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**DESIGN PRACTICE IN THE UK CAR INDUSTRY:
HOW COVENTRY UNIVERSITY IS ADDRESSING THE NEEDS**

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This paper considers the needs of the UK car industry and identifies specific situations that have serious implications upon design practice. The response at Coventry University to these needs is discussed and our PAKTS model for Design Education introduced.

INTRODUCTION

The passenger car industry in the UK is a very mature industry. It has evolved over almost 90 years from small enterprises to today's large multi-national organisations operating in a very competitive environment. If the UK automotive industry is to successfully compete in future car markets, it is essential that it at least matches Japanese manufacturers' "vitality and continuous product recycle" [1]. The industry's design practice has had to change to match this evolution. Some of the situations that now have to be seriously addressed are:

- shortening the concept-to-market lead time requiring the product to be 'right first time'
- a greater focus on the customer who has higher expectations of product performance.
- manufacturers focusing on core technologies and assembly with design responsibility being devolved to the component and sub-assembly suppliers.
- multi-disciplinary teams requiring a team approach to design.

The response at Coventry University to these needs

Coventry University has strong links with the automotive industry and this is reflected in the undergraduate and postgraduate courses it provides. Design plays a major role in several programmes of study. Design research is the focus of the University's Centre for Integrated Design, with automotive applications being a major interest.

A MODEL FOR DESIGN EDUCATION

At Coventry University, we have devised the "PAKTS" model of Design Education (Figure.1). The tree-like structure of the PAKTS model embraces the total educational needs of the professional designer. We find this model a particularly convenient way of expressing our design education aspirations and one that reflects our dedication to the development of professionally trained engineering designers, especially for the automotive industry.

Figure1: The PAKTS model for Design Education

The synonym PAKTS is also representative of the five major branches of growth that we wish to see in a mature engineering designer. These are:

- **Processes:** We consider Design a general problem solving activity and prefer students to develop a model of Design for themselves. As a reflection upon the automotive industry, the student must appreciate the management of design in a concurrent engineering environment to achieve a total product realization quickly and effectively.
- **Attitudes:** We demand a professional approach to all work. This requires the student to form an “ownership” of the problem and to adopt an overall responsibility for the preparation of a suitable solution and its presentation to all parties We expect students to develop self-reliance and a life-long attitude to self-learning, recognizing that they must often seek new information and knowledge to solve a problem.
- **Knowledge:** We focus upon the fundamental principles of engineering science and business. The generalist technology education we provide gives the student a framework for the continuous development of knowledge throughout their career. We require students to acquire sufficient knowledge to allow them to evaluate the performance of engineering design concepts and to verify the fulfillment of specified targets. We can test the ability of a student to acquire depth of knowledge by setting specific tasks which require research into a narrow range of knowledge..
- **Tools:** The Design Science of tools provides efficient techniques for the support of the design process, e.g. CAD, QFD, FMEA, DFA, MA, Taguchi. The automotive industry, in particular, has appreciated the suitability of these tools and techniques to the design of their products. Tools embody good design practices that have been established from rigorous research in Design Science
- **Skills:** We recognise that the ability to organize, analyze, evaluate, synthesize, acquire information, communicate, plan, visualize, co-operate with others, lead others and justify actions are essential skills of competent designer. These skills are developed by practice through a problem-led approach to learning.

CONCLUSIONS

Here, we have considered the needs of the UK automotive design industry. We have briefly described Coventry University’s response to these needs. Finally, we have introduced our PAKTS model for Design Education. We believe that this model provides a thorough description of the approach that we take to developing young engineering designers for a life long career in the UK automotive industry.

REFERENCES

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