1. Full names of all project group members

Gabrielle Cervantes
Wendy Chew
Megan Dittamore

2. Short Written Abstract *(200-300 words)* – The abstract should provide a clear summary of the proposal. What is the problem? Be specific, and focused with your ideas and arguments.

With expanding technology and other aspects becoming more ingrained into everyday life, there is a need for people to both understand their tech and also to use it in unexpected ways. With this site, we hope to bridge a gap of knowledge that exists in tech and allow people the opportunity to help themselves when tackling problems they might be facing in everyday life. Whether it be repairing their cell phone or repairing a well, having a community based knowledge bank could potentially improve people's livelihoods and build communities where previously people felt isolated and alone. With this, we hope that people will find new, innovative solutions with how to make their tech work in less than ideal circumstances and potentially allow people to learn more in the process. By showing tutorials or solutions from that area where the community is located, this could build more solutions but also might teach other people from similar areas how to address certain problems, from individuals to tech giants.

With this knowledge, it might also teach people from the Global North that tech can and does exist in the global south. The Global South is oftentimes stereotyped and seen as being less technologically advanced, when in reality, most times the tech is simply used in different ways and utilized by different means. Building a site like this might help to change that perception and help people learn what tech challenges people in the global south face when having to live in different conditions.

3. Introduce the Problem

In today's day and age there is a lot of conversation about sustainability and durability of technology, however the values consumers espouse are not being reflected in the technology developed by corporations. Phones are designed to break every two years, and many of our gadgets have similar functions, malfunctioning after some predetermined amount of time. The breakdown of machines forces users to replace their electronics much more often than should be necessary. After the technology is discarded, little thought has been put into what to do with the e-waste that remains.

Phones and other technology contain rare metals, as well as toxic components. The frequent disposal of technology in the global north leads to people scavenging for these rare metals. The countries where old e-waste is dumped are often developing

countries, such as Ghana and China. Children are frequently the ones gathering metals, a process that is hazardous to their long-term health and the environment around them. The children work in unregulated conditions, with almost no one valuing their health over the traces of precious metals that can be found after burning an old phone.

There are serious environmental concerns when dealing with the generation and disposal of e-waste. The burning of computers in Ghana leads to terrible toxins being released into the air, infecting the air quality for the entire surrounding area, and even getting into the food at a market. Currently two billion people in the world own smart phones, which requires a huge number of resources, especially when phones are built to break down every other year. The extraction of resources as well as the waste leftover has a heavy environmental toll on the planet.

Awareness over these problems has been increasing in the general population, but many people continue to buy a new smartphone every other year, along with many other household pieces of technology such as charging cables and kitchen appliances. There is a feeling of helplessness among consumers, due to the lack of alternative options.

These are just a few reasons (though significant in their scope), to redefine our relationship with technology to make it last longer, and we in the global north can look to the global south for inspiration on how to have a healthier outlook on the technology we own and use regularly.

Ship breaking in countries such as Indonesia happens with simple tools, and the metals gathered from old liners contribute to the economy. This is an example of recycling that the global north should incorporate into the life cycle of their products, a move towards considering how the device will be taken apart.

More emphasis needs to be placed on a safe and productive dismantling of technology at the end of its life. These considerations need to occur at the design phase of devices, rather than the current model of shipping waste to less advantaged countries as an afterthought. The shift required in this perspective would likely necessitate companies stop building technology to break.

Another lesson from the global south comes from Kenya, where durable 3D printers have been invented. These printers were designed to adapt to the difficult environment while maintaining a simple design. While common in Kenya, there exist other places with similar environments that could benefit from the technology developed in Kenya.

Innovation through repair is an area that is gaining momentum in the global north, as more users come to terms with the global cost of our short-lived devices. The philosophy of repair should be embraced, and in the process be made accessible to as many people as possible.

We propose to build a forum dedicated to repair and innovation. This forum will be accessible to users at no cost, beyond what is needed to access the internet to access the website. Users will be encouraged to share their innovations, like the Kenyan 3D printers, so that people in other places with similar climates can use their design, or be adapted again to a slightly different environment, and shared again with additional users.

Users will also be encouraged to post their repair solutions that other communities might find useful, and to ask questions of the public for undocumented problems. This will encourage the rejuvenation of potential e-waste, and the recycling of common materials. The content in our forum will be user generated, and free to access. It will allow for many types of media, including text, images, and video. The scope of our project is global, with the hope that people from all around the world can offer up novelties in perspective, along with simple, practical solutions to common problems.

Keeping the website free for users is a high priority, as there are many resources online that keep their content behind a paywall. Solutions to common problems should be archived clearly, making the barrier for entry as low as possible, and allowing users to approach the problems at their own pace. We hope to foster many levels of development, from solutions that anyone could implement, to highly technical explanations for niche problems.

Expertise will not be necessary to post on our forums. This will allow for individuals to post creative solutions to problems that might not occur to someone who is an expert in their field, and allows for people running into every day problems to improvise a solution, and then post it and get feedback on their repair and how it can be improved.

There are a few other websites with goals similar to ours, education websites such as the Khan academy, and several corporate run websites that encourage innovation, but with their tools, and usually at a cost to the user. These websites usually offer certificates for completing courses. We will not be quizzing users or endorsing them, but will be focused instead on repairing and building, with access for everyone.

This project will be built using the MediaWiki platform, as it is a highly accessible tool to create a forum like the one we have in mind. This will easily allow for

international participation, and simplifies decisions pertaining to layout and design of the website, as we will be following the Wiki formatting.

Due to the prevalence of Wiki's, it is not unreasonable for this website to experience serious growth over time, especially as more and more solutions are posted over time, the number of users can be expected to increase.

We will showcase and elevate innovations that come out of the global south, and that might have potential to help people around the world, as well as to help those in the global north rethink their relationship with their technology. By becoming involved with the building of technology, we in the global north can better understand how our devices work, and how they could be better built to last. Through replicating the process of building a device that someone else proposed, we might be more likely to attempt innovation ourselves, with goals of durability and sustainability in mind. These changes in perspective would force our society to confront the tech industry, and ask why they aren't prioritizing durability, sustainability, and environmental health. A more conscious understanding of technology and the lifecycle around it could encourage corporations to consider from the onset what the end of their device will involve.

The more people engage with technology around them, the better they can know what to demand from the manufacturers of their devices. Free and open knowledge has the potential to improve people's lives by allowing them agency over their technology, and an invitation to think about things differently.

4. Design Concept

With our proposal, having access to community knowledge without having to pay a fee, knowing any basics or having access to certain material, we hope to help people learn on their own how to make and use their own technology. With this free community knowledge readily available, challenges that people face in communities can be tackled together versus being tackled alone.

This idea was initially based on a group that exists on Facebook, known as the Buy Nothing Group. These groups are community run platforms that allow individuals to post resources that they no longer need. The resources could be from a small pot to a flat screen TV, to full couches. The individual would make a post to the group and on a first come first serve basis, give the resource to someone in the community who needed it. This model builds community while also allowing people who could not normally afford products the opportunity to be able to have them. With this, we hope to take the spirit of a group like the Buy Nothing groups on Facebook and allow people the opportunity to share knowledge with their community.

While considering our own idea on how we could possibly integrate tech into this solution, we found a few sites that are similar in this regard, both in implementation and in values. (1) The RepairWiki (2) LinkedIn Learning or Coursea (3) Khan Academy (4) Company Sites like Grow with Google and AWS Amazon. Of the three, RepairWiki is by far the closest we've found that mirrors our own goals, and while the other options are also great sources of knowledge to become educated about certain topics, there are some charges that are associated with each.

Company sites like Grow with Google and AWS Amazon are services of self learning that an individual user can complete in their own time. These courses are specifically for the company they are affiliated with and are useful if you are seeking to learn skills for that specific company. In these two cases, a User can complete their learning at their own pace and also pay to take a certificate test, which will show the User understands the topic well enough to work with the material now. Our project is similar in the aspect that we want to give people the opportunity to learn at their own pace and have a place that hosts knowledge the User can learn. Our project does differ in that we do not make the User pay for classes nor do we make them take tests to have certain certificates. Our goal is to make the information readily available and free for Users to use and refer to again and again.

Similarly, sites like LinkedIn Learning and Coursea also wish for User's to pay for their services. For LinkedIn Learning, Coursea, AWS Amazon and Grow with Google; they all have the advantage of having 'professional' individuals teaching long standing courses dedicated to specific topics. In our own site, we will be allowing users that have solutions to post their own methods, rather than just accredited individuals. Each of these corporate examples also allow Users to take tests and receive certificates showing that they are capable and hold to a standard set by each site they received training from. Our site, in our current developmental phase, will not have this option.

Khan Academy is a free site that teaches a wide variety of topics, mostly focused on educational purposes for children and teens from elementary school to high school. However, this site is not restricted to that demographic but is also available to anyone who wants to either learn or refresh themselves with the topics available on the site. It is a self paced learning that allows anyone who wants to learn to do so for free and also take exams and tests the site generates on the topics. This site does mirror our own goal of wanting education to be free and readily available to people but does not allow individual posting of solutions. The site is again, like the Corporate examples, run by several individuals that are dedicated to their individual topics. The topics on Khan Academy are also limited strictly to topics seen in the American Education system, which is helpful to students that reside inside of the United States and sometimes applicable to students outside of the United States. We're hoping to build a site that would allow communities all over the world the opportunity to share in their knowledge and have a place to do so, even if they're not experts in their own field. In a way, our

solution could potentially be similar to an open forum such as YouTube, but would allow people to post solutions where they would not have to watch advertisements and would also allow Users to add written instructions to their tutorials as well.

Finally, we found something very similar to our own goal. The Repair Wiki is a site where people can post their own personal solutions to tech problems people could potentially face. On this website, people can post their own solutions and the Wiki also has a discord where people can discuss solutions while also asking questions on how to best approach a solution for their own problems. This site is very similar to our own goals, but it does lack the community building we wanted to see in our own application. There is also a large push on the site for the political agenda, the right to repair. This site is very similar to our own and we could use it as a potential foundation for what we hope to achieve at a later point in our own implementation.

With our own site, we hope to take a few details from all the sites we have shown above, but we do mostly want to focus on the community that this would be able to build for people all over the world. Knowledge is a powerful thing, both to share and to gain, and we want to support people that are seeking that knowledge. By providing a way to showcase unusual or even unheard of solutions from places all over the world, we give people from those places the opportunity to show that there are ways that technology can thrive and live in the most unfriendly of environments. With these examples, we did mostly focus on online learning and sharing platforms but there exists multiple examples of places of education existing outside of the internet and outside of where technology can currently reach.


4.1 Use Cases

People will use this website if they want to find solutions on how to address their technological problems or teach other people from similar areas how to address certain problems. This website will help people to learn from the challenges that people face in the communities and help the communities to tackle the challenges together. The website allows people to post a tech need such as unstable access to the internet, downed power, need for a printer, how to repair a laptop, etc. People in that area should be able to see that need and fill it if they can by showing tutorials or solutions on how to repair or how to adapt tech to those conditions. People should be able to attach media such as video and images to help people understand the problems and solutions clearly. People that are facing the same problem could also refer to the solution easily by searching the problem on the website. It also allows people to post useful knowledge about tech problems that might help other people from similar areas. The website connects people from similar areas by helping each other on tech needs. It allows people to have access to community knowledge without having to pay a fee, knowing

any basics or having access to certain material. It helps people learn how to make and use their own technology at their convenience. The primary stakeholder for the website will be the communities using it since they will benefit from this by having access to community knowledge at no cost.

4.2 Application architecture

The website will be created using the MediaWiki platform. The reason for using MediaWiki is because it is a free and open-source software. Since the users of the website will be the communities all over the world, it is important to have a multilingual, extensible, customizable, and reliable website. Everyone is welcomed to share their tech knowledge on the website so it would be great to allow fast action on ideas community members come up with. The website will allow decentralized action, in which people can post solutions or questions about the tech problems that are reviewed afterward. If someone makes a mistake on a page, someone else can correct it so that it does not continue being shown to the communities. Most importantly, it will allow easy retrieval of archived tech knowledge as opposed to Facebook which buries old posts and threads in non-searchable archives.

The framework of the website will be pretty similar to the Repair Wiki as we will be using the MediaWiki platform. There should be a space for people to post a problem or solution.There should also be a search bar for people to search for common tech issues. The information will be organized and displayed using the wiki format like the photo below.
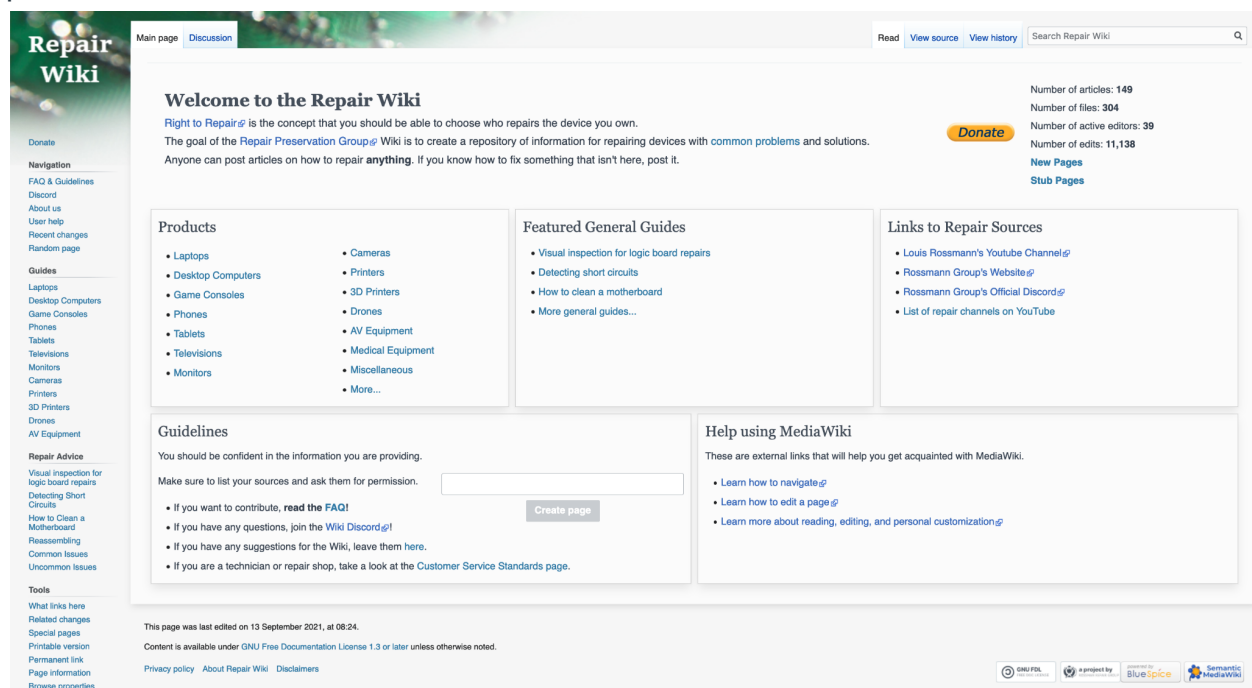
The number of people who will use this service is expected to be more than one million every month. According to a report, Wikimedia sites are accessed by more than 1 billion unique devices every month. So we believe the number of people who use this website will increase over time as there is a lot of conversation about sustainability and durability of technology in today's day and age.

4.3 Socio-technical considerations

With our design, we're hoping to change the perception on how the world views the global south. Unfortunately there is a stereotype that certain countries and demographics are underutilizing their tech or simply do not have access to the resources necessary to maintain that tech. With our Wiki, we are providing people a space to showcase their own work while also giving people the opportunity to learn unusual or unconventional solutions to modern problems with tech. By allowing people from undeveloped countries to showcase their own knowledge and solutions, they have the opportunity to take back their own stories and show that they have something to give to the world in terms of tech.

There is a large push for the 'right to repair' when concerning tech products people have purchased. As we build this site that allows for the spread of knowledge on how to repair and fix things, we cannot ignore the politics surrounding our own idea of tech. If people begin learning how to repair their own products from corporations such as Microsoft or Apple, there might be some interesting conversations that begin to form around the spread of information and who has the right to change products after they are purchased. Our intentions are to show that there can be solutions that might be considered unconventional and give people the opportunity to showcase their own skills while also helping others along the way.

5. Concluding Discussion

The sustainability of technology is becoming a bigger concern for consumers continuously, and by learning from the global south and each other we can better understand our technology and how to sustain it. This awareness can have practical solutions, with people from all over the world sharing their unique and creative solutions to common problems, as well as more intricate problems. Our project could decrease the amount of e-waste by encouraging users to try and fix their belongings before replacing them. We look to the right to repair, and recycling to try to fix our broken world. We hope to achieve a change in perspective for the global north, and a forum to showcase the innovations of the global south.

6. Bibliography

[1] Bruce Etling, Robert Faris and John Palfrey. 2010. Political Change in the Digital Age: The Fragility and Promise of Online Organizing. Retrieved from https://dash.harvard.edu/bitstream/handle/1/4609956/SAIS%20online%20organizing%20paper%20final.pdf?sequence=1
Summary: The article concludes that policy makers and scholars that have been most optimistic about the impact of digital tools have over-emphasized the role of information, specifically access to independent sources of information and unfiltered access to the Internet.

[2] Catherine Howell and Darrell M. West. 2016. Internet as a Human Right. Retrieved from https://www.brookings.edu/blog/techtank/2016/11/07/the-internet-as-a-human-right/
Summary: This article discusses the UN's decision to make access to the internet a human right, and the implications for countries who shut down the internet of its citizens.

[3] Karl Bode. 2019. The Case for Internet Access as a Human Right Retrieved from https://www.vice.com/en/article/3kxmm5/the-case-for-internet-access-as-a-human-right
Summary: The internet is a utility that is necessary for a free and healthy democracy to flourish. The Internet cannot be viewed as a luxury good, and there is evidence to back up these assertions.

[4] Western Washington University ISC. 2021. Rooted in the Community: The Equitable Internet Initiative with Janice Gates. Video. (April 14 2021). Retrieved November 11, 2021 from https://www.youtube.com/watch?v=ELHod1Xgdr4
Summary: This video talks about trying to bring the internet to residents of Baltimore, in historically red-lined districts. She discusses the challenges of working in these areas and the need to go to the communities to find out what they view their needs as.

[5] Daniel Greene. 2021. The Promise of Access. Retrieved from https://mitpress.mit.edu/books/promise-access
Summary: Greene provides an interesting case- technology has been pushed in the last few years as a cure all in terms of solving poverty, unemployment and other issues. There have been multiple pushes by the US in the past for students / younger people to become more literate in computer science but the reality of it is that tech cannot be used as a cure all it is being toted as and oftentimes, people who need it the most are not able to even access it.

[6] Zeynep Tufekci. 2019. In Hong Kong, Which Side Is Technology On? Retrieved from https://www.wired.com/story/hong-kong-protests-digital-technology/
Summary: Almost like a sci fi movie, protesters are utilizing tech to help one another communicate and to quickly react to how their government is changing. With the increase of surveillance tech in Hong Kong, protesters are fighting back against a government who is collecting their data and using it against them.

[7] Kaveh Waddell. 2016. Virtual Classrooms Can Be as Unequal as Real Ones. Retrieved from

https://www.theatlantic.com/technology/archive/2016/09/inequaity-in-the-virtual-classroom/501311/

Summary: Even with everything moving to an online platform, there's still students who struggle with learning alongside their peers. From internet access to the required tools to successfully complete assignments, sometimes the classroom, which was already fraught with accessibility problems, is no longer accessible to students.

[8] Aahil Rajpari. 2020. Is Internet Access a Human Right? Retrieved from
https://sites.uab.edu/humanrights/2020/10/12/is-internet-access-a-human-right/

Summary: This article looks at whether or not internet access should be considered a human right, from the viewpoint of the covid-19 pandemic. It considers the opinions of those who are skeptical of this argument. However, it is clear that the pandemic solidified the necessity of technology in today's world. It also looks at how governments around the world are restricting internet access, and how it has direct authoritarian outcomes. It concludes that internet access has been accepted as a human right.

[9] G. C. Townsend and K. Sloan. 2015. Julian scholars: Recruiting and graduating low-income, first-generation computer science majors. DOI: 10.1109/RESPECT.2015.7296504.

Summary: Using funding from the National Science Foundation (NSF), DePauw University launched a program for low-income, first-generation scholars in STEM fields - Julian Scholars. All but one of the undergraduate students began college expressing interest in medical careers, yet over half of the STEM graduates now pursue computer science graduate degrees or computing careers - an important statistic, as little research about recruiting and retaining underrepresented low-income, first-generation computing students exists. The program predicts a 100% graduation rate, although two of the Julian Scholars left the program to study English. Cornerstones of the program include a week-long summer research experience bridging high school and college, common classes for each cohort, mentoring, one-on-one resume and internship/research counseling, and scholarships. Rockman et al surveyed the Julian Scholars about the bridge program and additional program components to provide quantitative data and also held focus groups to collect qualitative data to augment graduation rates and post-graduation career information.

[10] Jack J. Barry. 2020. COVID-19 exposes why access to the internet is a human right. Retrieved from https://www.openglobalrights.org/why-access-to-internet-is-human-right/

Summary: Covid-19 exposed that access to the internet in the modern day is a necessity, as the right to education cannot be accessed without it, however even in developed countries there is a lack of internet access in many households. Internet access is now required for access to work and education, especially since many jobs require an online application. The government should play a larger role in bringing the internet to low-income areas, using Mexico as an example in their efforts to connect rural areas.

[11] Nadine Bloch. 2019. How technology is shaping creative activism in the 21st century. Retrieved from https://wagingnonviolence.org/2019/03/

Summary: Showing the different methods with how technology has innovate and changed the

way that people can successfully protest. Peaceful protesting is a large way to create change and is oftentimes opposed by governments- this article details how vital access is and also how it is changing how people can create assemblies and gather in peace.

[12] Amnesty. 2020. Tactics to secure your smartphone before joining a protest. Retrieved from https://www.amnesty.org/en/latest/campaigns/2020/06/tactics-to-secure-phone-before-a-protest/
Summary: Methods by which protesters can safely go to protests to protest in peace, without having to worry about endangering their friends or family. This can be used to show how 'access to the internet' is not truly accessible with the constant data being collected by major companies and also how people are having to change with the times to better be able to pass information and also how to protect themselves while protesting.

[13] Janna Anderson and Lee Rainie. 2018. The Future of Well-Being in a Tech-Saturated World. Retrieved from https://www.pewresearch.org/internet/
Summary: Digital life empowers people to improve, advance or reinvent their lives, allowing them to self actualize, meet soulmates and make a difference in the world.

[14] He W, Zhang ZJ, Li W. 2021. Information technology solutions, challenges, and suggestions for tackling the COVID-19 pandemic.DOI :10.1016/j.ijinfomgt.2020.102287
Summary: This paper examines emerging technologies used to mitigate the threats of COVID-19 and relevant challenges related to technology design, development, and use. It also provides insights and suggestions into how information systems and technology scholars can help fight the COVID-19 pandemic.

[15] Optus Business. 2017. How is technology helping to solve global challenges? Retrieved from https://www.optus.com.au/enterprise/accelerate/technology/
Summary: Same technology can be applied to help remedy a variety of wider challenges facing society, from healthcare to environmental sustainability – and technology leaders can play an important part in driving that change through innovative thinking and collaboration.