Audira

Team 21: Dynamo

Executive Summary:

Broken communication and workplace discrimination are **persistent challenges** for deaf and hard-of-hearing employees, especially in fast-paced, communication-heavy environments like retail, manufacturing, and hospitality. Audira addresses this gap through a **cost-effective app-smartwatch integration**, and our mission is to directly improve traditional communication channels like walkie-talkies, revolutionising workplace inclusivity and productivity for deaf individuals in diverse working settings. With our commitment to fairness, human rights, and equitable people-first growth, we aim to successfully empower as many deaf individuals as possible to thrive prosperously in their workplace environment.

Pain Points of Target Audience:

#1: Slow Communication

Firstly, in addition to their inability to hear, people who are deaf are usually unable to speak, cutting off 2-way communication completely.[3] In rush hours of restaurants, warehouses, and retail stores, fast communication is critical and usually verbal, through radio systems or walkie-talkies[4], which the deaf are unable to use. These environments often require real-time communication between multiple staff members, leaving deaf people who do not use the radio systems out of the loop.

#2: Workplace Discrimination

Deaf people face discrimination in workplaces.[5] This results in a deaf person, even though equally or more willing and capable as another employee to carry out duties, are biasedly not chosen for more important tasks, hence enjoying less raises and promotions. This is partly due to some tasks depending on sound-like alarms, timers, or someone asking for help that currently lack visual alternatives. Workplace discrimination could also stem from unfair personal biases.

Product Description:

Our solution consists of a novel and innovative ecosystem that solves the 2 pain points mentioned. It consists of a smartwatch and a mobile application.

Smartwatch:

Current communication systems rely heavily on walkie-talkies, excluding deaf people. Our smartwatch includes deaf people by allowing messages and alerts, typically broadcast by radio, to be broadcast to deaf people as well. Whereas, employees who can hear will continue to rely on audio-based communication. All messages broadcast from other employees or managers will be **transcribed via low cost**[1] **open-source APIs** such as **OpenAI Whisper** and **appear** on the smartwatch together with **haptic feedback** (vibrations), alerting deaf employees. Deaf employees can respond to this through **AI-generated preset replies, feasible via tools like Rasa NLU.**[2] They can also notify their managers when they are **on break** or in need of **assistance**, improving the current communication system through the **buttons** on the side. (**Solves Pain Point #1**)

The smartwatch also has integrations to include **task workflows** for deaf employees, allowing them to check off tasks they have completed. In addition, our smartwatch has a **built-in microphone** that uses AI to translate important sounds into alerts on their watch, such as glass breaking, customer requests, or alarms, giving the deaf the same **situational awareness** required for certain tasks. (**Solves Pain Point #2**)

Mobile Application:

This app is to be used by **managers and superiors**. Managers can use the app to broadcast messages to all employees. Other employees will hear this message as per normal, while deaf employees will receive this information after transcription. (**Solves Pain Point #1**)

Conventionally, managers assign tasks to their employees with a task list at the start of a shift. This task list can be integrated into the smartwatch, allowing managers to **track the tasks** completed by deaf employees without verbal communication, while other employees can rely on verbal communication as is done now. (**Solves Pain Point #1**)

When evaluating employees for positions, one can reference the tasks completed by deaf employees to **fairly assess** whether a termination is justified, or whether they are deserving of a raise or promotion. (**Solves Pain Point #2**)

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[1] Garske, N., & Garske, N. (2023, November 19). Evaluating the expense of OpenAI Whisper: API or Self-Hosted? Nikolas' Blog. https://nikolas.blog/whisper-api-vs-self-hosting/
[2] Using NLU only. (2025, April 25). Rasa Documentation. https://legacy-docs-oss.rasa.com/docs/rasa/nlu-only/
[3] National Deaf Center. (2023, February 27). Deaf 101: Can Deaf people talk? - National Deaf Center. https://nationaldeafcenter.org/resource-items/deaf-101-can-deaf-people-talk/
[4] Anytone. (2025, January 7). How walkie talkies facilitate communication in large retail stores. Qixiang Electron Science & Technology Co., Ltd. https://www.anytone.net/a-news-how-walkie-talkies-facilitate-communication-in-large-retail-stores
[5] Manciagli, D. (2020, December 3). Council Post: Workplace struggles for deaf employees. Forbes. https://www.forbes.com/councils/forbescoachescouncil/2020/12/03/workplace-struggles-for-deaf-employees/

Sustainable Development Goals:

(8) Decent Work and Economic Goal

Audira changes the workplace to include people who are deaf and provides more opportunities for them to be included in our workforce.

The presence of the workflow allows tasks to be distributed in a systematic manner which reduces miscommunications and results in more productive work being done. This leads to higher levels of economic productivity and thus more revenue for the company, addressing subpoint 8.2.[6]

(10) Reduced Inequality

With the workflow, each employee is held accountable for their daily work. As such, there is quantitative data on the work each employee does. Managers will know specifically if an employee is hitting their Key Performance Indicators (KPIs) by reviewing the tracked data.

Competitor Analysis:

In comparison to other solutions that could assist people who are deaf, we stand out by making ours more relevant and targeted towards people who are deaf, as well as ensuring sustainability in the process.

	Audira	Smart Watches (i.e. Apple Watch)	Smart Glasses (i.e. XanderGlasses)
Cost	95 dollars	Around 300 dollars[13]	Around 1000 dollars[14]
Ease of Implementation	Already **designed to be implemented in the workplace** and we provide the service to implement it	Requires strict control to prevent users from accessing other features	Users require time to adapt to the new glasses and some may already wear glasses
Assistivity to People who are Deaf	Has both Speech to Text to receive information and Text to Speech to send out information as a Walkie Talkie	Lacks the ability for people far away from communicating with them using Walkie Talkies.	Lacks the ability for the people who are deaf to express their words
User Friendly	**Easy to use User Interface (UI)** as it only has limited features	Complex UI due to its vast amount of features	Lack of a proper UI for interaction
Usage Duration	Up to **5 days**	Up to 3 days[15]	Up to 3 hours[16]
Sustainability	Made of Recycled Materials for most components	Frequently releases high amounts of carbon during the mining and production process[17] [18]	

As such, each employee's performance is based solely on these data, and not on bias. With the more transparent system, the HoH will be treated equally with the rest when considering bonuses and promotions. As such, there is reduced inequality in the workplace by considering people with disabilities on the same playing field. This addresses subpoint 10.3 which is to eliminate discriminatory practices and promote appropriate action.[7]

Financial Analysis:

Hearing-impaired workers **lose ~15–20% productivity** due to communication barriers.[8] Audira aims to recover half of that – **yielding a 7% gain**. In U.S. retail and logistics, where output averages $90K per worker[9], Audira drives a **$6,300 gain per employee—over $500K across 100 workers** after discounts. Managers benefit too. Assuming the standard 25:1 employee-manager ratio, Audira saves around **3 hrs/week** in coordination time, translating to **~$6,250 in annual gains per manager**.[10] Audira also reduces errors and safety incidents.

Year	2025	2026	2027	2028
Initial Investment needed ($)	100,000			
Potential Benefits ($)				
Value of Gain in Worker Productivity	500,000	1,000,000	1,500,000	2,000,000
Value of Gain in Manager Productivity	25,000	50,000	100,000	150,000
Improvement in Operational Efficiency and Communication	110,000	170,000	230,000	300,000
Yearly Cost Savings ($)	635,000	1,220,000	1,830,000	2,450,000
Accumulated Cost Savings ($)	635,000	1,855,000	3,685,000	6,135,000
Total Costs ($)				
Raw Materials and Hardware Inputs	3,400	3,400	3,400	3,400
Packaging and Logistics	600	600	600	600
Software Implementation	1,000	2,000	4,000	8,000
Annual Subscription Fee	60,000	120,000	240,000	480,000
Training Costs (assuming an increase of 100 deaf employees yearly)	80,000	80,000	80,000	80,000
Total Cash Outflow ($)	245,000	206,000	328,000	572,000
Net Yearly Cash Benefit ($)	390,000	1,014,000	1,502,000	**1,878,000**
Accumulated Cash Benefits ($)	390,000	1,404,000	2,906,000	**4,784,000**

Component	Cost per Unit
E-ink display (small, low-power)	$5
Microcontroller + sensors (proximity, vibration, mic)	$10
Biodegradable/recycled strap and casing	$4
Battery (optimized for energy efficiency)	$3
Light/vibration modules	$4
Assembly and quality testing	$8
Total Hardware per Unit	**$34**
Packaging + logistics	$6
Final Production Cost per Unit	**$40**

Miscommunication costs about $2,000 per employee yearly[11]; by reducing 30%, Audira **saves $600 per worker ($60,000 total) plus $50,000 from fewer safety incidents.**[12] By FY28, Audira would deliver roughly **$6.1 million in accumulated operational value**. Raw materials are sourced from recycled and eco-friendly materials to minimize environmental impact and we estimate a **per-unit raw material and assembly cost of ~$34, with an additional $6 allocated for packaging and logistics**. **Initial per-user software costs average ~$10**, including AI inference, manager dashboard access, and OTA updates. Our **one-time total per-unit cost** (hardware, software, and support) **is ~$95**, inclusive of training, onboarding materials and profits. We plan a **$50/month subscription per deaf user**. Audira has **first-year production costs around $100K, $80K yearly expansion for 100 new users, and $300K annual subscription costs**. By year 4, with 400 users, **cumulative cash benefits reach ~$4.8 million and net benefits ~$1.9 million in FY2028**.

[6] *Goal 8 | Department of Economic and Social Affairs*. (n.d.-b). https://sdgs.un.org/goals/goal8#targets_and_indicators
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