

Configuring Carenotes to integrate with LiveObs

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Version Control

Version History

Date	Version	Issued By	Changes
12.07.2018	1.0 DRAFT	Christine Wadsworth	
13.07.2018	1.1	Christine Wadsworth	Amendments made following review by Calvin Wood, Head of Project Management
13.07.2018	1.2	Christine Wadsworth	Amendments made following review by Carl De'ath, Business Analyst
16.07.2018	1.3	Christine Wadsworth	Amendments made following review by Marco Greco, New Business Sales Lead

Version Approval

Version	Name	Title / Organisation
1.3	Carl De'ath	Advanced Health and Care

Distribution

Date	Version	Name	Title
13.07.2018	1.0	Calvin Wood	Head of Project Management
13.07.2018	1.1	Carl De'ath	Business Analyst
16.07.2018	1.2	Marco Greco	New Business Sales Lead

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Executive Summary

Introduction

Cheshire and Wirral Partnership NHS Foundation Trust (CWP) currently use Carenotes as their patient administration system. They have purchased a solution from BJSS called LiveObs to assist with patient monitoring.

So that LiveObs can utilise patient information from Carenotes, CWP need Carenotes to integrate with LiveObs so that certain messages regarding a patient's status are sent from Carenotes to LiveObs via HL7 Admission, Discharge and Transfer (ADT) messaging.

Current situation

CWP have signed a Statement of Work (PUB-CMH-10002-SOW CWP-Eobs) for Advanced Health and Care (AHC) to scope the work required to deliver this integration piece.

If the information provided in this Client facing specifications document regarding the work required to deliver the integration is acceptable, a further Statement of Work will be created with full details of the project.

CWP received a verbal proposal in April 2018 of the estimated costs to complete the development to integrate LiveObs directly into Carenotes but the size and cost of the project renders it untenable without the support of other parties at present. Therefore, as a first step (and to help build support for the solution), the use of existing functionality in Carenotes, combined with proprietary technologies are being considered to achieve the desired ends.

Objective

To investigate the existing and intended workflows, to establish the scope of the work to be done, and to document the amount of configuration, reporting and deployment work which would be required to achieve the intended result.

Business benefits

CWP can pilot the live use of LiveObs utilising the patient information from Carenotes.

Scope

Advanced will deploy various roles to undertake these changes:

Advanced Project Management

All projects undertaken by Advanced are done so in line with our standard project management methodology referred to as the Corporate Project Methodology or 'CPM'. The goal of CPM is to provide a framework in which all types of projects can be planned, estimated, controlled, and completed in a consistent manner. Advanced will appoint a PRINCE2 qualified project manager with extensive experience of our methodology and implementation of our solutions.

Liaison with the vendor of the third party LiveObs solution (BJSS) to establish the deployment.

Business analysis

A review has been done of the current Trust processes to analyse and understand the functions required to trigger the appropriate messages to LiveObs and document accordingly to enable the Reporting and Consultancy to assess the work effort required.

Reporting services

The Reporting team will set up an initial load script and a continuous export package to generate flat files from the message queue table and export to the directory, and provide the testing.

Testing and verification

Advanced testing and verification of the changes in a suitable test environment.
Trust to undertake on site testing of the integrated Carenotes and LiveObs solution.

Consultancy

Advanced consultants will provide any required system configuration to enable the export of the HL7 messages to the directory, and will provide instructions and documentation for the handling of the message queue.

Post-go live support

Existing Service desk arrangements for the current version of Carenotes at CWP and support for the messaging service from Carenotes to the local directory.

Proposed Solution

Overview

There have been several discussions between CWP, BJSS and Advanced to establish how an integration might be achieved. To this end, BJSS have written a solution architecture diagram – see Appendix 1.

Carenotes already has trigger points which support the generation of a number of HL7 ADT messages. The proposed solution will see these messages exported via flat file to a local directory where they will be picked up by a BJSS service, parsed and forwarded onto the LiveObs API.

An assessment of message volume has been carried out, to gauge the viability of the solution, and it is assumed that a maximum number of seven messages per hour will be being transferred. Moreover, an estimated transmission time of 3 minutes is being assumed, from message generation in Carenotes to update in LiveObs.

Existing Carenotes functionality

Carenotes currently supports the generation of four ADT HL7 message types (see Appendix 2 for examples) –

A01 – Patient admitted

Trigger points:

- Creation of a Spell
- Create of Inpatient Episode
- Ward Stay marked as 'Bed Occupied'

A02 – Patient transferred

Trigger points:

- New Ward Stay opened and the old one closed
- Closing Ward Stay

A03 – Patient discharge

Trigger points:

- Closing inpatient episode
- Closing spell

A08 – Patient information update

Trigger points:

- Update data on patient record
- Change of patient Address
- Marked as died

Trigger points originally discussed with CWP but **not** currently available and out of scope for this project:

A03

Missing trigger points:

- Closing Care Review
- A08 is sent when a patient is marked as died, not an A03. CWP explicitly requested an A03.

A08

Missing Trigger point:

- No message generated when GP Record is updated

Implementation

The implementation plan will require involvement from numerous parties. Advanced, BJSS and CWP IT support services.

Advanced

- Reporting services will configure Carenotes to start generating the HL7 ADT messages at the given trigger points, noted above
- Reporting services will create an 'Initial load' script which would export all the current patient demographics and admitted values for active inpatients.
- Consultancy to set up tasks to export HL7 messages from the database to specified directory in flat file
- Consultancy to document and demonstrate the use and monitoring of the message queue in Carenotes

BJSS

- LiveObs and related services install
- Further points TBC by BJSS

CWP

- Create and share directory for flat file exports
- Open firewalls (where necessary) to support integration between Carenotes and LiveObs

Support

The HL7 ADT message generation trigger points are not explicitly supported within the Carenotes release cycle at present. It is intended to be brought into line (and potentially expanded upon) in due course but does not sit on the roadmap at present.

Plan

Below is a list of the recommended high-level work streams required to deliver the project.

Work stream	Work Item	Description
AHC Project manager and Business analyst	Initial call to gather requirements	To discuss all trigger points and requirements to be able to create workflow algorithms to enable Development and Consultancy to assess the workload.
AHC Project Manager	Client facing requirements document issued to Trust	Trust to decide whether to proceed.
AHC Professional Services	Statement of Work (SoW) created	
As per SoW	Project kick off	
As per SoW	Reporting team phase	
As per SoW	Consultancy input	
As per SoW	Testing and verification phase	
As per SoW	Sign off UAT	

Deliverables

To provide the work as per the specifications in this document.

All detail will be included in a Statement of Work which will be created if this work is to go ahead.

Activities (WBS)

All activities will be detailed in the Statement of Work

Dependencies and constraints

To be included in the Statement of Work

Roles and responsibilities

To be included in the Statement of Work

Timescales

To be included in the Statement of Work

Costs

Professional services

Work stream	Effort estimate (days)	Rate/day	Price
Project Management	5	£955.00	£4775.00
Reporting	15	£955.00	£14,325.00
Consultancy	2	£955.00	£1910.00
Total cost			£21,010.00

Non-services deliverables

Work stream	Frequency	Price
Licence – capital cost	Once	£5000.00
Support and maintenance (additional to existing arrangements)	Annually	£1000.00

Risks and issues

All risks and issues will be detailed in the Statement of Work

Change control

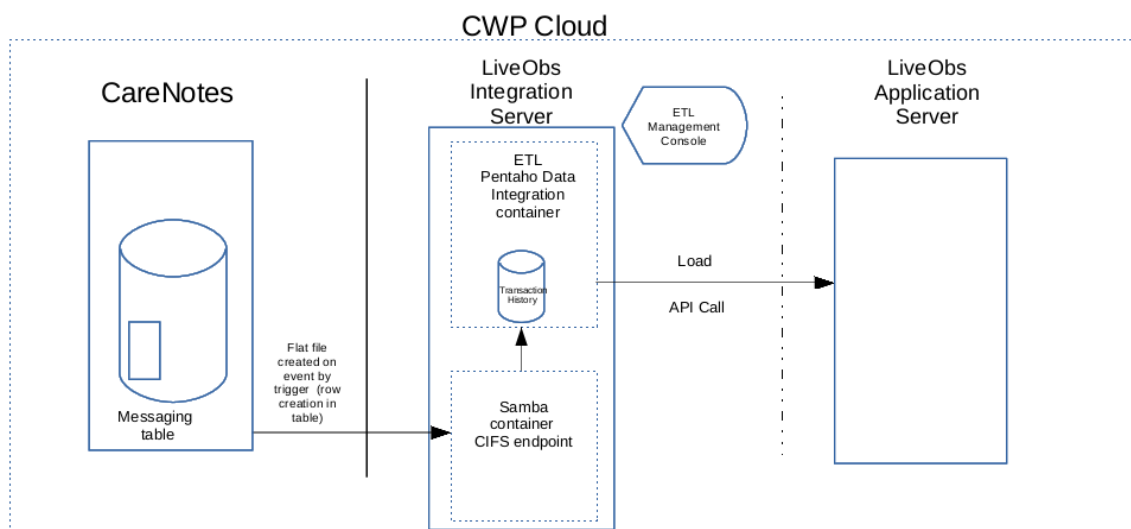
To be included in the Statement of Work

Progress reporting

To be included in the Statement of Work

Appendices

Appendix 1 – Solution Architecture proposed by BJSS



Assumptions:

1. Advanced will provide for CareNotes a description for flat file and process model for all message creation trigger points.
 1. Outstanding are A11, A12, A13 and if applicable A20, A28, A31 and A40.
 2. The naming of the flat files should be unique and time stamped i.e. YYYYDDMMHmSS_PKofTableRow.
2. CWP Systems Support team available to review Advanced/CareNotes trigger process model.
3. Preliminary examination by Peter Hardy (CWP Clinical Systems Support Manager) shows at max around 1100 messaging events per month. Assuming in a worst case scenario that these events all happen during business hours only, would translate into not more **than seven events per hour**.

Deliverables (BJSS) :

1. Business logic transformation.
2. Bulk load (initial load) job.
3. Standard load job (high frequency, low volume).
4. Recovery jobs.
5. ETL cockpit / dashboard / management console.

Long term support (1st and 2nd level) will be with CWP Clinical Systems Support and BI team.

Appendix 2 – Example messages from Carenotes

A01 messages

Spell -

```
<message msgtype="HL7L2_ADТ_A01" msgid="9fe0e73b-2e0b-4919-930d-5f9284b3cf30" msgdate="20180308" msgtime="120600"><hl7l2_payload>MSH|^~\&|CN|A||201803081206||ADТ^A01|9fe0e73b-2e0b-4919-930d-5f9284b3cf30||2.4|||826|ASCII|
```

```
PID|1|4853379371|1718|^|^|Jones^John^^Mr||19880111|Male||25 Hillbrow  
Road^^Worlingham^Beccles^NR34 9AR^|||||
```

```
ZGP|1|A^NARROWCLIFF SURGERY^^Dr^^|Narrowcliff^Newquay^Cornwall^TR7 2QF^^Narrowcliff  
Surgery|G7108091|L82029
```

```
PV1|1||Bangalore|SPELL|||||Adult|||||20180308000000|||||CREATE|
```

```
</hl7l2_payload></message>
```

Inpatient -

```
<message msgtype="HL7L2_ADТ_A01" msgid="343658d6-ec7e-45cd-ac1a-38a4fb6d641c" msgdate="20180308" msgtime="120800"><hl7l2_payload>MSH|^~\&|CN|A||201803081208||ADТ^A01|343658d6-ec7e-45cd-ac1a-38a4fb6d641c||2.4|||826|ASCII|
```

```
PID|1|4853379371|1718|^|^|Jones^John^^Mr||19880111|Male||25 Hillbrow  
Road^^Worlingham^Beccles^NR34 9AR^|||||
```

```
ZGP|1|A^NARROWCLIFF SURGERY^^Dr^^|Narrowcliff^Newquay^Cornwall^TR7 2QF^^Narrowcliff  
Surgery|G7108091|L82029
```

```
PV1|1||Bangalore|SPELL|||||Adult|||||20180308000000|||||
```

```
PV1|2||Bangalore|INPATIENT EPISODE|||||Adult|||||20180308000000|||||CREATE|
```

```
</hl7l2_payload></message>
```

Ward Stay -

```
<message msgtype="HL7L2_ADТ_A01" msgid="493174c5-ce30-412a-a7d5-8b253d72e6e6" msgdate="20180308" msgtime="121300"><hl7l2_payload>MSH|^~\&|CN|A||201803081213||ADТ^A01|493174c5-ce30-412a-a7d5-8b253d72e6e6||2.4|||826|ASCII|
```

PID|1|4853379371|1718|^^^|Jones^John^^^Mr||19880111|Male||25
Road^^Worlingham^Beccles^NR34 9AR^||||||||||||||
Hillbrow

ZGP|1|A^NARROWCLIFF SURGERY^^^Dr^^|Narrowcliff^Newquay^Cornwall^TR7 2QF^^^Narrowcliff
Surgery|G7108091|L82029

PV1|1||Bangalore|SPELL|||||Adult|||||||||||||||||||||||||||||||||20180308000000|||||||

PV1|2||Bangalore|INPATIENT EPISODE|||||Adult|||||||||||||||||||||||||||||||||20180308000000|||||||

PV1|3||Bangalore|WARDSTAY|||||||||||||||||||||||||||||||||20180308120000|||||UPDATE|

</hl7l2_payload></message>

A02 messages

New ward stay opened and existing one closed -

<message msgtype="HL7L2_ADT_A02" msgid="188afde3-cb3d-46c2-bfac-47d33f3404a9" msgdate="20180308"
msgtime="121600"><hl7l2_payload>MSH|^~\&|CN|A||201803081216||ADT^A02|188afde3-cb3d-46c2-bfac-
47d33f3404a9||2.4||||826|ASCII|

PID|1|4853379371|1718|^^^|Jones^John^^^Mr||19880111|Male||25
Road^^Worlingham^Beccles^NR34 9AR^||||||||||||||
Hillbrow

ZGP|1|A^NARROWCLIFF SURGERY^^^Dr^^|Narrowcliff^Newquay^Cornwall^TR7 2QF^^^Narrowcliff
Surgery|G7108091|L82029

PV1|1||Bangalore|SPELL|||||Adult|||||||||||||||||||||||||||||||||20180308000000|||||||

PV1|2||Bangalore|INPATIENT EPISODE|||||Adult|||||||||||||||||||||||||||||||||20180308000000|||||||

PV1|3||Bangalore|WARDSTAY|||||||||||||||||||||||||||||||||20180308120000|20180308121000|||||||

PV1|4||Cathedral House|WARDSTAY|||||||||||||||||||||||||||||||||20180308121000|||||CREATE|

</hl7l2_payload></message>

Closing ward stay -

<message msgtype="HL7L2_ADT_A02" msgid="601e6fe8-8c94-4bf0-8047-5129a9b512c4" msgdate="20180308"
msgtime="123500"><hl7l2_payload>MSH|^~\&|CN|A||201803081235||ADT^A02|601e6fe8-8c94-4bf0-8047-
5129a9b512c4||2.4||||826|ASCII|

```
PID|1|4853379371|1718|1235522^^^|Jones^John^Jacob^^Mr||19880111|Male||25          Hillbrow
Road^^Worlingham^Beccles^NR34 9AR^|01502 568224||English|||||England|||||

ZGP|1|A^NARROWCLIFF  SURGERY^^Dr^^|Narrowcliff^Newquay^Cornwall^^TR7  2QF^^Narrowcliff
Surgery|G7108091|L82029

PV1|1||Bangalore|SPELL|||||Adult|||||||||||||||||||||||||||||||||||||20180308000000|||||

PV1|2||Bangalore|INPATIENT EPISODE|||||Adult|||||||||||||||||||||||||||||||||||||20180308000000|||||

PV1|3||Bangalore|WARDSTAY|||||||||||||||||||||||||||||||||||||20180308120000|20180308121000|||||

PV1|4||Cathedral
House|WARDSTAY|||||||||||||||||||||||||||||||||||||20180308121000|20180308123500|||||UPDATE|

</hl7l2_payload></message>
```

A03 messages

Closing inpatient episode -

```
<message msgtype="HL7L2_ADT_A03" msgid="48dd6de0-09d7-460b-ae5d-91ec86de15d5" msgdate="20180308"
msgtime="123900"><hl7l2_payload>MSH|^~\&|CN|A||201803081239||ADT^A03|48dd6de0-09d7-460b-ae5d-
91ec86de15d5|2.4||||826|ASCII|

PID|1|4853379371|1718|1235522^^^|Jones^John^Jacob^^Mr||19880111|Male||25          Hillbrow
Road^^Worlingham^Beccles^NR34 9AR^|01502 568224||English|||||England|||||

ZGP|1|A^NARROWCLIFF  SURGERY^^Dr^^|Narrowcliff^Newquay^Cornwall^^TR7  2QF^^Narrowcliff
Surgery|G7108091|L82029

PV1|1||Bangalore|SPELL|||||Adult|||||||||||||||||||||||||||||||||||||20180308000000|||||

PV1|2||Bangalore|INPATIENT
EPISODE|||||Adult|||||||||||||||||||||||||||||||||||||20180308000000|20180308123900|||||UPDATE|

PV1|3||Bangalore|WARDSTAY|||||||||||||||||||||||||||||||||||||20180308120000|20180308121000|||||

PV1|4||Cathedral House|WARDSTAY|||||||||||||||||||||||||||||||||||||20180308121000|20180308123500|||||

</hl7l2_payload></message>
```

Closing spell -

<message msgtype="HL7L2_ADT_A03" msgid="04b282a7-8ece-4d6a-a991-c4417ff79f04" msgdate="20180308" msgtime="124200"><hl7l2_payload>MSH|^~\&|CN|A||201803081242||ADT^A03|04b282a7-8ece-4d6a-a991-c4417ff79f04||2.4||||826|ASCII|

PID|1|4853379371|1718|1235522^^^|Jones^John^Jacob^^Mr||19880111|Male||25 Hillbrow Road^^Worlingham^Beccles^NR34 9AR^||01502 568224||English|||||England|||||

ZGP|1|A^NARROWCLIFF SURGERY^^Dr^^|Narrowcliff^Newquay^Cornwall^TR7 2QF^^Narrowcliff Surgery|G7108091|L82029

PV1|1||Bangalore|SPELL|||||Adult|||||||||||||||||||||||||||||||||||||20180308000000|20180308124100|||||UPDATE|

PV1|2||Bangalore|INPATIENT EPISODE|||||Adult|||||||||||||||||||||||||||||||||||||20180308000000|20180308123900|||||

PV1|3||Bangalore|WARDSTAY|||||||||||||||||||||||||||||||||||||20180308120000|20180308121000|||||

PV1|4||Cathedral House|WARDSTAY|||||||||||||||||||||||||||||||||||||20180308121000|20180308123500|||||

</hl7l2_payload></message>

A08 messages

Address added -

<message msgtype="HL7L2_ADT_A08" msgid="bf8852f4-184e-457e-bd4d-1a4438e9e6bd" msgdate="20180308" msgtime="120300"><hl7l2_payload>MSH|^~\&|CN|A||201803081203||ADT^A08|bf8852f4-184e-457e-bd4d-1a4438e9e6bd||2.4||||826|ASCII|

PID|1|4853379371|1718|^|^|Jones^John^^Mr||19880111|Male||25 Hillbrow Road^^Worlingham^Beccles^NR34 9AR^|||||||||||||

ZGP|1||||

</hl7l2_payload></message>

Address updated -

<message msgtype="HL7L2_ADT_A08" msgid="5c898363-c579-451e-ad6f-5c89f95bcd25" msgdate="20180308" msgtime="122100"><hl7l2_payload>MSH|^~\&|CN|A||201803081221||ADT^A08|5c898363-c579-451e-ad6f-5c89f95bcd25||2.4||||826|ASCII|

PID|1|4853379371|1718|1235522^^^|Jones^John^Jacob^^Mr||19880111|Male||25 Hillbrow Road^^Worlingham^Beccles^NR34 9AR^||01502 568224||English|||||England|||||

ZGP|1|A^NARROWCLIFF SURGERY^^Dr^^|Narrowcliff^Newquay^Cornwall^TR7 2QF^^Narrowcliff Surgery|G7108091|L82029

</hl7l2_payload></message>

Patient record updated -

<message msgtype="HL7L2_ADT_A08" msgid="6a0d783b-66b3-490e-84e1-4c0cc1e10ff4" msgdate="20180308" msgtime="121900"><hl7l2_payload>MSH|^~\&|CN|A||201803081219||ADT^A08|6a0d783b-66b3-490e-84e1-4c0cc1e10ff4||2.4|||826|ASCII|

PID|1|4853379371|1718|1235522^^^|Jones^John^Jacob^^Mr||19880111|Male|||25 Hillbrow
Road^^Worlingham^Beccles^NR34 9AR^|||English|||England|||

ZGP|1|A^NARROWCLIFF SURGERY^^Dr^^|Narrowcliff^Newquay^Cornwall^^TR7 2QF^^Narrowcliff
Surgery|G7108091|L82029

</hl7l2_payload></message>

Marked as died on 08/03/2018 -

<message msgtype="HL7L2_ADT_A08" msgid="2ebf2e72-f50f-446e-82d4-38dfaa2e3578" msgdate="20180308" msgtime="161100"><hl7l2_payload>MSH|^~\&|CN|A||201803081611||ADT^A08|2ebf2e72-f50f-446e-82d4-38dfaa2e3578||2.4|||826|ASCII|

PID|1|4853379371|1718|1235522^^^|Jones^John^Jacob^^Mr||19880111|Male|||25 Hillbrow
Road^^Worlingham^Beccles^NR34 9AR^||01502 568224||English|||England|||20180308|

ZGP|1|A^NARROWCLIFF SURGERY^^Dr^^|Narrowcliff^Newquay^Cornwall^^TR7 2QF^^Narrowcliff
Surgery|G7108091|L82029

</hl7l2_payload></message>

Appendix 3 – BJSS contact details

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