MINISTRY OF HEALTH
SINGAPORE

Framework for Articulating Project Outcomes Indicators

Articulation of Project Outcomes/KPIs

- Framework and Guidelines to articulate KPIs

1. Indicate **Three to Five** tangible outcomes (across the following Outcome Categories) that the project targets to achieve:

a. Business and adoption outcomes

(1) Manpower Productivity
(2) Clinical/Care Effectiveness,
(3) Process/Operational Improvements
(4) Population Health/Preventive Health
(5) IT Security/Resiliency
(6) Adoption/Engagement

b. Systems decommissioning outcomes

In the case of a new system to replace an existing system(s), decommissioning of the existing system(s) and the resultant cost savings should be included as a Project Outcome.

(7) Systems Decommissioning & Cost Savings

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Articulation of Project Outcomes/KPIs

- Framework and Guidelines to articulate KPIs

2. Outcomes and KPIs should be SMART – **S**pecific, **M**easurable, (incremental benefit must be measurable), **A**chievable (within the parameters of the project), **R**ealistic and **T**ime-bound (i.e. the period of the project). Do not indicate the IT deliverables here.

3. Indicate the unit of measure to be used for the targets/KPIs (e.g. days, hours, percentage) to measure the success of the outcomes and indicate the baseline, target and timeframe (i.e. year, quarter or month) to when the target would be achieved. Please refer to the following few slides for sample KPI examples for the various Outcome Categories.

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Outcomes Categorising and KPI Examples (1 of 3)

Outcome Categories	Categories Description	KPI Examples
1) Manpower Productivity	a) Manpower savings and reductions or reconfigured job scopes to encourage top-of-license practice	a) Reduced man-hours, reduced staff, reduced manpower costs
2) Clinical / Care Effectiveness	a) Improved care quality and patient safety, better clinical compliance to guidelines / protocols b) Improved health outcomes c) Better optimisation of healthcare utilisation / practises, improved healthcare value through the delivery of appropriate yet cost-effective care	a) Reduced errors / adverse events, reduced re-works, higher rate of clinical compliance / improved compliance with medication b) Lesser infections, decreased number of complications, reduced diseases rates, shorter time to recovery; c) Reduction in unnecessary tests / treatments / visits / admissions / average length of stay, increased in number of patients right-sited, lower cost of care to achieve desired health outcomes
3) Process / Operational Improvements	a) Process optimisation and efficacy from streamlined operations and practices, resulting in better, timelier and seamless patient experience, integrated and seamless care between care providers across the care settings b) Increased capacity, throughput, utilisation from automation c) Operational savings such as improved use of space, optimisation of IT systems' running cost	a) Shorter turnaround time to patient services, reduction in waiting time, shorter turnaround time to admission / discharge / registration, shorter time to transit patients across care settings, shorter time for patients to receive care / services in the community b) Higher throughput, higher equipment / system utilisation, higher ROI from increased volume / transactions / load c) Increased cost savings through optimised space usage, lower operating cost of IT systems

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4

Outcomes Categorising and KPI Examples (2 of 3)

Outcome Categories	Categories Description	KPI Examples
4) Population Health / Preventive Health	Better understanding and analysis of our population to deliver health promotion and preventive care programmes a) Greater insights to our population such as population health index / nation disease rates / health trends & indicators b) Improved the health of our population through effective delivery of health promotion programmes / preventive health programmes	a) Increased population health statistics and insights such as number of risk profiles / genomic profiles, healthcare trends / patterns for disease prevention / surveillance, increased predictive models that are accurate b) Higher uptake numbers of health screening tests/programmes and follow-ups for abnormal results c) Improved health index for population such as % of population with healthy lifestyle and behaviors, reduced disease rates for the nation, reduced disease outbreaks d) Improved quality of life for population such as Disability-Adjusted Life Year (DALY), Quality-Adjusted Life-Year (QALY) or other quality of life measures

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Outcomes Categorising and KPI Examples (3 of 3)

Outcome Categories	Categories Description	KPI Examples
5) IT Security / Resiliency	a) Strengthen IT security defenses, in compliance to the requirements of the current Healthcare IT Security Policy b) Improved on IT resiliency to ensure robustness, continuous access and optimisation of infrastructure and solutions, in compliance to the requirements of the business service levels *(Note that it is an underlying requirement to meet and comply with the requirements of IT Security & Resiliency)*	a) Reduced security threats / attacks / risks, reduced unauthorised access, reduced audit findings b) Reduced downtime / higher uptime / availability from failures, reduced redundancy / higher efficiency / performance of systems, faster system recovery, decreased / zero data loss
6) Adoption / Engagement	a) Users adoption rates or deployment plan by the phases or timeline b) Engagement or outreach rates in terms of increased participation and usage rates	a) Number of sites deployed, number of active users b) Number of new account sign up, number of active accounts, number of sign-in, number of transactions, number of services purchased, number of downloads
7) Systems Decommissioning & Cost Savings	a) Decommissioning of the existing system(s) or application(s) that would be replaced once the project is implemented, and the associated cost savings.	a) Number of systems/apps to be decommissioned (Please also indicate the system/app names and estimated decommissioning timeframe) b) Annual Opex cost savings, based on their current maintenance costs

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Project Outcomes – 1) Manpower Productivity

Outcome Category	Desired Outcomes	**Current Baseline** (Please indicate how baseline measure is derived, as well as current cost for activity / process)	**Proposed Targets** (Please indicate how targets and the timeframe (i.e. year, quarter or month) to when the target would be achieved)	**Financial Implications** (i.e. potential / estimated cost savings / avoidance, to time bound the figures annually or across 'X' years)
Manpower Productivity	Reduction in time on tracking of inventory	a) 1000 hours (in total) for 5 inventory staff to perform stock counts and replenish stocks per month b) 50 hours to manually track stock expiry per month • Current Manpower cost for these activities per year = 1050 hours x $15 (per hr blended inventory staff rate) x 12 months = $189, 000	a) In first 2 years of implementation (by FY19 Q4), to reduce 60% time or 600 hours (in total) per month with RTLS stock tracing & bin top up concept. From 3rd year FY20 Q1 onwards, to reduce 95% time or 950 hours (in total) per month b) Upon implementation (FY18 Q4), to reduced 98% time or 49 hours per month to track expired stocks	Potential cost savings in manpower per annum = 999 hours x $15 (per hr blended inventory staff rate) x 12 mths = $179,820 Potential cost savings in manpower across first 3 years - $413,460 • Year 1 – 649 hours x $15 x 12 months = $116,820 • Year 2 – same as Year 1 • Year 3 – 999 hours x $15 x 12 mths = $179,820

Prime/Direct Impact of Proposed Targets on Beneficiaries

Elimination of manual processes (e.g. counting in the supplies) and reducing workload of inventory staff as well as enhanced tracking and management of stock level of supplies.

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Project Outcomes – 2) Clinical / Care Effectiveness

Outcome Category	Desired Outcomes	Current Baseline (Please indicate how baseline measure is derived, as well as current cost for activity / process)	Proposed Targets (Please indicate how targets and the timeframe (i.e. year, quarter or month) to when the target would be achieved)	Financial Implications (i.e. potential / estimated cost savings / avoidance, to time bound the figures annually or across 'X' years)
Clinical / Care Effectiveness	Reduction in unnecessary (duplicated / redundant) investigation tests	a) Estimated that 2% of the investigative tests are duplications / unnecessary • Annual workload for top 10 tests are 500,000 • Average price for the top 10 tests is $10	a) Built in algorithms to prompt duplicated / redundant investigative tests to reduce unnecessary tests by 2% annually upon implementation, by FY18 Q1	Potential cost savings of reducing unnecessary investigative tests by 2% per year = 2% x 500,000 load x $10 (average price for top 10 test) = $100,000

Prime/Direct Impact of Proposed Targets on Beneficiaries

Clinical decision support will help to prompt and deter ordering of duplicated investigation tests that incur additional expenses on patients' part and increase laboratory workload.

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Examples For Illustration Purpose

Project Outcomes – 3) Process / Operational Improvements

Outcome Category	Desired Outcomes	Current Baseline (Please indicate how baseline measure is derived, as well as current cost for activity / process)	Proposed Targets (Please indicate how targets and the timeframe (i.e. year, quarter or month) to when the target would be achieved)	Financial Implications (i.e. potential / estimated cost savings / avoidance, to time bound the figures annually or across 'X' years)
Process / Operational Improvements	Reduction in patient waiting time with more timely and seamless patient services	80% of the patients are served within 60 minutes and 20% of the patients are served within 90 minutes.	• By FY18 Q1, 80% of the patients are served within 15 minutes which is 45 minutes faster • By FY18 Q1, 20% are served within 30 minutes, 60 minutes faster.	<to provide potential savings >
Prime/Direct Impact of Proposed Targets on Beneficiaries Deliver a more seamless and hassle-free patient experience through IT automation. Patients are served more timely.				
Process / Operational Improvements	Increased capacity with pharmacy automation	Fulfill on average of 10,000 outpatient prescription orders per day.	By FY18 Q1, to increase capacity by 30% with same staff strength - Fulfill on average 13,000 prescription orders per day, 3000 orders more than previous times	<to provide potential savings >
Prime/Direct Impact of Proposed Targets on Beneficiaries Enhanced efficiency to process the prescription orders and dispense the medications faster and accurately with zero near misses.				

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Examples For Illustration Purpose

Project Outcomes – 4) Population Health / Preventive Health

Outcome Category	Desired Outcomes	Current Baseline (Please indicate how baseline measure is derived, as well as current cost for activity / process)	Proposed Targets (Please indicate how targets and the timeframe (i.e. year, quarter or month) to when the target would be achieved)	Financial Implications (i.e. potential / estimated cost savings / avoidance, to time bound the figures annually or across 'X' years)
Preventive Health	Increased screening for obesity condition to refer to weight management clinic	Average number of new patients referred to weight management clinic each year in Hosp A = 2,000	By FY18 Q1, to screen and identify 50% more patients with BMI greater and equal to 35 to be referred to weight management clinic = 0.5 X 2,000 = 1,000 more patients.	Potential cost savings, with reference to literature study, Bariatric Surgery for obesity patients can lead to savings of 13,000 over a lifetime and generated additional 0.8 years of life and 4.1 quality-adjusted life years per patient.

Prime/Direct Impact of Proposed Targets on Beneficiaries

Increased screening of obesity patients to refer to weight management clinic for targeted delivery of treatments (e.g. Bariatric surgery) or interventions to reduce obesity.

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10

Project Outcomes – 5) IT Security / Resiliency

Outcome Category	Desired Outcomes	Current Baseline (Please indicate how baseline measure is derived, as well as current cost for activity / process)	Proposed Targets (Please indicate how targets and the timeframe (i.e. year, quarter or month) to when the target would be achieved)	Financial Implications (i.e. potential / estimated cost savings / avoidance, to time bound the figures annually or across 'X' years)
IT Resiliency	Improve the availability of systems through virtualisation of data centers	Average availability of the systems = 95%	By FY18 Q1, to maintain availability of 99.9% up time of systems.	<To calculate the potential loss of revenue (which could be avoided) with system downtime causing disruptions to hospitals' operations>

Prime/Direct Impact of Proposed Targets on Beneficiaries

Virtualisation of data centers for significant reduction in unplanned downtimes, and minimises disruptions to hospitals' operations and to achieve an overall system up-time / availability to 99.9%.

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11

Project Outcomes – 6) Adoption / Engagement

Outcome Category	Desired Outcomes	Current Baseline (Please indicate how baseline measure is derived, as well as current cost for activity / process)	Proposed Targets (Please indicate how targets and the timeframe (i.e. year, quarter or month) to when the target would be achieved)	Financial Implications (i.e. potential / estimated cost savings / avoidance, to time bound the figures annually or across 'X' years)
Adoption rates	100% inpatient wards adoption in 3 years of deployment (Year 2018 to 2020)		• By FY18 Q1 – to deploy to 50% of the inpatient wards • By FY19 Q1 – to deploy to 80% of the inpatient wards (cumulative) • By FY20 Q1 – to achieve 100% adoption of the inpatient wards (cumulative)	
Prime/Direct Impact of Proposed Targets on Beneficiaries NA				
Engagement or Outreach rates	Citizens' sign ups and number of transactions in first 2 years of deployment		• By FY18 Q1 – to achieve more than 10,000 citizens' sign-ups in total, with 5000 transactions per day • By FY19 Q1 – to achieve more than 60,000 citizens sign-ups in total, with 10,000 transactions per day	
Prime/Direct Impact of Proposed Targets on Beneficiaries NA				

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12

Project Outcomes – 7) Systems Decommissioning & Cost Savings

Outcome Category	Desired Outcomes	Current Baseline (Please indicate how baseline measure is derived, as well as current cost for activity / process)	Proposed Targets (Please indicate how targets and the timeframe (i.e. year, quarter or month) to when the target would be achieved)	Financial Implications (i.e. potential / estimated cost savings / avoidance, to time bound the figures annually or across 'X' years)
Systems Decommissioning & Cost Savings	Decommissioning of [system name]	Current cost of maintaining [system name]. FY16 Opex for [system name]: • Software: $xx • Hardware: $xx • Professional Services: $xx • IHiS Manpower: $xx • H-cloud Hosting: $xx	By FY18 Q1, to decommission [system name].	<Annual cost savings from decommissioning [system name], based on the latest available Annual IT Opex.>

Prime/Direct Impact of Proposed Targets on Beneficiaries

Ensuring that systems that have been superceded by new systems are decommissioned, with cost and manpower savings as well as reduction in security and resiliency risks.

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13

Template on Project Outcomes

Outcomes Owner:	*(Please indicate name of owner, organisation and department. You may specify multiple owners to the KPIs.)*

Outcome Category	**Desired Outcomes**	**Current Baseline** (Please indicate how baseline measure is derived, as well as current cost for activity / process)	**Proposed Targets** (Please indicate how targets and the timeframe (i.e. year, quarter or month) to when the target would be achieved)	**Financial Implications** (i.e. potential / estimated cost savings / avoidance, to time bound the figures annually or across 'X' years)

Prime/Direct Impact of Proposed Targets on Beneficiaries

Outcome Category	**Desired Outcomes**	**Current Baseline** (Please indicate how baseline measure is derived, as well as current cost for activity / process)	**Proposed Targets** (Please indicate how targets and the timeframe (i.e. year, quarter or month) to when the target would be achieved)	**Financial Implications** (i.e. potential / estimated cost savings / avoidance, to time bound the figures annually or across 'X' years)

Prime/Direct Impact of Proposed Targets on Beneficiaries

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14

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