Taltioni Data Model Document

Contents

1. INTRODUCTION

1.1. Overview

Taltioni platform provides a secure storage place for end-users' personal health records (PHRs). Authorized Taltioni applications can access the end-users' health records through the Taltioni Web Services API as defined in the **Taltioni Application Developers Guide**. The **Taltioni Web Services API Reference** provides detailed schemas and complete descriptions of the supported operations.

There are two types of operations:

- **General operations:** Get information on the supported data types and codes
- **Health record operations:** Get, set, update or delete information related to a specific end-user's health record

This **Taltioni Data Model document** provides a summary of the available data types and related vocabularies used in the operations. The data types are divided into:

- **Core data types:** Fixed health record data types (frequent changes are not expected after service launch)
- **Observation data types:** Dynamic data types (new data types are added on a regular basis according to the needs by new Taltioni applications)

1.2. Target audience

This document is targeted to service developers and other professionals interested in the composition of the Taltioni data model.

1.3. Data model evolution

The data model will evolve according to the needs of the Taltioni applications. Consequently, this document will be regularly updated.

1.4. Related documentation

Related documents and data sources are listed in the table below.

Document	Description
Taltioni documentation	
Taltioni Application Developers Guide	Information and guidance for developers.
Taltioni Web Services API Reference	Taltioni Web Services interface methods and data types.
Taltioni tietomallin laajennukset	Document describing the principles for data model management and extensions (to be available).
External links	
THL/Kela code server http://www.thl.fi/fi_FI/web/fi/tutkimus/palvelut/koodistopalvelu	Primary source for external vocabularies and code sets.
Fimea / Perusrekisteri http://www.fimea.fi/laaketieto/perusrekisteri	The primary source of pharmaceutical information

2. CORE DATA

2.1. Core data types

The core health information data types are listed the table below.

Core data type	Description
HealthRecordProfile	Basic personal information including contact information and permanent health information such as blood type.
Condition	Health conditions of the person (e.g. diagnoses)
Medication	Active and past medications of the person
Allergy	Active and past allergies of the person
Immunization	Immunizations the person has received
LabTestResult	Test results (lab) of the person. Includes all the test results from the performed test.
Procedure	Medical procedures done to the person. A course of action intended to achieve a result in the care of persons with health problems.

2.2. Core data components

Full definition of each core data type component is included in the **Taltioni Web Services**

API Reference –document. The most common components (attributes and sub-types) are listed in the table below.

Note that components with type='codeset' are linked with a vocabulary. Definitions of the vocabularies are included in Section 4.

Component	Name, description	Type	Mandatory	Comment
HealthRecordProfile (part A)	Personal identification and contact information			
PersonalID	Personal identification code (hetu)	string	Yes	
FirstName	Given name	string	Yes	
LastName	Last name	string	Yes	
DateOfBirth	Date of birth	dateTime	No	
EmailAddress	Email address	string	No	
MobilePhone	Mobile Phone	string	No	
HealthRecordProfile (part B)	Other personal information			
BloodType	Blood type	codeset	No	
Gender	Gender			
Language	Language	codeset	No	
MaritalStatus	Marital status	codeset	No	
Nationality	Nationality	codeset	No	
Occupation	Occupation	codeset	No	
Condition				
Name	Condition/diagnose name (Codeset: ConditionName)	codeset	Yes	
OnsetDate	Date when the condition was first observed	dateTime	No	
Status	Current status	string	No	
StopDate	Date when the condition was resolved	dateTime	No	
Medication				
ActiveIngredient	Active ingredient of the medicine.	codeset	No	
ATCCode	ATC classification system code	codeset	No	
Name	Medication name (Codeset: MedicationName)	codeset	Yes	
DoseForm	Medication dose form	codeset		
Prescribed	Prescription or non-prescription medicine	codeset	No	

MedicationSubstitution	Substition information of the medicine	codeset	No	
Allergy				
AllergenType	Allergen type	codeset	No	
Name	Allergen name (Codeset: AllergyName)	codeset	Yes	codeset not available
Reaction	Description of the allergy reaction (Codeset: AllergyReaction)	codeset	No	
Immunization				
Name	Name of the immunization (Codeset: ImmunizationName)	codeset	Yes	
AnatomicSurface	Anatomic surface for the immunization	codeset	No	
Route	Immunisation route (Codeset: ImmunizationRoute)	codeset	No	
LabTestResult				
Name	Laboratory test measurement value (LabTestResultName)	codeset	Yes	
LabResultUnit	Measurement unit	codeset	Yes	
Procedure				
ProcedureName	Name of procedure	codeset	Yes	

An example of a data object - Immunization :

Component	Example
ImmunizationName	MPR (MPR-rokote)
Date administered	12.5.2012
ExpirationDate	12.5.2022
Sequence	
AnatomicSurface	VO (Vasen olkavarsi)
Route	IM (Lihakseen)
AdverseEvent	kuumereaktio
AdverseEventTime (new)	13.5.2012
Medication name	13535; PRIORIX
Lot	
Manufacturer	GlaxoSmithKline Biologicals

3. OBSERVATIONS

3.1. Observation types

The following observations are supported:

Type	Description	Display name	Comment / Misc info
AlcoholConsumptionLevel	Estimated alcohol consumption level	Alcohol consumption	
AlcoholConsumptionPerDay	Alcohol consumption observation for one day.	Alcohol consumption note	
BloodGlucose	Blood glucose	Blood glucose	
BloodOxygenSaturation	Blood Oxygen Saturation	Blood oxygen saturation	
BloodPressure	Systolic and diastolic blood pressure.	Blood pressure	
BodyTemperature	Temperature (fever)	Body temperature	
Cholesterol	Cholesterol values (total, HDL, triglyceride, LDL)	Cholesterol	
CigarettesPerDay	Cigarettes per day	Smoking note	
ConditionTest	Condition test result, condition test and condition tes tquestionnaire	Condition test	
Creatinine	Indicator of kidney function	Kreatinine	
Exercise	Amount and intensity of performed exercise	Exercise	
ExerciseSteps	Walking (steps)	Step recording	
HbA1c	Glycated hemoglobin	Glycated hemoglobin	
HealthJournalEntry	Health-related note/free text information	Health note	
HeartRateMax	Maximum heart rate	Maximum heart rate	
HeartRateRest	Heart rate at rest when measured independently of blood pressure.	Heart rate at rest	
Height	Height	Height	
Hemoglobin	Hemoglobin	Hemoglobin	
INR	Laboratory test measure of blood coagulation	Coagulation	
InsulinInjection	Actual insulin injections	Insulin injection	
MealAlimentation	Quality of meals (subjective assessment)	Meal quality	
MedicationIntake	Medication intake events	Medication intake	
Pain	Pain assessment	Pain	
Peakflow	Peakflow measurement, with optional FEV1 and FEV6 values.	Peakflow measurement	
PhysicalActivityLevel	Physical activity	Physical activity	
RiskTestResult	Risk test results based on questionnaire and/or other data	Risk test	
SelfTestQuestionnaireResult	Results of a questionnaire based self test (other than risk tests)	Self test	

Sleep	Sleep time and experience	Sleep quality	
SleepLevel	Average sleep time	Sleep	
SmokingStatus	Smoking status	Smoking	
WaistCircumference	Waist circumference	Waist circumference	
Weight	Weight, with optional height and BMI.	Weight	

3.2. Observation attributes

The attributes of each observation type are listed below.

Component	Dscription	Display name	Type / unit	Manda -tory	Comment
Common to all observations:					
EffectiveDateTime	Time when observation occurred/started.	Time	datetime	Yes	
PerformerType	Performer related to the action.	Performer	codeset	No	
Notes	Additional free-text information added to the data.	Notes	string	No	
AlcoholConsumption Level					
AlcoholConsumptionLevel	Alcohol consumption level measured as estimated number of drinks per week (one drink contains approximately 12g alcohol).	Drinks per week	numeric	Yes	
AlcoholConsumptionPer day					
DrinksPerDay	Observed alcohol consumption per day (one drink contains approximately 12g alcohol).	Drinks per day	numeric	Yes	
BloodGlucose					
Glucose	Blood glucose	Glucose	numeric [mmol/l]	Yes	
MealContext	Measurement time with respect to meal (codeset: BloodGlucoseMealContext)	Before/after meal	codeset	No	
SampleType	Wholeblood or Plasma (Plasma glucose 10–15% higher than wholeblood glucose level). (codeset: BloodGlucoseSampleType)	Sample type	codeset	No	
PostExercise	Indicates if the measurement was done after exercising.	Exercise context	yes/no	No	
HealthContext	Health context indicating minor or major illness, menstrual cycle or stress. (codeset: BloodGlucoseHealthContext)	Health status	codeset	No	

SampleLocation	Body site for Blood Glucose sample (codeset: BloodGlucoseSampleLocation)	Body site	codeset	No	
BloodOxygen Saturation					
SpO2	Blood oxygen saturation	SpO2	numeric [%]	Yes	
BloodPressure					
Systolic	Systolic blood pressure	Systolic	numeric [mmHg]	Yes	
Diastolic	Diastolic blood pressure	Diastolic	numeric [mmHg]	Yes	
HeartRate	Heart rate	Heart rate	numeric [bpm]	No	
IrregularHeartBeat	Irregular heart beat	Irregular heart beat	yes/no	No	
Position	Position for the measurement (standing, lying, sitting, unknown) (codeset: BloodPressurePosition)	Position	codeset	No	
MeasurementPoint	Measurement point for the measurement (codeset: BloodPressureMeasurementPoint)	Measurement point	codeset	No	
BodyTemperature					
Temperature	Measured body temperature	Temperature	numeric [°C]	Yes	
Site	Measurement location. (codeset: BodyTemperatureSite)	Measurement site	codeset	No	
Cholesterol					
TotalCholesterol	Cholesterol	Cholesterol	numeric [mmol/l]	Yes	
HDL	HDL-cholesterol	HDL	numeric [mmol/l]	No	
Triglyceride	Triglyceride	Triglycerides	numeric [mmol/l]	No	
LDL	LDL-cholesterol	LDL	numeric [mmol/l]	No	
Cigarettes Per Day					
CigarettesPerDay	Number of cigarettes smoked during one day.	Cigarettes per day	numeric	Yes	
ConditionTest					
Type	Identification of the condition test (Codeset: ConditionTestType)	Type	codeset	Yes	
ConditionScore	Physical Condition Index	Score	numeric	No	
VO2Max	Estimated maximal oxygen uptake.	Maximal oxygen uptake	numeric [ml/kg/min]	No	
Duration	Either achieved duration or	Duration	numeric	No	

	fixed value depending on test type.		[s]		
Distance	Either achieved distance or fixed value depending on test type.	Distance	numeric [m]	No	
HeartRate	Heart rate at the end of test	Heart rate	numeric [bpm]	No	
PreconditionResult	Passed/failed	Precondition test	codeset	No	
Creatinine					
Creatinine	Creatinine (fS-Krea laboratory value)	Creatinine (fS-Krea)	numeric [µmol/l]	Yes	
Exercise					
Duration	Duration of exercise	Duration	numeric [min]	No	
Distance	Moved distance during exercise.	Distance	numeric [m]	No	
Title	Descriptive title of the activity event	Description	string	No	
Intensity	Intensity of the exercise (Codeset: ExerciseIntensity)	Intensity	codeset	No	
MET	Metabolic equivalent of task	MET value	numeric [kcal/kg/h]	No	
SpeedAvg	Average speed	Average speed	numeric [km/h]	No	
HeartRateAvg	Average heart beat rate during exercise.	Heart rate (average)	numeric [1/min]	No	
Activity	Activity type (codeset: ExerciseActivity)	Activity	codeset	Yes	
Calories	Consumed energy during exercise	Energy consumption	numeric [kcal]	No	
ExerciseSteps					
Steps	Steps registered by pedometer	Step count	numeric	Yes	
AerobicSteps	Steps identified as aerobic	Aerobic steps	numeric	No	
RunningSteps	Steps identified as related to running	Running steps	numeric	No	Nokia
Duration	Duration of exercise	Duration	numeric [min]	No	
Distance	Moved distance during exercise.	Distance	numeric [m]	No	
Intensity	Intensity of exercise (codeset: ExerciseIntensity)	Intensity	codeset	No	
MET	Metabolic equivalent of task	MET value	numeric [kcal/kg/h]	No	
EnergyConsumption	Consumed energy during exercise	Energy consumption	numeric [kcal]	No	
HbA1c					
HbA1c	Glycated hemoglobin (laboratory value)	HbA1c	numeric [%]	Yes	
HealthJournalEntry					

Content	Health-related note/free text information.	Note	string	Yes	
Category	Category of the note (codeset: HealthJournalEntryCategrory)	Type	codeset	No	
HeartRateMax					
HeartRateMax	Maximum heart rate	Heart rate	numeric [bpm]	Yes	
HeartRateRest					
HeartRateRest	Heart rate at rest	Heart rate at rest	numeric [bpm]	Yes	
Height					
Height	Height	Height	numeric [cm]	Yes	
Hemoglobin					
Hb	Hemoglobin (B-Hb)	Hemoglobin	numeric [g/l]	Yes	
INR					
INR	INR	INR	numeric	Yes	
InsulinInjection					
Type	Description of insulin taken (codeset: InsulinInjectionType)	Insulin type	Codeset	Yes	
Amount	Amount of insulin taken (insulin units)	Amount	IE	Yes	
MealAlimentation					
MealAlimentation	Subjective meal quality (healthiness) assessment.	Meal quality	numeric	Yes	
ID	Identification of meal quality assessment method (Codeset: MealAssessmentMethod)	Meal quality assessment method	codeset	No	
MealType	Meal type	Meal type	codeset	No	
MealTime	Meal time	Meal time	datetime	No	
Medication intake					
IntakeEvent	Medication intake event (too early, taken, delayed, missed).	Status	codeset	Yes	
IntakeOffset	Number of minutes that the intake occurred after/before the intended time. Negative number means that reported intake time occurred before intended time.	Timing	numeric [min]	No	
Pain					
Pain	Pain assessment	Pain assessment	numeric	Yes	
ID	Identification of pain assessment. (Codeset: PainAssessmentMethod)	Pain assessment method	codeset		

Peakflow					
PEF	Peak Expiratory Flow	PEF	numeric [l/min]	Yes	
FEV1	Forced expiratory volume in 1 second	FEV1	numeric [l]	No	
FEV6	Forced expiratory volume in 6 second	FEV6	numeric [l]	No	
PostMedication	Post medication context	Post medication	yes/no	No	
Cough	Cough	Cough	yes/no	No	
Short Effort	Short Effort	Short effort	yes/no	No	
Long Time To Peak	Long Time To Peak	Long time to peak	yes/no	No	
PhysicalActivityLevel					Korvaa PAI:n (PAI tai muu menetelmä ilmoitetaan ID:n kautta)
PhysicalActivityLevel	Physical activity level	Activity	numeric	Yes	
ID	Identification of assessment method. (codeset: PhysicalActivityAssessmentMethod)	Assessment method	codeset		
RiskTestResult					
Score	Score of a risk test (e.g. diabetes risk test)	Score	numeric	Yes	
ID	Identification of the test (codeset: RiskTest)	Test	codeset	Yes	
SelfTestQuestionnaireResult					
Score	Score of a questionnaire-based test result (e.g. life expectancy test):	Score	numeric	Yes	
ID	Identification of the test. (codeset: SelfTest)	Test	codeset	Yes	
Sleep					
SleepTime	Hours of sleep.	Sleep time	numeric [h]	Yes	
Quality	Level of sleep satisfaction, scale.	Sleep quality	numeric	No	.
ID	Identification of sleep quality assessment method. (Codeset: SleepAssessmentMethod)	SQuality assessment method			
SleepLevel					
SleepTimeAverage	Hours of sleep (average)	Sleep time (average)	numeric [h]	Yes	
SmokingStatus					
Status	Smoking status (0-9 discrete scale) (codeset: SmokingStatus)	Status	codeset	Yes	
PackYears	Number of cigarette packs per day multiplied by the number	Pack years	numeric	No	

Amount	of years smoked Number of cigarettes / day	Cigarettes per day	numeric	No	
Waist circumference WaistCircumference	The measured waist circumference	Waist circumference	numeric [cm]	Yes	
Weight Weight	Weight	Weight	numeric [kg]	Yes	
Height	Height (at the time of weight measurement, used for BMI calculation).	Height	numeric [cm]	No	
BMI	Body Mass Index	Body Mass Index	numeric	No	

4. VOCABULARIES

Vocabularies related to the core data sets and observations are listed in the tables below. The tables list vocabulary items for some vocabularies. Note however, that the listings are not complete. When the Taltioni platform is fully operational, internal vocabularies will be available as Excel-files and they can also be retrieved programmatically from the Taltioni Web Services API. For complete external vocabularies, please check the original sources listed in the table.

4.1. Vocabularies for core data types

Codeset Id	Description	Code values / display texts (internal codes), examples	Source	Version	Comment
Person					
BloodType	AR/YDIN Veriryhmä combined with Rhesus+/- information.	Values: A-, A+, AB-, AB+, B-, B+, O-, O+	Internal	1.0	
Language	Native language	Example: ES; espanja	External: ISO 639-1	2003-02-26	
MaritalStatus	Marital status	Example: 2; avioliitossa	External: AR/YDIN - Siivilisääty	2011-05-26	
Nationality	Kansalaisuus	Example: FI; Suomi	External: ISO 3166	2012-08-02	
Occupation	Ammatti	Example: 1233; Myynti- ja markkinointijohtajat	External: JHS 150	2012-10-05	
Condition					
ConditionName	ICD-10 code or ICPC-2 code	Example (ICD-10): J09; Influenssa, aiheuttaja tietyt tunnis. virustyypit	External: THL koodistopalv	ICD-10: 2012-10-19	

			elu ICD-10 / ICPC-2	ICPC-2: 2012-01-26	
Medication					
ActiveIngredient	Code and name of active ingredient.	Example: 2301;Ibuprofenum	External: Fimea – Lääkeaineet		
ATCCode	Medication ATC codes. Lowest hierarchy level only.	Example: D06AX04; Neomysiini	External Fimea – ATC luokitus (THL CS)	2011-11-28	
MedicationName	Code and name of all available drugs.	Example: 7115; FURESIS 500 mg tabletti	External: Fimea – Perusrekisteri / Myyntilupanumero tai EUmyyntilupanumero		
MedicationDoseForm	Code and name of drug dose forms.	Example: 173;tabletti	External: Fimea – Perusrekisteri /Lääkemuoto		
MedicationPrescribed	Information if the drug is a prescription or over-the-counter drug.	Example: R; Reseptilääke K; Itsehoitovalmiste	External: Fimea – perusrekisteri		
MedicationSubstitution	Information if the drug can be substitutet.	Example: T; Voidaan vaihtaa vastaavaan lääkkeeseen	AR/LÄÄKITYS Lääkkeen vaihdettavuus		Koodisto vaihdettu!
Allergy					
AllergenType		Value: physical factor, respiratory allergen, contact allergen, medicine, food allergen	Internal		
AllergyName	List of allergy names		Internal		Sopivaa koodistoa ei ole. Jätetään toistaiseksi pois.
AllergenReaction	List of allergy reactions	Value: separately available	Internal		
Immunization					
ImmunizationName	List of immunization names.	Value: separately available	Internal		
ImmunizationAnatomicSurface	Body site for immunization	Example: VO; Vasen olkavarsi	External: AR/YDIN – Pistoskohta		
ImmunizationRoute	Immunization route	Example: IM; Lihakseen	External: AR/YDIN – Rokotustapa		

LabTestResult					
LabTestResultName	Laboratorio tutkimuksen koodi ja nimi.	Example: 1552; B-Hemoglobiini	External: Kuntaliitto – Laboratorio-tutkimusnimikkeistö (THL / CS)	2012-03-21	
LabResultUnit	List of laboratory test units.	Example: mmol/l	External: Kuntaliitto – Laboratorio-tutkimusnimikkeistö (THL /CS)	2012-03-21	
Procedure					
ProcedureName	List of procedure codes and names.	Example: JK3AN; Sappiteiden gammakuvaus	External: THL – Toimenpidel uokitus	2012-10-19	

4.2. Vocabularies for observation data sets

Codeset Id	Description	Code values (internal codes), Examples	Source	Version	Comment
BloodGlucoseMealContext	Meal contexts for blood glucose measurements.	Example: MDC_CTXT_GLU_MEAL_PREPRANDIAL; Ruokailun jälkeen	External: IEEE 11073-10417		
BloodGlucoseSampleType	Blood Glucose measurement type	Example: MDC_CONC_GLU_CAPILLARY_WHOLEBLOOD; Kokoveri	External: IEEE 11073-10417		
BloodGlucoseHealthContext	Health context related to Blood Glucose measurement	Example: MDC_CTXT_GLU_HEALTH_MINOR; Lievä sairaus	External: IEEE 11073-10417		
BloodGlucoseSampleLocation	Body site for Blood Glucose sample	Example: MDC_CTXT_GLU_SAMPLELOCATION _FINGER; Sormi	External: IEEE 11073-10417		
BloodPressurePosition	Position context for blood pressure	Value: sitting,lLying, standing	Internal		
BloodPressureMeasurementPoint	Measurement point for Blood Pressure	Value: arm, wrist, finger	Internal		
BodyTemperatureSite	Body Temperature site	Value: armpit, general, ear, finger, gastro-intestinal-tract mouth,	External: IEEE		

		rectum, toe, tympanum	P11073-10408		
ConditionTestType PreconditionResult	Condition Test type Condition Test Precondition	Value: [Taltioni ID numbers] Value: passed, failed	Internal Internal		
ExerciseActivity ExerciseIntensity	Exercise Activity type Intensity of exercise	Value: separately available value: low, medium, high	Internal Internal		
HealthJournalEntryCategory	Health Journal Entry source.	value: own, professional, automatic	Internal		
InsulinInjectionType	Type of insulin injection.	Value: fast effect, slow effect	Internal		
MealAssessmentMethod	Methods for meal quality assessment	Value: separately available	Internal		
MealType	List of meal types	Value: breakfast, lunch, dinner, snack, supper	Internal		
MedicationIntakeEvent	Medication Intake	Value: too early, in time, delayed, missed	Internal		
PerformerType	Perfomer of measurement, procedure	Value: self, professional, laboratory	Internal		
PainAssessmentMethod	Methods for pain assessment	Value: separately available	Internal		
PhysicalActivityAssessmentMethod	List of methods for describing physical activity level.	Value: separately available	Internal		
RiskTest	List of risk tests	Value: separately available	Internal		
SleepAssessmentMethod	Methods for sleep quality assessment	Value: separately available	Internal		
SmokingStatus	Smoking status	Example: 4; Ei tupakoi	External: AR/YDIN – Tupakointist	2011-11-03	

			atus		
SelfTest	List of self tests.	Value: separately available	Internal		