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FACT SHEET

Improving Quality and Efficiency of Healthcare Through Infocomm: Seven Consortia to Develop and Trial Innovative Healthcare Infocomm Solutions

The importance of infocomm to transform the healthcare sector

Healthcare is information-intensive and infocomm can be a key enabler to improve the quality and cost effectiveness of the healthcare delivery process. Infocomm innovations in healthcare institutions are playing a critical role in improving healthcare quality, such as significant reduction of preventable medication errors in the case of Computerised Physician Order Entry (CPOE).

A key benefit of leveraging infocomm is providing healthcare practitioners with access to timely and accurate information and complementing their decision-making process with clinical decision support systems. This will help to enhance the quality of care and also enable doctors to manage their patients at the right level of care. For example, visibility of patients' medical history allows a principal physician to holistically manage and coordinate the care of patients with chronic diseases who may require treatment from different specialists across the healthcare system for their multiple ailments.

Call-for-Collaboration

The Ministry of Health (MOH), the Infocomm Development Authority of Singapore (IDA) and The Enterprise Challenge (TEC) an initiative under the Prime Minister's Office issued a joint Healthcare Call-for-Collaboration (CFC) on 4 October 2007 inviting healthcare institutions and infocomm partners to form consortia to architect, develop and trial innovative solutions to improve efficiency in the healthcare system and for better clinical care quality. A S\$3 million investment over two years (from June 2008 to June 2010) will be provided by IDA, MOH and TEC to support the projects.

This is built on IDA's ten-year Intelligent Nation (iN2015) masterplan for the Healthcare sector to capitalise infocomm to enable innovation in healthcare delivery processes.

When the CFC closed on 31 January 2008, 27 proposals were received. In June 2008, seven consortia were selected to trial innovative infocomm solutions as part of the Healthcare CFC programme. The consortia will commence development in 2008. The projects are targeted to complete in two years (by 2010).

The CFC programme aims to encourage innovations in the following areas:

- a) Delivering safer care by enhancing medication safety, reducing healthcare associated infections, improving communication among healthcare practitioners during patient handovers and ensuring right site procedures (for example, right implant and right patient);
- b) Enhancing quality of care by providing care the patient needs according to best medical science and evidence available today (e.g. timely information to support decision making), improving the continuity of care and reducing reworks (e.g. re-admission, repeat procedures, etc), and;
- c) Achieving greater efficiency in healthcare operations by facilitating re-engineering of workflows and simplification and standardisation of processes.

FOR MORE INFORMATION

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SOLUTIONS PROVIDED BY SEVEN CONSORTIA UNDER THE CFC

Project Title	Intelligent & Real-time Operating Theatre Dashboard System
Consortium Lead	National University Hospital (NUH)
Members	<ul style="list-style-type: none"> ▪ Friartuck Pte Ltd ▪ Fujitsu Asia Pte Ltd
Summary of Solution	<p><u>Background</u></p> <p>The management of operating rooms is a very complex process. It requires the coordination of human and material resources in a way such that surgery can be performed efficiently, cost effectively and safely. Decisions involving operating room coordination require inputs from multi-disciplinary stakeholders and disparate IT systems. The dynamic setting requires decisions to be made based on often incomplete or sporadic information resulting in repercussions that propagate throughout the system.</p> <p><u>Proposed Solution</u></p> <p>In this project, the consortium will be implementing an integrated and real-time Operating Theatre Dashboard system to capture, synthesise, and automatically displays essential patient's surgical information from disparate sources, with the aim of implementing an efficient pre, intra and post operating room workflow centred around patient safety.</p> <p>The proposed solution allows information to be gathered from diverse sources and pertinent information to be displayed to the relevant staff. With the proposed system, nurses in the A&E department will be able to identify available slots and make timely arrangement for the patient. Nurses in the wards can monitor the progress of the surgeries and prepare patients in time for subsequent operations to avoid any delays and maximise the usage of the operating theatres. Relatives and families of the patient will be kept informed of the status of the operation in the waiting area via the dashboard. The proposed system will also allow nurses in the operating rooms to trigger an automatic notification such as request for blood, equipment, or lab test to the appropriate caregiver or service provider via text messaging. This reduces the amount of time needed for the respective caregiver or service provider to revert, increases patient safety and allows staff in the operating rooms to focus on patient care.</p>
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Project Title	Improving Door-to-Balloon Times
Consortium Lead	Singapore General Hospital (SGH)
Members	<ul style="list-style-type: none"> ▪ National Heart Centre (NHC) ▪ Singapore Civil Defence Force (SCDF)
Summary of Consortium Solution	<p><u>Background</u> Acute myocardial infarction, also known as a heart attack, occurs when a sudden blockage in the coronary arteries causes damage and death to part of the heart. This is an emergency where early treatment enhances the outcome for patients. The current treatments to reopen blocked arteries in Singapore are balloon angioplasty or by administering a thrombolytic drug.</p> <p><u>Proposed Solution</u> The consortium solution aims to reduce treatment times for acute heart attacks (Door-to-Balloon (D2B) and Door-to-Needle (D2N) times) for patients at the Emergency Departments (ED) of all the major public hospitals, through the use of pre-hospital wireless 12-lead Electrocardiogram (ECG) transmission by the SCDF ambulance service. Pre-hospital ECG transmission allows the ED to stand by for the ambulance arrival and allows earlier activation of treatment for eligible patients. Such patients will be fast-tracked to receive immediate medical attention. In addition, pre-hospital ECG will enable the ED to activate the on-call cardiology interventionist before the arrival of the patient at the hospital.</p> <p>The consortium proposes that the ECG readings be transmitted wirelessly to a receiving station which, will be hosted at the Headquarters of SCDF. The receiving station will automatically route the data to the respective receiving hospitals within seconds. This will alert ED staff of the ambulance's impending arrival and allow earlier activation of treatment for eligible patients, thus reducing D2B times.</p> <p>Studies have shown that if D2B time can be reduced to less than 90 minutes, for every 33 patients treated, 1 additional life will be saved. Therefore, this proposed solution will be able to significantly reduce mortality for a widespread health problem.</p>
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Project Title	Integrated Children Mental Wellness System
Consortium Lead	Institute of Mental Health (IMH)
Members	<ul style="list-style-type: none"> ▪ Fujitsu Asia Pte Ltd ▪ ASKnLearn Pte Ltd
Summary of Solution	<p><u>Background</u> Currently, children and adolescents with Attention Deficit Hyperactivity Disorder (ADHD) and Anxiety Disorders are treated at the Child Guidance Clinic, Singapore's main centre for the treatment of behavioural and emotional disorders in the young. The interventions may consist of medical treatment as well as psychological therapies such as cognitive behaviour therapy. These interventions are generally paper-based and have to be provided on site by mental health professionals.</p> <p><u>Proposed Solution</u> The consortium aims to develop an innovative and holistic IT system to facilitate early detection and intervention of children with mental health conditions, starting with the commonest behavioural and emotional problems. It will also serve as a portal to promote awareness of mental wellness to the public.</p> <p>The proposed solution involves the development of a web portal that serves as a single point of access for mental health professionals, children and their families to interact with each other, and to access resources and content for treatment and education. Therapeutic role-play computer games based on locally developed interventions such as the Audio Visual Interactive Decoding (AVID) programme and a Cognitive Behavioural Therapy (CBT) workbook would be constructed. These interventions are meant for children with learning difficulties, attentional problems and anxiety disorders. There would also be learning content covering topical areas relating to the treatment and management of anxiety and ADHD for care-givers and medical professionals.</p> <p>The system will facilitate the provision of early assessment, treatment and on-going care by mental health and other healthcare professionals, equip family members with the capability to manage their children with behavioural and emotional problems in the community, and generate public awareness on mental well-being.</p>
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Project Title	ORLocate
Consortium Lead	O'Connor's Pte Ltd
Members	KK Women's and Children's Hospital (KKH)
Summary of Solution	<p><u>Background</u> An integral but laborious part of surgery is to prepare all the necessary surgical apparatus and consumables that will be needed. These need to be tallied against an inventory list after the surgery to make sure every single apparatus or consumable has been accounted for.</p> <p><u>Proposed Solution</u> This project will provide a comprehensive solution that allows KKH's medical and nursing professionals to automatically track and count all surgical apparatus and consumables so that they can be immediately alerted of any missing items.</p> <p>The proposed solution uses a Radio Frequency Identification (RFID) tag to track each item so that manual counting can be eradicated.</p> <p>The proposed solution saves time and minimises human errors which may arise from manual counting of surgical apparatus and consumables. It has the potential to help KKH enhance patient safety, as well as to allow its medical and nursing professionals to focus more on patient care, thereby optimising the use of KKH's manpower and operating theatre resources.</p>
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Project Title	Care-QUEST
Consortium Lead	National Healthcare Group (NHG)
Member	Healthcare Messaging Systems Pte Ltd
Summary of Solution	<p><u>Background</u> Presently, clinicians are unable to perform real-time clinical queries and trend analysis in groups of patients under their care. Often they need to raise a request to the IT department which usually requires a long turn around time before their requests are processed.</p> <p><u>Proposed solution</u> The proposed solution, Care-Quest, seeks to implement real-time bioinformatics by constructing a proof-of-concept clinical query engine support tool to allow clinicians to data-mine clinical information from existing hospital systems. Care-Quest is the first real-time clinical query engine in Singapore that is specially designed to be a support tool for doctors to monitor and measure the quality of their patient care. The system will enable doctors to ask clinical questions and empower them to seek insights in four key areas, quality of care, patient safety, and surveillance of trends and provide a tool for learning and research.</p> <p>A simple user's interface will be incorporated for the doctors to construct medical queries under his/her care, and these queries can be stored in a library and shared amongst peers, to be re-used and applied for patients under their care. Patient's confidentiality will be protected as only the clinician in charge is given the access to specific patient identifiers. Broader groups of patients can only be accessed with prior institutional and ethics approvals.</p> <p>Care-Quest will encourage a climate of research and step-wise improvement in health care delivery by providing realtime answers to urgent questions.</p>
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Project Title	Quality through Unique Electronic Structured Templates (QUEST)
Consortium Lead	National Heart Centre (NHC)
Member	Eclipsys Healthcare IT (Singapore) Pte Ltd
Summary of Solution	<p><u>Background</u> Patient's medical data and information are currently recorded on paper. In instances of illegibility of handwritten information or data misplacement, doctors are unable to respond expeditiously to referring doctors. A fast-track appointment system was implemented by the NHC in 2004 for scheduling of priority appointments. However, it was found that a substantial proportion of fast-track referral cases could have been given routine appointment and vice-versa.</p> <p><u>Proposed solution</u> The objective of this solution is to implement an electronic clerking system to streamline clinicians' paper based task at NHC. The proposed system will capture essential information identified by NHC's clinicians via a point and click format. With the captured data, the system will be able to track outcome and provide decision support in developing treatment plans for patients.</p> <p>The implementation of the proposed system will streamline the clinicians' paper-based task, reducing likelihood of errors from illegibility and data misplacement. It also provides NHC's clinicians with a decision support system to assist in predicting heart disease risk and prioritising appointments for critical referral cases, thus greatly enhancing patient safety.</p>
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Project Title	Healthcare X-Change Portal
Consortium Lead	Singapore Health Services (SingHealth)
Member	ECnet Ltd
Summary of Solution	<p><u>Background</u> The current local systems and websites by healthcare providers and bodies offer a low level of public interaction, and may thus be viewed as informational and/or promotional sites, which limits their appeal to the individual.</p> <p><u>Proposed solution</u> The proposed solution aims to improve the flow of useful information and advice on healthy living/medical care through providing expert content and enhancing interaction with users, and to promote a stronger sense of self-involvement and ownership amongst members of the public. The portal is a platform to create a community of health activists, with the guidance of professional healthcare advisers from SingHealth that can benefit the wider community in a cost effective and sustainable manner.</p> <p>With the implementation of the proposed solution, individuals will have ready access to health information, health assessment tools, and healthcare experts from SingHealth, thus empowering the individuals for self-management of health conditions. It is hoped that the implementation of the portal will help result in a healthier nation, with focus on illness prevention, faster intervention of illnesses and thus a reduction in medical costs.</p>
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