



Health Promotion Board

Integrated Service-Oriented Healthcare System

SHAPE & IDEAS

(Student Health Assessment ProgrammE and Integrated Dental Electronic Assessment System)



The Singapore Health Promotion Board (HPB), a statutory board of Ministry of Health is chartered to lead national health education, promotion and disease prevention efforts.

It is responsible for implementing health education and promotion programmes, providing health screening services, delivering school health and dental services, and promoting healthy lifestyles.

The School Health Service (SHS), a division of HPB is responsible to promote good health and reduce illness among school-going population in Singapore, through comprehensive school and clinic-based programmes.

The School Dental Service (SDS), a department under the SHS Division is responsible to educate and maintain the high standard of dental health of all school children through the systematic provision of basic dental care.

SHAPE & IDEAS *Fast Facts*

- ✦ Asia's largest and only integrated real-time primary patient management system for medical and dental care
- ✦ Largest coverage of 330 primary and secondary schools and over 1,200 kindergartens and childcare centres
- ✦ Extensive external interface with government ministries, public hospitals, polyclinics
- ✦ Largest LIVE data migration exercise involving 65 million records accumulated over the last 15 years from IBM Mainframe to SHAPE system
- ✦ Fast, accurate capture of LIVE screening test and medical data from the field involving 35 screening teams of doctors and nurses deployed every week
- ✦ Contains, maintains and manages over 1 million student medical records
- ✦ Supports more than 900 patients and over 50 specialist clinics at Student Health Centre everyday
- ✦ Highly Robust, Stable, Reliable: 99.95% uptime, 40,000 transactions per peak hour
- ✦ Right from day one, real-time capture and tracking of health records kicks-in throughout the patient's lifetime

“SHAPE & IDEAS has radically improved front-desk services, resulting in 50 per cent savings of patient registration time, savings of 400 man-days/year for appointment-scheduling and have cut down administrative workload.”

Mr Lam Pin Woon

Chief Executive Officer
Health Promotion Board, Singapore

Challenge

The ongoing national school and clinic-based programmes are targeted at 500,000 students across the nation's 300 schools that include primary schools up to tertiary institutions and special institutions e.g. Madrasah and special schools.

Every week, up to 30 mobile health teams comprising doctors, nurses and clerical officers provide onsite school-based health screening and immunization services in schools during the school terms.

Add another 1,000 kindergartens and childcare centres to the health screening coverage and altogether, it makes up close to a 1 million student medical records for the entire healthcare database. This calls for a robust and scalable National Student Screening & Referral System to help HPB support and facilitate these programmes.

The National Student Screening & Referral System is an integrated and centrally managed clinical systems composed of the **Student Health Assessment Programme (SHAPE)** and the **Integrated Dental Electronic Assessment For Students (IDEAS)** operational systems.

Large-scale Integration and Tracking

The School Health Centre (SHC), a department of the SHS serves as a referral centre for the school-based health programme where students who are identified during field screening to have health problems are referred for further assessment and management. Those who missed the health screening or immunization in school are also referred to the SHC.

In the same way, as part of the school-based health programme, dental health screening is conducted at the schools. The School Dental Service (SDS) operates 185 static Field Dental Clinics (FDCs), 30 Mobile Dental Clinics, a School Dental Centre (SDC) and three Zonal Referral Centres. The SDC is situated at the HPB building and serves as a referral centre for the FDCs and the MDCs.

The SHC functions like a large-scale outpatient institution housing more than 50 general and specialist clinics or carepoints which provide further assessment, investigation and management of students with health problems. Attendance at the SHC is by appointment.

Primarily, the SHS had two existing internal systems, namely the School Health Service System (SHSS) and the School-based Health Programme System (SHPS). The SHSS was running on IBM mainframe, IBM ES/ 9000 with OS/ 390 and Oracle database for its Clinic Module and Appointment Module that was used to support the SHC operations.

A different wireless web-based system called the School-based Health Programme System (SHPS) was used to support field screening which allowed the mobile teams to capture and store students' medical and immunization records as well as view clinical data from the SHC.

There was also a need to interface with a wide range of external systems at the designated Polyclinics, Ministries such as the Ministry of Education, the Ministry of Community Development & Sports, National Immunization Registry (NIR), childcare centres, kindergartens, the new SDS system, the Central Provident Fund Board and the Public Service Division to share and access related data and information to support the student health programmes.

Unlike the SHS, the SDS did not have any existing computerized system for dental care. Student dental records, appointment scheduling, daily/ monthly work reports were carried out manually.

Faced with different internal systems and the need to interface with such numerous and diverse external systems, HPB recognized that it would require an integrated system to enhance sharing and accessibility of information among different service stations within SHC as well as to communicate with the external systems. In addition, it needed an easy, seamless and efficient means to capture, share medical records, dental records as well as track and

monitor disease conditions among the school-going population. The new system would also facilitate smooth workflow and appointment making in the clinic to minimize the student's waiting time at each service station.

Solution

Ecquaria's deep expertise and its track record of 100 percent successful implementation experience for large scale mission-critical projects along with the proven scalability and extensibility of its flagship platform, the **Ecquaria Service-Oriented Platform™ (Ecquaria SOP™)** are critical contributing factors for being selected as HPB's technology partner to design, develop and implement both SHAPE and IDEAS systems.

Massive Data Migration

The system is also arguably the largest and most complex service-oriented healthcare IT system undertaken by a healthcare organization in Singapore - if not the world - showcasing best-of-breed real-time patient and case monitoring capabilities.

The project is mammoth in both scale and complexity in view of the sheer massive data migration exercise involving over 65 million records accumulated over the last 15 years from IBM Mainframe to the new enterprise-class JEE Web-based SHAPE and IDEAS system that has Ecquaria SOP™ serving as its underlying infrastructure.

In particular, SHAPE holds and manages the electronic medical records for Singapore's entire student population - about 500,000 active students at any one time - with a new cohort entering the system at the beginning of each year.

In essence, HPB was looking for a comprehensive, mission-critical and integrated patient management system to collate, provide statistical reports for monitoring and tracking performance of screening programmes for students' medical and dental health.

Our Approach: Ecquaria Service Covenant Framework™

Beyond just transforming HPB's clinical, business processes and operations, Ecquaria's approach to healthcare management is to empower different levels of healthcare providers ranging from the management, clinicians, front-desk to the operational staff to offer committed levels of service covenants or end-to-end turnaround times to their patients i.e. students.

Ecquaria's revolutionary **Ecquaria Service Covenant Framework™**, (**Ecquaria SCF™**) is a refreshing approach that equips the HPB ecosystem with an integrated platform, powered by its award-winning software infrastructure product, the **Ecquaria Service-Oriented Platform™** (**Ecquaria SOP™**), to assess **real-time** over and under-achievement of stipulated **Key Performance Indicators (KPI)** in a closely mapped, dynamic business-IT process workflow.

Right at the start, both SHAPE and IDEAS systems are designed as a highly scalable, mission-critical and integrated Service-Oriented system using **Ecquaria SCF™** as a key guiding approach and philosophy.

Coupled with the intuitive, top-down business process-oriented solution approach enabled by **Ecquaria SOP™** and the **Ecquaria SCF™**, HPB's business processes related to administration, clinical systems as well as all various Service Stations and Care Points are accurately mapped to the SHAPE and IDEAS system. In addition, **Service Covenants** can now be established intuitively and the associated **Key Performance Indicators** tracked and reported in real-time - all this as a matter of forethought.

This significantly empowers healthcare providers in the healthcare ecosystem to pre-empt or redress any service degradation in service levels across the healthcare delivery chain.

A One-stop, Non-stop Service-Oriented Healthcare Solution

The new SHAPE system which links the Front Desk Management System (FDS) and Clinical Information System (CIS) is highly scalable and available that is capable of supporting up to 900 patients a day at the SHC inclusive of the entire day-to-day planning and operations of the doctors and nurses at more than 50 clinics and carepoints.

Intuitive, System-Driven Care Plans

SHAPE's intelligent queue system manages the patient flow the moment they arrive at the SHC - such as sending them for registration, payment and then into the respective Clinics they need to visit. In the Clinics, SHAPE intelligently triggers different specialized medical careplans and workflows based on the reason for referral - eg, Cardiac Careplan for heart problems etc.

The action does not stop at night. After office hours, there are nightly batch external interface transactions - exchange of large quantities of data within SHPS (school medical screening results and appointments), Ministry of Education (updated student list, their schools and class), Ministry of Home Affairs (updated student address, death and adoption status), NIR (exchange of patient immunization records), MCPS (Medical Claims), Ministry of Community Development & Sports and MCYS & the People's Action Party Community Foundation, PCF (Preschool and Kindergarten student list) and the Ministry of Education -TAF (List of overweight and underweight students and their schools).

Common Services and Data Exchange

With a central application platform for both SHAPE and IDEAS, HPB enjoys reusability of some of the common services and functions such as authentication, access control, electronic payment, data exchange services and workflows, which help reduce the complexity and costs of maintaining both systems.

The new integrated system also allows HPB to re-use some of the common services such as appointment scheduling, health record management that were earlier developed for the Breast Cancer Screening and Cancer Screening system based on the central Ecquaria SOP™ platform. This dramatically reduces overall development effort, risks and costs.

In short, the Ecquaria SOP™ - empowered SHAPE and IDEAS system epitomizes superior delivery of healthcare in a service-oriented manner, embracing the concept of Service Covenanting™, Process Tracking, Process Monitoring and Proactive Alerts right at the start of the delivery chain.

The end result is a service-oriented patient care solution that provides the students dedicated and efficient healthcare services through improved clinical response times and more accurate diagnosis.



Benefits

Delighting Patients

- ✓ Shorter waiting time, clinical response time and referral cycle
- ✓ Improved Patient Care
- ✓ One Patient, One EMR - Lifelong e-Record captured

Delighting Clinicians & Administration

Real-time, Seamless Data Exchange

- ✓ Online patient data accessibility at every point in the care process across all departments, stakeholders (e.g. Front Desk Admin, General and Specialist Clinics, Treatment Room etc.) as well as field and external systems at public/ private institutions
- ✓ 3G Wireless (for IDEAS)
- ✓ Real-time Access - Anytime, Anywhere
- ✓ One Patient, One EMR

Intuitive, System-driven Care Plans

- ✓ Ease of clinical process and data management - System intuitively recommends prescribed Clinical Processes or treatment templates (Care Plans) for doctors/ dentists and nurses
- ✓ Proactive alerts to different users e.g. appointment reminders, drug allergy etc.
- ✓ Care Plans based on the SOAP (Subjective Objective Assessment and Management Plan) procedure and International Code of Diseases (ICD) ensure compliance to international best medical practices
- ✓ Rapid adoption and deployment of Care Plans and best practices for future extended systems

Quick Capture & Access to Patient Data

- ✓ Fast, accurate, intuitive medical/ dental data capture and retrieval leading to accurate diagnosis and treatment

Delighting Management

Fully Web-based, Centralized Integrated Management System

- ✓ Highly available, robust, scalable, open, integrated and centrally managed system for data storage and management

Ease of Management & Tracking

- ✓ Intuitive, top-down process-driven, visual mapping of operational (FDS) and clinical processes (CIS) across all Service Stations and Care Points increase accuracy, compliance and efficiency in implementation and management
- ✓ Built-in Change Management Intelligence e.g. one-stop consolidated billing and payment in sync with changing or evolving business rules and government policies
- ✓ Highly configurable role-based access security control system (RBAC), enforcing "need-to-know" basis of medical records
- ✓ Real-time patient and case monitoring capabilities via customizable CXO, management and operations dashboard dials
- ✓ Improved governance
- ✓ One Patient, One EMR - Progressive and real-time tracking of patient's lifelong health meets national disease prevention objective

Investment Protection

- ✓ Common Services and Functionalities (e.g. Appointment management, authentication, data exchange controls etc.) contribute to long-term re-usability and maintainability
- ✓ Ecquaria's award-winning product and innovative expertise combined with in-depth medical and dental domain knowledge from medical and health experts and professionals

Supporting National Preventive Healthcare Programmes the Service-Oriented Way



SHAPE & IDEAS

Student Health
Assessment
Programme

&

Integrated Dental
Electronic Assessment
for Students

"IDEAS is a simple, streamlined and user-friendly electronic system which enables us to capture clinical records easily. It also offers efficient clinic management and reporting for HPB's School Dental Service. This has enhanced overall patient experience and improve customer service."

Dr Eu Oy Chu

Deputy Director
School Dental Service
Health Promotion Board, Singapore



Ecquaria is NIA and APICTA 2006 Finalist. Ecquaria SOP™ is proud to power Asia Pacific's award-winning and Asia's largest and only integrated REAL-TIME Healthcare & Dental System (SHAPE & IDEAS).

For more information, visit www.ecquaria.com

Every effort has been made to ensure the information included in this brochure is true and correct at the time of going to press. However, the products described herein are subject to continuous development and improvement, and the right is reserved to change their specification at anytime.

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