Wir vernetzen Gesundheit

BlueMedication

Specification Medical Practice Software Interface

Spezifikation Schnittstelle Praxis Software

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1 Introduction

1.1 Document Purpose

This document contains the specification of the interface the BlueMedication system provides for the integration and data interchange with medical practice information systems (MPIS).

1.2 Intended Audience

Software architects and software developers.

1.3 Glossary

Term	English	German
ACS	Access Control Service (of the Health Info Net platform)	Access Control Service (der Plattform der Health Info Net AG)
CDS	Clinical Decision Support	Clinical Decision Support
eMediplan	Standardized medication list as defined by the Interessengemeinschaft eMediplan (See http://chmed16af.emediplan.ch/)	Standardisierter Medikationsplan definiert durch die Interessengemeinschaft eMediplan (siehe http://chmed16af.emediplan.ch/)
Medical Practice Information System (MPIS)	Information System a medical practice uses for patient administration and medical documentation.	Praxis Software für die Patientenverwaltung und Dokumentation der medizinischen Krankengeschichte.

2 Interface Overview

The BlueMedication system offers three services:

- Medi-Extraction/Consolidation-Service
- Medi-Check-Service
- Standard-eMediplan-Generation-Service

The Medi-Extraction/Consolidation-Service gets as inputs an unstructured hospital report (or any kind of unstructured document) containing a medication list and the current medication list for a patient in the standard eMediplan format (see [eMediplan] for details). The medication list is extracted from the hospital report and a consolidation is performed with the current eMediplan resulting in an updated eMediplan. The extraction and consolidation process is controlled by the user through a HTML UI. This service could also be used to extract only an eMediplan out of an unstructured hospital report (no consolidation with an existing eMediplan).

The Medi-Check-Service performs a CDS-Check which consists of a set of checks (e.g. drug interaction) to verify the eMediplan of the patient. The result is a redirect to a temporary HTML resource to visualize the test results. Alternatively to the direct call of the REST endpoint, the user could use the service via the BlueMedication Printer Driver, i.e. call the service by printing the eMediplan document generated by the MPIS.

The Standard-eMediplan-Generation-Service performs the conversion of a CHMED string (see [eMediplan] for details) to a standard eMediplan in the form of a PDF and vice versa.

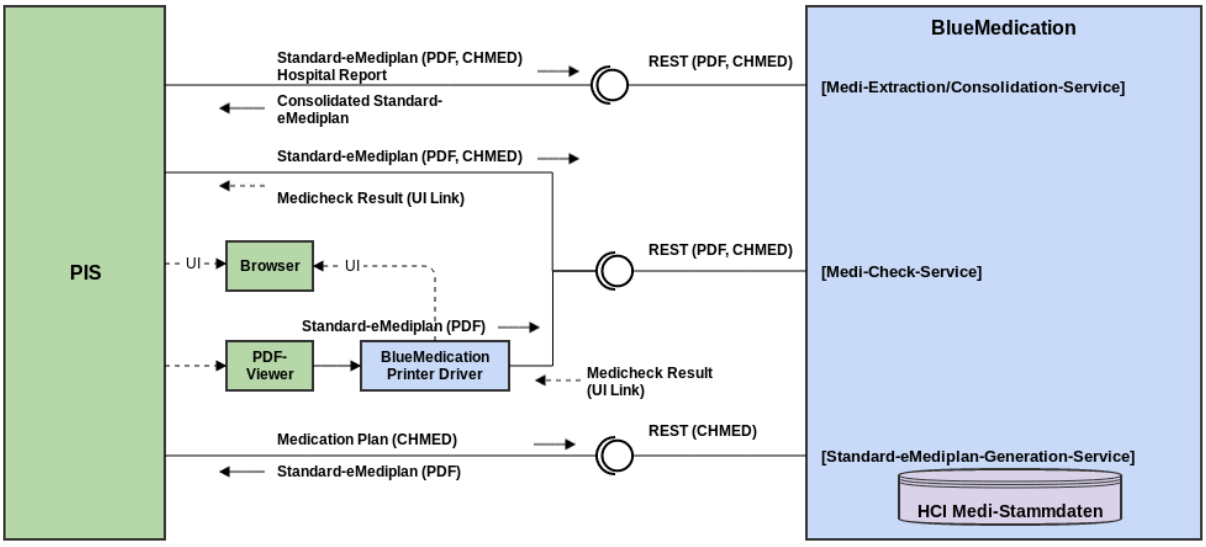


Figure 1 – BlueMedication Overview

3 Technical Specification

3.1 Basic Interface Design

BlueMedication provides a RESTful API for the communication with the MPIS (See [REST]).

3.2 Security

BlueMedication uses the HIN platform as security infrastructure (See [HIN] for details). There are several options for interacting with the BlueMedication application via the HIN infrastructure.

HIN Client

The http traffic from the medical practice is routed via the HIN Plattform with the HIN Client acting as an http proxy. In the HIN Client, the certificate and private key of the HIN Identity the medical practice uses are stored in a soft token.

The connection between the HIN Client and the HIN datacenter is encrypted and authenticated using a 2-way TLS protocol. The HIN Access Control Service (ACS) provides authorization, i.e., verifies that the HIN Identity is authorized to access the BlueMedication platform. From the HIN datacenter, the request is forwarded to the BlueMedication application server over a secured channel.

The HIN Client must be installed on the same machine as the MPIS application accessing the BlueMedication service. In ASP environments, the HIN Client must be installed in single- or in multiuser server mode. HIN provides these options which are described in [HIN-Client].

oAuth

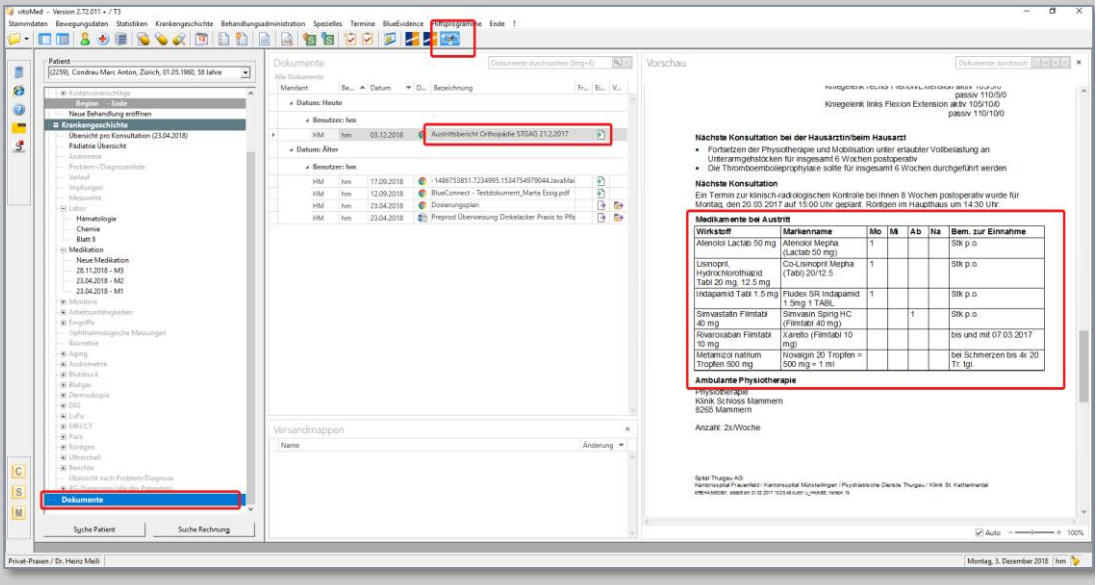
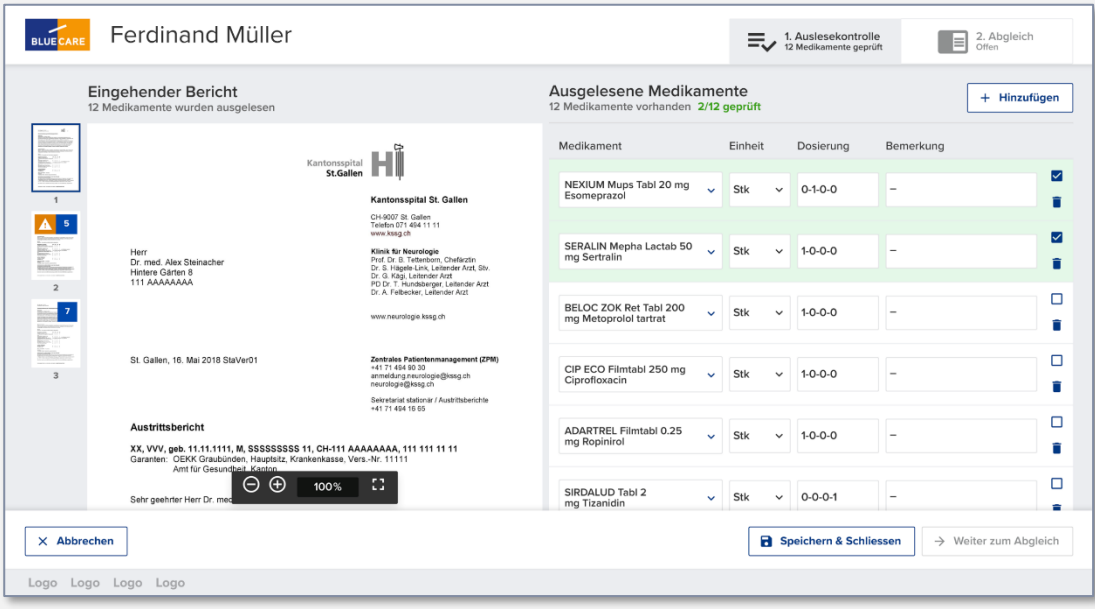
Optionally, the MPIS application can access the BlueMedication platform services from the MPIS server which holds an oAuth token. A HIN Client is still needed for the initial issuing of the oAuth token and for the interactive access to the extraction and consolidation user interface in the browser.

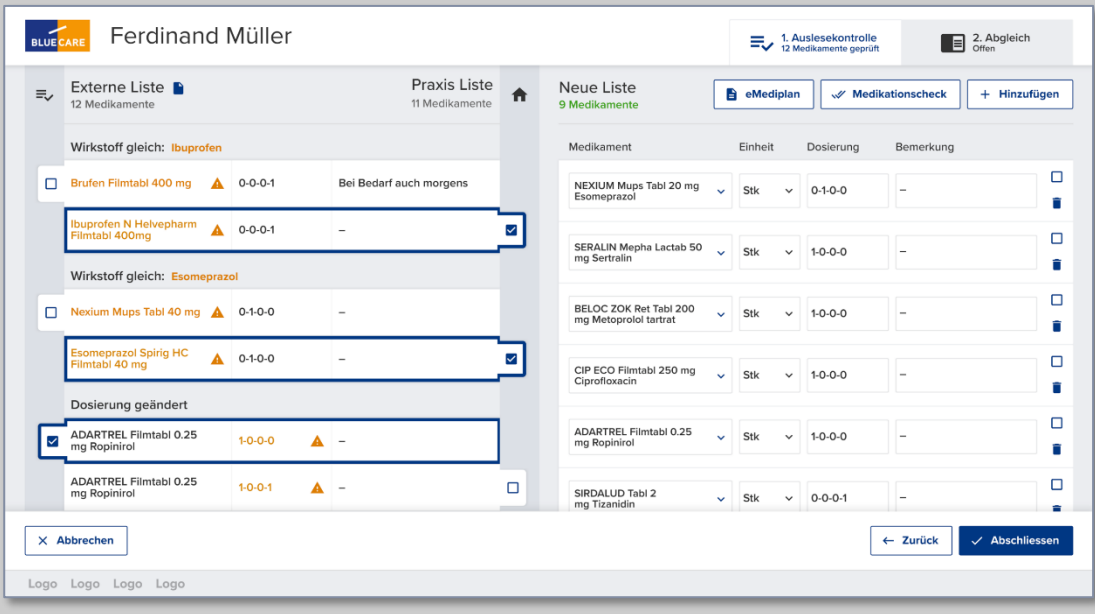
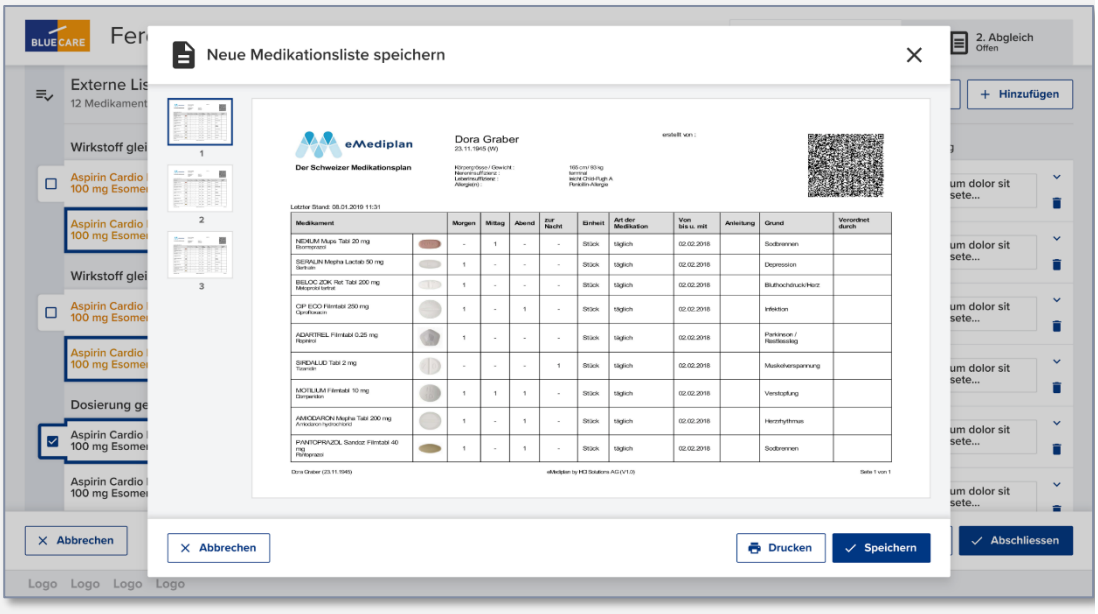
3.3 Medi-Extraction/Consolidation-Service

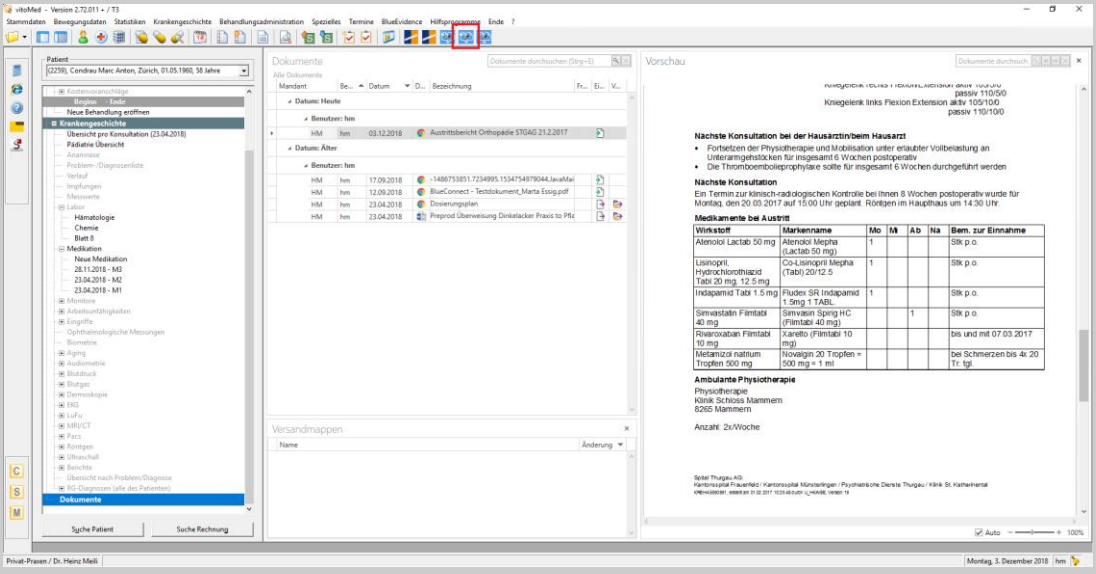
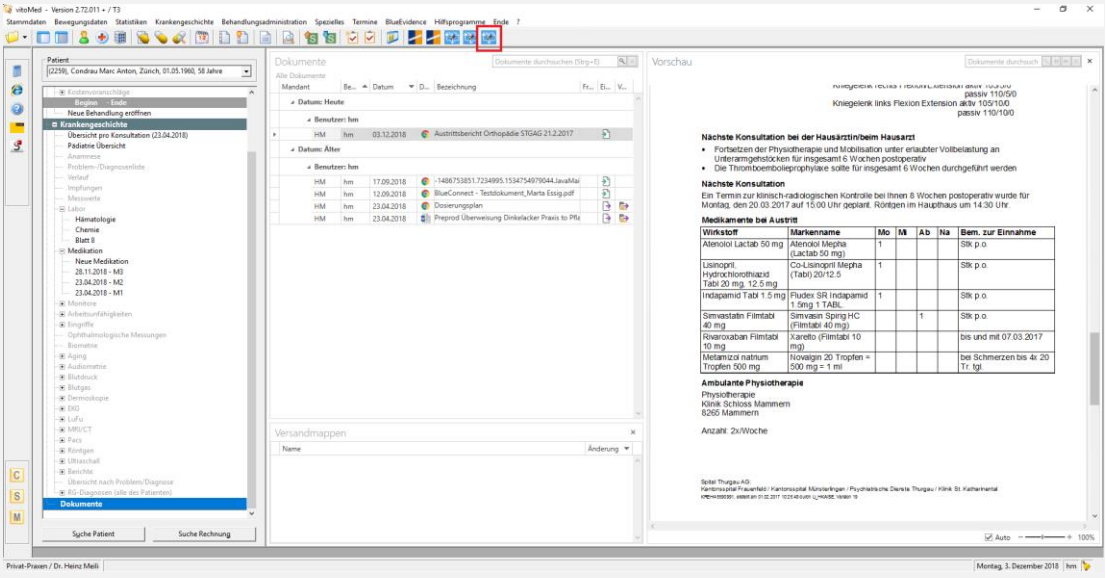
The general workflow for the usage of this service is as follows:

1. Initial upload of hospital report to BlueMedication. In case of a consolidation, a current eMediplan must also be uploaded.
2. User interaction during extraction and/or consolidation process resulting in a new eMediplan. The user interface is based on HTML supplied by BlueMedication.
3. Transfer of the consolidated eMediplan (in case of extraction and consolidation) or extracted eMediplan (in case of extraction only) back to MPIS
4. The MPIS replaces its medication list with the new medication list (providing appropriate historisation of the old medication list)

3.3.1 User Workflow

Step	User Action | User Interface
1	The user selects a hospital report in a patient's medical record
2	The user activates the function "Medikationsplan-Abgleich". If there is no current eMediplan for this patient, only an extraction will be done of the hospital report. If there is a current eMediplan, a consolidation is done after the extraction. *User Interface example with function button:* 
3	The browser is opened and the user is checking the extracted medication of the hospital report 

Step	User Action | User Interface
4	After the check of the extracted medication is finished, the user consolidates the extracted medication of the hospital report and the current medication plan of the selected patient. The user will only reach this view if there is a current eMediplan present for a consolidation. 
5	After the consolidation (or the extraction), the new medication plan is shown and can be saved in Blue-Medication. After the medication plan is saved, the browser windows is closed and the user returns to the MPIS application. 

Step	User Action | User Interface
6a	In the MPIS application, the user activates the function “Download konsolidierter Medikationsplan” and the recently saved medication plan of this patient is downloaded from BlueMedication. *User Interface example with function button:* 
6b	The user can activate the function “Download extrahierter Medikationsplan” if only an extraction was done. *User Interface example with function button:* 

3.3.2 Sequence Diagram

The service architecture is shown in the following figure:

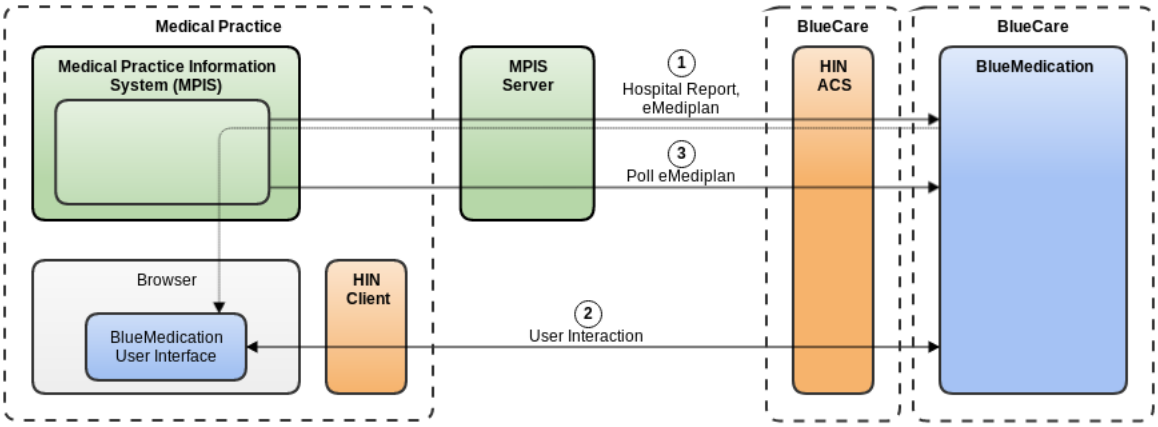
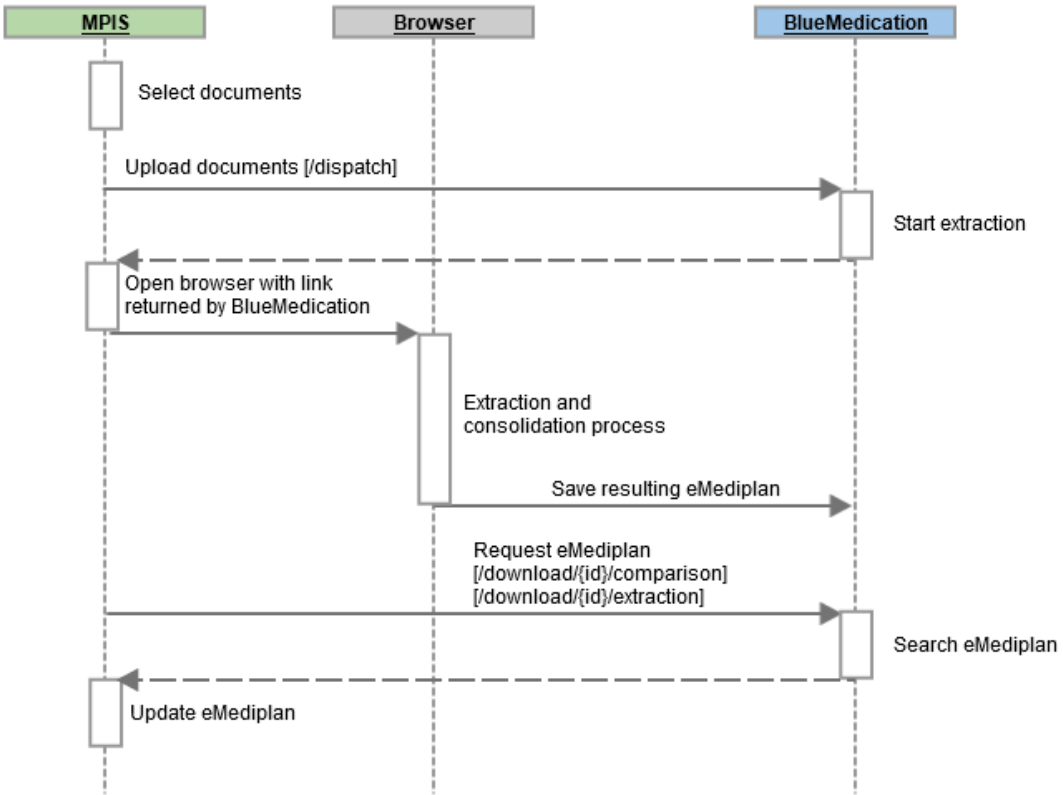


Figure 2 – Architecture of the Medi-Extraction/Consolidation-Service

In this architecture, the download of the eMediplan to the MPIS is implemented by a service call from the MPIS to BlueMedication. Other options for the transfer of the eMediplan to the MPIS may be considered in future versions of this specification.

The sequence diagram of the service is shown in the following figure:



3.3.3 API-Specification

The detailed definition of the API can be found in the Open API spec.

API Function « Upload Documents »

This is the initial call to start the whole extraction and consolidation process. The MPIS application sends the current eMediplan for a particular patient with a new hospital report containing a new mediplan. Additionally few patient attributes like the name are delivered with the request.

BlueMedication returns a redirect to a HTML resource which can be opened in a browser and contains the whole UI for the extraction and consolidation process. The URL contains a query parameter ‘id’ which can be used to download later the result of the extraction and/or consolidation.

API Function « Download eMediplan »

After the user has finished the extraction and/or consolidation in the BlueMedication UI in the browser and saved the resulting eMediplan, the user can trigger the download from within the MPIS application to download the recently saved eMediplan. The id returned by the initial upload is used to identify the eMediplan.

3.4 Medi-Check-Service

This service will be documented in future version of this specification.

3.5 Standard-eMediplan-Generation-Service

This service will be documented in future version of this specification.

4 Appendix

4.1 References

Reference	Title | Version	Path
[REST]	Representational state transfer	https://en.wikipedia.org/wiki/Representational_state_transfer#Applied_to_web_services
[HIN]	HIN Services	https://www.hin.ch/services/
[HIN-Client]	HIN Client Handbuch	https://download.hin.ch/documentation/HIN_Client_TerminalServerModus_1.6_de.pdf
[eMediplan]	Specification of the eMediplan standard	http://chmed16af.emediplan.ch/

4.2 Version History

Version	Change	Date	Author
0.1	Initial full draft	09.04.2019	Martin Mühlemann
1.0	Review input incorporated & released	17.04.2019	Martin Mühlemann, Marc Condrau