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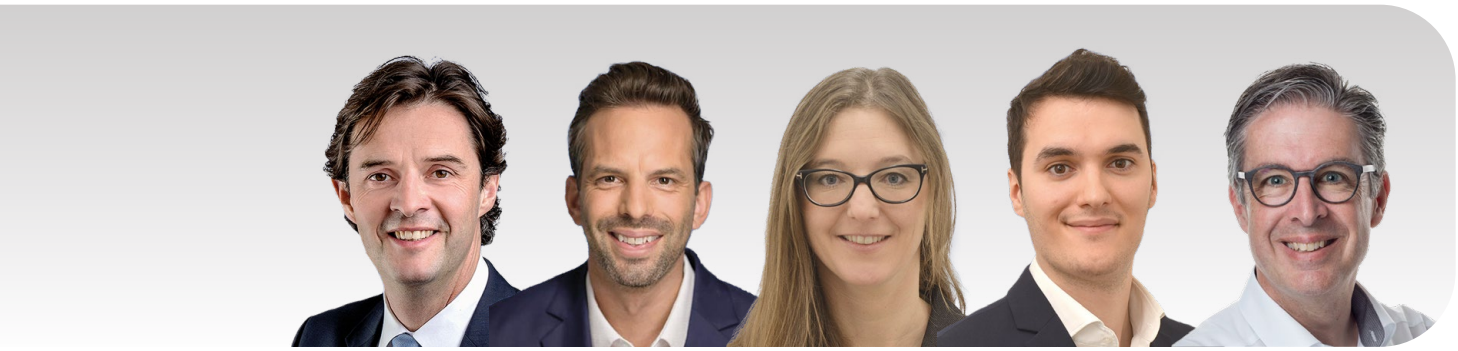
IoT - paving the way to the era of connected things



From left to right: **André Arrigoni**, Partner; **Manuel Gantner**, Manager, IoT & Control Systems; **Rahel Strässle**, Senior Consultant; **Baton Shala**, Consultant; **Stephan Keller**, Senior Vice President, Member of the Executive Board

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From IoT to EoT The prelude to a new age

The development of the Internet of Things (IoT) began more than 30 years ago. Although the term "IoT" was not yet born at that time, the basic ideas were. However, the IoT only gained momentum in the context of the digital transformation and the associated reassessment of conventional business models. The IoT has evolved from simple, isolated machine-to-machine applications to intelligent and interconnected "Smart Connected Products" within ecosystems.
André Arrigoni

Driven by advancing digitalization, the IoT is now on an unstoppable winning march that is making its way from industry to industry and is probably far from over. Currently, we are already seeing the next stage on the horizon, where things will make autonomous decisions and process transactions. Welcome to the Economy of Things (EoT).

In simplified terms, the IoT is the result of a combination of diverse technological developments. These include sensor and actuator technology as well as communication, analysis and presentation technologies. For example, IoT applications are increasingly influencing product and service development in the manufacturing industry. Moreover, IoT is also creating new challenges for sales and distribution, and thus many new opportunities in the market.

The main goal of IoT applications is to generate added value. This requires data that is refined into information in order to use IoT analytics to gain insights from it and draw the right conclusions.

This Eraneos Focus provides you with an introductory in-depth look at the terminology and the various evolutionary stages of the IoT. We also highlight the success factors on the way to becoming an IoT service provider and show why IoT analytics are indispensable when it comes to extracting business-relevant information from huge amounts of sensor data. The interview with Stephan Keller from V-Zug provides exciting insights into the challenges and goals of IoT implementation across the enterprise and sheds light on the topic from a practical perspective.

We wish you an inspiring read and lots of new insights into this exciting topic of the future.

> "The next stage of IoT evolution takes us to the connected and smart communicating ecosystems of the Economy of Things (EoT)."
>
> **André Arrigoni, Partner**

From Sensors to the Economy of Things

In this chapter, we describe what is behind the terms IoT and EoT, which components are involved, how an ordinary product is further developed to become a connected IoT product with digital services, and what needs to be taken into account when implementing IoT in general. One thing is clear: successful IoT applications require much more than just an Internet connection.
Manuel Gantner

What is the meaning of IoT and EoT?

The Internet of Things (IoT) is a global infrastructure consisting of interconnected objects, systems and intelligent services to process information from the physical world. The various components and technologies are described in more detail in the following chapters. In addition to the technical approach, the IoT mindset is essential to generate the targeted customer benefits.

IoT can be used in almost every industry and in various forms: It ranges from simple sensors (e.g., to measure temperature, heartbeat, or current position) to cameras providing optical image analysis (e.g., to detect structural damage to engineered buildings). Other possible areas of application may include visual quality control of products and classification or counting of vehicles. The use of the IoT in so-called "Smart Connected Products" goes even a step further and opens up opportunities for additional digital services and new business models, ranging from smart household appliances to autonomous vehicles such as physically acting drones or delivery robots.

In this context, the Economy of Things (EoT) can be seen as an evolution of today's IoT. Just as we are used to searching for products on the web, comparing prices or processing transactions, things will be able to perform such tasks autonomously in the future. In addition to the IoT, a separate intelligence is crucial for the processing of contracts and transactions. Distributed ledger technologies (DLT) such as IOTA are predominantly used here.

How is the IoT structured?

Sensors and **actors** are used in the IoT as links between the real and the digital world. Some of these data streams can be processed close to the sensor/actor at the edge of the network. This decentralized form of data processing is referred to as **edge computing**.

Connectivity in the IoT is predominantly provided by radio transmission technologies. The new 5G mobile communications standard in particular offers great potential for linking IoT devices. It can replace cables in many areas in the future and will lead to considerable cost savings. In addition, several low-power transmission technologies for large and small distances are already available today, and can be operated on a battery for several years without any problems.

IoT platforms enable the interconnection of different IoT devices and communication across system boundaries. The IoT data is mapped in real time as a **digital twin** in the platform. The functional scope of IoT platforms varies greatly and the market is confusing due to the large number of different IoT platforms.

As a rule, an IoT platform provides the **application management** for developing the application as well as **device management** for connecting, identifying and managing the devices. Because both the strengths and weaknesses and the prices of platforms vary across dimensions, multiple platforms can also be deployed in parallel. IoT platforms form the basis for the provision of **digital services** that ultimately represent the intended benefits.

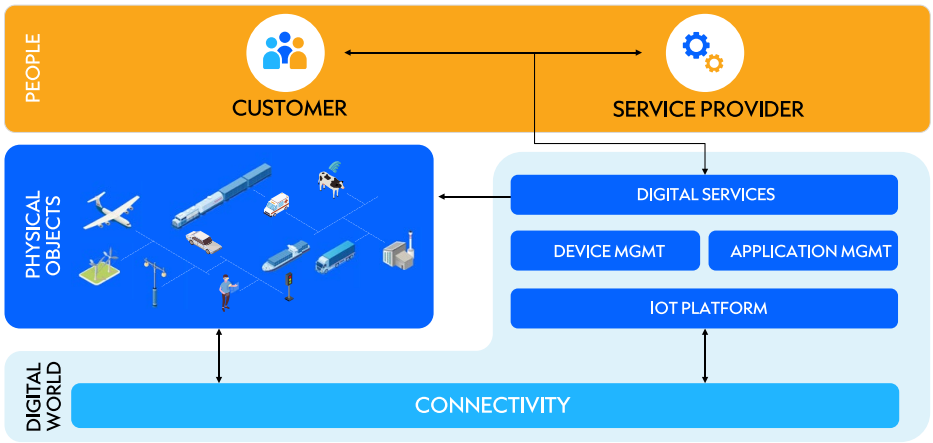


Figure 1: Structure of the Internet of Things (IoT)

The evolution from product to EoT ecosystem

In addition to the use of stand-alone sensors (e.g., to measure air quality), it is primarily everyday products that are becoming "smart" and becoming a "Thing". The example of "Smart Street Lighting" illustrates the evolution from a physical product to its integration into an EoT ecosystem and will be referred to again in the following chapter:

1 A street light used to be a simple physical product that could only be turned on and off.

2 Since the conversion to more power-saving LEDs and demand-driven control, the use of electronics is required for this purpose. The electronics and embedded software enable the lantern to provide digital services for parameterization or data analysis as value-added services, for example. This makes it a smart product.

3 If the product is also connected via the Internet, it is referred to as a smart connected product, which can now be accessed globally. Connectivity opens up access to entirely new services.

4 Today, for example, sensors for traffic counting, for measuring emissions such as noise, CO2 or temperature, and buttons for emergency situations are built into street lights. The classic lantern manufacturer is thus becoming a provider of digital services. This enables them to build up a comprehensive product ecosystem and enter new markets.

5 Coupled with collaborations in partnership-based and connected ecosystems, the data can be shared across manufacturer boundaries - for example with pedestrians or vehicles - and thus enable further digital services.

6 In the Economy of Things, the street light (e.g., as a charging station for electric vehicles) can offer further services to other "Things". The vehicle searches for suitable charging stations on its journey and determines the most suitable service provider on behalf of the owner. The price is negotiated, the charging process is carried out and the amount is settled via distributed ledgers from "Thing to Thing".

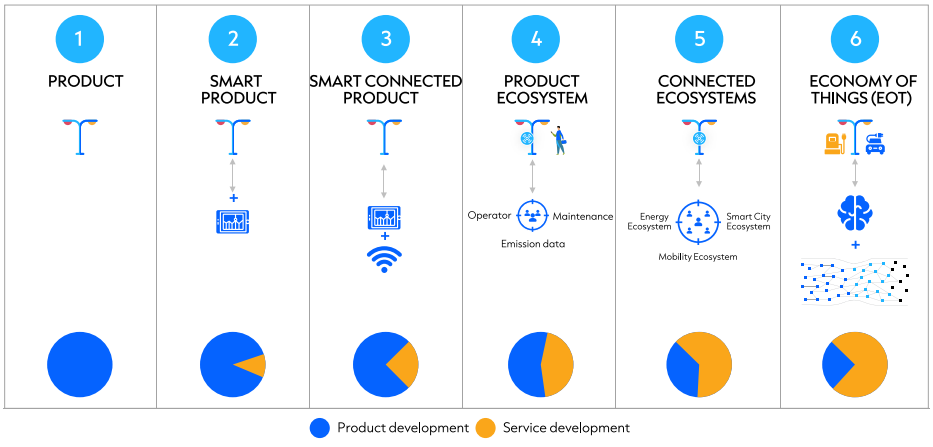


Figure 2: The evolution from product to connected ecosystem

Eraneos supports the development of the "Swiss IoT Guidelines for Smart Buildings" with the ambition to establish unified IoT standards in the field of Smart Buildings in order to boost interoperability.

Detailed information on security requirements in the IoT environment can be found in our E-Paper "Security in the IoT - A topic on the move"

What are the factors leading to successful IoT applications?

There are several factors to consider for the implementation of successful IoT applications. Both product manufacturers and end users need to address at least the following factors.

Added value instead of useless features

An IoT application can only be successful in the longer term if significant added value is generated with it by solving a problem. Orientation along the customer journey, an iterative approach and collaboration in cross-functional teams are key factors for widely accepted solutions.

Standardization instead of lock-in

In the past, the focus of IoT products was mostly on online data availability through connectivity. However, due to proprietary protocols and locked-in interfaces, data could only be shared with great effort. This already led to almost insurmountable hurdles in the technical "foundation". The use of standard protocols and a certain semantics allows a more flexible and interchangeable deployment.

Digital ecosystems instead of isolated solutions

1+1=3. Even in the IoT environment, the greatest added value results from collaboration. Partnerships in digital ecosystems lead to higher-quality services that are not oriented to the system boundaries, but rather as a system-of-systems to the customer journey of the clients.

New skills are required

In order to drive the evolution of the IoT, additional skills are required in addition to the basic technical skills. As illustrated by the example of the street light, the development of additional infrastructure and digital services calls for specific know-how.

Privacy and security by design

As a rule, IoT applications directly or indirectly provide deep insights into the privacy of users. Compliance with data protection regulations is therefore essential, otherwise there is a risk of severe penalties, among other things. Since IoT devices are also often considered easy prey and can be used as gateways, they are increasingly in the focus of attackers. Accordingly, solid and professionally managed security requirements throughout the entire lifecycle of IoT products and IoT applications are a must-have right from the start.

Sustainability as a focus and not just a side benefit

Sustainability is becoming increasingly important. The IoT can and should make a major contribution here. To this end, sustainability considerations must be included from the outset and not just regarded as a secondary benefit or suitable sales argument.

A successful IoT business model affects the entire organization

The added value of the Internet of Things (IoT) is linked to the consideration of a holistic approach. Organizations often tend to focus on a few product-related use cases. However, this does not allow the full potential to be exploited. As a result, IoT projects stagnate or are even doomed to failure. However, as a trending topic, IoT is more present than ever: Transforma Insights predicts that the global IoT market will generate revenues of up to $1.5 trillion by 2030. But how should companies approach IoT projects strategically?
Baton Shala

The IoT influences various activities of an organization: from product and service development to production and sales to the working and business methods practiced. In order for the full potential to unfold across the company, IoT topics must be included at an early stage and taken up as a strategic field of action when developing a digital or innovation strategy. The focus is always on the benefits that the IoT can provide for the organization, its employees and its customers.

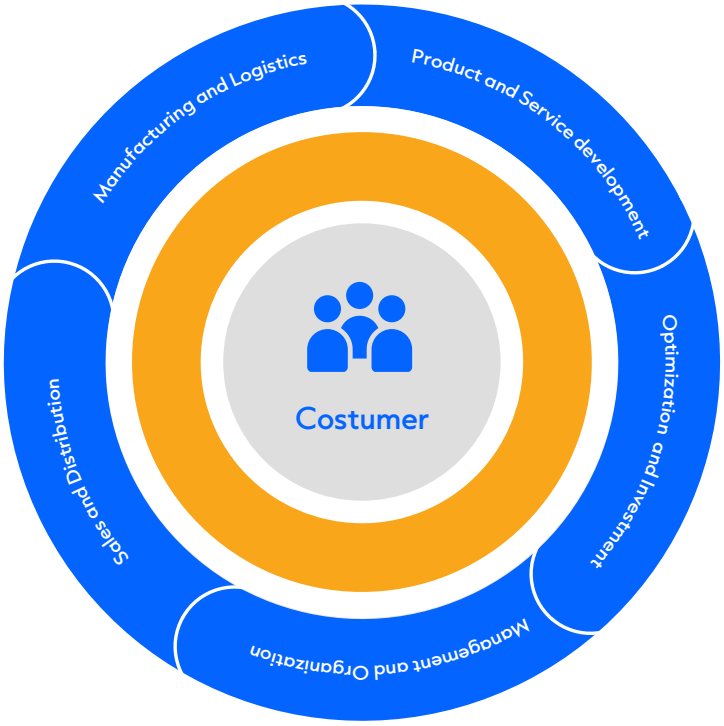


Figure 3: The IoT influences various activities of an organization

Product and Service development
Technologies around the IoT are shifting corporate value creation from offering purely physical products in the direction of **data-based services**.

The transformation to a service provider is an indispen-sable step for manufacturers. The path from the "physical" product to the "smart" revenue model is characterized by numerous challenges. Figure 4 describes typical barriers on the way from physical product to IoT profit.

When developing IoT products, organizations are often inspired by application examples and neglect the actual needs of their customers. However, smart products and services are based on a deep understanding of customer needs. Accordingly, the benefits for customers should be the focus of product development. To ensure that products can be continuously improved, IoT-based customer insights are possible (e.g., by analyzing usage data). Such data-based insights also enable organizations to bring their offerings closer to the market and to develop innovations and interfaces with tangible benefits to build ecosystems on.

In the era of the Economy of Things (EoT), product and service development continues to gain importance. Digital products are expected to act autonomously and intelligently in the interest of the owner or user and to process transactions. For example, the charging station at the street light is then determined on the basis of the price, charging speed, power origin or planned route, and payment is processed directly.

Profit product & service	• The investment pays off • New products and services generate revenue or cost savings	**Profitability problem** Revenue or cost savings cannot recoup investment costs **Logging & Monitoring** The revenue potential or cost savings are not sufficiently exploited
Service	• Services are considered so value-adding that a user fee can be charged for them • Services are used by customers • Value-added services are available	**Monetization problem** Not enough services that can be offered for a fee **Usage problem** Services are insufficiently used by customers **Insufficient service offering** Product does not have the potential to provide valuable services
Product	• Smart Connected Product, smart street light connected to the internet • Smart product, e.g. smart street light with electronics and local analysis if necessary • Normal product, e.g. normal street light	**Connectivity problem** Product is not connected to the Internet **Interconnectivity problem** No electronics and power supply available

Figure 4: Barriers on the path to IoT profit
Making money with the IoT - but how? Wortman et al. (2019)

Manufacturing and Logistics
In manufacturing and logistics, the IoT provides important data on product and service quality, manufacturing processes, the effectiveness of the overall plant, or inbound and outbound logistics. In order to make this data usable, action steps, activities or technologies used must be adapted and realigned. The goal is first to optimize the processes in manufacturing and logistics with the help of IoT in order to interconnect the internal processes as well as the external logistics processes on this basis. All corporate processes from manufacturing to optimization must be coordinated with the players involved in the ecosystems in order to ensure optimal collaboration with added value.

Dynamic structures are needed to respond to short-term changes (e.g., updates, new features or interfaces). Compared to product and service development, the focus here is on the requirements of internal stakeholders.

Sales and Distribution
The positioning of the service offering is also changing fundamentally as a result of the IoT. The central questions are what exactly is to be monetized or what relationship is to be built up with customers and how the revenues flow. A simple entry point to the IoT is to add free digital services to existing products with the goal of improving transparency (e.g., condition monitoring), efficiency (e.g., predictive maintenance), or the integration of the product into the customer's work and production environment.[2]

In the next step, additional products (e.g., IoT dash buttons or self-ordering EoT products) or services can be offered in existing markets for a fee (e.g., light metering, traffic metering, or emissions metering-as-a-service). In this context, the revenue model is fundamentally changed by the IoT: In contrast to the physical product, digital services are not sold once, but are billed on a time basis as subscriptions/leases, per use in specific quantity units, or per success in agreed key figures (outcome-based).

In the EoT, the products and/or services offered also open up new opportunities to participate in a marketplace and thus benefit from new revenue models.

2
Successful IoT business models, Jan Roding et al. (2017)

Management and Organization
The successful transformation from product to service provider requires a new mindset within the organization:

- Profitability no longer depends on the products sold, but on the organization's innovation performance, "coopetition" with competitors, and the type and duration of services billed digitally.

- New roles need to be created in development, operations, data analytics and business process management to extract value from data.

- Employees need to be systematically trained and educated with a view to changing roles and tasks.[3]

In addition, IoT-based data allows evidence-based management of corporate activities.

Optimization and Investment
The newly gained transparency is accompanied by new opportunities for continuous improvement. In this context, the organization's business model must also be viewed holistically during optimization. For example, new insights from usage data can lead to new products that again affect all corporate activities. A new offering can also be introduced in the form of a new revenue model or through participation in a new market. A key factor is the involvement of internal and external customers in all corporate activities. After all, the perceived added value of an offering determines whether it is actually "smart" or not.

In principle, it makes sense to quickly test specific IoT use cases in pilot projects. The governance in place for innovation topics can provide a secure framework. As soon as a strategic added value can be identified, a central IoT team can pursue the topic across the enterprise.

3
Making money with the IoT - but how? Wortman et al. (2019)

Insights instead of pure data IoT Analytics – the intelligence of the sensor system

Data is ubiquitous and continuously increasing in terms of volume and complexity. IoT analytics, as a subfield of data analytics, supports the interpretation of huge floods and collections of data from connected IoT devices. If the sensors in the network were the endings of nerves, then IoT analytics would be the brain that analyzes and interprets the nerve sensations. It is the analysis of the data that makes the IoT an intelligent system.
Rahel Strässle

IoT analytics exploited to its full depth helps organizations obtain a better understanding of various interactions, optimize decisions, and thereby create business value.

The journey of IoT data

But how do we get from the sensors to the actual added value? IoT data goes through five basic steps on its journey: **Create, Communicate, Aggregate, Analyze** and **Act** [Ref. Deloitte, 2015].

Create & Communicate: driven by the availability of an increasing number of wireless technologies such as 5G, NB-IoT or LoRa, a wide variety of objects are equipped with an ever-increasing number of sensors to collect huge amounts of real-time data.

Aggregates: single data points rarely provide valuable insights. Only when data is enriched over time and space does it gain meaningfulness. And just as we too use all our senses and existing information to build an overall picture of our complex environment, in many cases the value of sensor data only becomes apparent when it is combined and correlated with other data sources.

Analyze: IoT analytics uses cutting-edge Big Data methods to filter out relevant information from the heterogeneous, fragmented flood of data. Whether the analysis happens in the cloud, on the device itself, or somewhere in between is an architectural decision that must be made based on security requirements, "need for speed", available bandwidth and computing power, and desired independence.

Act: Based on the insights gained, targeted measures can be taken to improve performance, reliability and security as well as the customer experience.The sensors monitor whether the measures are achieving the desired success in real time and provide the algorithms with the necessary feedback in near real time. This closes the circle.

The value-generating step is in the "Act". But it is the analysis that defines where the journey is headed.

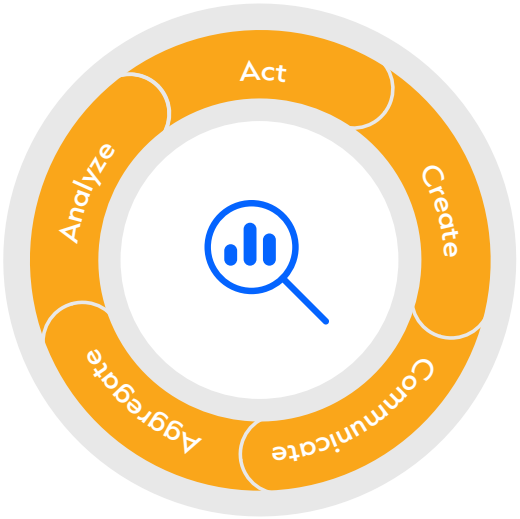


Figure 5: The journey of IoT data

Trust enables autonomy

When we rely on data to make informed business decisions, we need to trust not the data itself, but the insights extracted from it. The more we trust the quality of these insights, the more autonomous the systems can become.

What will happen?

With the help of predictive analytics, we recognize what is not directly apparent in existing data through statistical methods: machine learning models are trained with historical data to elicit trends and patterns. Applied to the currently available data, we are thus able to predict the future with a probability or perceive anomalies.

How do we achieve a specific goal?

Prescriptive analytics use probabilistic measures to show us how we can best remedy or optimize a situation. This often involves looking for courses of action to maximize or minimize a business-relevant KPI.

Prescripitve analytics (e.g., for escalators) not only allows us to maintain high quality standards and minimize the risk of failure, but also to plan spare parts orders and service intervals much better and more accurately (predictive maintenance).

Should we leave the decisions to the machines?

If we combine prescriptive analytics models with the autonomy of artificial intelligence (AI), we can not only predict the future, but actually implement it. In the early stages, the models are often used with additional human control.

For certain application areas, such as real-time responses to user behavior or autonomous driving, human interaction is not practicable. For example, thanks to IoT analytics and AI, the autonomous Mars robot Perseverance was able to select the optimal landing site 301 million kilometers away from us in real time and land safely.

When we complement prescriptive analytics and AI with distributed ledger technologies, we enable the Economy of Things: not only do we give connected devices the intelligence to make the right decisions, but we also gain transparency and security for transactions, and thus access to decentralized marketplaces. It might sound like the distant future, that escalators will arrange their own maintenance with service companies, or that street lights and cars will negotiate the price of electricity without our intervention. However, the technologies that make this possible are already available today.

The potential of IoT Analytics

We don't have to fly to Mars to exploit the potential of IoT analytics. But it takes courage and creativity to venture into these uncharted territories.

IoT analytics offers compelling benefits in many areas: be it in optimizing management strategies, monitoring and managing buildings, data centers and other expensive infrastructures, in asset management, for applications in retail or healthcare, for urban planning or in the supply chain.

Viewed from a different perspective, IoT analytics offer potential in all phases of a product's lifespan: during manufacturing, transportation, maintenance and repair, as a provider of information about a product's use, or as a source of information for customers. Organizations must differentiate themselves through digital services and corresponding business models in order to remain competitive in the long term. Gaining insights from data is therefore not a "nice-to-have," but an imperative. In most cases, the data already exists. Exploratory data analysis can be a first step into a data-driven future.

V-ZUG on the road to success with IoT An interview with Stephan Keller

About V-ZUG Group

V-ZUG is the leading Swiss brand for household appliances. For more than 100 years, V-ZUG has been developing and producing appliances for kitchens and washrooms in the heart of Switzerland and offers comprehensive services. In Switzerland alone, more than 300 technicians are on duty in the service area. As Swiss market leader, V-ZUG Group also markets their products in selected premium markets abroad. V-ZUG Group currently employs around 2000 people. V-ZUG Holding AG is listed in the Swiss Reporting Standard of the SIX Swiss Exchange, Zurich.

What are your tasks at V-ZUG?

Stephan Keller: My area of responsibility includes the product development of all V-ZUG appliances. This includes both the physical products and the associated digital product parts. The latter extend from our appliances to the cloud as well as to smartphone apps or other IoT devices..

What was the initial spark for the start of IoT?

SK: V-ZUG was quick to adopt an innovative approach and the use of new technologies. For this reason, as early as 2005, we deliberately equipped appliances with modems, connected them via the Internet and enabled their integration into building bus systems. This was a deliberate "tech push" without a pronounced market need, in order to find out potential customer benefits, to map use cases and gather initial experience. At that stage, however, there was not enough demand for our advance to be successful. At the same time, the manufacturing costs were still too high. When the components became massively cheaper and more professional in 2015, and customer demand for digital products increased, the project gained new momentum due to the improved cost/benefit ratio. A complete relaunch with new infrastructure took place. Since then, IoT has become an integral part of the V-ZUG product range.

> "For V-ZUG, IoT is no longer a matter of choice, but a matter of course."
>
> **Stephan Keller, Senior Vice President, Member of the Executive Board**

What does IoT stand for at V-ZUG and what significance does it have for you today?

SK: For V-ZUG, IoT is no longer a matter of choice, but a matter of course. In terms of benefits, we focus on the interaction of the virtual and the physical products for a seamless customer journey. The importance has changed in different areas: In food preparation, for example, our approach is moving beyond actual cooking towards the overall "eating" experience. We want to accompany our customers throughout the entire process chain and perfect the cooking process. This begins with inspiration and individual advice, taking personal needs into account. Since V-ZUG with its physical products normally appears in this process at the earliest during storage (cooling) and the cooking process, we focus in the preceding steps, for example, on video inspiration. Food preparation is where V-ZUG's actual core business begins: cooking. Here, appliances such as the cooktop, pots, stove, steamer, fume hood or dishwasher are fully connected to the preferred preparation app. This enables perfect preparation of the appliances (e.g., preheating), support in handling the food, and regulation of the appliances among them-

selves (e.g., passing on information from the pan to the cooktop). The final process step is cleaning, where the dishwasher, for example, can preselect the cleaning program based on the food preparation.

Ecosystems play a big role in the IoT, how do you position yourself?
SK: There are various ecosystems in our environment. The Smart Home ecosystem is only a second priority for us. Our highest priority is the food journey, which represents our core process. In this area, we are clearly focusing on an open partnership in many ecosystems and want to prevent a "lock-in" from the customer's point of view. In this regard, we are actively working in standardization and interest groups to create the technical basis for integration. We can build partnerships on this standardized technical basis, for example, by using a recipe to transmit the associated shopping list directly to a partner's food delivery app. Flexibility and straightforward integration into different ecosystems are very important to us. With our app, we also offer our own ecosystem, into which we will gladly integrate other partners in the future.

How has the development process and customer involvement changed through IoT?
SK: In the area of development, the customer journey is also moving further into focus. The emphasis is on understanding the entire customer process, in which we want to be seamlessly involved. Such integration forces many companies to adopt a "cross-industry" way of thinking, which enables optimal interaction between the partners involved. What is often forgotten in today's trending topics is the scope and complexity of embedded software on devices. App and cloud development, for example, can be easily outsourced, but not the embedded software, which houses numerous company secrets. Due to the increasing functional scope, systematic requirements engineering and professional testing are also becoming more and more important. We have greatly expanded and professionalized these areas.

Many IoT projects fail - what is V-ZUG doing to prevent this?
SK: We try to think strongly outside-in and less inside-out. We focus on customer benefits and the customer journey, and not on our own interests or current trend topics without any reference to the customer.

A "tech push" in this context rarely leads to quick success, but can be useful for gaining experience and for the ongoing expansion of the offering

When is a product successful in terms of IoT from V-ZUG's point of view?
SK: Since IoT components are becoming increasingly inexpensive (hardware), we do not explicitly measure success or failure in terms of the cost/benefit ratio in the narrower sense. Furthermore, there are many different perspectives from which success can be measured. In today's competitive environment, maintaining com-petitiveness in the long term with the help of the IoT can already mean success. At V-ZUG, we want to use IoT in the future to implement ideas that generate additional, clearly recognizable customer benefits.

In which areas do you see the greatest customer benefits generated by IoT?
SK: In terms of food preparation, we pursue the goals of "Better Tasting Food", "Less Food Waste", "Ease of Life", "Inspiration" and "Health". Our devices have become IoT devices to optimally support our customers in "Food Preparation" or "Textile Care". We generate added value, for example, with our "Guided Cooking" app, through accurate maintenance that no longer requires on-site diagnostics, or by importing upgrades from the cloud that continuously improve the functionality of the devices.

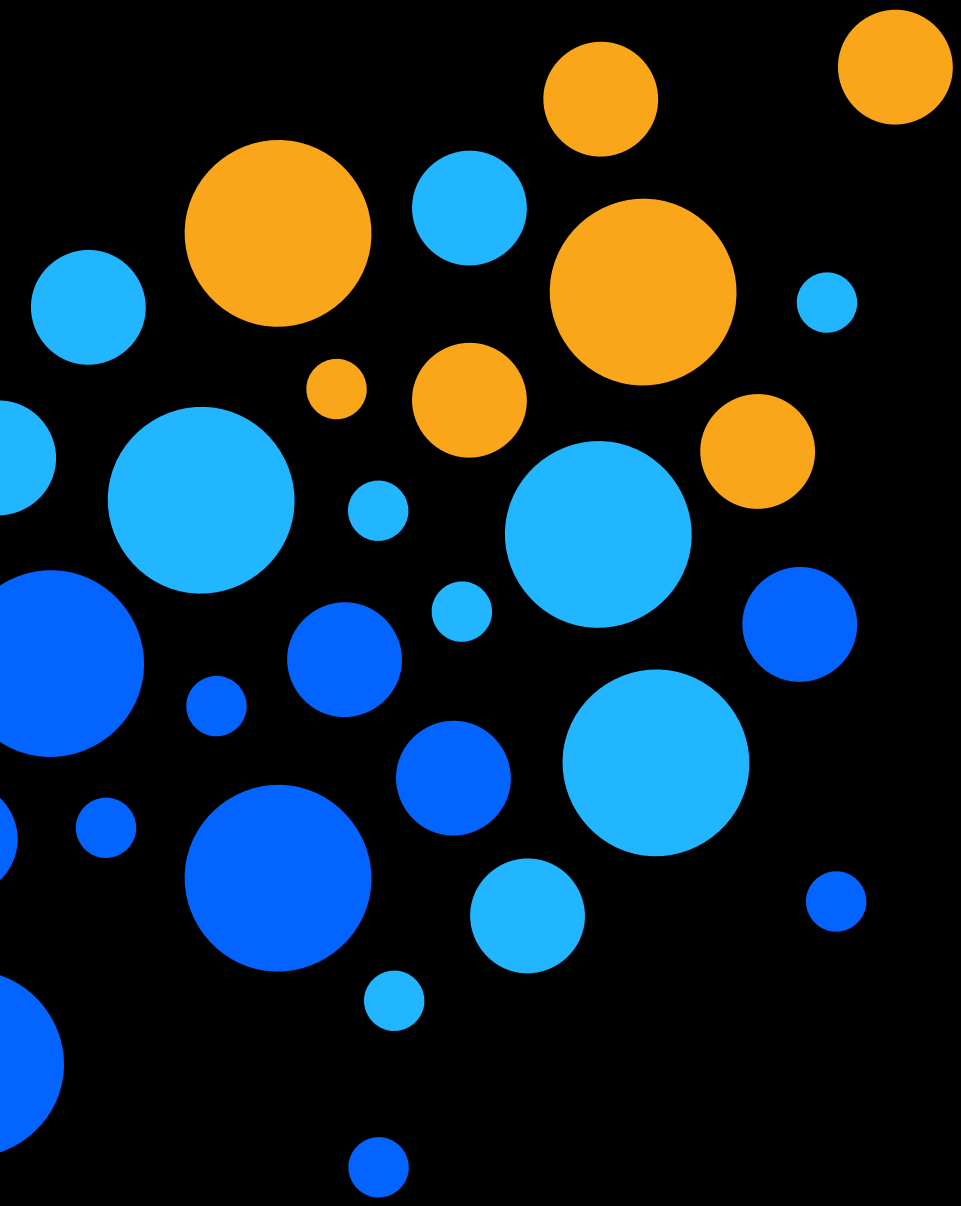
In the future, we could offer real estate companies textile care, including equipment reservation, billing and maintenance, as a new service for their end customers. Indirect additional benefits are also conceivable. For example, energy management can potentially be im-proved through smart grid integration by adjusting the operating time of a V-ZUG appliance - especially in the textile care sector - to the demand in the power grid. This can reduce power fluctuations and optimize the grid.

What benefits does V-ZUG enjoy thanks to the IoT?
SK: As customers share their data with us, we can use it for business intelligence purposes. This ultimately leads to better end products and results in a better customer relationship. Direct feedback on satisfaction with our products is very valuable to us.

Do you also use Industrial IoT (IIoT) in the manufacturing of your devices?
SK: In this area, the whole Industry 4.0 and thus also (I)IoT plays a central role. For example, we were able to use it to significantly optimize our inventories - both in terms of raw materials, semi-finished products and modules as well as finished products. Particularly in the C-parts area, our suppliers' IoT solutions measure local inventory and automatically replenish spare parts based on this data. In production, everything is traceable and all components and processes are transparent. We are currently building a vertical factory that takes into account many other aspects of digitalization and involves a lot of pioneering work. Among other things, we want to tap IoT potential in the future to model and measure energy flows in order to manufacture our products more sustainably. The potential applications of IoT and digitalization in manufacturing are very diverse.

Where do you see the biggest hurdles in the use of the IoT?
SK: Our product retention time in the market is very long. Devices in consumer electronics are being replaced much more frequently today than our appliances. In the case of capital goods, on the other hand, control spare parts can be replaced by an on-site service visit, which in turn would be too costly for household appliances. Our goal is to ensure the smooth functionality of the equipment during its lifespan - which often means 15 years or more - without intervention. Over this long period, for example, complex issues arise in the area of security and data protection, which must be ensured throughout the entire product life cycle. To ensure this, we had to invest quite a bit.

What can we expect from digitalization in the near future?
SK: My personal forecast is that the trend toward digital as a matter of course will continue. In general, there will be consolidation across all digital topics in the corporate world. New hypes are usually overestimated at the beginning and are driven by technology. In the process, opportunities are highlighted and new requirements are also created. In the end, however, the market decides whether a demand exists or a new demand is awakened by a purposeful application.



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Experienced in a wide range of industries

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