

Evolution of Personal Health Records in Singapore

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ABOUT NCS

- IT Services arm of SingTel
- Asia's Leading IT & Telecommunications Company offering a full suite of:
 - Telco (voice, data, Internet, mobile & satellite)
 - Consultancy and System Integration Services
- Global workforce of more than 20,000
 - SingTel has 32 offices in 16 countries
 - NCS has 18 offices in 10 countries
 - Over 7,000 staff across the region with 300+ staff in Australia
- Group revenue of \$8 Billion in Australia



Our Regional Commitment



Our Customers

- Ministry of Health, Singapore
- Ministry of Defense, Singapore
- Department of Health, Hong Kong
- Department of Health, South Australia
- Health Promotion Board, Singapore
- Health Sciences Authority, Singapore
- Schering-Plough Pharmaceuticals
- Roche Pharmaceuticals
- Pharmalink Asia Pacific
- National Healthcare Group, Singapore
- Singapore Health Services
- Singapore Anti-Tuberculosis Association



Our Health Industry Solutions

Hospital Information Systems

- Inpatient Management
- Outpatient Management
- Electronic Inpatient Medical Record
- Emergency Patient Management
- Patient Billing & Cash Management
- Appointment Scheduling
- Electronic Meal Ordering
- Financial Management & Cost Control
- Sales & Distribution
- Human Resource & Payroll
- Management Information Reporting

Professional Support Systems

- Inpatient Medication Administration
- Electronic Medical Record Exchange
- Kidney Transplant Management
- Liver Disease Management
- Renal and Dialysis Management
- Community Psychiatric Care
- Chronic Disease Management Program
- Pharmacy Tracking & Dispensing System

Government , Licensing and Regulatory Systems

- Pharmaceutical Regulatory & Information System
- Quality Enhancement & Surveillance System
- Medical Device Regulatory & Information System
- Blood Donor Management Solution
- Laboratory Information & Scientific Data Management
- Bio-Safety Management System
- National Casemix and Data Warehousing Solutions
- Medical Claims Processing
- Secure Health Network (Medinet)

Public Health Systems

- Public Health Information System
- Contact Tracing System
- Adverse Drug Reaction Register
- Student Health Management
- National Disease Registries
- Organ Transplant Registry
- SARS Information System
- Vaccination Information System
- Integrated Dental Management
- Personal Health Records

Personal Health Records vs Medical Records

- Personal Health Records contain information collected by the healthcare consumer
- Medical Records contain information about a consumers health compiled and maintained by healthcare providers
- A PHR does not replace the legal medical record of any provider.
- Increasingly electronic PHR's are leveraging content from medical records

Personal Health Solutions in Singapore

- 3 Web based solutions
- Evolved over 10 years
- All solutions developed by NCS
 - Fit For Life
 - MyHealth.sg
 - National Health Portal

WWW.FITFORLIFE.COM.SG

myhealth.sg

my
HEALTHPORTAL
good health - a click away



- Commissioned in 1999
- Began life from an internal staff program
- Personal Account accessed via Username/Password
- Health Risk Assessments for Personal Health Report
- Both consumer and provider entered data
- Developed using Microsoft ASP
- Decommissioned in 2008



- Commissioned in 2007
- More comprehensive Health Assessments
- Managed Programs and Interactive Content
- Personalised Health Profile and Feedback
- Personal Health Folder with case history
- 5000 Active users and 70,000 visits in first year
- www.myhealth.sg



Health Screening

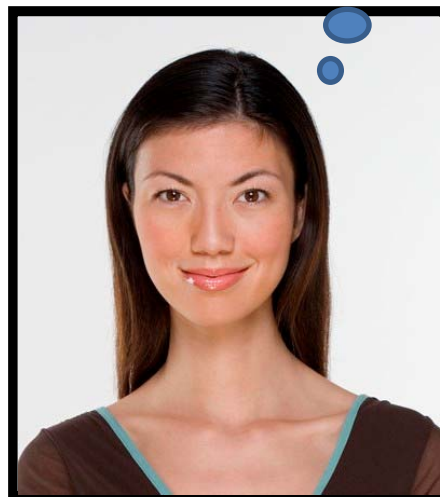
Weight Management



Fitness



Mental Health



Monitors health risk factors such as

- Hypertension
- Blood pressure
- Diabetes
- Cholesterol

...and provides

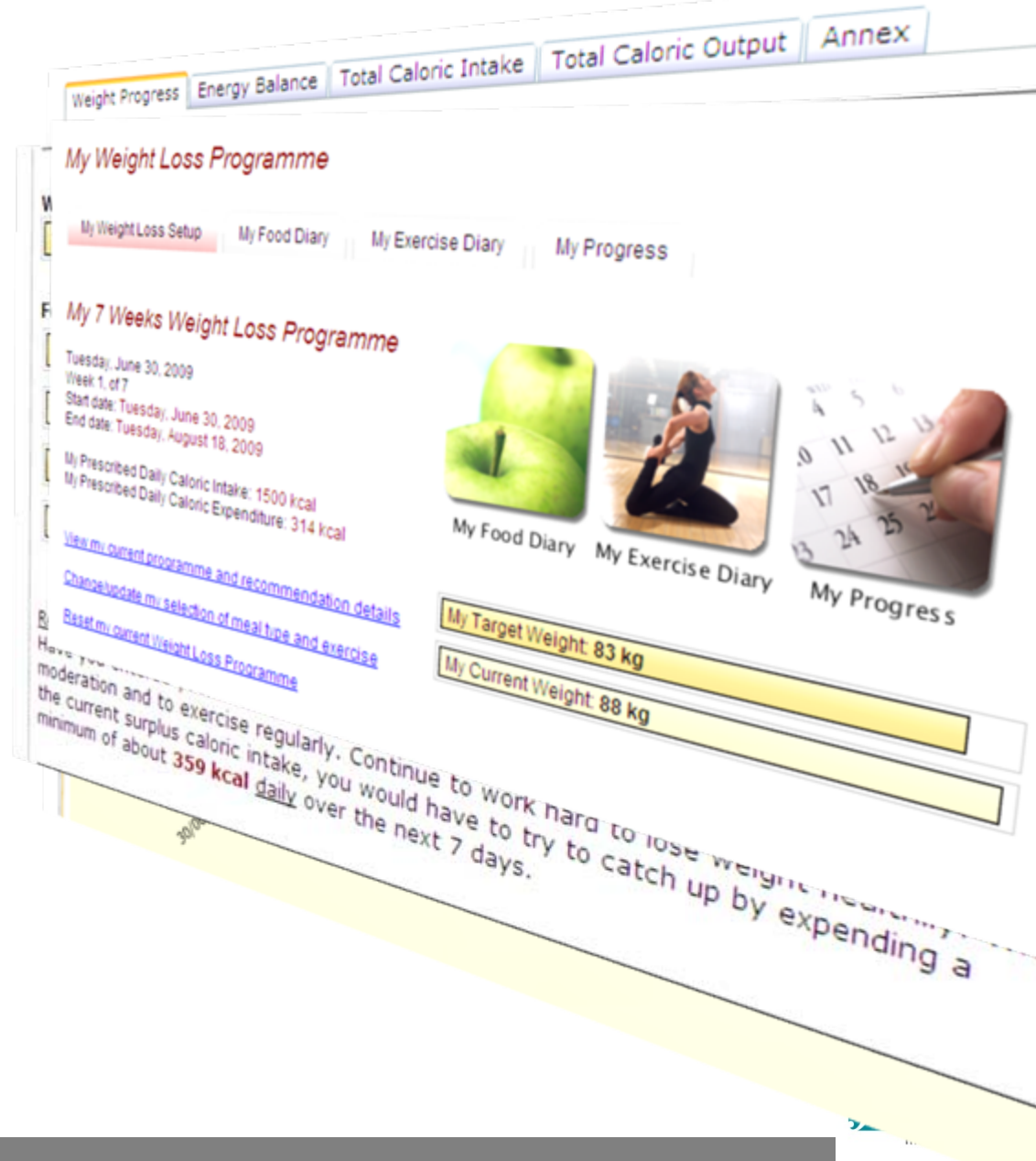
- Health report card
- Trend charts
- Personalised advice



Weight Management

Uses Screening Data to develop personalised:

- Goals
- Weight Loss Plan
- Weekly Status Reports
- Chart Progress

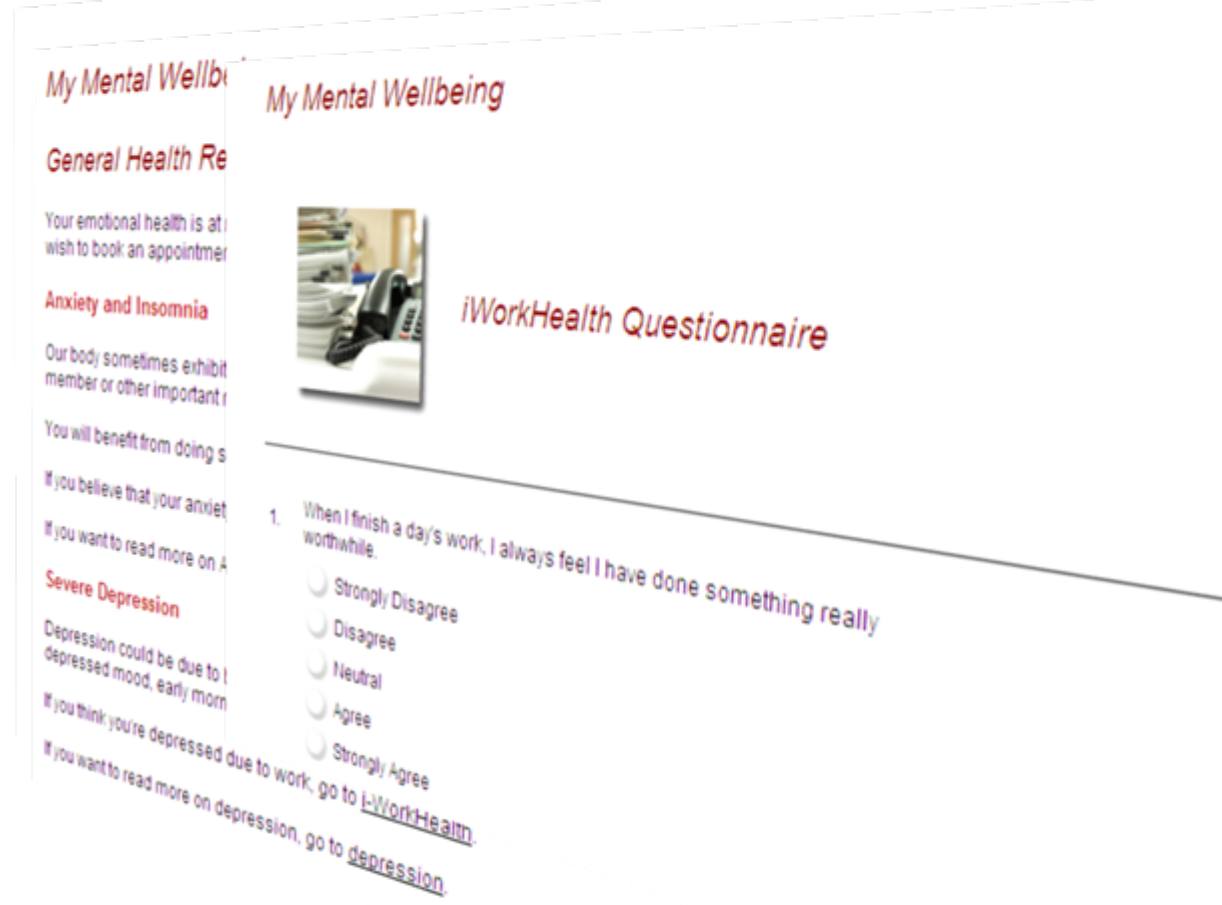


Online Assessments for:

- General Mental Health
- Workplace Stress
- Post Traumatic Stress

Offers advice on coping strategies for:

- Insomnia
- Depression
- Anxiety
- Stress Management





Creates a fitness plan that:

- Evaluates fitness level
- Sets Goals
- Monitors Diet
- Selects Exercises
- Personal Fitness Diary
- Monitors Progress

My Fitness Programme

[My Fitness Setup](#)[My Food Diary](#)[My Exercise Diary](#)[My Progress](#)

Welcome to your personal fitness programme

We offer you a choice of up to three common exercises – walking, running and swimming. You can participate in these activities with minimal investment – a pair of jogging shoes and/or swimwear.

These exercises are best suited for those starting their fitness journey here.

[Get Started](#)

Technology

- NCS iConnect Framework
- Microsoft ASP.net AJAX extensions
- Two factor authentication using Cardspace
- Silverlight interactive multimedia

- Commissioned 2009 (Phase 1)
- Personal Health Record (PHR)
- Personalised health management tools
 - Health Risk Assessment (HRA)
 - Behavioural Health Intervention Programmes (BHIP)
 - Health Trackers
- Health education resources
- Collaborative disease management between patient and care providers

Internet
Users



HPB
Users



Other
Organisations



Consumer Portal - NCS PortalConnect™ Framework

Home Page

Search Service

Dashboard

Dynamic Content

NHP Business Services

PHR Services

- My Laboratory Results
- My Drug Allergies
- My Food & Environmental Allergies
- My Healthcare Expenditures
- My Health Insurance Coverage & Premiums
- My Health Trackers

User Services

- My Dashboard
- My Alerts
- My Subscription
- My Reports
- My Appointments
- My Caregivers

Portal Maintenance

- Code Tables
- System Configuration
- System Reports
- User Management
- Access Control
- Page Templates

BHIP Adapter Framework

- Subscription
- Single Sign-On

Common Services

- User Registration
- Profile Management
- Calendar of Events

Health Risk Assessment

BHIP Packages

Weight Management

Smoking Cessation

Diabetes Management

more...

NCS iConnect™ J2EE Framework

Identity & Access Management

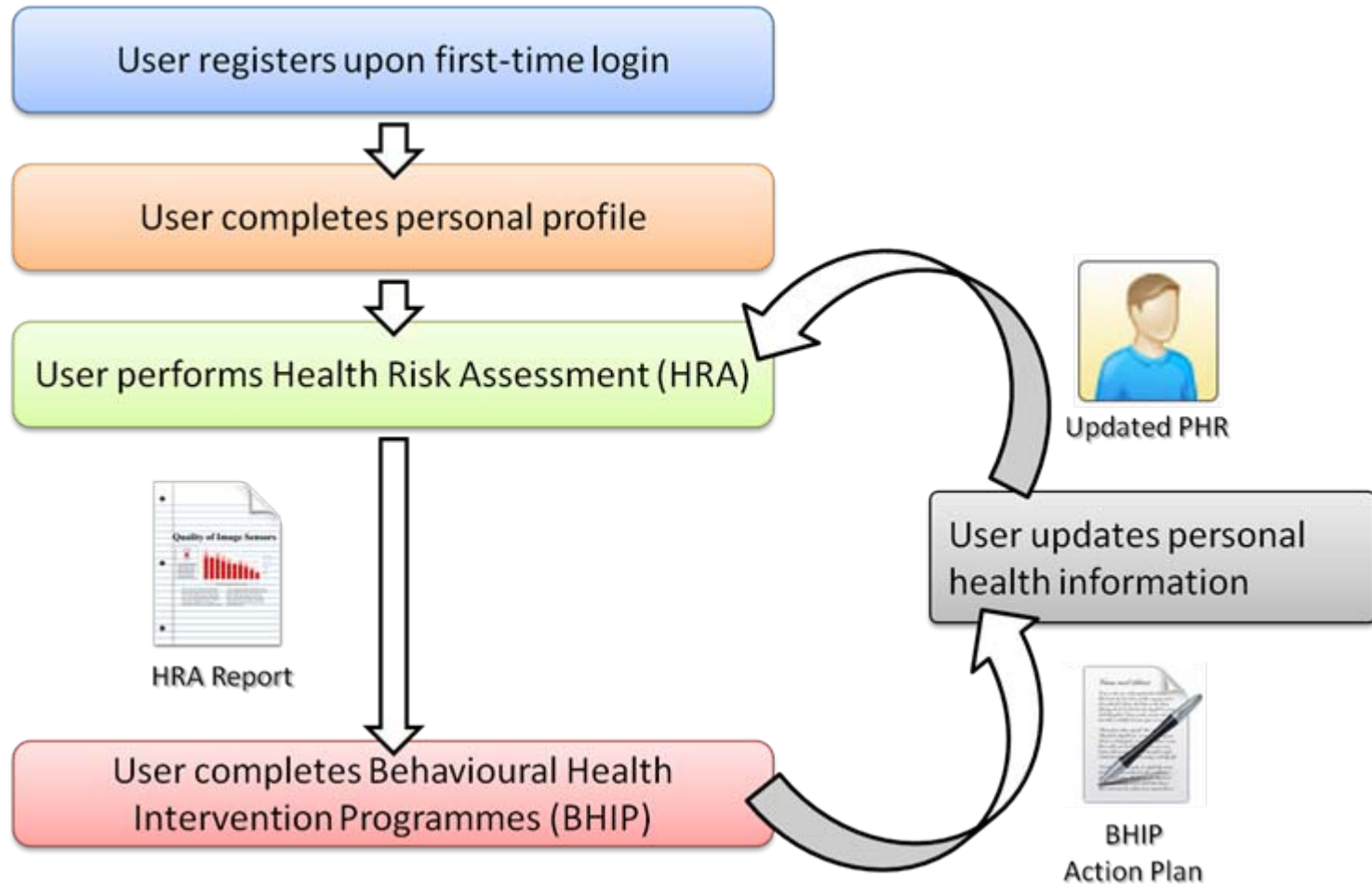
System Management Services

MediNet Service Bus

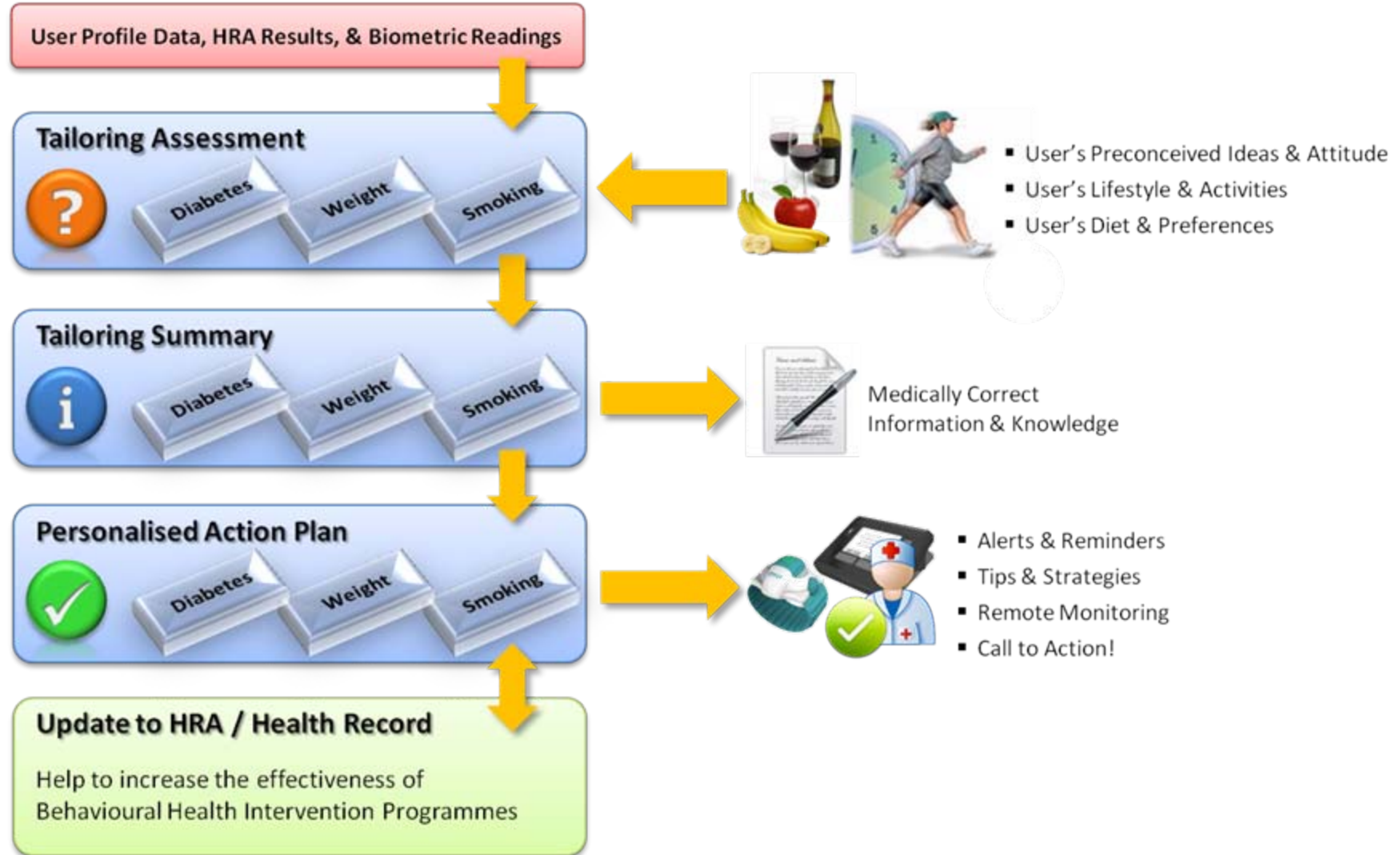
Personal Health Record

- Healthe Platform incorporating Oracle HTB
- Security and privacy built into architecture
- Connects, auto-populates and shares data between:
 - Healthcare providers information systems
 - Consumers
 - Home health monitoring devices
 - Behavioural Health Improvement Programs

Enrollment



Behavioural Health



Benefits

- Business driver is for demand reduction particularly in Chronic Disease
- Identify and Target 'at risk' population
- Empower healthcare consumers
- Proven benefit from Fit for Life and Myhealth
- Proven benefits in Clinical Trials

Benefits

Diabetics:

- 92% of participants manage their diabetes better,
- A1C levels dropped from 7.17 to 6.74,
- 67% improved their medication habits
- 86% said they are able to better communicate with their doctor

Benefits

Obesity:

- 55% lost weight,
- 15% dropped an entire BMI stratification
- 45% increased physical activity
- 52% improved eating habits

Benefits

Smokers:

- 58% of participants quit smoking
- 19% Intent-to-Treat quit rate
- 92% of participants who quit smoking indicated high confidence to remain smoke free

Outreach Strategy

Year	Phases	Cumulative Number of Users	Outreach For Recruitment Of Users
2009	1	10,000	Polyclinic and government specialist clinics patients
2010	2	50,000	Civil service workplace
2011	3a	100,000	Private clinics and hospitals patients Selected private workplaces
2012	3b	200,000	More workplaces Insurance policyholders

Beyond Phase 3, the NHP shall be operated via a Public Private Partnership (PPP) model

- NCS Portal Connect
- Healthe Platform using Oracle Technologies
- Supports standards including HL7 V2 and V3, CDA and SNOMED CT
- Service Oriented Architecture (SOA) enabling web services integration from existing solutions

healthe.

ORACLE

SNOMED
INTERNATIONAL



Lesson's Learnt

- PHR's complement Preventative Medicine and Health Promotion campaigns
- Must provide benefits to both consumer and provider
- Need to be standards based
- Must facilitate empowering the consumer to manage their health
- PHR's are a useful tool in demand reduction

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Thank You | *Let us be a Value Creator for your organisation*

