Identified Technical Infrastructure

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| **Technology** | **Purpose** |
| Git | Industry standard version control and code management tool for collaboration. We will use Git in combination with Fork, a Github extension for visualizing branches and merging, to keep track of changes and version history. |
| JavaScript / React | Dynamic and responsive user interface capability for the web dashboard that can be customized according to the client's needs. Third-party libraries can facilitate communication between the factory's Programmable Logic Controllers (PLCs) and the dashboard. |
| Programmable Logic Controllers (PLCs) | Industry standard for machine programming and automation, used to control the factory machinery. |
| Factoryio | Simulation software to replicate the factory environment. It will allow us to create a prototype factory and begin reading data from the simulated PLC. |
| Web API’s | Application Programming Interface (API) for real-time communication between the factory and dashboard. |
| NodeRED | Open-source flow-based programming tool built on top of Node.js. Used to create a workflow for the PLC and facilitate direct communication with the dashboard within the same tech stack. |
| Online Database | Online database to store information securely and reliably, such as client login credentials. Firebase has been considered as it offers 1GB of data transfer per month, which should be sufficient for the MVP and the client's needs. |
| Online Server | Hosts the web dashboard. Selection of hosting provider, operating system, and necessary software is required. Reliable free services may not be available, and the cost of the server may need to be factored into the project budget. |
| IDE | An Integrated Development Environment (IDE) for JavaScript development, such as Visual Studio Code or WebStorm, would be suitable for developing the web dashboard using JavaScript/React. Additionally, an IDE or development environment for programming the PLCs may be required depending on the specific hardware and software used. |