

## **International Experience and a Model for University/Industry Partnership**

Dr. Devdas Shetty  
Dean, College of Engineering,  
Lawrence Technological University,  
Southfield, Michigan, USA

Dr. Louis Manzione  
Dean, College of Engineering, Technology & Architecture  
The University of Hartford,  
West Hartford, Connecticut, USA

&

Dr. Clement Imbert  
Faculty of Engineering,  
University of the West Indies, Trinidad  
West Indies

### **INTRODUCTION**

This paper looks a model of international partnership and experiential learning where institutions with global partnership can benefit from bringing the academic and industrial cultures together. The partnership is between the University of the West Indies and the University of Hartford, USA through its Engineering Applications Center.

The Engineering Applications Center of the University of Hartford is involved in innovative types of projects with industry. There is an existing mechanism for University/Industry liaison for fostering joint research and cooperation as well as technology transfer. Once the needs are identified, the Center tries to match the needs with the expertise of faculty, research engineers and consultants. It contributes to the quality of engineering education by involving students. The research projects are carried out by undergraduates or graduate students as senior capstone project, graduate thesis or faculty consultancy. In many cases industry gets a very cost-effective solution that is difficult to get anywhere.

This paper provides an example of partnership, where the graduate engineers from the Metal Industries Company (MIC) of Trinidad and Tobago working in academic relationship with the University of the West Indies, Trinidad spend a part of their academic program in USA. The US part of the program is at the University of Hartford in a training program focused on advances in innovative product design approaches. The training involves hands on approach to the study and investigation of tools and techniques in the design of innovative products. One major part of the training program involves projects and case studies. The case studies focus on the design and development of products that are already identified as aligned to the strategic directions of the company. The projects and case studies involve selective product design and development under the guidance of faculty members from the University and technical specialists from the industry.

The paper outlines the rationale of this program and the project outcomes. In summary, the

traditional reluctance, particularly in the USA to develop good industry/university and international relationship can be overcome through the establishment of international outreach programs such as the one described.

### *1. Trinidad Component of the Program*

The major aim of the Trinidad component of the program involves visit by subject experts to identify the background, and develop a focus for such a collaborative and joint activity. These visits to Metal Industries Company and the University of the West Indies, Trinidad and Tobago will provide a working arrangement for systematic development of topical areas of interest. These visits could result in lectures and short time seminars in topical areas that are relevant to Trinidad and Tobago. The visits could also be used for conducting week-long training workshops for a large group of MIC professionals. These professionals are not only design engineers, administrators, but also product support professionals and suppliers.

### *2. US Component of the Program*

The US part of the program is at the University of Hartford. A group of MIC engineers visit each year for a month-long training program. This is a customized training program focused on advances in innovative product design approaches.

The objectives of this training program are:

- To get the design engineers to appreciate the theoretical and practical aspects of the different product development approaches.
- To get the participants to understand that there are several software packages and decision making techniques available that aid with product design.

Specific sub-topics of this training program are:

- Principles of Product Creation

- Concept Generation
- Design for Manufacturing
- Design for Assembly/Disassembly
- Data Acquisition & Instrumentation
- Group Decision Making Technique
- Hands on expertise on:
  - Computational Fluid Dynamics
  - DFA/DFM
  - DFD
  - CAD/CAM:
  - Pro/ENGINEER
  - Fluent
  - LabVIEW
  - Numerical Computing
  - Plotting: MATLAB
  - Quality Function Deployment

- To develop the designer's competency with all the above named software and techniques in order for him to have the necessary tools to develop and communicate design ideas efficiently.

### *3. Follow up on Product Development in Trinidad*

Engineering Applications Center will work with MIC engineers on the design, development of new products identified by the group

### **Technology for Commercialization**

1. Modified Wheel Chair – Safety Enhancement
2. Non contact Surface Roughness Measurement Instrument (Off-line metrology product, that is used in laboratories and factories)
3. Laser based Surface Roughness Instrument (Portable -Probe type and miniaturized instrument)
4. Low cost vibration measurement instrument (optics based)

5. Non-contact inspection instrumentation (Can be used for volume, shrinkage and quality evaluation)

6. Develop the capability MIC engineers on Precision Measurement, Inspection and Testing

### Conclusions

This example shows a good case of successful partnership, where the product design engineers work in an atmosphere of continuous improvement and academic training. The designers gain the capability to design and innovative, and practice thereby enhancing the product quality and marketing goals.

### References

1. Product Design for Manufacture and Assembly, *Geoffrey Boothroyd, Peter Dewhurst, Winston Knight*
2. Design For Product Success, Society of Manufacturing Engineers, Dearborn, Mich, 2002, *Devdas Shetty*
3. LabVIEW 8 Student Edition, 2007 Pearson Education Inc, Upper Saddle River, New Jersey, Robert H. Bishop
4. Measurement and Automation 2007 Catalog, National Instruments
5. Mechatronics Systems Design, 1997 *PWS Publishing Company, 20 Park Plaza, Boston MA, Devdas Shetty, Richard Kolk*
6. Engineering Design: A Materials and Processing Approach

3<sup>rd</sup> Edition, Mc Graw-Hill, New York, 2000

7. Pro/ENGINEER website; [www.proengineer.com](http://www.proengineer.com)  
LabVIEW website; [www.ni.com](http://www.ni.com)
8. FLUENT website: [www.fluent.com](http://www.fluent.com)
9. MATlab website: [www.mathworks.com](http://www.mathworks.com)
10. Wikipedia the online encyclopedia: [www.wikipedia.com](http://www.wikipedia.com)