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GemsTracker Integration

GemsTracker

GemsTracker is short for Generic Medical Survey Tracker and is a system built to ensure that the right person answers the right survey concerning the right patient at the right moment.
This limited focus resulted in a system that can use complex rules to ensure who answers what survey, while still enabling changes to these rules while the study is in progress. This capability is too complex for most EPD's.
Because of this limited focus, GemsTracker (GT) has been built cooperate with other systems in order to exchange information with other system to load them where the data is needed,

Types of Integration

Integration is a broad concept. Integration of GemsTracker takes many forms, including integration with questionnaire systems such as LimeSurvey and Google's Open Data Kit. However, this piece is about integration with other systems within hospitals and healthcare institutions. These forms of integration fall into three main categories:

	Data import	**Data export**	**Systeem Integratie**
Data categories	- Name & address - Appointments - Measurements	- Measurements *Name, address and appointment exports are options usually not used.*	- Password integration - Screen integration for use in EPD's
Some examples	HL7 message integration using appointments. CSV import of measurements.	CSV Export for analysis. PDF/Word export for import into EPD's.	LDAP / Radius link up. Open GT in a HiX screen

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Data import

Here for several technology types the possibilities and current implementations thereof. In principle, all forms of technology can handle all forms of data import, including name and address, agreements, but also measurement data.

Technology	**Speed**	**Implementation examples**
CSV Import [Comma Separated Values]	Slow, usually days or weeks after the data has been entered in the EPD	Usually this information is extracting from an existing datawarehouse environment. ***Joint Compassion -*** *Maasstad:* name & address data. ***Depar studie -*** *Amphia, Maasstad, Albert Schweitzer:* name & address data, appointment data, medication lab values.
SOAP [Simple Object Access Protocol] XML-Based	Push (EPD starts the exchange): minutes up to hours after entry in the EPD. Pull (GT starts the exchange): hours up to days after entry in the EPD.	This is a method only of interest for systems that already have a SOAP implementation. ***Pulse –*** *The Skalpell EPD used push integration, the Intramed EPD uses pull integration. In both cases name and address information and app*ointments were exchanged.
JSON-REST Api [JavaScript Object Notation]	Direct, EPD pushes information to GT	This is a method only of interest for systems that already have an option to send information to a REST Web server. ***Pulse*** *- Emma EPD* supplies *name and address information, app*ointments and some measurement data.
HL7 Listener	Direct or maybe a delay of a couple of minutes	Easy to implement at easy hospital that already has an Enterprise Integration Server, e.g. Cloverleaf. ***HiX*** *- Erasmus MC* and *UMC Utrecht* importer *name and address information and app*ointments. Extending this to measurement data or lab values is possible, but expensive in comparison to using CSV or JSON.

Many projects use more than one technique to import data.

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Data Export

GemsTracker can also export all kinds of data, but in practice only measurement data, ie answers to questionnaires, are exported. The overview below therefore concerns primarily the export of answer data.

Technology	**Speed**	**Elucidation**
CSV Export [Comma Separated Values]	On demand or on a regular basis, e.g. daily	**Pulse** uses automatic export of measurement data, that data is then picked up and imported into the EPD
R / SPSS / Stata	On demand using the GT web interface	
PDF	On demand using the GT web interface	This works on a patient level as well as at the survey and tracks levels and exports the selected data to a PDF
Excel	On demand using the GT web interface	
Word	On demand using the GT web interface	**CP Register** uses Word export for patient, track and survey data, for manually copying selected data into the EPD.
Copy & Paste	On demand using the Data set mapper	Using the data set mapper a specialized report can be designed and put into the EPD using copy & paste. Surprisingly effective.
SOAP	Push and pull possible	Is possible, but not in use.
JSON-REST Api	Direct, GT pushes information to the EPD	***Pulse*** – GT pushes measurement moments and data to Emma.
HL7 Listener	Direct or maybe a delay of a couple of minutes	Is possible, but not in use.

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Systems Integration

Systeem integratie komt in 2 vormen: wachtwoord management en scherm integratie met EPD's.

Centralized password management

The Erasmus MC uses Radius authentication and the Maasstad LDAP integration to verify passwords. This means that the password a) is not stored in GemsTracker in any form and b) changes when the password is changed centrally.

Both forms of external password must be set per project, but the amount of information to be supplied is limited, in the case of LDAP only the address of 1 or more LDAP servers is required, for example of Windows Active directory servers.

EPD Screen integration

EPD Screen integration means showing a GemsTracker patient screen using a button in the EPD when at that patient. This can be visually integrated as part of the EPD (preferred) or a browser window can pop up.

This has been in use at the Erasmus MC and Equipe healthcare, who use this with the EPD's HiX, Skalpell, Intramed and Emma. However, these where specialized implementations.

Starting since version 1.8.7 a generic implementation exists as well, that can be setup using the GT web interface for all EPD's. This version is used at the UMC Utrecht, the Maasstad hospital and Rijndam Revalidation, using the HiX EPD.