

3. Deliverable C – Design Criteria and Target Specifications

1. List of Prioritized Design Criteria

#	Need	Design Criteria
1	More efficient running of the production line with its current equipment.	Rate of Production: Kegs per hour (KPH) Cans per minute Bottles per minute
2	A simple interface that is economically feasible, and technically sound and simple.	Ease of use Cost (\$)
3	Stages leading up to the fill will decrease in speed by 10%, and stages leading away from it increasing in speed by 10%.	Cans per minute Bottles per minute Kegs per hour (KPH)
4	The interface must be capable of identifying areas of non-compliance in the production line and make suggestions based on the raw data. This must result in an increase in overall equipment efficiency of 2%, to warrant the expense of the new interface.	Data collection and processing Cans per minute Bottles per minute Kegs per hour (KPH)
5	An easy-to-use interface for discerning points of suboptimal throughput, or other non-conforming stations in the production line.	Ease of use Production flow (KPH, Cans/bottles per hour).
6	The interface should not combat with existing infrastructure (hardware, software, or other systems of communication or organization)	Easy implementation Compatibility
7	The system should be installed, have employees trained for its usage, at an affordable premium	Ease of use Easy implementation Cost (\$)
8	Should compute with a superior processing power in order to avoid delays or system reboots in case of a software crash.	Processing power (CPU speed) GB of RAM)

2. Benchmarking

There are several technical engineering firms who provide human-machine interfaces (HMIs), that connect to production line equipment like pump's sensors, and scanners to oversee and provide important efficiency related data for various (sometimes all) stages of production. Many of the products and services offered in the area of production line efficiency, however, do not compile data automatically to produce computer generated protocols for tackling stations of non-conformance on the production line, but rather save and archive data for later manual analysis.

Firms like ThermalTech provide an interface that oversees all sections of brewery processes, and provide automation for the brewing, and raw data for manual human analysis on the production side.

ThermalTech's interface also offers remote access, which improves ease of use. Other companies like Veritech, offer a production-line exclusive HMI that is also only capable of providing raw technical data pertaining to short-term production efficiency. Both technologies pull real-time information from production line equipment.

The User expectation for an HMI, based off existing technical solutions, is that the HMI will provide real-time data pertaining to short-term production efficiency, in doing so identifying areas of non-conformance in the production line. According to our research, there is no evidence of user expectation for products to provide real time computerized analysis based off of metrics like station speed or other variables.

3. Target Specifications

Design Specifications	Relation (<, >, =)	Value	Units	Verification Method
Functional Requirements				
System Processing Power	>	3	GHz (Multi-Core Processor)	Software Analysis
Data collection, storage and processing	>	16	GB of RAM	Software Analysis
Longevity	<	5	Years	Part Specifications
Constraints				
Cost	=	2,000 - 10,000	\$ CAD	Estimate, <u>Needs a final Check</u>
Speed of filler (bottle neck)	=	180-375/300/16-30	CPM/BPM/KPH	
Non-Functional Requirements				

	Easy implementation	=	yes	User satisfaction	Test
	Ease of use	=	yes	User satisfaction	Test

4. Client Meeting Reflection

The client meeting impacted the development of our design and specification by clearly outlining what the needs, financial and physical limitations that Mill Street has. The client explained where the bottleneck in their production line was, at the filler station, allowing us to focus our design on eliminating this bottleneck in order to satisfy the needs that they outlined in the meeting of a 2% increase in overall equipment efficiency.

Other needs and specifications mentioned by the client include the ease of use of the product, economic feasibility, and compatibility with existing equipment. The client meeting allowed us to determine that the 2% increase in overall equipment efficiency as the most important because that was the end goal for this design, if the design did not increase efficiency, then it would be useless to Mill Street. No changes were made to the needs from deliverable B.