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14 June 2010

Clerk to Panel
Panel on Commerce and Industry
Legislative Council
10h floor, Murray Road Multi-storey Carpark Building
Hong Kong
(Attn: Ms Yue Tin-po)

Dear Ms Yue,

**Commercialisation of R&D Projects
Funded by Innovation and Technology Fund (ITF)**

You may recall that following the Finance Committee meeting on 29 January 2010, we provided supplementary information on the income generated by the R&D projects in Enclosure 4 to paper FCR(2009-10)48 vide our earlier letter dated 19 February 2010. At the Panel Meeting on 16 March 2010 (in relation to paper CB(1)1357/09-10(3)), the Administration was requested to provide supplementary information on the work of the R&D Centres in commercialisation of R&D deliverables. I am pleased to attach at Annexes A to J further assessments of these projects in respect of their commercialization work, covering both financial and non-financial aspects.

It is Government's policy to develop Hong Kong as a regional technology hub and to invest and promote the development of innovation and the technology in Hong Kong. Examples cited in the assessment forms will be helpful to give Members a better understanding of the technology transfer and commercialisation efforts under ITF projects. It would be helpful if you could provide copies of these assessment forms at the panel meeting tomorrow to facilitate Members' further queries on this subject, possibly under Agenda Item VI.

Yours sincerely,



(Davey Chung)

for Commissioner for Innovation and Technology

c.c. Clerk to Finance Committee
(Attn: Ms Anita Sit)

Form to Assess Success of R&D Project

Name of R&D Centre: Hong Kong Applied Science and Technology Research Institute (ASTRI)

Project Title: ARD/025 - Advanced and Affordable MRI Systems (MRI)
ART/042 - Advanced and Affordable Magnetic Resonance Imaging (MRI)

Project period: 1 November 2008 to 30 April 2010

Project Investigator(s): Corbett Rowell

Collaborating partner(s): Time-Medical Ltd

Brief description of project: The aim of this project is to develop a dedicated low-field Open MRI system.

Total Project Cost (\$million): 6.54 (i) \$3.28M (from ITF / 50%)
(ii) \$3.26M (by industry contribution / 50%)

Nature of R&D	Details
<input checked="" type="checkbox"/> Technology breakthrough (e.g. rocket science)	<p>0.2T permanent Magnet This project has designed and constructed a new open magnet with high performance, but much more compact and cost effective. The magnet can provide a highly uniform magnetic field. Far field active shielding coils are used to reduce the stray field outside the magnet to protect the diagnostic and monitoring equipments from stray electromagnetic field interference.</p> <p>Gradient coil To spatially encode the MRI signal, 3 linear magnetic field “gradients” will be</p>



	<p>superimposed onto the uniform field produced by the main magnet in all x, y and z directions. The developed MRI System is much more compact since the newly designed gradient coils can enhance the gradient field strength changing over a shorter distance.</p> <p>HTS coil</p> <p>This project applied the Propriety US Patented High Temperature Superconducting (HTS) technology for the RF coil. This gives us a tremendous advantage in the signal to noise (SNR) performance of the system. The use of superconducting RF coil enables a dramatic improvement in SNR at a given field strength. With the HTS probe, the developed MRI System is able to produce image with quality equivalent to 1.5T system but at 1/3 of system cost.</p>
<p><input checked="" type="checkbox"/> performance/reliability/capacity enhancement in existing products/processes</p>	<ol style="list-style-type: none"> 1. Dedicated MRIs for specialist clinics due to compactness and accessibility 2. With the propriety US patented HTS coil and cryogenic technology, this MRI system is able to improve image quality by 200% to 500% compared with the conventional MRI system with the same field strength. 3. Equipped with multi-nuclei detection capability for a broad range of non-invasive disease diagnosis, such as cancer markets without surgical biopsies 4. Compact for fitting into small facility, intensive care unit or operation room
<p><input checked="" type="checkbox"/> lowering of cost</p>	<ol style="list-style-type: none"> 1. High quality image at affordable price for all hospitals in developing countries: With the propriety US patented HTS RF technology, the newly developed MRI system is able to deliver high-quality images at 1/3 of system cost 2. Environmental Friendly: This MRI system consumed less power and manufactured from fewer materials because its compact size and improved design


Expected R&D results <i>(as stated in the original application)</i>	R&D results finally delivered	IP created (e.g. patents filed/registered)
<ul style="list-style-type: none"> • Further improve both industrial design and cryo system into the MRI system • System Optimization: RF Optimization, amplifiers, connectors, signal processing, and software integration. • Certification: Apply for US FDA approval & China SDA approval. • OSMS V2 Architecture: Develop cryo delivery system for OSMS v2 and system architecture for next generation affordable MRI machines 	Same as expected or planned in original application	TiMed got FDA and SFDA approval for the system

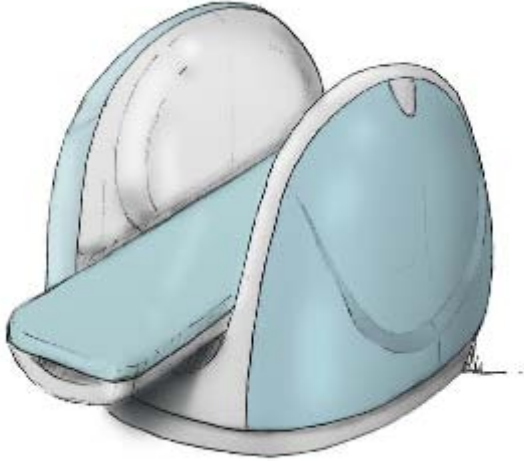
Analysis of “Success”#				
Financial			Non-financial	
	Actual	Projected		
<input type="checkbox"/> Licensing (i) no. of companies			<input checked="" type="checkbox"/> Nurturing of R&D talent (i) no. of R&D positions provided/duration	Created 5 positions within ASTRI and the partner company established an office within HKSTP and hired several new employees.

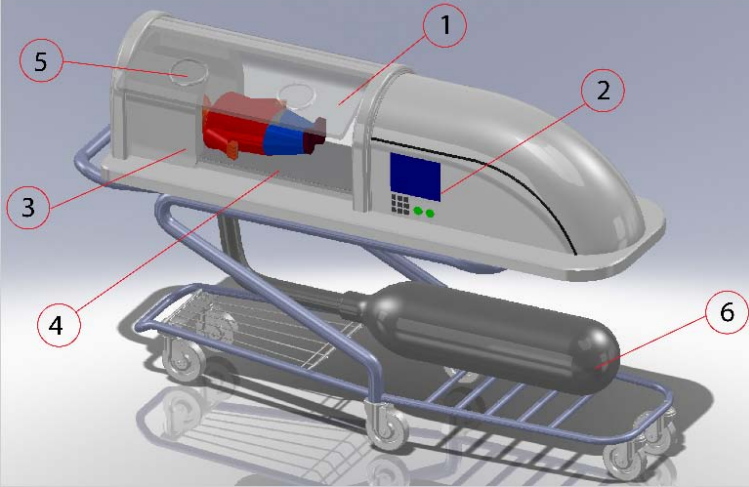
<p>(ii) <i>licensing income</i> (<i>\$million</i>)</p> <p>(iii) <i>royalty received</i> (<i>\$million</i>)</p>			<p>(ii) no. of research interns trained/ duration</p>	<p>Created more than 100 positions at TimeMedical in Hong Kong, US, India, Taizhou, Shanghai and Singapore and five research positions at ASTRI.</p> <p>N/A</p>
<p><input checked="" type="checkbox"/> Transfer of IP (i.e. exclusive)</p>	<p>Exclusive</p>		<p><input checked="" type="checkbox"/> Sharing of knowledge</p> <p>(i) no. of academic/professional publications</p> <p>(ii) no. of seminars/conferences attended to disseminate the R&D results</p>	<p>Nil.</p> <p>Attended over 30 seminars/ international conferences/ trade fairs (e.g. RSNA, ISMRM, China High-tech fair) to disseminate the R&D results and products to academics, potential investors and government officials in Hong Kong, P.R. China, Europe, India, Singapore and US.</p>
<p><input checked="" type="checkbox"/> No. of samples/prototypes/products produced/sold and income (\$ million)</p>	<p>No of existing products = 3</p> <p>1) HTS Probe (High Temperature Superconducting Coil and Cryogenics)</p> <p>2) PICA – General Purpose Whole-Body Hybrid MRI</p>			

	(0.35T) 3) MONA – Special Purpose Hybrid MRI (0.2T)			
<input type="checkbox"/> Spin-off	N/A		(iii) other channels (e.g. web sites, company visits)	For more details, please refer to: http://www.time-medical.com/news.htm
<input type="checkbox"/> Income from contract research for further development of R&D results (\$million)			<input checked="" type="checkbox"/> International and Local Industry/ Technology Award(s)	<p><i>The market is mainly in the Chinese Mainland and India, not in Hong Kong.</i></p> <p>TiMed has obtained ISO 9001 and ISO 13842 certificates for the Hong Kong Facility in April 2009. The Hong Kong facility could produce over 36 Mona systems per year. The target selling price for Mona (0.2T) and Pica (0.35T) MRI system is about USD0.2M and USD0.35M respectively. Currently there is no MRI systems sold in Hong Kong as both systems have just obtained the US FDA approval in late 2009. However, PRC and Singapore government have expressed a strong interest in products and have provided the company with great funding and facilities support.</p> <p>The company has just signed their first export sale for their 0.35T whole body MR system PICA to Singapore (Clarity Radiology P/L) and the Philippines (South East</p>

				Asia MRI Centre) on 28 April 2010 in China Medical City (CMC) Taizhou.
<input type="checkbox"/> Subsequent income generated from the licences granted/transfer of IP/spin-off		Estimated income: \$5.06M from 2010 to 2015	<input checked="" type="checkbox"/> Contribution to Government Policy and social value	<p>The expertise gained through this project enables Hong Kong to participate in a very lucrative medical instrumentation industry. The niche MRI systems successfully developed in this project has made MRI imaging more accessible and affordable to needy patients. All these will have significant impacts and benefits to health care quality and policy in Hong Kong now and beyond.</p> <p> Hybrid Pica MRI System</p> 

				<p>Hybrid Mona MRI System</p>  <p>Both the PICA (0.35T) and MONA (0.2T) MRI systems have obtained the US FDA approval in 2009 along with the company's patented High Temperature Superconducting Orthopedic RF coil.</p>
<p><input type="checkbox"/> Others</p>			<p><input checked="" type="checkbox"/> Further development of R&D results by another party (parties)</p>	<p>Future development include the world's first Neonatal (Baby) MRI systems and the MRI Incubator.</p> <p><u>Conceptual design of the Baby MRI system (0.5T – permanent magnet)</u></p>

			 <p><u>Conceptual design of MRI incubator</u></p>
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			 <p>ASTRI and Time Medical will jointly develop both the Baby MRI and MRI incubator and the application for funding proposal are under the approval process by ITF.</p>
<p>Total:</p>	<p>\$ <u>5.06</u> million</p>	<p><input checked="" type="checkbox"/> Soft power (e.g. setting new standards or enhancing Hong Kong's reputation as an innovation and technology centre)</p>	<p>This project has not only enhanced ASTRI's understanding of the multi-disciplinary science and technology principles underlying the magnetic resonance imaging (MRI), but also developed a complete platform for constructing dedicated high performance MRI systems to enable faster clinical diagnosis at a fraction of the current cost. It has also enhanced image signal processing software algorithms for a complete MRI imaging solution for medical applications. The expertise gained through this project enables Hong Kong to</p>

		participate in a very lucrative medical instrumentation industry.
	<input type="checkbox"/> Others	

Please include the timeframe for all estimated income and achievements (up to 10 years).

Reasons rendering the project not successful in meeting the objectives and achieving the desired deliverables (if applicable) –

Dr Cheung Nim-kwan

Hong Kong Applied Science and Technology Research Institute

Updated as at 1 June 2010

Form to Assess Success of R&D Project


Name of R&D Centre:	Hong Kong Applied Science and Technology Research Institute (ASTRI)
Project Title:	1. LED for General Lighting – Area Light Source (ART/003, LGL) 2. LED based Intelligent Outdoor Lighting System (ART/039, IOL)
Project period	LED for General Lighting – Area Light Source: from 15 September 2006 to 14 September 2008 LED based Intelligent Outdoor Lighting System: from 15 May 2008 to 15 October 2009
Project Investigator(s):	Dr. Enboa WU and Mr Ming LU
Collaborating partner(s)	Guangzhou Lovely Lighting, Shenzhen BER Lighting, OptiLed Holdings, LEEAN Technology
Brief description of project:	<p>In the LGL project, the team developed various solid state lighting platform technologies including optical, thermal, electrical, wireless networking control, material characterization. MR16 lamps, ceiling lamps, and intelligent control module were developed as the project deliverables.</p> <p>To cope with the global demand in terms of energy efficiency and reduction of carbon generation, the R&D team extended the platform technologies developed in LGL to road lighting application (IOL). The new platform technology developed has resolved various critical issues, such as road safety, dust/water proof, intensity level, uniformity of illumination, system efficacy, cost, reliability under strict environmental condition, and maintenance works thereof, etc. The platform technologies successfully gave rise to product prototypes for market evaluation and received certifications from third parties' certifications.</p> <p>In IOL, the streetlamp technology developed in the project fulfilled the road lighting-related standards and criteria for Hong Kong and the Mainland.</p>
Total Project Cost (\$million): 24.79	(i) \$21.77M (for ITF /88%) (ii) \$3.02M (by industry contribution / 12%)

Nature of R&D	Details
<input checked="" type="checkbox"/> Technology breakthrough (e.g. rocket science)	<ol style="list-style-type: none"> 1. The use of light metal with 3-D thermal management design to develop an outstanding and relatively low-cost solution for LED lighting applications. Heat dissipation was improved by 30% to 50%. The system efficacy was improved by 15% to 25%. Reliability was enhanced. 2. The compact wireless networking module was successfully integrated with the LED lamp. Overall improvement of energy efficiency is around 30% saving in power for general lighting application. 3. Compared to commercial products, our LED component could have the thermal resistance reduced by around 64%. As a result, reliability of lighting system was improved. The efficacy could be enhanced by around 35%, significantly reducing the cost of streetlamp.
<input checked="" type="checkbox"/> performance/reliability/capacity enhancement in existing products/processes	<ol style="list-style-type: none"> 1. Heat dissipation was improved by 30% to 50%, which improved the system efficacy by 15% to 25%. The first generation MR16 lamp (Six-star) manufactured by OptiLED has been proved to last 2.5 years without failure. 2. Energy consumption was reduced by around 30%.
<input checked="" type="checkbox"/> lowering of cost	<ol style="list-style-type: none"> 1. Logistic cost was significantly lowered owing to 25% reduction in weight 2. Use of LED-based MR16 lamp resulted in 75% cost saving in energy. 3. Significant saving in maintenance and waste disposal costs. 4. With the integration of sensor, the intelligent lighting control system achieved 30% saving in energy consumption. 5. The development of high performance LED component reduced the cost of overall system by around 10% to 15%. 6. Various types of end products (LED streetlamp) can spawn from the modularized design, 30% to 40% saving of overall product development cost can be achieved.

Expected R&D results <i>(as stated in the original application)</i>	R&D results finally delivered	IP created (e.g. patents filed/registered)
In the LGL project, R&D team targeted to develop	Based on various solid state lighting	Thirteen patents were filed.

<p>the low-cost thermal management solutions and filed 2 US patents. Besides, the optical performance for spot-light source was optimized for improving the system efficacy and illumination performance.</p> <p>Moreover, R&D team targeted to develop the wireless networking platform for next generation lighting control system by integrating the LED lamp and control.</p> <p>In the IOL project, R&D expected to resolve the critical issues in outdoor and road lighting application, i.e. reliability, thermal issue, costing and payback period. Besides, R&D targeted to optimize the optical system in order to improve the illumination intensity and uniformity for the enhancement of road safety.</p> <p>R&D reviewed the cost structure and proposed technical solutions with new business model so as to reduce the deployment cost of LED streetlamp technology.</p>	<p>platforms developed by the team, the following product prototypes are developed as deliverables:</p> <ul style="list-style-type: none"> a) High power LED MR16 spotlight b) High power LED ceiling lamp c) Compact wireless lighting control module d) Intelligent high power LED MR16 spotlight e) High power LED streetlamp f) High power and high lumen output Chip-on-Board (COB) LED package g) Intelligent high power LED streetlamp <p>The technologies were licensed to 4 companies.</p>	
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Analysis of “Success”#			
Financial		Non-financial	
	Actual	Projected	

<input checked="" type="checkbox"/> Licensing (i) no. of companies (ii) licensing income (\$million) (iii) royalty received (\$million)	4 Note(1) -	- - -	<input checked="" type="checkbox"/> Nurturing of R&D talent (i) no. of R&D positions provided/ duration (ii) no. of research interns trained/ duration	19 1
<input type="checkbox"/> Transfer of IP (i.e. exclusive)	-	-	<input checked="" type="checkbox"/> Sharing of knowledge (i) no. of academic/professional publications (ii) no. of seminars/conferences attended to disseminate the R&D results (iii) other channels (e.g. web sites, company visits)	0 2 20 (Appendix I)  Exhibitions: China SSL, Opto Taiwan
<input type="checkbox"/> No. of samples/prototypes/products produced/sold and income (\$ million)	-	-	<input checked="" type="checkbox"/> International and Local Industry/ Technology	1. 青年商會主辦「2009 環保『友』道企業大賞」節能產品獎
<input type="checkbox"/> Spin-off	-	-		
<input checked="" type="checkbox"/> Income from contract research for further development of	Note (2)			

R&D results (\$million)			Award(s)	
<input checked="" type="checkbox"/> Subsequent income generated from the licences granted/transfer of IP/spin-off		Estimated income for 10 years: \$22M (incl. licence fees, service fees and royalties)	<input checked="" type="checkbox"/> Contribution to Government Policy and social value	2. Silver Award, 2009 Hong Kong ICT Award, Yes. Discussion is underway with Highways Department and Housing Department for trial use of the products in public housing estates and individual road sections.
<input type="checkbox"/> Others	-		<input checked="" type="checkbox"/> Further development of R&D results by another party (parties)	Yes Some of the platform technologies developed were contributed to HKPC's "Development of Automobile Advanced Frontlight System".
Total:	\$ <u>22.0</u> million		<input type="checkbox"/> Soft power (e.g. setting new standards or enhancing Hong Kong's reputation as an innovation and technology centre)	-
			<input type="checkbox"/> Others	-

Please include the timeframe for all estimated income and achievements (up to 10 years).

Notes: (1)The Project has received a total licensing fee of \$1.88 million from the industry sponsors, which was offset against their industry contribution.

(2)The Project has received an income of 0.2 million from contract research services for the industry sponsors, which was offset against

their industry contribution.

Reasons rendering the project not successful in meeting the objectives and achieving the desired deliverables (if applicable) –

Dr Cheung Nim-kwan

Hong Kong Applied Science and Technology Research Institute

Updated as *at 1 June 2010*

Appendix 1: Seminars/conferences attended

No.	Event Name
1	Host workshop of 'Application of LED in General Lighting', Hong Kong, 2006.
2	Co-host workshop of 'Flotherm Gathering', Hong Kong, 2006.
3	Invited speaker in the workshop of '海峽兩岸光電子產業對接會', Fuzhou, 2007.
4	Collaborated with HKOEA and China SSL Office to hold the technical forum of 'China SSL 2007', Shanghai, 2007.
5	Invited speaker in America Hong Kong Electronics Association, Hong Kong, 2007.
6	Co-host and invited speaker for the forum of 'IDT EXPO 2007-燈飾業交流會-『將環保概念融於設計以創商機』'.
7	Co-host '普通照明研討會：問題與對策 2007', Guzhen, 2007.
8	Attended and presented in the seminar on the SME Development Fund Project, Hong Kong, 2008.
9	Invited speaker in the workshop of '2008 海峽兩岸 LED 產業項目對接會', Xiamen, 2008.
10	Host workshop of 'Next Generation Lighting Technology', Hong Kong, 2008.
11	Assisted China SSL Office to organize 'China SSL 2008 Workshop and Exhibition', Shenzhen, 2008.
12	Invited speaker in the workshop of 'Green Technologies and Application 2008', Shenzhen, 2008.
13-14	Industry and University Consultation Forum – 2008, Hong Kong, 2008. Industry and University Consultation Forum – 2008, ShenZhen, 2008.
15	Co-host the work shop and invited speaker in the workshop of '2009 海峽兩岸 LED 與太陽能光伏產業項目對接會', Xiamen, 2009.
16	Co-host the forum and invited speaker in the forum of '2009 海峽兩岸光電論壇', Xiamen, 2009.
17	Host a workshop of 'Workshop on Solid-State Lighting for Green Building Application', Hong Kong, 2009.
18-19	Industry and University Consultation Forum – 2009, Hong Kong, 2009. Industry and University Consultation Forum – 2009, Shenzhen, 2009.
20	Invited speaker for the APEC workshop for development of LED lighting standards and testing technology, Taiwan, 2009.

Form to Assess Success of R&D Project

Name of R&D Centre: Hong Kong Applied Science and Technology Research Institute (ASTRI)

Project Title: ART/027CP Next Generation Antenna Sub-Assemblies (NGASA)

Project period: 1 February 2008 to 31 July 2009

Project Investigator(s): Corbett Ray Rowell

Collaborating partner(s): Kantan Inc, Group Sense Limited, Altai Technologies, Vtech, Innotech, Zhuhai Unitech Power, Shenzhen Huawei Century, Autotoll Limited, Convenient Power HK Limited

Brief description of project: This project is aimed to develop a new antenna sub-assemblies platform technology that can be applied across industry in the segments of Multi-band & Miniature, Low Cost Beam-forming and MIMO applications.

Total Project Cost (\$million): 8.67 (i) \$7.82M (from ITF/ 90%) (i) \$0.85M (by industry contribution/10%)

Nature of R&D	Details
<input type="checkbox"/> Technology breakthrough (e.g. rocket science)	
<input checked="" type="checkbox"/> performance/reliability/capacity enhancement in existing products/processes	ASTRI improved the RF and antenna performance for several wireless applications, ranging from wireless power, road tolls to base station antennas.
<input type="checkbox"/> lowering of cost	

Expected R&D results <i>(as stated in the original application)</i>	R&D results finally delivered	IP created <i>(e.g. patents filed/registered)</i>
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<ul style="list-style-type: none"> • SD Size Tri-Band GSM Antenna • Multi-mode Digital TV Antenna • Multi-mode Handset Antenna • GPS Antenna Assembly • Directional Antenna Sub-assembly • WiFi Beam-forming Antenna • WiMax Beam-forming Antenna • RFID Beam-forming Antenna Reader • MIMO USB Dual-band Antenna • Dual-mode MIMO + Beam-forming Antenna Array 	<p>Same as expected or planned in original application</p>	<p>Six patents filed</p>
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Analysis of “Success”#				
Financial			Non-financial	
	Actual	Projected		
<input checked="" type="checkbox"/> Licensing <i>(i) no. of companies</i> <i>(ii) licensing income (\$million)</i>	<p>1</p> <p><i>Note(1)</i></p>		<input checked="" type="checkbox"/> Nurturing of R&D talent <i>(i) no. of R&D positions provided/ duration</i> <i>(ii) no. of research interns trained/ duration</i>	<p><i>(i) 4 positions at ASTRI, and the partner companies hired several new employees</i></p>

(iii) royalty received (\$million)			<input checked="" type="checkbox"/> Sharing of knowledge	
<input type="checkbox"/> Transfer of IP (i.e. exclusive)			(i) no. of academic/professional publications	2 publications in IEEE Transactions
<input type="checkbox"/> No. of samples/prototypes/products produced/sold and income (\$ million)			(ii) no. of seminars/conferences attended to disseminate the R&D results	ASTRI held a seminar on advanced antenna technology (See attachment for photos of seminars/conferences)
<input type="checkbox"/> Spin-off			(iii) other channels (e.g. web sites, company visits)	A website http://antennas.astri.org that is regularly used by almost 70 companies
<input checked="" type="checkbox"/> Income from contract research for further development of R&D results (\$million)	Note (2)		<input type="checkbox"/> International and Local Industry/ Technology Award(s)	
<input type="checkbox"/> Subsequent income generated from the licences granted/transfer of IP/spin-off		Estimated income for 5 years: \$5M	<input type="checkbox"/> Contribution to Government Policy and social value	
<input type="checkbox"/> Others			<input type="checkbox"/> Further development of R&D results by another party (parties)	
Total:		\$ <u>5.0</u> million	<input checked="" type="checkbox"/> Soft power (e.g. setting new standards or enhancing Hong	ASTRI's antenna technology is now found

	Kong’s reputation as an innovation and technology centre)	inside several consumer products (iPhone speakers, direction-finding car keys and innovative iPhone wireless charging units), and is used by thousands of people in HK everyday (road-charging RF jammers). (See attachment for photos of consumer products in operation) ASTRI has established its Antenna R&D Centre as one of the best in class worldwide.
	<input type="checkbox"/> Others	

Please include the timeframe for all estimated income and achievements (up to 10 years).

Notes: (1)The Project has received a total licensing fee of \$0.03 million from the industry sponsors, which was offset against their industry contribution.

(2)The Project has received an income of \$0.82 million from contract research services from the industry sponsors, which was offset against their industry contribution.

Reasons rendering the project not successful in meeting the objectives and achieving the desired deliverables (if applicable) –

Dr Cheung Nim-kwan
Hong Kong Applied Science and Technology Research Institute
Updated as *at 1 June 2010*

ASTRI Antenna & RF R&D: Consumer Products

Wireless Power Charging Coils for iPhone Charger



Direction Finding Antenna Keychain for Cars and Kids



Road-toll RF Jammers



Antenna Seminar



Advanced Antenna Technology Seminar in 2009
Mr Corbett Rowell, R&D Director, Antenna and RF Technologies, CT
Group of ASTRI, delivered a presentation

Form to Assess Success of R&D Project

Name of R&D Centre: Hong Kong Applied Science and Technology Research Institute (ASTRI)

Project Title: Practical MIMO for WiMAX/LTE Device (ART/043CP, PMdevLTE)

Project period: 25 June 2008 to 24 December 2009

Project Investigator(s): Henry Ye

Collaborating partner(s): Innofidei Inc

Brief description of project: This project aims to develop and implement the core technologies for 4G wireless communication devices. In order to enhance the spectrum efficiency, most, if not all, of the next-generation wireless standards (such as WiMAX and LTE) will be based on MIMO technology. While technical barriers such as antenna correlation with closely-spaced multiple antennas will continue to be investigated, this project will explore key areas in system implementation, such as advanced angular-domain channel estimation technique, multi-user detection and interference reduction. An MIMO-OFDM platform (WiMAX/LTE) will be used to evaluate ASTRI's innovations. The enhanced MIMO technologies will be applied to WiMAX/LTE devices to demonstrate the significance of ASTRI's invention. Reference designs and core IP modules will be delivered as the achievements of this project. In the meantime, the wireless communication R&D talents trained in this project will benefit the local as well as greater China industry to strengthen their competitiveness in the world market.

Total Project Cost (\$million): 16.71

- (i) \$13.65M (from ITF / 82%)
- (ii) \$3.06M (by industry contribution / 18%)

Nature of R&D	Details
<input checked="" type="checkbox"/> Technology breakthrough (e.g. rocket science)	The team has focused on developing the core technologies for TD-LTE standard. LTE is the latest and greatest standard for cellular communications. The ASTRI team has indeed become a global leader in providing TD-LTE core technologies. As a result, ASTRI has been invited to have joint demonstrations with industry leaders, such as

	Agilent, Rohde & Schwarz, Motorola, Alcatel-Lucent, and ZTE.
<input type="checkbox"/> performance/reliability/capacity enhancement in existing products/processes	
<input type="checkbox"/> lowering of cost	

Expected R&D results <i>(as stated in the original application)</i>	R&D results finally delivered	IP created <i>(e.g. patents filed/registered)</i>
<ul style="list-style-type: none"> • Broadband MIMO Simulation System • Broadband MIMO Channel Measurement System • MIMO-OFDM hardware platform • Advanced MIMO algorithm development 	Same as expected. A technology license agreement has been signed with Innofidei.	4 patent applications filed

Analysis of “Success”#				
Financial			Non-financial	
	Actual	Projected		
<input checked="" type="checkbox"/> Licensing (i) no. of companies (ii) licensing income (\$million)	1		<input checked="" type="checkbox"/> Nurturing of R&D talent (i) no. of R&D positions provided/ duration (ii) no. of research interns trained/ duration	(i) 25 engineers (ii) 5 to 6 interns

<i>(iii) royalty received (\$million)</i>	<i>Note(1)</i>		<input checked="" type="checkbox"/> Sharing of knowledge	
<input type="checkbox"/> Transfer of IP (i.e. exclusive)			(i) no. of academic/professional publications	(i) Published 3 journal or conference papers.
<input type="checkbox"/> No. of samples/prototypes/products produced/sold and income (\$ million)			(ii) no. of seminars/conferences attended to disseminate the R&D results	(ii) Provided more than 6 presentations in international/regional conferences. Also provided 3 or more technical training courses to local communities. (see attachment for photos of seminars/conferences)
<input type="checkbox"/> Spin-off			(iii) other channels (e.g. web sites, company visits)	(iii) Demonstrated ASTRI's reference design in major international tradeshows such as 2009 MWC and 2009 CTIA (see attachment for photos in 2010 Expo in Shanghai)
<input type="checkbox"/> Income from contract research for further development of R&D results (\$million)			<input checked="" type="checkbox"/> International and Local Industry/Technology Award(s)	The team won the 2009 Hong Kong Industry Award –Technological Achievement.
<input type="checkbox"/> Subsequent income generated from the licences granted/transfer of IP/spin-off		Estimated income for 5 years:	<input type="checkbox"/> Contribution to Government Policy and social value	

		\$10M		
<input type="checkbox"/> Others			<input checked="" type="checkbox"/> Further development of R&D results by another party (parties)	Innofidei and picoChip are building commercial products based on ASTRI's technologies.
Total:		\$ <u>10.0</u> million	<input type="checkbox"/> Soft power (e.g. setting new standards or enhancing Hong Kong's reputation as an innovation and technology centre)	
			<input type="checkbox"/> Others	

Please include the timeframe for all estimated income and achievements (up to 10 years).

Note 1 The Project has received a royalty income of 1.56 million from the industry sponsor, which was offset against the industry contribution.

Reasons rendering the project not successful in meeting the objectives and achieving the desired deliverables (if applicable) –

Dr Cheung Nim-kwan

Hong Kong Applied Science and Technology Research Institute Company Limited

Updated as at 1 June 2010

LTE Conference / Expo



GSM Mobile World Congress on
16-19 Feb 2009



International ICT Expo on
13-16 Apr 2009



LTE Asia 2009 on 8-9 Sep 2009



ITU Telecom World 2009
on 5-9 Oct 2009



4th Int'l Conference on Access
Networks on 1-3 Nov 2009



TNO Asia 2009 on 12-13 Nov
2009

ASTRI in Information and Communication Pavilion Expo 2010, Shanghai



3


Form to Assess Success of R&D Project


Name of R&D Centre:	Automotive Parts and Accessory Systems R&D Centre
Project Title:	Development of Automobile Advance Front light System
Project period	Oct 2007 to Mar 2009
Project Investigator(s):	Lawrence POON
Collaborating partner(s)	APAS, HKPC & Wong's Automobile Lamp Industrial Holding
Brief description of project:	To develop a low cost adaptive front light system (AFS) with integrated & safety feature that is able to follow the driving environment with automatic turning and leveling to increase the night driving visibility by collaborating with industrial partners.
Total Project Cost (million): \$7.06	(i) \$3.46M (from ITF/ 49%) (ii) \$3.60M (by industry contributions/ 51%)

Nature of R&D	Details
<input checked="" type="checkbox"/> Technology breakthrough (e.g. rocket science)	a. First AFS developed in Hong Kong & China area b. First combined OEM and after market product selection
<input checked="" type="checkbox"/> performance/reliability/capacity enhancement in existing products/processes	a. Introduced and transferred AFS knowledge to HK industry (Sponsor) b. Enhance existing product line with new technology and process (From conventional car headlight to AFS)
<input checked="" type="checkbox"/> lowering of cost	a. Competitor Price >US\$700.00 (all foreign supplier) b. Targeted AFS price aimed at US\$350.00 (locally produce & supply china OEM and after market)

Expected R&D results <i>(as stated in the original application)</i>	R&D results finally delivered	IP created (e.g. patents filed/registered)
a. A low cost prototype with all major advance feature b. Key AFS component and system design know-how & associated process c. Ultra-high resolution motion system for adaptive control.	a. A low cost prototype based on Camry with major advance features produced and demonstrate b. Developed key AFS components and system design know-how & associated process c. Ultra-high automatic adaptive control motion strategy & system implemented and transferred to sponsor(s).	a. China patents filed # 200810169476.2 ‘vehicle headlamp and method controlling deflection of illumination’ b. HK register # 1127252 ‘vehicle headlamp and method controlling deflection of illumination’

Analysis of “Success”#				
Financial			Non-financial	
	Actual	Projected		
<input type="checkbox"/> Licensing (i) <i>no. of companies</i> (ii) <i>licensing income (\$million)</i> (iii) <i>royalty received (\$million)</i>			<input checked="" type="checkbox"/> Nurturing of R&D talent (i) no. of R&D positions provided/ duration (ii) no. of research interns trained/ duration	15 positions N/A
<input checked="" type="checkbox"/> Transfer of IP (i.e. exclusive)	Exclusive		<input checked="" type="checkbox"/> Sharing of knowledge (i) no. of academic/professional publications	a. Hold 3 seminars in ChongQin, Fuzhou & WuHan by APAS b. 5 Conferences with various state holders

Analysis of “Success”#				
Financial			Non-financial	
	Actual	Projected		
				c. HK Auto Parts Expo 2008
<input checked="" type="checkbox"/> No. of samples/prototypes/products produced/sold and income (\$ million)		APAS will receive royalty income from the collaborating partner for a five-year period after product shipment begins.	(ii) no. of seminars/conferences attended to disseminate the R&D results	d. Showcase headlamp @ 2009 Guangzhou Auto Show 
<input type="checkbox"/> Spin-off			(iii) other channels (e.g. web sites, company visits)	e. Website and direct contact with potential customer Organized Demos for company visitor over 15 times
<input type="checkbox"/> Income from contract research for further development of R&D results (\$million)			<input type="checkbox"/> International and Local Industry/ Technology Award(s)	
<input type="checkbox"/> Subsequent income generated from the licences granted/transfer of IP/spin-off			<input type="checkbox"/> Contribution to Government Policy and social value	
<input type="checkbox"/> Others			<input checked="" type="checkbox"/> Further development of R&D results by another	Sponsor further develop and modify their headlamp for market adaptation with 華

Analysis of “Success”#				
Financial			Non-financial	
	Actual	Projected		
			party (parties)	南理工大學 for 廣州汽車廠.
Total: \$ _____million			<input checked="" type="checkbox"/> Soft power (e.g. setting new standards or enhancing Hong Kong’s reputation as an innovation and technology centre)	- lead the development of GB standard for AFS in China - Showcased to foreign visitors as local innovation
			<input checked="" type="checkbox"/> Others	- Sponsor fits up a new facility of 67,000m ² for production on June 2010. - Constructed a new testing facility for AFS standard - Upgrade sponsor capability and confidence for targeting OEM
				

Please include the timeframe for all estimated income and achievements (up to 10 years).

□ Reasons rendering the project not successful in meeting the objectives and achieving the desired deliverables (if applicable) –

Dr. Yang YING

Automotive Parts and Accessory Systems R&D Centre

Updated as at 1 June 2010

Form to Assess Success of R&D Project

Name of R&D Centre: The Hong Kong Research Institute of Textiles and Apparel (HKRITA)

Project Title: Finer Nu-Torque Cotton Yarn Production

Project period: 1 March 2007 to 30 November 2008

Project Investigator(s): Prof XM Tao, Dr Bingang Xu, Dr Kwok-po Cheng, Mr Sing-kee Wong

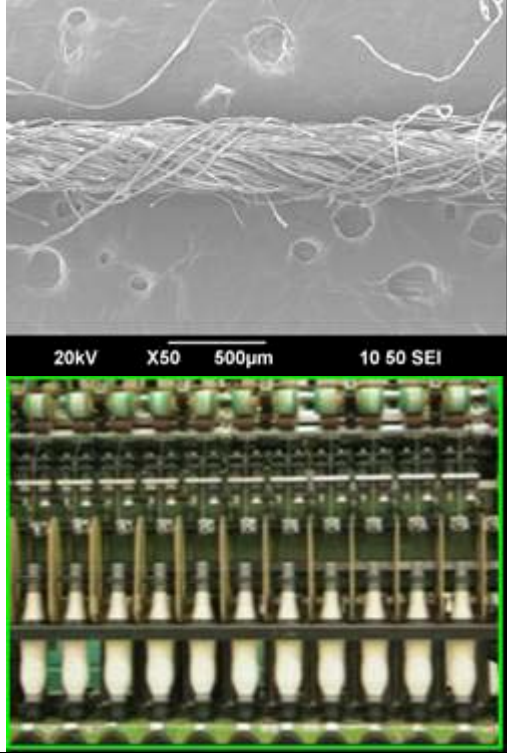
Collaborating partner(s): The Hong Kong Polytechnic University
Central Textiles (HK) Ltd. (sponsor)
TAL Apparel Ltd (sponsor)


Brief description of project: The project aims to further develop the spinning technology for mass production of finer torque-free (namely Nu-Torque) cotton yarns for weaving and knitting. The target yarn counts are 30 Ne and 40 Ne. The project scope covers the optimization/enhancement of yarn spinning, weaving, knitting, dyeing and garment making. The performances of fabric and garment made from the proposed finer Nu-Torque cotton yarns will be assessed by a series of laboratory testing and wear trial of their final products (garment)


Total Project Cost (\$million): 2.38 (i) \$2.13M (from ITF/ 89 %) (ii) \$0.25M (by industry contributions/ 11 %))

Nature of R&D	Details
<input checked="" type="checkbox"/> Technology breakthrough (e.g. rocket science)	The project has succeeded in providing fine cotton yarn with less torque in ring spinning process, replacing the conventional production of single yarn that requires at least two separate operations, i.e. ring spinning and yarn doubling.
<input checked="" type="checkbox"/> performance/reliability/capacity enhancement in existing products/processes	The Nu-Torque cotton yarn production can provide soft, less hairiness and evenness single cotton yarn for high quality fabric/garment manufacture.
<input checked="" type="checkbox"/> lowering of cost	The Nu-Torque cotton yarn production can save production cost and time by combining ring spinning and yarn doubling in one operation.

Expected R&D results <i>(as stated in the original application)</i>	R&D results finally delivered	IP created (e.g. patents filed/registered)

<ol style="list-style-type: none"> 1. Product and process parameters – optimized spinning processing parameters with ordinary combed cotton optimized yarn; 2. Technical limits for fine Nu-Torque cotton yarns – raw material, spinning geometry, yarn count/twist/speed ratio; 3. Modification unit if necessary for finer Nu-Torque cotton yarns – refined yarn modification unit via dynamic analysis of the yarn path trial: 30 Ne and 40 Ne; 4. Woven and circular knitted fabrics and assessments – optimized processing parameters for weaving and circular knitting, fabric assessment; 5. Garments made from these fabrics – shirts, polo shirts, pants; 6. Sweaters made from the finer Nu-Torque cotton yarns. 	<p style="text-align: center;">Are the deliverables have been achieved</p>	<p>The relevant IP application has been filed.</p>  <p>The top image is a scanning electron microscope (SEM) image showing individual cotton fibers with their characteristic lumen and surface structure. The bottom image is a photograph of a textile spinning machine, showing multiple spindles with bobbins, used for producing fine cotton yarns.</p>
Analysis of “Success”#		
Financial	Non-financial	
	Actual	Projected

<input checked="" type="checkbox"/> Licensing (i) no. of companies (ii) licensing income (\$million) (iii) royalty received (\$million)		10-20 (Licensing fee being considered)	<input checked="" type="checkbox"/> Nurturing of R&D talent (i) no. of R&D positions provided/ duration (ii) no. of research interns trained/ duration	4 0
<input type="checkbox"/> Transfer of IP (i.e. exclusive)			<input checked="" type="checkbox"/> Sharing of knowledge (i) no. of academic/professional publications	4
<input type="checkbox"/> No. of samples/prototypes/products produced/sold and income (\$ million)			(ii) no. of seminars/conferences attended to disseminate the R&D results	4 

				
<input type="checkbox"/> Spin-off			(iii) other channels (e.g. web sites, company visits)	http://www.hkrita.com/newsletter/issue3/rnd.htm
<input type="checkbox"/> Income from contract research for further development of R&D results (\$million)			<input checked="" type="checkbox"/> International and Local Industry/ Technology Award(s)	2009 China National Textile and Apparel Council Science and Technology Award Certificate (First Class).
<input type="checkbox"/> Subsequent income generated from the licences granted/transfer of IP/spin-off			<input type="checkbox"/> Contribution to Government Policy and social value	
<input type="checkbox"/> Others			<input type="checkbox"/> Further development of R&D results by another party (parties)	
Total: \$ _____ million			<input checked="" type="checkbox"/> Soft power (e.g. setting new standards or enhancing Hong Kong's reputation as an innovation and technology centre)	Yes
			<input type="checkbox"/> Others	

Please include the timeframe for all estimated income and achievements (up to 10 years).

Reasons rendering the project not successful in meeting the objectives and achieving the desired deliverables (if applicable) –

Haider Barma

Hong Kong Research Institute of Textiles and Apparel

Updated as at 1 June 2010

Form to Assess Success of R&D Project


Name of R&D Centre:	Hong Kong R&D Centre for Logistics and Supply Chain Management Enabling Technologies
Project Title:	RFID Enablement Middleware for Enterprise Applications
Project period	From 1 Apr 2005 to 31 Dec 2006
Project Investigator(s):	Mr. Edward Wong / HKU
Collaborating partner(s)	<ol style="list-style-type: none">1. Pretide Technology Inc.2. IBM3. Eprogistics Limited4. Hong Kong Article Numbering Association5. ICO Ltd6. Shenzhen Gold Valley Science & Technology Co. Ltd7. Shenzhen Techedge Intelligent System Co. Ltd8. BAX Global Freight Forwarding (Guangzhou) Co. Ltd9. Smartsoft10. Shenzhen XinJia Industrail Equipment Co. Ltd
Brief description of project:	To develop a flexible middleware called RFID Enablement Middleware for Enterprise Applications (RAE). The purposes of the RAE are (i) to facilitate painless and cost effective integration of backend systems and RFID equipments; (ii) to facilitate easy connection to the global supply chain infrastructure, such as EPC, DTTN, EDI; and (iii) to improve efficiency and visibility in supply chain management.
Total Project Cost (\$million): 11.52	<ol style="list-style-type: none">(i) \$10.25M (from ITF/ <u>87%</u>)(ii) \$1.27M (by industry contributions/ <u>13%</u>)

Nature of R&D	Details
<input type="checkbox"/> Technology breakthrough	
<input checked="" type="checkbox"/> performance/reliability/capacity enhancement in existing products/processes	Facilitate enterprises using the RFID technologies to enhance and streamline their business operation such as warehouse management, asset management, and process monitoring
<input checked="" type="checkbox"/> lowering of cost	Reduce the cost for integrating the data collected at the front-line or shop-floor through RFID equipment with the backend enterprise applications

Expected R&D results <i>(as stated in the original application)</i>	R&D results finally delivered	IP created (e.g. patents filed/registered)
1. Requirement Specifications and Architectural Design 2. RAE Middleware prototype equipped with the following components: <ul style="list-style-type: none"> • RFID Interface Module, RFID Event Module, RAE Object Module, Internal and External Access Interface Module • Adapters providing open data exchange interfaces, such as XML, CSV, web services, etc. • A set of supporting functions, such as administration and configuration UI, toolbox for assisting enterprise application integration, system monitoring and reporting 	1. Completed 2. Completed 3. Completed 7 pilot projects (5 in mainland and 2 in HK): Mainland: <ul style="list-style-type: none"> • RFID-Enabled Ship-in & Ship-out Management Pilot System • RFID-Enabled Supply Chain Management System with Anti-Counterfeiting Measure Pilot System • RFID-Enabled Work-In-Progress Monitoring Pilot System • RFID-Enabled Container Management Pilot System 	1. Hong Kong Short-Term Patent No. HK1101027 entitled “RFID Application Enablement Object Modeling System (RAEOMS) for RFID-enabled Business Activity Monitoring” is filed in 2007; 2. RAE was hardened by EBS and trademarked as “RFiDY” in 2007

Expected R&D results <i>(as stated in the original application)</i>	R&D results finally delivered	IP created <i>(e.g. patents filed/registered)</i>
tools, etc. • A proof-of-concept demonstration on interfacing global SCM network • A proof-of-concept demonstration on potential new enterprise application supported by RFID 3. 4-6 pilot projects to demonstrate the new system 4. Training/seminar/exhibition on the new system	• RFID-Enabled Warehouse Management Pilot System • HK: • RFID-Enabled Pallet Tracking Pilot System • Integration with Pretide RFID Middleware 4. Conducted seminars and trainings for the system: • GD-HK Technology Co-operation Seminar and Kick-off meeting in Guangzhou (6/05) • Training workshops on RFID Application Enablement in Hong Kong (12/2006)	

Analysis of “Success”#				
Financial			Non-financial	
	Actual	Projected		
<input type="checkbox"/> Licensing (i) <i>no. of companies</i> (ii) <i>licensing income (\$million)</i>			<input checked="" type="checkbox"/> Nurturing of R&D talent (i) <i>no. of R&D positions provided/ duration</i> (ii) <i>no. of research interns</i>	33 regular staffs and 9 student helpers N/A

Analysis of “Success”#			
Financial		Non-financial	
	Actual	Projected	
(iii) royalty received (\$million)			trained/ duration
<input type="checkbox"/> Transfer of IP (i.e. exclusive)			<input checked="" type="checkbox"/> Sharing of knowledge (i) no. of academic/professional publications (ii) no. of seminars/conferences attended to disseminate the R&D results
<input type="checkbox"/> No. of samples/prototypes/products produced/sold and income (\$ million)			5 10 
<input type="checkbox"/> Spin-off			(iii) other channels (e.g. web sites, company visits) 19
<input type="checkbox"/> Income from contract research for further development of R&D results (\$million)			<input type="checkbox"/> International and Local Industry/ Technology Award(s)
<input type="checkbox"/> Subsequent income generated from the licences granted/transfer of IP/spin-off			<input type="checkbox"/> Contribution to Government Policy and social value
<input checked="" type="checkbox"/> Others	Upon completion of R&D, development on		<input checked="" type="checkbox"/> Further development of R&D results by another party (parties) The commercialization plan of RFID product development will

Analysis of “Success”#			
Financial		Non-financial	
	Actual	Projected	
	<p>RAE was continued and the Middleware “RFiDY” was developed to suit real business deployment. It allows companies to integrate the new RFID systems with their existing legacy systems at minimal effort and cost. By adopting RFiDY middleware, user companies will be able to connect in a speedy manner to the global supply chain infrastructures, such as EPC, EDI and DTTN, for deployment of RFID systems painlessly and cost effectively.</p> <p>So far four RFID products have been developed, they are: (i)</p>		<p>continue and two new products, namely (i) RFID Mobile Facility Management Solution and (ii) RFID Warehouse Management Solution, are in the pipeline for next deployment. With the strengthened product portfolio, RAE technologies and RFiDY will continue to generate value through their contributions to the commercial market as well as R&D communities.</p>

Analysis of “Success”#				
Financial			Non-financial	
	Actual	Projected		
	RFID Asset Management Solution; (ii) RFID Library Management Solution; (iii) RFID Educational Kit; and (iv) RFID Document Management Solution (see attachment). A total revenue of over \$17M as facilitated by RFiDY has been generated.			
Total: \$ <u>17</u> million			<input type="checkbox"/> Soft power (e.g. setting new standards or enhancing Hong Kong’s reputation as an innovation and technology centre)	
			<input type="checkbox"/> Others	

Please include the timeframe for all estimated income and achievements (up to 10 years).

Reasons rendering the project not successful in meeting the objectives and achieving the desired deliverables (if applicable) –

Prof. CJ Tan

Hong Kong R&D Centre for Logistics and Supply Chain Management Enabling Technologies

Updated as at 1 June 2010

Attachment

i) Use of RFID for Automatic Baggage Handling & Reconciliation (Asset Management) at Airport Authority Hong Kong

- In 2003, HKIA adopted to apply RFID technology to improve the Baggage Handling and Management System
- In mid 2004, RFID equipment installation commenced at baggage handling areas
- In Aug 2005, over 20M RFID label used per year
- In 2008-10, RAE/RFiDY is deployed to enhance AA's Baggage Handling System



ii) Use of RFID for Mortuary Services (Asset Management) at a Public Healthcare Organization

HA decides to deploy RFID in 2009-10 to streamline the operations and enhancing the management of bodies in HA mortuaries after the previous mortuary incidents to ensure correct identification and safeguard the loss of bodies

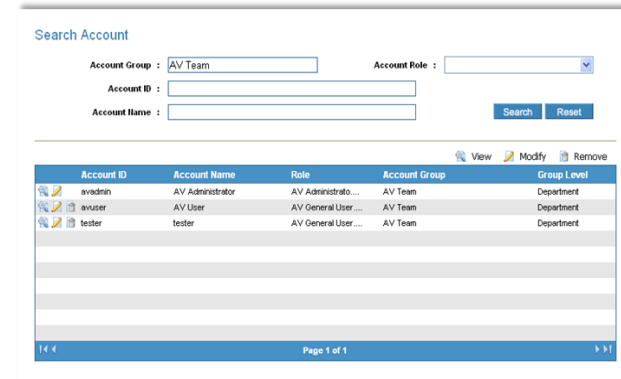
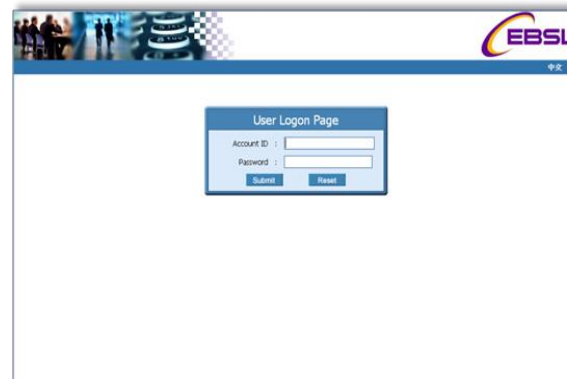
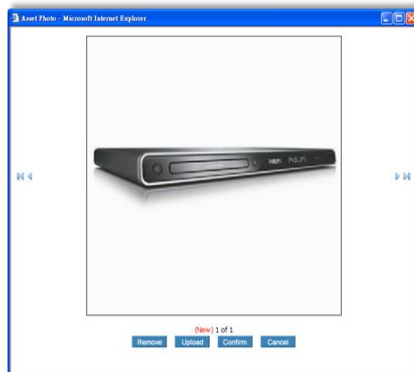


iii) Use of RFID for Asset Management at a University in HK

In 2009-10, a university needed to automate the asset inventory system using RFID technology to manage asset including tools, audio & visual equipment, fitness facilities, etc.

EBS deployed the RFID Asset Management Solution that can :

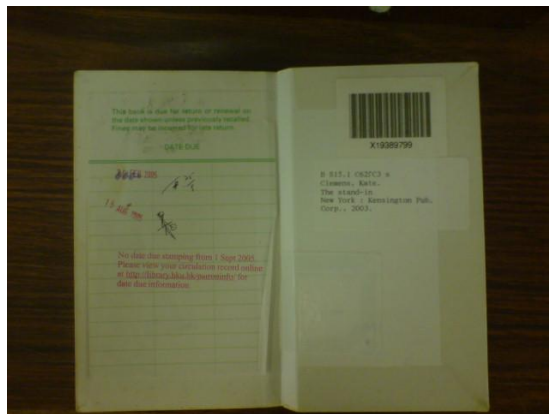
- i. Manage inventory record
- ii. Inventory taking
- iii. Inventory search
- iv. Generate management reports



iv) Use of RFID for Library Management at The University of Hong Kong Libraries

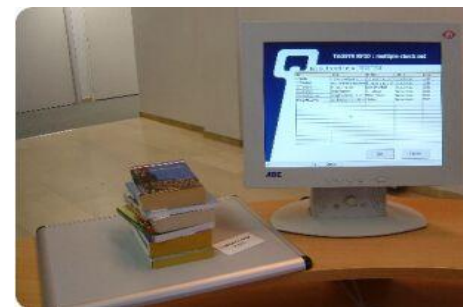
In 2008, RAE/RFiDY was employed to provide RFID based library solution for HKU.

- Tagged 1.3 Million Volumes without interrupting daily operation
- Large number of return transactions per day
- Up to 11,000 loans in Main Library in 1 day
- Over 100,000 registered library users
- Installed Librarian Stations, Self Check Kiosks, Security Gates, Return Unit, Tagging Stations and Handheld Inventory Devices
- Integrated EBSL RFID Library Management System with Millennium via SIP2



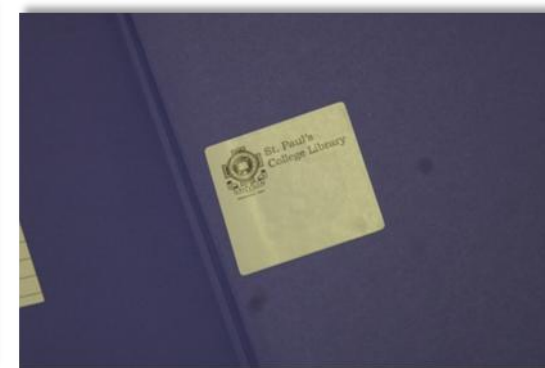
v) Use of RFID for Library Management at Hong Kong Heritage Discovery Centre

- Reference Library situated at the Hong Kong Heritage Discovery Centre, providing reference materials on HK history, heritage conservation, architecture, etc. for public
- The Library requested in 2009 to upgrade part of the old RFID system without interrupting her normal operation
- EBS deploys the RFID Library Management Solution that can support the existing VLib library system:
 - i. RFID Staff Station
 - ✓ Borrow / Return books
 - ✓ Register new books
 - ✓ Check book status
 - ✓ Arm / Disarm RFID security bit of books
 - ii. RFID Handheld Device
 - ✓ Check inventory
 - ✓ Search books



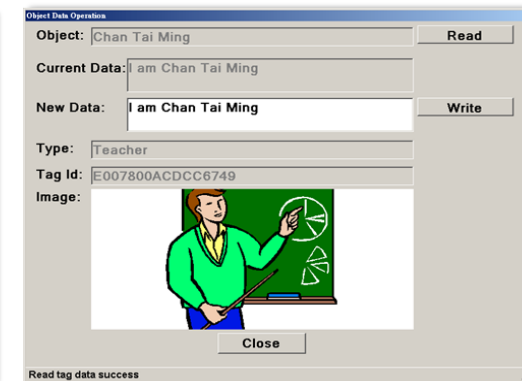
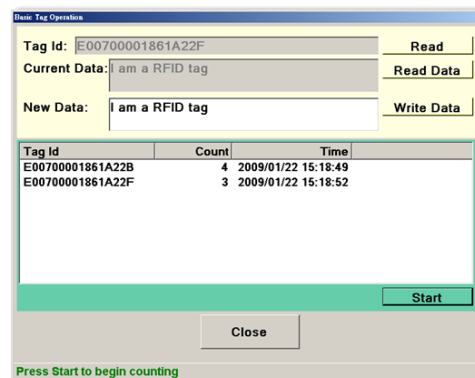
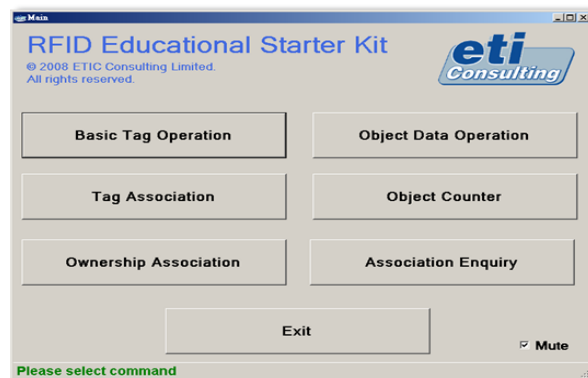
vi) Use of RFID for Library Management at St Paul's College

- Founded in 1851, St Paul's College is the oldest school to commence operation in HK
- The Library in 2007 requested to migrate the barcode library system to RFID library system
- EBS deployed the RFID Library Management Solution that can support the existing VLib library system:
 - i. RFID Staff Station
 - ii. RFID Self Check Kiosk
 - iii. RFID Inventory Device
 - iv. RFID Security Gate



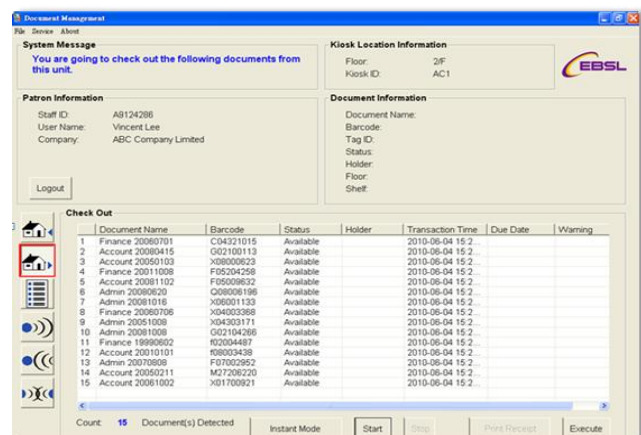
vii) Use of RFID for Education (Educational Starter Kit) at a College

- The College looks for materials to educate RFID technology which is one of the teaching syllabus of High School
- EBS offered in 2008 an RFID Educational Starter Kit to assist teachers to demonstrate RFID technology with simpler equipments and user friendly interface



viii) Use of RFID for Document Management at a Listed Retail Bank in HK

- The Bank had difficulties to track and trace the loan application form within the office. The Bank also wanted to optimize the internal loan application process to improve customer service.
- In 2007, EBSL assisted the Bank to develop an RFID Document Management Solution that can:
 - i. Record the document movement history
 - ii. Record the ownership of documents
 - iii. Automate the document circulation process



Form to Assess Success of R&D Project

Name of R&D Centre: Nano and Advanced Materials Institute (NAMI)

Project Title: Demonstration Line for the Production of Low-Cost Humidity Sensor

Project period: 16 July 2007 – 15 January 2009

Project Investigator(s): Dr. Ning WANG, Hong Kong University of Science and Technology;
Dr. Chun ZHANG, NAMI; Dr. Jian-ying MIAO, NAMI

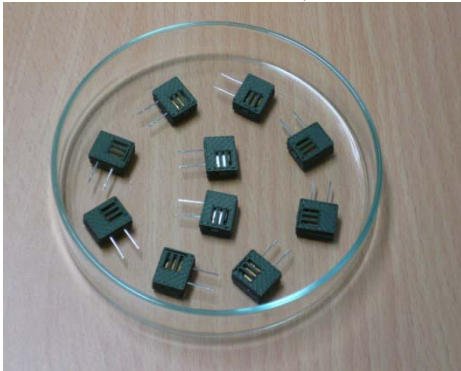
Collaborating partner(s): Hong Kong University of Science and Technology (HKUST)
Alliance Enterprises Ltd.

Brief description of project: Based on an earlier development at HKUST, a novel material based on porous alumina thin film was used to fabricate a sensor device which exhibits fast response and high sensitivity to humidity at competitive cost.
The objective of this project is to develop a demonstration line to optimize the process of manufacturing and to evaluate the productivity, the reliability, and the production cost for mass production
The success of this project will create new lines of humidity sensing components that could be manufactured in Hong Kong / PRD region, and such low-cost humidity sensing components will further benefit for other local industries, e.g. manufacturers of consumer electronics.

Total Project Cost (i) \$ 0.41M (from ITF/ 70%)
(\$million): 0.58 (ii) \$ 0.17M (by industry contributions/ 30%)

Nature of R&D	Details		
<input type="checkbox"/> Technology breakthrough			
<input checked="" type="checkbox"/> performance/reliability/capacity enhancement	Performance	Commercial Products	Target Product

Nature of R&D	Details		
in existing products/processes	Operating RH Range	20-95% RH	10-95% RH
	Storable Humidity	95% RH or less	95% RH or less
	Detecting Accuracy	±5% RH (25°C, 60% RH)	±3% RH (25°C, 60% RH)
	Response Time	<1 min (30-90% RH)	<20s (30-90% RH)
<input checked="" type="checkbox"/> lowering of cost	Less than HK\$3 per humidity sensor head		

Expected R&D results <i>(as stated in the original application)</i>	R&D results finally delivered	IP created (e.g. patents filed/registered)
<ol style="list-style-type: none"> 1. A demonstration line with the production rate of 8000 humidity sensor heads per month 2. The production cost of the humidity sensor is less than HK\$3 per humidity sensor head 3. The specifications of the humidity sensor head are comparable to those available in the market <p>Operating Humidity Range at 10-95% RH Storable Humidity at 95% RH or less Humidity Detecting Accuracy ±3% RH (25°C, 60%RH) Humidity Response Time <20s (30-90% RH)</p>	<ol style="list-style-type: none"> 1. Completed 2. Achieved 3. Achieved 	<ol style="list-style-type: none"> 1. U.S. provisional patent of “A low cost processing method for the fabrication of AAO-based fast-response humidity sensor” was filed on 22nd December, 2009 (Application No.: 61/282139; Confirmation No. 9625) 

Analysis of “Success”#

Financial			Non-financial	
	Actual	Projected		
<input checked="" type="checkbox"/> Licensing			<input checked="" type="checkbox"/> Nurturing of R&D talent	
(i) no. of companies	2	3	(i) no. of R&D positions provided/ duration	(i) One
(ii) licensing income (\$million)	\$55,000	\$0.15M in 2011	(ii) no. of research interns trained/ duration	(ii) N/A
(iii) royalty received (\$million)			<input checked="" type="checkbox"/> Sharing of knowledge	
<input type="checkbox"/> Transfer of IP (i.e. exclusive)			(i) no. of academic/professional publications	N/A
<input checked="" type="checkbox"/> No. of samples/prototypes/products produced/sold and income (\$ million)	N/A	500 prototypes	(ii) no. of seminars/conferences attended to disseminate the R&D results	Symposia: China Hi-Tech Fair 2009, Inno Design Expo
<input type="checkbox"/> Spin-off			(iii) other channels (e.g. web sites, company visits)	TV Show: Now TV (5 August 2009)
<input type="checkbox"/> Income from contract research for further development of R&D results (\$million)			<input type="checkbox"/> International and Local Industry/ Technology Award(s)	
<input type="checkbox"/> Subsequent income generated from the licences granted/transfer of IP/spin-off			<input type="checkbox"/> Contribution to Government Policy and social value	
<input type="checkbox"/> Others			<input type="checkbox"/> Further development of R&D results by another party (parties)	
Total:	\$ <u>0.2</u> million		<input type="checkbox"/> Soft power (e.g. setting new standards or enhancing Hong	

	Kong's reputation as an innovation and technology centre)	
	<input type="checkbox"/> Others	

Please include the timeframe for all estimated income and achievements (up to 10 years).

Reasons rendering the project not successful in meeting the objectives and achieving the desired deliverables (if applicable) –

Prof. KM NG

Nano and Advanced Materials Institute

Updated as at 1 June 2010

Form to Assess Success of R&D Project



Project Title:	Development of Miniaturized Micro/Nano-injection Moulding Machines
Project period	1 December 2003 – 31 January 2008
Project Investigator(s):	Prof K L Yung, HK PolyU
Collaborating partner(s)	NA
Brief description of project:	The project aims to develop a micro-injection moulding machine for the production of miniaturized plastic components.
Total Project Cost (\$million): 11.8	(i) \$9.8M (from ITF/ 84%) (ii) \$2.0M (by industry contributions and from PolyU/ 16%)


Nature of R&D	Details
<input type="checkbox"/> Technology breakthrough (e.g. rocket science)	
<input type="checkbox"/> performance/reliability/capacity enhancement in existing products/processes	
<input checked="" type="checkbox"/> lowering of cost	The project has helped build up the local capability in designing and producing micro-injection moulding machine, which is more competitive in cost than overseas' machines.

Expected R&D results <i>(as stated in the original application)</i>	R&D results finally delivered	IP created <i>(e.g. patents filed/registered)</i>

<p>A set of miniaturized micro-injection moulding machine prototype, which enables table-top manufacturing of advanced micro sized products, and the technology for the further design of a series of the miniaturized micro-injection moulding machine.</p>	<p>HK PolyU had developed two versions of micro-injection moulding machine prototype, and successfully licensed the low cost version to a local machine manufacturing company. A joint-venture company has been set up between HKPolyU and the company.</p>	<p>Vertical Injection Moulding machine</p>
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Analysis of “Success”#				
Financial			Non-financial	
	Actual	Projected		
<input type="checkbox"/> Licensing <i>(i) no. of companies</i> <i>(ii) licensing income (\$million)</i> <i>(iii) royalty received (\$million)</i>			<input checked="" type="checkbox"/> Nurturing of R&D talent <i>(i) no. of R&D positions provided/ duration</i> <i>(ii) no. of research interns trained/ duration</i>	7
<input type="checkbox"/> Transfer of IP (i.e. exclusive)			<input checked="" type="checkbox"/> Sharing of knowledge <i>(i) no. of academic/professional publications</i> <i>(ii) no. of seminars/conferences attended to disseminate the R&D results</i>	2 10 seminars
<input type="checkbox"/> No. of samples/prototypes/products produced/sold and income (\$ million)				

<input type="checkbox"/> Spin-off			(iii) other channels (e.g. web sites, company visits)	 <p>9 exhibitions</p> 
<input type="checkbox"/> Income from contract research for further development of R&D results (\$million)			<input checked="" type="checkbox"/> International and Local Industry/ Technology Award(s)	Gold Medal Prize at the 35 th International Exhibition of Inventions, New Techniques and Products held in Geneva in April 2007
<input type="checkbox"/> Subsequent income generated from the licences granted/transfer of IP/spin-off			<input type="checkbox"/> Contribution to Government Policy and social value	
<input checked="" type="checkbox"/> Others	HKPolyU collaborated with a local company and	It is estimated that 10 machines	<input type="checkbox"/> Further development of R&D results by another party (parties)	

	<p>set up a \$10 million joint venture in 2009 to commercialise the R&D results.</p>	<p>will be sold in 2010.</p>		
<p>Total: \$ <u>5.0</u> million</p>		<p><input checked="" type="checkbox"/> Soft power (e.g. setting new standards or enhancing Hong Kong's reputation as an innovation and technology centre)</p>	<p>The project has enhanced the awareness and local capability in the micro-parts and machine manufacturing technology. A few companies have engaged in the production of micro-injection moulding parts.</p> 	
		<p><input type="checkbox"/> Others</p>		

Please include the timeframe for all estimated income and achievements (up to 10 years).

Reasons rendering the project not successful in meeting the objectives and achieving the desired deliverables (if applicable) –

Form to Assess Success of R&D Project



ITF Programme:	Small Entrepreneur Research Assistance Programme
Project Title:	Light Four-Wheel Vehicle
Project period	Phase I: 24 October 2003 – 23 February 2004 Phase II: 1 March 2006 – 31 October 2007
Project Investigator(s):	Miss CHUNG Sin-ling / EuAuto Technology Ltd
Collaborating partner(s)	The Hong Kong Polytechnic University
Brief description of project:	To design and develop the chassis of an electric vehicle(EV)
Total Project Cost (\$million): 3.82	(i) \$1.91M (from ITF/ 50%) (ii) \$1.91M (by industry contributions/ 50%)

Nature of R&D	Details
<input type="checkbox"/> Technology breakthrough (e.g. rocket science)	
<input checked="" type="checkbox"/> performance/reliability/capacity enhancement in existing products/processes	The electric vehicle (MyCar) has successfully been developed and granted Transport Department's vehicle type-approval as a private car in August 2009. It can reach a maximum speed of 64km/h and travel a distance of 80-110km subject to road condition.
<input type="checkbox"/> lowering of cost	

Expected R&D results <i>(as stated in the original application)</i>	R&D results finally delivered	IP created <i>(e.g. patents filed/registered)</i>

(1) Full set of final drawings complete with engine, mechanical motion system and chassis design	Achieved	Nil
(2) Final set of bill of materials	Achieved	
(3) Two full scale of final prototypes	Achieved	

Analysis of “Success”#				
Financial			Non-financial	
	Actual	Projected		
<input type="checkbox"/> Licensing			<input checked="" type="checkbox"/> Nurturing of R&D talent	4
<i>(i) no. of companies</i> <i>(ii) licensing income (\$million)</i> <i>(iii) royalty received (\$million)</i>			(i) no. of R&D positions provided/ duration (ii) no. of research interns trained/ duration	
<input type="checkbox"/> Transfer of IP (i.e. exclusive)			<input type="checkbox"/> Sharing of knowledge	
<input checked="" type="checkbox"/> No. of samples/prototypes/products produced/sold and income (\$ million)	As at 31 January 2010, the company has sold more than 100 units of MyCar. (The unit price is	The company estimates that the sales will reach 1000 units in 2010-11.	(i) no. of academic/professional publications (ii) no. of seminars/conferences attended to disseminate the R&D results	

	\$100,000)			
<input type="checkbox"/> Spin-off			(iii) other channels (e.g. web sites, company visits)	
<input type="checkbox"/> Income from contract research for further development of R&D results (\$million)			<input checked="" type="checkbox"/> International and Local Industry/ Technology Award(s)	<p>Green Fleet Award at British International Motor Show held in London in July 2008</p> 
<input type="checkbox"/> Subsequent income generated from the licences granted/transfer of IP/spin-off			<input checked="" type="checkbox"/> Contribution to Government Policy and social value	<p>The deliverable contributes to government measures to promote the use of electric vehicle in Hong Kong</p> 
<input checked="" type="checkbox"/> Others	EuAuto has recently announced a merger of the company with a US auto mobile maker which targets		<input type="checkbox"/> Further development of R&D results by another party (parties)	

	at the EV/hybrid vehicle market. The company estimates that the sales volume of the US market could reach 20,000 units in 2011.		
	Total: _____ million	<input type="checkbox"/> Soft power (e.g. setting new standards or enhancing Hong Kong’s reputation as an innovation and technology centre)	
		<input checked="" type="checkbox"/> Others	The company has demonstrated the reputation of the local industry in the automobile market, in particular, the development of EV.

Please include the timeframe for all estimated income and achievements (up to 10 years).

Reasons rendering the project not successful in meeting the objectives and achieving the desired deliverables (if applicable) –
