



## Student Company Report

### **Bubbles**

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Teacher: Henrik Graversen

2019/2020

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## Executive summary

Back in August 2019 we set out to build a company from scratch. None of us knew about the existence of our future business partners. Through networking, speeddating and mixing and matching we were attracted by the same core values to what became Bubbles. After a few months' of exploration of problems mainly related to noise-pollution we were able to connect the dots and zoom in on a purpose which is deeply meaningful to all of us: Using our technology to make a profound difference for vulnerable schoolchildren with attention and hyperactivity disorders. Networking, feedback, user-experiments, MVP pitching, and hard, hard work has resulted in the truly innovative Bubbles 'Learning Bubble' system. It has been praised by audio technology experts and special needs educators alike. And since the Danish elementary schools were re-opened after the COVID-19 lockdown we have succeeded in selling systems

to four schools for a total of €5,825 generating a €2,107 operating profit and a € 4,261 net profit for the year. Our business model is a cash-flow friendly combination of direct sales of hardware components for the system and recurring license fees. The net weekly cost to the schools per pupil connected to a Bubbles system full-time is comparable to the cost of ½ hour of one-to-one education of a special needs child. We have been approached by a potential investor, but declined because we think it is too early to dilute our equity.

**Visit our website:**  
[www.bubbles.cx](http://www.bubbles.cx)

**Mathias Kanstup,**  
*Business Banking at Nordea Bank PLC* -  
"The system operates as promised. I believe Bubbles has significant growth potential."

**Marianne Holst Pedersen,**  
*Inclusion Pedagogue of ADHD-pupils at Vestervang School* -  
"The headphones were able to bring down redundant sense impression, thereby allowing the affected children to participate. Both class community and social relations improved significantly with implementation of the Bubbles system."

**Hans Holm,**  
*Judge at Regional CP Fair, Trusted Advisor and Certified Transformational Coach* -  
"There's no doubt, affected children need Bubbles!"

**Claus Buelund,**  
*Judge at Regional CP Fair, Senior Corporate Procurement Manager at B&O Bang & Olufsen PLC* -  
"It doesn't just work - it performs impeccably."

**Ivan Høeg,**  
*Judge at Regional CP Championship, Strategic Management Consultant* -  
"Bubbles will disrupt conventional schooling of these pupils. Mark my words."

**Michael Elefsen,**  
*Judge at National Championship Qualification Round, CEO at FRECON Ltd.* -  
"This! is the real thing. Can I adopt these guys?"

**Michelle Vester,**  
*Teacher at Snebjerg School* -  
"This has immense opportunities. Children struggle with concentration, motivation and diagnoses. With redundant sense impression cancelled or reduced, they are able to adhere to procedural sequences of learning. It is going to strengthen their capabilities and foster self-worth."

**Lennart Petersen,**  
*Principal at Ranum School* -  
"We are on a tight budget but have just ordered our second Bubbles system. High praise for the technology, the ease of use, and the excellent service behind it!"

# Problem

ADHD is short for Attention Deficit/Hyperactivity Disorder. It includes difficulty staying focused and paying attention, difficulty controlling behavior and hyperactivity. ADD is short for Attention Deficit Disorder excluding the hyperactivity disorder. Both impair children's ability to cope socially and academically.

Children diagnosed with ADHD and ADD are a growing problem. In Denmark in 2019 28.200 pupils of primary- and lower secondary schools suffered from ADHD or ADD. That is nearly 4 percent of all pupils of primary- and lower secondary schools. Boys significantly outnumber girls. The average age of children receiving the diagnosis is 12 years.

The relative long-term consequences of suffering from ADHD/ADD as a child are very serious: They are 50 (fifty) times less likely to have a close childhood friend. Half of them fail at Math and Danish when leaving lower secondary school. At age 25 only one third of them will have completed upper secondary education. They are three times as likely to become convicted criminals. 66% of adults diagnosed with ADHD/ADD are disconnected from the labor market. The remaining 34% earn €15,300 less annually than the national average.

Most people have an instinctive understanding of how challenging it can be to focus in noisy environments. Our auditory sense will send signals to the brain, imposing us to identify the frequency and by whom it has been sent. Some of us are better at ignoring these signals than others.

Sensitive hearing is a very common symptom among children suffering from ADHD or ADD. If you combine sensitive hearing with our common

curiosity and the challenges of ADHD/ADD you have the basis for a hectic and chaotic day in school. Our study showed that schoolchildren are continuously struggling with auditory distractions into their sensitive hearing. It triggers a negative dynamic in the classroom between the child and the other children reinforcing the problems associated with ADHD/ADD.

# Product

We have developed a unique way of giving teachers exclusive real-time voice access to Active Noise Cancelling (ANC) headphones. It is sold as a turn-key system which creates a muted 'Learning Bubble' for ADHD/ADD children. It has been praised by ADHD/ADD pedagogues and audio electronics professionals.

ANC technology uses microphones to pick up low-frequency noise and neutralize it before it reaches the ear. The headset generates a sound that is phase-inverted by 180 degrees to the unwanted noise, resulting in the two sounds cancelling each other out. A separate ANC headphone in a classroom will not discriminate between background noise and the voice of the teacher.

Our 'MotherBubble' is a voice server and the critical system component. It is deployed in each classroom in order to guarantee our extremely low latency rates. We studied internet voice servers beforehand and learned that low latency had to be our primary design objective if we were to gain a competitive advantage.

Via Bluetooth the 'MotherBubble' simultaneously connects the teacher's on-ear ANC microphone

with up to 7 student ANC headphones for a seamless and transparent user experience. By default neither teacher nor any of the students in the classroom (with or without headphones) notice the system. It simply filters unwanted noise before it reaches those who are better off with a quiet work environment. For access to 'MotherBubble' an app-client is installed on the teacher's as well as the student's computer or smartphone. Each student must be licensed in order to access the Bubbles system.

The 'MotherBubble' hardware components are: Cabinet, cooling fan, power supply, memory card and a motherboard featuring a microprocessor. It is assembled by us. In order for the system to operate, sustained access to the internet is needed, Bluetooth on all units must be enabled and the teacher must have a computer running Windows 10. We learned that 96% of teachers in Denmark are equipped with a laptop with this exact operating system. Also, security is highly prioritized. The 'MotherBubble' connects to the internet through hotspot technology or WiFi-sharing, which is available to all network-types: public, school, mobile 4G and conventional internet.

We need to acquire a connecting link due to safety reasons. For instance, if the 'MotherBubble' is directly connected to the school network the network would be extremely vulnerable to direct access by a remote source rendering the network system compromised and susceptible to hacks. Therefore, teacher and students are asked to dial a certain IP-address, corresponding to the one displayed in the app-client. The IP-address will change when a new unit requests access or if it is shut down, ensuring security. Thus Bubbles is in compliance with General Data Protection Regulation.



The Bubbles system is a real thing. It is the result of an enormous effort to listen, learn, experiment, test, refine and rethink. We are truly proud of it and it's promise for these vulnerable children. The system now works flawlessly, as witnessed by a Bang & Olufsen PLC expert, various CP judges, and four primary- and lower secondary schools using and paying for the Bubbles system. The system has been stress-tested for multiple uninterrupted 2-week stints.

## Product development

### Timeline

Product development was initiated in August 2019. At the time we were trying to solve another problem related to noisy environments, namely outdoor traffic noise. Within weeks we realized that open air active noise cancelling with outdoor loudspeakers were beyond our technological and financial reach, and decided to explore indoor noise as a potential business opportunity. We have family members, who work in noisy open plan office environments, and they told us that face-to-face meetings can be quite challenging because of the background noise. So, we experimented with moving our outdoor concept inside by hooking ANC-circuitry up with a bluetooth loudspeaker in order to create a desktop bubble where background noise is neutralized within a radius of 1 metre from the loudspeaker.

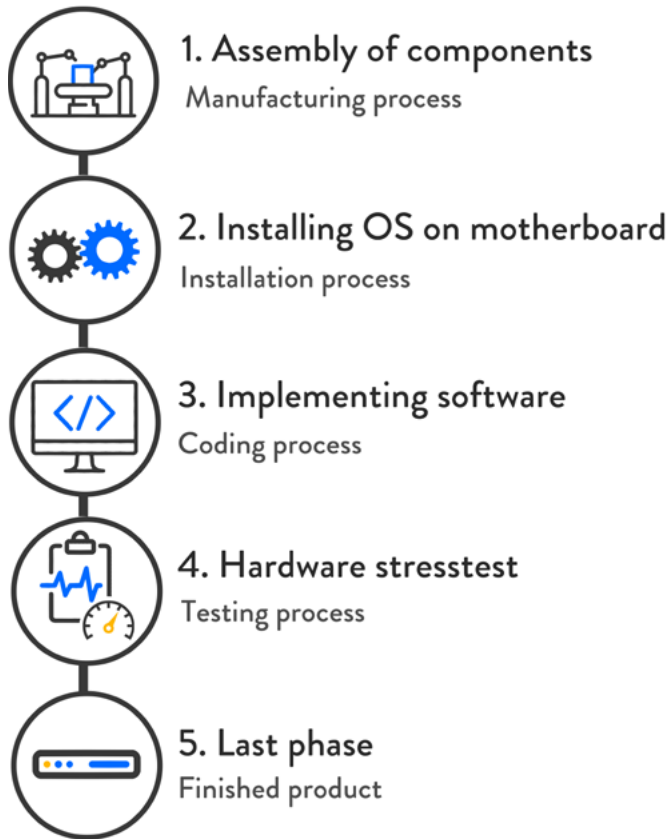
These experiments taught us a lot about ANC possibilities and limitations in noisy environments, primarily that instead of reinventing the wheel we should build upon the cutting edge ANC-technology available in leading ANC headsets today. By adding

unique communications capabilities to this platform we could develop a truly innovative solution to “the conflicting needs for noise cancellation and availability”. This exact phrase on our whiteboard became a turning point for our company. By mid-November 2019 Christian, our CTO, looked at it and asked “What are we doing? Is this our dream? To develop something which may facilitate even higher concentrations of office workers per square metre? Instead we could use our technology to change lives for the better.” Christian’s younger sister suffers from ADHD and he had just realized that he had the possibility to help her cope better with school.

Her limited ability to focus is completely ruined in a noisy classroom. Often, Mathilde comes home completely distraught and exhausted due to continuous disruption of focus in school. This was a genuine ‘light bulb’ moment, which soon became a pivot point for Bubbles towards a vision to help children suffering from attention and hyperactivity disorder, do better academically and socially. Shortly afterwards Bubbles shelved the open plan office focus (at least temporarily) in favor of this deeper unresolved pain. Since then we have worked flat out researching, developing, refining, and selling a seamless, transparent user experience within the classroom and within the constraints of the schools’ IT network policies and capabilities. This is done in close collaboration with teachers, inclusion pedagogues and IT staff in the schools. Without their onsite and online feedback we would have been grasping at straws in the dark.

## Production flow

The Bubbles server is assembled and manufactured in Herning by Christian, CTO. It takes on average 20 minutes per unit. Also, all of us are able to install the system when visiting a customer. The hardware of the system hasn't changed significantly since December, but the software is quite different today. This is due to our continuous product development and customer involvement. The software has been tailored specifically to the needs of our customers.



## Supply chain

Our prototype was built with components from local electronics retailers. We then sourced the components internationally in order to lower cost. We learned a lesson from this: There is more than price to sourcing a supplier. Because we ended up paying more than we tried to avoid because of COVID-19 related delivery problems. We ended up driving for hours to get critical components before a delivery deadline. In short, we have learned that for us 'just-in-time' manufacturing requires reliable suppliers with a stock in Denmark.

## Suppliers

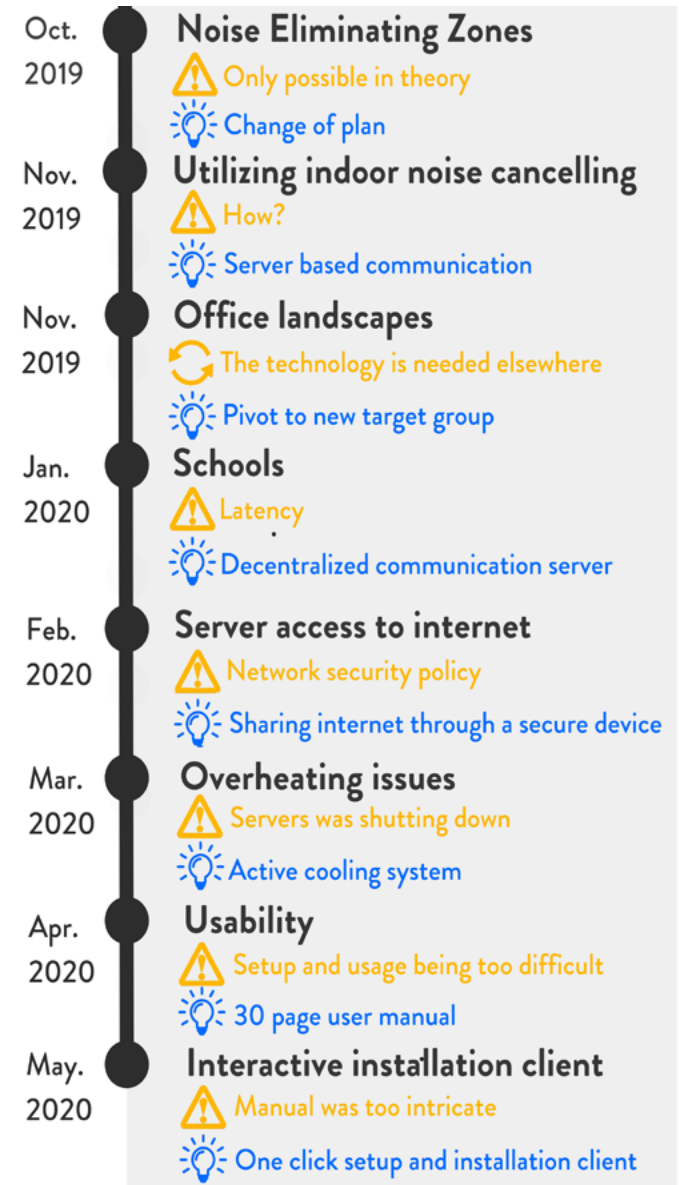
Our assortment of Bubbles endorsed headphones consists of B&O H8i, SONY WH-1000MX3 and TaoTronics SoundSurge 60. The TaoTronics headphone will be branded with the Bubbles logo. Computersalg DK Ltd. supplies us with the Plantronics Voyager Legend Bluetooth ANC microphone. Initially, Bubbles 3D printed the MotherBubble cabinet. We have realized that for now this is a waste of time and use generic metal cabinets instead. The internal hardware components of the server are sourced from a number of Danish suppliers.

## Vision & Mission

**Why:** We believe that all children should be given equal opportunities to develop academically and socially.

**How:** We develop, build, and market educational technology tools to help schools and parents support vulnerable children to the max.

**What:** The Bubbles 'Learning Bubble' system.







# Marketing

Bubble has two separate groups of users: Schoolchildren with hyperactivity and attention disorders and their teachers. The teachers are in a strong position to influence buying decisions, but they do not make the decision. That is the responsibility of school management.

This was not entirely clear to us initially. We were so busy understanding and solving the problems in the classroom that we made the 'easy' assumption that once we had revolutionized the ADHD/ADD learning space breaking into the market would be a trivality. So, by mid-February when we considered the system good enough to sell we unleashed CEO Nicklas on a sales raid. We believed that something this revolutionary would be received with open arms by the principals, so why not call the decision-makers straight away? 42 variations of "no, please go away" later we had to reconsider everything. We knew what the Bubbles system could do for the users, but we clearly had something to learn on the marketing front. So we made a questionnaire directed at teachers to research how schools buy. Basically, we now understand that a principal is hard-coded to say no to any out-of-the-blue sales pitch. They are like a locked door. The key to this door is to find allies behind it. Teachers have a large say in the flat hierarchy of Danish institutions. So we decided to book a (discounted last-minute) stand in a remote corner of the largest educational conference in Denmark. We worked the hallways and gained 38 contacts behind the locked doors and 9 direct invitations to come and demo the Bubble system onsite.

Then COVID-19 struck and closed those doors again. What's the point of demonstrating with no users in school?

COVID-19 was an opportunity to build on those contacts. Nicklas had learned his lesson about the limitations of cold canvassing in B2G/B2B and now networked his way to more than 470 new education LinkedIn contacts in with a "give, give, give, ask" approach. Christian stress-tested our system and we also thought long and hard about COVID-19 related business opportunities. Lock-down and social distancing in nursing homes was a new opportunity, but we would have to dive into additional technical and business development to get there. We decided against it for two reasons: 1/ the Bubbles system is a huge business opportunity in it's own right and 2/ the education sector is just about as recession-proof as possible. Diverting our focus elsewhere would be much riskier than staying focused. Today, nursing homes have re-allowed physical visits and this opportunity has evaporated. Since the schools were allowed to reopen in late April we have sold our systems to four schools.

## Market

The number of children in Denmark with ADHD and ADD has been growing every year for two decades. In 2019 more than 28.000 children between 7 and 16 had this diagnose. They are distributed across 1084 council schools, 556 private schools, 245 residential lower secondary schools, 128 special needs schools and 164 residential special needs schools. 46% of the diagnosed children attend ordinary classes in council schools, 42% special needs classes and 12% attend private schools. The authorities mainly support these pupils with extra teacher support,

including a weekly number of one-on-one lessons. This is expensive: An ordinary pupil in an ordinary council school costs society €8,192 a year. A pupil in a special needs class costs €66,711. This is considered a necessary investment, but as documented the outcome is not exactly a resounding success.

The weekly cost of a Bubbles 'Learning Bubble' per pupil is less than ½ an hour of one-on-one education. Special needs children receive a minimum of 9 one-on-one lessons per week.

We sell directly to the schools. A small company approached us after our participation in the educational conference wanting to become a dealer. After consideration we declined. We do not consider it in our strategic interest to distance ourselves from the schools at this point of time.

A TV-station's report about the Bubbles system in April has generated more than 98,800 views on the accompanying [Facebook](#) video. The Danish ADHD Association featured us. Parents from all over the country started calling us. Along with teachers they are now vital keys to opening the locked doors.

## Sales

We now appreciate the wisdom of Mike Tyson: "Everybody has a plan until they get punched in the face." We have learned that selling is hard. Not to mention underrated. But first of all we have learned that there is a deep truth to the old joke that the 5th P of Kotler's 4P-model is 'Pselling': The first four P's of marketing strategy are easy enough as long as they do not have to deal with the reality of selling. Sometimes salesmanship can compensate for a lacking marketing strategy, sometimes not. But selling is first of all about asking questions and listening and



what we learned was that the answers become very straight and real when we ask for money. This has raised our understanding of the whole picture tremendously.

Bubbles has now issued five invoices to four different schools for a total of €5,825,65. The first three sales were made within a week of the partial reopening of Danish elementary schools, the fourth school bought a system by the end of May, and the largest order by far came 10th June. We have setup a Zoho CRM system to facilitate our sales efforts and to gain insights into the efficiency of our marketing strategy. A total of 2,177 elementary and lower-secondary schools are in our sights.







For now, in order to sell Bubbles systems, we understand that we need to offer a free one week on-site demonstration. We need to prove the value of the system, but it is also a big opportunity to learn more about our target group.

We know, that the Bubbles system makes a huge difference to these vulnerable children and continue to finetune our value-proposition.

## Finances

### Desire to succeed

To make money, you have to spend money. Not least if you plan to make a ding in the universe and develop new technology. In order to start out with working capital we invested €268.46 each, establishing a startup equity of €805.37 Since then, we have had great success in the various regional and national competitions of Company Programme. In total, we have made €3,355.70 on awards. This has done wonders for our cash-flow and allowed us to practice our “fail fast” mindset. To spend money, it helps to make money. Otherwise, you risk losing some measure of control over your startup and future.

Following media exposure in connection with our win in the Danish Company Programme we were contacted by the owner of a small publishing house, who expressed interest in buying a minority share in Bubbles. Our finances and cashflow are quite healthy and we can personally borrow capital interest free from family and friends if necessary, so we declined. This is not the time for dilution.

**Profit and Loss Account**  
01.10.2019 - 17.06.2020

	Budgeted	Actual
Revenue	€5.000,00	€5.825,65
External costs:		
Materials	€1.070,00	€1.669,40
Other external costs	991,95	€2.048,52
<b>Cost of Sales</b>	<b>€2.061,95</b>	<b>€3.717,92</b>
<b>Gross Profit</b>	<b>€2.938,05</b>	<b>€2.107,73</b>
Salaries	€0,00	€0,00
<b>Total Expenses</b>	<b>€0,00</b>	<b>€0,00</b>
<b>Operating Profit</b>	<b>€2.938,05</b>	<b>€2.107,73</b>
Miscellaneous Income	€0,00	€3.355,70
<b>Net Profit</b>	<b>€2.938,05</b>	<b>€5.463,43</b>
Company Income Tax (22% in Denmark)	€646,37	€1.201,96
Appropriations of Profit	€0,00	€0,00
<b>Net profit for the year</b>	<b>€2.291,68</b>	<b>€4.261,48</b>

### Profitability

Of course, award money is not a direct measure of our profitability, and therefore we have accounted for them under “Miscellaneous Income”. We have made a €2,107 gross profit on €5,825 worth of sales leaving us with a 71,85% gross profit margin versus 78,56% projected. The outbreak of COVID-19 first meant our access to schools was cut off and any chance of selling was neutralized for the duration of the lock-down. Since the end of April, after the elementary school pupils were allowed back to school, we have been able to close our four first deals. We have offered discounts to neutralize the COVID-19 lockdown (schools do not want to pay license fees for empty classrooms). Currently, we offer the Bubble server at a temporarily reduced selling price of €402 with a €17 additional monthly license fee per user.



On top of that the customer typically pays us a one-off €80 price per ANC-headphone.

#### Balance Sheet

01.10.2019 - 17.06.2020

Current Assets		Liabilities	
Stock	€420,00	Share Capital	€805,37
Debtors	€0,00	Loans	€0,00
Cash in Bank	€4.109,93	Creditors	€0,00
Cash in Hand	€536,91	Retained earning	€4.261,48
		<b>Owners' Equity</b>	<b>€5.066,85</b>
		<b>Total Liabilities and owners' Equity</b>	<b>€5.066,85</b>
<b>Total Assets</b>	<b>€5.066,85</b>		

#### Cost structure

Although we avoid fixed costs like the plague, we accept that sometimes they are money well spent. Product liability insurance being one example, our online accounting software another. Eliminating those would either incur unacceptable risk or much higher costs, not to mention loss of the day-to-day financial overview afforded by our accounting software.

We have learned that at this stage there is no substitute for demonstrating our system on-site and face-to-face at learning conferences. This has led to higher sales costs than projected. On the other hand, we have demonstrated that this approach works and we are certain that sales would have been significantly higher if COVID-19 had not paused our market entry.

Components sourcing is a balancing act between pushing for lowest price and supply reliability.

#### Costing

Profit margin for: 1 system - 3 users

	Summer 2020	Future
<b>Price</b>	€1.215,70	€1.295,57
Packing	€0,00	€24,16
Transportation	€88,59	€0,00
Hardware	€253,64	€253,64
<b>Cost</b>	€342,23	€277,80
<b>Gross Profit</b>	€873,47	€1.017,77
<b>Profit margin</b>	71,85%	78,56%

## Experience

Over time we have gathered valuable learnings, both as individuals and as a team. We have highlighted the ones most important for us.

#### Selling proposition

As previously mentioned we found entering the market selling both B2B and B2G difficult. Basically, we did not understand the buying decision process in Danish schools. We went straight for the principal without realizing that his automatic response would be “no”. We learned to understand the politics and now know that we need to find a key to the locked door: Sell a teacher or a parent on our system. Teachers have a large say in Danish schools. Parents of children with learning disabilities are often quite frustrated, actually most school boards will have at least one of them as a member ...

#### Calculated risks

We calculated our capital requirement and decided on a startup equity of €804. This gave us early on the opportunity to develop a high level of customer involvement and a MVP. We learned that in order for





others to believe in our company and us, we had to actively enhance chances of success ourselves.

### **Hard work**

Initially, none of us had a real understanding of our upcoming work fields. A technical product developer who had no interest in customer relations, a financial manager who had zero experience with entrepreneurship and a creative marketing manager whose only actual experience with marketing was as a consumer. Since then we have developed. In spite of our glaring differences, we have one thing in common: Work ethic. We learned the meaning of dedication to mission. We have had to put the company first in all priorities - family, friends and sports. However we also learned how meaningful it can be to turn a dream into reality.

### **Our motivation**

Bubbles is a roller-coaster. Some days are hard, some days are magic. The difference between running into an “impossible” technological obstacle one day, and seeing a schoolboy crying a couple of days later when his school’s Bubble system was reinstated is hard to describe. We have become a close-knit team with the kind of loyalty you only get from taking on the world as brothers/sisters in arms. In order to understand our motivation we decided early on to journal our ups and downs. It has given us perspective and is a source for some good laughs when we kick back.

### **Network**

Bubbles is supported by a homogeneous network as our families stand firmly behind our passion for building Bubbles. Also, the judges of Company Programme have been a tremendous resource. They

have given us constructive feedback right from the beginning. Not only when pitching at conferences but also afterwards, we have received genuine feedback. Mathias Kanstrup, Business Advisor at Nordea Bank PLC, handles our account with Nordea but has also been generous with his time mentoring us on financial and legal issues.

A local university incubator has invited us to learn from their 58 resident academic experts, providing a broad advisory board.

Head of ‘Denmark’s Learning Festival’, Kirsten Greve, introduced us to multiple potential customers and business partners.

## **Management**

### **The company**

Bubbles I/S is a registered unlimited partnership built upon shared management divided into areas of accountability. The agreement spells out anticipated performance levels and consequences if they should not be reached along agreed timelines. Eventually, shares in Bubbles will be vested accordingly.

### **The team**

The team consists of three young and enthusiastic people. We share multiple personal traits which has strengthened our ability to progress in a short period of time. No team member hesitates by the hour when in need of focus. Also, we encourage one another to do better and hold on to any motivation when in doubt. Our educational profiles are different, which has boosted our resourcefulness. We did not know each other prior to founding Bubbles and our

personal backgrounds are very different, too. This could all make pulling in the same direction difficult but we share a deep belief in our vision and mission.

The team members are: Christian Ørum CTO. Christian is our tech wizzard. He has built the Bubbles system from scratch including programming the server. Jasmin Akhsas CMO. Jasmin is our master communicator and marketing/innovation specialist. Nicklas Stokholm CEO. Nicklas is that rare blend of super salesmanship and financial flair.

### Team progress

Bubbles is built upon learning by doing. Through hard work and continuous honest evaluation we learned the importance of matching individuals by their skills and mindset. We have matured over time and learned how to constructively part ways with former team members who did not act in accordance with our agreements. We have also learned that there is strength in our diversity. Our different approaches to tasks gives us the potential for more agility, especially when our teamwork can adapt to these differences. Consequently, we have learned to separate tasks and deadlines in order to keep weekly track of our progress. At this point we communicate thoroughly by means of an online platform, Zoho Connect . We have come to respect each other professionally. This has improved our capability to initiate change and take responsibility for our actions.

## Future

### Market potential

More than 28.000 children diagnosed with ADHD/ADD in Denmark are potential users of the Bubbles system, however the future potential is beyond:

The Danish market has even bigger potential: Almost 8.000 students in upper secondary schools have similar diagnoses. Parallel to the educational market we have identified potential markets for our technology in open plan offices in the private and public sector as well as in noisy industrial settings.

Outside Denmark Scandinavian markets are of particular interest, due to their similarities in school systems, culture and educational philosophy. In total, 78.000 children are suffering from ADHD when looking at Denmark, Norway and Sweden combined.

### Technology development

We view the Bubble system as a platform with potential for further development. Currently, we are looking at making a portable version of the server by adding an internal battery and an integrated touch-screen. This is not complicated. The first prototype is undergoing tests.

Our plan to build continuous measurement of user movement (a symptom of ADHD) into the Bubbles system is also moving forwards. The 'ADHD Tracker' will add extra value to the schools. We have now identified all the components needed for this subsystem.

### Branding

Our next batch of Taotronics headphones will be branded with the Bubbles logo.





