



**MINISTRY OF HEALTH**  
SINGAPORE

# **CODE OF PRACTICE**

**DATA PORTABILITY**

**Effective Aug 2024**

**Version 1.0**

**Issued by MOH Infocomm, Technology & Data Group**

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## INTRODUCTION

When healthcare providers switch from one Healthcare IT System to another, it is essential that they continue to have access to the Records of their patients and other service recipients, for the purposes of safety and continuity of care. This requires the accurate and complete porting of Records between Healthcare IT Systems.

This Code of Practice for Data Portability (“**Code**”) was developed by the Ministry of Health (“**MOH**”), in consultation with relevant stakeholders, to set out MOH’s minimum expectations with regards to Data Migration in order to uphold Data Portability.

### 1. Objectives of this Code

1.1 This Code is intended to:

- (a) Set out the practices that Healthcare IT Vendors shall comply with when providing support or services to ensure Data Portability;
- (b) Promote a Client-centric approach to the provision of Data Migration services to ensure Data Portability; and
- (c) Advocate best practices for Data Portability across the healthcare information technology industry.

### 2. Application

2.1 This Code applies to the Healthcare IT Vendors and Healthcare IT Systems set out on MOH’s webpage at <https://go.gov.sg/moh-dataport>, for the purposes outlined on the webpage.

### 3. Definitions and Interpretation

3.1 In this Code, unless the context otherwise requires, the following terms shall have the corresponding meanings:

*“Client”* means a party purchasing Healthcare IT System products and/or services from a Healthcare IT Vendor.

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<i>“Contractual Agreement”</i>	means an agreement between a Healthcare IT Vendor and a Client for the provision of any Healthcare IT System products and/or services by that Healthcare IT Vendor to that Client.
<i>“Data Migration”</i>	means the process of selecting, preparing, extracting and transforming data, and transferring such data from one computer storage system to another, to ensure Data Portability.
<i>“Data Migration Schedule”</i>	means a schedule detailing the expected timeframe for completion of tasks for Data Migration and Post-Data Migration Activities.
<i>“Data Portability”</i>	means the ability to move, copy or transfer data from one computer storage system to another as identified by the Client, while ensuring the accuracy and completeness of Records as well as the privacy and interests of the individuals to which the Records relate, in accordance with this Code.
<i>“Healthcare IT System”</i>	means an information technology solution, software or system which supports a Client’s operations.
<i>“Healthcare IT Vendor”</i>	means a party providing Healthcare IT System products and/or services.
<i>“Incoming Healthcare IT Vendor”</i>	means the Healthcare IT Vendor that will be providing Healthcare IT System products and/or services to a Client (i) in addition to those provided by an Outgoing Healthcare IT Vendor; or (ii) in place of those provided by an Outgoing Healthcare IT Vendor.
<i>“Outgoing Healthcare IT Vendor”</i>	means the incumbent Healthcare IT Vendor that is providing Healthcare IT System products and/or services to a Client.
<i>“Records”</i>	means the data of an individual (which may include personal data and any financial and medical information of the individual) that is obtained by, given to, or retained by the Client for the purposes

of facilitating the Client's provision of services to the said individual.

*"Post-Data Migration Activities"* means any activity in relation to Data Migration as agreed upon between an Outgoing Healthcare IT Vendor and a Client which is to be performed after Data Migration is completed (such as validation of data post-Data Migration and data cleansing).

*"Subscription"* means the access to and use of a Healthcare IT System.

*"Subscription Term"* means the period which starts on the earlier of the date that the Healthcare IT System is successfully commissioned or the date that the Client is successfully onboarded onto the Healthcare IT System, and ends upon the earlier of the expiration or the termination of the Contractual Agreement.

3.2 In this Code, unless a contrary intention appears:

- (a) words importing the singular only shall also include the plural and vice versa where the context requires;
- (b) references to a person include any individual, company, limited liability partnership, partnership, business trust, unincorporated association or government agency (whether or not having separate legal personality);
- (c) all references to clauses in this Code, unless otherwise expressly stated, shall be construed as references to clauses numbered in this Code and shall include all sub-clauses within that clause;
- (d) a reference in this Code to "including" shall not be construed restrictively but shall mean "including without prejudice to the generality of the foregoing" and "including but without limitation"; and
- (e) any reference to any legislation shall be deemed a reference to such legislation as amended or revised from time to time and be deemed to include any subsidiary legislation made under such legislation.

**IMPORTANT NOTICE**

This Code is provided with the understanding that MOH is not rendering legal or other professional advice or services. Accordingly, this Code should not be used as a substitute for consultation with the relevant professionals on the requirements of Data Migration. In no event shall MOH be liable to any Healthcare IT Vendor, Client or any other person using this Code for any decision made or action taken, or for refraining from making any decision or taking any action in reliance of the information contained in this Code, or for any consequential, special or similar damages, even if advised or notified of the possibility of such damage.

#### **4. Review of this Code**

- 4.1 This Code may be reviewed and amended by MOH from time to time to ensure that this Code continues to promote high industry standards of service for Clients in the healthcare sector and develop best practices across the healthcare information technology industry.
- 4.2 MOH may review and amend this Code from time to time, after consultation with:
- (a) Healthcare IT Vendors;
  - (b) Healthcare IT System consumer advocates; and
  - (c) such other organisations and persons it considers appropriate (for example, regulators and associations).

#### **A. KEY COMMITMENTS**

#### **5. Transparent, Fair, Honest and Ethical**

- 5.1 The Healthcare IT Vendors shall conduct negotiations with Clients in good faith, which shall include but is not limited to:
- (a) providing sufficient and accurate information during negotiations to achieve pre-agreed outcomes (for example, ensuring that the Client is aware of the functionalities and limitations of the Healthcare IT System products and has made an informed decision to onboard the Healthcare IT System products or commence Data Migration); and
  - (b) acting honestly and fairly having regard to the legitimate interests of the Client and observing accepted or reasonable commercial standards of

fair dealing. The Client's legitimate interests shall include, but are not limited to, the Client's interests in relation to the Client's operations, healthcare safety, Data Portability, accuracy of records (including Records) and data security.

- 5.2 The Healthcare IT Vendor shall include Data Migration as part of the scope of Healthcare IT System products and/or services that it provides to its Client. The Healthcare IT Vendor shall include clauses relating to Data Migration in each Contractual Agreement, including, but not limited to, clauses on the type of support rendered and fees related to Data Migration (which may constitute part of the contract price or be separately priced).
- 5.3 The Healthcare IT Vendor shall ensure that practices and processes are in place to enable it to fulfil its obligations in relation to Data Migration stated in each Contractual Agreement and any other agreement between the Healthcare IT Vendor and a Client. This may include, but is not limited to, having a change management process to identify, authorise, implement and validate all changes made to the relevant Healthcare IT System and ensuring that there is no conflict in practices and processes relating to the completion of Data Migration and Post-Data Migration Activities.
- 5.4 The Healthcare IT Vendor shall comply with the Personal Data Protection Act 2012, Computer Misuse Act 1993 and any other applicable legislation or laws. This Code does not exclude any obligation of the Healthcare IT Vendor that exists apart from this Code, including but without limitation to obligations arising from any contracts entered into by the Healthcare IT Vendor.
- 5.5 The Outgoing Healthcare IT Vendor and the Incoming Healthcare IT Vendor shall render such reasonable assistance and/or cooperation to each other as is necessary to ensure that Data Migration and Post-Data Migration Activities are duly completed. For the avoidance of doubt, Outgoing Healthcare IT Vendors and Incoming Healthcare IT Vendors shall render such reasonable assistance and/or cooperation regardless of whether their respective Contractual Agreements with the Clients have been breached in any way.

## 6. **Customer-focused**

- 6.1 The Healthcare IT Vendor shall provide products and/or services that meet the Client's needs.
- 6.2 The Healthcare IT Vendor shall use its best endeavours to monitor and review on an ongoing basis the outcomes of products and/or services provided or rendered to Clients in respect of Data Migration and consider whether changes are required to ensure that their Client's needs are met.

**7. Deal Fairly with Complaints**

7.1 The Healthcare IT Vendor shall use its best endeavours to respond to complaints relating to Data Migration in a manner that is:

- (a) prompt, efficient and transparent;
- (b) consistent with the law; and
- (c) fair under all circumstances.

7.2 The Healthcare IT Vendor shall use its best endeavours to review its processes, products and services if multiple complaints in respect of a similar issue are received.

**B. DATA MIGRATION AND CORRESPONDING ROLES OF PARTIES**

8. There are four (4) key steps in Data Migration, which involve multiple parties. Table 1 provides an overview of the responsibilities of each party involved and examples of the tasks to be completed by each party. Table 2 outlines the key steps and the corresponding role of each party.

Table 1: Overview of responsibilities of parties involved in Data Migration

<b>Parties involved</b>	<b>Responsibilities</b>
Incoming Healthcare IT Vendor	<ul style="list-style-type: none"> <li>i. Develop, discuss and reach agreement with the Client and the Outgoing Healthcare IT Vendor on a plan for Data Migration (“<b>Data Migration Plan</b>”);</li> <li>ii. Work with the Outgoing Healthcare IT Vendor to execute the agreed Data Migration Plan;</li> <li>iii. Ensure that the migrated data is accessible via the Healthcare IT System; and</li> <li>iv. Support the Client in data validation.</li> </ul>
Outgoing Healthcare IT Vendor	<ul style="list-style-type: none"> <li>i. Discuss, support and reach agreement with the Client and the Incoming Healthcare IT Vendor on developing the Data Migration Plan;</li> <li>ii. Support the Incoming Healthcare IT Vendor in executing the agreed Data Migration Plan; and</li> </ul>



	iii. Support the Client and/or Incoming Healthcare IT Vendor in data (export) clarification.
Client	<ul style="list-style-type: none"> <li>i. Discuss, review and reach agreement with the Incoming Healthcare IT Vendor and the Outgoing Healthcare IT Vendor on the Data Migration Plan;</li> <li>ii. Instruct the Outgoing Healthcare IT Vendor to support the Incoming Healthcare IT Vendor. This includes making arrangements for financial compensation, if applicable;</li> <li>iii. Involve the relevant parties in the planning and execution of the Data Migration, as needed;</li> <li>iv. Work with the Incoming Healthcare IT Vendor to validate dataset post-Data Migration; and</li> <li>v. Provide written confirmation to the Incoming Healthcare IT Vendor and the Outgoing Healthcare IT Vendor on the completion of the Data Migration.</li> </ul>

Table 2: Key steps in Data Migration and the corresponding role of each party

	1. Request for Data Migration	2. Development of Data Migration plan	3. Execution of Data Migration	4. Follow-up post-Data Migration
<b>Incoming Healthcare IT Vendor</b>	C	R, A	R, A	R
<b>Outgoing Healthcare IT Vendor</b>	C, I	C	R	R
<b>Client</b>	R, A	C	I	R, A

Responsible (R)= Assigned to complete the task or deliverable

Accountable (A) = Has final decision-making authority and accountability for completion. Party also has ultimate control over the project and its resources.

Consulted (C) = A stakeholder or subject matter expert who is consulted before a decision or action. Not directly involved in carrying out the task.

Informed (I) = Party must be informed before/after a decision or action.

## C. KEY STEPS IN DATA MIGRATION

### 9. Request for Data Migration

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- 9.1 If (i) the Client engages the Incoming Healthcare IT Vendor to provide Healthcare IT System products and/or services to replace those of the Outgoing Healthcare IT Vendor; and (ii) such engagement of the Incoming Healthcare IT Vendor is the direct and sole cause of any breach by the Client of the terms of any Contractual Agreement between the Client and the Outgoing Healthcare IT Vendor, the Outgoing Healthcare IT Vendor shall still make reasonable efforts to minimise disruptions to the process of Data Migration notwithstanding any enforcement of its contractual rights as a result of any such breach.
- 9.2 The Outgoing Healthcare IT Vendor shall assist the Client in determining if the Subscription Term applicable to that Client is sufficient for Data Migration and Post-Data Migration Activities to be completed.

### **10. Development of Data Migration Plan**

- 10.1 The responsibilities of the Outgoing Healthcare IT Vendor in relation to the development of a Data Migration Plan shall include, but are not limited to, the following:
- (a) explaining to the Client the support required from the Client to achieve pre-agreed outcomes (such as clarifying the data items and data volume for Data Migration);
  - (b) availing itself for clarifications and discussions on the technical feasibility and details (such as data format and quality) in respect of the Data Migration with the Incoming Healthcare IT Vendor and the Incoming Healthcare IT Vendor's personnel (which shall include, but is not limited to, the Incoming Healthcare IT Vendor's subcontractors);
  - (c) achieving common understanding and agreement with the Client and the Incoming Healthcare IT Vendor on the Data Migration Plan. The Data Migration Plan may include items such as expected data output and its format, number of exported datasets required, the Data Migration Schedule, and any other technical matters; and
  - (d) providing assistance in relation to technical matters where necessary.
- 10.2 The responsibilities of the Incoming Healthcare IT Vendor in relation to the development of a Data Migration Plan shall include, but are not limited to, the following:
- (a) availing itself for clarifications and discussions on the technical feasibility and details (such as data format and quality) in respect of the Data

Migration with the Outgoing Healthcare IT Vendor and the Outgoing Healthcare IT Vendor's personnel (which shall include, but is not limited to, the Outgoing Healthcare IT Vendor's subcontractors);

- (b) informing the Client of the related functional impacts, which may arise from differences in datasets or data code standards between the existing and new Healthcare IT Systems, that cannot be migrated into the new Healthcare IT System;
- (c) achieving common understanding and agreement with the Client and the Outgoing Healthcare IT Vendor on the Data Migration Plan. The Data Migration Plan may include items such as the expected data output and its format, number of exported datasets required and Data Migration Schedule, and any other technical matters;
- (d) explaining to the Client the support required from the Client to achieve pre-agreed outcomes; and
- (e) establishing a reasonable Data Migration Schedule<sup>1</sup>. The Data Migration Schedule (and any changes thereto) shall be mutually agreed upon in writing between the Incoming Healthcare IT Vendor, the Client, and the Outgoing Healthcare IT Vendor.

## **11. Execution of Data Migration Plan**

11.1 The responsibilities of the Outgoing Healthcare IT Vendor in relation to the execution of a Data Migration Plan shall include, but are not limited to, the following:

- (a) ensuring that there is sufficient manpower to perform the Data Migration for the period needed by the Client;
- (b) ensuring that the Outgoing Healthcare IT Vendor's responsibilities in the Data Migration Plan (for example, data export) are completed within the timeframe agreed upon in the Data Migration Schedule;
- (c) fulfilling the Outgoing Healthcare IT Vendor's responsibilities set out in Table 1 above, in accordance with the agreed Data Migration Plan;

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<sup>1</sup> For reference, various industry norms for the duration of Data Migration and Post-Data Migration Activities are set out on MOH's webpage at <https://go.gov.sg/moh-dataport>.

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- (d) working with the parties involved in Data Migration to address and rectify issues in a timely manner; and
- (e) taking reasonable steps to protect Records from misuse or loss, and from unauthorised access, modification, or disclosure.

11.2 The responsibilities of the Incoming Healthcare IT Vendor in relation to the execution of a Data Migration Plan shall include, but are not limited to, the following:

- (a) ensuring that there is sufficient manpower to perform the Data Migration for the period required by the Client;
- (b) ensuring that activities in the Data Migration Plan (for example, data import) is completed within the timeframe agreed upon in the Data Migration Schedule;
- (c) fulfilling the Incoming Healthcare IT Vendor's responsibilities set out in Table 1 above, in accordance with the agreed Data Migration Plan;
- (d) keeping the Client updated on the progress of the Data Migration and escalate issues or challenges to the Client in a timely manner;
- (e) working with the parties involved in the Data Migration to address and rectify issues in a timely manner; and
- (f) taking reasonable steps to protect Records from misuse or loss, and from unauthorised access, modification, or disclosure.

## 12. Follow-up post-Data Migration

12.1 Data Migration shall be deemed to be completed when:

- (a) data has been exported from the Outgoing Healthcare IT Vendor's Healthcare IT System. The data to be exported shall be mutually agreed upon between the Client, the Incoming Healthcare IT Vendor and the Outgoing Healthcare IT Vendor;
- (b) all exported data has been (i) imported into the Incoming Healthcare IT Vendor's Healthcare IT System; or (ii) provided to the Client in a format which is acceptable to the Client, if the exported data cannot be imported into the Incoming Healthcare IT Vendor's Healthcare IT System;

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- (c) the Incoming Healthcare IT Vendor's and Outgoing Healthcare IT Vendor's responsibilities set out in Table 1 above have been fulfilled in accordance with the Data Migration Plan;
- (d) Post-Data Migration Activities are completed; and
- (e) the Client has provided written confirmation to the Incoming Healthcare IT Vendor and the Outgoing Healthcare IT Vendor that the Data Migration has been completed.

12.2 The Outgoing Healthcare IT Vendor shall not terminate the Client's access to the Outgoing Healthcare IT Vendor's Healthcare IT System:

- (a) if the data exported can be imported into the Incoming Healthcare IT Vendor's Healthcare IT System, prior to the completion of the Data Migration into the Incoming Healthcare IT Vendor's Healthcare IT System and any Post-Data Migration Activities; or
- (b) if the data exported cannot be imported into the Incoming Healthcare IT Vendor's Healthcare IT System, until the Client has agreed for the Outgoing Healthcare IT Vendor to so terminate the Client's access to its Healthcare IT System.

### **D. DATA ITEMS AND FORMAT**

13. If the data exported can be imported into the new Healthcare IT System, the Outgoing Healthcare IT Vendor shall ensure that:

- (a) the data exported is mutually agreed upon among the Client, the Incoming Healthcare IT Vendor and the Outgoing Healthcare IT Vendor;
- (b) the data exported is in accordance with Clauses 15 and 16;
- (c) the exported data set provided by the Outgoing Healthcare IT Vendor to the Incoming Healthcare IT Vendor includes, without limitation, the information set out in Regulations 37(2) and 37(3) of the Healthcare Services (General) Regulations 2021<sup>2</sup>, and any other information advised or required by MOH<sup>3</sup>; and

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<sup>2</sup> <https://sso.agc.gov.sg/SL-Supp/S1035-2021/Published/20211230?DocDate=20211230>

<sup>3</sup> Including through MOH's agents and partners.

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- (d) the Incoming Healthcare IT Vendor is provided with a written guide (for example, a data dictionary), when requested, to assist the Incoming Healthcare IT Vendor with the Data Migration. The written guide shall include information which would assist the Incoming Healthcare IT Vendor in the interpretation of the exported data.
14. If the data exported cannot be imported into the new Healthcare IT System, the Outgoing Healthcare IT Vendor shall ensure that:
- (a) the data exported is mutually agreed upon between the Client and the Outgoing Healthcare IT Vendor;
  - (b) the exported data is provided to the Client in a manner which is acceptable to the Client, and is in accordance with Clauses 15 and 16;
  - (c) the information set out in Regulations 37(2) and 37(3) of the Healthcare Services (General) Regulations 2021, and any other information advised or required by MOH, is migrated into the new Healthcare IT System, notwithstanding that the rest of the exported data cannot be migrated into the new Healthcare IT System; and
  - (d) the Client is provided with a written guide (for example, a data dictionary), when requested. The written guide shall include information which would assist the Client and/or the Incoming Healthcare IT Vendor in the interpretation of the exported data.
15. Regardless of whether the data exported can be imported into the new Healthcare IT System, the Outgoing Healthcare IT Vendor shall use best efforts to ensure that the Client is able to download the exported data independently.
16. Regardless of whether the data exported can be imported into the new Healthcare IT System, the Outgoing Healthcare IT Vendor shall ensure that the exported data meets the following requirements:
- (a) Industry-standard machine-readable format which is validated and well-formed, e.g. JSON, csv or XML;
  - (b) Not in any proprietary data standards, unless both the Incoming Healthcare IT Vendor and the Outgoing Healthcare IT Vendor use the same standards; and
  - (c) Data field names are appropriately labelled to reflect the nature of the data items. For example, data field names such as “001”, “002” and “003”

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are not appropriate naming conventions.

**Figure 1. Unusable data export due to lack of proper field labelling**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T		
1	PCNO	DateDispense	CatCode	Code	Description	TotDispense	Unit	Usage	Dosage	TotUnit	FreqCode	FreqDesc	Precaution1	Precaution2	Precaution3	MCDateFrom	MCDateTo	Remarks	Reference	SPU	CPL	
3310	1935920	11/2014	D-VITA	BETAMETHASONE TABLET	15.00	TAB	ONE TO BE TAKEN 3 TIMES (6 HOURLY)									0.000	0.0000	0.00	0.00	0.00		
3311	1935920	11/2014	D-VITA	DERMASONONE CREAM/OINTMENT 0.1%	15.00	GM	MASSAGE ON AREA THREE TIMES A DAY									0.000	0.0000	0.00	0.00	0.00		
3312	1936020	11/2014	D-VITA	AMOXYCILLIN 250MG	15.00	CAP	ONE TO BE TAKEN THREE TIMES (8 HOUR									0.000	0.0000	0.00	0.00	0.00		
3313	1936020	11/2014	D-VITA	CHLORPHENIRAMINE 4MG	10.00	TAB	ONE TO BE TAKEN 4 TIMES (6 HOURLY)									0.000	0.0000	0.00	0.00	0.00		
3314	1936020	11/2014	D-VITA	PROMEDYL-B	90.00	ML	TAKE TWO 5ML SPOONFUL 4 TIMES (4 HO									0.000	0.0000	0.00	0.00	0.00		

**Figure 2. Unusable data export due to lack of proper field labelling**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	
1	PCNO	DateDispense	CatCode	Code	Description	TotDispense	Unit	Usage	Dosage	TotUnit	FreqCode	FreqDesc	Precaution1	Precaution2	Precaution3	MCDateF	MCDateT	Remarks	Referenci	SPU	CPU	AmtBefor	DisAmt	SellPrice	
213313	19360	20/11/2014	D-VITA	CHLORPHENIRAMINE 4MG	10	TAB	ONE TO BE TAKEN 4 TIMES 6 HOURLY TAKE TWO 5ML SPOONFUL 4 TIMES									0	0	0	0	0	0	0	0	0	0
213314	19360	20/11/2014	D-VITA	PROMEDYL-B	90	ML	TAKE TWO 5ML SPOONFUL 4 TIMES (4 HO									0	0	0	0	0	0	0	0	0	0

## UPDATES

- This most up-to-date version of this Code is available to all relevant Healthcare IT Vendors and their Clients at MOH's webpage: <https://go.gov.sg/moh-dataport>.