

## A BENCHMARKING RELATED SURVEY OF ROBOT AND AUTOMATION IN INDUSTRY IN MALAYSIA

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### Introduction

Robotics is an area where knowledge and methods from mechanical and electrical engineering and from computer science are being integrated to form a new kind of machine. The use of automation can achieve sustainable development and increases the competitiveness and productivity of Malaysia industries. Robotic and Automation in industry are key factors to get the competitive advantage in this global environment. The objectives of this study were to identify the present uses and status of robot and automation in the Malaysian industries (Mahmud Hasan and Abd. Rahman, 1998), state-of-art robotic research, utilising the Multimedia Super Corridor (MSC) in modern robotic applications specially in tele-medicine (Mahmud Hasan et al. 1997), and computer telephony integration (CTI) system. To achieve these, the research projects were subdivided in few areas. The main research areas were nation wide robot and automation survey, Embedded system for tele-robotic (Mahmud Hasan et al. 1997), modular robot link design, customised tele-robot design for tele-medicine application, dedicated real-time server design for tele-medicine, intelligent mobile platform design, Internet application design, DSP for robot sensor (Mahmud Hasan, 1998), Computer telephony interface devices design and implementation.

### Materials and Methods

In this survey there were two types of questionnaires were prepared, one for "Robot and Automation in Industry" and another for "Benchmarking". (The questionnaires were designed to identify the automated machines as well as the machine handling strategy (the administration). The benchmark reports were prepared from the survey questionnaires, the major criteria were: accessibility, independence, fairness, accountability, efficiency and effectiveness of the industry. On other hand it is also possible to fill up and submit the questionnaire from the web. There were good responses, because a feedback benchmark report was provided to the responding industries. The outcome of this research is a valuable information about the present robot and automation scale and their benchmark against the world class. Other researches were carried under this project umbrella were: Internet based ECG machine, internet based course production, intelligent mobile platform, dynamic hybrid robot control system approach for tele-medicine and modular robot design.

### Results and Discussion

Second Industrial Master Plan in Malaysia, 1996-2005 (IMP2) is focusing on an integrated industry-wide vision embracing both manufacturing and business support services. There are 8 industry groups under the IMP2: (1) The electrical and electronics industry group; (2) The textiles and apparel industry group; (3) The chemical industry group; (4) The resource-based industry group; (5) The agro-based and food products industry group; (6) The transportation industry group; (7) The materials industry group; and (8) The machinery and equipment industry group. Targeting the IMP2 plan this research project was considered to surveying the application of automation and robotics in Malaysia. Basically, the manufacturing automation consists of a collection of technologies that can be divided into two interrelated categories: (I) Product automation technologies, and (II) Infrastructure technologies. The results and suggestion of our "A benchmarking related survey of Robot and Automation in Industry in Malaysia" show that the robotics is a technology where innovation playing the most important role. A system must be formulated that will encourage innovations and achieve greater output per unit input. From this survey it was observed that, in the past, the Malaysia economy was propelled by input-driven growth. Labour was the main source of economic growth. The country has now come to an innovation-driven stage where labour and capital resources can no longer be the main sources to increase output. The reason is that countries labour supply is dwindling and there is a limit to which capital investments can continue to grow before diminishing returns set in. From now on, Malaysia's economic growth must be sustained by making the best use of our labour and capital resources, and putting in place systems that will encourage innovations and achieve greater output per unit input.

### Conclusions

It was observed that majority of the industries have long conveyer belt with light sensors, contact sensor and pellet (labour intensive semi-automated industry). It means that these industries are in position a very good to transfer to the automation technology. It is necessary for the medium and large companies to have a fresh look at robots to see how this powerful technology can help them solve manufacturing challenges.

### References

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