elektor *startup*

innovate > launch > trade

electronica
fast forward
the startup platform

2018/2019 edition

Startup Guide

productronica
fast forward
the start-up platform
powered by Elektor

elektor
start-up
games
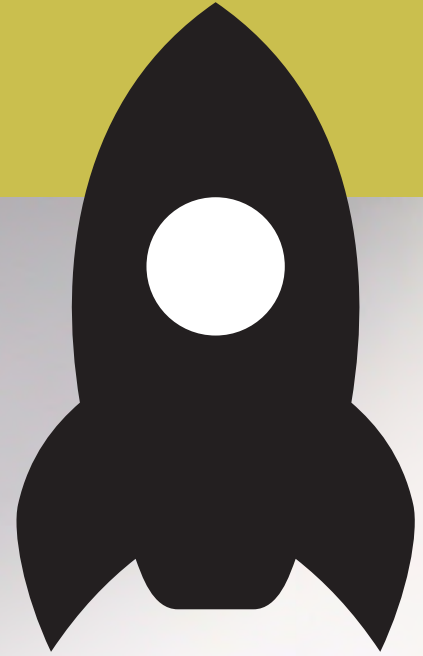
Sweet Dreams

Does that ever happen to you, waking up in the middle of the night with a brilliant idea that for sure is going to make you millions? That revolutionary product on which humanity has been waiting for so long? Excitement keeps you awake, and you toss around in bed for hours. In such cases the best way to get back to sleep is to write down the idea on a slip of paper. This frees up the mind and will take you back to Slumberland in no time.

Does that ever happen to you, waking up in the morning and finding a note on your bedside table with scribbled words and lots of exclamation marks? It appears to be your own handwriting, so you must have written the note yourself, but what on earth is it about? That it's gibberish is obvious, so you throw the piece of paper in the trash before going down for breakfast. A new long day with the same boring work you've been doing for years is just around the corner.

However, not everyone bins their nightly scribbles in the morning. Some people manage to decipher the doodles and start working on them. They see opportunities, maybe not as many as the night before, but enough to invest some serious effort in it. They believe in it. A prototype is built and a team is formed; a startup is created, an exciting adventure begins. Many of those startups would have been better off if they had thrown that bedside note away, but some turn out to be viable and a few even rake in millions.

This guide presents a number of smart folks who didn't throw away their notes in the morning but kept them and worked them out thoroughly. The results, whether prototypes or startups, were presented at an Elektor Startup Competition. Whether they'll make it far, we don't know yet. What is certain though is that your idea, however sloppily noted or formulated, can take shape with some attention and elaboration and can be judged as useful, sometimes even genius, by a strict jury and a critical audience. It's never too late to rummage your trash bin!

Clemens Valens, Chairman of the Jury

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Contents

Q&A with Falk Senger,
Managing Director of Messe München

About electronica & Fast Forward 2018

Q: Once again electronica 2018 saw a new record number of visitors and exhibitors. Does this growth reflect the electronics industry?

Trade fairs always reflect the current situation within a sector. We were therefore very hopeful even before electronica 2018 that an increase in the number of exhibitors would also mean more visitors. Naturally, the electronics sector benefits from the latest developments in society, for example, digitalization, connectivity, and artificial intelligence. At electronica, the world's leading trade fair, companies showcase their innovations and visitors know this. It is, therefore, a must for both sides and we're delighted that the number of visitors has increased by over ten percent.

Q: To what extent is this development influenced by digitalization?

Digitalization is the umbrella under which current developments are taking place: Internet of Things,

artificial intelligence, smart energy or blockchain would not be possible without digitalization. As the leading trade fair in the area of electronics, electronica showcases the various components and applications that make digitalization possible.

Q: While topics such as robotics, Internet of Things and Industry 4.0 were discussed merely as concepts a few years ago, we now see many companies that are making these topics a reality. In 2018, electronica's slogan was "Connecting Everything – Smart, Safe & Secure." The "security concept" is clearly being emphasized. Is there a special reason for this?

The motto "connecting everything – smart, safe & secure" shows that connectivity is playing an ever-growing role in our daily lives, both in a private and work setting. At the same time, security for connected factories, smart homes, and mobile end devices must be guaranteed. Consumer surveys show this too. In the run-up to the trade fair, we published the results of the electronica Trend Index. For the survey, some 7,000 consumers from around the world were questioned on topics such as smart mobility, voice control, and e-health.
The results revealed that the public is receptive towards these topics. However, consumers expect that the technologies and applications are safe from abuse by third parties. The results also clearly show that security is a key concern for the majority of people.

Q: More and more international companies are coming to electronica to sign new cooperation agreements and to get a sense of the newest innovations. What significance does electronica have in the area of fostering innovation?

At the world's leading trade fair for electronics, visitors look forward to seeing new products from the electronics sector every two years. For us as the trade fair organizers, it's therefore essential that we identify trends and encourage innovations. By that I mean not only new products but also encouraging startups and targeting pupils and students. Given the lack of specialist staff nowadays, trade fairs are also a platform for discussions between companies and potential new employees.

Q: With electronica Fast Forward powered by Elektor, a competition was on the agenda for the second time in a row which presents young companies and new approaches from all over the world. Do you see the next "global players" in the electronics industry here?

With electronica Fast Forward, we offer young companies an excellent opportunity to present themselves and their solutions to the market. We're very grateful for our partnership with Elektor. The second contest was immensely successful and we hope that the startups that took part in electronica Fast Forward will establish themselves on the market: There could even be a future global player among them.

Q: What do you particularly like about the Fast Forward concept?

The combination of a classic exhibition and product pitches in the forum is what makes electronica Fast Forward so successful at the trade fair. Participants have the opportunity to present their solutions both at the stand and to visitors and the jury in detail during short presentations. At the same time, visitors can find to the point information about innovative future solutions.

Q: Which startups caught your attention and have been your favorite among the winners?

As far as I'm concerned, all the startups that took part in electronica Fast Forward are winners. Through their innovations, each individual company

is helping to shape the electronics of the future. I was particularly pleased to see such a variety of entries among the more than 30 participants. The solutions and products covered a range of areas including automotive, embedded, medical electronics and cybersecurity.

Q: In 2019, the productronica Fast Forward event will be held for the first time together with Messe München, a spin-off of electronica. 2019 is, so to speak, an innovative year. Will there be an electronica Fast Forward 2020?

We're delighted about the possibility of extending our partnership with Elektor at productronica and we're convinced that Fast Forward will become a successful and established concept there too. The success of the first two Fast Forward contests as part of electronica has shown that encouraging startups and innovations is a very popular concept. Discussions regarding electronica Fast Forward 2020 are on-going." ■

Facts & Figures
electronica Fast Forward

Finalists of electronica Fast Forward (e-ffwd) 2016 & 2018 worldwide

David Rhotert from Companisto to their investment in MOWEA

"With this first investment, we are pleased to have provided the founders of MOWEA with a good starting position for what we hope will be a very successful future."

MOWEA during the final ceremony 2016

BotFactory

"We had to make ourselves known to people who are interested in electronics (also professionally).
The win of the e-ffwd 2016 increased our credibility."

Volabo

"We believe that in 2022 the first vehicles powered by an ISCAD will already be on the road."


Volabo booth at e-ffwd 2018

The Background information 2016

The first edition of the electronica Fast Forward concept was a real success with 74 applicants in three categories (Idea, Prototype, Startup) from 22 different countries. Out of those applicants 34 finalists were selected (Ideas = 7; Prototype = 16; Startups = 11). In our last Startup Guide we displayed all of them but for the new edition we made some research and talked with the finalists to see their development.

The 91% Statement 2016

We got positive feedback and can look at a total survival quote of 68 % after 2,5 years, counting in all categories. Out of the startup category, 91 % are still alive and economically healthy. Due cooperation and finance rounds, the startups raised more than 10 Mio. €*. * 4 out of 10 shared insights
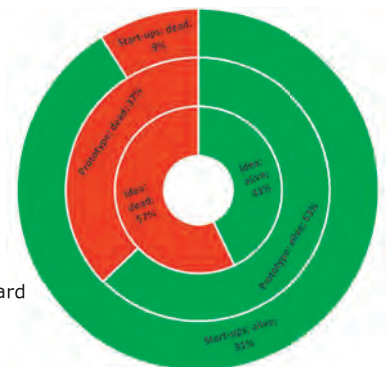
"Survival-Quote" of electronica Fast Forward finalists of 2016

European finalists from 2016 and 2018

Teiimo
"We are looking for a strategic investor who supports us with a funding in the single-digit million range. Above all, we want to promote product development and expand the sales network."

Teiimo, winner of e-ffwd 2018

Wisebatt
"electronica Fast Forward was great. We were happy to meet new customers and partners. Thank you for your support Elektor!"
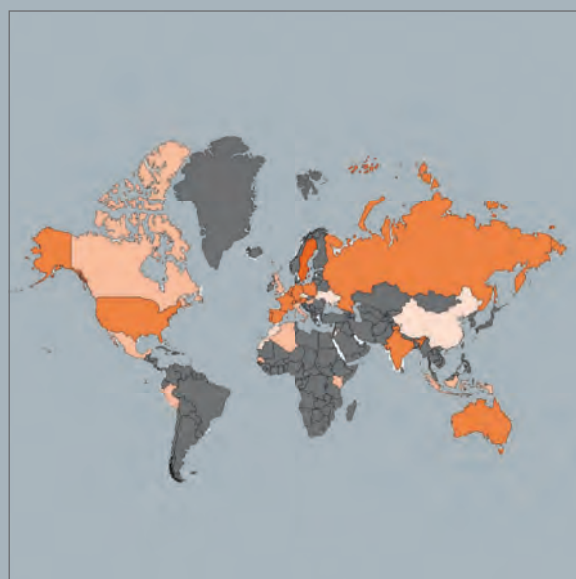
Wisebatt, finalist of e-ffwd 2018

Inecosys
"The last time at electronica Fast Forward we only presented the concept, now we have a finished product with which we can present the actual design."

Inecosys, finalist of e-ffwd 2018

The Background Information 2018

electronica Fast Forward – powered by Elektor 2018 with 162 applicants and 32 finalists was the biggest event so far in the history of Fast Forward.

This time the Fast Forward area was situated in the middle of the hall C5 right next to Avnet (one of our main sponsors). All 4 days, we had high traffic and visitors to our startups.

The Perks 2018

Each finalist achieved his own booth with a presentation-area of about 8 m². We had an open Fast Forward area of about 450 m², where discussions took place. The finalist concurred against each other during the Pitching contest. Each of them had 5 minutes to convince the jury of their product. At the last day of the electronica fair. Four finalists got elected to prise the 3 winners out.

All finalists got high attention from Elektor's community before, during and after the contest took place.

Dark orange shows finalists, light orange applicants

Q&A
with Christian Reuter
On Arrow's involvement in FFA 2018

By C.J. Abate, Elektor

Foto Christian Reuter, Training Officer Engineering

The electronica 2018 Fast Forward Award event jointly staged by Elektor and Messe Munchen was co-sponsored by global technology provider Arrow. Here we have Arrow's Christian Reuter look back on the event in his answers to 9 pertinent questions asked by Elektor's C.J Abate.

C.J. Abate: Arrow sponsored electronica Fast Forward Award, the startup platform powered by Elektor. The competition — which took place throughout 2018 and wrapped up at electronica 2018 in Munich — gave startups

from around the globe a chance to showcase their electronics technologies. Given the high traffic to the booth and the positive feedback from attendees, we're very pleased with the event. How satisfied are you with the event's outcome?

Christian Reuter: For Arrow it was great to be part of Fast Forward at electronica 2018. Our booth was always crowded with visitors. Almost all startups came to our booth to talk with us about the optimization of their development and about services Arrow we offer in addition to components provision. Another reason to stop by was to learn more about our campaigns in collaboration with crowdfunding platform Indiegogo. Also, many visitors showed high interest in the presentations or our demo boards. In sum we are very pleased with our presence at Fast Forward.

C.J.: A few years ago, Arrow began developing its own boards in cooperation with its customers. Prior to electronica 2018, Arrow offered free boards to the Elektor community members (via the "Arrow Board Raffle") so they could start developing new electronics products. Tell us about Arrow's boards — specifically those that are the most popular among engineers developing new products.

Christian: The raffle was phenomenal. We hoped that a few hundred Elektor readers would participate. Within the eight weeks of the raffle, more than 1000 participants filled out the form to get a board. Among the most popular were smart-home boards like our ARIS board family. With these boards it is possible to easily start a smart home project and remotely track temperature, humidity, brightness or shocks and control your home, garden or summer house. The programming of the boards is easy, and due to the Arduino header it is possible to stack a shield if needed. We also had many requests for our System on Module boards like the Dragonboard and i.mx7 board. These boards target Linux users who need an industrial version of a Raspberry Pi. Many visitors were also interested in the Chameleon board. This board is based on a Cyclone-V FPGA and some FPGA knowledge is needed to work with it.

C.J.: The entire Elektor team was impressed by the exceptional innovations presented by startups that participated in electronica Fast Forward. What are your thoughts on the participants and winners?

Christian: For me as a jury member it was great to listen to all pitch presentations, and it was not easy to select the top startups on the final day. The level of innovation was very high, so perfect for Arrow to be part of it given we are known for "Guiding Innovation Forward". Also the bandwidth of ideas was great. The participants covered smart home, thought about education, software tools for developers, predictive maintenance, new interactive board games and smart wearables. And don´t forget the cocktail machine that really was an eye catcher. I´m confident that some of them will be successful.

C.J.: About 3 years ago, Arrow and Indiegogo launched a crowdfund-to-production service for entrepreneurs. You highlighted this service at the electronica 2018 event. Provide some details about the service and how entrepreneurs can use it. How do you support entrepreneurs from ideation through production?

Christian: Well, as an entrepreneur you just need to launch the campaign on the Indiegogo webpage or on arrow.com. In your project relates to electronics, it will be automatically reviewed by an Arrow engineer. Next step is that we get in contact with the entrepreneurs and in this case it depends on the campaign / project which service is needed. Some of the Fast Forward startups looked into this straight away and discussed with us the next step of production or modification of their device. Some of them launched an Indiegogo campaign and plan to work closely with us moving forward.

C.J.: How exactly can Arrow help startups deal with prototyping and manufacturing challenges?

Christian: Arrow has a partner program with companies we work with for this support. If a

startup needs support for the CAD design, software, certification, production or something different, we work with experienced partners who can offer this service. These are the same partners we work with on our traditional customer projects. Additionally an Arrow engineer supports startups during the full process.

C.J.: What does it mean to become Arrow Certified?
What are the benefits?

Christian: Arrow is reviewing all campaigns from Indiegogo. If we think a campaign is a great idea, we

issue the "Arrow Certification" which is published on Indiegogo. This might lead to more investors given it is visible that Arrow sees a potential.

C.J.: Arrow had two separate zones electronica 2018 where it showed off the solutions it can deliver. One zone was focused on Internet of Things solutions.
The other focused on software solutions. The Elektor community will be very interested to learn about what Arrow is doing with software.

Christian: Arrow is a global technology and services provider. Nowadays the biggest part of the developing phase is the software development. To offer the right services we have software resources and we want to support our customers with the latest technologies and technical trends. Artificial Intelligent (AI) is coming more and more, so this is just one example we´re focusing on.

C.J.: Tell us out about Arrow's commitment to fostering startup growth. How does sponsoring events like electronica fast forward figure into Arrow's overall plan to engage and support the electronics startup scene?

Christian: As we talked already about the Fast Forward event and the high level of innovation the startups demonstrated, Arrow wants to drive this innovation. The goal is to guide startups with our services and experience to build a long-term business relationship. With Indiegogo and such events we can get in direct contact with entrepreneurs. We`d like to get in contact with them at a very early stage of the development phase. The sooner a startup gets in contact with us, the better we can support them. As startups don´t know business partners like us in detail, such events present us with great opportunities.

C.J.: Thousands of Elektor community members have great ideas for innovative new electronics products. But many of them think of themselves as engineers, not as businessmen and businesswomen. And thus, they're reluctant to take their first step down the path of becoming entrepreneurs. Do you have any advice or words of encouragement for these potential startup leaders?

Christian: I think most important is that you are 100% sure to do this step. Second: don´t do it alone. You will see that the workload is too high to cover all tasks by yourself and you can´t be expert in finance, engineering and marketing. Many entrepreneurs don´t see all the needs, they are mainly developers and not sales or marketing experts. You can have the best product but if no one knows it or it´s too expensive, you can´t sell it. At the Arrow partner network we have companies, who guide startups regarding these requirements. They will provide you with a marketing analysis, support on how to run a crowd funding campaign or get financial support. Arrow is happy to support on logistics and technical support. ■
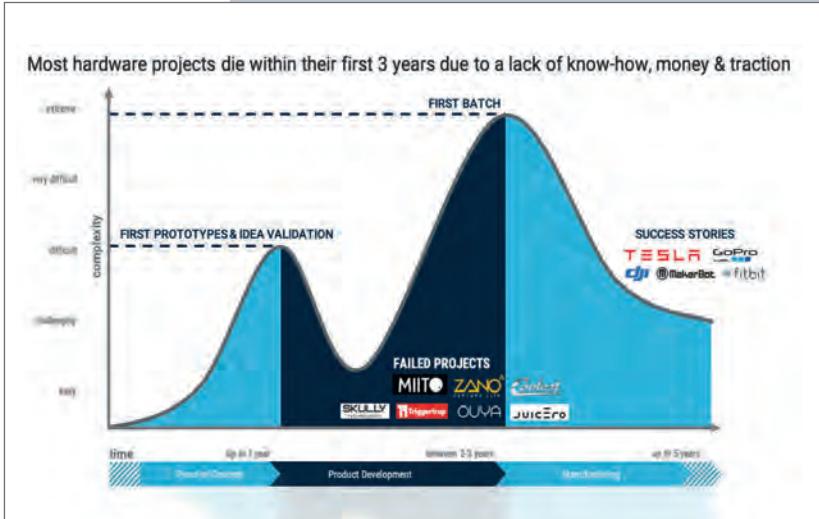
How to Develop and Manufacture
your First Hardware Product

By Niclas Fritz, BatchOne
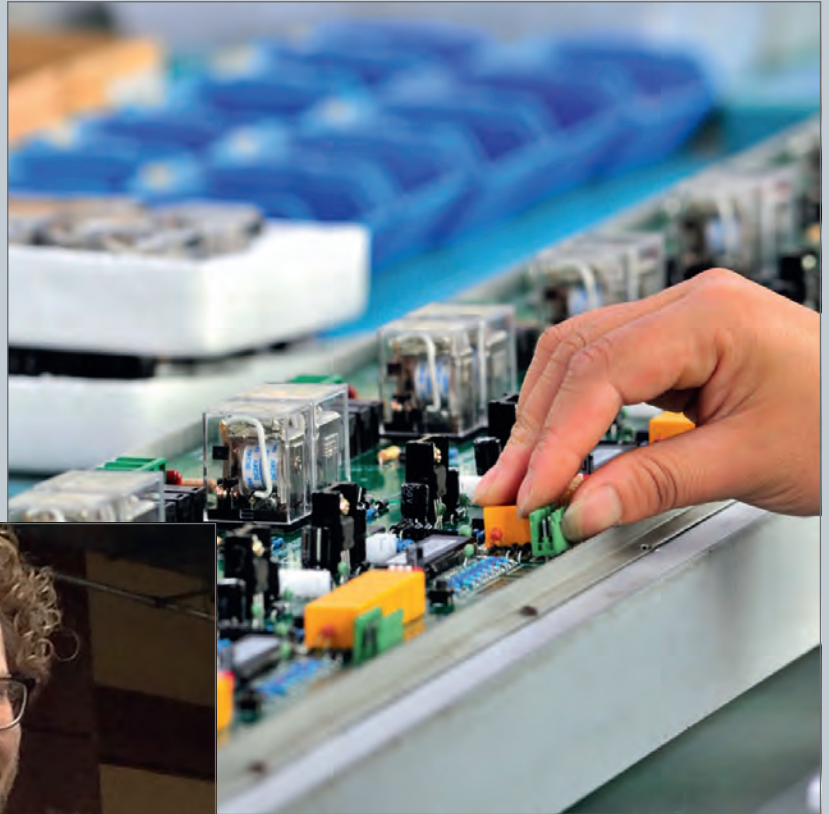
www.batchone.com

Electronic product manufacturing is a cyclic process, and many startups are sadly unaware of the dangers of jumping in overenthusiastically as well as at the wrong place. This article, a written rendering of a dynamic presentation by Niclas Fritz delivered at the electronica Fast Forward 2018 event, provides solid advice to prevent mistakes right at the beginning.

Figure 1: Typical hardware startup lifecycle.

Figure 2: Different hardware startup that failed for various reasons.

Part 1:
Common Hardware Startup Pitfalls

After everybody has mainly been talking about software, hardware made its comeback, and not only by virtue of the Internet of Things. Due to Arduino, Raspberry Pi & Co., first prototypes could be built much faster. Likewise, 3D printing now permits testing first product designs and mechanical parts at a fraction of the costs compared to 10 years ago. In addition, Kickstarter, Indiegogo and other crowd-funding platforms have made it much easier for en-trepreneurs to fund their projects early on. Finally, a global supply chain makes it possible for everybody, even in the smallest village, to order parts from Chi-na and tinker with them a few days later.

Despite the new 'tools' available, hardware is still very difficult. There are dozens of blog posts of hard-ware founders that raised money via crowdfunding, and failed to deliver. A simple google search would yield surprising findings. Examples are Ada, Coolest Cooler, i+ Case, instacube, myIDKey and Zano. Many projects keep failing because most founders have never developed and manufactured a product before, and they simply underestimate the complexity. Some of the main reasons are listed below

- **Incomplete team**
Compared to a complex app that usually needs 2-3 skills (back-end & front-end development plus design), a hardware product easily needs 10 skills or more. Since many of the new hardware products are connected to the Internet, you need the same skills for your app to control your IoT device. On top of

that, you need industrial design, mechanical engineering, electrical engineering, embedded software, project management, sourcing, purchasing, quality management, controlling as well as distribution, logistics, sales and marketing. All these extra steps make it much more challenging to get the physical products to your end customer. Without outsourcing some of the tasks to professionals, startups will not be able to deliver.

• Chaotic project management
Most hardware founders underestimate the importance of proper project management in hardware, as many steps must be completed in a specific sequence. Likewise, they are often incapable of estimating the correct duration for the various steps. Forgetting about one or taking more time with another can significantly delay your shipping date and put your product at risk.

• Overconfidence
Asking for advice has never hurt, especially in hardware. Products are often very complex and small details can matter hugely. Even if you are sure about something, explain it to experts or friends to get some feedback. Investing in a product review and seeking feedback is sure to save both of you lots of money and other resources down the road.

• Underemphasizing product development
Doing a very good job on product development is more important than many people think. It is complex, costly and takes even experienced engineers longer than they usually expect. But remember, the components and the industrial design you choose have a huge impact on manufacturing costs, quality and usability. Being rash or saving money during development will often result in delays. Both increase costs and potentially put your whole project at risk.

• Underestimating the transition from prototype to serial production
From day one, you need to think about how to manufacture your product. What can be 3D printed at home and assembled by hand might not be able to be manufactured at scale or at least not at the calculated price. Likewise, your proof-of-concept which will be up and running quickly on your Arduino or Raspberry Pi will need a lot of work to run on a cost optimized architecture. This often includes different chip sets and even different concepts.

• Working with the wrong manufacturing partner
Hardly any successful product was ever developed and manufactured without the help of partners. Make sure to work with the right external experts and leverage their experience. Don't make the mistake of working with inexperienced partners or partners who don't care about you. Therefore: never rely on a solely virtual and online audit when choosing your partner(s). Double check if what they say is in line with what you see when you go and visit them.

• Insufficient effort in sales
Performance in sales early on is very important. In fact, spending 50% on marketing and sales and 50% on product development is the right mix for any CEO in the beginning. Selling your product requires a tremendous effort. Before you ship your products, you need to build up a potential customer base and

distribution partners, and online shops and retailers need to be lined up as well.

Running out of money

Managing your cash flow is of critical importance. Many startups run out of money when they have to pay manufacturing partners up front or even their own salaries. It often takes several months until the money of sold products comes in, even when the business is running fine.

Part 2:
How to Develop and Manufacture your Product

Developing and selling a product that customers want, along with reasonable production costs, is the difference between success and failure. Since you are not a multinational, you only have one attempt to get it right. Making too many mistakes or spending unnecessary money will kill you on the way. In the second part of this article, we will focus on how to develop and manufacture your product right.

• How to build a proof-of-concept and verify your assumptions
Before you even start to make your first prototype, you have to understand the problem you are trying to solve. The more time you spend on this, the faster you will ship your product. Go out there and talk to potential customers to get a better idea of what the problem is. Creating several key 'personas' to match the ideal customers also helps a lot to identify new and specific opportunities, making the overall product potentially much richer than initially intended.

The next step is to create a proof-of-concept to validate your product idea and the solution you have de-
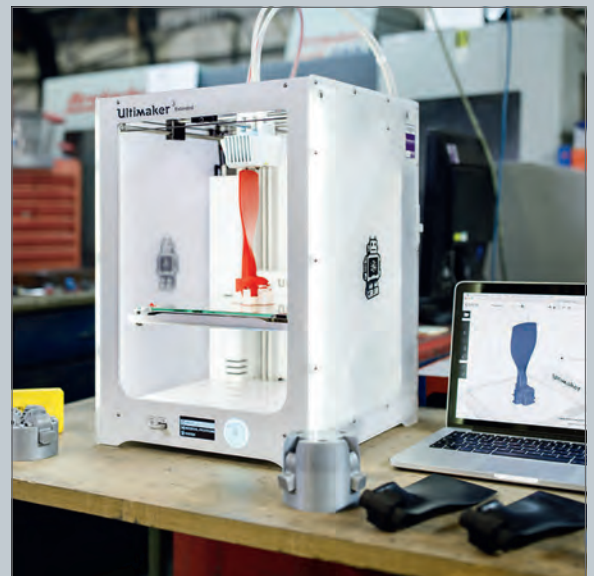

Figure 3: Example of a 3D printer.
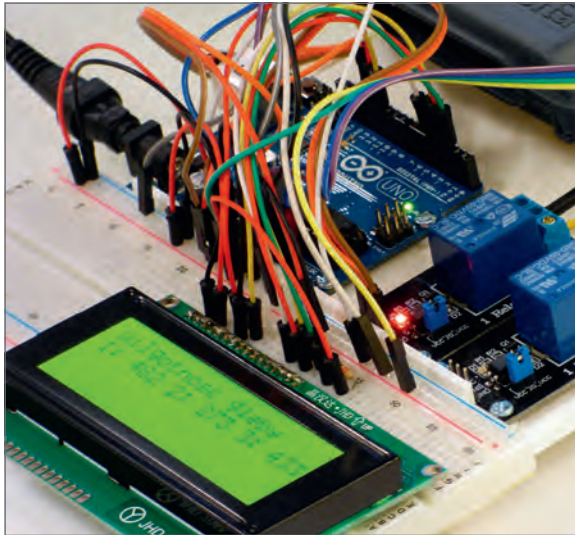Source: Wikipedia Commons.

Figure 4: Example of an electronics prototyping setup using an Arduino. Source: Pixabay
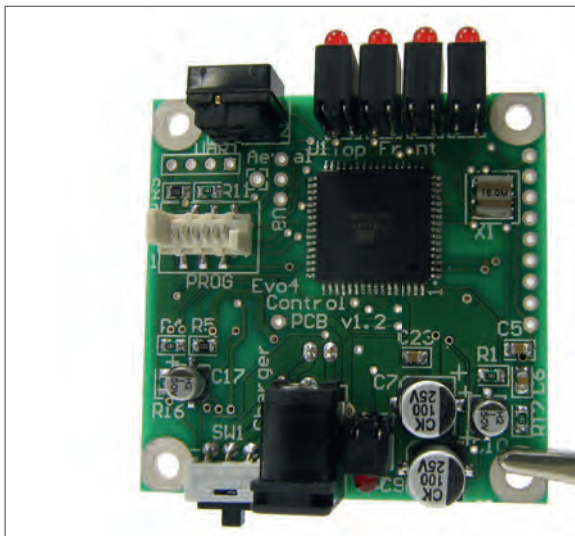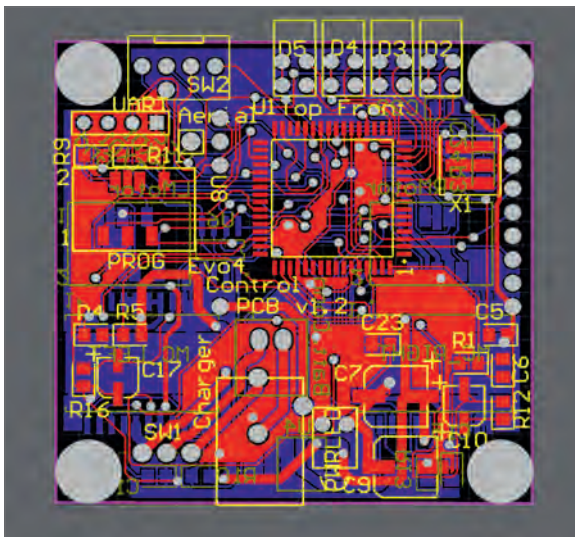

Figure 5: This picture shows (left) a printed circuit board (PCB) layout, created on a computer and (right) the manufactured board, populated with parts. Source: Wikipedia

signed for your identified problem. One of the most important things in early product stages is to prototype often and rapidly. But ideally, come up with lots of ideas and evaluate them before you make your first prototypes. If you want to check an idea, try it out in the simplest way possible. Use a 3D printer to make a quick design and test it. If it works, great. If it does not, improve it and print again the next day. Sometimes it also makes sense to use different 3D printers. An Ultimaker for super-fast tests and a Formlabs for the more advanced concepts and delicate parts that already look more like the final version. For quick and dirty prototypes, it is often smart to start with cardboard for a first evaluation. Ideally, you can also use off-the shelf parts or use parts of competitors' products.

Regarding the electronics, it is often best to start with an Arduino or a Raspberry Pi for the first trials since they often have the right sensors included. If not, you can get shields with extra sensors, or hook up anything else you need. But if you already have an idea about your target architecture, select an evaluation board with a similar microcontroller. It is also recommended to try out different libraries and forums for help and extra speed. In the end it does not matter if the electronics you use right now are big, expensive and don't fit your first designs. Verifying your assumptions is more important. Saving costs and making your electronics smaller is going to be one of your main future goals.

• **How to choose the right electric components**
Once you have built a proof-of-concept and your future customers love it, it is time to choose the right electronic components and develop the first PCB layout. But before you start, it is essential to define the engineering specifications. The following requirements should be included to ensure your product will not fall short:

• Legal requirements and certifications needed
• Environment under which the product operates including required tests
• General hardware and sensors
• Types of data you want to gather and process
• Power and battery requirements
• Firmware / APIs / libraries
• Software and cloud services
• Definition of all mechanical parts including their function
• Materials used

Now you have a rough idea of your product specifications. That's great! Next, start focusing on the electronic components, as they often have a big impact on other aspects of the product. Make sure they fulfill the legal, environmental, general hardware, including sensor, power and battery requirements. Afterwards, verify that they are available in small and large quantities at competitive prices and that they have short lead times. Since this is usually hard to figure out on your own, it is highly recommended to work with an electronic distributor. They know everything about the components and can make sure that they work well together, are affordable and whether they will still be available for ordering in a few years. Changing the microprocessor one week before you order your components for mass production because it is not available will likely kill

your startup. Choosing the wrong components is a common mistake many startups make, but it is also an easy one to avoid.

Next, you should make a first PCB design based on the selected electronic components. If your PCB is very complex for the layout, it sometimes makes sense to use a development board with a bigger form factor, with easy access to all components. This can speed up the development time and help to debug many problems. Start writing the software and make the first test with your electronic hardware to double check whether the components harmonize and operate as planned. Make immediate changes if things don't work as planned or in case you identify superior components in terms of price, lead times or performance, since this is the last time changes won't cost you much money.

• **How to design and engineer your product**
Once you have identified your product specs, selected the electronic components, designed the target PCB schematics / layout, it is time to start thinking about the industrial design (ID) of the product. Unless there is no experienced industrial designer in your team, it is of critical importance that you team up with a professional industrial designer right away. Your designer of choice should ideally have years of experience in your specific area (e.g. automotive, consumer tech, med-tech) and has already introduced many products to the market. This will save you lots of time and money in the long run, as you will receive valuable feedback about aesthetics, usability, manufacturability and how to reduce your manufacturing costs from the start. By the way, industrial design is one of the best tasks you can outsource. Working together with an agency or a freelancer that is understanding startups and is charging decent fees is also usually much cheaper and faster than hiring a designer full-time. In addition, an agency often uses input from 2 or 3 designers in the 'ideation' phase to get better results much faster.

A good product design takes the following points into account:

• Usability is more important than function
• Good aesthetics are key
• The best designs are simple
• The design should support mechanical functions
• Details matter a great deal
• Manufacturing of the parts should be easy and reasonable in price
• Make sure to meet all certifications and/or regulations (CE, FCC, drop test, IP Class etc.)
• Repairs and customer support should be easy
• Avoid common mistakes such as faulty sealings and overheating
• Company logo and other branding elements should support the design
• Never forget product packaging requirements

A good design process starts with understanding the customer journey and how users engage with the product. This should be documented with story boards from day one where the product is packed and unpacked, used the first time, used again, potentially updated and repaired as well as replaced and recycled. Once you have an understanding, start

Figure 6: Examples of first design sketches during a BatchOne ideation workshop.

to develop the first design sketches. As soon as you are able to pick 1 to 3 clear winners, start to make the first 3D models with CAD programs and optimize your designs. Be sure to include limiting factors such as the size of important mechanical parts, PCBs and other components. 3D renderings can also help you to better evaluate the quality of the designs. Next, build your first design models and prototypes to evaluate how your product feels and how potential customers use it. Since it is an iterative process, keep improving everything you don't like until you are happy.

In parallel with developing your electronics and starting to work on your industrial design, you should start working on your first mechanical concepts. Begin to prototype your opening or release mechanisms or whatever mechanics your product requires. Make sure to try out some off the shelf components and experiment with different materials such as plastic and metal. The goal is to find a simple solution that works and is inexpensive to manufacture.

After, the industrial design is finished and your mechanical concepts are working, the next step is to take care of the Mechanical Engineering (ME). Of course, you can also hand over the 3D design files to your ME partner. Some design agencies have an ME team inhouse, some don't. In case the design agency does not offer engineering services, the same rules to finding the right ME partner apply as when looking for and ID partner. In the mechanical engineering phase, the design is taken to the next level and all housing and mechanical parts of your product are prepared for production. Wall thicknesses, draft angles and sealings are added, or fine-tuned, fixing features for the housing parts are created and the overall assembly is checked once again. Ideally this phase has two loops of prototypes, so you can identify any issues early on. Whatever is bothering you now, will certainty bother your customers later and result in negative feedback. And now is the last chance to easily fix them!

Figure 7: Example of several design prototypes which look like the future product but don't work.

Figure 8: Optimization of the wall-thickness during the mechanical engineering phase to increase manufacturability.

- **How to manufacture your product and ship your first batch**

Once you have united the electronics, mechanics and design and ended up with a product which is about 80% ready, it is time to start optimizing for mass production. But before you take any additional steps, it is important to find the right partners for injection molding, electronics, assembly and other steps you are going to outsource. Each partner should be selected carefully. This will take a lot of time and often months pass before you reach a final agreement. One wrong decision can endanger your whole project. To find a good partner, it is recommended to evaluate up to 10 potential partners as a first step. Ask the best 5 for a quote and evaluate them based on the following points:

- Level of related experience with similar products
- Do they have enough capacity? Can they scale up with you?
- How do they communicate with you? Do they speak the same language?
- Feedback quality of their engineering staff
- How realistic is the proposed timeline?
- Willingness to sign an NDA? How do they handle your data?
- What kind of quality processes are in place and how do they control them?
- Do they have a dedicated project management team? Do they listen?
- What are the payment terms? The later you have to pay, the better!
- Total costs – keep in mind, it hardly ever pays off to go with the cheapest option!

Once you have chosen your manufacturing partners, it is very important to work together from this point onwards and jointly finalize your product design, since you will benefit from their established manufacturing know-how and processes.

Some general advice to reduce manufacturing costs is to:

- Simplify the design and reduce the number of parts
- Develop modular designs which can be used for other product versions
- Use standard components
- Design multi-functional parts (e.g. structural + electricity earthing)
- Design for ease of fabrication
- Provide tolerances

Some general advice to reduce assembly costs is to make sure:

- Parts are inserted from top
- Parts are self-aligned
- Parts do not need to be oriented
- Parts are secured immediately (e.g. with clips, no screws needed)
- Parts require no / as little mounting aids as possible
- Parts require only one hand for assembly when assembled by hand
- Manual labor is reduced to a bare minimum
- Product can be assembled by unskilled labor / without a lot of training

At this point you build your engineering prototypes without ordering expensive tools just yet. The goal is to do some assembly dry runs and evaluate the overall quality of the product. The main focus is usually the refining of the design of plastic and metal parts for high volume production as well as the last optimization of the PCBs and cable lengths.

Once you are set, the next step is to order the tools. Your contract manufacturer will now manufacture the first few dozen units, using your defined manufacturing assembly procedures. To ensure your manufacturer is doing things according to your specifications, station at least one engineer at the manufacturing site. It is also important to do basic quality tests including power, thermal, and electromagnetic interference / static etc. Any identified flaws should be dealt with until all specifications are fulfilled.
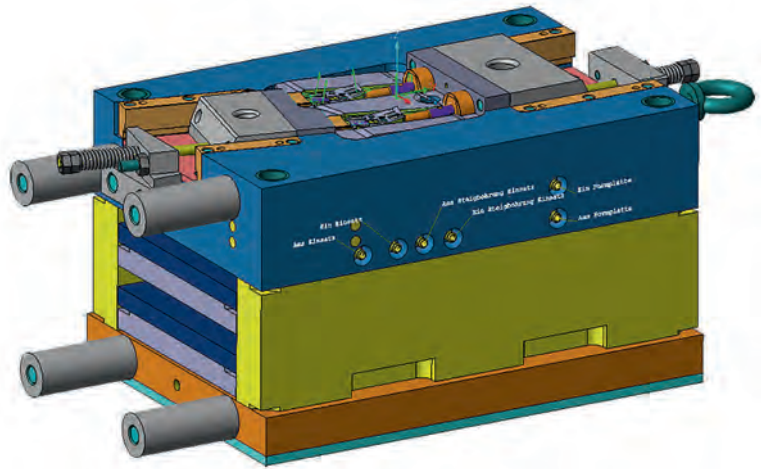
Figure 9: Example of a CAD tool design.

This is the first time, you know how your final product is manufactured and what it looks like. Now is the time to get the last certifications and tests (battery, drop, temperature, etc.) done. Any certification you can get done during the development process, should be done before. Depending on the complexity of the product, it can take 10+ weeks to get some certifications. Check also for cosmetic features like in-mold decoration, pad printing, plastic colors, or screen printing and optimize if necessary. From now on, you will start to ramp up the production and increase the percentage of products off the assembly line that work, and number of units made per day. These will be the first units you can sell. Congratulations, you have taken a huge step!

Manufacturing is a never-ending process. Unfortunately, you are still at the very beginning. Your goal now is to carefully analyze your manufacturing process to further reduce the costs of goods sold and to reduce the failure rate below 1%. Also make sure that all training procedures as well as quality assurance (QA) and quality control (QC) procedures are in place. Continuously test all products and process and improve whenever possible. Likewise, start optimizing the supply chain for subsequent production runs. If demand is high, set up additional lines. Most importantly, already start working on your next product. Like in the music industry, "One-Hit Wonders" don't survive long. ■

The **Best Startup** in the **Benelux!**

#1 Arkite

This is the title of the winner of the Elektor Startup Games, which took place during the Electronics & Applications (E&A) trade fair in Utrecht, Netherlands. Eight Startups competed against each other for this prestigious title, and the winner received expert marketing assistance and entry to **e**lectronica Munich, the world's biggest electronics trade fair for electronics engineers.

The following were participants at the
Elektor Startup Games 2019:

Loratec - The company for Smart Internet of Things
applications!

Envitron - Providing a system to measure, analyse
and optimise all forms of energy.

Participants were expected to convince the jury
on the merits of their innovation, based on clear
performance. Not only the best technical aspects
but also commercial viability and sustainability were
of great importance. The projects presented ranged
from connected children's toys, industrial energy
management, 3D printing with metal, to cooling of
stacked-microprocessors.

#2 ValCUN

#3 Incooling

Picoo - A revolution in the field of play: a robust,
interactive device that moves children and allows
them to play together

Gight - The guiding light: Creators of innovative
sensors and software/hardware that help prevent
accidents for elderly people living alone at home

Arkite - The Human Interface Mate that provides
employees with real-time picking and assembly
instructions through Augmented Reality and warns
them in case of error in a pre-emptive manner

Incooling - Designs state-of-the-art cooling systems
with a mission to bring next-generation computing
performance.

ValCUN - Develops disruptive technologies that
allow quick and economic 3D metal printing with the
opportunity to use recycled metals.

Aircision - Developing free space optics (FSO)
solutions for telecommunications. They are
conducting the world's first FSO trial for 5G.

In addition to the jury, independent visitors to the
trade fair also showed much interest in the startups
and their products.

And the winners are...

#1 **Arkite,** The Best Startup in the Benelux
with "Human Interface Mate"

#2 **ValCUN**
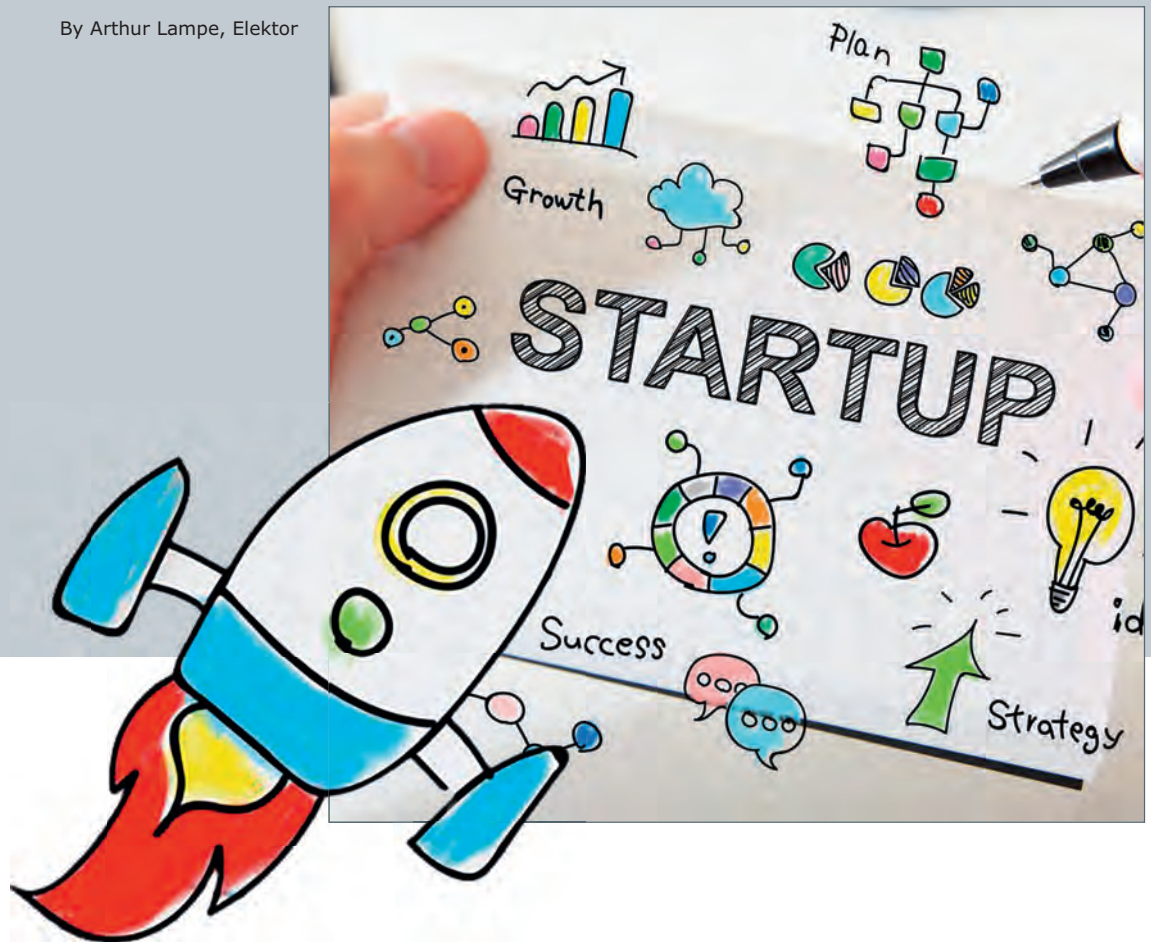with "Disruptive Metal 3D Print Technology"

#3 **Incooling**
Incooling with "2-phase CO_2 Cooling at High
Pressure"

Elektor thanks all the Startups for their participation
and wishes them future success. We are also grateful
to the sponsors for their dedication and contributions
to the event. ■

Tips & Tricks
for Startup Founders

By Arthur Lampe, Elektor

The things you can do to increase your chance of success as a startup or scale up.

1. Bootstrap as long as you can.
Focus on your product and market first. *"Generally speaking, too many startups focus on fundraising and not building the business or product, so bootstrap as long as you can,"* says Marvin Liao, Partner at 500 Startups. Another area in which startups fail is by assuming that raising money from Venture Capitalists (VCs) is a business model, *"Get your money from your customers to pay for your product,"* says Sepúlveda Schulz. (Stapley-Bunten, 2019)

2. Find the right product-market fit.
"Most investors will invest in the Product-market fit, rather than in development. Product-market fit is trying to keep up with user demand." (Stapley-Bunten, 2019). Use a Minimum Viable Product (MVP) to test your ideas and find the right fit.

3. Developed a detailed business plan.
"As part of the Business Plan you should have produced financial forecasts and the assumptions behind them and this will enable you and others to assess how much funding you need and be able to value your business."
(Smith, GETTING FINANCE - PART 1, 2019)

4. Be prepared.
"Remember that to attract any investor you will need a real business and not just dreams, and that business must have a real and supportable valuation."
(Smith, GETTING FINANCE – PART 2, 2019)

"If you intend to use crowdfunding, you will have to invest time and money if you want it to be a success. The major reason pitches falter on a crowdfunding

platform is that the founder hasn't secured enough pledges and backers before launching the funding round. The founder hasn't put any effort into pitching to investors or not doing any research and thinking there is easy money to be had. You need to be pitching and learning from your efforts, tweaking the next pitch with the feedback from investors. By knowing your audience you can tailor your messaging to align with their experiences, play to their needs and views of the world. Putting yourself into their shoes, what are the objections they would have to your pitch?" (Dutta, 2019)

The things you want to avoid as a startup or scale up founder

1. Falling in love too early.
Don't fall in love with your product until you have something to prove! *"First make real sales or sign contracts. The more sales, clients, contracts, letters of intent, negotiations, etc. that you can prove, the more real your business is to an outsider and the easier it will be to raise finance and the greater the value of the company."* (Smith, GETTING FINANCE - PART 1, 2019)

2. Not learning from feedback.
"This is a big failure of many founders, they just can't step back and see that their baby is the ugly duckling everyone else does. Too many founders get arrogant and unwilling to learn and keep pitching the same unsuccessful script to investors. Big mistake. Learn, change your ways, change your product, change your beliefs, adapt and survive. Show a willingness to take feedback and rejection, investors evaluate your reactions to their objections." (Dutta, 2019)

3. Hire too soon.
We know by now that a good team is critical for a successful startup. If you can't find the right co-founders, you might want to hire someone for a role, but be careful not to hire too soon or hire the wrong person. *"Before you do, ask yourself: is this really a role I need? You need a plan of the transparent goals you want them to hit and you need them to agree to hit them. Don't make a gut decision on a great person who is not a great fit for those goals."* (Stapley-Bunten, 2019)

4. Being too positive about time and costs.
It is wise to set up the best and worst case scenario. *"Everything typically takes longer than expected and costs more. By far the biggest reason that startups and early-stage companies fail is simply that they run out of money. My own rule of thumb would be to estimate the time and cost and then double both!"* (Smith, GETTING FINANCE - PART 1, 2019).

Quoted work

Dutta, S. (2019, April). LIFE'S A PITCH, Startups Magazine
https://startupsmagazine.co.uk/article-lifes-pitch

Smith, K. R. (2019, March). GETTING FINANCE – PART 1, Startups Magazine
https://startupsmagazine.co.uk/article-getting-finance-part-1

Smith, K. R. (2019, April). GETTING FINANCE – PART 2, Startups Magazine
https://startupsmagazine.co.uk/article-getting-finance-part-2

Stapley-Bunten, D. (2019, April). FIRESIDE CHAT: HOW TO SUCCEED WITH A STARTUP, Startups Magazine
https://startupsmagazine.co.uk/article-fireside-chat-how-succeed-startup

Arthur Lampe had always an interest for Startups and innovation and loves to work on new daring products and marketing them. As a startup, there is nothing more important than having the right team and correct product-market fit. In my function at Elektor, I can help the founders of tech startups in accomplishing their dreams.

Prototype

electronica
fast forward
the startup platform

elektorstartup
innovate > launch > trade

Prototype

The Prototype category includes participants who already have a working prototype of their technical innovation, but are not yet on the market.

Connexi [Australia]
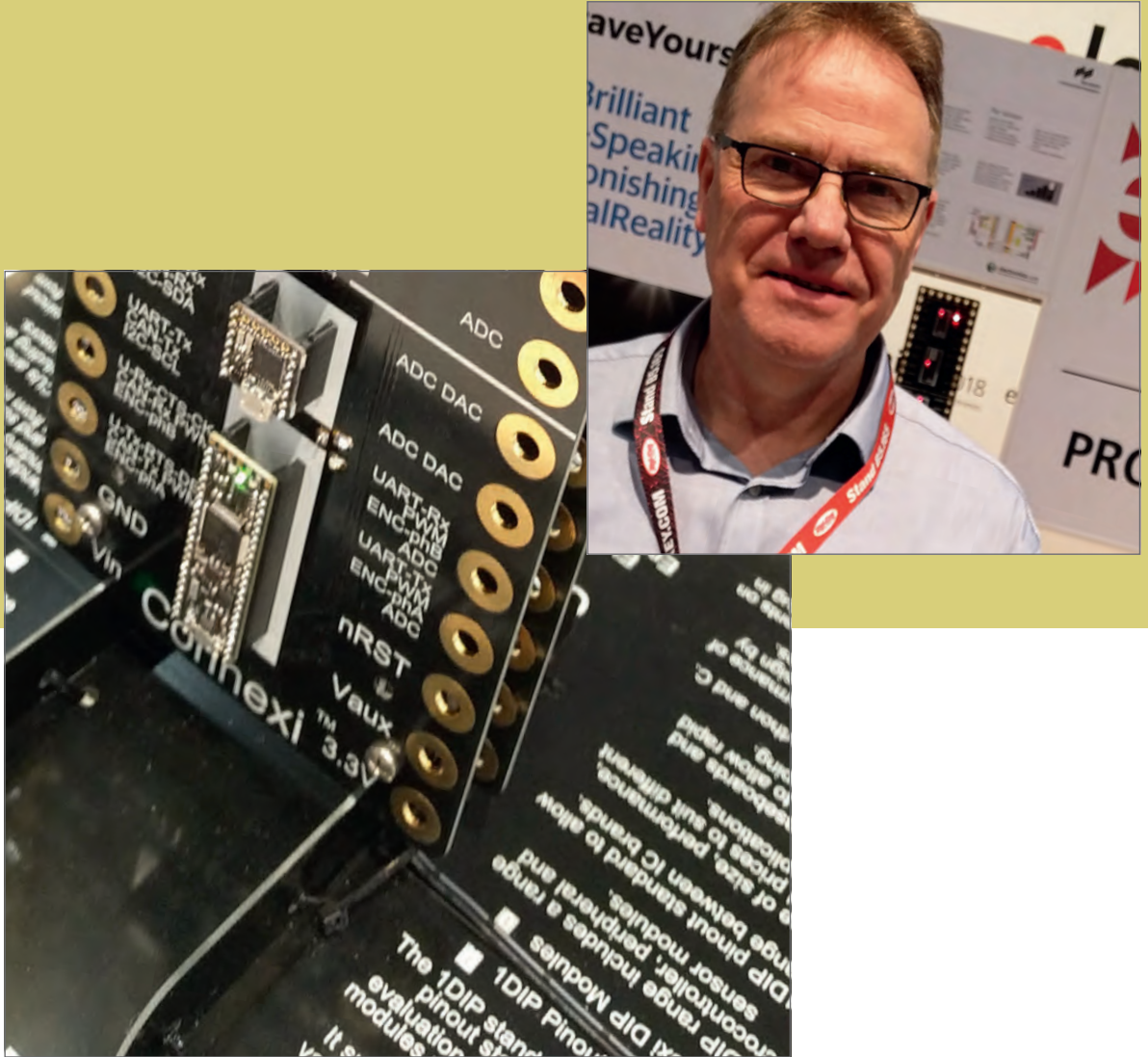
The Problem

Electronic modules and break-out boards are very useful but most have limitations.
- Varying size and pinouts
- No published standards
- Pinouts vary between models
- Not suitable for production
- Can't swap IC brands because their modules differ
- Not enough IO ports
- No prototype baseboards
- Stacked modules run out of IO

The Solution

Connexi DIP modules
- 0.6" or 0.9" wide bread-board friendly
- 7SIP for wired modules
- 14 20 32 40 40 48 64 DIP
- Flexible pinout standard
- Open source standard 1DIP
- Swap and compare IC brands
- Designed for MCUs, MPUs analog, digital, power, sensors
- Pin compatible breadboards

The Innovators

The key innovations are:
Define a user-oriented pinout standard that is independent of any IC pin functionality and publish the 1DIP standard. Use slightly higher pin count microcontrollers and parallel as many pins as needed to achieve all the functions in the 1DIP standard. Consistent alt functions on all pins. Design modules that will appeal to Makers but engineer them to commercial & industrial standards suitable for products requiring CE FCC & UL e.g. ESD protection on USB.

The Technology

Many new ICs are only available in packages that are not compatible with various manufacturing processes, e.g. BGA, wafer scale, QFN. Hand soldering, high current 70um PCBs, older pick and place machines, etc all limit use of fine pitch and advanced packages. Connexi DIP modules can use the latest IC and packaging technologies including BGA, wafer scale and micro vias. As new technologies emerge, you can upgrade your products by simply plugging in a newer pin-compatible module. Supports C and MicroPython.

The Questions

Ranking
*What do you need the most to make your startup/ project a success?*

Rank the options below from 1 to 4 where 1 is the most important.
1 Marketing
2. Finance
3. Operational support
4. Technology support

Tell us a little bit more about option 1.

Connexi products are designed for Makers, commercial/industrial product manufacturers, research labs and educators. Marketing to a diverse user base will be very important. The right type of marketing and advertising will be essential for a successful launch and ongoing viable growth.

We anticipate a controlled rollout of products targeting selected sectors, using press releases and samples to create awareness of the products as well as a forthcoming launch.
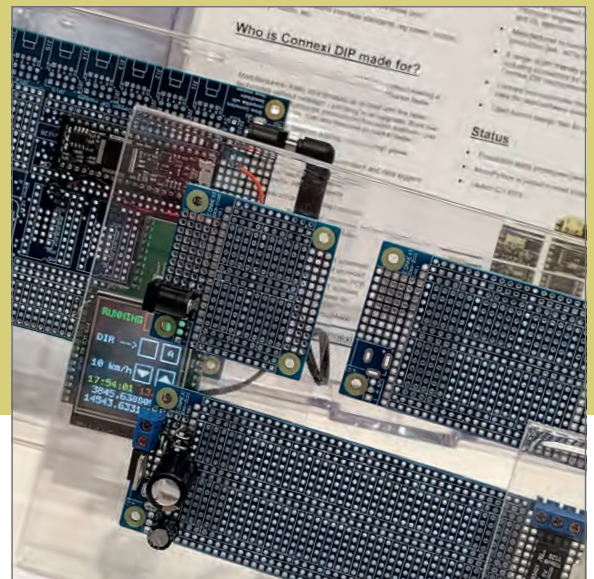
Markets
What are your primary markets?

Our primary market is initially to the following:
- Makers and anyone who wants an alternative to hand surface mount assembly.
- Programmers who also want to build things. Python and C will be supported
- Commercial manufacturers, especially those needing a fast time to market.
- Design engineers wanting to build prototypes and test equipment. For example, the combination of pre-made hardware including baseboards and MicroPython allow rapid prototyping without significant knowledge of hardware and software.

Secondary markets are currently seen to be:
- Research labs, R&D departments
- Educational institutions. We will have baseboards and peripherals targeted at universities and schools to teach programming (C and MicroPython), hardware design and robotics.

Groups
Who are your primary target groups?

1. At launch, we will target the more technical users first as they are most likely to recognise the advantages of Connexi DIP modules and accelerate early uptake.
2. C and MicroPython users, Industrial users.
3. Educational institutions and research labs at a later date.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

We anticipate using online and physical store retailers such as Digikey, Mouser, RS Components, Element 14, Elektor store and other trade and retail electronics distributors.
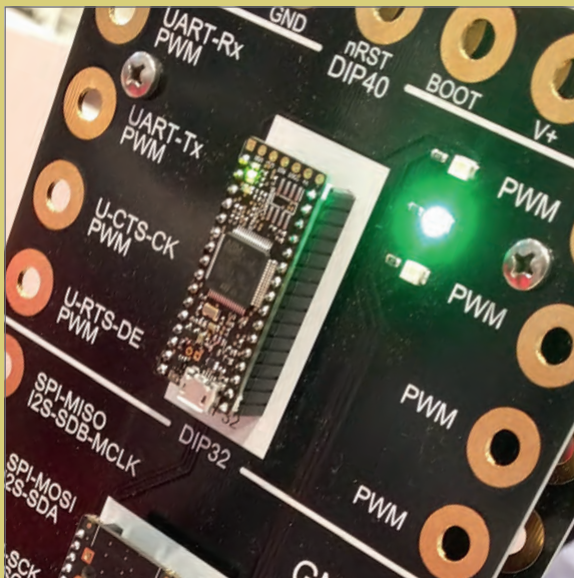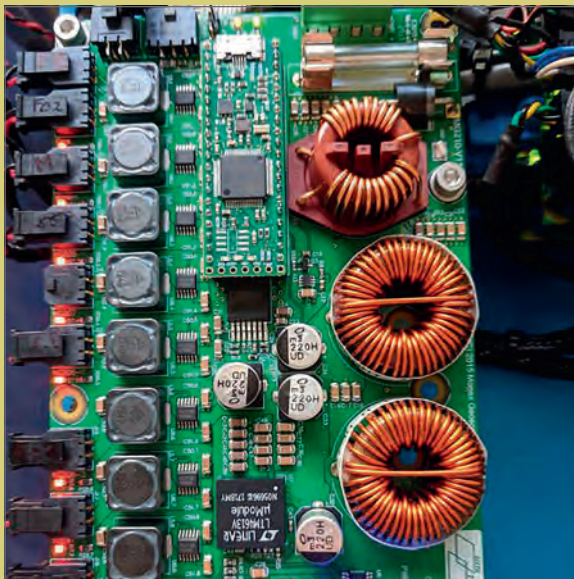
Investment
How much financial investment you are aiming for?

We plan to launch through a Crowdfunding campaign with a funding level not yet set. We do not anticipate seeking additional investment after launch but it may depend on interest and positive reactions from our target groups.

The future
Where do you believe your company or product to be in 3 years' time?

We want to be a recognised and respected player in the electronics module and single board computer market. After launching STM32 modules we plan to release modules with other brands of microcontroller followed by Linux modules and pin compatible peripheral modules. In three years we want to have acceptance in most of our target markets and hopefully international distribution of a wide range of modules.

Target Plus
Is there anything else you would like to tell us about your startup/product?

The positive feedback from Electronica Fast Forward, from the organisers and sponsors, other exhibitors at Electronica and visitors to the stand has given us the confidence to proceed with Connexi DIP products. We are still finalising products, MicroPython software, product costing, manufacturing, and marketing plans. We will be launching in the second half of 2019.

Our vision is to help users reduce the time to prototype electronic products and subsequent time to get finalised products to the market place. We have seen a need in this area of product development for easily customisable universal DIP modules that can be used to create low-cost prototypes for proof of concept. ■

Contact

Connexi

228 Canterbury Rd.
Canterbury, VIC 3126
Australia

Phone +61 417 353707

c.mason@connexi.com.au

Lightblock

LED Lamp [Germany]

The Problem

Most lamps currently on the market do not live up to the potential of LED technology. They have high failure rates and short lifespan due to poor cooling and design.

The Solution

- Sophisticated heat management with active cooling
- Software monitoring of all operating parameters
- Open software architecture for different communication protocols.
- Intuitive setup via software and remote control.
- Modular expandability of several lamps with synchronization.
- All parts integrated into the lamp body.
- Lifespan 50,000 hours.

The Innovators

Michael Zigan has provided unique lighting solutions for museums, trade fairs, and industry. All components including electronics, software, and housing have been developed, designed and manufactured by himself. The Lightblock is designed in a way that it can be used in many applications, including Aquarium Lighting, Museum lighting, Living Spaces, Exhibition Stand Construction, Plant Lighting and more!

The Technology

Microcontroller controlled Nichia LEDs, with infrared remote control, USB ports, night lights, fully controllable, dimmable, real-time clock/timer, active temperature-controlled cooling system, reflective light sensor, and colour rendering index, CRI92. Windows software is available to Control and configure the lamp, and all the relevant parameters can be set via the USB interface. Several lamps can be synchronized via the Software, and parameters saved to your control device.

LED Aquarium Lamp (with combined visible light and infrared light sensor)
The reflective light sensor can measure the emitted quantity of light from the Lightblock on a background in lux. Therefore you know how much light is present on a surface at any distance.

Light emitted by the Lightblock is reflected from the ground, measured by the internal light sensor and displayed on the Lightblockcontrol software in Lux. The Lightblock can be synchronized with other Lightblocks with all parameters using the Lightblockcontol software.

All Lightblocks connected to a USB hub are recognized and listed by the software. Save with parameters and transfer them synchronized and work in parallel. Due to active cooling and innovative housing design, the Lightblock is only 5x1x20cm. Thus, there are a large number of potential applications.

The Lightblock is universally applicable due to its multifunctional design. The hardware and software design allows the implementation of various interfaces beyond USB and the infrared interface. WLAN, DMX and other light control protocols can be individually implemented. The Lightblock can be equipped with various communication protocols for stage technology, home automation or internet communication. Currently implemented are an ambient light detection that allows regulation of a defined amount of light. In addition, scenarios are programmable: for example, switching the Lightblock on in the dark and off again at a defined time.

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.
1. Finance
2. Marketing
3. Technology support
4 Operational support

Tell us a little bit more about option 1.

The main problem is that I would have to produce 1000 pieces to get a realistic production cost. I also do not have the finances for this. Furthermore, I do not have enough customers for 1000 pieces. With smaller quantities, the selling price becomes too high - A vicious circle.

Markets
What are your primary markets?

The consumer market, but I also see potential in exhibition stand construction, museums, and shopfitting.

Target Groups
Who are your primary target groups?

Mainly consumers who are willing to spend a little more money on a high-quality design products. Also, companies looking for a reliable, highly configurable product.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

1. Wholesalers
2. My own webshop
3. Retailers

Investment
What is the financial investment you are aiming for?

The main issue is to advance production costs.
1000 pieces, typically cost around about 80,000 EUR.

The future
Where do you believe your company or product will be in 3 years' time?

I hope to find wholesalers who can sell larger quantities of the product in order to keep production costs low.

Plus
Is there anything else you would like to tell us about your startup/product?

I'm always improving the product, implementing new features, and finding other applications, all with the focus on offering a really good and high-quality product. ■

Contact

Michael Zigan

Mühlenweg 1
38173 Sickte
Germany

www.el-licht.de

SIMLIB

[Germany]

The Problem

SIMLIB helps you detect the following:
- Rapid, high-speed and temporary movements!
- Movements at a distance!
- Areas out of sight!

In normal circumstances, setting a light barrier can be challenging. It is therefore mostly done by hand. SIMLIB is different: It is done automatically and also mobile.

The Solution

An automatically aligning mobile light barrier: Sender and Receiver Units scan the areas in front of them and communicate with each other. SIMLIB has up to five Sender and Receiver units, which relay to a handheld unit: It is now possible to build a light barrier around corners. Far-away areas are capable of being observed by the operator.

The Innovators

The inventor and holder of the utility patent is Johannes Dobsch. A mechanical engineer and founder of Dobsch PKE SIMLIB, Dobsch PKE was founded in 2012 as a manufacturing company for mechanical machines and prototypes. SIMLIB is the first original product from Dobsch PKE. The first idea conception to first functional Prototype took approximately one and a half years.

The Technology

Each Sender and Receiver is equipped with an IR-Laser, wireless communication device, and unique IR-Sensor. Communication between the Sensor and Receiver units and the handheld is executed on its own Network. The utility patented IR-Sensor is a development of Dobsch PKE. This sensor is different from all other IR-Sensors in that the detection area is 14.000mm², which is far superior to any other sensor. It is designed in such a way that the detection area even be further extended.

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.
1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

This is a unique product and not yet present on the market. I have to start from zero. This is the reason why I need some help in Marketing. It is very important that customers know that SIMLIB exists.

Markets
What are your primary markets?

SIMLIB is a mobile light barrier! I foresee a market where fast and temporary observations of an area or movement are required. For example, this could be on construction sites, or in the security sector, rescue and safeguarding in the case of accidents, or (where my idea originated) during the loading and unloading of dangerous goods in airports or harbours.

Target Groups
Who are your primary target groups?

Construction, companies that work in hazardous areas like breakdown services or even firefighters. Additionally, companies operating at airports and ports. There are many more possible applications! For example, during Electronica, a visitor told me he was looking for such a solution for a glider plane, where the towing winch needed to be secured.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?
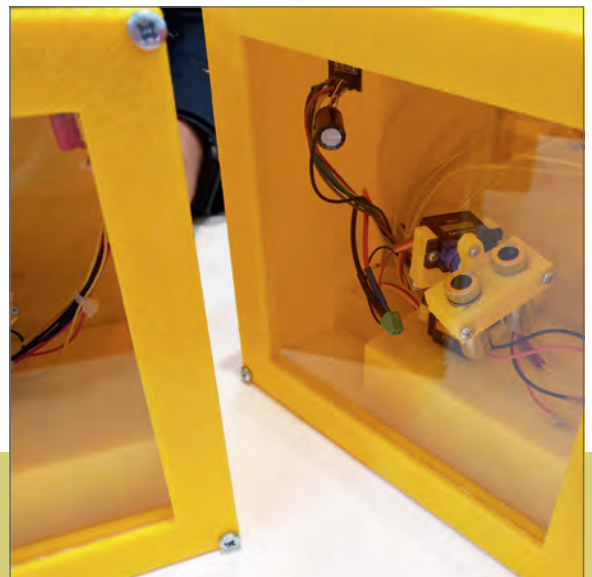
This is a difficult question because I would like to use as many as possible. The fact is that SIMLIB is a technical device that needs some explanation: The function is not obvious if you just see it. I think exhibitions and the correct contacts in the market would be very helpful. But where to find these people? This is also why I think Marketing is very important for me!

A web page and online portals are also particularly important.

Investment
What is the financial investment you are aiming for?

I think the investment is overseeable because development is complete. After testing, production can start. The biggest investment is in scaling production, but this shouldn't be too much. I would say a small five-digit figure is realistic

The future
Where do you believe your company or product will be in 3 years time?

In three years it will be known to some markets. My plan is to go fast into new markets and countries. Three years is the period that I want to bring the next evaluation level of SIMLIB to the market. Here I want to implement the feedback from customers and conversations

Plus

Is there anything else you would like to tell us about your startup/product?

Yes of course! I'm so proud of SIMLIB because I did everything by myself. It has been an interesting journey to see it growing from an idea to an industry level product. I'm completely convinced that lots of people have potential applications and ideas where SIMLIB can help them in their daily lives and businesses, especially with the improvements I made from the prototype you saw during electronica. These include extended range, IP enclosure, battery management, filtering out ambient light and many more. ■

Contact

Dobsch PKE

Mahkornstr 26
94315 Straubing
Germany

Phone +49 160 2555841

johannesdobsch@gmx.de

V-Juice
The Flattest Inductive Charger for Smartphones

[Germany]

www.v-juice.xyz

The Problem

A Smartphone with an empty battery could mean being cut off from the civilized world: no WhatsApp, no maps, no camera, no public transport ticket, no Pokémons, no music.

Why has wireless charging has not made a breakthrough until now?
- High costs for equipped new furniture (avg. lifetime ~12 yrs.)
- External retrofit chargers are not interior design compatible

The Solution

Never leaving your home with an empty battery. "eVerywhere Juice" = V-Juice Chargers Pads installed at the "natural resting places" of smartphones. "eVerywhere Juice" = a large number of V-Juice Charger Pads in public areas, on public transport, bars, and restaurants to charge smartphones.

behind or under furniture
- No cumbersome casings and ugly cables on your aesthetic furniture
- Slide protection on the bottom surface to secure the pad
- Easy to remove and place in a new location
- Enables integration of wireless charging seamlessly into your interior design
- German engineering and innovative patented design

The Innovators

Tilman Röder: Entrepreneur. Award Winner "Mit Multimedia erfolgreich" by the German Ministry of Economic Affairs & Employment. Expertise in various industries.
Assad Assadi: Sales and marketing expert. Track record in market introduction of innovative products, e.g. Zeiss VR One.
Supplier network: Each a specialist their own field with proven expertise and experience in materials and processes - Dedicated to innovation and quality.

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.
1. Marketing
2. Finance
3. Operational support
4. Technology support

Tell us a little bit more about option 1.

Marketing is key for us to draw interest to our consumer product, V-Juice: our thinnest wireless charger. Good marketing is a prerequisite to being successful at market entry.

V-Juice is attractive not only for persons having an affinity with technology but for literally every smartphone user with an understanding of functionality and interior design. It is important to address several target groups in parallel.

The Technology

- Next level o. wireless charging
  - Works with qi capable devices & upgraded others
    - Super thin Charger Pad
      - Electronic module placed separately - can be hidden

V-Juice

eVerywhere Juice

The idea is to achieve a pull-effect, with customers asking for V-Juice Chargers in shops.

Marketing is also important to get the attention of potential partners (sales channels, advertising customers, utilization of V-Juice as part of their own products to create additional customer benefits, …).

It was a great marketing opportunity for V-Juice to be present at Electronica 2018 with a booth in the Electronica Fast Forward area. We gained a lot of food for thought and extended our network.

Markets
What are your primary markets?

Worldwide, especially Europe, USA, Japan and Korea as well as the Americas.

Target Groups
Who are your primary target groups?

Early innovators and people with an affinity for technology. Persons searching for innovative gifts for persons that already have everything are the second target group. Then comes the rest of Smartphone users: iPhone 8 or later as well as smartphones from Samsung, Nokia, LG, Google, Sony are QI capable and can be charged immediately with V-Juice chargers. Most other smartphones can easily be upgraded with an adapter or a specially adapted case. Makers looking to integrate seamless inductive charging into sofas, workplaces, and even more weird places will love the extra-thin V-Juice charger pad.

Also, elderly people may have trouble inserting the connector of a power supply cable into the plug of a smartphone. Consequently, they could benefit from our solution, whilst maintaining their beloved interior design.

Also, public transport, utility firms and many kinds of other service providers are our target groups to provide power (juice) using V-Juice chargers. Brand companies are potential customers, who may wish to put their logo or advertisements on V-Juice charger pads, providing juice for smartphones in bars, restaurants, shops, etc.

V-Juice will also be used to retrofit existing equipment in order to charge an increasing number of handheld devices (barcode scanners, detectors, tablets, …) at their normal resting places.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

Online stores, furniture shops, electronics retail, telecommunication providers, wholesale for promotional items, do-it-yourself specialty stores, producers of investment goods, specialty shops for elderly people, the catering industry, public transport, and utility companies.

Investment
What is the financial investment you are aiming for?

V-Juice is currently self-financed. However, our current arrangement is not producing what it could. For quick market penetration, an investment of 780,000€ is required.

The future
Where do you believe your company or product will be in 3 years time?

In 3 years, V-Juice will be a given term and used like "to google" for an internet search. By then it will be "Oh, my smartphone is empty, I need to V-Juice it".

When your smartphone battery is running low, you will look on your maps for V-Juice. You will find out that there is a bar just around the corner with V-Juice chargers sponsored by "Hofmeister" (or another brand). You will go there and watch out for the Hofmeister logo. You will find it, put your smartphone on it – "bing, bing" – you will be happy, your problem will be solved - in 15 to 30 minutes… you will have enough juice to continue WhatsApp, to take pictures, to listen to music, to get around, …
In the meantime, you will buy a drink, perhaps a Hofmeister – and in that case, the bar owner will also be happy.
V-Juice charger pads will help ensure that you never leave your home with a half charged phone. There will be V-Juice charging spots in public areas to V-Juice your smartphone on the go: in cafes and restaurants, on the exercise machines in gyms, next to advertisement boards, at kiosks, at bus and train stations, at events and festivals, meeting rooms and offices, on shop floors, etc.

Our long term target is to have at least one V-Juice charger on the ISS!

Plus
Is there anything else you would like to tell us about your startup/product?

Innovation is a matter of inspiration.
Successful innovation is a matter of reach and getting support.

We are looking forward to new sponsors and partners who are also fed up with empty smartphones and are looking to change the situation. ∎

Contact

V-Juice
Tilman Röder

Emil-Geis-Straße 33
81379 München
Germany
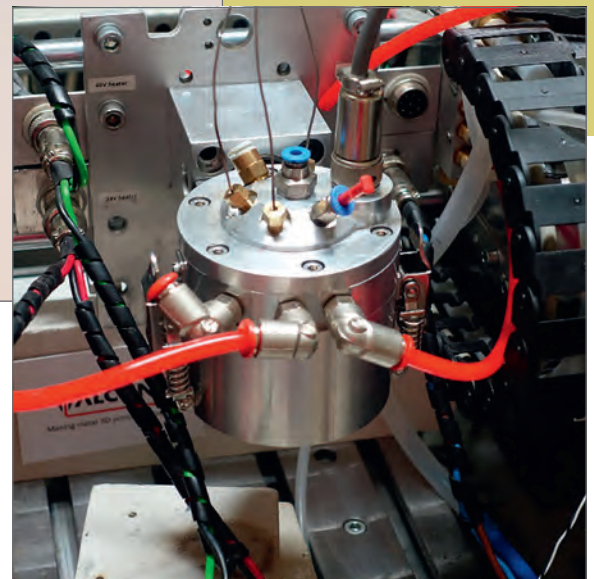
Phone +49 172 1083212

tilman@v-juice.xyz
www.v-juice.xyz

ValCUN

Affordable Metal 3D Printing [Belgium]

www.valcun.be

The Problem

- Long lead times
- Part complexity/integration
- Milling/turning waste
- No time for failure

The Solution

Affordable and integrable
- multi-material
- feedstock independent
- technology hybridizable
- alloy customization
- recycling and reuse

The Innovators

Young startup team experienced advisory team Lean startup approach:
- Learn Fast, Fail fast
- Breadboarding

Granted funding:
Lean startup approach:
- ESA Feasibility Study
- FlemishGovernmentFeasibilityStudy

Expert Advisory:
- dr. ir. Jonas Galle, Mechatronics
- ir. Johan Van den Bossche, CEO & Coach vSO Kwadraat VZW
- dr. ir. Bart Meersman, Business Electronics
- Marc Pecqueur, CEO PE-consultant BVBA
- dr. ir. Jan De Pauw, Metallurgy System engineering

The Technology

- Molten metal extrusion
- Focused plasma preheating

The Questions

Ranking
What do you need the most to make your startup/ project a success?

1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

Technology development is known to be expensive. Building a proof-of-concept and prototype with limited resources (both hardware as FTE's) is a challenging job but essential to get started and to progress at a stable rate.

Markets
What are your primary markets?

Our first focus is the 3D printing of aluminum parts for the heat exchanger and cooling elements of for example power electronics. Initially prototyping to get the confidence of the market, but eventually, the technology should allow (mass) production parts

The next step is to extend to other highly electrical and thermal conductive metals such as copper.

Target Groups
Who are your primary target groups?

Production industry and the bigger SME companies. Initially with extensive R&D activities, and later, more with production facilities with our solution as an alternative for conventional manufacturing and molding.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

We'd like to use established channels to get our 3D printer to market such as known distributors (which already showed interests): RS components, Conrad and from the 3Dprint sector: FormID, Trideus.

Furthermore, exhibitions in the field will be important to increase visibility. This could be 3D printing exhibitions and industries where 3D printing is becoming of interest, such as electronics, automotive, manufacturing.

Investment
What is the financial investment you are aiming for?

Currently, we aim for 1M€ to expand the team to 6 FTE's and to get the prototype ready by Q1 of 2020 and another 2.5M€ to be able to go-to-market in Q3 2021

The future

Where do you believe your company or product will be in 3 years time?

Within 3 years we will have a growing business in both 3D print servicing and the sales of our MVP printer. Taking into consideration the market introduction in Q3 2021, we expect a turnover of 1,5M€ in 2022

We will be busy in the design of the next generation printer for big series manufacturing of metal parts. Also running on a parallel track, our materials will be extended from aluminum to copper.

Plus

Is there anything else you would like to tell us about your startup/product?

ValCUN aims for affordable and competitive metal 3D printing. The ValCUN technology will change the landscape of how products will be manufactured. Check out our company video:

https://youtu.be/Y8UD_1Qn-zQ

ValCUN

Contact

ValCUN

Christiaan van der Heydenlaan 24
9041 Oostakker
Belgium

Phone +32 478 718233

info@valcun.be
www.valcun.be

BraveYourself VR

www.braveyourself.de
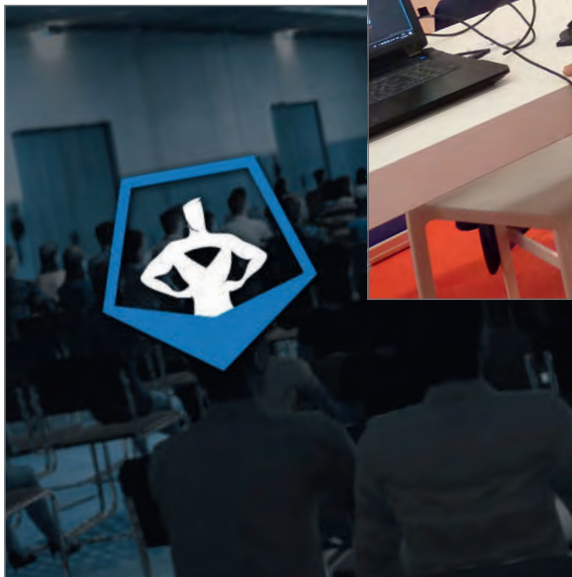
The Problem

Many people are struggling with the fear of presentations. They would love to improve their skills but are lacking time, money and a realistic training environment. Furthermore, they face the problem of finding a suitable coach/public speaking trainer, especially if a presentation needs to be held in a foreign language.

The Solution

BraveYourself VR came up with the idea to create a platform where Coaches and students can meet and set their appointments online. Afterwards, they have the opportunity to train their speeches in VR - either with the help of a Public Speaking coach or on their own with the feedback of others.

The Innovators

Max Aigner came up with the idea of BraveYourself in December 2017. He was always passionate about 3D modeling and VR programming. What's more, he found public speaking difficult. This is why he wanted to combine perfecting public speaking with new technology. Kathrin Aigner joined Max in May 2018. She finished her studies in International Management, with her task being to take care of all Business Development tasks.

The Technology

A human coach gets support in his teaching through our VR Software. We offer the possibility of integrating other people in order to receive feedback via a network function. The user can be rated and train together with others. This happens via voice recordings. Furthermore, our solution provides the option for the Speaking Trainer to add distractions in order to make the training even more difficult. With our partner Brainboost, we even provide the option of measuring user stress and concentration levels.

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.

1. Marketing
2. Operational support
3. Finance
4. Technology support

Tell us a little bit more about option 1.

We are doing lots of user tests for our Public speaking Training Software in Virtual Reality. We need a lot of people to test our software in order to find out how we can help our potential customers and what features they really want. We also need excellent marketing guides and lots of people to visit

our website, **www.braveyourself.io**. This traffic will help us in providing the best possible product to increase self-esteem.

Markets
What are your primary markets?

We help companies by training and motivating their employees. We help them face and overcome the biggest fear in human nature: Public Speaking.

The training and learntec market is huge. We want to improve how people react in certain situations. It is somewhat psychological as well.

Also, the Public Speaking market is quite huge.

In order to help other companies to learn from our experiences, we also provide workshops about VR and digitalization and create Virtual Reality Simulations as part of our individual development/ consultancy work.

Target Groups
Who are your primary target groups?

Our Target Groups
- are mid-sized or large companies requiring corporate communication training
- Communication trainers who want to provide better training solutions to their customers
- The individual that has an upcoming speech and wants to train in a safe environment before going live

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

We use Instagram, Instapage, Facebook, Youtube-Videos, and Linkedin as our channels.

Of course, Google App Store and Apple Store are important partners as well.
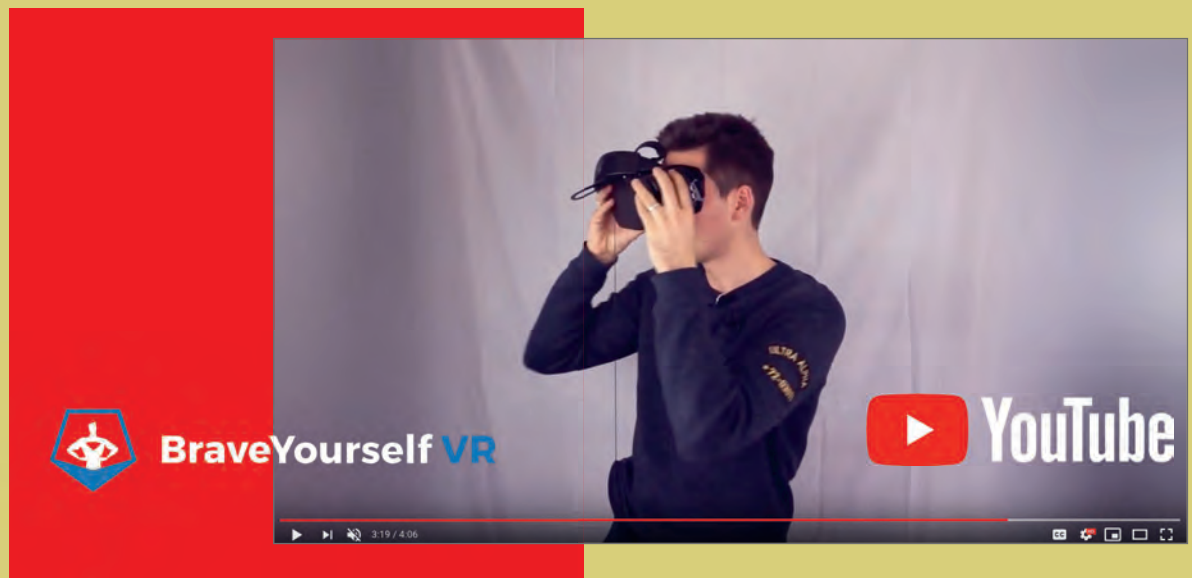
We would like to do more events like Fast Forward and marketing projects with local businesses, like newspapers.

Public speaking is one of our favourite channels. Check out our talk on how 5G transforms our communication with our pitch on Youtube

http://www.youtube.com/channel/UC1eT3PI7CQ5XfqYxyVkk_UA

Investment
What is the financial investment you are aiming for?

We have spent about 60.000€ on the current version over the last 1.5 years – One Oculus Rift Software + Hardware suitcase, One Android Version and an iPhone Version. All the marketing and designs included distribution amongst six people currently. Of course, our working time is not added to that expense. We think that we will have a large user base in approximately two years and want to employ two more people, so 120.000€ is what we are aiming for.

The future
Where do you believe your company or product will be in 3 years time?

In three years, we will have millions of active users that are being trained in public speaking. Digitalization means that technology is suddenly capable of adapting to the human. This means that keyboard and mouse inputs are superceded by more human-like inputs including body language and voice control. Creativity will play a big role in the future as well.

With Braveyourself you can train exactly this. You can be creative when solving difficult situations in Virtual Reality. You can train to overcome your fears and make your great ideas come true. You can enhance your communication skills by speaking in public! How great is that?

Brainboost and all the other companies and individuals that helped make this vision become a reality. We are getting up every morning, eager to create something meaningful and this makes us proud. If you want to help us change the world with better communication, go to **www.braveyourself. io** and register for our newsletter and download the latest test version of braveyourself. Thank you

Contact

BraveYourself VR

An der Schäferwiese 16
81245 München

Phone +49 174 4995142

kathrin.aigner@ames.co.at
www.braveyourself.de

Dadig
Pool Filtration Regulator

[France]

www.dadig.com

The Problem

When you have a swimming pool you want your water to be clean without spending too much money. To achieve this, you must, weekly, measure the temperature of the water, do some calculations and reprogram your filter clock. Quickly, you set the clock to an important duration of filtration, to be quiet, despite the cost.

The Solution

The solution is to have, in place of the filter clock, a regulator that measures water temperature, performs the calculations and directly controls the filtration pump according to the calculated value. Instead of doing each week, the regulator will do it every day and thus better optimize costs. You are quiet and you save money.

The Innovators

D. Guilbert-Jacquin
Dadig Sasu
France

The Technology

The heart of the system is an Atmega 328P microcontroller at 16 Mhz. The human/machine interface is made using an IR remote control and Oled screen of 0.96 inches on I2C network. A DS3231 RTC module with backup, on I2C network, give the time reference. The temperature sensor is a DS18B20 1wire. The power supply is provided by a 2W AC / DC converter 220V / 5V, protected by a varistor. Control of the pump is achieved using a 16A power relay. The electronics are put in a box for din rail identical to the filter clocks.

The Questions

Ranking
What do you need the most to make your startup/project a success?

Rank the options below from 1 to 4 where 1 is the most important.
1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

To start mass production and develop the market, it's necessary to have a lot of money.

Markets
What are your primary markets?

1. Swimming Pool manufacturers
2. Final customers of swimming pool manufacturers

Target Groups
Who are your primary target groups?

Swimming Pool makers

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

Direct contact and exhibition

Investment
What is the financial investment you are aiming for?

1. Marketing and prospection
2. Production tools

The future
Where do you believe your company or product will be in 3 years time?

1. Marketing and sale of the product
2. Complete product range (IoT,..)
3. Development of our next product based on swimming pool technology

Plus
Is there anything else you would like to tell us about your startup/product?

No, thanks.

Contact

Dadig Sasu

Rue de la Pommeraie 28
70000 Vaivre et Montoille
France

phone +33 6 09683380

guilbert.jacquin@dadig.com
www.dadig.com/

Hexabitz [USA]
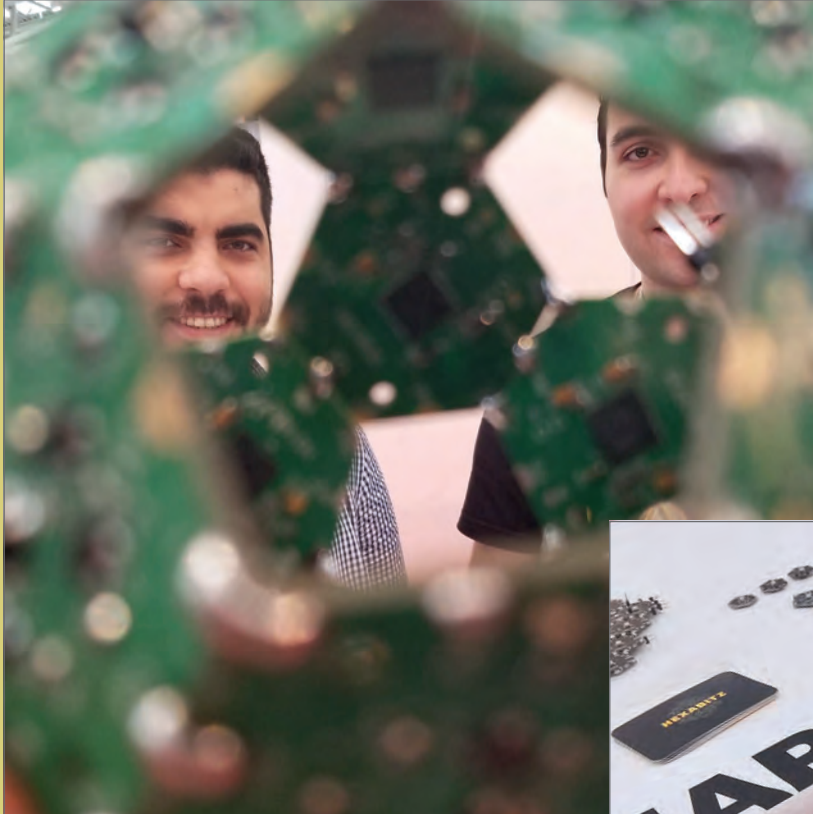
www.hexabitz.com

The Problem

Electronic prototyping boards are not made for real-life applications. They are bulky, heavy and their form factor does not allow them to replace custom-made PCBAs. Custom-made PCBAs are not modular or reusable. They pollute the environment, cost more and increase the time to design and produce.

The Solution

Hexabitz is a modular electronic prototyping system suitable for real-life applications. Modules are small, lightweight and can be soldered together to make rigid flat and curved PCBAs. Hexabitz is a multi-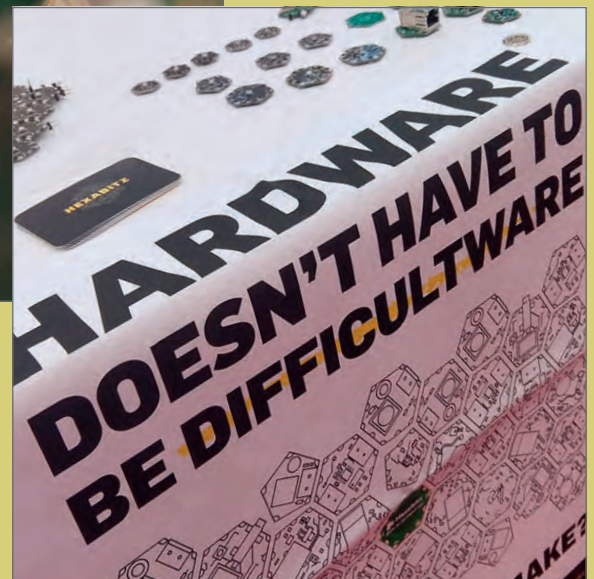processor system based on the novel wired-mesh concept. It is modular, configurable and more scalable than traditional prototyping solutions.

The Innovators

Asaad Kaadan is the founder & CEO of Hexabitz. He holds a Ph.D. and Masters in Electrical & Computer Eng. from Univ. of Oklahoma, USA and BSc. in Electronics Eng. from Univ. of Aleppo, Syria. He has researched and built modular electronics, robotics systems and wireless/ optical communication systems for both the academia and industry.
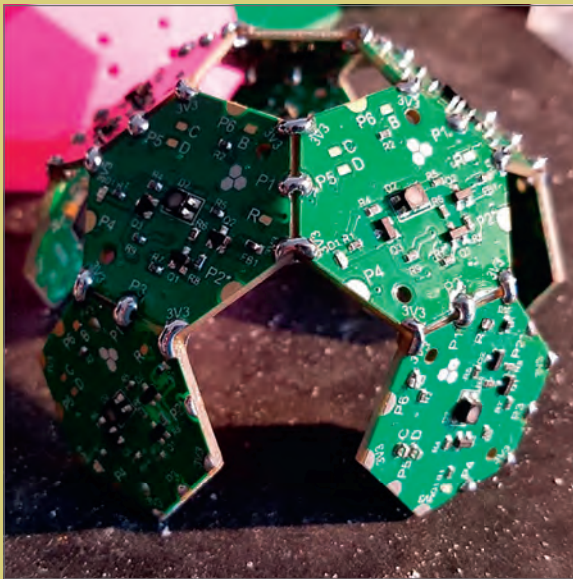
The Technology

Each Hexabitz module has a single functionality (sensors, relays, power, etc.) and its own small ARM microcontroller. Modules can be used stand-alone or combined with each other in an array. Arrays can be flat or curved and can take any configuration or shape you want. Hexabitz modules have no connectors to minimize size and weight. You solder them side-by-side to make rigid and configurable boards. The integrated MCUs provide reconfigurability, backend communication functionality and can be used in parallel and multi-tasking applications.

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.
1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

Hexabitz has a large number of products (modules) that need to be designed, manufactured and supported in order to cater to the professional prototyping and IoT market. Thus, requiring us to continuously grow our team. External funding can help us grow faster to provide our customers with a one-stop shop, making them come back for all their needs, and providing us with a sustainable growth engine.
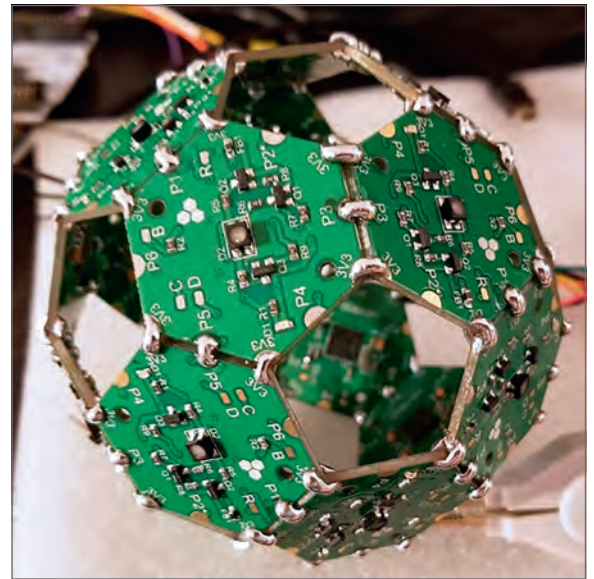
Markets
What are your primary markets?

North America
Europe
MENA
Asia

Target Groups
Who are your primary target groups?

- Professional engineers, startups and small businesses looking to professionally prototype their products and launch IoT projects with minimum upfront investment and fastest time to market.

powered by Elektor

- Engineers, scientists, students and makers looking for a prototyping platform that mimics custom PCBAs the most in terms of size, weight, and form factor

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

We are currently using our website and various social media channels to reach our target customers. We have also used in the past both international tradeshows and local workshops to interact closely with our target audience and collect face-to-face feedback. We would like to do more of these types of interaction in the future

Investment
What is the financial investment you are aiming for?

We have been bootstrapping so far and we're looking for seed funding to help us grow our team and keep our extensive hardware inventory in-stock (which turned out to be a not-so-easy task at all!)

The future
Where do you believe your company or product will be in 3 years time?

with hundreds of solutions, virtually all of them are following the same old computing model with different flavors. At Hexabitz, we're introducing many new innovations to traditional prototyping such the ultra-modular wired-mech architecture, a multi-processor design, and a compact connector-free horizontal form factor, among others. We invite everyone interested to join us in exploring these fascinating ideas and rethink electronic hardware prototyping from scratch!

Contact

Hexabitz

19500 Ballinger Way NE
Seattle, WA 98155
USA
Phone +1 918 607-1785

asaad@hexabitz.com
www.hexabitz.com

In three years time frame, we see Hexabitz offering hundreds of different modules covering 90% of our customer's needs for prototyping and IoT. We also hope to launch our own high-level development tools that make building and programming complex multi-processor, Hexabitz projects a breeze!

Plus
Is there anything else you would like to tell us about your startup/product?

Some people say we're working in a particularly crowded space. This is partially true, however, professional and maker prototyping is crowded

iTIMER [Israel]

The Problem

Both in the domestic and industrial markets, there is a need to control the time in which a device is switched on or off. The smart home systems market is very large. However, in houses previously unplanned for this purpose, the installation of these systems may be cumbersome.

The Solution

Our solution is affordable and modular. It can be installed in areas, as needed progressively, and does not require a significant investment.
Applications:
- Heaters
- Pumps
- Lighting
- Blinds
- Irrigation

The Innovators

Everything started as a personal project. We then realized that there was a commercial demand for this kind of device. We are based in Jerusalem Israel. All electronics, mechanical, safety aspects and the enclosure were carefully designed by us. Our near future goal is to develop a whole series of digital timers controlled by the Internet.

The Technology

Our goal was to keep the design as simple as possible without compromising on any desired features. We demonstrate that it's possible to design advanced features with free design tools. We are currently adding WIFI capability to the iTIMER.

- Real-Time Programming
- Mechanical Design
- 3D Printing
- WIFI

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.
1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

Good marketing is essential. No matter how good your product is, without the good marketing, it is equivalent to keeping it on your desktop.

Markets
What are your primary markets?

Pumps, blinds, irrigation, heaters are available in almost any home. Our solution is modular, thus allowing the user to install the Itimer according to his requirements. There is no need to invest in expensive systems.

Target Groups
Who are your primary target groups?

Everywhere there is the need for time controlled charges. Ranging from lights to gardening - Any residential or commercial application that requires timing.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

Hardware stores are our natural channel. Nevertheless, online sales is the future. We are also thinking about selling our product as a Kit so anyone with a 3D printer can produce it !

Investment
What is the financial investment you are aiming for?

We need to recruit more personel to be enable the development of a complete line of products and to invest in an effective marketing campaign.

The future
Where do you believe your company or product will be in 3 years time?

We hope to follow the market trend. CAN capability, more sensors, etc.

Plus

Is there anything else you would like to tell us about your startup/product?

Both in the domestic and industrial markets, there is a need to control the time in which a device is switched on or off. The smart home systems market is very large. However, in houses previously unplanned for this purpose, the installation of these systems may be cumbersome due to existing wiring configurations. Additionally, the cost limits such options. Itimer is the solution.

Our solution is affordable and modular. It can be installed in areas, as required progressively, and does not require large investment.

Contact

Ysaac Benjamin

PO Box 43099
91430 Jerusalem
Israel

Phone +972 52 5590092
Fax +972 2 6540576

Startup

electronica
fast forward
the startup platform

Startup

The Startup category is for excisting companies founded within the last 24 months. The product or service submitted by the Startup must be consired to be innovative.

Board Architect

[Sweden]

www.boardarch.com
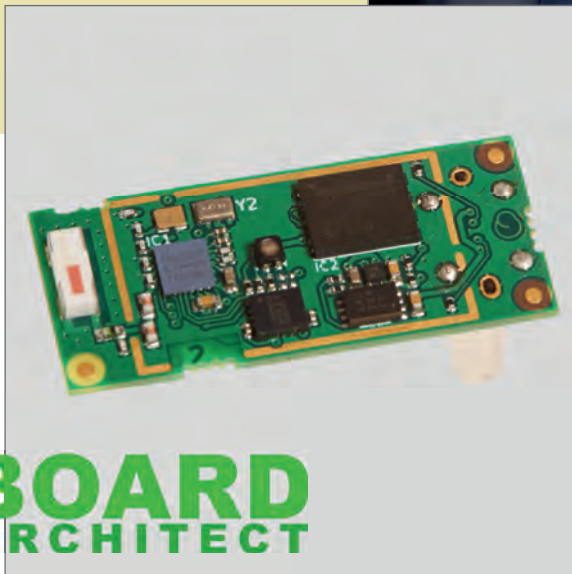
The Problem

Electronic systems are becoming more and more complicated. It is time-consuming to develop and maintain hardware and software. Most of the work goes into achieving basic functionality, for example getting the communication up and running. With fast-paced technical developments currently on the market, it is tough to maintain designs and stay up to date with cost-efficient solutions.

The Solution

The online toolchain puts an end to time-consuming routine work throughout the whole life cycle of electronics. Hardware design, software development, and manufacturing of electronic systems are rationalized. Automation and reuse of design blocks, code generation, maintained components database, and production services are key to a shortened time to market.

The Innovators

Board Architect is founded by Fredrik Jonsson and Anders Lindgren. Both have a solid experience in the electronics industry and a keen entrepreneurial spirit. Fredrik Jonsson has a Ph.D. in radio electronics and has been working in research and development. He has previously developed design aid tools. Anders Lindgren has developed analog, digital and power electronics. Anders founded and headed-up several hardware startups previously.
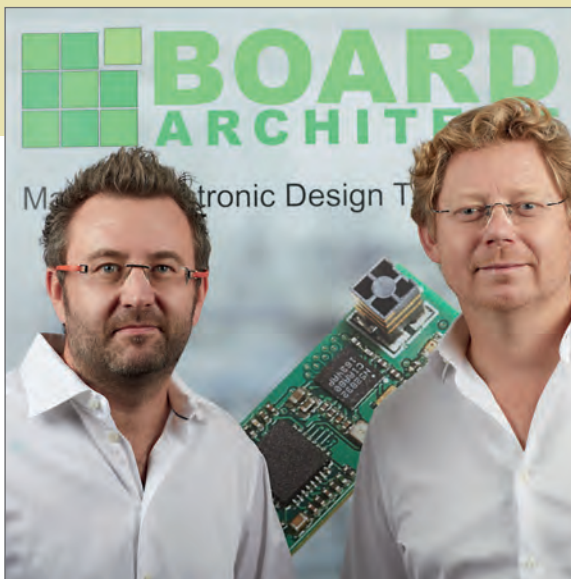
The Technology

The hardware design is automatically put together from a selection of building blocks like MCUs, power supplies, connectivity in all forms, etc. A board outline can be sketched, and connectors and other components can be placed at fixed positions. Throughout the selection, design rules are checked in real time and component and manufacturing costs are visible and updated continuously. After board design and development, we take care of prototype manufacturing for the initial tests.

It doesn't stop there: we also offer cost-efficient series production. Throughout the lifetime, of the product, the design is maintained through our updated and verified building block library and component database.

The Questions

Ranking

What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.
1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

Today we have a demo version of our online design tool for electronic products. We have funded the development ourselves so far and want to speed up the development pace and increase focus and
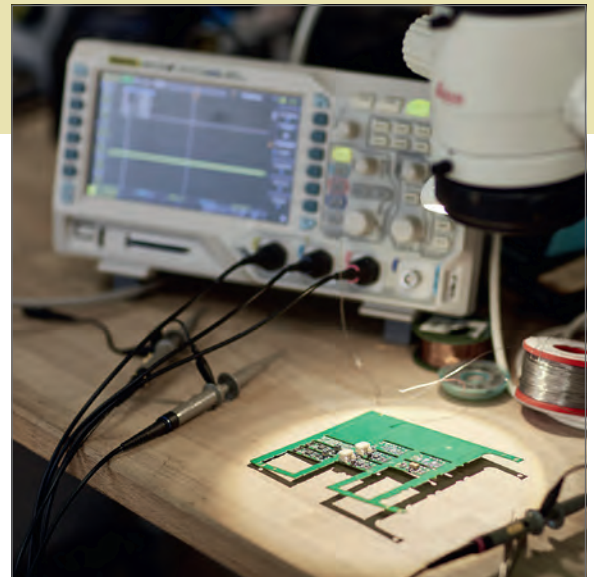
resources on the marketing of the service. In order to do that we need to move from growing and funding the company organically to fund the expansion through partners or external investors. This is why financing is most important for us at this moment.

Markets

What are your primary markets?

There is really no specific isolated market for the online design tool. For the most part, we see the whole global market as our market. However, since we are connecting production to the tools making it possible to order fully assembled boards there is

a bit of localization to it, we want to produce quick turn-around prototypes fairly local. We put our first focus on Europe, but everyone will be welcome to use the tools and services.

Target Groups

Who are your primary target groups?

In the beginning, our typical target customers are small-medium sized product owning companies

wanting to speed up and rationalize their development. They can be companies with their own development departments as well as companies with limited hardware expertise. The tools help both inexperienced hardware designers to make designs as well as helping those more experienced to design faster. We also see great interest from makers and fellow startups with electronics based product ideas.

Channels

Which channels are you using, or would you like to use, to bring your startup/product to the market?

We will primarily be using the web and also be more hands-on with local customers in order to explain the benefits and generate enthusiasm. This will also give us valuable insights into what they are looking for in a tool like this and the features they require. We are also having discussions with potential semiconductor companies and distributors to team up and offer the tool as a part of their online offering for design support and sales generation.

Investment

What is the financial investment you are aiming for?

We are discussing funding through both market partnerships as well as external investors. The amounts needed differ somewhat depending on what the partners bring and support from their side and the investor's vision of speed and growth.

The future

Where do you believe your company or product will be in 3 years time?

We will have a large segment of the market and a thriving user community contributing and making money from their uploaded building blocks. Semiconductor companies will use our tool as part of their design process and offer customized developments boards based on their building blocks. Customers use the tool both for rapid prototyping and running as well as maintaining and producing larger volume with our tool. Hopefully, industry has opened its eyes to the digitalization

of design work and there are several competitors chasing us, from a far distance.

Plus

Is there anything else you would like to tell us about your startup/product?

What we actually do! Board Architect is developing an online tool for simple and fast electronic design and product maintenance. The user selects functionalities in the shape of building blocks, which can be microcontrollers, power supplies, sensors, etc. The tool brings them to a user-defined board and makes a complete routed board out if, with layout, BOM and everything needed. Costings for each block in different volumes are available throughout the design process. When the design is complete, the user can choose the number of boards required and hit the order button to get fully assembled products in the mail 2 weeks later. ■

Contact

Board Architect AB

Raggatan 11
11859 Stockholm
Sweden

Phoine +46 704 612004
www.boardarch.com

CeLaGo Sensors GmbH

[Germany]
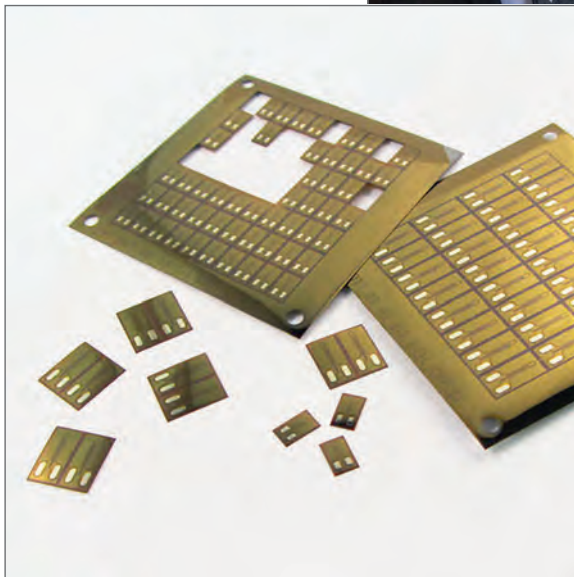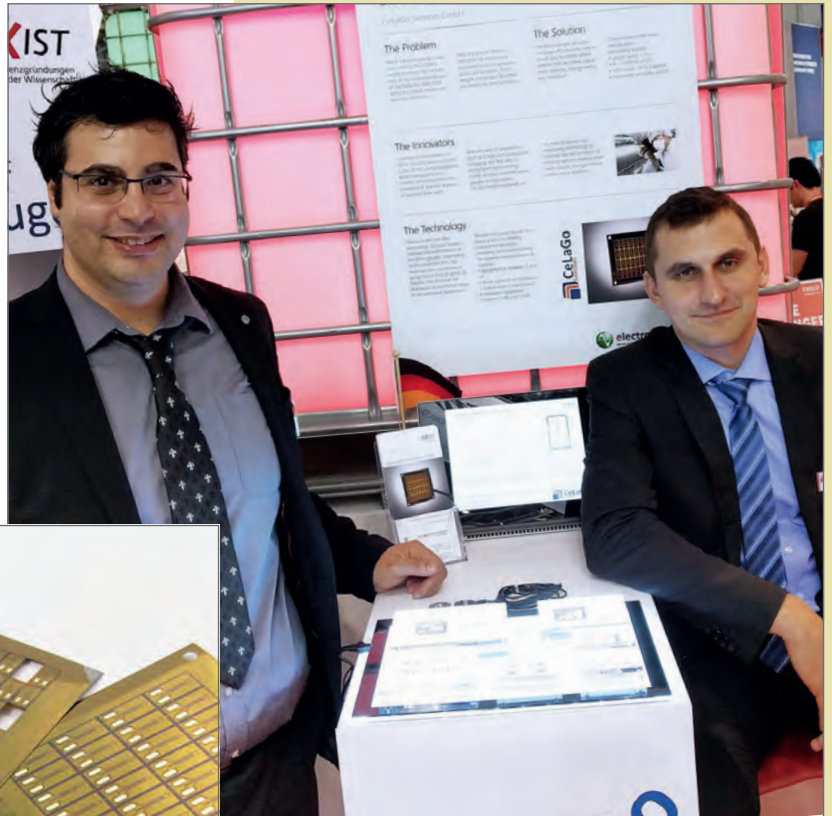
www.celago-sensors.de

The Problem

Metal foil strain gauges have been among the primary sensor elements for decades and are an indispensable part of everyday life. With their ability to convert strains into electrical resistance, they are used in diverse detectors for mechanical parameters such as pressure, strain, compression, force, weight, and torque. They are limited however by their sensitivity.
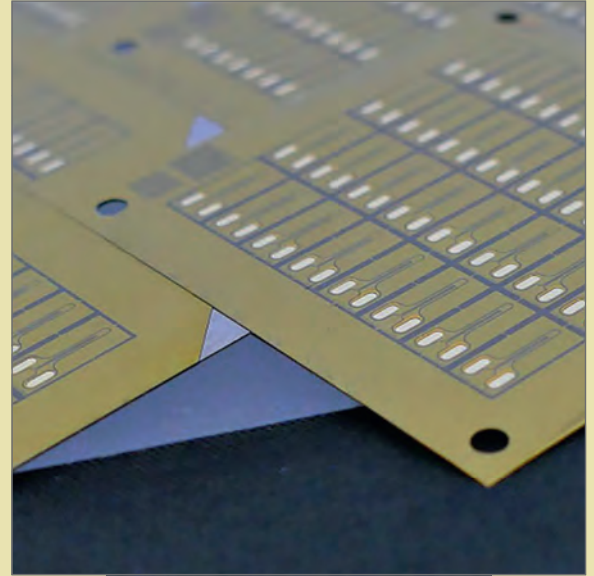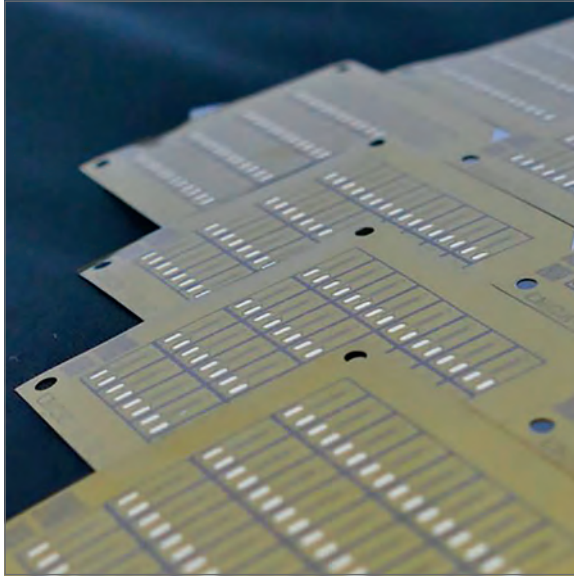
The Solution

Foil-strain gauges on a thin film base offer benefits which enable you to create sensor systems that are more robust, more sensitive, energy-saving and individual with characteristics that have already been extensively verified:

- gauge factor = 11±1
- R = 1,000 Ω ±0.5%
- TCR comp. 10.9±3 ppm/K
- transverse sensitivity ≤50%

The Innovators

Founded in Saarbrücken in 2017, CeLaGo Sensors GmbH is one of the young companies which emerged from a transfer of research from the University of Applied Sciences in Saarland (htw saar). With the aim of establishing itself as a high-tech production company, the first step is being taken by launching highly sensitive thin film strain gauges on the market. CeLaGo helps companies in the field of sensor and measuring technology to increase the performance of existing systems, making them more robust, energy-efficient and/or more sensitive.

The Technology

Thanks to thin-film technology, CeLaGo Sensors improve the performance of foil strain gauges. Depending on the thin film used, foil strain gauges can achieve a gauge factor (GF) of up to 30. Specific thin films can be developed to satisfy the needs of a particular application. Besides the gauge factor, the focus is also on stability, reduced temperature-sensitivity and reproducibility. The possible characteristics at a glance:

- gauge factor between 2 and 30
- linear signal-strain behaviour
- temperature compensated
- resistance adjustable between 1 kΩ and 50 kΩ.

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.
1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

Starting with the market of industrial sensor manufacturers, the aim is also to address innovators in other sectors with our new technology. The challenge here is to find the right tools and not to waste time, energy and money.

Markets
What are your primary markets?

Due to the existence of strain gauges for more than 60 years, our primary target market is that of industrial sensor manufacturers, who reach their limits with ordinary strain gauges and exceed them thanks to our high sensitive sensors.

Target Groups
Who are your primary target groups?

Our target group are manufacturers of sensors for strain, force, pressure, torque or weight.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

Compared to advertising in magazines or websites, the participation in trade fairs has shown the highest return of investment.

Investment
What is the financial investment you are aiming for?

The next investments are aimed at expanding the production line in order to serve mass markets.

The future
Where do you believe your company or product will be in 3 years time?

Our product has established itself on the market and the expansion of the production line is running at full speed. As a company, CeLaGo Sensors has positioned itself as a reliable supplier to the sensor system manufacturers of the world.

Plus
Is there anything else you would like to tell us about your startup/product?

Don't hesitate to test a new technology. Order your first samples now and convince yourself of the performance of the new generation of strain gauges. ■
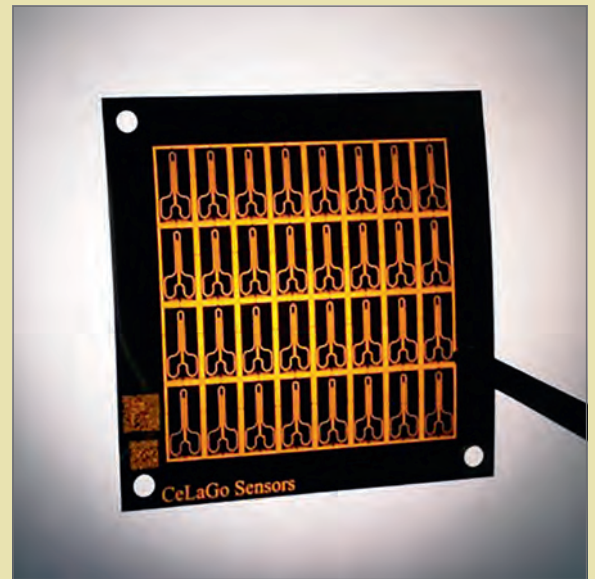
Contact

CeLaGo Sensors GmbH

Eschbergerweg 46
66121 Saarbrücken
Germany

Phone +49 681 85787-660
Fax +49 681 85787-665

info@celago-sensors.de
www.celago-sensors.de

Cocktail Joe

[Germany]

www.cocktail-joe.de

The Problem

Modern gastronomy often engages low or unskilled employees in the company. Therefore, the beverage menu is usually limited to a few, easy to serve items. In particular, the production of high-quality cocktails has always required well-trained and reliable personnel.

The Solution

"Cocktail Joe" is the solution to produce a wide range of high-quality cocktails with minimal effort. This is made possible by exact portioning of ingredients.

The Innovators

The innovators are brothers Michael and Max Buschmann. They possess technical knowledge through the study of automation technology and electrical engineering. In addition to their engineering studies, they have the necessary gastronomic experience from their family-owned businesses in Cologne.

The Technology

The use of 18 ingredients allows the production of over 60 different cocktails. In addition to the simple and intuitive operation which is achieved using an integrated touch screen, the machine convinces with its amazing light show. This is achieved using 20 individually controllable RGBW LEDs. The drive is provided by two stepper motors equipped with encoders, which ensure the exact dosage of the ingredients and positioning of the slide. "Cocktail Joe" ensures easy handling using a magnetically coupled slide. Safe operation is ensured by a light grid.

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.
1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

To be successful it is important to ensure a cost-effective, high quality production. At this time we are producing a series of 10 cocktail machines. More and more we determine that our product is really demanding in craftmansship. For this reason we would not be able to satisfy a large demand of our product. A big promotional campaign would not be proposeful at this time.

Markets
What are your primary markets?

We believe high quality cocktails are appreciated in many places around the world. Due to the less complex and uncomplicated nature of sales and transport, we will initially focus on countries within the European Union.

Target Groups
Who are your primary target groups?

We have engineered our Cocktail Machine "Cocktail Joe" for professional use. Made from high-quality and robust materials, we have invested a lot of

development time to ensure a fully thought-out and proven product. This has its price which is not practical for most private consumers. This is why Cocktail Joe is mainly aimed for gastronomic businesses such as bars, hotels, restaurants and catering providers. We are currently building an additional rental shop on which the machine is also available at private or business parties.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

At the moment we are promoting Cocktail Joe through the Cologne-based gastronomies "Papa Joe's Biersalon", alias "Klimperkasten", as well as "Papa Joe's Jazzlokal", alias "Em Streckstrump",

Plus
Is there anything else you would like to tell us about your startup/product?

It is now exactly one year since we integrated the machines into our two family businesses: "Papa Joe's Biersalon" as well as "Papa Joe's Jazzlokal". During this period, a total of 16240 cockails were mixed by our machine, acheiving a profit of around 70,000 €. We are therefore convinced of the potential of our product. ■

in which a cocktail machine is actively used. In the future, we would also like to build up a stronger Internet presence via social networks and present our product at gastronomic trade fairs.

Investment
What is the financial investment you are aiming for?

Almost all of our costs are currently incurred as a result of the complex production process. Our long-term goal is to organize a flexible and fast production. For this reason we need to invest the most of our budget in the production.

The future
Where do you believe your company or product will be in 3 years time?

Within the next year we would like to sell all machines of the first production and invest in a larger production. We believe that with Cocktail Joe we can establish a new quality standard for cocktails.

Contact

Max Buschmann & Michael Buschmann GbR

Im Wielpützfeld 9a
51503 Rösrath
Germany

Phone +49 1516 7462767

info@cocktail-joe.de
www.cocktail-joe.de

Cocktail Joe
the amazing cocktail machine
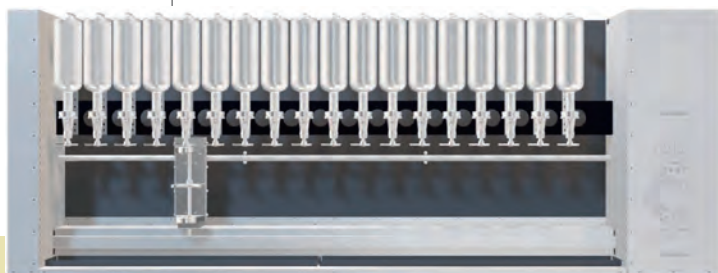
Contunity GmbH

[Germany]
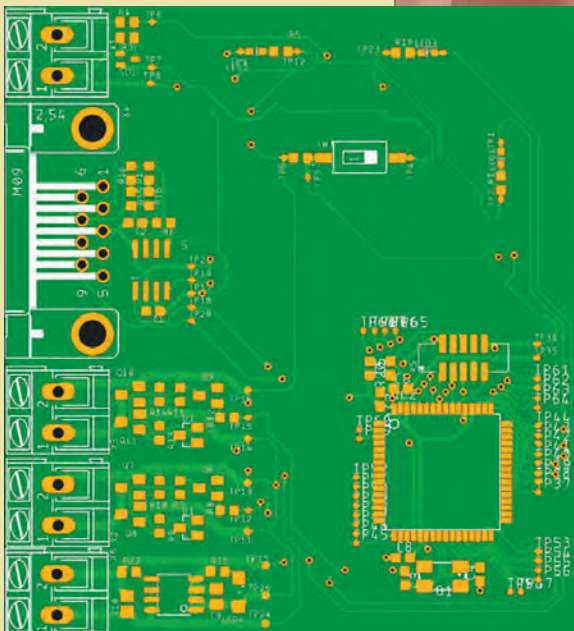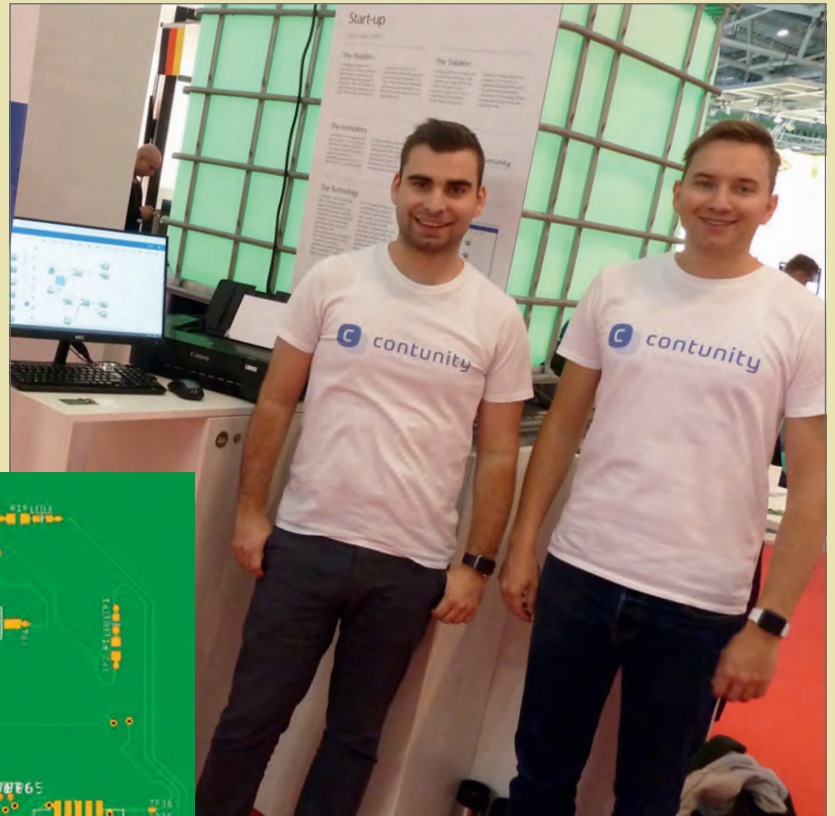
www.contunity.eu

The Problem

Embedded systems are being integrated into more and more devices. Currently, these are developed by highly trained engineers, who are unable to keep up with the design. In an age, where manufacturing is becoming more and more automated, the design process is becoming a bottleneck. In addition, hardware and software are developed separately. This is unproductive and leaves a lot of people behind.

The Solution

Contunity offers an easy-to-use user interface where you tell us what you need, press a button and get all your required output files. First, a user defines their required functionality through
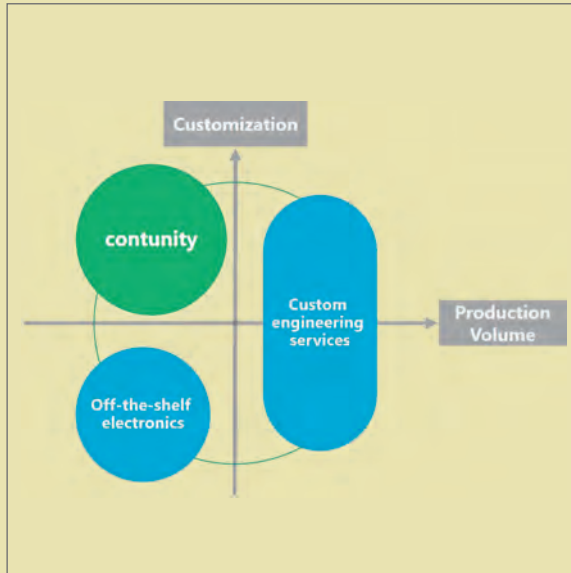
predefined modules and block diagrams. Second, our sophisticated algorithms and AI automatically generate schematics, PCB-layouts, BOM, embedded Source-Code and simulation files.

The Innovators

Contunity has an excellent and diverse team. The CEO Tobias Pohl has an MSc. degree in automotive engineering with years of experience in embedded systems. The CTO Alex Pohl has an MSc. degree in engineering as well and another MSC. degree in management. Both are supported by their CPO André Alcalde with 8 years of experience in the electronics industry, most recently at Intel, as well as an executive MBA. Additionally, we have a diverse international team with complementary strengths and expertise ranging from marketing, sales, and HR to software, AI and electronics.

The Technology

Contunity´s main technology lies in the background algorithms mentioned in the product description. Firstly, the schematics generator identifies hardware requirements and generates fully functioning schematics. It also parametrizes every component

to suit requirements. After this, a bill of materials is generated, followed by layout generation. During this step, all components are fitted on to a board of appropriate size to fulfill the physical constraints defined by the user. These components are then routed with all the necessary routes and vias. The last step is the generation of embedded software code. This approach to embedded development is completely new and fully automated.
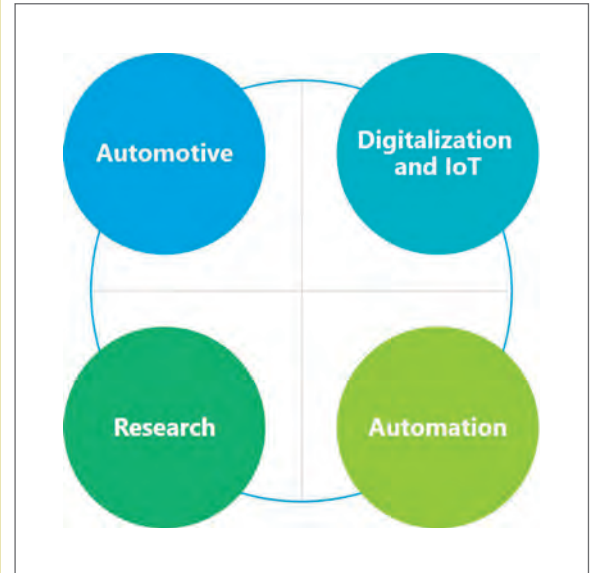
The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.
1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

We provide a software solution that radically lowers know-how barriers and reduces development times by up to 90%. We are currently running a pilot phase, where we are looking for innovative companies, who want to be at the forefront of the engineering of the future. On top of that, we are constantly looking for talents to join our team. To achieve both goals we need to bring our company and our solution to a larger audience. We envision a world, where electronics engineering is quick and easy and we want to spread our vision.

Markets
What are your primary markets?

Our focus markets are embedded solutions in automation, Industrial IoT and Smart Sensor markets. Our current focus is on central Europe and we plan to expand to all of Europe, North America, and Japan.

Target Groups
Who are your primary target groups?

Our target groups consist of engineering service providers as well as in-house engineering departments, especially in areas where fast development cycles and prototyping is required.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

When we began, we used our own network to make direct contact with potential customers. Simultaneously we are using online marketing tools to bring our solution to a larger audience. Another important channel for us is trade fairs and industry conferences.

Investment
What is the financial investment you are aiming for?

We plan on raising a seed funding round of 1 million Euro, mid-2019. With this, we can bring our software to the next level and achieve a larger market reach. It will be spent mostly on acquiring talent and growing our team.

The future
Where do you believe your company or product will be in 3 years time?

The future of electronics engineering will be an intense combination of human engineering and automation through software. We believe that in 3 years, our software will be a leading force in the area of electronics automation enabling almost every technician to be a world-class electronics and embedded software engineer.

Plus
Is there anything else you would like to tell us about your startup/product?

We at Contunity believe that humans should have the freedom to do what they love. And engineers love innovation and creativity. That is why our only goal is to help every engineer to work on the most cutting edge technologies. But what about the rest? Unfortunately, many tedious engineering tasks are still left to be done, that´s where our software comes in.

Innovative engineers + our software = The Dream Team. ■

Contact

Contunity GmbH
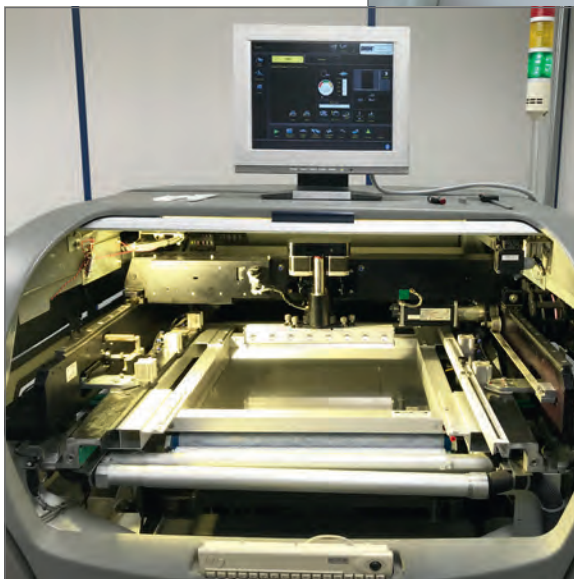
Kühamer Weg 1
84431 Heldenstein
Germany

Phone +49 172 6979751

info@contunity.eu
www.contunity.eu

Productronics

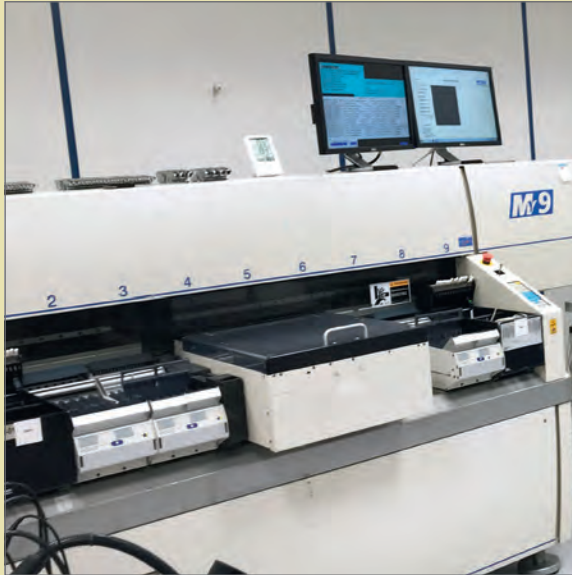**[The Netherlands]**

www.productronics.nl

The Problem

Within 5 days a high-tech prototype/small series from Gerber to PCBA? Electronics integrated on textile or foils?

The Solution

Productronics

Startup

The Innovators

Productronics is an innovative and dynamic startup with core competencies in know-how, technology, quality, and service. By use of our broad knowledge in electronics design, SMT technology, micro assembly, controlled BGA repair, reballing processes and our flexible assembly lines, we can do more

The Technology

Productronics offers an (µ) assembly EMS service to provide customer total peace of mind with a very short assembly time of only several days and with high quality and superior reliability. We thoroughly check the design files and provide the customer with feedback before ordering. Our equipment is able to pick and place small components down to 01005 packages. We are using many technologies for assembling surface mount components in different packages such as µBGA, BGA, LGA, Flip-chip, fine pitch, and through hole components. Detailed analysis of assembled components is also possible with X-Ray Inspection. The whole production facility is ESD protected and climate controlled. Components and PCBs are stored in climate controlled conditions.

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.

than only assembled high-tech PCBAs. We really can support the customer depending on their needs.

1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

Becoming known by electronic design / R&D companies and electronic engineers is our main focus at the moment.

Markets
What are your primary markets?

The Netherlands, Belgium, and Germany. Our secondary focus will be the rest of Europe.

Target Groups
Who are your primary target groups?

Everyone who has a board or small series to assemble can be our customer: design houses and product man¬ufacturers (who have electronics in their products), R&D engineers, and also EMS companies with a focus on mass production who would like to outsource small series and prototypes.

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Channels

Which channels are you using, or would you like to use, to bring your startup/product to the market?

The internet is very important to us. Also, one of our unique selling points is our service which is being promoted by our own customers.

Investment

What is the financial investment you are aiming for?

We have already invested a serious amount of money in our SMT lines and attributes. We are now looking for 500k euros to invest in additional machines to improve/expand our services and to hire people.

The future

Where do you believe your company or product will be in 3 years time?

Multiple assembly lines (SMD & THT) and a dedicated assembly line to support 24hr rapid prototyping only.

Plus

Is there anything else you would like to tell us about your startup/product?

We are an innovative company and are always looking for new technologies and opportunities to broaden our knowledge. We are also open to collaborations with other companies in order to bring their project and technologies to the next level. ■
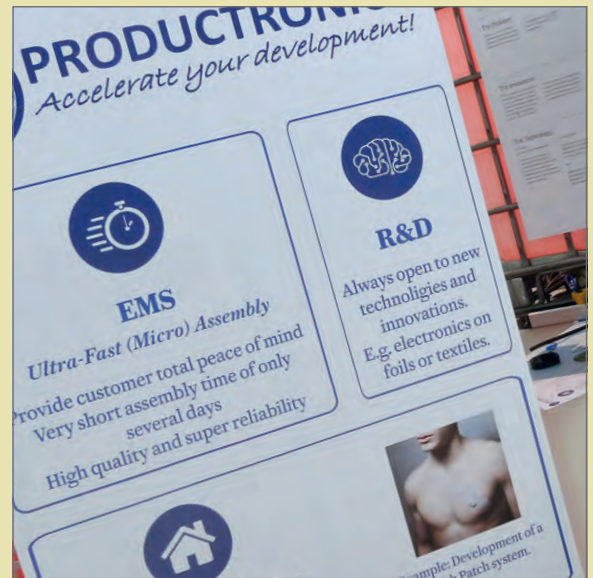
Contact

Productronics

Franklinstraat 25
6003 DK Weert
Netherlands

Phone +31 6 20720777

info@productronics.nl
www.productronics.nl

Inecosys GmbH

[Germany]

www.inecosys.de
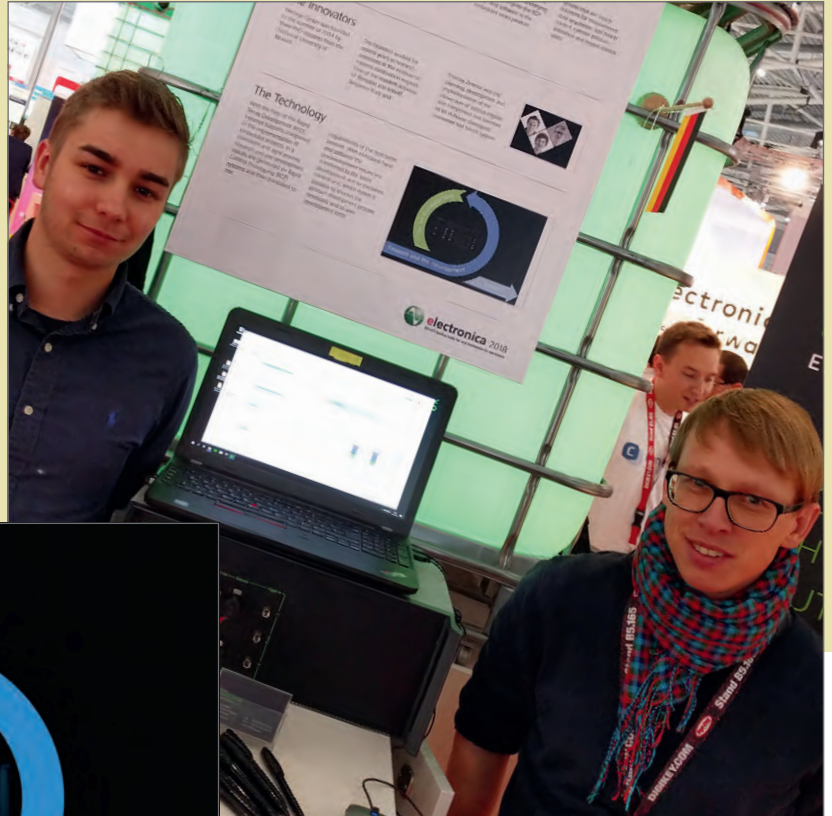
The Problem

Our customers are wasting time and money by being unable to automatically transfer their knowledge from research to series development and finally in their series embedded product.

The Solution

Inecosys supplies RCP-systems with a software environment and the series development framework with an underlying process to integrate RCP hardware and software in the embedded series product.

The Innovators

Inecosys GmbH was founded in the summer of 2014 by three Ph.D. students from The Technical University of Munich. For several years, the founders worked as research associates at the Institute of internal combustion engines.

The Technology

The Rapid Series Development generates a consistent and agile process, research and pre-development results and fits them to the requirements of the series product. With a platform, the pre-development results are transferred to the series development and to the series control unit.

The Questions

Ranking
What do you need the most to make your startup/project a success?

Rank the options below from 1 to 4 where 1 is the most important.
1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

We have changed our business model, and now we have to redesign and internationalize our homepage. In addition, we need to work on our communication strategy and identify the correct channels in order to find our first customers and partners for the new development platform.

Markets
What are your primary markets?

Energy, manufacturing & production, transportation, construction machines, mining, agriculture, and health-tec. Machines that are expensive, produced in small quantities and often customised.

Target Groups
Who are your primary target groups?

Our customers are classic machine and plant builders whose core know-how lies in the construction of plants and machines, i.e. those in mechanics, who are forced by digitalization and accelerated market forces to replace mechanics with electromechanics. Also, companies that develop embedded hardware for their customers and want to use time or cost advantages.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

At the moment we mainly use trade fairs and events as well as our personal network to address the market. In the coming weeks, we will increase telephone marketing and online marketing and address potential customers directly.

Investment
What is the financial investment you are aiming for?

For the next financing round, we are planning a volume of € 2.5 million, which is expected to be closed at the beginning of 2020.

The future
Where do you believe your company or product will be in 3 years time?

We will have changed the development process of many companies and have further developed ourselves as a company. We will have significantly reduced the costs per series output stage and improved programmability. We will have a tool which allows automatic circuit design and thus further increased savings potentials.

Plus
Is there anything else you would like to tell us about your startup/product?

In addition to regularly strengthening our team with new employees, we are actively seeking customers and partners who would like to test our new development approach. So if you are interested in generating a solution from prototype to small series in the electro-mechanical field, please do not hesitate to contact us.

Contact

Inecosys GmbH

Agnes-Pockels-Bogen 1
80992 München
Germany

Phone +49 89 20036590
Fax +49 89 20929188

info@inecosys.de
www.inecosys.de

Inveox GmbH

[Germany]

www.inveox.com

The Problem

Time-intense, highly manual processes in labs resulting in irregularities in cancer diagnoses (1-15 % nowadays)

Expensive and error-prone procedures costing the healthcare system ~50 Mio. € p.a.

Hundreds of patients misdiagnosed or wrongly treated due to false-positive/negative laboratory findings

Fatal medicinal, psychological and personal consequences

The Solution

Increased efficiency and patient safety with our automation system for histopathology labs, increasing operational efficiency while reducing error risk and significantly improving patient safety

Innovation & automation in 3 components – a data & communication platform, proprietary biopsy containers, an automation device for sample entry - providing a basis for reliable cancer diagnoses

The Innovators

MARIA Industrial Engineer by training, healthcare pioneer by passion. As Founder & Managing Partner of Inveox, Maria Driesel primarily manages business development and strategic partnerships.

DOMINIK - Molecular Biotechnologist & healthcare trailblazer. As Founder & Managing Partner of Inveox, Dominik Sievert spearheads product development and intellectual property (IP) & Innovation.
Team Inveox– leveraging diversity Uniting experts from 14 nationalities & 9 fields eg. engineering, mechatronics, computer sciences, statistics, computer vision/AI, etc., with a 50% female share.

The Technology

Digital examination request
- Web-based, highly secure data- & communication platform
- Seamless communication between physicians and labs
- Unique, highly secure, encrypted allocation of information
- Information-exchange in real time: sample tracking, status retrieval, capacity planning

Intelligent sample container & automation device
- Novel sample container w. unique ID & integrated filter
- Lab device for automated sample handling, incl. touch-free formalin disposal & repacking of samples into biopsy cassettes, unique ID, laser tech. Visual ID & AI-based image recognition

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.
1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

For us, as a startup, all four mentioned areas are equally important to our success. Depending on which phase we are in, one area might take higher priority – however, we value all areas equally and all are equally important in achieving our common goal. Currently, we are heavily investing in product development and market development in Germany and neighboring countries. In the short term, we will expand our sales and service team structures. Mid-term, we believe the further development of our products and internationalization, including the US market, are the next steps to our company's growth and development.

Markets
What are your primary markets?

Our customers are pathology laboratories – be they privately-owned, in private or public hospitals, part of a laboratory chain, or in pharmacological and research institutes as well as their respective senders. We share a common vision with all of our customers: providing fast, reliable diagnoses for patients while laying the cornerstone for the best possible treatment and targeted medical care.

Target Groups
Who are your primary target groups?

Benefits for the clients

For laboratories
Inveox significantly improves the efficiency and operational safety of histopathology laboratories. By implementing our automated system, an average pathology lab can save up to 7800 working hours, resulting in a total saving potential of approximately 250K € every year. In times of high wages and chronic shortages of lab assistants, this is not only a financial benefit but also operational, especially in hospitals.

For physicians
The Inveox automated system increases the efficiency of labs, meaning physicians receive faster, more reliable diagnoses. Additionally, physicians benefit from the streamlined, detailed communication with their laboratory, which facilitates more timely and target treatment for their patients.

For the benefit of us all
Every second person is confronted with a cancer diagnosis at least once in their lifetime. Our revolutionary automated system contributes to preventing patient harm and unnecessary expenses resulting from incorrect or delayed treatments, thus reducing insurance costs and even potentially allowing for a new allocation of funds within the healthcare system.

Channels

Which channels are you using, or would you like to use, to bring your startup/product to the market?

Through our research and development partnerships, our collaborations with experts from renowned university hospitals are a core element for our product development. Through these collaborations, we ensure that our solutions are geared not only for current market needs but especially future needs and solve real pain points. The industry is based on a strong network – the majority of our prospective clients now come from the recommendations of colleagues from other laboratories, hospitals, and research institutions. We are very thankful to be in close contact with many of the most important opinion leaders in the industry. We are constantly expanding our network of interested clients and brand ambassadors.

Through intensive feedback programs and partnerships, Inveox not only ensures products are developed based on customer needs and market demands but also contributes to strengthening the reputation of German laboratories and research institutions internationally.

Investment

What is the financial investment you are aiming for?

At this time we are not actively searching for new investments. That said, we are always interested in creating new contacts, partnerships, and mentoring opportunities to broaden our perspectives, challenge our ideas, and improve our products.

The future

Where do you believe your company or product will be in 3 years time?

The key points of our further development are company scaling and internationalization. We look to achieve this through the expansion and further growth of our strong leadership team, input from industry experts, and the extension of our network. Fostering close and trusting cooperations with our partners, mentors, and investors are also very important to us.

With the strong support of our current partners, we are currently implementing our products in Germany and exploring opportunities within the European market, while also actively planning our US market entry for late 2019 onwards.

Plus

Is there anything else you would like to tell us about your startup/product?

Time-intense, highly manual processes in labs are expensive, error-prone and the most common reason for irregularities in cancer diagnoses. Statistically, every second person is confronted with a cancer diagnosis at least once during their lifetime. In addition to other diagnostic procedures, the basis for this is usually the analysis of a tissue sample taken from the body. Any errors that may occur

during the process of sample receipt and registration (due to mix-ups, contamination, or even loss of the tissue sample) run through the entire subsequent laboratory process. According to expert estimates, irregularities currently occur in 1-15% of all cases and, in the worst case, can lead to misdiagnosis, incorrect treatment or unnecessary surgery. In Germany alone, every year hundreds of patients are misdiagnosed or treated incorrectly due to false-positive/negative laboratory findings, causing fatal medicinal, psychological, and personal consequences for patients and their families.

At the same time, histology labs are facing a huge lack of qualified staff while the number of samples to handle every day (up to 3000 samples per day per lab) increases dramatically due to demographical changes and implementation of new test methods (e.g. molecular pathology). The introduction of any personalized treatment requires a personalized diagnosis first, which Inveox aims to enable, sample by sample.

Therefore, Inveox has developed an automated system for histopathology labs, increasing operational efficiency, significantly improving patient safety, and collecting relevant sample data (e.g. samples parameters, size, color, shape, image recognition of the sample). The system consists of three components - a data and communication platform, proprietary biopsy containers, and an innovative automated device for sample entry. Inveox thus solves the biggest efficiency problem, eliminates the most important risk factor for patient safety in histopathology, and presents the world's first automated system for sample entry, and holds protecting property rights for it.

Contact

Inveox GmbH

Lichtenbergstraße 8
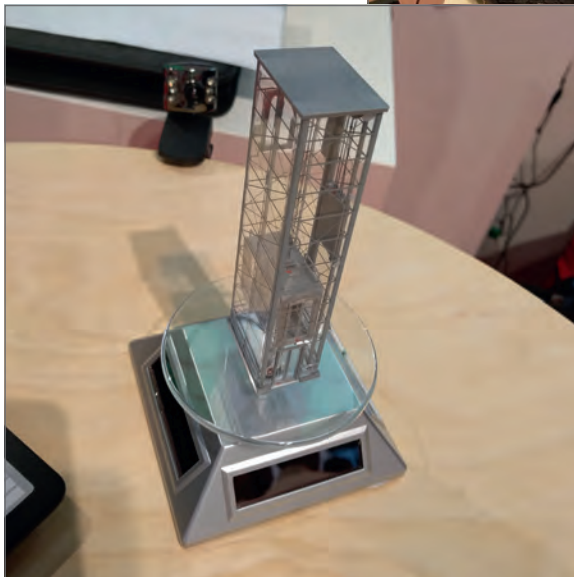85748 Garching bei München
Germany

Phone +49 89 57847601

info@inveox.com
www.inveox.ocm

JLC
Smart Elevator Systems

[Germany]

The Problem

- An increasing number of elevators
- Increasing staff shortage
- The interval-based maintenance method can no longer be guaranteed
- Currently, there is only a subjective maintenance method that depends on the technician

The Solution

"EAS" Elevator Analysis System
- EAS replaces interval-based maintenance
- higher quality maintenance through "standardization" of maintenance measures
- a fourfold number of lift systems per technician is possible
- the workflow at the elevator service providers is considerably accelerated

The Innovators

Christof Jähne, Certified technician specializing in electrical engineering.
My target is to create and deliver real added value for elevator service providers and end customers through electronics and information technology.

The Technology

Uses a redundant system which works with the well-known MQTT protocol. The sensors comprise of acceleration and/or a gyroscope sensor for acquiring data. In time, Motion events are unpredictable. Therefore, accurate detection requires immediate recording. The data is transmitted by radio to a Severmodul and from there to the data center. The data is processed and classified in the data center. Then the possible cause of the error is reported to the technician.

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.
1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

We need startup financing for operations and personnel.

Markets
What are your primary markets?

Our market is every elevator.

Target Groups
Who are your primary target groups?

Our target group is elevator service providers who want to offer their customers a more outstanding service that sets themselves apart from their competitors. Elevator service providers who want to know the wear and condition of their elevators at all times to ensure excellent service. Elevator service providers who want to expand with our product and/or increase their margin.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

We want to market our product using direct sales as well as through advertisements and articles in journals and portals. In addition, we want to advertise our product in related fields such as Facility Media.

Investment
What is the financial investment you are aiming for?

550.000€

The future
Where do you believe your company or product will be in 3 years time?

Many elevators across Europe will be equipped with our system.

Plus
Is there anything else you would like to tell us about your startup/product?

JLC offers a radio-based system solution for automatic elevator maintenance in the predictive maintenance area.

Contact

Smart Elevator Systems

Neugasse 19
65510 Hünstetten
Germany

Ledovation GmbH

[Austria]

The Problem

A common problem in gastronomy is when guests are overlooked by service staff. This problem occurs especially in cozy spaces with bays and separations. The overlooked and often annoyed guests can cause a loss of revenue as well as generate a bad reputation for the restaurant or hotel.

The Solution

We present an easy to use solution, 'SERVICE TUBE':
A simple touch to the surface of the tube indicates a service wish indicated by the change of the LED-color: Touch for service!

The Technology

SERVICE TUBE uses a touch sensor as well as the latest custom designed BT-mesh technology. This allows direct tube to tube communication and improved signal transduction. To establish SERVICE TUBE as an IoT platform, a gateway module with

Our table management app, operating on a smartwatch, tablet or mobile informs the staff effectively! The data generated by SERVICE TUBE can be used for even more innovative apps.

implemented web services can be used. The hardware is based on a custom designed circuit board, mounted on a 3D-printed base. 12 LEDs and a Li-Ion battery guarantee ambient LED candle light atmosphere for up to 40h. SERVICE TUBES are charged by a custom designed docking station optimized for easy to use charging.

The Innovators

Clemens Schöpf, Ph.D./CEO: The Innovator & Founder of Ledovation. Main responsibilities: Business development, sales, fundings, SCM, Team Management

Markus Arzl, CTO: The technical head and co-founder of Ledovation. Main responsibilities: hard and software prototypes, strategic development

Lukas Schöpf, programmer & technical support. Main responsibilities: 3D-printing, smartwatch programming; Hard & software development

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.
1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

Our Product 'SERVICE TUBE', is an easy to use waiter call system that is ready for market launch. We have already sold over 100 pieces and have received good feedback from our initial customers in the gastronomy and hotel sectors. We are currently searching for the correct channels to increase our sales.

Markets
What are your primary markets?

The Hotel and Gastronomy sectors. We recently devised a mechanical theft protection system for SERVICE TUBE. Thus we would also like to target pubs and restaurants with higher guest frequencies.

Target Groups
Who are your primary target groups?

Because it is IoT ready we can provide additional anonymous guest data. We plan to establish SERVICE TUBE as a platform solution for gastro apps.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

We are currently using TV, internet (social media) as well as ferries to promote our product.

Investment
What is the financial investment you are aiming for?

Circa 100k€ mainly for marketing

The future
Where do you believe your company or product will be in 3 years time?

We hope to find our product in many Hotel Lobbies, Restaurants and bars across Europe.

Plus
Is there anything else you would like to tell us about your startup/product?

We are currently working on a fully digital solution in addition to Service TUBE... stay tuned! :-)

Contact

Ledovation GmbH

Andreas-Hofer-Straße 36a
6020 Innsbruck
Austria

Phone +43 676 7413173

office@ledovation.at
www.ledovation.at

Querom Elektronik GmbH

[Germany]

www.querom.de

> **Winner of the Third Prize of the electronica Fast Forward 2018**

The Problem

For the electrification of, for example, vehicles, a high-voltage DC/DC converter is needed, which takes the energy from a high-voltage battery and transforms it to a respective low-voltage. At the same time, the high-voltage converter has to charge the battery in the low-voltage vehicle electrical system. Charging is a complex process which can in the worst case, destroy the battery.

The Solution

The Querom 3000 HVDC-12 is a compact high-voltage DC/DC converter with integrated battery protection function. The intelligent software adapts output voltage to battery conditions and thus minimizes aging effects on the battery in the vehicle electrical system. The permanent adaptation of charging parameters ensures the supply of the electrical system.

The Innovators

Querom Elektronik GmbH was founded in March 2017 by Christoph Bacher, Sebastian Reinhardt, Tobias Oswald, Anton Mitterreiter and Thomas Schulz

in Geisenhausen. All five founders have extensive experience in the development and production of power electronics in their respective fields. Early on they recognized the trend towards electromobility and the special requirements in the high-voltage sector. As specialists, they offer customers sustainable solutions with added value.

The Technology

A multiphase design with high switching frequencies allows the usage of small and cheap passive components, while top-of-class power semiconductors help to keep losses low. A digitally implemented control loop eliminates the influence of component age and wear on control loop performance. Modern Cortex based processors with specifically designed software enable full digital control of the multiphase converter and offer great design flexibility as well as several ways to keep the light-load-efficiency high. Users can choose between multiple methods and scenarios of communicating with the converter and integrating it into existing power systems.

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.
1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

At the moment our project is not finished, and therefore can not be sold in the near-term, although there have been many inquiries. Our big challenges are in developing the hardware because it requires a very complex solution with a versatile platform for several applications. To reach the important project milestones, the correct measures including personnel support are our focus.

Markets
What are your primary markets?

We have started in the DACH region for various markets, in particular, electromobility. Additional markets are industrial plants, data centers and renewable energy with storage systems. After a successful market entry, we intend to extend into more European countries.

Target Groups
Who are your primary target groups?

Our primary target groups are companies that convert conventional drives to electric drives and system vendors of power trains. Furthermore, we are looking for vehicle manufacturers of small series and commercial vehicles where high voltage DC/DC converters supply the low voltage system from high voltage batteries.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

We are using SEO for generating specific inquiries. Moreover, we use our existing contacts and network for directly distributing our solutions. Furthermore, we are building up cooperations with suitable partners. We want to use industry-specific partners to bring our startup with a product to market.

Investment
What is the financial investment you are aiming for?

To bring our product to market, we require around 1.000.000 Euro. This would be spent on prototyping, human resources, and production.

The future
Where do you believe your company or product will be in 3 years time?

Our company will cooperate with a suitable partner in our industry. We will provide our solution in many variants for different applications. Also, new innovative solutions will be developed. For example, in the Internet of Things arena.

Plus
Is there anything else you would like to tell us about your startup/product?

There are a lot of good and innovative ideas, which cannot be used because of a lack of resources. The market for power electronics and electronic devices with software solutions is booming. Querom also offers accompanying services such as technology consultancy and wants to shape future markets with our business model and its long term potential.

Contact

Querom Elektronik GmbH

Vilsbiburger Straße 70 - 74
84144 Geisenhausen

Phone +49 (0) 8743 967 197-0

kontakt@querom.de
www.querom.de

Reedu GmbH & Co. KG

[Germany]
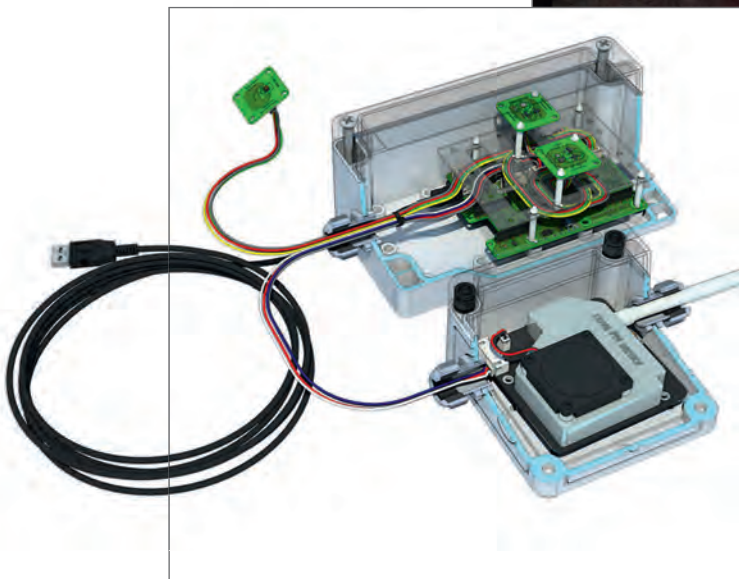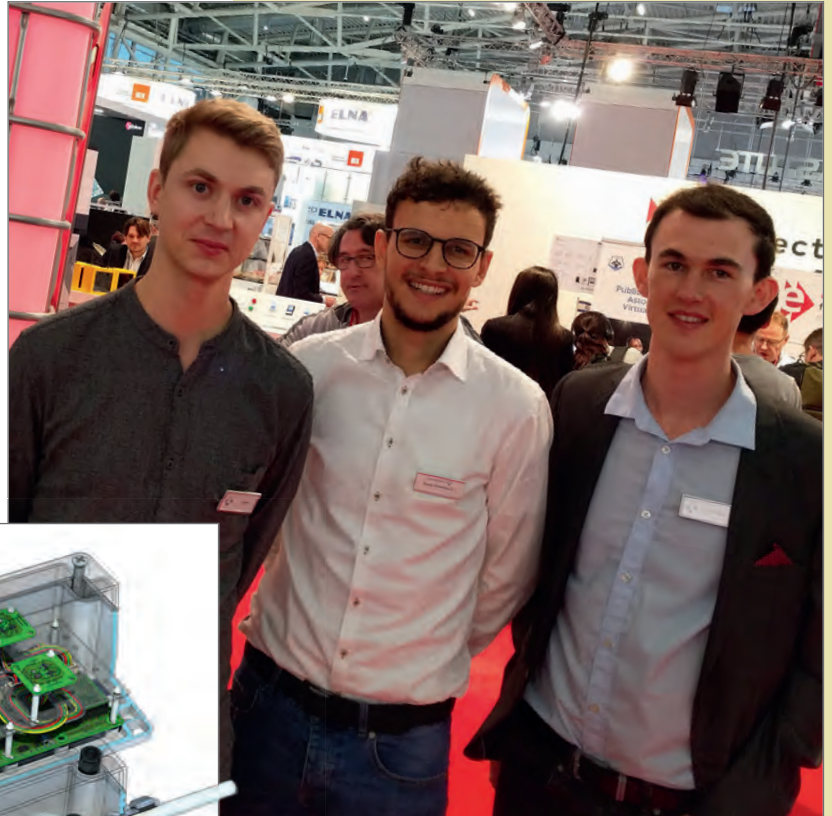
www.reedu.de

The Problem

Environmental data can be processed to form information to address socially relevant topics like air pollution or climate change. Official measurements are mostly limited in terms of spatial coverage and degree of openness. Moreover, sensor systems are often closed systems which do not allow identification or modification of the hardware setup.

The Solution

To address the increasing interest of citizens in collecting environmental data from their local environments, we developed senseBox as an entirely open system. It allows non-expert users to build their own modular and flexible measurement device. The data being collected is published on the web on openSenseMap, our platform for sharing and analyzing open environmental data.

The Innovators

Reedu GmbH & Co. KG is a startup company based in Münster, Germany. It develops, builds and sells senseBox. The company is a spin-off from the Institute for Geoinformatics in Münster, with whom a close R&D cooperation exists until today. The company offers products and services in IoT and digital education, starting from the development and design of open-source hardware and sensor equipment, products, and workshops in the arena of digital education and sensor network infrastructures.

The Technology

An Open-Source microcontroller is at the center of the senseBox project. It is based on the ARM Cortex-M0+ processor from Microchips' SAM D21 family. Sensors and actuators can be connected over a standardized JST plug system for I2C, UART and GPIO interfaces. Two XBee compatible sockets allow easy UART or SPI module integration. Further product features are Crypto Authentication for OTA programming via Microchip ATECC608A and an onboard Bosch BMX055 gyro/accelerometer/ magnetometer and energy saving functionalities. This enables a huge variety of applications for IoT, Citizen Science, and Digital Education.

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.
1. Marketing
2. Finance
3. Operational support
4. Technology support

Tell us a little bit more about option 1.

We developed the Open Source Board SenseBox which is based on the Arduino platform. It is optimized for connecting sensors as well as educational purposes. Currently, we are well-known in the educational market. More than 100 schools and universities in Europe our product to teach children and students how to code and build environmental measurement stations. Nonetheless, the board is not well known in the electronics industry: therefore more and better marketing might be the solution.

Markets
What are your primary markets?

Our primary markets are schools, universities and education institutions. Moreover, there are cities and initiatives which are interested in IoT environmental stations. Much of the interest in our board comes from the LoRaWAN community. We are well known in German-speaking parts of Europe, however, there could be also interest in other parts of the world.

Target Groups
Who are your primary target groups?

Our primary target groups are cities and educational institutes. Furthermore, the senseBox is also regularly purchased by private individuals and companies.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

We currently use our own online shop as the primary channel to sell our product. However, we might be able to achieve a higher market share by partnering with a large distributor such as digi-key for example.

Investment
What is the financial investment you are aiming for?

Right now we are bootstrapped and cross-financed by workshops and governmental sponsors. We are lucky that our product is very open and social. This helps us in receiving financial assistance from governmental institutes and foundations.

The future
Where do you believe your company or product will be in 3 years time?

We believe we have the potential to become a significantly larger company. Currently, 3500 users of our web platform openSenseMap.org share their data with the world using our service. We believe we could reach easily 10.000 users in the next 3 years who will continuously share their sensor data with us and the world. We believe, that thanks to our community we will be the biggest platform for open environmental sensor data in the world.

Plus
Is there anything else you would like to tell us about your startup/product?

You can support our ideas and open-source projects by purchasing our original products.

Contact

Reedu GmbH & Co. KG
Heisenbergstraße 2
48149 Münster

www.reedu.de

Sourcingbot

[Germany]
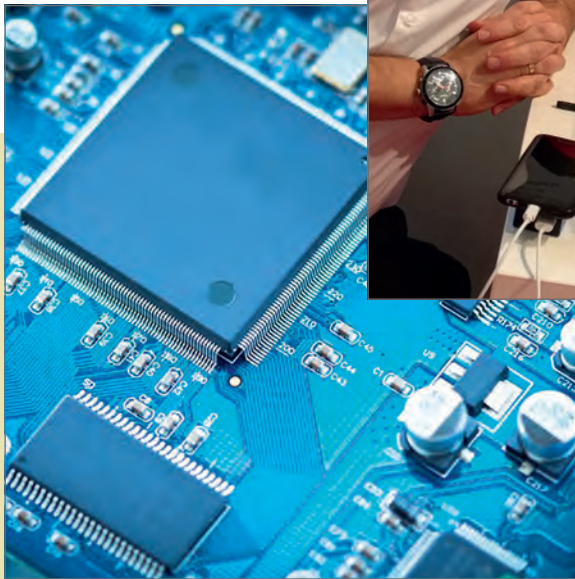
www.sourcingbot.com

The Problem

Searching & comparing electronic parts is very
difficult because each manufacturer tests his
parts in a different and lab environment. The
remaining information is still on hard-print PDFs.
The procurement domain is now entirely Online, but
sourcing remains behind!
1. Information is not digital.
2. Existing processes require costly & time-
   consuming lab

The Solution

We provide a real lab-based comparison, that existing marketing oriented data-sheets are unable to provide. Furthermore, using our platform we can advise and provide suitable cross-references. Using machine learning & prediction models we are able to provide a part comparison in your own operating point and under your design constraints.

The Innovators

Ran Oren - Professional services expert with 10 years of industry experience

Eran Keren - 12 years experience in enterprise software development

Founded within Humboldt innovation in Berlin as part of Exist startup Germany. Sourcingbot is a joint research project rising from the increasing joint Israeli-German research association (GISEP) Our technology relies on lab-based measurements, using ISO / IEC 17025. We utilize prediction models & machine learning algorithms to allocate alternative suppliers to match your operating point.

The Technology

Find: Search 1000s of part manufacturers from top distributors. The sourcing industry has now its real e-commerce platform!

Compare: Parts tested in identical lab environments, Search the biggest cross reference part database out there!

Simulate: Compare your BOM using our automatic simulation algorithms, Identify similar products right at your operating point

Cross-referencing: The largest cross reference for passive components! Find your alternative suppliers fast!

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.

1. Finance
2. Marketing
3. echnology support
4. Operational support

Tell us a little bit more about option 1.

We are in the goto market phase, therefore, we need to demonstrate our solution to the market

Markets
What are your primary markets?

Global electronics manufacturing, mainly around consumer electronics.

Target Groups
Who are your primary target groups?

Engineers who do PCB/IC design.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

Professional exhibitions but also online marketing, such as social networks (professional)
And startup related ecosystems.

Investment
What is the financial investment you are aiming for?

irrelevant.

The future
Where do you believe your company or product will be in 3 years time?

Similar market share to octopart.com, well-known search platform focusing on electronic components, with a unique solution for engineers. We will be the biggest.

Plus
Is there anything else you would like to tell us about your startup/product?

We just returned from Electronica in Shanghai China! It was amazing and really good.

Contact

Sourcingbot

www.sourcingbot.com

Swabian Instruments GmbH

[Germany]

www.swabianinstruments.com

The Problem

In modern research labs, scientists invest more than 30% of their time for the development of dedicated software for instrument control and data acquisition. This results in high development costs and long development cycles.

The Solution

Imagine you could define any thinkable digital measurement on a software layer. A multi channel time-to-digital converter would capture all your physical signals and stream all toggle events to your computer as a continuous time-tag-stream. Swabian's software engine enables you to hook unlimited measurements onto the time-tag stream that can be a logic analyzer, protocol analysis, etc

The Innovators

Swabian Instruments is run by two founders from the University of Stuttgart, Dr. Helmut Fedder and Dr. Michael Schlagmüller, that have a background in quantum technology and strong ties to academia. The founders were awarded an EXIST Gründerstipendium to bring their technology to market in 2016 and are Finalists of the Innovationspreis BW 2018. Growing the team to 5 full time employees required not only technical know-how but also a clear business plan, clear values and the leadership skills that are necessary to to get the best employees on board.

The Technology

The customers of Swabian Instruments first replace a number of expensive Instruments with a single digital frontend of Swabian's Time Tagger Series. The digital frontend offers a number of general input channels, captures all signals of a measurement environment, time-stamps all toggle events (rising and falling edges) and streams them in a highly compressed form - a so-called time-tag-stream - to the user PC. On the PC runs a versatile software engine that enables the user to define arbitrary digital measurements on a software layer and hook them onto the time-tag-stream. All measurements run in parallel and can be extended and linked in a generic fashion. This is a very powerful data acquisition architecture that is applicable whenever the signals are digital and sparse.

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.
1. Finance
2. Marketing
3 .Technology support
4. Operational support

Remark: besides **Marketing**, the next most important thing is **Recruitment** and this is something Elektor could help with.

Tell us a little bit more about option 1.

I always say, starting up a company means three things: 1. Sales, 2. Sales, 3. Sales. After you have taken your first steps and confirmed that you can actually sell your product or idea, you have to build a team and your next goal should be to get outstanding people on board.

Markets
What are your primary markets?

Measurement and Instrumentation, R&D.

Target Groups
Who are your primary target groups?

Universities and Research Institutes.
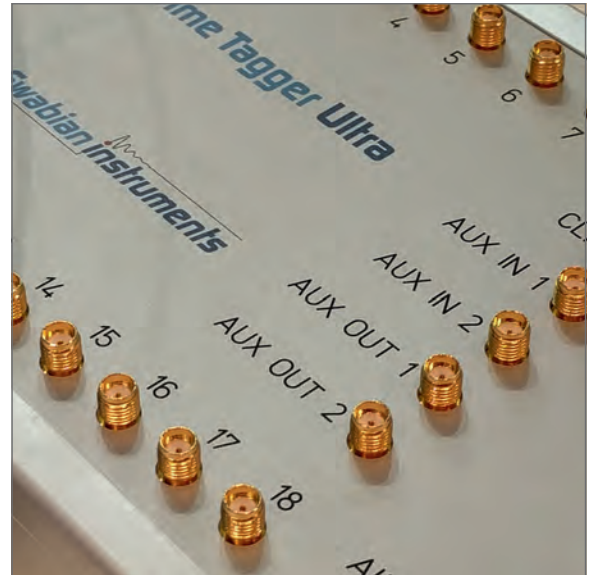
Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

Scientific conferences, such as Photonics West, CLEO, DPG March meeting and trade shows such as ECOC, electronica, OFC

Investment
What is the financial investment you are aiming for?

None.

The future
Where do you believe your company or product will be in 3 years time?

20 employees, 10 M annual revenue

Contact

Swabian Instruments GmbH
Frankenstr. 39 71701 Schwieberdingen

info@swabianinstruments.com

DeltaProto

[The Netherlands]

www.deltaproto.com

The Problem

Regular SMT pick & place machines must be correctly configured. This process can be expensive and time-consuming. Therefore it's not always possible to order proto PCBAs as often as you might like. Regular machines are only equipped for mass production. Nowadays EMS companies that are willing to produce proto PCBAs must fit proto production run into their schedule. It often takes weeks to receive proto PCBAs.

The Solution

Proto PCBA production by our own custom software and machines. Ordered in 5 minutes, Checked within 1 day, Ready after 5 days.
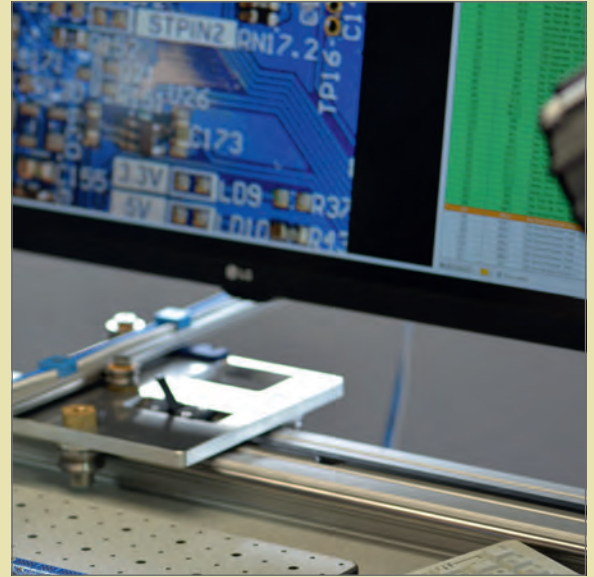
The Innovators

DeltaProto was founded in the Netherlands in 2015 by Michiel Wanninkhof and others. The Founders have 50 years+ of relevant experience in EMS and 10 employees (full and part-time). Our goals are as follows: Establishing our business in France in 2019, Germany and the UK in 2020. We plan to expand into three more Europian countries in 2021.

The Technology

Cheap PCBA proto service (quick quotation using the online calculator) and assembled PCBAs within 5, 10 or 20 days, including components and PCB, usually for less than 1000 euros. DeltaProto is a Dutch company focusing exclusively on the production of proto PCBAs. We have developed our own software system and production machines.

We think it'll be almost impossible for any other company to deliver proto PCBAs faster or cheaper!

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.

1. Marketing
2. Operational support
3. Finance
4. Technology support

Tell us a little bit more about option 1.

We believe our proposition is simple and clear: Our growth over the last 24 month has shown that the service is fulfilling a need. The most important thing for the next stage of our growth is to inform more engineers across Europe.

Markets
What are your primary markets?

- OEM R&D departments
- Engineering companies
- Technical Universities and Research Institutes
- EMS

Target Groups
Who are your primary target groups?

Hardware engineers & R&D managers

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

- Mouth to Mouth
- Own website
- LinkedIn
- Google Adwords

Investment
What is the financial investment you are aiming for?

2019: 500k (Marketing & R&D)
2020: 500k (Marketing)

The future
Where do you believe your company or product will be in 3 years time?

Proto PCBA factories in Benelux, Germany, France, Nordic and Italy.

Plus
Is there anything else you would like to tell us about your startup/product?

Our proposition significantly reduces proto manufacturing lead time and related costs.
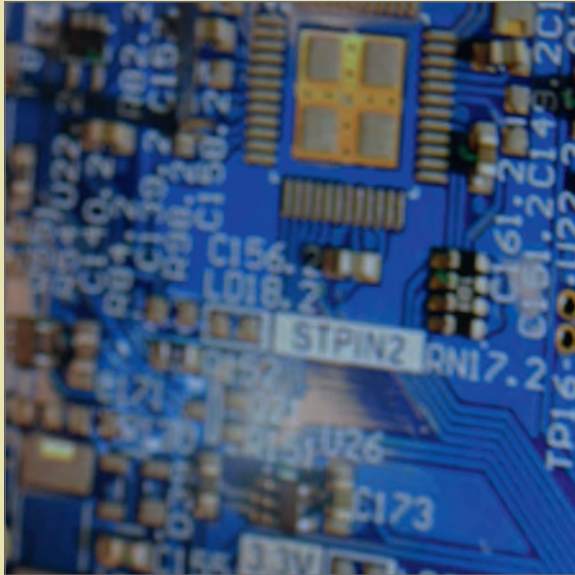
We enable electronic R&D departments, engineering companies, and OEMs to quickly develop engineering PCBAs and reduce time to market. A service that is regarded as a game changer in the industry and essential to support the required change to 'hardware scrum'.

Contact

DeltaProto

Hellingweg 10
1151 CS Broek in Waterland
Netherlands

Phone +31 20 7173868

info@deltaproto.com
www.deltaproto.com

ExoKrypt UG

[Germany]

www.exokrypt.de

The Problem

Security vs. Usability

Security is expensive, complex, not sexy and anything but fun for users, employees, and operators. Up to now, usability and security have been contradictory.
1. Security costs money, is complicated and is no fun for users, employees or operators to use!
2. Smartphones are closed ecosystems that leave little room for functional & security expansions!

The Solution

Security meets Usability - The only way security works –> AI-based multi-factor-authentication | Separate, user-controlled hardware case | Awareness & information as „first-line-of-defense"

Usability –> Fewer active authentications needed + easy to use UI | Modular, protective cover + stylish finishes | Long-term learning success by means of gamification

The Innovators

Tobias Kohlhuber (29)
Privacy, Marketing & SEO | CEO - eikoon SEO | Co-Author„Mobile Anwendungen in Unternehmen" - Springer Verlag | B.Sc. Business Informatics

Stefan Kleeberger (28)
Server & Network, Linux, Application Development | Healthcare and Automotive Industry | Statistics, HPC, and ML| B.Sc. Bioprocess Informatics

Erik Kunz (28)
Web & online shop design, UX/UI and CI | CEO - eikoon Web | Ext. design PM Hornbach | PHP, CSS3 and HTML 5 | B.Sc. Business Informatics

The Technology

ExoKrypt's "ExoShield Case" multifunctional protective cover is geared to user requirements. It is modular, stylish and equipped for the toughest conditions. A simple and secure extension for every smartphone used daily. The concept includes three types of protective covers. Each type is preconfigured for the specific target user group. In addition, the cases allow customization by the user. The core case is also housing a variety of different secure hardware components e.g. a secure element that can produce, store and process keys and biometric data securely. At a later stage, it can provide the required security to handle cryptocurrencies in a way that only hardware wallets can do today, but on your smartphone.

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important.

1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

ExoKrypt is dependent on capital in the form of a seed investment to achieve its goals. All shares are currently held by the founders. Hardware development, especially hardware security, is very cost intensive.
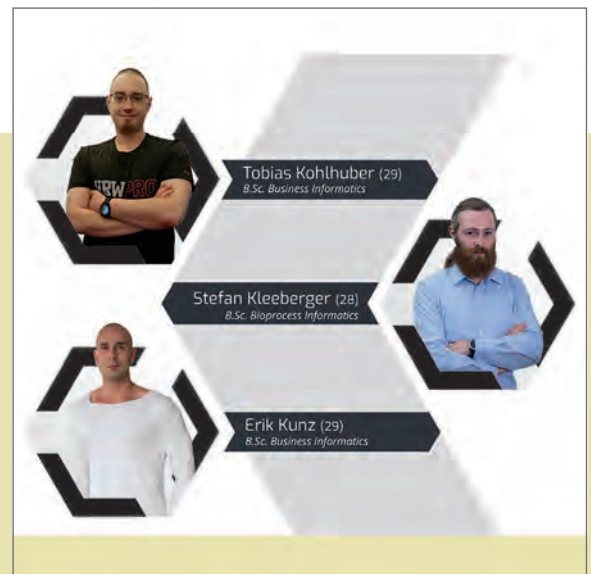
Markets
What are your primary markets?

ExoKrypts primary markets are the consumer market with a focus on users who want a stylish and functional smartphone case and the business market with a focus on security relevant target groups.

Target Groups
Who are your primary target groups?

Because of ExoKrypt's complex ecosystem, our targets are divided into three groups.
First group: For the stylish and functional smartphone case, ExoKrypt aims for the consumer sector. Target groups are outdoor enthusiasts and lifestyle lovers.
In the second group, rolling out a secure soft &

hardware solution, ExoKrypt aims for industrial and B2B markets. The target groups here are all kinds of users who need access to physically or digitally areas with restricted access through authentication.
The third group of ExoKrypt's solution is aimed at government and military markets. Here, a user group with the highest security needs is targeted.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

Different target groups require different sales strategies. For this reason, the target group-

oriented sales and distribution concept is divided into four areas. Each channel is optimized for the requirements and desires of the customer group and should ensure long-term establishment in the respective market segments.

1. Consumer market: The current corporate website of ExoKrypt will be extended with an online shop.
2. Business market: Direct sales and trade fair appearances.

all user groups. Regardless of knowledge level or level of awareness, ExoKrypt wants to protect people from all ranks with its complete solution.

It is a personal concern of ours to make the digital world more secure for everyone.

3. Extended business and consumer market: ExoKrypt retail stores.
4. Government and military market: Experienced sales team and external service providers with access to this market.

Investment
What is the financial investment you are aiming for?

Currently, the search is limited to Business Angels. Attributes: committed on a long-term basis, well capitalized, well linked in the fields of IT & electronics, future-oriented and innovative. With the ongoing development of the product, ExoKrypt now also aims for venture capital and is preparing a crowdfunding campaign.

The future
Where do you believe your company or product will be in 3 years time?

In three years, ExoKrypt will be available on the consumer market with a variety of smartphone cases. The launch of ExoKrypt's security centered products will be in preparation and entry to the business market will be in reach.

Plus
Is there anything else you would like to tell us about your startup/product?

Our motivation for ExoKrypt was, is and will always be to make the daily, digital routine more secure for

Contact

ExoKrypt UG

Moosstraße 80
85356 Freising
Germany

Phone +49 176 81124485

kontakt@exokrypt.de
www.exokrypt.de

WBC Technologies

[The Netherlands]
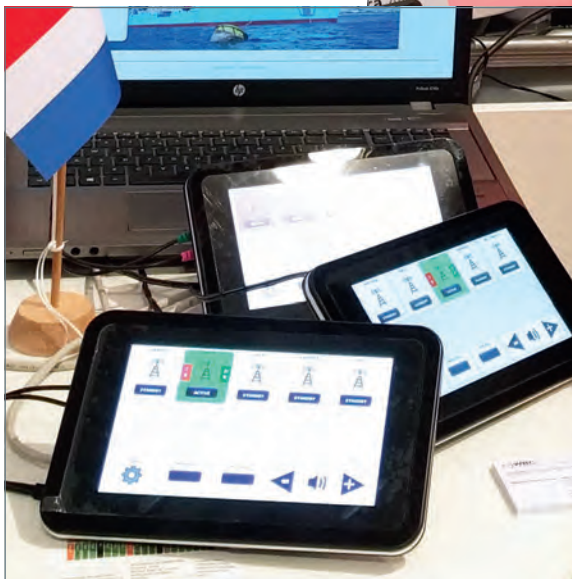
www.wbc-technologies.com

The Problem

On a modern ship, multiple communication channels and equipment are present. All terminals require a lot of space on the navigation console and this is not an ergonomic solution for the sailor and can cause confusion. Radio systems like mf/hf, vhf maritime, vhf air, uhf are present. Also, telephone systems based on fbb, vsat, wifi and gsm. The internal comms cover e.g. pa, alarms and ships internal telephone.
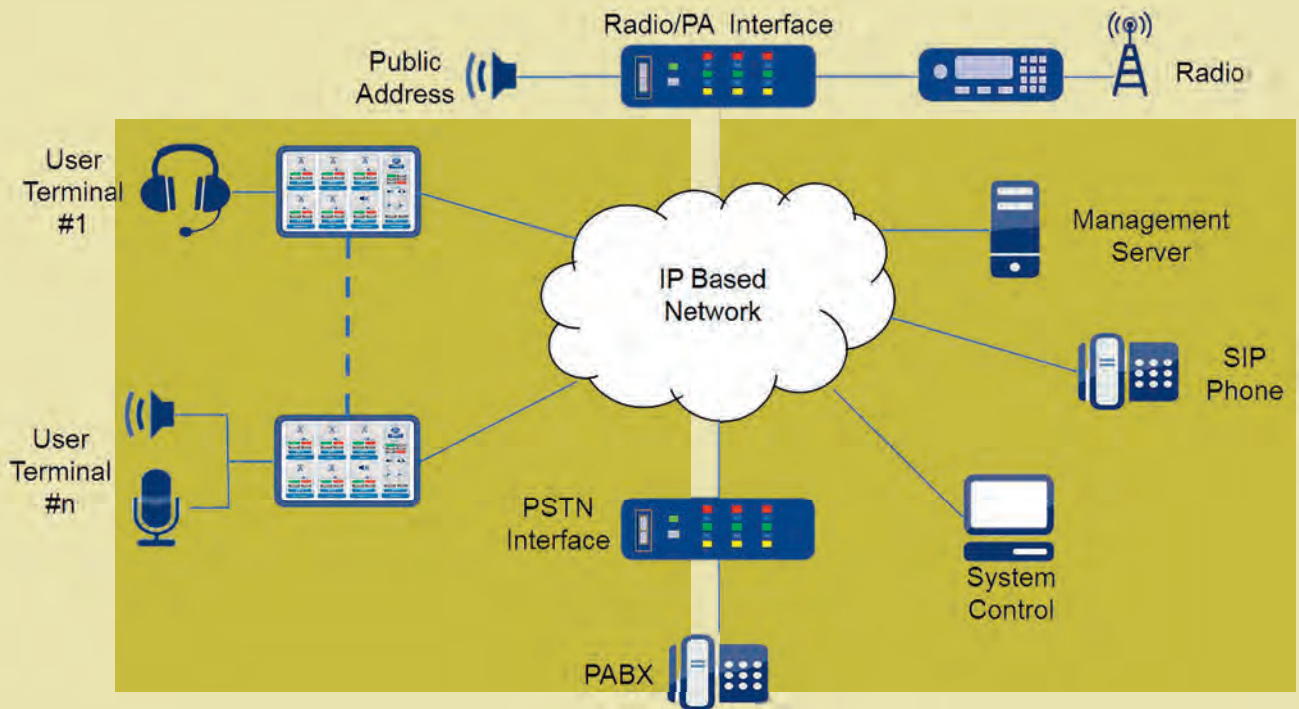
The Solution

WBC Technologies noticed during the design of bridge systems that we can improve the accessibility of communications systems using our modular intercom comms system 'POLLUX'. POLLUX is modular and provides access to all on board comms systems. It has a user-centric intuitive modern human-machine interface based on touch control.

The Innovators

WBC Technologies is a young company with old roots. We are active in the maritime industry and design bridge systems, antenna top side layout and ship communication systems. In the past, we started to think about a central access system. A number of tactical intercom systems were reviewed. Our conclusion: too large, too complicated, too expensive. In June 2017 the basic idea for POLLUX was born. Hardware and software are designed in house by WBC Technologies.

The Technology

The innovative approach of POLLUX is based on the advanced capabilities of large tactical intercom systems with the addition of some unique features. The core is a distributed design with the Raspberry Pi 3B as the core engine in each module. Web-based

configuration, SIP or RoIP protocol and reusable software modules are the technology cores. POLLUX has a unique number of features which are combined in one design.

- No Single Point of Failure
- Modular Design
- High Audio Quality
- Dual Homing
- Conference Call
- Split Ear Function
- Video Capable
- Power Over Ethernet (PoE)
- Range of user terminals (UT)
- Affordable

The Questions

Ranking
What do you need the most to make your startup/ project a success?

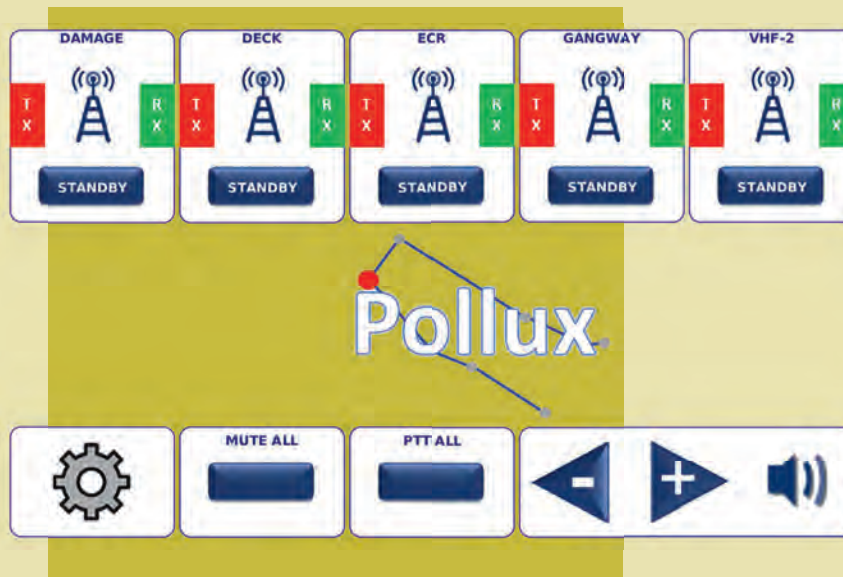Rank the options below from 1 to 4 where 1 is the most important
1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

In order to have enough time to develop the product (software and hardware), you need an income in the meantime to live. Also, the investment in tools and prototype needs to be financed.

Markets
What are your primary markets?

Shipbuilding (luxury yachts, smaller working boats, small patrol vessels).
Public safety vehicles (fire truck, police cars, etc), Hotels, Locks.

Target Groups
Who are your primary target groups?

Shipbuilding (luxury yachts and small patrol vessels)

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

At the moment we use our own money, knowledge and sales channels, to develop the required capability of the products. Potential customers, sales channels (companies working in the applicable field of the target group) and internet are sources for the definition of the product.

Investment
What is the financial investment you are aiming for?

We have done some calculations and to get the first prototype ready within a year, we require approximately 300k euro. This includes a salary for software and hardware engineers, software development tools, production and sales costs.

The future
Where do you believe your company or product will be in 3 years time?

To have the system to be used on board of commercial vessels, this depends on the approval of the applicable authorities. With the correct investment, in three years we can have a product that sells with 10+ systems per year.

Plus
Is there anything else you would like to tell us about your startup/product?

The product is based on Raspberry Pi. Research has to be done to see if the hardware can fulfill the required environmental conditions (temperature, mechanical, shock, EMCEMI, integration capabilities). Also, software configuration, computing speed, and safety are topics. The more detailed functionalities of the product for different market/target groups are to be defined. There is still a lot of work to do before product specification is such that a management plan can be defined and a final roadmap presented for bringing the product to the market.

Contact

WBC Technologies
P.O.Box 2015 4200BA Gorinchem
The Netherlands

willem@wbc-technologies.com

Teiimo [Germany]
Technologies in Motion

www.teiimo.com

> **Winner of the First Prize
> of the electronica Fast Forward 2018**

The Problem

For capturing biometric data people have to compromise on comfort, precision, and usability. Countless applications in e.g. healthcare, work safety, sports are waiting for the right solution. Wearing sensors and electronic systems close to the body is usually requires hard plastic housings and uncomfortable wiring solutions or solutions that are glued to the body.

The Solution

Base layers by Teiimo: sensor and interconnect technology that is highly comfortable, measures heart rate, heart rate variability, position, 3D motion, posture, temperature and more. The technology allows for the free placing of sensors and is ready

for applications in Active assisted living, Medical technology, Sports, Work safety and many more.

The Innovators

Teiimo is one of the leading companies for textile system integration in the field of comfortable electronics. Located in Munich, our young company develops its own products and technologies but also works for other companies and organizations as a development and technology partner. Teiimo was founded by Markus Strecker, a renowned expert in wearable technologies. The company's vision is to make life easier, more comfortable and fun. With Teiimo products and applications, the technology always follows function and comfort.

The Technology

Teiimo solved the big challenge in the field of smart garments: to integrate electronics in a way that the user has everything: Full freedom of movement, high data accuracy, and maximum comfort. Sensors and electrical connections become one with the garment which is easily washable. Paired with state of the

art wireless trans mission technologies, data can be transmitted in real time. Our textile interconnect solutions are soft, stretchable, washable and low-ohmic. They are extremely thin, stretchable and comfortable electrodes - unnoticeable to the user - are paired with specifically designed electronics and powerful algorithms. This technology provides seamless integration of smart electronic systems in our day-to-day garments.

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important
1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

Our focus is on sustainable growth. Currently, however, we can only exploit only a small percentage of the existing market potential. We are looking for a strategic investor who supports us with funding in the single-digit million range. Above all, we want to promote product development and expand our sales network.

Markets
What are your primary markets?

Teiimo is a leading company in textile system integration in the field of conformable electronics. Our sensor and interconnect technology is highly comfortable, measures heart rate, heart rate variability, position, 3D motion, posture, temperature and more. The technology allows the free placing of sensors and is ready for applications in Active Assisted Living (AAL), Medical, Sports, Work safety and others.

Target Groups
Who are your primary target groups?

As a preferred development and technology partner, we help companies and organizations develop and industrialize products in the wearable technology market. Our primary target group is safety at work: R&D, production, fire services, healthcare and AAL doctors but also institutions for rehabilitation and prevention, and in the area of sports athletes, clubs and associations.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

Currently, our focus is on directly addressing customers, for example, building development partnerships. Furthermore, we are well represented

at conferences and trade fairs. In the future, we would like to strengthen our sales network and branding and want to expand our marketing activities in a comprehensive manner, in particular, to redesign the Internet and promote press relations and social media activities.

Investment
What is the financial investment you are aiming for?

See topic ranking above

The future
Where do you believe your company or product will be in 3 years time?

After an intensive startup phase in the years 2014 to 2016, in the past two to three years we have focused on the development of prototypes and pre-production and entered into new market segments. Over the next three years, we want to strengthen our position as a system provider, expand geographically and build up a strong sales network. By 2022, Teiimo should be the preferred partner of its customers.

Plus
Is there anything else you would like to tell us about your startup/product?

Our textile interconnect solutions are soft, stretchable, washable and low-ohmic. Extremely thin, stretchable and conformable electrodes - unnoticeable to the user - are paired with specifically designed electronics and powerful algorithms. This technology provides seamless integration of smart electronic systems in our day-to-day garments. For capturing biometric data people have to compromise in comfort, precision, and usability. Wearing sensors and electronic systems close to the body usually requires hard plastic housings and uncomfortable wiring solutions or solutions which are directly glued to the body.

Contact

Teiimo
Barenweg 13
82110 Germering
Bavaria
Germany

www.teiimo.com

VOLABO GmbH

[Germany]

www.volabo.com

The Problem

Both costs for Electric Vehicles and their moderate driving ranges prevent potential customers from buying such cars. Furthermore, the mining of materials, e.g. rare earth heavily impacts the environment. Current EVs use high voltages between 400 V and 800 V which are challenging to treat in production and maintenance of these cars and which can be a critical factor in case of accidents.

The Solution

VOLABO developed the first 48 V motor to feature a virtual gearbox. This enables the motor to continuously adapt to the load profile of the EV and thus make better use of battery capacity. ISCAD is up to 25% more efficient than state-of-the-art which
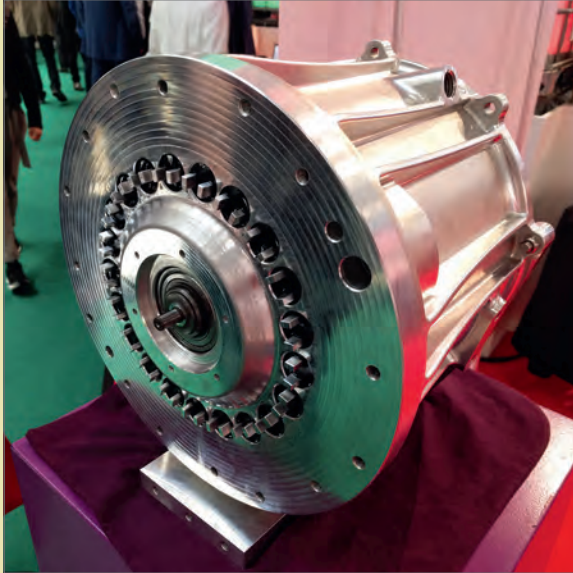
means an increased driving range or a smaller, cheaper battery. No rare earth metals are needed for production.

The Innovators

The idea came about at the chair of electric drives and actuators. During their Ph.D. studies, Adrian Patzak and Florian Bachheibl gained expertise with well-known industry and automotive corporates. Prof. Dieter Gerling already founded his first company in 2006 and contributes a wealth of experience in business administration as well as a large network. Two Marketing and sales employees complete the team on the business side. The core know-how of VOLABO is driven by excellent software developers, constructing and electrical engineers to create a world-wide unique product.

The Technology

Conventional electric motors use copper windings inside and thus, cannot change their number of magnetic pole pairs after production. Hence, they are optimized for a very limited operating area, where they are highly efficient. Apart from that point, the efficiencies of conventional electric drives decrease.

Imagine you drive your car in a single gear only! Instead of copper windings, ISCAD's stator consists of aluminum bars which are individually controlled by software. This allows the number of poles to be adjusted during operation in order to maximize efficiency in the entire motor operating area. The motor principle makes it possible to generate high performance with a very safe 48 V battery using cheap and highly available materials.

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important
1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

No comments.

Markets
What are your primary markets?

Basically, ISCAD technology is very scalable and can, therefore, be used in almost all applications. Due to the safety aspect of 48 V, we see great advantages especially on water and in the agricultural sector. Furthermore, the automotive industry is an attractive target market, which we will convince with our efficient, cost-effective drives.

Target Groups
Who are your primary target groups?

The main target group are OEMs as well as tier one suppliers. However, companies that are active in the retrofit sector are also interesting, as the drive can be installed without high-voltage safety measures.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

We use conventional social media platforms and present the innovative technology at trade fairs for emobility. In addition, scientific papers are published in various journals. On May 3rd and 4th, VOLABO, in cooperation with other startups in the e-mobility scene, will hold the e-mobility days 2019 at the University of the Federal Armed Forces in Munich. Here, many innovative e-vehicles can be experienced on the university's test track. In addition, pioneers of e-mobility will give insights into their ideas in various talks. Further information and registration at e-mobilitaetstage.com.

Investment
What is the financial investment you are aiming for?

For the qualification and certification of the drive, we are looking for a seven-figure amount.

The future
Where do you believe your company or product will be in 3 years time?

We believe that in 2022 the first vehicles powered by an ISCAD will be on the road.

Plus
Is there anything else you would like to tell us about your startup/product?

ISCAD is the first electric drive that can provide high power up to 300 kW at safe voltages of 48 V.

Contact

Volabo
Alte Landstrase 23
85521 Ottobrunn
Germany

www.volabo.com

Wisebatt

[France]

www.wisebatt.com

The Problem

Designing hardware devices can be difficult. It usually requires between 6 to 48 months to have a first prototype. Five hardware iterations will usually be required before going to production and a minimum investment of $1m is necessary in order to launch a product on the market.

The Solution

Wisebatt is a unique simulation tool for electronics engineers developing IoT devices. They can build virtual prototypes and collaborate to make the optimal choice between cost, battery life, and performance. Within minutes, engineers access complex modeling results that would usually take them weeks.

The Innovators

CEO Wilfried Dron, developed Wisebatt's technology during his Ph.D. He has been working in the field of electronics for 7 years. He also was an embedded system design teacher in leading French tech universities for 5 years.

Marion Blatter, Chief Product Officer, is a Central St. Martins (London) Alumna. She has a unique experience of 4 years using global design to disrupt services and tools in various industries.

The team consists of 12 people.

on more than 10 years of academic research. It is patented and was tested and validated in over 200 experimentations in several environment configurations. It allows for a 92% accuracy of simulation results.

The Questions

Ranking
What do you need the most to make your startup/ project a success?

Rank the options below from 1 to 4 where 1 is the most important
1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

We are at the stage in our development where the tool is stable, and all we need is to bring it to market. We can reach an international audience quite easily (it is already used in 58 countries so far).

The Technology

Our technology estimates the autonomy of a device by taking into account the entire system, its operation, and its consumption, as well as the non-linearities of its power source(s). 350.000 line of codes and a hybrid modeling technology allows high software definition to run in the same simulation as low-level energy transfer without compromising results accuracy. This unique technology relies

Markets
What are your primary markets?

Engineering for Small and Medium Electronics working in almost every field of application.

Target Groups
Who are your primary target groups?

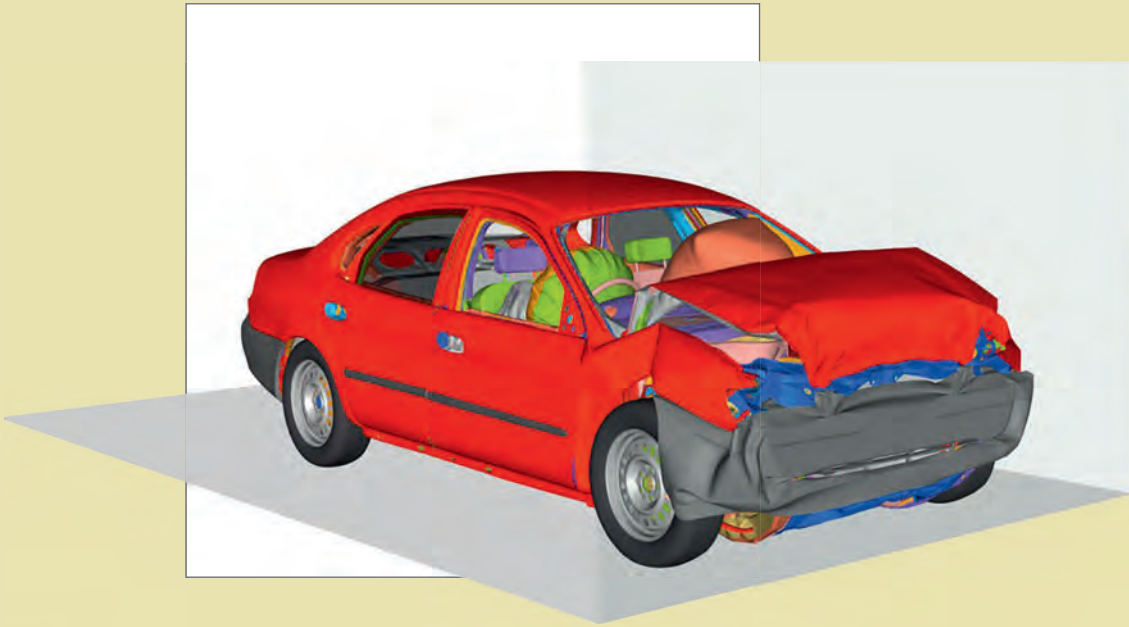Electronics Engineers focused on Industrial IoT.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

PR, Social Networks, Events, Tradeshows.

Investment
What is the financial investment you are aiming for?

We are planning to raise 3-5 M € by end 2019 to develop in Europe and reach North America.

The future
Where do you believe your company or product will be in 3 years time?

We aim to be the first step of an electronic device design process.

Plus
Is there anything else you would like to tell us about your startup/product?

Our team is growing quickly and we are looking for more talent to join our journey. We are especially looking for a web developer and business developer. Feel free to contact us at jobs@wisebatt.com

Contact

Wisebatt
61 rue de Douai
750019 Paris
France

info@wisebatt.com
www.wisebatt.com

Wizama

www.wizama.com

" Winner of the **Second** Prize
of the **e**lectronica Fast Forward 2018 "

The Problem

It is becoming increasingly difficult to get family members around a table to share sociable moments. The technological and digital developments of recent years have created a gap between the new generation, the so-called screen generation, and the previous ones.

The Solution

A board game console that brings board games to life to catch the attention of young players, while maintaining the conviviality and sociability of board games. This new "video and ludic" device is also a way to reinforce the ties between generations,

especially with the screen generation, and to make digital a driver of sociability.

The Innovators

Franck Botta: CEO, CTO, senior R&D engineer at Technicolor, he was part of the team that designed the Orange VOD platform. He worked on connected object technologies and big data. Florent Guitton: COO. Graduate of the Ecole Polytechnique de Nantes in electronics, he has successfully piloted the deployment of telecom systems internationally for Thales. Damien Botta: HR Manager. Graduate in the Sociology of organizations and holder of a master's degree in management science, he worked for Total and the Accor group.

The Technology

In 18 months, the following milestones have been reached:

- Completion of the first operational prototype of the console and its connected objects
- Development of 4 games
- Filing the first patent

- One of the main challenges to create the first prototypes of the console was on the RFID side.

Detecting small connected objects with large antennas, getting precise positions of connected objects, detecting objects in metallic environments have been some of the main difficulties that we solved with the support of RFID experts known at international level

The Questions

Ranking
What do you need the most to make your startup/project a success?

Rank the options below from 1 to 4 where 1 is the most important
1. Finance
2. Marketing
3. Technology support
4. Operational support

Tell us a little bit more about option 1.

Finance is key and enables to have resources for marketing, technology support and operational support!

Markets
What are your primary markets?

Our primary markets are the European and US entertainment markets

Target Groups
Who are your primary target groups?

Regular and tech-savvy players are the first target of Wizama and could be our opinion influencers. Parents will be the first targeted mass market because they are sensitive to the values conveyed by the board game: sharing and usability. They will use the game console as a way to get together as a family.

As for toy libraries, clubs, and themed bars, they will be privileged as a channel to promote the console and its games.

Channels
Which channels are you using, or would you like to use, to bring your startup/product to the market?

We plan to sell our SquareOne console on a crowdfunding platform as a first step. As a second step, we plan to sell our product in specialized shops.

Investment
What is the financial investment you are aiming for?

For a successful commercial launch, we plan to raise € 4 million to start production, marketing, and communication and enrich the catalog of games with known licenses and also original games.

The future
Where do you believe your company or product will be in 3 years time?

In three years time, our SquareOne Console will be distributed in Europe and North America and will be the best way to have a good time with your friends and family!

Plus
Is there anything else you would like to tell us about your startup/product?

If you would like exclusive information on Wizama and SquareOne, or if you want to be the first to know when it's available, visit our website and sign up for our newsletter! Player support is the key to Wizama's success!

Contact

Wizama
Parc d'activité de beaujardin
35410 Chateaugiron
France

www.wizama.com

Sensry GmbH

[Germany]

www.sensry.de

The Problem

Next generation applications require the adaption of smart and secure sensors with data connectivity. Existing semiconductor standard solutions often provide insufficient flexibility and missing software environment. The most critical item, however, is the missing inherent data security approach encompassing the complete value chain of the product.

The Solution

Sensry is a newly established company offers an individual sensor node with highly flexible and customizable hardware configurations according to customer requirements. The universal sensor platform USeP combines cutting-edge assembly and packaging technologies with new design methods as well as various integration possibilities for sensors.

The Innovators

Konrad Herre: Managing history with C-positions in Foundry and product/ASIC/ASSP companies, Founder and mentor of several start ups.

Mario Grafe: Long experiences in embedded system design, hardware & software development and project management for sensor system.

Partners: Next Big Thing, Global Foundries, Fraunhofer

The Technology

- SoC with RISC-V power for smart node computing
- Inherent multi-layer data security and authentication
- Integration of various sensors
- Support of multiple communication standards

- Adequate memory resources
- Very fast design using standard library HW chiplets
- Smallest form factor due to advanced packaging
- Available software toolchain
- Integration in fog, edge and cloud computing
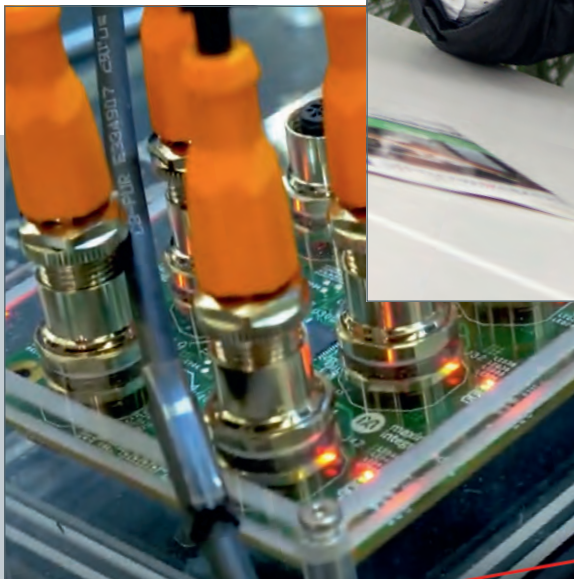- Low power consumption

Contact

Sensry GmbH
Maria-Reiche-Str. 1
01109 Dresden Germany

info@sensry.de
www.sensry.de

Distribution
Advantages and Benefits for Startups

Marco Giegerich is Director of Vertical Markets & Third Party Management EMEA at Avnet Silica, where he has worked since 2008.

Avnet Silica supports hardware startup companies around the globe from the prototyping phase to mass production. Marco Giegerich (Director of Vertical Markets & Third-Party Management EMEA, Avnet Silica) discusses the benefits that the company has delivered to startups in a wide range of areas, such as medical devices, wearables, and industrial manufacturing.

Q: Why are distributors like Avnet Silica involved in the startup scene?
Marco Giegerich: For us, startups are tomorrow's technology drivers and supporting them means working together to transform their ideas into innovative products. We can also learn a lot from startups. Their wealth and diversity of ideas is impressive. Their approach, team spirit, innovative capabilities, and technology viewpoints are always fascinating for us — especially in the context of the

development of new markets. That alone is a great reason to get involved here.

Many countries offer various initiatives and hubs for technology startups, where benefits include proximity to academia, industry, and other businesses. That's an excellent environment that provides the ideal conditions for starting up and developing a new company. With our expertise in hardware, we offer these fledgling companies support from the prototype phase through to mass production. We have a comprehensive overview of the products of our manufacturing partners and, thanks to our many years of close collaboration with them, we also gain insight into and influence their product development.

Q: What must hardware teams pay attention to when developing product ideas and prototypes?

Marco: The focus is initially on the system concept and on the selection of the "right" components. For example, startup teams do not necessarily have access to the latest components or know which ones will be available in a few years or which are really suitable for mass production. That's why it's so important to have insight into the manufacturers' roadmaps and long-term product availability plans. Distributors are the experts in that area and can provide the appropriate advice and assistance in selecting the right components and product designs. Of course, we also keep an eye on certifications, standards, and costs for the qualification of the finished products. Startups may have a great idea, but they also need to think about the components and whether they'll be suitable for the target market. They need to be sure their product specifications are solid and that the end product will get certified. Then they'll have to consider how long a specific component will be available and capitalise on their great idea by ensuring a fast time-to-market. By working with distribution specialists, the development phase is definitely more efficient for startups because we put the developers on the right track from the outset. Subsequent unplanned changes can be expensive and delay the product launch — and that can be a life-or-death issue for a startup. These are the areas where we can provide new companies with decisive assistance.

Q: What are the specific challenges of manufacturing for B2B startups?

Marco: One challenge they have is to is to keep the whole process in mind. Manufacturing is complex and can be difficult to understand. It's really important that they have access to information and choose the right manufacturing partner. There's a lot to think about, including a manufacturing partner's production capacities, the prototyping and legal provisions as well as locations, production costs, and more. Each market has its own requirements for certifications, production conditions, etc. At Avnet Silica, we have many years of experience in a wide range of projects and with customers from different technical fields, so we can contribute a lot of support to startups in terms of resolving these challenges.

Q: What benefits do hardware startups have when working with Avnet Silica?

Marco: It is definitely not easy to develop a well-founded and realistic product plan based on an idea. Startups benefit from working with us because we can help them throughout the whole process of consulting and design evaluation, as well as providing design optimisation and technical support that continues through to the production phase. We can also give them contacts to other industries. Aside from the manufacturing process itself, the production phase includes commercial consultations. We help startups answer key business questions — such as whether their product will turn out to be profitable, whether and how to optimise it, and how to develop a go-to-market strategy. We also provide expertise on the probable costs of turning their idea into a product. In short, startups benefit from our years of experience, our network, and international positioning.

Q: How exactly does that work?

Marco: We provide startups with access to the latest technologies, communities, experts, and a versatile partner network. We can help them develop their product and get it ready for mass production or find a production partner. Depending on the requirements, we support them with our local experts. In addition, startups can also leverage the potential of our online communities Hackster.io or element14. These help them share knowledge with other users and benefit from their experience, know-how, and the collective intelligence of the group. In terms of the design, design optimisation, and commercial marketing of the products, we're always on stand-by to help startups. They also have the opportunity to access our online resources such as MakerSource or Dragon Innovation.

Avnet Silica

Avnet Silica is the European semiconductor specialist division of Avnet, Inc., one of the leading global technology distributors and acts as the smart connection between customers and suppliers.

www.avnet-silica.com

Q: Which startups have already successfully used the Avnet Silica offering?

Marco: We have been involved in the startup scene with a dedicated team for some time now and have worked on projects in a wide range of areas, such as medical, wearables, and industrial manufacturing. They include all sorts of products, from music headphones and devices that measure patients' vital functions to complex industrial solutions, such as single-arm robots that can be controlled with a smartphone. An important aspect of their success is the close partnership and collaboration with the startups, because a lot of IP is shared in both directions. ■

We Support Your Startup

How EBV supports European "techpreneurs" like cosinuss° and SimyLife-ups

A contribution by **EBV Elektronik**

Figure 1: The SimyBall

Most products start out as a great idea on paper or screen. Turning that idea into reality and getting it to market takes money, time, and expertise. Successfully establishing a startup requires not only a great idea but also engineering power, reliable supply chain services, extensive technology experience, and a diverse partner network to market products. This is what a distributor like EBV Elektronik can offer startup companies and electronics newcomers in the semiconductor industry. EBV's support includes all the resources you need to put plans into practice and to make your idea a reality: access to design services, parts for prototyping, contract manufacturers, and consultation on IP protection, marketing, and financing. As there are a variety of ideas and startups, the support they need varies on a case by case basis. EBV is engaged in various startup activities across Europe and has its own initiative — "StartmeUp" — to provide innovative developers and startups with a platform for interacting and successfully developing and implementing new solutions with dedicated resources from EBV.

An idea is only as good as the team behind it! In this article, we review two exciting business cases:

SimyLife (www.simyball.com) and cosinuss°
(www.cosinuss.com).

SimyLife: Creating a stress management device with EBV

SimyLife Co-Founder Andreas Chabicovsky developed various on-site trainings to help athletes and business professionals manage stress to their advantage and use it to stir up power levels and achieve wellbeing in their daily lives. To help his clients continue practicing mental training techniques outside the class, he needed a tool that could be easily incorporated in their daily lives. The solution was the active stress management device SimyBall — a simple and intuitive gaming device with the concept that playing reduces stress (**Figure 1**).
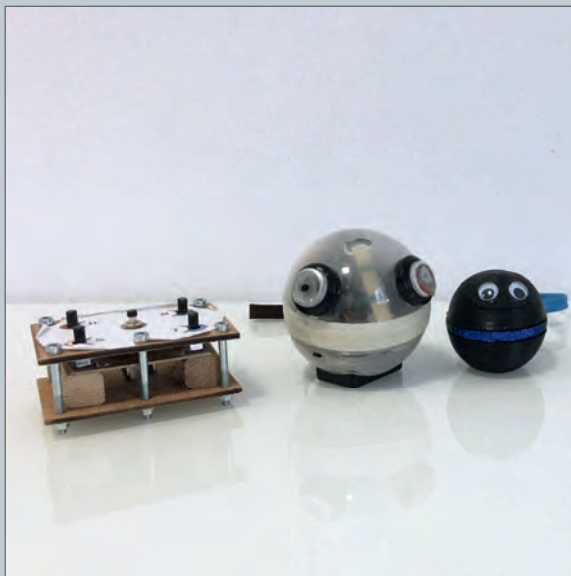

Figure 2: The evolution of SimyBall

Having a great product idea for a high-tech device for health and wellbeing, the Simylife team required support to design, develop, and launch an electronic gaming device. EBV Elektronik specialists supported and guided this startup company in "tuning" the product concept. They also helped the company understand risks and cost management in the hardware development process (**Figure 2**).

SimyBall is a bio-sensory device (**Figure 3**) with a mobile game controller that records stress information and combines it with educational stress management games. The vital signs (e.g., skin conductance, pulse, skin temperature, etc.) recorded by SimyBall are integrated into a fascinating feedback and gaming experience. By turning mental training into a game, SimyBall increases energy and performance levels by using positive activation while reducing negative stress.

Design challenges for SimyBall

Great product vision requires semiconductor market knowledge and supply-chain expertise. Turning a

concept into a commercial product involves skills not only in hardware, software, and industrial design, but also in component pricing, manufacturing, supply chain and product lifecycle management. Acquiring these skills or hiring consultants requires money, time, and effort. Having a trusted advisor to help guide and manage the process will have a big influence on a business's overall success.

- Low product costs without compromising quality: Success and the wide-adoption of SimyBall depends directly on cost. The designers faced the challenge of picking the right components and designing low-cost/high-quality housing. Complicating this objective was SimyLife's desire to build the product in Austria rather than low-cost manufacturing locations like China.
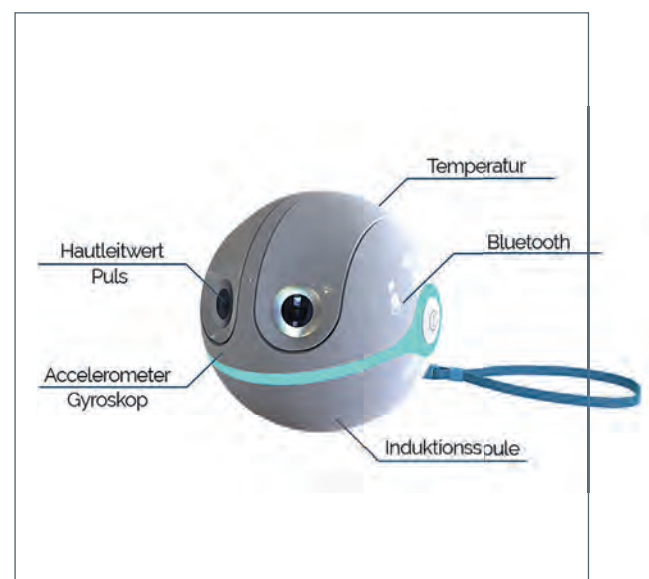

Figure 3: SimyBall parts

- Small size: The ball's size had to be small to keep it easy and realistic for a client to use and carry around. Picking small form-factor components and designing PCBs with tight space requirements posed a considerable challenge. Signal quality, interference, and other noise issues had to be minimal to ensure sensing accuracy was not affected.
- Future-proof design: SimyLife's experienced Industrial Design partners (Edelweiss Industrial Design) had to ensure that the product would have flexible interfaces and that the overall design would allow for easy upgrades and feature enhancements. SimyBall needed to be built such that new technologies, protocols, and standards could be easily integrated with minimal redesign and effort.
- Build in scale: Andreas and his startup team were well aware of the need and challenges for constant improvement of supply chain, component lead times, management of outsourced manufacturing entities, and pricing optimisation.

The SimyLife and EBV partnership

It's important to make the right choices and decisions about a product from the very beginning. EBV has been SimyLife's strategic partner from the start. EBV met the SimyLife founders at a startup event in Vienna, Austria, and quickly became a trusted technology advisor. The EBV team helped optimize SimyLife's supply chain, develop a go-to-market approach (B2B vs. B2C), and support a commercial-ready product from a proof-of concept design. EBV also provides SimyLife a platform to market through various channels: at industry conferences, at EBV events, and at the Innovation World Cup Series, the world´s leading Internet of Things innovation competition.

Experts with long experience in the healthcare and startup market provided coaching and advice on product strategy and go-to-market approaches. By involving EBV early in the product definition phase, the SimyLife team took advantage of its insights in the wearables market and extensive experience with startups. Furthermore, EBV educated SimyLife on the criteria to be used for cloud partner selection: trade-offs between large players like AWS or Azure versus local providers who host data in Europe, privacy and other regulatory requirements for gathering personal health data, and other considerations required for the medical/personal healthcare market.

On the hardware front, EBV helped identify components for the entire signal chain that met cost, size, and accuracy requirements. All selected products were guaranteed to be available for at least two years. EBV introduced SimyLife to local EMS partners so the product could be built in Austria, a goal for the SimyLife founders. Further, the team provided updates on the latest product releases and roadmaps, and educated the SimyLife team on technology trends and emerging standards. This unbiased technology advice enabled SimyLife engineers make the right design choices to meet current requirements and future-proof the product for enhancements.

"Keeping the costs down not only at the mass production level, but at the prototype phase too, was a challenging task. And EBV have supported us well in

Figure 4: The cosinuss° in action

it, along with the peace of mind regarding the components' origin and authenticity which we enjoy," said Marcel Aberle, Co-Founder, SimyLife. SimyLife offers on-site self-learning activation and stress management seminars. It employs SimyBall as a key tool to teach relaxation and activation techniques that include elements of the Yi Gong, Thai Chi, and Progressive Muscle Relaxation, all packaged in an appealing gamified environment. This has resulted in more productive and focused employees with higher creativity and lowered stress levels. The first set of SimyBalls produced are already being used in seminars. Consumers can also get some for themselves via the Kickstarter program.

cosinuss°: Wearable IoT device to monitor vital signs

The cosinuss° team has developed a product that enables users to accurately monitor heart activity and body temperature at the same time (**Figure 4**). The technology is based on Dr. Johannes Kreuzer's doctoral work, which focused on a small wearable that measures heart rate activity and body temperature. The result is the patent-pending earconnect technology and an in-ear wearable — the cosinuss° One.

The cosinuss° One accurately and continuously measures heart rate, heart rate variability, core body temperature, and arterial oxygen saturation of the blood from within the ear canal. It is small, light-weight, non-intrusive, and convenient to use. Data generated from the device is wireless sent to any Bluetooth- or ANT+-compatible phones or smart watches (**Figure 5**). Data is visualised using either cosinuss° One App or third-party apps like Garmin.

Design challenges for cosinuss°

Developing an idea, creating a market, and generating demand is a challenging process – especially in the startup environment where resources are limited

Figure 5: The cosinuss° communicates wirelessly with Bluetooth- and ANT+-compatible phones and smart watches.

and a short time-to-market is a key success factor. Design choices, business models, and customer acquisition approaches must be considered and adjusted to ensure the product gains market acceptance. cosinuss° had to decide if its product should be sold to consumers directly or to other businesses. The company had other questions to answer as well. Should it add audio capability to its product? Should they develop a medical-grade product that complied with the appropriate certification standards? Addressing these questions required a solid understanding of the constantly evolving wearables and consumer markets, visibility into new technologies and standards, and expert guidance. A few design challenges were clear.

• Minimise power consumption: cosinuss° One had to be low power so users would be able to wear it for many hours without frequent recharges. Selecting low-power components, optimising software, and ensuring optimal power design were key in achieving long battery life for a single charge. (cosinuss° operates for up to 8 hours non-stop and only requires an hour to charge.)
• Maintain a small form-factor: The size and weight of the product had to be small to keep it comfortable during wear. Picking small form-factor components to designing PCBs with tight space requirements posed a considerable challenge. Signal quality, interference, and other noise issues had to be minimal to ensure sensing accuracy was not affected.

The cosinuss° and EBV partnership

EBV has been engaged with cosinuss° on several fronts from their first meeting at a connected Health Forum in Munich, Germany, in 2011. With extensive knowledge in the healthcare, wearables, and startup markets, EBV has been a key advisor to cosinuss° on various topics, including the startup's business model and go-to-market strategies. By being in-

volved from the early stages, EBV has assisted the company in developing a strategy and defining its product. EBV has helped the cosinuss° team focus on the high-end consumer segment instead of creating a medical-grade device, which involves a greater risk due to FDA compliance certifications and a much longer product development time. By focusing on the consumer segment, the cosinuss° team can directly engage customers through numerous channels, including its online store, third-party retailers (e.g., Amazon), bike stores, and even a Kickstarter program for its in-ear thermometer product for children – the degree°.

On the hardware front, EBV helped identify components for the entire signal chain to meet power, cost, size, and accuracy requirements. EBV was also instrumental in educating the cosinuss° team on various methods to minimize power consumption via microcontroller settings. Further, the EBV team was proactive in providing updates on the latest product releases and roadmaps, and they educated the cosinuss° team on technology trends and emerging standards.

"EBV helped us a lot in finding the right components for our very special requirements. They also showed us where the manufacture's road map will go to, which is important to know for the next product generation," said Dr. Kreuzer.

EBV's unbiased technology-related advice enabled cosinuss° engineers make the right design choices to meet current requirements and to future-proof the product for enhancements. EBV introduced cosinuss° to local and regional EMS partners so the product could be built in Europe. The EBV partnership offers cosinuss° an additional benefit: the opportunity to engage a large ecosystem and network in the healthcare and wearables segment. EBV introduced cosinuss° to other healthcare/wearables companies that would be interested in its technology.

By combining heart rate data with body temperature athletes can optimise performance and fitness levels. Function and comfort were extensively tested by athletes from different disciplines. cosinuss° One devices are in production and can be purchased directly from the company's website or through retail outlets like Amazon. To date, the devices have been received well in the sports and fitness community. Jan Frodeno and Anja Beranek, well-known Ironman world champions, have been successfully using the cosinuss° One in their training, and they are acting as brand ambassadors. In 2017, another partnership started. The F-1 teams are now using the earconnect technology to monitor their drivers' pulse, heart variability, body temperature, and accelerating power. ∎

Bavaria

The ideal base for tech startups

By Invest in Bavaria

Startup-Kampagne
www.invest-in-bavaria.com/start-ups/

When you picture Bavaria, you automatically think about mountains, Oktoberfest and cars. But there is so much more to the southeastern region of Germany. Did you know that Bavaria is also home to one of Europe's strongest startup and innovation ecosystems in Europe? That the Bavarian capital Munich is actually Europe's biggest ICT hub? No? Then read this!

If you want to get a feeling for the Bavarian startup ecosystem, you have to start with the regional economy. Bavaria is one of Europe's most competitive industrial regions worldwide. Just to give you an idea of its economic strength:

- With a gross domestic product (GDP) of €594 billion (2017), Bavaria would be the seventh largest economy in Europe. Most of that economic power, about 29% of the GDP, comes from the manufacturing industry (by comparison: it's 15% in the USA and 13% in the UK).

- Nearly three-quarters of the world's 50 most innovative companies have a base in Bavaria, and most of them are synonymous with outstanding

€60 billion (+5.3%)*. Bavaria is home to companies from a wide range of different fields of electrical engineering and electronics, such as "Bavarian-born" global leaders like Infineon Technologies, SUMIDA, and Osram Opto Semiconductors, as well as international players like Texas Instruments, ST Microelectronics, NXP and NVIDIA. This segment is benefiting from the growing demand for Industry 4.0, connected household appliances, next-generation automotive electronics, and energy-efficient products.

innovation, especially in the areas of automotive technology, electrical and mechanical engineering, life sciences and robotics. Among the most recognisable companies are Siemens, Adidas, Allianz, Audi, BMW and MAN. Plus a rising number of international tech giants have a base in Bavaria, including IBM (Watson IoT), Google, GE (its Healthcare Commercial Center), Texas Instruments and Microsoft (IoT & AI Insider Lab).

- This validates Bavaria as a top ICT hub. Today, Munich is Europe's top ICT location, ahead of even London and Paris, according to a study by the European Commission.

Before we talk about the huge impact this economic strength has on the Bavarian startup ecosystem, let's consider the Bavarian electronics industry.

Electronics Industry in Bavaria

The electronics industry is one of the largest industrial sectors in Germany and has a wide-ranging, very dynamic and innovative portfolio. Automation and energy technology, intermediate goods (especially electronic components) and consumer goods (household appliances, entertainment electronics) are industrial focuses.

Over 220,000 employees work for more than 700 companies in the electronics industry in Bavaria (i.e., approximately one-quarter of the employees in the electronics industry in Germany). In 2017, these companies generated a total sales revenue of

Bavaria's Startup Ecosystem

So, what does this immense corporate and manufacturing power mean for our startup scene? Bavaria is the perfect location for B2B startups, especially in the areas of artificial intelligence, production & manufacturing, insurtech (digitalisation in the insurance sector) and mobility. If your customers are producers or larger corporates, Bavaria is the place to be in Europe. Traditional companies all over Bavaria have understood that they can benefit from such innovative solutions, while accelerating startups' success and growth at the same time with their resources such as expertise, machinery or capital.
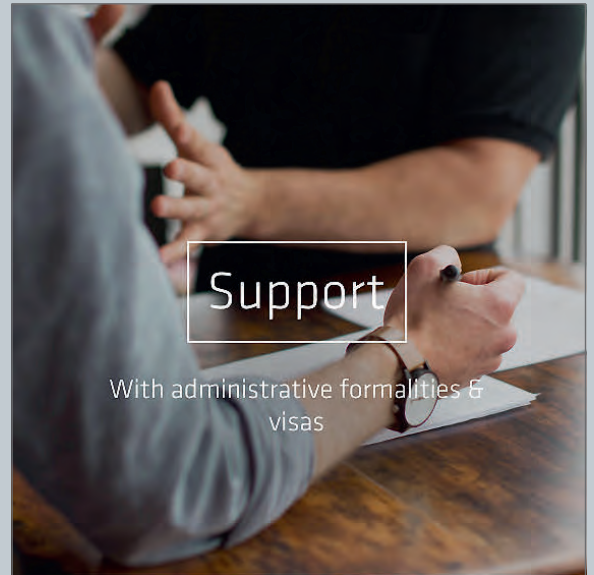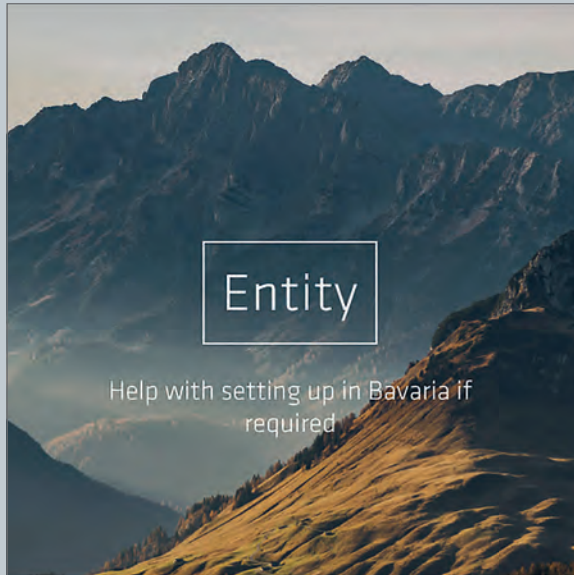
Most of the companies offer accelerators or contact points. There is the VW Data Lab, BMW Startup Garage, Siemens Next 47, Wayra from Telefonica to name a few of the bigger ones. The Silicon Valley-based startup accelerator Plug & Play runs three verticals in Munich. Open technology programmes like Techfounders are working with companies such as BMW, Knorr-Bremse and Festo. The FASTTRACK Accelerator, a consortium of three family-run, medium-sized automotive suppliers in southern Bavaria offers pilot projects in their real manufacturing environment (an overview of the most important accelerators can be found on the Invest in Bavaria website).

Did you know that insurers are getting more and more interested in manufacturing processes? For example, insurance company Munich RE and

the Bavarian robotic producer KUKA launched the "Smart Factory as a service" project, which is focused on making the automated manufacturing process as safe as possible. So, if insurers are interesting for you, make sure you reach out to the InsurTech Hub Munich, a vibrant ecosystem of startups, investors, research institutions and corporate partners such as Munich RE, Allianz, and Generali.

All of this makes the Bavarian tech scene a deeply tech-driven ecosystem, where you will not find much chitchat but many people with a strong idea and the will to build it.

If all of this has convinced you to take a second look at Bavaria, reach out to us. Invest in Bavaria is a public agency, belonging to the Bavarian Department of Economic Development. As a publicly funded organisation, our services are free of charge and

Entity

Help with setting up in Bavaria if required

Support

With administrative formalities & visas

Ois Easy Startup Package
www.invest-in-bavaria.com/ois-easy.html

As you can see, Bavarian corporates have understood that startups make a significant contribution to digitalisation with their disruptive business models and technologies. And the rest of Bavaria has too. Startups need the right conditions, infrastructure, specialist professionals, research, to promote the topics of digitalisation, disruptive technologies and industry and Bavaria offers all of these, not just in its metropolitan areas but right across the state. More than 50 technology campuses, incubators and accelerators throughout the region support national and international startups in the launch phase and beyond.

The ecosystem is characterised by a strong public support system. Organisations like BayStartup help with coaching and financing. Gründerland Bayern and the Chamber of Commerce offer advice on incorporating your legal entity. Digital incubation centres like WERK1 offer affordable office space and an all-inclusive big startup family. In addition, many organisations offer makerspaces for you to build your prototypes (e.g. at UnternehmerTUM and at the Innovationspark Augsburg). All of this results in the Munich metropolitan area being ranked second in ICT startup formations (over 3,000 formations since 2012) in Germany. And with UnternehmerTUM we are home to one of the biggest entrepreneurship centres in Europe. Strong universities and research institutes, such as the Technical University Munich, FRAUNHOFER and the DLR, play a major part.

of course confidential. Our team is made up of around 30 staff in Bavaria in Munich, Nuremberg and Hof and a worldwide network of Bavarian foreign representatives. The organisation offers information about the German legal and taxation system, tips for finding the right lawyer/tax consultant, assistance with site analyses so you can identify the perfect location, and even business support for successfully settled companies, for example during expansion.

Once you decide to open a German entity, we can offer you the soft-landing package "Ois Easy". The "Ois Easy* Startup Landing Package" (*Bavarian for a carefree business landing) is dedicated to international startups that want to open a legal entity / office in Germany and establish themselves long term in the German market. The aim is to make the market entry as carefree as possible. There are no strings attached to the package and it is completely free of charge. The package includes free co-working space for three months, various coaching opportunities and support while opening up your legal entity.

- The free co-working space for three months is available at one of the participating Bavarian digital incubation and technology centres. You can tell us which location / city in Bavaria you prefer and what timeframe would be best and we will check with our partners. Just to give you some examples, for Munich the participating centres are Werk1, Techfounders, MTZ and Gate Garching

www.youtube.com/watch?time_continue=1&v=xnjGUMRf2okm

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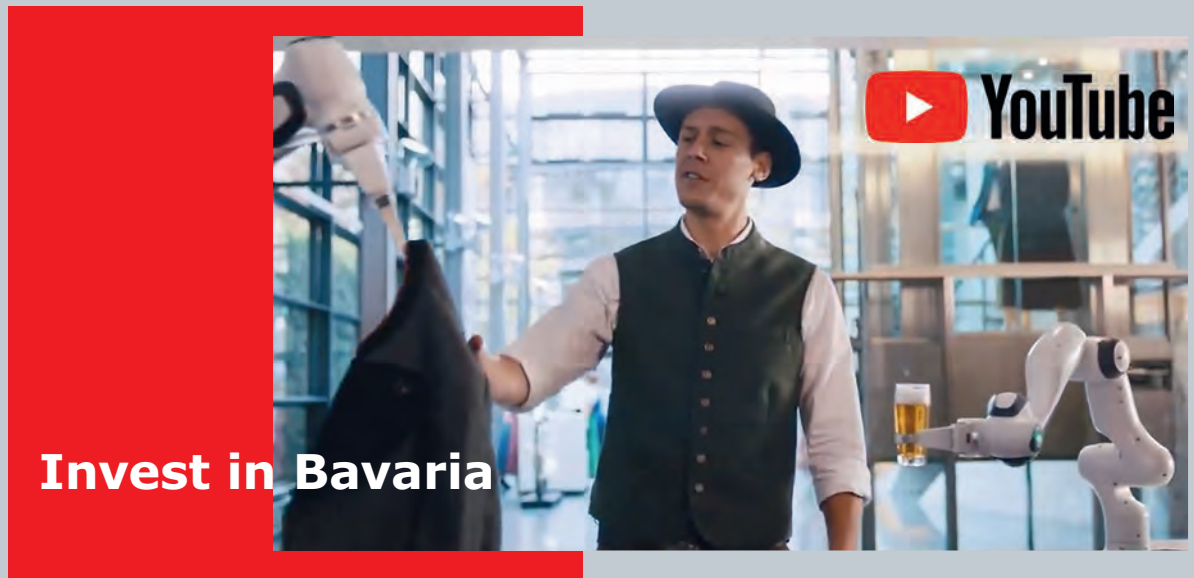
- The coaching opportunities from BayStartup, our partner for Ois Easy, focus on how to set up a German entity, how to develop a business plan for the German market, how to approach German investors and what to be aware off when entering the German market. BayStartup is the Bavarian startup network for company formation, financing and acceleration.

- Plus we help you find lawyers, tax consultants, etc. if needed and will be there for you throughout the process of establishing the legal entity.

The best thing is that the package is not a strict accelerator or anything equivalent, it's just a tool you can use in whatever way you need it. You can choose which part of the package is interesting for you, we just create it to suit your needs and wishes. The application process is also very easy, you just fill out the questionnaire on the website and send us your pitch deck. You just tell us when you want to start your time in Bavaria and what kind of offers are interesting for you.

You can find an overview of all the possible locations and more information on the programme here:

www.invest-in-bavaria.com/ois-easy/

We are looking forward to see you soon in Bavaria! ■

Colophon

Startup Guide

| **powered by** elektor