Sustainability Considerations

Environmental Sustainability

Electronic waste is a growing environmental concern around the world[1], as devices are increasingly built with shorter product cycles. In this regard, as a device with many electronic components, WALDO could potentially contribute to this problem.

WALDO is intended for use in care homes by residents with learning disabilities and their carers. With its relatively fixed capabilities, and since updates to the product would primarily be delivered via software updates to the machine learning model used, WALDO should have a long product lifespan. Furthermore, a long lifespan would enable WALDO to better fulfil the role of being a companion, as the care home resident gets more used to its presence and interacting with it.

In spite of this, this group believes that sustainability should still be a consideration when designing a replicable production version of WALDO. Several measures that can be taken to reduce WALDO's environmental impact include:

- Using a soft toy that is environmentally friendly as the device exterior. Environmentally friendly soft toys can be built with recycled materials or be built to be recyclable, and make use of non-toxic or organic materials in their construction[2]
- Reducing the number of electronic components used. One method of doing this would be to use a custom-built integrated circuit that is able to handle all the computation required, instead of two embedded devices (Jetson and Pi) in the current implementation
- Providing disposal information with the WALDO device, to ensure that WALDO is disposed of in a responsible manner, and relevant components are recycled

Economic Sustainability

A study in 2014 led by the London School of Economics and Political Science (LSE) estimates that autism costs the UK at least £32 billion per year in treatment and lost earnings and is the country's number one most costly[3] medical condition. The adult specialist care market, which is WALDO's target market, was valued at nearly £16 billion in 2017[4], a share that is forecast to increase. Care for people with learning disabilities takes up approximately half this amount[5].

In addition, a study done by the Personal Social Service Research Unit (PSSRU) and University of Kent in 2018 shows that recruiting and training staff in autism and learning disability supported care homes cost the homes an average of about £1,012[6] per client per year.

With WALDO possibly being a one time fixed cost(<£400) with low maintenance fees, employing the use of WALDO in care homes will certainly provide care homes with cost savings of about £1,000 per client per year. The cost savings can also be transferred to patients, thus

reducing the cost of care for residents with additional needs. Cost savings can also be realised for patients not residing in care homes but in their own residential homes. As such, WALDO could certainly bring economic benefits to all stakeholders involved and is an economically sustainable solution.

Bibliography

[1] Semuels, A. (23 May 2019) The World Has an E-Waste Problem. *Time*. [Online] Available from: https://time.com/5594380/world-electronic-waste-problem/ [Accessed: 18 June 2019].

[2] Skye, J. (n.d.) *Earth Friendly Toys*. [Online]. LoveToKnow. Available from: https://greenliving.lovetoknow.com/Earth_Friendly_Toys [Accessed: 18 June 2019].

[3] Anonymous. (10 June 2014) Autism is the most costly medical condition in the UK. *London School of Economics and Political Science (LSE).* [Online]. Available from: http://www.lse.ac.uk/website-archive/newsAndMedia/newsArchives/2014/06/Autism.aspx [Accessed : 19 June 2019].

[4] Anon (2017) Care homes market study: Final report. *Care homes market study: Final report*.

[5] Laing, W. (2016) *Complex care market looking 'broadly positive': Headline findings from LaingBuisson's latest research and analysis*. LaingBuisson Healthcare Intelligence. Available from: https://www.laingbuisson.com/wp-content/uploads/2018/02/LaingBuisson_Adult_Specialist_Care_2ed_market_briefing.pdf [Accessed: 19 June 2019].

[6] Curtis, Lesley A. and Burns, Amanda (2018) Unit Costs of Health and Social Care 2018. *University of Kent.* [Online] Available from: https://doi.org/10.22024/UniKent/01.02.70995 [Accessed : 19 June 2019].