

# 2008 Ohio Student Research Forum

The Ohio State University

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## RESEARCH ABSTRACT FORM

**TITLE:** Assisting in the design of a safe and new industrial environment.

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**INSTITUTION:** Ohio University

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When the current set-up and building capacity of an existing industrial setting no longer supports high level production and causes disorganization of workers, machinery and stock material, the consequences are grave. Specifically, the production rate is reduced, the stock materials and finished products are exposed to environmental elements, safety hazards arise, and the employee retention rate drops. To solve all of these problems our consulting team created a comprehensive plan to relocate the company to a new facility. In the process our team was confronted with a myriad of setbacks including human and time constraints. At the end we were able to deliver a proposal that will secure safety regulations, inventory control, and a detailed factory layout that will guarantee an increase in productivity. The areas researched included construction conflict resolution, an employee retention plan, international standards certification, six sigma quality improvement strategies, machinery and material layout.

The client expressed the desire for an organized layout which would keep a balanced pace in production. After researching factory production, it was concluded that each worker must collaborate and work in an assembly line to complete the production of an elevator. The production layout was designed so that machinery is arranged according to the progressive steps required to manufacture an elevator. The machines and work stations are positioned to give employees a reasonable amount of space to reduce the risk of injury when transferring materials. Once a part is manufactured, it is transferred to the next station on a roller conveyor belt. I designed two separate assembly lines, one for manufacturing cabins and another assembly line for cabin doors. Once each subassembly is created, the two are assembled and fabricated at assembly stations. Completely fabricated and painted elevators will be stamped and stored according to their stamp in a storage area. The storage of material is also essential to the production of a manufacturing company. The materials should be placed in an organized fashion that allows easy access by workers. The current layout provides storage that can be accessed by crane, loading trucks and forklifts. The client originally expressed that he wanted to use an overhead crane that would hang from the ceiling rafters. Information was not adequately provided about the size and composition of the ceiling rafters. Consequently, I suggested the use of an overhead bridge crane that is self supported by ASTM A-36 or ASTM A572 GR50 steel beams.