# Critical Analysis

As part of our Lab 7 task, we looked back at our Portable Water Quality Monitoring Device project and tried to critically think about what’s working, what assumptions we made, and what we’ve learned so far. This helped us see our work from different perspectives and consider real improvements.

## System Impact

We originally designed the system to help people monitor if their water was safe to drink, especially in places where clean water isn’t guaranteed. While the idea is promising, we realised it could have more impact than we thought — supporting health, education, and sustainability (UN SDGs 3 & 6). People could use it at home, while travelling, or in schools and farms. But to make that happen, the system would need to be truly portable, affordable, and easy to use.

## Key Assumptions & What We Learned

We assumed the system would be cheap, easy to build, and useful to anyone. But testing showed us that sensors often don’t work as expected, and getting everything to connect —especially between Arduino, APIs, and cloud platforms — is harder than it looks. We also assumed people would easily understand and use the data, but that's not always the case, especially for older or visually impaired users.

One big lesson was to verify everything early — power requirements, sensor compatibility, and code examples. We wasted time on sensors that never worked properly. We also learned to question our own thinking. Just because we would use this system doesn’t mean everyone else would.

We realised that some of our assumptions were based on bias — like assuming that if something makes sense to us, then it will work for everyone. But not everyone has the same access to technology or understanding of how APIs and spreadsheets work. The lack of early testing with real users limited the design choices we made.

## New Perspective

We now think more broadly about who our system is really for. Not everyone will find an API-based setup easy to use. Not everyone has Wi-Fi. And some people might need audio feedback, battery power, or even alerts in different formats. Including these perspectives helped us see what features really matter.

We also started to think about inclusion. For example, the current version doesn’t support people with visual impairments and might be confusing for older users. This highlighted the need to think more about accessibility — not just functionality.

## What We’d Do Differently

This reflection made it clear we need to:

* Simplify or get help with technical parts like sensor setup.
* Use Google Sheets and Apps Script instead of Blynk for more control.
* Focus on portability — power the device with a battery and remove the need for a PC.
* Include backups for sensors or data logging to avoid future obstacles.
* Think more about the end user — who they are, where they are, and how they’ll actually use it.

We also now understand that we need a clearer plan from the start, especially when working with technology we’re not yet confident with. Too much time was spent solving problems that could’ve been avoided with better planning or choosing simpler components.

## Final Reflection

Lab 7 was a wake-up call. It showed us that making a useful IoT project is about more than building — it’s about understanding your users, questioning your assumptions, and being flexible when things don’t go to plan. We’re not giving up on the idea, but we’re approaching it smarter now, with a clearer focus on what works, what doesn’t, and what we still need to learn.

Even though the original plan didn’t work out exactly as we hoped, we’ve learned important lessons about inclusive design, testing early, and managing complexity. These lessons will help us in future projects—and maybe even lead us to a better version of this one.