City University London
The University for business and the professions

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Tuba Valve – Design Assignment

Students are presented with a problem to design a valve system for a Brass musical instrument. Historically and presently there are numerous problems associated with the designs of valves that exist in the market. Mr. Kornhauser, who is a musician and an enthusiast, has patented an idea for a rotary valve which could potentially solve the problems associated with:

- Imperfections in valves
- Problems associated with Historical musical scores
- Compromised notes
- Problems associated with using more than one instrument
- And possibly the material from which the valve is manufactured

Your team is put together to look at Mr Kornhauser's ideas and follow the design process given by Dr. Kovacevic in order to achieve an optimal balance between customer requirements and a practical solution of a valve system. You are asked to put emphasis on finding a practical solution to help Brass instrument musicians around the world.

The team is asked to find all engineering characteristics which could help to finally optimise the patented valve proposed by Mr. Kornhauser and design a rotary mechanism for the valve. However, you should not disregard the idea of designing a completely new valve or any other solutions at early stage in the design process. Your group of students should follow the procedure in order to gain an in depth knowledge and understanding of the problem through:

- **Work Breakdown structure** –to focus clearly and kept moving the project in the right direction.
- **Objectives tree** – to understand the customer attributes and to prioritise the importance of the attributes by giving each one a rating.
- **Functional model** –to breakdown the problem into fundamentals. It was the black box approach which aided us to simplify our thoughts and problems.
- **Design matrix** –look at the problem from an engineering perspective and to think of certain characteristics of paramount importance for the solution.
- **Morphological chart** –to find as much solutions as possible for solving a problem in question by breaking that into sub-functions of the functional model
- **Decision matrix** – to find out which of the proposed variants suits a customer the best.

The project presentation should be ready for Friday 14th December 2007 and will be presented by group of students of the Manufacturing Department at the Faculty of Mechanical Engineering ate the University of Tuzla.

Attached with this Project assignment are extracts from the patent of Mr Kornhauser.