

Module 1 – Case Study EPB Custom Cabinets

Observations (Needs Assessment)

After observing Mr. Burger assemble a cabinet, the following notes were made about his cabinet making process:

- Safety – stepping on wires
- Different work stations – has to move stuff around
- Transition time between activities
 - Setting glue
 - Putting clamps on
 - Taking clamps off (multiple clamps)
- Table at an awkward height – lots of bending over
- Lots of time measuring and re-measuring
- Only one person working
- Could use jigs
- Fine touching after gluing

Needs Statement

Mr. Burger needs a way (method or process) to safely and efficiently assemble cabinets.

Mr. Burger needs a way to streamline the assembly process.

These imply that Mr. Burger should still be assembling cabinets. Limits our search space to human only.

Maintain cabinet quality while increasing production throughput.

Problem Statement

Design a method so Mr. Burger can safely and efficiently assemble cabinets. Improving production throughput and cabinet quality are key goals.

Objectives and Constraints

The objectives and constraints are provided in Table 1.

Table 1: Objectives and Constraints

Objectives	Constraints
Assist Mr. Burger with lifting the cabinets	Cost under \$10 000
Reduce the assembly time by 10-30%.	Equipment size limited to a double standard door
Reduce yearly maintenance costs by 10%	Equipment has to be large enough to make a useable cabinet
Work on glass cabinets Minimum required force for wood? Maximum for glass?	Design & construction time of 6 months
System mass to be less than 500 lbs	Be able to operate alone
Normal operating height for Mr. Burger and assistants	Must meet safety standards, ref. Ontario ...
Reduce the number of steps to make a cabinet by 15%	
Reduce manufacturing defects by 15%	

Criteria

The criteria for selecting the best conceptual design are provided in Table 2.

Table 2: Criteria

Criteria
Cost [\$]
Design & Manufacturing time of the new process [weeks]
Design & manufacturing time of cabinet [days]
Size of the jig [ft x ft x ft]
Mass of the jig [lbs]
Weight of loading that can be taken [lbs N] (no – be consistent with units)
Yearly maintenance costs [\$]