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**Health informatics — HL7 Personal
Health Record System Functional
Model, Release 1 (PHRS FM)**

*Informatique de santé — Modèle fonctionnel d'un système de dossier
de santé personnel, version 1 (PHRS FM)*

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Contents

| | Page |
|--|-----------|
| Foreword | v |
| Introduction | vi |
| 1 Scope | 1 |
| 2 Normative references | 1 |
| 3 Terms and definitions | 1 |
| 4 The Functional Model | 2 |
| 4.1 Overview and Definition..... | 2 |
| 4.2 PHR-S Functional Outline..... | 4 |
| 4.2.1 The Functions and Their Use..... | 4 |
| 4.2.2 Personal Health Section Functions..... | 5 |
| 4.2.3 Supportive Section Functions..... | 5 |
| 4.2.4 Information Infrastructure Section Functions..... | 5 |
| 4.3 Common Major Concepts Across the Model..... | 6 |
| 4.3.1 The “Action-Verb” Hierarchy..... | 6 |
| 4.3.2 Relevant Standards..... | 8 |
| 4.3.3 Consents, Authorizations, and Preferences..... | 8 |
| 4.3.4 Scope of Downstream Uses of PHR data..... | 8 |
| 4.4 Type of Profiles..... | 8 |
| 5 Conformance Clause | 9 |
| 5.1 Introduction (Reference)..... | 9 |
| 5.2 Scope and Field of Application (Normative)..... | 9 |
| 5.3 Concepts (Normative)..... | 9 |
| 5.3.1 Functional Profiles..... | 9 |
| 5.3.2 Conformance Model (Normative)..... | 10 |
| 5.3.3 Profile Traceability (Normative)..... | 11 |
| 5.4 Normative Language (Normative)..... | 11 |
| 5.5 Conformance Criteria (Normative)..... | 12 |
| 5.5.1 Introduction..... | 12 |
| 5.5.2 Criteria in the Functional Profile..... | 12 |
| 5.5.3 ‘Dependent SHALL’ Criteria..... | 12 |
| 5.5.4 Referencing Other Criteria or Functions..... | 12 |
| 5.6 PHR-S FM Structure and Extensibility (Normative)..... | 13 |
| 5.6.1 Hierarchical Structure..... | 13 |
| 5.6.2 Naming Convention..... | 13 |
| 5.6.3 Priorities..... | 14 |
| 5.6.4 Extensibility..... | 14 |
| 5.7 Functional Profile Conformance (Normative)..... | 14 |
| 5.7.1 Introduction..... | 14 |
| 5.7.2 Rules for Functional Domain Profiles..... | 14 |
| 5.7.3 Rules for Creating New Functions in Functional Profiles..... | 16 |
| 5.7.4 Rules for Derived Functional Profiles..... | 17 |
| 5.7.5 Conformance Statement..... | 17 |
| 5.7.6 Rules for Functional Companion Profiles..... | 18 |
| 5.8 Use Cases and Samples (Reference)..... | 19 |
| 5.8.1 Functional Profile Use Cases..... | 19 |
| 5.8.2 Sample Functional Domain Profile Conformance Clauses..... | 20 |
| 5.9 Interpreting and Applying Conditional ‘SHALL’ (Reference)..... | 21 |
| 5.9.1 Construction of Conformance Criteria Using the Conditional ‘SHALL’ Overview..... | 21 |
| 5.9.2 General Concepts..... | 21 |
| 5.9.3 Rationale for ‘Dependent SHALL’..... | 22 |
| 5.9.4 How to Apply the ‘Dependent SHALL’..... | 22 |
| Annex A (normative) Function List | 25 |

| | |
|--|-----------|
| Annex B (informative) Glossary | 27 |
| Annex C (informative) PHR Sources | 54 |
| Annex D (informative) Anticipated Uses | 57 |
| Annex E (informative) Mobile Device Impact on, and Issues related to, PHRs | 58 |
| Annex F (informative) Background | 64 |
| Annex G (informative) Acknowledgements | 65 |
| Bibliography | 66 |

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 215, *Health informatics*.

Introduction

Notes to Readers

The HL7 Personal Health Record System Functional Model (PHR-S FM) was approved as a Draft Standard for Trial Use (DSTU) in July 2008. In September 2010 the PHR-S FM was presented to ISO TC215 as a New Work Item Proposal (NWIP) ballot and received comments from the international community. The comments from that ballot were used to update and improve the draft standard. In September 2013, the standard was updated, re-balloted, and the comments reconciled – resulting in the current version.

Information about HL7 is given in [Annex F](#).

Changes from Previous Release

Not Applicable for Release 1.

Background

Personal Health Record (PHR) Versus a Personal Health Record System (PHR-S)

The PHR WG makes a clear distinction between a PHR and a PHR System (PHR-S). The PHR is the underlying record (e.g. data, information, pictures, sounds, graphs, or videos) that the software functionality of a PHR-S maintains. There has been much discussion surrounding the definition of a personal health record. The PHR-S FM does not attempt to define the PHR, but rather to identify system features and functions necessary to create and effectively manage PHRs. The PHR-S FM offers examples of data elements, but is not intended to provide details necessary to specify a data model.

The overarching theme of a PHR-S involves a patient-centric tool that is controlled, for the most part, by the individual PHR Account Holder. A PHR-S should be immediately available electronically and able to link to other systems. The PHR-S provides functionality to help an individual maintain a longitudinal view of his or her health history, and may be comprised of information from a number of sources – e.g. from providers and health plans, as well as from the individual. Data collected by the system is administrative and/or clinical, and the tool may provide access to health-related forms (e.g. Advance Directives) and advice (e.g. diet, exercise, or disease management). A PHR-S might also help the individual collect behavioral health, public health, patient-entered and patient-accessed data (including medical monitoring devices), medication information, care management plans and the like, and might be connected to providers, laboratories, pharmacies, nursing homes, hospitals and other institutions and clinical resources. This PHR-S FM is universal and therefore generic by design. There may be additional constraints in certain realms or regions. For example, in the US Realm, the management of laboratory results is subject to the Clinical Laboratory Improvement Amendments (CLIA) federal regulation.

At its core, the PHR-S should provide the ability for the individual to capture and maintain demographic, insurance coverage, and provider information. It should also provide the ability to capture health history in the form of a health summary, problems, conditions, symptoms, allergies, medications, laboratory and other test results, immunizations and encounters. Additionally, personal care planning features such as Advance Directives and care plans should be available. The system must be secure and have appropriate identity and access management capabilities, and must use standard nomenclature, coding and data exchange standards for consistency and interoperability. A host of optional features have been addressed over the course of this initiative, including secure messaging, graphical presentation of test results, patient education, guideline-based reminders, appointment scheduling and reminders, drug-drug interactions, formulary management, health care cost comparisons, document storage and clinical trial eligibility.

The effective use of a PHR-S is a key point for improving healthcare in terms of effective self-management, patient-provider communication and quality objectives.

Health informatics — HL7 Personal Health Record System Functional Model, Release 1 (PHRS FM)

1 Scope

The HL7 PHR-S FM defines a standardized model of the functions that may be present in PHR Systems.

It is beyond the scope of the PHR system to control the use (or intended use) of PHR data. On the contrary, it is within the scope of the PHR system to manage the authorization of an individual (or other application). Those parties are then responsible for using the data for appropriate (or intended) purposes. The system manufacturers specify “intended and permitted use of PHR data” in their Terms of Service and Terms of Use agreements.

This Functional Model is not:

- a messaging specification;
- an implementation specification;
- a conformance specification;
- a specification for the underlying PHR (i.e. the record itself);
- an exercise in creating a definition for a PHR;
- a conformance or conformance testing metric;
- a requirement specification for a single PHR system (see [Annex D](#), Anticipated Uses).

The information exchange enabled by the PHR-S supports the retrieval and population of clinical documents and summaries, minimum data sets, and other input/outputs.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/TR 14292:2012, *Health informatics — Personal health records — Definition, scope and context*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

base functional profile

existing functional profile from which new (child) functional profiles are created/derived

3.2

conformance

fulfillment of a product, process, or service of specified requirements

3.3

conformance criteria

requirements indicating the behavior, action, or capability that constitutes implementation of the function

3.4

conformance clause

section of a specification that defines the requirements, criteria, or conditions to be satisfied in order to claim conformance

3.5

conformance statement

description of the function in a PHR system that has been implemented. It reflects the degree to which a PHR system has met the functional profile's requirements and may include optional functions and information

3.6

derived functional profile

functional profile that is created from a base functional profile, also known as a child functional profile

3.7

extension

ability for a PHR-S to incorporate additional functionality beyond what is defined in a functional profile

3.8

functional profile

subset of the PHR-S FM in which functions have been designated (sometimes in varying degrees) for certain PHR systems or sources or level of functionality

3.9

informative functional profile

registered functional profile that has successfully completed formal public scrutiny via the HL7 consensus process

3.10

inherited criterion

conformance criteria listed in a header function that will be inherited by all its children functions, and conformance criteria listed in a parent function that are inherited by all its children functions

3.11

registered functional profile

functional profile that has successfully completed HL7 EHR WG registration process and review

3.12

situational criterion

criterion that is required if the circumstances given are applicable

4 The Functional Model

4.1 Overview and Definition

The PHR-S FM is divided into three sections: Personal Health, Supportive, and Information Infrastructure. Functional profiles can be developed which identify various functions from one or more of these three sections in order to describe a given system, and allows for further characterization of that profile by the assignment of priorities to each function in the profile (see [Figure 1](#)). While the PHR-S FM should contain all reasonably anticipated PHR-S functions, it is not intended to comprise the entire list of all functions that may be found in any specific PHR-S. Again, functional profiles will be developed to constrain the functions for an intended use [see [5.1](#), Introduction (Reference)]. This document defines the PHR-S Functional Model and describes the general use of profiles and priorities (see [Annex C](#), PHR Sources, for examples of stakeholders that might create profiles).

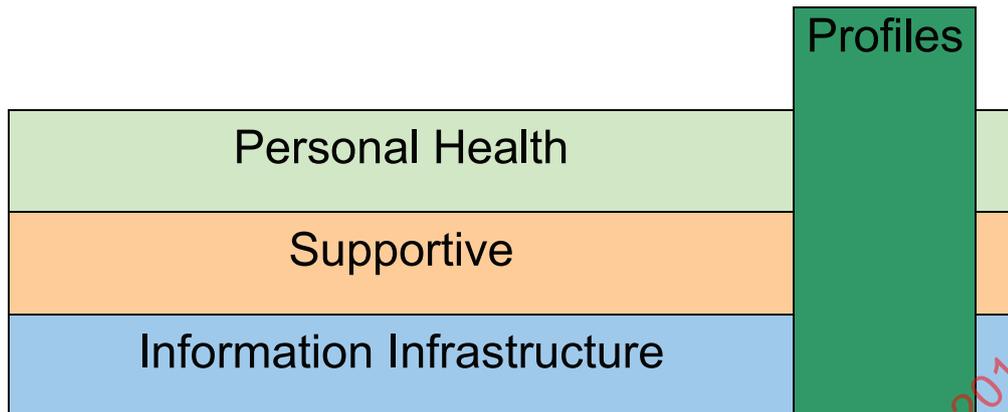


Figure 1 — PHR-S FunctionList Sections

As previously mentioned, the PHR-S FM is divided into three main sections: Personal Health, Supportive, and Information Infrastructure. Within the three main sections are a number of subsections (parent-child relationships). Each subsection is comprised of a number of individual functions. Functions describe the behavior of a system in consumer-oriented language and are intended to be recognizable to all key stakeholders of a PHR-S. Each function contains a Function Name, Function Statement, and Conformance Criteria (which are “normative” in an ANSI-accredited standard) as well as other associated information such as Description (which is reference information and is not a normative part of the ANSI-accredited standard).

The numbering of the functions maintains parent-child relationships between the sections and subsections (e.g. “PH.1.1 Account Holder Profile” is the parent of child “PH.1.1.1 Identify and Maintain a Patient Record”). In many cases the parent is fully expressed by the children (see [Figure 2](#)). In the aggregate, the PHR-S Functional Model is intended as the superset of functions from which a subset can be derived by a Stakeholder Community to illustrate what they need in a PHR-S for their setting. Only a subset of this inclusive set of functions (one or more PHR-S Functional Profiles) will apply to any particular PHR-S implementation.

| | |
|-----------------------------------|---|
| Personal Health | PH.1.0 Account Holder Profile |
| | PH.2.0 Manage Historical Clinical Data And Current State Data |
| | PH.3.0 Wellness, Preventive Medicine, and Self Care |
| | PH.4.0 Manage Health Education |
| | PH.5.0 Account Holder Decision Support |
| | PH.6.0 Manage Encounters with Providers |
| Supportive | S.1.0 Provider Management |
| | S.2.0 Financial Management |
| | S.3.0 Administrative Management |
| | S.4.0 Other Resource Management |
| Infrastructure Information | IN.1.0 Health Record Information Management |
| | IN.2.0 Standards Based Interoperability |
| | IN.3.0 Security |
| | IN.4.0 Auditable Records |

Figure 2 — PHR-S Functional Outline

4.2 PHR-S Functional Outline

4.2.1 The Functions and Their Use

The PHR-S Functional Model can be used to:

- Promote a common understanding of PHR functions upon which developers, vendors, users and other interested parties can plan and evaluate PHR functions.

- Provide the necessary framework to drive the requirements and applications of next level standards, such as PHR content, coding, information models, constructs and interoperability for information portability between sub-systems of a PHR-S and across more than one PHR-S.
- Establish a standards-based method by which each realm (country) can apply these PHR-S functions to care settings, uses, and priorities.
- Inform those concerned with new, additional, or other use of PHR data and national infrastructure what functions can be expected in a PHR-S.

4.2.2 Personal Health Section Functions

Description of Personal Health section functions: The Personal Health (PH) section functions are the subset of PHR-S functions that manage information and features related to self-care and provider based care over time. PH section functions can yield a summary record of an individual's care, including ad hoc views of the overall PHR.

Example of a Personal Health section function: A function to ensure that the individual PHR Account Holder's demographic information is captured and maintained so that the individual is unambiguously identified.

Actors for Personal Health section functions: As the subject of PHR information, the PHR Account Holder is the principal user of PH section functions.

4.2.3 Supportive Section Functions

Description of Supportive section functions: The Supportive section functions are the subset of PHR-S functions that assist the PHR Account Holder with administrative and financial requirements. Also included are PHR-S functions that provide input to systems that perform clinical research, promote public health and seek to improve the quality and outcome of health care delivered.

Example of a Supportive section function: A function that will electronically query local immunization registries to ensure that a person is currently registered and determine the person's immunization status.

Actors for Supportive section functions: The PHR Account Holder is the principal user of Supportive section functions, but under certain circumstances, health care providers might be expected to perform various Supportive section functions.

4.2.4 Information Infrastructure Section Functions

Description of Information Infrastructure section functions: The Information Infrastructure section consists of PHR-S functions that support Personal Health and Supportive section functions. These functions ensure that the PHR-S provides information privacy and security, interoperates with other information systems (including PHR and EHR systems), and helps make PHR-S features accessible and easy to use.

Example of an Information Infrastructure section function: A function to ensure that PHR data, such as an immunization record, can only be viewed and updated after an individual or system authenticates the user's identity within the PHR-S.

Actors for Information Infrastructure section functions: Information Infrastructure section functions are generally performed transparently by the PHR-S on behalf of (and without intervention of) PHR-S Account Holders and other users.

4.3 Common Major Concepts Across the Model

4.3.1 The “Action-Verb” Hierarchy

4.3.1.1 Consistency in the Conformance Criteria

Within the authoring group, there was an intentional effort to create language consistency in the conformance criteria. The “Action-Verb” Hierarchy diagrams below are used to create semantic harmony within the conformance criteria so that, for example, if the Personal Health Chapter has a conformance criterion using the Action-Verb “Update,” that term has the same meaning as in the Supportive Chapter’s conformance criteria.

The levels in the hierarchy are granular and have a parent-child relationship. For example, the diagram below reveals that the “Capture” of information covers local data entry (“Enter”) and importation of data from an external source (“Import”). Similarly, under the “Maintain” section of the diagram, the term “Store” could invoke Action-Verbs listed below it. If the parent term is not used, then the respective verbs in the child will be cited individually in the criterion. If the term “Manage” is used, all of the applicable Action-Verbs included in the table are encompassed in that criterion. Authors are responsible for determining whether one or more of the sub-verbs are appropriate for a given function and must write conformance criteria that constrain the use of the Action-Verb hierarchy according to the intent of the profile being created.

4.3.1.2 The “Secure (System)” Category

The Secure System Category provides Action-Verbs for controlling access (authenticating and authorizing users), tracking activities (logging and auditing), and sustaining operations. This category has one parent, Secure (System), and three (3) intermediate children: Control Access, Track, and Sustain (Operations).

| Secure (System) | | | | |
|-----------------|-----------|-------|-------|----------------------|
| Control Access | | Track | | Sustain (Operations) |
| Authenticate | Authorize | Log | Audit | |

Figure 3 — Secure (System)

4.3.1.3 The “Manage (Data)” Category

The data management Category provides Action-Verbs for the complete range of data handling actions by a system. The category has one parent, Manage (Data), and six (6) children with subsets: Capture, Maintain, Render, Exchange, Determine, and Manage-Data-Visibility.

| Manage (Data) | | | | | | | | | | |
|---------------|----------|-----------|--------|---------|---------|----------|----------|-----------|--------|------------------------|
| Capture | Maintain | | | Render | | | Exchange | Determine | | Manage-Data-Visibility |
| Auto-Populate | Store | Update | Remove | Extract | Present | Transmit | Export | Analyze | Decide | De-Identify |
| Enter | Archive | Annotate | Delete | | | | Import | | | Hide |
| | Backup | Attest | Purge | | | | Receive | | | Mask |
| Import | Decrypt | Edit | | | | | Transmit | | | Re-Identify |
| Receive | Encrypt | Harmonize | Unhide | | | | | | | |
| | Recover | Integrate | Unmask | | | | | | | |
| | Restore | Link | | | | | | | | |
| | Save | Tag | | | | | | | | |

Figure 4 — Manage (Data)

The hierarchical principle above was applied during the development of the PHR-S FM. The Action-Verbs and other terms used in the model are found in the model's Glossary (see [Annex B](#)). It is important to be consistent in the terminology used in the PHR-S FM conformance criteria to ensure consistent interpretation.

4.3.1.4 PHR Account Holder Privacy

It is the bias of this Model that consumer privacy rights be protected to the fullest extent possible. However, as an international model that attempts to describe functionality for many PHR system sub-types (e.g. integrated PHR/EHR systems, stand-alone PHR systems, or vendor-provided Web-based systems), statements concerning consumer control over information are frequently tempered by the phrase (with some variations) "in accordance with user role, organizational policy, or jurisdictional law." This phrase does not extend license to institutions to violate individual rights, but acknowledges that legitimate exceptions may exist to the general rule of PHR Account Holder control over their PHR information. In all cases, the model requires that the privacy policy of a PHR system be fully transparent to PHR Account Holders, and that a PHR-S has the ability to capture a PHR Account Holder's consent on how his or her personal information may be used and disclosed (see functions in IN.3.8, Patient Privacy and Confidentiality for additional detail.)

4.3.1.5 Functionality versus Implementation

It is important to note that many functions provide the capacity for functionality (e.g. provide for standards-based interoperability), but do not give implementation details. A function, when implemented, must be implemented within the context of the entire PHR-S FM. For example, implementation of many functions throughout the model are expected to conform to the security and audit functions found within IN.3 (Security) and IN.4 (Auditable Records), and functions performed "by the PHR Account Holder" may be actually performed by others as delegated by the Account Holder (see IN.3.2, Entity Authorization). Examples of PHR implementation contexts within the Mobile Device space can be found in Annex E, Mobile Device Impact on, and Issues related to, PHRs.

4.3.2 Relevant Standards

Relevant Standards:

- ISO/TR 14292 “Personal health records - definition, scope, context and global variations of use”

4.3.3 Consents, Authorizations, and Preferences

Consumers may desire to declare a consent, authorization, or preference differently in the PHR-S context than in the EHR-S context. The method of handling consents, authorizations, or preferences is not addressed by the PHR-S FM. Rather, such issues ought to be addressed during implementation. For example, such functionality could be implemented in a “services-aware” fashion if desired (for example, as a smart-cloud-type-query). Differences between multiple versions of consents, authorizations, or preferences may be best adjudicated by humans. The state of the art may not yet be adequate to handle such adjudication computationally.

4.3.4 Scope of Downstream Uses of PHR data

The PHR-S FM currently only envisions privacy, security, and confidentiality measures that extend to the initial PHR data-exchange recipient and not to (possible) subsequent recipients of the PHR data that might be passed on by the initial data-exchange recipient.

This PHRS-FM is universal and therefore generic by design. There may be additional constraints in certain realms or regions. For example, in the US Realm, the management of laboratory results is subject to the Clinical Laboratory Improvement Amendments (CLIA) federal regulation.

4.4 Type of Profiles

Characterization of a PHR profile based on its attributes:

- Scope and nature of content

Some PHR systems do not contain any patient clinical data, but just have consumer health information, personal health journals, or information about benefits and/or providers.

Of those PHR systems that have clinical information, some are populated by EHRs, some are disease specific, some include just specific subsets (e.g. lab reports), and some are comprehensive.

- Source of information

Data in PHR systems may come from the consumer, patient, caregiver, healthcare provider, payer, or all of these.

- Custodian of the record

The physical record may be operated by a number of parties, including the consumer or patient, an independent third party, a healthcare provider, an insurance company, or an employer.

- Data storage

Data may be stored in a variety of locations, including an Internet-accessible database, a provider’s EHR-S, the consumer/patient’s home computer, a portable device such as a smart card or thumb drive, or a privately maintained database.

- Degree of Interoperability

PHR system may be stand-alone or be interoperable with other EHRs/PHRs or somewhere in between.

- Party controlling access to the data

While consumers or patients always have access to their own data, they do not always determine who else may access it. For example, PHRs that are “views into a provider’s EHR” follow the access rules set up by the provider. In some cases, consumers do have exclusive control.

5 Conformance Clause

5.1 Introduction (Reference)

The following is the HL7 EHR Work Group (EHR WG) -approved Conformance Clause for the PHR System Functional Model (PHR-S FM). As important background on conformance, please note the following:

- a) This conformance clause defines what it means to conform to the PHR-S FM.
- b) Conformance to the PHR-S FM is defined for functional profiles. A PHR system (PHR-S) does not directly conform to the PHR-S FM, rather it conforms to one or more functional profiles.
- c) Conformance criteria are associated with every function in the PHR-S FM.
- d) This conformance clause does not specify testing or validation procedures to determine whether a PHR-S conforms to a functional profile or whether a functional profile conforms to the PHR-S FM.

The technical and management staff of the U.S. National Institute of Standards and Technology (NIST), Information Technology Laboratory provided input and support for the development of this conformance clause.

5.2 Scope and Field of Application (Normative)

This *conformance clause* defines the minimum requirements for *functional profiles* claiming conformance to the PHR-S FM. It also identifies how PHR systems achieve conformance to the Functional Model (FM), which is via the system’s conformance to a particular functional domain profile, multiple functional profiles, or combination of domain and companion profiles. This clause specifies:

- The purpose, structure, and use of conformance criteria that are to be included in the PHR-S FM and conforming functional profiles,
- The rules for defining conforming functional profiles of the PHR-S FM,
- The relationship between functional profiles and PHR systems,
- Sample conformance clauses and use case scenarios,
- Guidance on the conformance requirements that a functional profile might levy on PHR systems,
- Guidance on the purpose and use of a PHR system Conformance Statement.

While the conformance requirements for functional profiles can be found in this clause, they necessarily reference the PHR-S FM and other sources.

This conformance clause does not specify testing or validation procedures to assess a functional profile’s conformance to the PHR-S FM. It also does not specify testing or validation procedures to determine whether a PHR system conforms to a functional profile or matches its Conformance Statement.

5.3 Concepts (Normative)

5.3.1 Functional Profiles

Creating a functional profile is a method for defining subsets of the PHR-S FM. A functional profile is a specification which uses the PHR-S FM to indicate which functions are required, desired, or implemented for certain PHR systems (e.g. systems characterized by their attributes such as source, custodian, technical approach, or level of functionality) or for other purposes (e.g. systems based

on scope or nature of information such as chronic conditions). See [5.8.1.3](#), [Figure 8](#), for examples of functional profile types.

Functional profiles can be created by healthcare community stakeholders with interest in using and/or providing a functional profile for a PHR system (e.g. Integrated Delivery Network, Employer or Payer). Functional profiles can represent the functionality required and desired for the level of functionality and interoperability, or reflect the functionality incorporated in a vendor's PHR system. Once a functional profile is defined it can be implemented by PHR systems or it may trigger the creation of derived functional profiles. A *derived functional profile* is a functional profile that is created from an existing functional profile, inheriting functions from the base (existing) functional profile.

There are two types of functional profiles: Domain Profile and Companion Profile. The Functional Domain Profile is the common type of profile used to describe a PHR system for a specific community of stakeholders and/or sponsors (such as, diabetes-specific, asthma-specific, EHR-linked or payer-linked). Also, a Functional Domain Profile of a PHR system can be for use in a selected realm to meet the rules, regulations and standards applicable for that realm. The Functional Companion Profiles is a type of profile that must be paired with one or more Domain Profiles. The purpose of a Companion Profile is to add unique features to a PHR System, such as for research or preventative care. For example, many PHR systems for consumers do not need to support clinical research. For a clinic that is supporting advanced research, the need may exist for a PHR system that is capable of all of the expected functions for routine patient self-monitoring activities, but also has unique features to support additional data collection needs for research reporting and clinical trials.

There is one type of mandatory inheritance in the PHR-S FM. All criterion listed in a parent function will be applicable to all the children of that parent function.

A formal process exists for registering and balloting functional profiles. Functional profiles that are submitted to the HL7 EHR WG with an attestation of conformance to Section 5, Conformance Clause, of the HL7 PHR-S FM Standard and successfully complete review by the WG are designated as "*Registered functional profiles*". Registered functional profiles that undergo formal public scrutiny via the HL7 consensus process as an Informative EHR WG ballot at the WG level will be designated as *HL7 Informative functional profiles*. HL7 Informative functional profiles are eligible to undergo full membership ballot via the HL7 consensus process.

5.3.2 Conformance Model (Normative)

A PHR-S does not conform directly to the PHR-S FM; rather, a PHR-S conforms to a functional profile (i.e. a subset – more specifically, a tailored subset) of the PHR-S FM. Conformance to the PHR-S FM is defined for functional profiles. A functional profile conforms either (1) directly to the PHR-S FM or (2) to another conforming functional profile. A PHR system does not conform directly to the PHR-S FM; rather, it conforms to a functional profile. Thus, functional profiles claim conformance to the PHR-S FM and PHR systems claim conformance to one or more conforming functional profiles. A PHR system can also claim conformance to a domain functional profile, in combination with one of more companion profiles. A PHR system cannot claim conformance to a companion profile only. [Figure 5](#) illustrates this relationship.

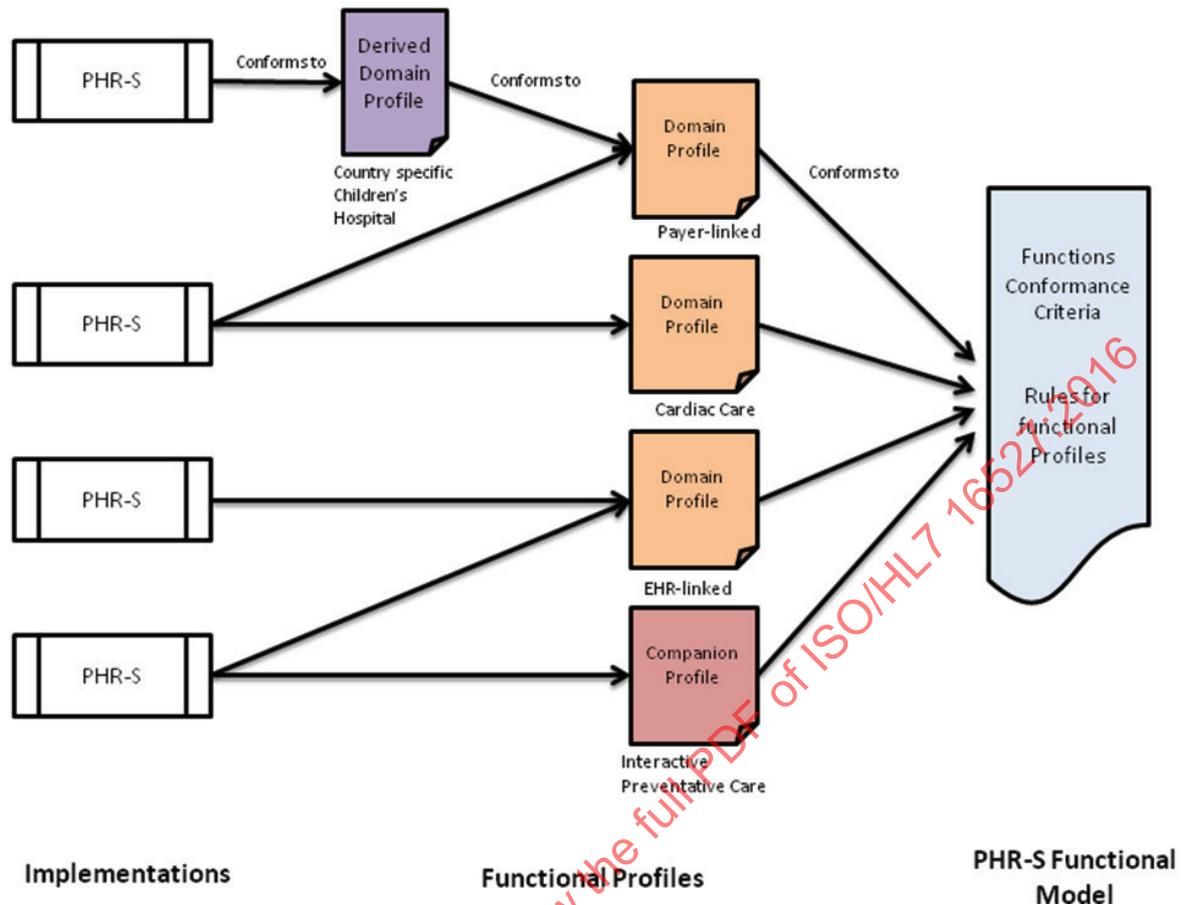


Figure 5 – Conformance Relationships

5.3.3 Profile Traceability (Normative)

Functional profiles allow for added specificity and extensibility to the FM with changes allowed to the base FM functions and criteria. However, 5.7, Functional Profile Conformance, defines rules for these changes. It is also required that any changes and additions be tracked. Two added columns in profiles accomplish this. One column will document the unique source FM row number for each item in the new profile (or source profile for a derived profile). The second column will provide codes for the type of changes from the source FM (or source profile). Together, these two traceability columns will keep track of the origins of the functions or criteria – and whether it is modified or unchanged from that within the FM or the source profile. This may be important when questions arise as to where did it come from, why did you choose or modify it, etc. It can also be helpful to have traceability back to the FM functions and criteria if and when revisions to a profile or for derived profile are needed to reflect care setting, regulatory, technology changes – or a future new release of the FM.

5.4 Normative Language (Normative)

The following keywords (i.e. normative verbs) **SHALL** be used to convey conformance requirements.

- **SHALL** – to indicate a mandatory requirement to be followed (implemented) in order to conform. Synonymous with ‘is required to’.
- **SHALL NOT** – to indicate a prohibited action. Synonymous with ‘prohibited’.
- **SHOULD** – to indicate an optional recommended action, one that is particularly suitable, without mentioning or excluding others. Synonymous with ‘is permitted and recommended’.

- **MAY** - to indicate an optional, permissible action. Synonymous with 'is permitted'.

The PHR-S FM (i.e. all chapters) contains normative, informative, and reference sections. In this conformance clause chapter, the normative content defines how a functional profile achieves conformance to the PHR-S FM.

5.5 Conformance Criteria (Normative)

5.5.1 Introduction

Every function in the PHR-S FM is associated with a set of conformance criteria. These *conformance criteria* form the basis for determining whether the function has been implemented.

5.5.2 Criteria in the Functional Profile

Functional profiles also have conformance criteria associated with every function in the functional profile. The functional profile's criteria are either (1) adapted from the PHR-S FM criteria with care-setting and application specific information or (2) if no care-setting or application specific criteria are present, inherited directly from PHR-S FM. Functional profiles **MAY** change PHR-S FM criteria to match the needs and priorities of the functional profile's constituency, e.g. by making it more specific, or changing it from 'may' or 'should' to 'shall'. The functional profile **SHALL NOT** be made less restrictive than the PHR-S FM by changing 'shall' criteria to 'may' or 'should' criteria. Functional profiles **MAY** also add additional criteria.

5.5.3 'Dependent SHALL' Criteria

Conformance criteria that contain the keyword 'shall' **and** a dependency on situational conditions are called 'dependent shall' criteria. The 'dependent shall' **SHALL** contain the phrase "in accordance with user role, organizational policy, or jurisdictional law" or other appropriate grammatical tie-in words (e.g. 'based on' rather than 'in accordance'). A 'dependent shall' criteria is used to highlight only these (i.e. user role, organizational policy or jurisdictional law) conditions. A 'dependent shall' criterion is a mandatory criterion for functional profiles and situational for PHR systems. Specifically,

- All functional profiles **SHALL** inherit the criterion, if the function appears in the functional profile.
- A PHR system **SHALL** implement the criterion only if the criterion is applicable per the stated dependency in the PHR-S FM.

5.5.4 Referencing Other Criteria or Functions

There is often a link between functions and their criteria with other functions and criteria. For example, a given function may depend on another function or on a specific criterion associated with another function.

A criterion in the functional profile that references another function in the functional profile **SHALL** reference that function by indicating its Function ID and Function Name, as "X.n.n (Name)" (e.g. "PH.1. 5 (Manage Consents and Authorizations)"). If the referenced function is required to be implemented, then all the 'shall' criteria of this referenced function apply.

A criterion in the functional profile that references a specific criterion in another function **SHALL** reference that function by rewriting the referenced criterion as one of its own and indicating the function from where it came.

5.6 PHR-S FM Structure and Extensibility (Normative)

5.6.1 Hierarchical Structure

Functions **MAY** be contained (i.e. nested) within other functions. A nested function is a ‘child’ to its ‘parent’ (i.e. the function that contains it). A child **SHALL** always have a parent. A function that is not a parent to another function is considered a ‘leaf’. [Figure 6](#) illustrates this hierarchical structure.

The PHR-S FM is represented as a hierarchical list of functions, consisting of functional headers and functions. Headers include an ID, Name and “H” in the column labelled “Type”. Headers **MAY** contain conformance criteria only if the criteria apply to all its descendent functions (children, grandchildren, etc.). All parent functions **SHALL** be designated as a header (“H”) function. Leaf functions contain at a minimum the following: ID, Name, Statement, Description, and Conformance Criteria and have an “F” in the “Type” column.

Conformance criteria listed in a header function **SHALL** be inherited by all its children functions. Similarly, conformance criteria listed in a parent function **SHALL** be inherited by all its children functions.

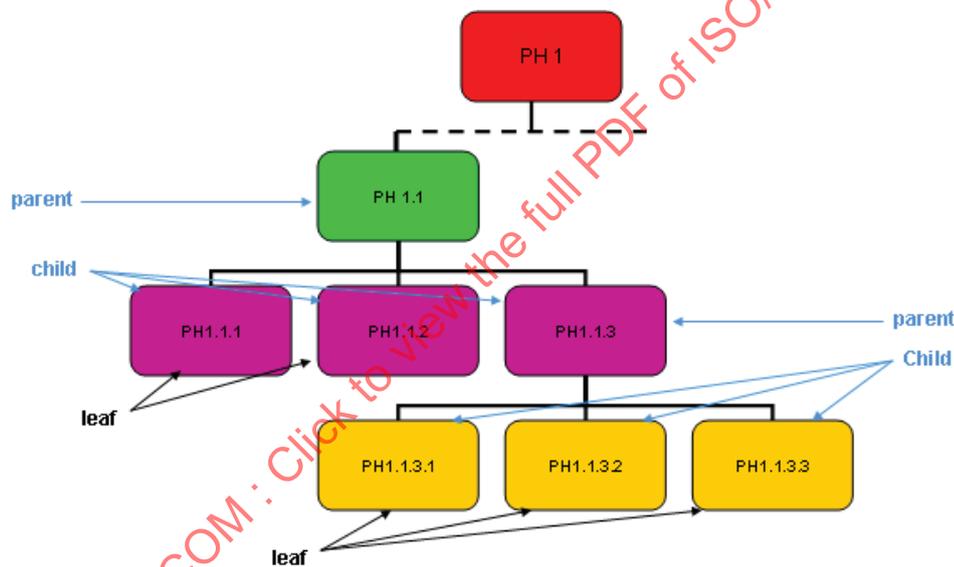


Figure 6 — Portion of the PHR-S FM hierarchical structure

Functional profiles either:

- Select functions from the PHR-S FM for inclusion in the functional profile,
- Deem a function in the PHR-S FM as not applicable, thus do not select it for inclusion in the functional profile,
- Add a new child function when it has been determined that there is no applicable function in the PHR-S FM to represent a functional need in the functional profile.

5.6.2 Naming Convention

Functional profiles **SHALL NOT** change the name or statement of a function except to allow for alignment to realm specific nomenclature. In these cases, the International Organization for Standardization (ISO) country code [ISO 3166 (all parts)] **SHALL** be appended to the function ID in the functional profile. The specific ISO Country Code designation is left up to the profile developers. It is recommended that the profile contain the mapping of the PHR-S FM function name and/or statement and the realm-adjusted

name and/or statement. It is further recommended that the HL7 Affiliate for a specific realm would coordinate the use of ISO Country Codes for all profiles under the specific realm.

5.6.3 Priorities

Functional profiles indicate the importance and/or immediacy of a functional profile by associating a priority with a function. Three priorities have been defined: Essential Now, Essential Future, and Optional.

- Essential Now indicates that the implementation of the function is mandatory, as of the profile issuance date.
- Essential Future indicates that the implementation of the function is currently optional but will be mandatory at some future time, which is specified by the functional profile.
- Optional indicates that the implementation of the function is optional.

Any or all of these priorities **SHALL** be used in a functional profile. If the Essential Future priority is used, then functional profiles are required to define the timeframe associated with implementing functions. A timeframe **MAY** be a date, time allotment (e.g. year 2008, or four months after functional profile publication), or event (e.g. subsequent publication of this functional profile). A functional profile **MAY** define multiple timeframes for the Essential Future priority. If multiple timeframes are defined, then the timeframe **SHALL** be used to qualify each occurrence of the Essential Future priority (e.g. EF-2008, EF-2009).

5.6.4 Extensibility

To accommodate changes in technology as well as functional profiles' needs, the PHR-S FM is designed for extensibility. Incorporation of additional functions in the functional profile beyond what is defined in the PHR-S FM is accommodated through a set of rules for adding new functions as defined in [5.7.3](#), Rules for Creating New Functions in Functional Profiles.

Incorporation of additional criterion, changing the sequence of criterion and providing greater profile-specific detail, beyond what is defined in the FM, is accommodated through a set of rules for adding new criterion or changing existing criterion as defined in [5.5.2](#), Criteria in the Functional Profile.

5.7 Functional Profile Conformance (Normative)

5.7.1 Introduction

A functional profile claiming conformance to the PHR-S FM **SHALL** meet all requirements specified in [5.7.2](#), Rules for Functional Domain Profiles, or in [5.7.6](#), Rules for Functional Companion Profiles.

5.7.2 Rules for Functional Domain Profiles

Functional domain profiles that adhere to the Rules for Functional profiles **MAY** claim conformance to the version of the PHR-S FM from which it was derived.

Functional profiles claiming PHR-S FM conformance **SHALL**:

1. Identify the PHR-S FM with version/date, from which the functional profile is derived,
2. Include a description, version and issuance date of the functional profile,
3. Contain a conformance clause which
 - a. Defines the requirements that PHR systems must satisfy in order to claim conformance to the functional profile.

- b. Defines the requirements that functional profiles derived from the functional profile (i.e. derived functional profiles) must satisfy in order to claim conformance to the functional profile.
 - c. Specifies that functions designated with the priority 'Essential Now' **SHALL** be implemented by conformant PHR systems.
 - d. Specifies that functions designated with the priority 'Essential Now' **SHALL** be included in any derived functional profiles.
 - e. If Essential Future is used, defines the meaning of 'Essential Future', including specifying the timeframe for when these functions are required to be implemented.
 - f. Requires that at least one function, regardless of its priority, be implemented in order for a PHR system to claim conformance to the profile.
4. Identify functions from the PHR-S FM that are applicable to the functional profile. For each function, indicate its priority (i.e. Essential Now, Essential Future or Optional).
 5. For each function, derive conformance criteria based on the PHR-S FM's conformance criteria.
 - a. In the functional profile, there **SHALL** be at least one criterion for each function that is mandatory (a 'shall' criterion).
 - b. If there are 'shall' criteria (for the function in the PHR-S FM), then those criteria **SHALL** also exist for the function (in the functional profile). Additionally, if the function is split (in the functional profile), then the parent's 'shall' criteria **SHALL** appear in at least one child of that function.
 - c. If, as yet there is no 'shall' criterion (for the function in the PHR-S FM), then at least one of the 'should' or 'may' criterion **SHALL** be made mandatory, i.e. a 'shall' criterion.
 - d. Adhere to the rules for referencing functions or criteria in [5.5.4](#), Referencing Other Criteria or Functions.
 6. For any function in the PHR-S FM where one or more criteria are 'dependent shall' criteria, the functional profile for that function **SHALL**
 - a. Replicate verbatim each 'dependent shall' in the functional profile, regardless of whether the dependent situation applies or not.
 - b. When the dependent situation applies, create 'shall' criteria that apply the dependency to the 'dependent shall' criterion, resulting in one or more new, constrained versions of the 'dependent shall' criterion.
 - c. State the specific scope of practice, organizational policy, and/or jurisdictional law which applies or state why these dependencies do not apply.
 7. Adhere to the rules for creating new functions in functional profiles in [5.7.3](#), Rules for Creating New Functions in Functional Profiles.
 8. Be structured in accordance with the structural requirements defined for the PHR-S FM in [5.6](#), PHR-S FM Structure and Extensibility.
 9. Complete the two traceability columns (see [5.3.3](#), Profile Traceability) for any changes to functions or criteria, and include the following codes for type of change: (1 – sequence, 2 – optionality, 3 – content, 4 – new). Multiple codes are allowed to document the type of changes. For example criterion #3 that is move to #1, changed from SHOULD to SHALL and with realm specifics on standards required would be "1, 2, 3".
 10. Be structured in accordance with the structural requirements defined for the FM in [5.6.1](#), Hierarchical Structure.

11. Use the Glossary Action-Verbs for modifying or creating new conformance criterion.

Functional domain profiles claiming conformance to the PHR-S FM **MAY**:

1. Create additional functions according to the rules specified in 5.7.3, Rules for Creating New Functions in Functional Profiles.
2. Contain conformance criteria more specific and limited in scope than those of the PHR-S FM.
3. Replace the text 'standard(s)-based' found in some criteria with specific standards and/or specifications named at the most discrete level of designation.
4. Change a 'should' criterion to a 'shall' or a 'may' criterion.
5. Change a 'may' criterion to a 'shall' or a 'should' criterion.
6. Ignore a 'should' or 'may' criterion in the PHR-S FM (i.e. not include it in the functional profile).
7. Add additional conformance criteria beyond those in the PHR-S FM.
8. Make the order of the conformance criteria significant (e.g. put all 'shall' criteria first).
9. Enforce common resolution of ambiguous semantics of the PHR-S FM.
10. Make the functional profile public (e.g. published on a web site) so interested parties can see/use it.
11. Submit the functional profile for registration review by the HL7 EHR WG.

Functional domain profiles claiming conformance to the PHR-S FM **SHALL NOT**:

1. Specify any requirements that would contradict or cause non-conformance to the PHR-S FM.
2. Modify the name or statement of any function in the PHR-S FM, except to allow for alignment with realm specific nomenclature as specified in 5.6.2, Naming Convention.
3. Change a mandatory conformance criteria to an optional criteria (i.e. replace the 'shall' within the criteria to 'should' or 'may') of any function in the PHR-S FM.
4. Modify any requirements of a function not selected for the functional profile (i.e. all unselected functions default to the PHR-S FM's criteria. If a profiling group wants to change something, they **SHALL** promote it into their functional profile).

5.7.3 Rules for Creating New Functions in Functional Profiles

If a function is not adequately specified for a functional profile or does not exist, the functional profile **SHALL** only create new children. Figure 7 illustrates the addition of a new child function.

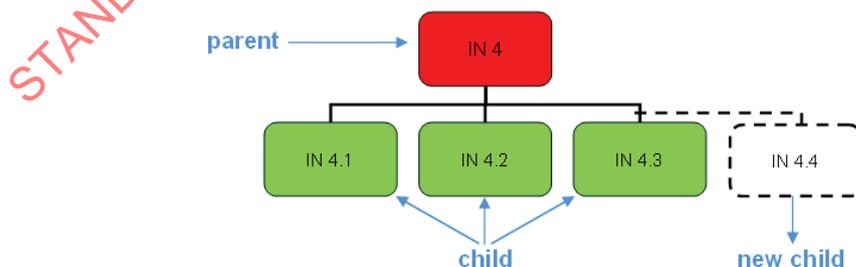


Figure 7 — Creating a new function

The following rules specify the method for creating new functions.

1. Whenever possible, conformance criteria **SHOULD** be used to avoid creating a new function. This may be done, for example, in cases where the original function's conformance criteria are too broad: divide the PHR-S FM's or base functional profile's inherited conformance criteria into two criteria in the functional profile, one being mandatory and the other optional.
2. When a 'leaf' function exists but is too broadly specified in the PHR-S FM or base functional profile for conformance criteria to adequately constrain it, then the function **MAY** be split as follows:
 - a. The original 'leaf' function is retained as the parent of its newly created children functions,
 - b. The original 'leaf' function's conformance criteria **SHALL** be distributed among its children functions.
3. When no candidate function exists to express the requirements of a functional profile, a new child function **MAY** be created (e.g. adding a new kind of summary list under the summary list's parent).
4. Parent functions **SHALL NOT** be split. This preserves the structure of the underlying PHR-S FM in the functional profiles.

If new children functions are created by a functional profile that is balloted or registered, these new functions will be captured by the HL7 EHR WG and tracked for review. The EHR WG **WILL** use these new functions and related criterion as input and candidates for changes to the FM (e.g. inclusion, relaxation of conformance criteria). The EHR WG **MAY** maintain a file of functions and criterion reviewed and rejected for inclusion in a future version of the FM.

5.7.4 Rules for Derived Functional Profiles

Derived functional profiles claiming conformance to one or more base functional profiles **SHALL**:

1. Adhere to all the rules for functional profiles as specified in [5.7.2](#), Rules for Functional Domain Profiles.
2. Adhere to the rules for creating new functions as specified in [5.7.3](#), Rules for Creating New Functions in Functional Profiles, if not prohibited by the base functional profile.
3. Identify the base functional profiles from which it is derived.
4. For each function inherited from a base functional profile, retain and not change mandatory conformance criteria to optional conformance criteria.

5.7.5 Conformance Statement

Functional profiles **MAY** want to require that a conformance statement be produced for systems claiming conformance to the profile. A *Conformance Statement* provides information about a PHR system, by presenting in a uniform manner the functions that have been implemented by the PHR system. A blank (i.e. yet to be completed) Conformance Statement typically takes the form of a questionnaire or checklist, to be completed for each PHR system.

A Conformance Statement provides a concise summary of a functional profile. It follows a standard layout, thus providing PHR system vendors and users a quick overview of the functional profile's functions. Moreover, it can also be used to highlight optional functions and capabilities supported by the PHR systems as well as document any extensions (i.e. additional functionality beyond what is in the functional profile) or specializations that have been made. A PHR system's Conformance Statement provides information that can be used in assessing the PHR system's conformance to a specific functional profile. Additionally, organizations wishing to acquire a PHR system **MAY** produce a Conformance Statement to indicate the functions that are required and/or desired in a PHR system.

Functional profiles **MAY** want to include a blank Conformance Statement in order to promote consistency among completed Conformance Statements. Conformance Statements can be useful in determining the

chances of interoperability between two PHR systems, by comparing the functions supported by each PHR system. Additionally, for conformance testing purposes, it can be used to facilitate the selection of tests that would be applicable to a particular PHR system being tested. For example, if a PHR system did not implement functions designated as 'Essential Future', this would be evident in the Conformance Statement and the tests for these functions (which are unimplemented) would not be performed.

5.7.6 Rules for Functional Companion Profiles

Functional companion profiles that adhere to the Rules for Functional profiles **SHALL** claim conformance to the version of the PHR-S FM from which it was derived. Functional companion profiles will follow [5.7.2](#), Rules for Functional Domain Profiles and [5.7.4](#), Rules for Derived Functional Profiles, except for the exceptions and addition described below:

Functional companion profiles claiming FM conformance **SHALL**:

1. Adhere to [5.7.3](#), Rules for Creating New Functions in Functional Profiles, for adding new functions.
2. Contain a conformance clause which

Defines at least one functional domain profile for which the companion profile can be linked that PHR systems must satisfy in order to claim conformance, or state any specific domain profiles that can or cannot be linked to the companion profile,

Defines the requirement(s) that companion profiles derived from the base functional companion profile (i.e. derived functional profiles) must satisfy in order to claim conformance to the functional companion profile.

3. Include **only functions being modified** from the Overarching section of [Annex A](#) as Essential Now and identify functions from other section of [Annex A](#) of the FM that are applicable to the functional companion profile. For each identified function, indicate its priority (i.e. Essential Now, Essential Future or Optional).
4. For each function, derive conformance criteria based on the FM's conformance criteria.

In the functional profile, there **SHALL** be at least one criterion for each function that is mandatory (a 'shall' criterion).

If there are 'shall' criteria (for the function in the FM), then those criteria **MAY** also exist for the function (in the functional companion profile) if changes. Additionally, if the function is split (in the functional profile), then the parent's 'shall' criteria **MAY** appear in at least one child of that function.

5. For any function in the FM where one or more criteria are 'dependent shall' criteria, the functional companion profile may elect to ignore the criterion, but **if selected** for that function **SHALL** follow the rules for "Functional profiles claiming PHR-S FM conformance **SHALL**" listed in [5.7.2](#), Rules for Functional Domain Profiles.

Functional companion profiles claiming conformance to the FM **MAY**:

1. Ignore a 'shall', 'should' or 'may' criterion in the FM (i.e., not include it in the functional profile).

There are no exceptions to [5.7.4](#), Rules for Derived Functional Profiles, for Derived Functional Companion Profiles.

5.8 Use Cases and Samples (Reference)

5.8.1 Functional Profile Use Cases

5.8.1.1 Example 1: PHR Source (based on custodian)

It is determined that a new source-based functional profile is needed to reflect the specific requirements and expectation of a system from this particular stakeholder source (e.g. a hospital, medical group, payer, or health record bank) – see [Figure 8](#). To help ensure widespread use and uniformity, the functional profile authors elect to undergo the registration review followed by the HL7 consensus process (i.e. submitting the registered functional profile for an “Informative” committee level ballot). If successful, the result will be designated an HL7 Informative Functional Profile.

After looking at current list of HL7 PHR informative functional profiles, the decision to create a new functional profile is made. Each function in the PHR-S FM is examined and those that are relevant to the PHR source chosen – e.g. a Provider-Linked PHR from an Integrated Delivery Network. From these functions, a small set of ‘core’ functions is selected as being essential and mandatory. For each function, conformance criteria are developed either adapting the PHR-S FM conformance criteria or in a few cases, using the PHR-S FM criteria as is. To complete the functional profile, a description of the functional profile is written that includes its intended use and audience, as well as a conformance clause. The functional profile is made public by publishing it on various web sites. Additionally, the functional profile is submitted to HL7’s EHR WG for registration review, comment and ballot.

5.8.1.2 Example 2: Level of Functionality derived functional profile

A community of interest (e.g. a regional health information exchange network, or a care management community who targets a specific chronic condition) or a particular stakeholder may want a functional profile. The Community of Interest or stakeholder may want a profile based on the level of functionality that they want for their patient population, to reflect the expectation of the PHR system’s sophistication and/or capabilities – see [Figure 8](#).

The Community of Interest or stakeholder does not want to create a new functional profile from scratch. After looking at the list of HL7 Registered PHR Functional Profiles, they find an existing functional profile that is very close to what they want. Using this functional profile as the base, they accept all the functions designated as ‘Essential Now’, reject functions designated as ‘Future’ and add several more functions. For each function, they review the conformance criteria and adapt the criteria to reflect their situational information.

5.8.1.3 Example 3: Vendor functional profile

A vendor of a PHR system wants to claim conformance to the PHR-S FM.

The vendor identifies and lists all the functions that are in his product. The vendor adds a description and a conformance clause (see samples in [5.8.2](#), Sample Functional Domain Profile Conformance Clauses). This is the vendor’s functional profile. If the vendor has actually implemented all the functions listed, then this is equivalent to ‘Essential Now’ and these functions are mandatory. Vendor features that are not in the PHR-S FM may be added as added functions or added criteria – within the rules of [5.7.2](#), Rules for Functional Domain Profiles, and [5.7.3](#), Rules for Creating New Functions in Functional Profiles, above. If functions that are currently implemented and those that will be implemented in the future are listed, then the functional profile is comprised of ‘Essential Now’ and ‘Essential Future’ and/or optional functionality. Finally, the vendor adds conformance criteria for each function inheriting directly (without change) the criteria in the PHR-S FM. This is appealing in that, the vendor has the opportunity to list the current functionality and, if desired, indicate future plans. In essence, this is similar to a vendor Conformance Statement (a concept with which most vendors are already familiar). A vendor may create multiple functional profiles.

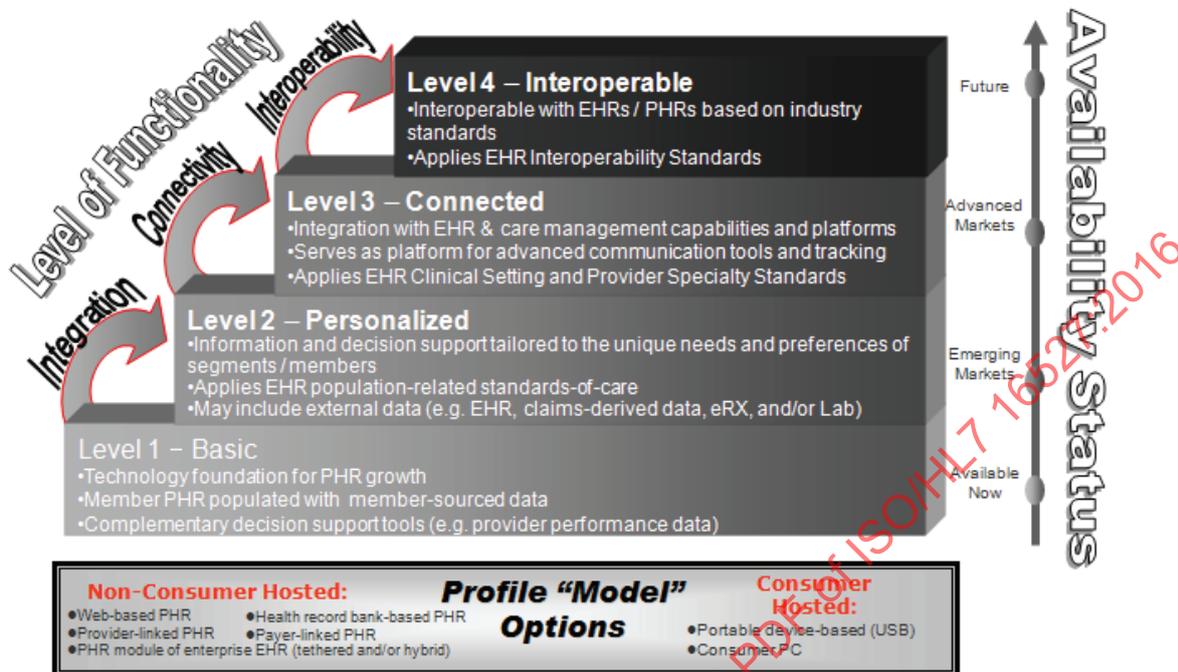


Figure 8 — Examples of Functional Profile Options by “Model” and/or Level of Functionality

5.8.2 Sample Functional Domain Profile Conformance Clauses

5.8.2.1 Developing a Conformance Clause

To aid functional profile developers in developing a conformance clause for their functional domain profile, as required by 5.7.2, Rules for Functional Domain Profiles, rule #3, the following fictional examples are offered. Note: in these examples, the keywords ‘**SHALL**’, ‘**SHOULD**’, and ‘**MAY**’ are capitalized and bold. This is a convention to draw attention to the keywords.

5.8.2.2 Sample 1: conformance clause for a Provider-linked PHR functional profile

This functional domain profile defines the conformance requirements for PHR systems and derived functional profiles. To conform to this functional profile, all ‘Essential Now’ functions **SHALL** be implemented. ‘Essential Now’ functions are considered mandatory functions. A PHR system is conforming if it implements all the functions designated as ‘Essential Now’ and the mandatory conformance criteria associated with that function. A derived functional profile is conforming if it follows the Rules for functional profiles.

Mandatory conformance criteria are indicated by the keyword ‘shall’. Optional conformance criteria are indicated by the keywords ‘should’ or ‘may’.

PHR systems **SHALL** provide a Conformance Statement structured according to the rules and policies defined in this functional profile.

5.8.2.3 Sample 2: conformance clause for a vendor system functional profile

Conformance is defined for My-PHRsystem. All functions in this functional profile are mandatory, are deemed as ‘essential now’, and **SHALL** be implemented in order to conform to this functional profile.

5.8.2.4 Sample 3: conformance clause for a community of interest functional profile

Conformance is defined for BuyMyDiabetesPHR. To conform to this functional profile, all functions labelled as 'essential now' **SHALL** be available and have been implemented. Functions labelled 'essential future' are optional, in that they are present for informational purposes only and **MAY** be implemented in future functional profiles.

5.9 Interpreting and Applying Conditional 'SHALL' (Reference)

5.9.1 Construction of Conformance Criteria Using the Conditional 'SHALL' Overview

Conformance criteria in the FM and those created can be structured in the simple format an Actor followed by normative verb followed by action or property. For example: The system **SHALL** capture demographic information as part of the patient record.

However, there are two conditional forms for which if the condition is true, then the following text must apply. One is If/Then. If condition, then Actor followed by normative verb followed by action. If the condition is not met (i.e. false) then ignore the rest of the sentence. For example, IF data is exchanged with internal or external systems, THEN the system **SHALL** conform to function IN 5.1 (Interchange Standards)

The other is a 'Dependent Shall' format. Actor followed by normative verb followed by action/interaction followed by 'according to scope of practice, organizational policy or jurisdictional law'. For example, "The system **SHALL** enable EHR-S security administrators to grant authorizations to principals according to scope of practice, organizational policy, or jurisdictional law."

The following example of a PHR-S FM 'dependent shall' criterion will be used to illustrate concepts throughout this clause.

PHR-S FM criterion: *The PHR-S **SHALL** provide the ability for PHR-S security administrators to grant authorizations to principals according to user role, organizational policy, and/or jurisdictional law.*

5.9.2 General Concepts

The purpose of the 'dependent shall' is to allow functional profiles to constrain a PHR-S FM 'shall' criteria based on situational conditions such as policy and legal implications. Specifically, the 'dependent shall' criteria in the PHR-S FM are 'shall' criteria plus a dependency, where the dependency is defined by:

- User role which applies to the various PHR Account Holder's possible or alternative roles – which may be care setting specific or not, or may be related to whether the PHR is about them or is for their dependent.
- Organizational policy which refers to a plan or course of action intended to influence and determine decisions, actions, and other matters of a group of persons organized for a particular purpose within an association and structure through which individuals cooperate systematically to conduct business.
- Jurisdictional law which refers to the territorial range of authority or control with the power, right, or authority to interpret, apply, and declare the body of rules and principles governing the affairs of a community and enforced by a political authority; a legal system.

The structure of the 'dependent shall' criteria in the PHR-S FM is the same as the 'shall' criteria except with the addition of the phrase "in accordance with user role, organizational policy or jurisdictional law" or other appropriate grammatical tie-in words (e.g. "based on" rather than "in accordance"). Note that all three dependencies are present in the PHR-S FM 'dependent shall' criteria. It is the functional profile that narrows it to any one dependency or any combination of the three. Moreover, in the functional profile, the specific user role, organizational policy, and/or jurisdictional law which necessitates evoking the 'dependent shall' is explicitly identified.

For example: (derived from the PHR-S FM criterion above)

PHR-S FM criterion: *The PHR-S **SHALL** provide the ability for PHR-S security administrators to grant authorizations in accordance with the U.S. Health Insurance Portability and Accountability Act of 1996.*

The difference between a ‘shall’ criterion and a ‘dependent shall’ criterion is shown in [Table 1](#).

Table 1 — Differences between ‘shall’ and ‘dependent shall’

| | ‘SHALL’ Criterion | ‘Dependent SHALL’ Criterion |
|---|---|---|
| Must be present in the functional profile? | Yes, either verbatim or modified (e.g. constrained or re-fined) | Yes, verbatim. If a dependency exists, add additional criteria reflecting the dependency. |
| Must be implemented by PHR systems? | Yes. | Situational - only implement if the dependency exists. Specifically, the PHR system does not implement the ‘dependent shall’ criterion (as copied from the PHR-S FM), but does implement additional ‘shall’ criteria created to reflect the dependency. |

5.9.3 Rationale for ‘Dependent SHALL’

The reason for using a ‘dependent shall’ in the PHR-S FM is to highlight certain criteria and bring them to the attention of the reader – both developers of functional profiles as well as other users. ‘Dependent shall’ criteria are considered to be special cases, where there are one or more dependencies that affect these criteria, across multiple care settings. Using the ‘dependent shall’ ensures that developers of all functional profiles address the criterion and consciously decide whether the criterion in question is applicable, based on the stated dependency.

Regardless of whether a dependency exists or not, the ‘dependent shall’ is copied verbatim into the functional profile. The reasons for this are:

- Adherence to the rule that a ‘shall’ criterion is always inherited by the functional profile.
- Consistency with handling the ‘dependent shall’ under all conditions (i.e. when there are dependencies and when there are not).
- Retention of the ‘dependent shall’ so that it is present for derived profiles.
- Retention of the ‘dependent shall’ so that it remains effective for this profile if future requirements change (i.e. the dependency may not be applicable at this present time, but may be applicable in the future due to changes in user role, organizational policy or jurisdictional law).

5.9.4 How to Apply the ‘Dependent SHALL’

The way to interpret and apply a ‘dependent shall’ criterion in a functional profile is as follows:

- Copy the criterion into the functional profile.
- Review the criterion and determine if any of the dependencies are applicable to the functional profile.
- If a dependency exists:

If one or more dependencies are applicable to the functional profile (e.g. there are jurisdictional legal requirements), add one or more ‘shall’ criteria that refine and further constrain the ‘dependent shall’ with respect to the dependencies.

For the new criteria, add an explanation and/or citing for the dependency. For example, “Jurisdictional legal requirements for this functional profile are defined by U.S. Federal Regulations HIPAA Security Rule 45 CFR Parts 160, 162 and 164”. The explanation or citing may be in an appendix. It is likely that multiple criteria will reference the same explanation or citing.

Examples:

Functional Profile criteria

1. The PHR-S **SHALL** provide the ability for PHR-S security administrators to grant authorizations to principals in accordance with HIPAA*.
2. The PHR-S **SHALL** provide the ability for PHR-S security administrators to grant authorizations for roles in accordance with 42 CFR Part 2*.

*Dependency Explanation: For a U.S. realm functional profile, the Health Insurance Portability and Accountability Act of 1996 (HIPAA) as well as other jurisdictional legal requirements or other more stringent requirements would be applied to 'dependent shall' criteria in the functional profile.

Table 2 — Summary of actions when dependency exists

| PHR-S FM | Dependency Applies? | Applicability | Functional Profile |
|-----------------|---------------------|---------------|---|
| Dependent SHALL | Yes | Mandatory | Copy SHALL from the PHR-S FM |
| | | Mandatory | Add additional criteria to reflect the dependencies. Use 'shall'. |
| | | Mandatory | Add explanation or citing. |
| | | Optional | Add additional criteria derived from 'dependent shall'. Use 'shall', 'should' or 'may'. |

- If no dependency exists:

If no dependency is applicable to the functional profile (i.e. there are no user roles, organizational policies or jurisdictional legal requirements that apply), then document the rationale for deciding that no dependencies apply. This explanation may be in an appendix. It is likely that this explanation will apply to multiple 'dependent shall' criteria.

Table 3 — Summary of actions for when no dependencies apply

| PHR-S FM | Dependency Applies? | Applicability | Functional Profile |
|-----------------|---------------------|---------------|---|
| Dependent SHALL | No | Mandatory | Copy SHALL from the PHR-S FM |
| | | Mandatory | Add explanation |
| | | Optional | Add additional criteria derived from 'dependent shall'. Use 'shall', 'should' or 'may'. |

- Add additional criteria – regardless of whether a dependency exists or not.

It is always permissible for a functional profile to add new criteria. Add new criteria that are derived from the 'dependent shall'. Use any keyword: 'shall', 'should' or 'may' (see 5.4, Normative Language) in these new criteria.

Examples:

1. The PHR-S **SHOULD** provide the ability for PHR-S security administrators to grant authorizations to principals.
2. The PHR-S **MAY** provide the ability for PHR-S security administrators to grant authorizations for roles.
3. The PHR-S **SHOULD** provide the ability for PHR-S security administrators to grant authorizations within contexts.

4. The PHR-S **SHALL** provide the ability for PHR-S security administrators to grant authorizations for roles for organizations with ten employees or more.

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Annex A (normative)

Function List

In the PHR Function List each function in the HL7 PHR-S FM is identified and described using a set of elements or components as detailed in [Figure A.1](#) and explained below.

| Function ID | Function Type | Function Name | Function Statement | Function Description | Criteria # | Conformance Criteria | Model Row # |
|-------------|---------------|---------------|--------------------|----------------------|------------|----------------------|-------------|
| Reference | Reference | Normative | Normative | Reference | Reference | Normative | Reference |

Figure A.1 — Functions in the PHR-S FM Function List

- **Function ID (Reference)**

The Function ID is a unique identifier for a given function. The Personal Health section functions are identified by 'PH' followed by a number (Example PH.1.1.3.1; PH.1.1.3.2). Supportive section functions are identified by an 'S' followed by a number (Example S.2.1; S.2.1.1). Information Infrastructure section functions are identified by an 'IN' followed by a number (Example IN.1.1; IN.1.2). Numbering for all sections begins at n.1.

- **Function Type (Reference)**

The Function Type indicates whether a given function is a header (H) or function (F).

- **Function Name (Normative)**

The Function Name conveys a terse description of a given function.

Example Account Holder Profile

- **Function Statement (Normative)**

The Function Statement offers a brief description of a function's purpose.

Example Maintain PHR Account Holder demographics, preferences, advance directives, consents and authorizations

- **Description (Reference)**

The Description conveys the fuller meaning and nuances of the Function Statement, often accompanied by clarifying examples.

Example The person that is the subject of the personal health record is referred to as the Account Holder to distinguish them as someone other than a patient or subject of a given healthcare system. The Account Holder creates a record that contains relevant demographic information and includes other administrative statements necessary to provide care, including advance directives and consents for care.

- **Conformance Criteria (Normative)**

The Conformance Criteria clarify how conformance to a given function may be viewed. Review the Conformance Clause, [5.5](#) and [5.6](#), for further information on conformance criteria and their uses.

For the full list of PHR-S FM functions, please refer to the included file EHR_PHRSFM_R1_2014AUG_FunctionList.html.

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Annex B (informative)

Glossary

B.1 Introduction and Overview

The Health Level Seven International (HL7) Personal Health Record System Functional Model (PHR-S FM) Glossary is an HL7 reference document that provides a set of definitions and guidelines in order to ensure clarity and consistency in the terms used throughout the functional model. The Glossary includes the definition of important terms used in the expression of PHR systems' functionalities, and comprises a consensus-based list of Action-Verbs and specific guidelines for constructing conformance criteria (CC).

HL7's EHR Work Group (EHR WG) intends to continually unify the glossaries that support both the EHR and Personal Health Records (PHR) System Functional Models, since both models overlap in health care information coverage and system functionalities, and since readers are often the same people. It is expected that Functional Profiles (FP) created within the context of the PHR-S FM will align with and respect this Glossary. However, this Glossary will not provide definitions for all the terms used in Functional Profiles. FPs will typically use context-specific, realm-specific, or specialized terms associated with their area of focus, and will need to incorporate a complementary glossary for these special terms. In the case where FPs are merged, care should be exercised to ensure that the same Action-Verbs are used with the same meaning, and that identical meanings are conveyed with the same Action-Verb. It is recommended that existing FPs be re-examined and updated to better align with this Glossary.

Action-Verbs play a critical role in phrasing conformance criteria (CC). Extensive efforts were made to categorize and normalize Action-Verbs and to develop guidelines for creating clear and consistent CCs throughout the PHR-S FM. Continuity with previous PHR-S FM versions is provided by including Glossary terms that have been deprecated, accompanied by suggestions for preferred replacement terms. Vigorous efforts were deployed to reduce the ambiguities inherent in the use of human language; care was used to respect the fundamental meaning of words and to avoid domain specific usage of terms.

Some common terms and Action-Verbs have not been included in this Glossary. For example, terms like 'computer', 'keyboard', 'archive' and 'compact' are considered general computer field terms that do not need to be defined here. Some other terms reflect functionalities inherent in any computer system and are not defined here, e.g. compute. Readers who desire definitions of terms not covered in the Glossary are invited to consult trusted dictionaries or encyclopedias. Where definitions of terms are taken from recognized sources, specific references are included.

B.2 Scope

- The EHR Work Group's PHR-S FM Glossary only defines terms that are unique to the PHR-S FM.
- Terms in the EHR Work Group's PHR-S FM Glossary will be submitted for inclusion in the HL7 Version 3.0 Edition Glossary.
- The creation of a PHR User Account is assumed to be within the scope of the PHR-S FM.

B.3 Known Issues

The following are known issues with this version of the glossary:

- This Glossary has been revised for Action-Verbs only. The Glossary Team (GT) intends to re-examine the other glossary terms in the future.
- Care has been taken to align definitions with trusted dictionaries. The two (2) main dictionary sources have been:
 - <http://dictionary.reference.com/index.html>, and
 - The Canadian Oxford Dictionary.
- Where definitions have been obtained from other trusted sources, the source is noted in the Reference column of the table. Invitations are extended to interested parties to complete the Reference column where applicable.
- Definitions provided are not expected to align with the various definitions included in other standards, jurisdictional laws and regulations, or in domain-specific glossaries. This glossary aims at being health care domain independent and universal.

B.4 Action-Verbs

B.4.1 The Action-Verb Structure

The Action-Verbs to be used for writing conformance criteria (CC) in the EHR-S FM and the PHR-S FM are organized in two (2) categories, each with its own set of Action-Verbs:

- A Secure (System) category;
- A Data Management category.

Each category consists of Action-Verbs that collectively represent a logical set of actions distinct from the other category. All Action-Verbs at all levels are defined in the glossary section of this document; illustrative examples are provided.

B.4.2 Secure (System) Category

The Secure System Category provides Action-Verbs for controlling access (authenticating and authorizing users), tracking activities (logging and auditing), and sustaining operations. This category has one parent, Secure (System), and three (3) intermediate children: Control Access, Track, and Sustain (Operations).

Table B.1 — Secure (System)

| Secure (System) | | | | |
|-----------------|-----------|-------|-------|----------------------|
| Control Access | | Track | | Sustain (Operations) |
| Authenticate | Authorize | Log | Audit | |

- Control Access: Ensure that the only those who are properly authenticated and authorized can use the system.
- Track: Ensure that system activities are traceable via logs and audit trails. Concepts include: govern; control; administrate; oversee; inspect; examine; assess; observe; monitor; police; enforce; and check.
- Sustain (Operations): Ensure that the system operates correctly. Concepts include: sustain operations; quality; integrity; throughput; mirror; reliability; failover; failsafe; versioned; virus-free; leak-free; up-to-date; and safeguard.

B.4.3 Data Management Category

The data management Category provides Action-Verbs for the complete range of data handling actions by a system. The category has one parent, Manage (Data), and five (5) children with subsets: Capture, Maintain, Render, Exchange, and Determine, and Manage-Data-Visibility.

Table B.2 — Manage (Data)

| Manage (Data) | | | | | | | | | | |
|---------------|----------|-----------|--------|---------|---------|----------|----------|-----------|--------|------------------------|
| Capture | Maintain | | | Render | | | Exchange | Determine | | Manage-Data-Visibility |
| Auto-Populate | Store | Update | Remove | Extract | Present | Transmit | Export | Analyze | Decide | De-Identify |
| Enter | Archive | Annotate | Delete | | | | Import | | | Hide |
| Import | Backup | Attest | Purge | | | | Receive | | | Mask |
| Receive | Decrypt | Edit | | | | | Transmit | | | Re-Identify |
| | Encrypt | Harmonize | | | | | | | | Unhide |
| | Recover | Integrate | | | | | | | | Unmask |
| | Restore | Link | | | | | | | | |
| | Save | Tag | | | | | | | | |

The first three subsets cover the capture, maintenance and rendering of data as follows:

- **Capture:** Auto populate fields of data based on partially filled information, Enter data manually, Import data from an external source (which may be a device), and Receive data from another system (which may be in a device).
- **Maintain:** Store, Update and Remove data:
 - **Store:** Save data on local media, Backup data on backup storage media, and Encrypt data for security and privacy purposes;
 - **Update:** Edit data by modifying it, Annotate data with notes, Tag data with labels, Harmonize data with other sources, Integrate data together, and Link data to other data;
- **Remove:** Delete data from the index or directory, and Purge data from the storage media.
- **Render:** Extract data based on certain criteria, Present data on an attached device, and Transmit data to external systems or devices.

The next subset provides a collection of verbs that comprise the set of actions commonly employed when exchanging data:

- **Exchange:** Send data to – or receive data from – an external system(s).

The next subset provides verbs for the determination of actions in processing data:

- **Determine:** Analyze data using rules and analytical steps and then Decide appropriate actions as a result of that analysis.

The final subset allows the construction of statements restricting the visibility of data and reversing those actions:

- **Manage-Data-Visibility:** De-Identify data as to prevent associating the data to a specific person, Hide data so that only authorized users can see that the data exist, and Mask data so that users can see that the data exist but only authorized users can actually view the actual data.
- To reverse these actions: Re-Identify, Unhide, and Unmask.

B.4.4 How Action-Verbs are defined

In this Glossary, Action-Verbs are defined in the following manner:

For an Action-Verb that has a parent, the Action-Verb's definition will start with the immediate parent verb and then a restatement of the meaning of the Action-Verb, followed by at least one (1) example labelled as such. Examples will use the Action-Verb being defined with explanatory descriptions where relevant. An illustrative example follows:

- **PRESENT (Action-Verb):** To **RENDER** (the parent Action-Verb) data by delivering the data to local users in a meaningful and appropriate way. For example, the system may **PRESENT** an alert automatically when a newly-arriving lab value is received that is out of normal range.

For a top level Action-Verb, the definition will include the next immediate level of children, followed by at least one (1) example labelled as such. Examples will use the Action-Verb being defined with explanatory descriptions where relevant. An illustrative example follows:

- **MANAGE (DATA) (Action-Verb):** To handle data by capturing, maintaining, and rendering data, determining actions about data, and managing data visibility. For example, the system shall provide the ability for a user to **MANAGE** patient and family preferences as they pertain to current treatment plans.

B.4.5 Deprecated Action-Verbs

The Glossary includes deprecated Action-Verbs, with suggestions on how to phrase their meaning using the standardized list of Action-Verbs and qualifiers as explained in [B.5.2](#), General Guidance.

In this Glossary, the term deprecated is used to qualify Action-Verbs that were previously used in conformance criteria and are not part of the updated hierarchy of Action-Verbs; therefore, deprecated Action-Verbs should not be used. These deprecated Action-Verbs have been labelled as such. Examples of deprecated Action-Verbs include **ALERT**, **QUERY**, and **SEARCH**.

B.5 Guidelines for Use

B.5.1 Introduction

Contributors to the contents of the PHR-S FM must be thoroughly familiar with this 'Guidelines For Use' clause. It is critical to the integrity of the PHR-S FM that key terms have a consistent meaning throughout the PHR-S FM specification.

B.5.2 General Guidance

Throughout the PHR-S FM, terms used for stating Conformance Criteria (CC) must respect meanings as conveyed in the definitions provided in this Glossary. Using the Action-Verbs rigorously will result in clearly written Conformance Criteria (CC) and help ensure consistent communication of functional requirements. Furthermore, combining various functional models and functional profiles is facilitated when a controlled set of terms is used consistently. Therefore, use of synonyms or local jargon should be avoided.

In the PHR-S FM, Statements and Descriptions should be written in 'business-like language', defining in business and user terms system capabilities that support user needs. CC should be written from the system's perspective, with rigor and consistency across functional areas, using Action-Verbs and the guidelines; CC should not be duplicates of the Statements and Descriptions. However, scope wise, both Statement/Description and the corresponding CC must address the same functionalities.

CC represents a fundamental component of the PHR-S FM by defining its functionalities in precise terms. Significant efforts were invested in developing a set of Action-Verbs with precise definitions that must be used in the construction of CC. The next clause provides specific guidance on how CC should be composed.

Since various realms may require the use of certain terms (for example, a term that is embedded in national law), this PHR-S FM Glossary maintains a realm-independent perspective. The long term intent is to construct CC that are computable and easy to validate as to their grammar and contents when it is relevant (e.g. use of list of approved Action-Verbs).

B.6 Constructing Rigorous Conformance Criteria

Rigor, clarity and consistency in crafting CCs are of paramount importance. The following rules are to be followed whenever possible:

- It is generally preferable to use separate CCs instead of trying to include multiple actions in a single criteria, unless such a combination provides for an economy of statements and is unambiguous.
- Where an action can be performed both automatically by the system and manually upon initiation by the user, separate CCs must be composed.

Selected verbs in conformance criteria should be at the proper level of granularity. If a parent verb in a hierarchy is used, then it means that the actions of all the children verbs under it are pertinent and apply.

- For example, instead of saying MAINTAIN clinical data which would imply storage, update and deletion of data, one would say STORE and UPDATE data if deletion of data was not allowed.
- For example, if a given CC expects EDIT and TAG to be reasonable application of the function, but that ANNOTATE, HARMONIZE, INTEGRATE, LINK are unreasonable, then the word MAINTAIN should be avoided in lieu of the more precise “EDIT and TAG”.
- An example of multiple Action-Verbs: The system SHALL provide the ability to CAPTURE, STORE, EDIT, and TAG-as-deprecated the entries in the registry or directory so that it is current.

The general grammar to use in developing rigorous CCs has the following structure:

The system [SHALL | SHOULD | MAY] [provide the ability to] [Action-Verb] [object(s)] [participant(s)] [qualifier(s)] [“according to scope of practice, organizational policy, and/or jurisdictional law”].

- The system is the subject of all the Conformance Criteria. Therefore [subject(s)] is not a parameter and has been replaced by ‘the system’.
- [SHALL | SHOULD | MAY]: mandatory. One – and only one – of these three auxiliary verbs must be used. Meanings are defined in PHR-S FM Conformance Clause document and are repeated here for convenience:

SHALL – to indicate a mandatory requirement to be followed (implemented) in order to conform.
Synonymous with ‘is required to’.

SHOULD – to indicate an optional recommended action, one that is particularly suitable, without mentioning or excluding others. Synonymous with ‘is permitted and recommended’.

MAY – to indicate an optional, permissible action. Synonymous with ‘is permitted’.

- [provide the ability to]: this is optional and is used when the action will depend on a user intervention;
- [Action-Verb]: mandatory. The Action-Verb must come from the standardized list presented in this Glossary and respect the definitions provided. When another verb would appear preferable, it is suggested to look for that verb in the Glossary definition section where it may be listed with suggestions for a replacement verb and composition. This guide provides numerous examples.
- [object(s)]: mandatory. Identifies the object(s) of the action.
- [participant(s)]: optional. Covers users (or external systems) that participate or are affected by the specified action.

- [qualifier(s)]: optional. This might relate to time, interval, condition(s). Can include (for example): “automatically”, “manually”, “in real time”, “according to the business rules”
- [“according to scope of practice, organizational policy, and/or jurisdictional law”]: optional, when the action could be governed by relevant practices, policies and/or laws.

Note that “...provide the ability to...” is a key phrase that means “manual intervention is expected”. Note also that “The system SHALL...” means that the system is required to perform the relevant function when all factors and specified conditions are met.

Some examples of rigorous CCs follow:

- The system SHALL provide the ability to PRESENT the list of scheduled patients according to selected criteria such as provider name, dates, time of day, nature of visit, etc. using language of choice.
- IF a provider attempts to prescribe a drug using the system, THEN the system SHALL DETERMINE whether interactions exist between the newly prescribed drugs and the medications on the patient’s current medication list, and RENDER an appropriate response to the provider, according to scope of practice, organizational policy, and/or jurisdictional law.

The verb ‘Conform’ is used with a special meaning in the FM and is not part of the Action-Verb model. It is a special instruction for including the functional requirements of one function in another function.

- For example: The system SHALL conform to function IN.1.1 (Entity Authentication).

B.7 Glossary of Terms for PHR-S FM

| Term | Definition | Citation | Location of Term in Functional Model |
|---|---|----------|--------------------------------------|
| Accept (DEPRECATED VERB) | Instead, use “PRESENT or RENDER a message of acceptance, based on the determination (ANALYZE and DECIDE) that the data is valid”. Adjust to the context. | | |
| Access | ACCESS is deprecated. Instead, use CONTROL-ACCESS if the context is one of controlling access to the system. Use RENDER or PRESENT or another relevant Action-Verb when the context is one of accessing data. | | EHR-S FM Glossary |
| “...according to user role, organizational policy, and/or jurisdictional law” | A key phrase within the PHR-S FM that enables certain functionality to be tailored differently depending on varying needs/requirements of differing stakeholders. (See “User Role”, “Organizational Policy”, and “Jurisdictional Law”.) The three elements of the key phrase may be in variance with each other and may require arbitration. For example, a stakeholder in the <u>user role</u> of PHR Account Holder may desire that a certain PHR data element be stored for one hundred years; the relevant organization may have an <u>organizational policy</u> that dictates that the element be stored for at most three years; and applicable <u>jurisdictional law</u> may dictate that the element be stored for at most seven years. | | |
| Actor | Human, organization, or a system actor. | | |
| Alert (used as noun) | A type of Notice that requires recipient’s action. | | EHR-S FM Glossary |

| Term | Definition | Citation | Location of Term in Functional Model |
|----------------------------|--|----------|--------------------------------------|
| Amend (DEPRECATED VERB) | Instead, use EDIT. | | |
| Analyze | To DETERMINE actions in the flow of processing data by comparing, correlating, or weighting certain data and by applying clinical or business rules, hence leading to a decision (see DECIDE). For example, the system may ANALYZE patient information using a drug-interaction database and a set of clinical rules. Another example is that the system may ANALYZE various protocols relative to a patient's condition. Another example is that a person may ANALYZE a proposed update to a patient's home address and DECIDE to reject the proposed update. | | |
| Annotate | <p>To maintain data by updating it in such a way as to enhance an element. For example, the PHR Account Holder may insert a note regarding the family history by including a note such as, "Great grandmother died of cancer (as indicated), but I am not sure whether it was lung cancer or liver cancer."</p> <p>To UPDATE data by attaching comments or notes to the data without editing the data. For example, an Attending physician may ANNOTATE the information entered by the Resident physician before signing the report.</p> | | |
| Anonymize | To maintain data by making its subject appear to be anonymous. For example, certain personal identifying information such as Name and/or National Identification Number would be stricken from a health care document before sharing it with others. | | |

| Term | Definition | Citation | Location of Term in Functional Model |
|------------------------------|---|-----------|--------------------------------------|
| Archive | <p>To maintain data by storing it in such a way as to move one or more extracts to offline storage, ensuring the possibility of restoring the extracts to online storage when needed (without loss of meaning). Wherever possible, archived data should be technology-independent so that future users are not dependent on obsolete technologies.</p> <p>To STORE data by moving the data to long-term storage media and deleting or purging data on the original online storage, according to scope of practice, organizational policy, and/or jurisdictional law. For example, the system at the Oak Street Hospital automatically ARCHIVES patient-related data that is older than eight years by encrypting and compressing it, moving it to long-term storage, purging it, identifying the data by month and year, and creating a pointer to the archived data. Another example is that a system may automatically ARCHIVE outpatient clinic schedules that are being replaced.</p> | ISO 18308 | EHR-S FM Glossary |
| Associate | <p>To maintain data by updating it in such a way as to draw connections between disparate data. For example, The PHR Account Holder may associate recent weight-gain data with socially-relevant data such as the recent death of a parent.</p> | | |
| Attest | <p>The PHR Account Holder may “Attest” to the information in the PHR. Such attestation may be useful to the provider and other stakeholders for determining the trustworthiness of the PHR information.</p> <p>To UPDATE information by ATTESTing that an EHR record (or part of an EHR record) is genuine.</p> <p>For example, a resident physician may ATTEST that the information contained in an EHR record was created by her. Another example is that an attending physician may annotate a resident’s version of the record and then ATTEST to those changes.</p> <p>Note: Attestations may be applied, affixed or bound to an EHR record, for example, via a digital signature, certification, or other verifying mark.</p> | | |
| Audit | <p>To TRACK system-initiated or user-initiated activities by analyzing logs based on policies or rules. For example, the system may automatically AUDIT the daily log for multiple-failed-logon-attempts. Another example is that an administrator may AUDIT the excessive use of extraordinary (i.e. “break-the-glass”) access to certain patient information in the Emergency Department.</p> | | |
| Augment (DEPRECATED VERB) | <p>Instead, use EDIT, ANNOTATE, or LINK with the appropriate qualifiers. Augmentation is the addition of information to existing healthcare data.</p> | | |

| Term | Definition | Citation | Location of Term in Functional Model |
|---------------------|--|----------|--------------------------------------|
| Authenticate | To CONTROL ACCESS to a system by validating the identity of a user, another system or a device before authorizing access. For example, the system may AUTHENTICATE Dr. Jones by validating his identity using a UserID and a biometric device. Another example is that the system rejects Sara Smith's attempt to AUTHENTICATE to the system after three failed password entries. | | |
| Authorization | (See "PHR Authorization") | | |
| Authorize | To CONTROL ACCESS to a system by applying permissions to use certain functionality or to view certain data. For example, the system may AUTHORIZE Dr. Jones, an Emergency Department physician, to view Emergency Department patient records (note: We assume that the administrator has entered a set of permissions for all Emergency Department physicians). Another example is that the system does not AUTHORIZE deletion by Sara Smith of a patient record that has already been signed. | | |
| Authorized PHR User | <p>An Authorized PHR User is a person who has been granted access to one or more PHR functions by the PHR Account Holder or by the PHR Account Holder Proxy.</p> <p>Examples of potentially Authorized PHR users include:</p> <ul style="list-style-type: none"> • PHR Account Holder Proxy (including representative payee) • School nurse • Summer camp administrators • Judicial system officers • Insurance carriers • Care providers • Employers (nationally or internationally) • Health management program administrators / coaches • VISA • Other PHR Users, including: <ul style="list-style-type: none"> • Public health organizations • Research organizations • Clinical Trials organizations | | |
| Auto-populate | To CAPTURE data by inputting it automatically using previously-existing data, providing a default value, or deriving it from other data, or by following various data-entry business rules. For example, the system may AUTO-POPULATE the city, state/province, and country fields when a user enters a zip-code. Another example is that the system may AUTO-POPULATE a newborn's home address with the mother's home address. | | |

| Term | Definition | Citation | Location of Term in Functional Model |
|---------|---|--|--------------------------------------|
| Backup | <p>To maintain data by storing it in such a way as to create a copy in case the original is lost, corrupted, or destroyed.</p> <p>To STORE data by placing a copy of the data onto an electronically-accessible device for preservation in case the original is lost, corrupted, or destroyed. For example, a system may BACK UP the incremental changes made to a patient's record by storing it locally on a daily basis. Another example is that an administrator may BACK UP a complete copy of certain data by storing it at an offsite facility.</p> | | |
| Capture | <p>To manage data by placing it into a system either through human intervention or mechanical means. For example, a PHR Account Holder may place PHR data into the PHR system via a keyboard or may include research data gathered from the Internet.</p> <p>A means of inputting or recording data into the system either through human intervention or mechanical means. (e.g. importing a file, device to PHR-S input, insertion of data via a message).</p> <p>To MANAGE data by auto-populating, entering, importing, or receiving the data, either through human intervention or automated means. For example, a system may CAPTURE patient's data entered by a physician through the keyboard or sent by the physician using a mobile device. Another example is that the system may CAPTURE laboratory results by automatically receiving laboratory data or by keyboard entry for locally performed tests.</p> | <p>http://www.merriam-webster.com/dictionary/capture</p> | <p>EHR-S FM Glossary</p> |

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| Term | Definition | Citation | Location of Term in Functional Model |
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| Clinical Document | <p>A Clinical Document is a documentation of clinical observations and services, with the following characteristics:</p> <ol style="list-style-type: none"> 1. Persistence – A clinical document continues to exist in an unaltered state, for a time period defined by local and regulatory requirements; 2. Stewardship – A clinical document is maintained by a person or organization entrusted with its care; 3. Potential for authentication – A clinical document is an assemblage of information that is intended to be legally authenticated; 4. Wholeness – Authentication of a clinical document applies to the whole and does not apply to portions of the document without the full context of the document; 5. Human readability – A clinical document is human readable. <p>Note: notice that the above definition does not mention a CDA document’s potential to also contain structured/coded data. Thus, if a PHR element explicitly needed structured/coded data support, the need would best be explicitly stated as a functional requirement. (The key issue is that any requirement to support structured/coded data is always in addition to the requirement to support human readability of the data.)</p> | | |
| Comment | To maintain data by updating it in such a way as to express an additional thought about an element. For example, the PHR Account Holder may insert a note regarding his general practitioner such as, “This physician has a strong grasp of rare skin diseases.” | | |
| Compact | To maintain data by storing it in such a way as to reduce the storage requirements of the data. For example, by compressing the data via a software algorithm, eliminating redundant phrases, or reducing the blank spaces between relevant data. | | |
| Compute (DEPRECATED VERB) | Instead, use “DETERMINE and STORE” or “DETERMINE and PRESENT” as appropriate in the context. | | |
| Consent | An agreement, approval, or permission as to some act or purpose given voluntarily by a competent person. | ISO 18308, [Black’s Law Dictionary, 2008] | |

| Term | Definition | Citation | Location of Term in Functional Model |
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| Context-based access | <p>Examples of “Context-based access” include:</p> <ul style="list-style-type: none"> • Emergency (“break the glass”) access (for example, by an Emergency Physician during a heart attack, or by an Emergency Responder during a life-threatening car crash). • Legal-access requirements (for example, a judge may grant law enforcement personnel access to certain portions of a set of PHR records during a criminal investigation). • Time-related access (for example, granting a trusted neighbor access while the primary proxy is on holiday). | | |
| Control Access | <p>To AUTHENTICATE users and/or systems and AUTHORIZE access to functionality and/or data. For example, the system may CONTROL ACCESS to the patient’s data by authenticating Dr. Jones’ identity and authorizing him to update his patient’s records. Another example is the system may CONTROL ACCESS to the system by refusing a hospital visitor the ability to authenticate to the system.</p> <p>NOTE: the set of CONTROL ACCESS Action-Verbs requires data specifying permissions. This permission data is managed via the MANAGE data Action-Verbs set.</p> | | |
| Controlled Method | <p>A “controlled method” is a pre-defined method of handling PHR information. The PHR system may use specific (i.e. “controlled”) application logic to handle requests for actions that may be desired by the PHR-Account-Holder (by constraining those possible actions). For example, a controlled method in the PHR system may recommend that a large DICOM image be captured via a hyperlink, in lieu of capturing the actual image, and may also recommend that the report be imported instead of the image.</p> | | |
| Correct | <p>To maintain data by updating it in such a way as to repair an incorrect element. For example, the PHR Account Holder may alter her address from 368 to 638 Oak Street.</p> | | |
| Create (DEPRECATED VERB) | <p>Instead, use “DETERMINE and STORE” or “DETERMINE and RENDER” or “DETERMINE and PRESENT” as appropriate to the context.</p> | | |
| Custodian | <p>A custodian is a person who maintains authority, ownership, responsibility, and control of clinical data.</p> | | |

| Term | Definition | Citation | Location of Term in Functional Model |
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| Decide | To DETERMINE actions in the processing of data by choosing a certain alternative based on an analysis, and acting accordingly. For example, the system may DECIDE to render a notification to off-duty nurses to report for duty based on clinic rules and the receipt of a tornado alert. Another example is that the system may DECIDE to RENDER an alert to a clinician that a prescribed drug is contraindicated with the patient's listed allergies, based on the analysis conducted. | | |
| Decrypt | To STORE data by converting encrypted data back into its original form, so it can be understood. For example, the system may DECRYPT clinical data received from an authenticated external laboratory system. | | |
| De-identify | To MANAGE-DATA-VISIBILITY by removing identifiers from data in such a way that the risk of identifying an individual is very small under the circumstances, as specified by scope of practice, organizational policy, and/or jurisdictional law. For example, a system may DE-IDENTIFY data for a researcher who wants to perform an analysis of drug effectiveness on diabetic patients. Another example is where a hospital may DE-IDENTIFY data for a set of patients to transmit to a university professor looking for illustrative cases for educational work. | | |
| Delete | <p>To REMOVE data by making it inaccessible to the application. For example, a user may DELETE an existing patient-appointment at the request of the patient.</p> <p>Note: In the case where the data becomes invalid but needs to remain in the system, the word "TAG" is preferred over the word "DELETE" or the word "Nullify". This type of action is considered a data "Tagging" process and not a data deletion process. For example, a health information management professional may desire to TAG a certain clinical term as obsolete, but the term needs to remain in the system for backward compatibility purposes.</p> | | |
| Demographic Data | Data related to identifying an individual (such as name, date of birth, age, gender, etc.). May also include emergency and other types of contact information for the individual and administrative data (such as health insurance eligibility). | http://www.skmtglossary.org/ | |
| Destroy (DEPRECATED VERB) | <p>Instead, use PURGE.</p> <p>To maintain control of data by removing access to the data in such a way as the data no longer exists by virtue of having been explicitly overwritten or altered in an unrecoverable way. For example, the PHR Account Holder may destroy certain data by overwriting it with binary ones and zeros, and with random numbers such that the original data is unrecoverable.</p> | | |

| Term | Definition | Citation | Location of Term in Functional Model |
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| Determine | To MANAGE data by analyzing it and making a decision based on the analysis. For example, the system may DETERMINE the possible severity of a patient's allergic reaction to a proposed drug by analyzing the patient's profile against a drug database and deciding whether the clinician should be presented with an alert or not. Another example is that a system may DETERMINE the next steps in a workflow based on an analysis of a patient's lab results, the patient's profile and the clinical rules of the clinic, this analysis leading to a decision as to the appropriate next steps in the clinical process. | | |
| Display (verb) (DEPRECATED VERB) | Instead, use PRESENT. | | EHR-S FM Glossary |
| Download | To capture data from an external system into the PHR Account Holder's system by inputting it via manual / real-time user intervention and demanding certain external data. For example, to download a list of nearby pharmacies for later study. | | |
| Edit | <p>To maintain data by updating it in such a way as to enhance an element. For example, the PHR Account Holder may alter his name from "John James Smith" to "John James (nickname: 'JJ') Smith".</p> <p>To UPDATE data by correcting, amending, appending, or augmenting the data. For example, the physician may EDIT the patient's home address by correcting the civic number from 368 to 638 Oak Street. Another example is that a physician may EDIT existing notes about an injury by appending an x-ray picture of a broken bone.</p> | | |
| Encrypt | <p>To maintain data by storing it in such a way as to convert the data into a form (a ciphertext) that cannot easily be understood by unauthorized people or systems.</p> <p>To STORE data by transforming the data into a form that is difficult to understand by unauthorized people or systems. For example, the system may ENCRYPT sensitive information such as the patient's financial information.</p> | http://searchsecurity.techtarget.com/Definition/0,,sid14_gci212062,00.html | EHR-S FM Glossary |
| Enter | <p>To CAPTURE data from a local system by creating it in such a way as to manually note certain data. For example, the PHR Account Holder may manually note the PHR Account Holder's street address via the keyboard.</p> <p>To CAPTURE data by inputting it manually (for example, via a keyboard) or through other input devices. For example, the user may manually ENTER the patient's street address via the keyboard. Another example is that the user may ENTER the patient's body weight via an electronic weight scale.</p> | | |

| Term | Definition | Citation | Location of Term in Functional Model |
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| Exchange | To MANAGE data by importing, receiving, exporting, or transmitting the data between systems. For example, the PHR Account Holder may exchange family history information with the PHR systems of other family members. | | |
| Export | To EXCHANGE data by sending data from one system to another (external) system or entity. For example, a PHR Account Holder may export data to a provider's system for inclusion in the PHR Account Holder's medical record. NOTE: The term Export has limited use within the PHR-S Functional Model. Consider using the term RENDER instead. | | |
| Extract | To RENDER data by locating, retrieving and possibly assembling data based on certain criteria and for certain purposes. For example, a system may EXTRACT for a clinician all the x-ray reports regarding the patient's chest. Another example is that the system may automatically EXTRACT allergy history when the physician enters a prescription. Another example is that a system may EXTRACT for a researcher the number of pneumonia-like cases treated at the Emergency Department within a specific time period. Another example is that a system may EXTRACT and aggregate information using a cohort of patients who have pneumococcal disease and categorize that cohort by specific age-ranges. | | |
| Filter | To maintain data by restricting access to the data in such a way as to only reveal subsets of the data. For example, the PHR Account Holder may only want to see data sent from the Elm Street Clinic within the past six months. | | |
| Harmonize | To UPDATE data by aligning and reconciling it with other information in the system, or with the data of another system (or systems). For example, the system may HARMONIZE a patient's new home address with the data of systems of other members of the care-team. | | |
| Health Care Provider | A Health Care Provider is a person licensed, certified or otherwise authorized or permitted to administer health care in the ordinary course of business or practice of a profession, including a health care facility. | HL7 Glossary, January 2002. | |
| Health Insurance Carrier (Payer) | The PHR Account Holder's Health Insurance Carrier is a third party entity that pays for, administers or underwrites coverage for health care expenses. Examples of Health Insurance Carriers include: an insurance company, a self-insured employer plan, a health maintenance organization (HMO), a preferred provider organization (PPO), a government agency or a third party administrator (TPA). | HL7 Glossary, January 2002. | |

| Term | Definition | Citation | Location of Term in Functional Model |
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| Hide | <p>To maintain data by restricting access to the data in such a way as to not reveal the existence of the data. For example, the PHR Account Holder may limit a search for “car crash injury” to return “the system cannot respond to the query as formulated”.</p> <p>See “mask”.</p> <p>To MANAGE-DATA-VISIBILITY by making specific information invisible so that the existence of the information is not expressed except to authorized users; viewers of the patient record receive no indication that the hidden information exists or does not exist. For example, the system may HIDE the existence of a patient’s psychiatric record from all viewers except for the patient’s psychiatrist.</p> | | |
| Home Monitoring Device | <p>A Home Monitoring Device is a healthcare device that may be used in the home that collects information about a person’s health. For example, an electronic bathroom scale may collect daily readings concerning a person’s weight and transmit it to a data collection unit. Home Monitoring Device information might either be collected into the PHR or into the EHR. That information might then need to be exchanged between the EHR and PHR systems. The information might also need to be summarized, filtered, staged, and translated into an alert message, etc. before being exchanged. A rules-engine can exist in the EHR system that informs the PHR system how to manage the Home Monitoring Device information of the PHR, and how to export the Home Monitoring Device information from the PHR to the EHR.</p> | | |
| Import | <p>To capture data from an external system by inputting it in such a way as requires manual / real-time user intervention. For example, the PHR Account Holder may manually import the address of the nearest pharmacy.</p> <p>To CAPTURE data into a local system by proactively accessing data from an external source and then downloading and integrating the data into the local system. For example, the system may IMPORT the latest drug trial data every Friday evening. Another example is that the user may IMPORT various sets of best practices related to juvenile diabetes.</p> | | |
| Inactivate | <p>To maintain control of data by removing access to the data in such a way as the data is no longer active for a certain reason. For example, the PHR Account Holder may no longer employ a list of local oncologists, while the PHR Account Holder is stationed in another country for a while.</p> | | |
| Input (DEPRECATED VERB) | <p>Instead, use CAPTURE, ENTER, RECEIVE, IMPORT or AUTO-POPULATE, depending on the context and scope of actions described.</p> | | |

| Term | Definition | Citation | Location of Term in Functional Model |
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| Integrate | To UPDATE data by merging other data with the existing data in a controlled manner. For example, a user may INTEGRATE summaries of health care services that were provided in another jurisdiction into the patient's local record. Another example is that the system may INTEGRATE a single-sign-on application with the system's existing user-authentication services. Another example is that the system may INTEGRATE multiple third-party modules to enhance its capabilities. | | EHR-S FM Glossary |
| Jurisdictional Law | Access to, or use of, PHR data or functionality may be categorized according to Jurisdictional Law. | | |
| Link (verb) | To UPDATE data by associating one piece of data with another piece of data. For example, the system may LINK a patient's encounter note with the patient's lab results. Another example is that a system may LINK attestable changes to a patient's record to the author's identifying information. | | |
| Log (verb) | To TRACK system-initiated or user-initiated activities (including access to data and/or functionality, attempts to access data and/or functionality, actions performed on data and/or functionality, and changes to system characteristics or versions) by storing a chronological trace of these activities. For example, the system may LOG the fact that modifications were made to a patient's record by storing the date, time, and identity of the user who modified the record as well as what changes were made to that record. Another example is that the system may LOG the fact that updates were applied to a drug-interaction database table, by storing the date and time at which it was updated. | | |
| Maintain | <p>To MANAGE data by manipulating it within a system. For example, a PHR Account Holder may keep certain data and discard other data, or add value to certain data by correcting or annotating it, or prioritize certain data by inactivating or archiving it.</p> <p>To ensure that a website, a piece of software, or database is kept up-to-date and in good order for the benefit of users. Could involve any of the following actions; capture, create, read, and update (edit, correct, amend, and augment).</p> <p>To MANAGE data by storing, updating, and/or removing the data within a system. For example, a system may provide the ability for a clinician to MAINTAIN data by keeping or discarding it. Another example is that a system may provide the ability for a clinician to MAINTAIN data by correcting or annotating it.</p> | ISO/IEC 20926:2009, 3.40 | EHR-S FM Glossary |

| Term | Definition | Citation | Location of Term in Functional Model |
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| Notice (noun) | A Notification, an Alert, or a Reminder. Information presented or transmitted to an interested party. For example, an alert, reminder, note, or message may convey an announcement, warning, issue, or new state/condition. Note: Use of these terms may have differing legal connotations in various realms. | | EHR-S FM Glossary |
| Notification | A type of Notice that does not necessarily require recipient's action. | | EHR-S FM Glossary |
| Nullify (DEPRECATED VERB) | Instead, use "TAG as nullified". | | |
| Obsolete (verb) (DEPRECATED VERB) | Instead, use "TAG as obsolete". | | |
| Organizational Policy | Access to, or use of, PHR data or functionality may be categorized according to Organizational Policy. "Organization" (in the case of a PHR-System) is equivalent to the concept of sponsorship for payers (insurers). The reason that the concept of "organizational policy" ought to be available to PHR system designers, for example, is that some vendors (say, an insurance company) might have an organizational policy against storing drug-use data to reduce the risk of liability if certain PHR information were leaked or stolen. | | |
| Output | To MANAGE data by extracting it from an internal system either through human intervention or mechanical means. For example, a PHR Account Holder may render PHR data onto a computer screen for personal review, or may deposit PHR data in a provider's system for use by the PHR Account Holder's provider. | | |
| PHR Account | <p>A PHR Account is a set of access controls associated with a single PHR Account Holder and his or her data.</p> <p>A PHR Account provides the PHR Account Holder with (1) access to his or her personal health data and (2) access to the functions of a PHR system.</p> <p>A PHR Account is conceptually similar to a bank account, which provides controlled access to data and to the functions of the system in which the data are stored."</p> <p>PHR Accounts may be hosted on a PHR Account Holder's stand-alone personal computer, a web-based system, or other portable electronic devices.</p> | | |

| Term | Definition | Citation | Location of Term in Functional Model |
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| PHR Account Holder | <p>The PHR Account Holder is the subject of the PHR Account, controls access to and permissions of the PHR Account, and controls the movement of data in and out of the PHR Account.</p> <p>The term PHR Account Holder is synonymous with the terms “patient” or “consumer.” In certain PHR Account matters related to decision making, the term PHR Account Holder is also meant to include the PHR Account Holder Proxy, as he or she may be the PHR Account Holder’s substitute decision maker.</p> | | |
| PHR Account Holder Proxy | <p>A PHR Account Holder Proxy is a person who is appropriately authorized to act on behalf of the PHR Account Holder within the PHR Account. For example, a PHR Account Holder Proxy could be a family member, friend, substitute decision maker, or other entity.</p> | | |
| PHR Application | <p>A PHR Application is a software system that offers PHR functionality and related services to PHR Account Holders through individual PHR Accounts.</p> <p>A PHR Application may reside on a PHR Account Holder’s personal computer, on a remote web server, on a portable electronic device, or on some combination of these and other technologies.</p> | | |

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| Term | Definition | Citation | Location of Term in Functional Model |
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| PHR Authorization | <p>A PHR Authorization is a permission granted by a PHR Account Holder to an Authorized PHR User to use a function or functions of the PHR Account for intended and permitted purposes according to organizational policy and/or jurisdictional law.</p> <p>PHR Authorizations may be to specific individuals or to specific remote computer systems.</p> <p>PHR Authorizations also may be role-based, i.e. granted to a class of individuals or a class of remote computer systems.</p> <p>PHR Authorizations may include varying levels of access, e.g. “read-only,” “write-only,” “read/write,” etc.</p> <p>The exact permissions and levels of PHR Authorizations may vary based on different PHR Sponsors and PHR Service Providers; the descriptions here are not intended to prescribe a particular approach.</p> <p>Authorization is the process of giving someone permission to do or have something. In multi-user computer systems, a system administrator defines for the system which users are allowed access to the system and what privileges of use (such as access to which file directories, hours of access, amount of allocated storage space, and so forth). Assuming that someone has logged in to a computer operating system or application, the system or application may want to identify what resources the user can be given during this session. Thus, authorization is sometimes seen as both the preliminary setting up of permissions by a system administrator and the actual checking of the permission values that have been set up when a user is getting access.</p> | <p>PHR Working Group definition, and http://searchappsecurity.techtarget.com/sDefinition/0,,sid92_gci211622,00.html</p> | |
| PHR Service Provider | <p>A PHR Service Provider is an organization that delivers a PHR Application to PHR Account Holders.</p> <p>A PHR Service Provider may offer PHR Applications directly to PHR Account Holders or indirectly via contracted PHR Sponsors.</p> <p>The term PHR Service Provider is synonymous with the term “PHR vendor” and enables the distinction between direct PHR-application providers and third-party sponsors (such as physician offices or hospitals). See also: PHR Sponsor.</p> | | |
| PHR Sponsor | <p>A PHR Sponsor offers PHR Account Holders access to a given PHR Application.</p> <p>A PHR Sponsor may not necessarily be the same entity as the PHR Service Provider.</p> <p>Examples of PHR Sponsors include: a physician office, a health system, an employer, a pharmacy, a health plan or a direct PHR Service Provider.</p> | | |

| Term | Definition | Citation | Location of Term in Functional Model |
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| Present | <p>To MANAGE data from a system by reading it in such a way as to offer pointers to data, but not the data itself. For example, a PHR Account Holder may offer a list of radiological images to a provider, but not offer the images themselves.</p> <p>To offer to view; to bring to one's attention; to bring or introduce into the presence of someone; to show or display</p> <p>To RENDER data by delivering the data to local users in a meaningful and appropriate way. For example, the system may PRESENT to a physician (upon manual request) a list of patients who are scheduled for care today, ordered by time-of-day, with the patient's known diagnosis using the physician's preferred terminology and language of choice. Another example is that the system may PRESENT an alert automatically when a newly-arriving lab value is received that is out of normal range. Another example is that a system may PRESENT to a physician a patient's lung respiration sounds. Another example is that a system may PRESENT patient-instructions using an audio and video system.</p> <p>Note: It is reasonable to assume that any data that is presented ought to be formatted, filtered, translated, transformed, mapped, and/or normalized, etc., as appropriate.</p> | | EHR-S FM Glossary |
| Pseudonymize | <p>To MAINTAIN data by creating a pseudonym for its subject. For example, the name "Robert Q. Jamison" might be replaced with a pseudonym such as "John Smith" in a health care document before sharing it with others.</p> | | |
| Purge | <p>To MAINTAIN control of data by removing access to the data in such a way as the data no longer exists by way of deletion or removal. For example, the PHR Account Holder may elect to delete all records related to the Elm Street Clinic because the PHR Account Holder never visited the clinic and is moving to a new country.</p> <p>To REMOVE data by making it unrecoverable at the storage and/or media-level. For example, the system may PURGE the patient record for John Smith according to a rule that targets all records that are older than seven years. (Note: Destroy and Purge are synonyms; PURGE is the preferred term.)</p> | | |
| Read | <p>To manage data by extracting it from a system for review. For example, a PHR Account Holder may review his current list of medications.</p> | | |

| Term | Definition | Citation | Location of Term in Functional Model |
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| Receive | <p>To capture data from an external system by inputting it without manual / real-time user intervention, enabling unattended, asynchronous data-reception. For example, various emails may be <i>received</i> from a provider for later manual review by the PHR Account Holder.</p> <p>To CAPTURE data from an external source by taking in that data without manual / real-time user intervention. For example, the system may RECEIVE various emails for a clinician who will later review them. Another example is that the system may RECEIVE from authenticated and authorized external systems laboratory results for a given patient. Another example is that the system may RECEIVE a facsimile transmission from an external device.</p> | | |
| Recommendation | <p>A suggestion by a caregiver regarding a person's health. The suggestion may be accepted or rejected by the person, since the recommended activity does not rise to the level of a mandated order. For example, a Primary Care Physician may recommend that a patient reduce his weight by five pounds by dieting, exercise, or both. Another example is that a physician may recommend that a person who has slightly elevated blood pressure consider taking one aspirin per day. Such recommendations ought to be captured in the person's health record to serve as reminders of the physician's suggestions. Also, if the recommendation is refused, the reason for refusal ought to be captured in the person's health record, for example, citing a refusal to take aspirin due to difficulty in swallowing pills.</p> | | |
| Record (noun) | <p>A writing by which some act or event, or a number of acts or events, is recorded; - as, a record of the variations of temperature during a certain time; a family record. An authentic official copy of a document which has been entered in a book, or deposited in the keeping of some officer designated by law.</p> | | EHR-S FM Glossary |
| Record (verb) (DEPRECATED VERB) | <p>Instead, use STORE (or its children Action-Verbs).</p> | | EHR-S FM Glossary |
| Recover | <p>To STORE data by rebuilding original data using backups of data. For example, the system may RECOVER last week's data following a hard disk failure, using an offsite backup copy. (See BACKUP.)</p> | | |
| Re-identify | <p>To MANAGE-DATA-VISIBILITY by combining data in such a way that the patient's identity is re-established according to scope of practice, organizational policy, and/or jurisdictional law. For example, the system may RE-IDENTIFY de-identified data by providing a key that allows authorized users to re-establish the link between a given patient and that patient's de-identified data.</p> | | |

| Term | Definition | Citation | Location of Term in Functional Model |
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| Reminder | A type of Notice that is specifically to prompt the recipient with information they may have previously received. (e.g. an appointment reminder). Distinct from an alert, where immediate action is required or an action is contraindicated (e.g. use of antibiotics). | | EHR-S FM Glossary |
| Remove | <p>To MAINTAIN data by making the data inaccessible or unrecoverable according to scope of practice, organizational policy, and/or jurisdictional law. For example, a system may, at a physician's request, REMOVE by purging patient information that was received by mistake. Another example is that a system may, upon request by an administrator, REMOVE by deletion the schedule of outpatient clinic opening hours.</p> <p>NOTE 1: The data may be deleted either by removing the data's pointer from the directory or by overwriting the data in such a way that the original data is unrecoverable.</p> <p>NOTE 2: In the case where the data becomes invalid but needs to remain in the system, the word TAG is preferred over the word REMOVE or "Nullify". This type of action is considered a data "Tagging" process and not a data deletion process. For example, a health information management professional may desire to TAG a certain clinical term as obsolete, but the term needs to remain in the system for backward compatibility purposes.</p> | | |
| Remove Access | To MAINTAIN data by disallowing access to the data in such a way as the data can no longer be retrieved. | | |
| Render | To MANAGE data by extracting, presenting and/or transmitting data to users or systems. For example, the system may RENDER laboratory results by presenting them on a computer screen. Another example is that the system may RENDER data by transmitting a drug prescription to a pharmacy. | | |
| Report (verb) (DEPRECATED VERB) | Instead, use "RENDER a report", or "PRESENT a report". | | EHR-S FM Glossary |
| Restore | To STORE data to the production system by using previously archived data. For example, the system may RESTORE patient-encounter data for a returning patient whose data had been archived due to inactivity. Another example is that the system may RESTORE, for evidentiary support, patient data that had been archived after the patient expired. (See ARCHIVE.) | | |
| Restrict Access | To MAINTAIN data by disallowing access to the data in such a way as the data exists, but is not seen by the requestor. | | |

| Term | Definition | Citation | Location of Term in Functional Model |
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| Save | <p>To MAINTAIN data by storing it in such a way as to manually mark it for data retention, to mark it in such a way that it is not subject to automatic deletion, or to make a copy of the data.</p> <p>To STORE data by placing it onto an electronically-accessible device for preservation. For example, a clinician may SAVE a given patient's demographic data or a newly-prescribed medication. Another example is that an administrator may SAVE an updated list of physicians that have practice privileges at the local hospital.</p> | | |
| Send | <p>To output data from the PHR Account Holder's system by exporting it in such a way as to (passively, automatically) route it to another system. For example, a PHR Account Holder's system may (passively, automatically) send weekly reports to a diabetes specialist's system regarding the PHR Account Holder's current weight.</p> | | |
| Store | <p>To MAINTAIN in a location (as a warehouse, library, or computer memory) for preservation or later use or disposal.</p> <p>To MAINTAIN data by backing up, decrypting, encrypting, restoring and saving that data onto electronically accessible devices. For example, a clinician may STORE a given patient's demographic data or a newly-prescribed medication. Another example is that an administrator may configure a system to STORE progressive copies of certain data on a regularly-scheduled basis for backup purposes.</p> <p>Note: data may be stored as plain text or in encrypted or compressed form.</p> | <p>http://www.m-w.com/cgi-bin/dictionary?book=Dictionary&va=store</p> | EHR-S FM Glossary |
| S u s t a i n (operations) | <p>To SECURE a system by promoting actions that enable the system to perform predictably and as intended. For example, a system may SUSTAIN (OPERATIONS) by applying business rules that enforce role-based access to the authorization management portion of the system, thus protecting the PHR Account Holder's data according to pre-determined security and privacy rules.</p> | | |
| Synchronize | <p>To output data from the PHR Account Holder's system by exporting it in such a way as to coordinate certain data with another system (or systems). For example, the PHR Account Holder may coordinate the medications prescribed by two physicians with a list of home remedies so that all each has a current list of the PHR Account Holder's medications/remedies.</p> | | |

| Term | Definition | Citation | Location of Term in Functional Model |
|--------------|---|----------|--------------------------------------|
| Tag | <p>To maintain data by updating it in such a way as to mark it for special use. For example, the PHR Account Holder may mark certain data for review by an oncologist.</p> <p>To UPDATE data by marking it for special use. For example, a nurse may TAG the previous week's records for patients that presented with a severe cough and fever. Another example is that a general practitioner may TAG certain data for review by an oncologist. Another example is that an administrator may TAG an interchange standard version as being deprecated.</p> <p>Note: see "flag" if the meaning is to signal a situation.</p> | | |
| Task | <p>A unit of work. A task (in the electronic health record sense) may be a clinical task (i.e. a task that occurs as part of the process of providing care for a patient) or a non-clinical task (e.g. an administrative task such as updating the list of providers who have admitting privileges at the local hospital). A task may arise in an ad hoc fashion or may appear according to a schedule. A task may be placed on a list and assigned to a person, a group of people, or to an automated mechanism; a task may also be shared, reassigned, prioritized (or re-prioritized), routed, corrected, updated, cancelled, or suspended.</p> | | EHR-S FM Glossary |
| Track (verb) | <p>To SECURE a system by logging and auditing system-initiated and/or user-initiated activities. For example, the system may TRACK the amount of time that the system was unavailable last month. Another example is that the system may provide the ability for an administrator to TRACK the number of active users of a newly-installed set of system functionality.</p> | | |
| Transmit | <p>To RENDER data by delivering the data to devices or other systems in a meaningful and appropriate way. For example, the system may (without human intervention) TRANSMIT an alert to a physician's beeper. Another example is that the system may (upon human intervention) TRANSMIT a given patient's encounter summary to an external facility. Another example is that the system may TRANSMIT data to another facility after mapping local codes to national codes.</p> <p>Note: It is reasonable to assume that any data that is transmitted ought to be formatted, filtered, translated, transformed, mapped, and/or normalized, etc., as appropriate.</p> | | |
| Unhide | <p>To MANAGE-DATA-VISIBILITY by making visible the existence of previously hidden information (see HIDE). For example, the system may provide the ability for a patient to UNHIDE his psychiatric record, and hence the existence of that part of his record becomes visible to all authorized clinicians.</p> | | |

| Term | Definition | Citation | Location of Term in Functional Model |
|-------------|---|----------------------|--------------------------------------|
| Unmask | To MANAGE-DATA-VISIBILITY by making masked information visible. For example, the administrator may desire to UNMASK certain patient financial information for the admission Department. For example, a system may provide the ability for an emergency department physician to UNMASK a patient's pregnancy status that was presented by the system as "*****", to reveal a status of "Pregnant". | | |
| Update | To enter into the electronic health record the most recent information or more recent information than was previously available. To MAINTAIN data by annotating, editing, harmonizing, integrating, linking and tagging the data. For example, a clinician may UPDATE a patient's medication dosage. Another example is that the system may UPDATE a patient's record. | ISO 22000:2005, 3.17 | EHR-S FM Glossary |
| Upload | To output data from the PHR Account Holder's system by exporting it via manual / real-time user intervention to another system. For example, to upload the PHR Account Holder's current list of medications to her General Practitioner's system. | | |
| User Role | Access to, or use of, PHR data or functionality may be categorized according to User Role. Examples of User Roles include: PHR Account Holder, administrator, Emergency Responder, and clinician. | | |
| View (noun) | To manage data from a system by reading it in such a way as to enable a certain, (requested) generally short-term, ad hoc perspective of the data. For example, a PHR Account Holder may review his current list of medications. Specific information displayed on a computer monitor after it has been filtered by the system. Compare with "Display." | | EHR-S FM Glossary |