

CELEBRATING  
COMMERCIALISATION  
YEAR 2014

# iiindex 2014

AN INTERNATIONAL EXPOSITION ON RESEARCH AND INNOVATION

invention  
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& design  
exposition 2014

INNOVATEUR  
wannabe!  
2014

27<sup>th</sup> - 30<sup>th</sup>  
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UNIVERSITI TEKNOLOGI MARA  
MALAYSIA

*Bridging  
the valley of death :  
advancing the  
commercialisation  
of research*

RESEARCH BOOK

# iiindex2014

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innovation  
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## FOREWORD

The Honourable Minister of Science, Technology and Innovation (MOSTI) has launched 2014 as Malaysia Commercialisation Year 2014 (MCY2014) with the theme Science Technology and Innovation (STI) for Wealth Creation. In line with this theme, Invention, Innovation, Design & Exposition 2014 (iidex2014) is an annual exposition organized by UiTM and is the ultimate platform to highlight and commercialise new inventions and innovations. Researchers and inventors will exhibit their products which cater to the needs and wants of the community and the country.

The iidex2014 creates a new dimension by fusing two competitive concepts, a competition among innovative products and a competition to invite Innovateur Wannabes to perform live pitching of their products to the audience. The iidex2014 focuses on comprehensive commercialization and creating opportunities for entrepreneurs to carry out R&D as well as to provide avenue to commercialise their products. Through expositions such as iidex2014, MOSTI hopes to inculcate the culture of commercialisation of new technology designed and created by Malaysians.

I wish to congratulate all the participants of the iidex2014 and this is the opportunity for all researchers to show their ideas and exhibits their products and creativity. Apart from showcasing their products, innovators will have the opportunity to provide a window to the industry for business matching during the exposition.

**Tan Sri Dato' Sri Sallehuddin Mohamed**  
Pro-Chancellor, Universiti Teknologi MARA

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## BUILDING MATERIALS INFORMATION (BUMI) FRAMEWORK FOR BUILDING ADAPTATION PROJECTS

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Current global construction trends show a large percentage of work undertaken were on improving the existing buildings using building adaptation (Douglas, 2006) approaches to extend its useful lifespan. Building adaptation works such as renovation, refurbishment and conservation, upgrading or retrofitting are consistent with sustainable building concept indicating an increasing respect for existing buildings to survive. It is expected to grow rapidly worldwide compared to demolition or new construction. This has created greater demand for building materials and volumes of construction debris. However, studies revealed that building adaptation activities involve potential exposures to hazardous and toxic building material substances. Stakeholders such as consultants, client, contractors, workers and people near the construction sites are exposed to many unknown risks. Research findings confirm the existence of hazardous substances in man-made building materials such as asbestos, lead, solvents, adhesives, chemicals called volatile organic compounds (VOC), polyvinyl chloride (PVC) and others. The adverse impacts to social health, safety and environment have created global awareness causing concerns amongst countries including Malaysia to provide maximum information on the hazardous and toxic contents (Construction Industry Development Board, 2006; EU Parliament, 2011; United Nations Environment Programme, 1995). The complicated building adaptation activities are often carried out in limited and confined spaces with unavailable or inaccurate data on the existing buildings and project information (Anumba et.al, 2006; Ali, 2010). The study also addresses the identified issues of limited but conflicting information on health and safety effects (Yashiro 2011, Wilt, 2011) and different levels of understanding the technical jargons on building products. Aim and objectives: This study aims to initiate the development of building materials information framework for building adaptation projects. The first objective analyses needed building materials information related to health and safety effects in building adaptation projects. The study uses scientific findings, journals, handbooks including online materials on how building materials in building adaptation projects may contribute to potential health risk and safety hazards. The collected information becomes knowledge base. Prior information on building material is critically required for planning, decision making, construction processes, maintenance and public information. The study suggests the information to be made visible, understandable and accessible for all stakeholders involved to reduce the negative impacts on health and safety. The second objective is to develop a Building Materials Information (BuMI) framework for information storage, retrieval and mapping. A prototype of BuMI may assists and improves access to information on the potential health and safety effects from exposure to building materials in building adaptation projects. Significance: The prototype BuMI is expected to influence decision making on social, environmental and economic impacts with recommendations for alternative greener materials for a sustainable future. It becomes a building materials data repository for interior building projects. It may also improve knowledge and awareness on the risks and mitigation strategies to avoid potential exposure to hazardous building materials. BuMI may also contribute to knowledge management on building materials that may encourage knowledge sharing amongst the construction stakeholders involved. It has the potential to be applied as a building materials management tool not only in building adaptation activities but also to other related construction projects.