To Include In Your IoMT Development Plan

Preparation is key. Here, we list four factors that you need to consider before moving forward:

1. *Focus not on technology, but on identifying the problems you want to solve*
   Make sure to ground your project in an understanding of cost, effort, and the desired outcome. IoMT solutions offer the possibility of radically improving healthcare and safety systems, both for provider and for the patient. Keep in mind the reasons why you want to develop your system, whether it be improving public health, reducing costs at a hospital, making a dangerous occupation much safer, or saving lives.

2. *Aim for the future*
   While it's convenient to start with a simple solution, we always encourage clients to keep long-term development in mind. Entry-level systems are lower in value, but value does increase with every step. Remember the scalability of your system: are you aiming for international integration of your system? If you are, you need to keep this in mind as you work on the local level. For example, while an early iteration of your biometric system may have limited use, as it grows, becomes well-known, and more applications become clear, it could become a key safety feature in the majority of hospitals, being integrated internationally. By keeping these paths in mind, you will be able to develop and grow your solution attentively.

3. *Invest in the right people*

   For many, IoMTs will be a new way of providing a healthcare service, so take the time to train your staff in preparation for entering this world. Many may be hesitant, but keep the focus on the problem you're solving. The sheer amount of benefits that IoMTs and biometrics offer will convince many of those who are reluctant. Team members who can think outside the box are indispensable and will play a key part in developing unique and innovative healthcare or safety solutions.

4. *Collaborate with experienced partners*

   At Evalan, we always develop new solutions in close consultation with the customer and we have come to view this as a strong value adder when it comes to implementing IoMT. It requires everyone involved to agree on the plan, to fully understand the product, and to offer maximum support. It enables us to cross the boundaries between disciplines and merge the knowledge and experience of different stakeholders. For example, a health professional's input on how a product is used can enable the tech team to adapt the product, so that the resulting solution is a perfect match with the daily realities in healthcare.

6. WRAPPING IT UP

The Future of Healthcare

While fears can interfere with the adoption of new technologies, we do not doubt that current concerns regarding IoT-based biometrics will fade as this technology becomes a central part of our world. At Evalan, we believe that investing in IoMT offers unparalleled opportunities to advance our systems of healthcare and safety, with all the signs pointing to its mainstream integration in the coming years, as highlighted in this whitepaper:

- A global necessity, due to an increasing and aging population, the strain on healthcare providers and budgets
- Potential to help many people, reducing workplace injuries, preventing falls, decreasing fatalities
- Changing payment models, with pay-for-outcomes becoming standard
- Improved efficiency: the ability to provide better healthcare for less
- Changing consumer demands, paying for outcomes, increasing independence with home health monitoring, personalized healthcare plans

There are many ways in which biometric solutions can engage with these opportunities, whether through entry-level problem-solving or more complex and comprehensive healthcare strategies. At Evalan, we work with a wide variety of organizations across diverse markets, from healthcare to the military, aiming to provide the best solution for the challenge you face.

About Us

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Evalan is a fast-growing and innovative development and application partner in the field of the Internet of Things. We work in close collaboration with our customers to achieve the best results possible. Evalan focuses primarily on remote monitoring, biometric measurements, and telemetric solutions for the healthcare, industry, and government sectors. We develop mobile devices, sensors, data management systems, data processing algorithms, and user interfaces for different platforms. We serve around 100 clients, ranging from large multinationals like Heineken and Unilever to government departments like the Ministry of Defence to hospitals and small technology companies. In 2010 and 2014, Evalan was ranked by the Chamber of Commerce among the 100 most innovative Dutch small to medium-sized enterprises. The company was founded in 2005. From our offices in Amsterdam, we operate in over 50 countries. Find out more at www.evalan.com. Or follow us on Twitter or LinkedIn.

If you are interested in exploring the possibilities of IoMT and biometric solutions in healthcare and safety, we invite you to contact us today. We look forward to discovering the real potential of IoMT and biometrics with you.

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References

1. *Unlocking the potential of the Internet of Things,* McKinsey Global Institute

2. *The IoT as a Growth Driver,* McKinsey Global

3. *Mapping the Smart-Home Market,* Boston Consulting Group

4. *#BizTrends2019: Digital, data-driven biometrics,* BizCommunity

5. *The global market for IoT healthcare tech will top $400 billion in 2022,* Business Insider Intelligence

6. *Ibid.*

7. *Internet of Medical Things, Forecast to 2021,* Frost and Sullivan

8. *As healthcare costs rise and patients demand better care, hospitals turn to new technologies,* Business Insider

9. *The future of home healthcare will rely on integrated service models,* InformationAge

10. *Fire Technology: The Future of Wearable Technology,* Firehouse

11. *Formula 1 plans biometric gloves for crash data in 2018,* Autosport

12. *NASA Technology Enables Better Patient Care,* NASA Technology

13. *CES 2019 update: digital health innovations from startups to Withings, Samsung and Philips,* smarthealth

14. *Ibid.*

15. *Ibid.*

16. *Biometrics entering a new era in healthcare,* HealthcareITNews

17. *Military Biometrics Market Report 2018: In-Depth Analysis of Production Demand and Consumption Growth Ratio by 2027,* MarketWatch

18. *Creating Better Health Worker - Patient Interaction Using ICT; Design for Applicability and Acceptance,* ChiSparks2014

19. *Eight IoT barriers for connected medical devices...and how to overcome them, Deloitte*

20. Ibid.

21. *June 2018: Evolving IoT Tech Enables Aging in Place,* ConnectedWorld

22. *Ahead of the Curve: Top 10 Emerging Health Care Trends,* AMCP Foundation

23. *Exploring Changes to the Quality Payment Program in 2019,* Revcycle Intelligence

24. *Future Agenda: Future of Patient Data,* Accenture

25. *ARMOR monitors Heat Stress of Soldiers,* Evalan

26.   *Monitor load with IoT,* Evalan

27. *Our innovative IoT solutions and applications,* Evalan