

Design for Comfort in Economy Class Aircraft Seat: Design and Evaluation

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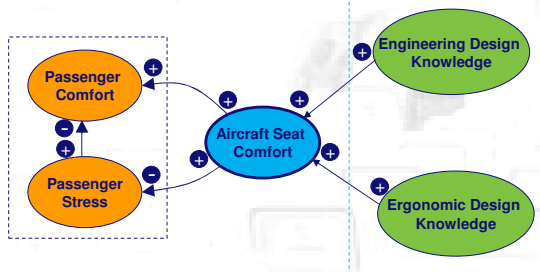


BACKGROUND

With the rapid development of technology, the comfort of service has become an important issue. Air travels, especially long distance, may cause both physiological and psychological discomfort to passenger. Passenger comfort is clearly a main factor in user's acceptance of transportation systems. Travel by air, especially long distance, is not a natural activity for human. Many people experience some degree of physiological and psychological discomfort and even stress during flying. Excessive stress may cause passenger to become aggressive, over-reaction, and even endanger the passenger's health. A number of health problems can affect flying passengers. The project aims to develop a smart and comfortable seat with the capability of detecting physiological and psychological changes of passenger's condition in real time. This in turn will be analyzed and appropriate adjustments such as seat parameters, temperature control, air ventilation, humidity etc. put in place. The approach is to create a comfortable economy class passenger seat. The proposed design will allow

- To increase the sense of sitting comfort
- To ensure that potential health accidents are prevented through an early warning, and
- To improve overall psychological and physiological comfort,
- Through the use of smart techniques that respond intelligently to the user's need and condition.

Success Criterion Key Factor Measurable Criterion



RESEARCH GOALS

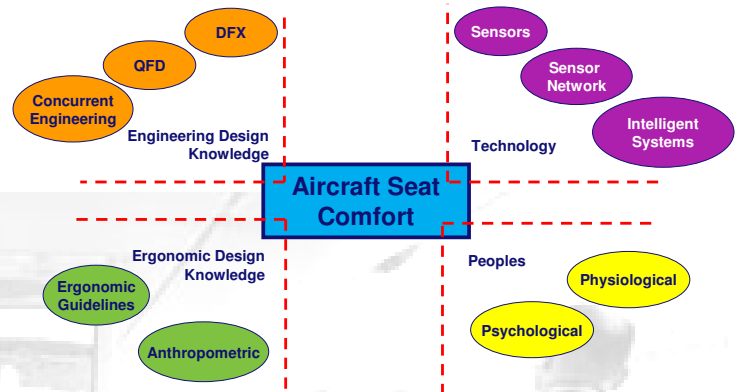
The main goal of the project is to research and design on comfort and discomfort in aircraft seat design and evaluation. This knowledge will contribute to an improvement in aircraft seat, which lead to more comfort and less discomfort for aircraft seat during long haul flight. To achieve this objective, 4 sub-goals are described:

- To contribute to the theory of comfort and discomfort in economy class aircraft seat;
- To propose how (dis)comfort can be integrated in the design process;
- To investigate how aircraft seat can be evaluated regarding comfort and discomfort;
- To Investigate how intelligent devices can be improved the economy class aircraft seat comfort.

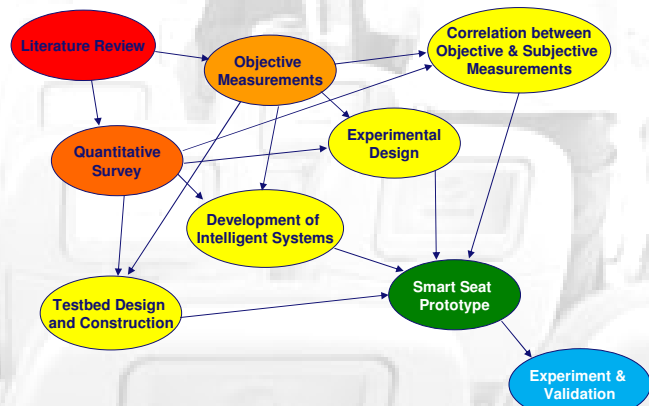
RESEARCH QUESTIONS

Sub-goals	Research questions
Contribute to the theory of comfort and discomfort in economy class aircraft seat	What are the subjective seat comfort descriptors of comfort and discomfort in aircraft seating? Can the subjective seat comfort descriptors be divided into meaningful groups (factors) of interrelated comfort descriptors? What subjective seat comfort descriptors are the best predictors of comfort and discomfort in economy class aircraft seat? What factors predict seat comfort and discomfort in economy class aircraft seat? Can subjective feelings of comfort and discomfort be predicted from objective measures?
Propose how (dis)comfort can be integrated in the design process	Can the Quality Function Deployment (QFD) method ensure comfort in aircraft seat design? Can the Design for X method ensure comfort in aircraft seat design?
Investigate how intelligent devices can improve the economy class aircraft seat comfort	Develop a smart aircraft seat prototype. Can intelligent devices improve the comfort of passenger while sitting on economy class aircraft seat?

THEORETICAL FOUNDATION



RESEARCH APPROACH



EXPECTED RESULTS

- Ergonomic design knowledge for economy aircraft seat
- Intelligent system for economy class aircraft seat

