OpenEyes - Ophthalmic Examination

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Target Audience

General Interest	
Healthcare managers	
Ophthalmologists	✔
Developers	✔

Amendment Record

Issue	Description	Author	Date
0.9	Draft	G W Aylward	11 Dec 2010
0.91	Revised draft	G W Aylward	20 Jan 2011
0.92	Revised draft	G W Aylward	14 Jul 2011
0.93	Revised draft	G W Aylward	2 Feb 2012

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Introduction

The recording and retrieval of the details of a clinical examination is a core function of OpenEyes. Such an examination can be quite variable in scope, and there are many separate elements[1] which can be included. Examples of elements in Ophthalmology include visual acuity, intraocular pressure, refraction, and gonioscopy. There is a close relationship between examination elements and archetypes (as defined in OpenEHR), though currently there are few agreed archetypes available for Ophthalmology.

The examination event needs to encompass all possible elements for the specialty (Ophthalmology) since a patient may present to one sub-specialty clinic with an unexpected problem requiring an examination usually done within another sub-specialty. However, most of the time a user will only want to fill in a small subset of elements. The default set of elements presented will vary between specialties, ophthalmic departments, and more importantly, according to where the patient is on their 'care pathway'. Hence a new patient will require a larger number of elements to be filled in than a patient who is having a brief follow up visit. The set of elements displayed will therefore depend on the sub-specialty, the site, and the 'status' of the episode.

Episode Status

The progress of a patient through their episode of treatment is tracked using the very simple concept of 'status'. For example, the following table shows how the status of a patient undergoing routine cataract surgery varies as they undergo care.

Description	Event type	Status
Seen as new patient	Examination event	New
Listed for cataract surgery	Booking event	Under investigation
Pre-assessment	Pre-assessment event	Listed/booked
Cataract surgery	Operation note event	Post-op
Seen next day	Examination event	Follow-up
Seen for follow up	Examination event	Follow-up
Discharged	Examination event	Discharged

The possible values for status will consist of a core set with additions for specific purposes and care pathways. For example, the Glaucoma sub-specialty may develop care pathways with more than one type of follow up visit (eg Follow up visit - pressure only, Follow up visit - visual fields).

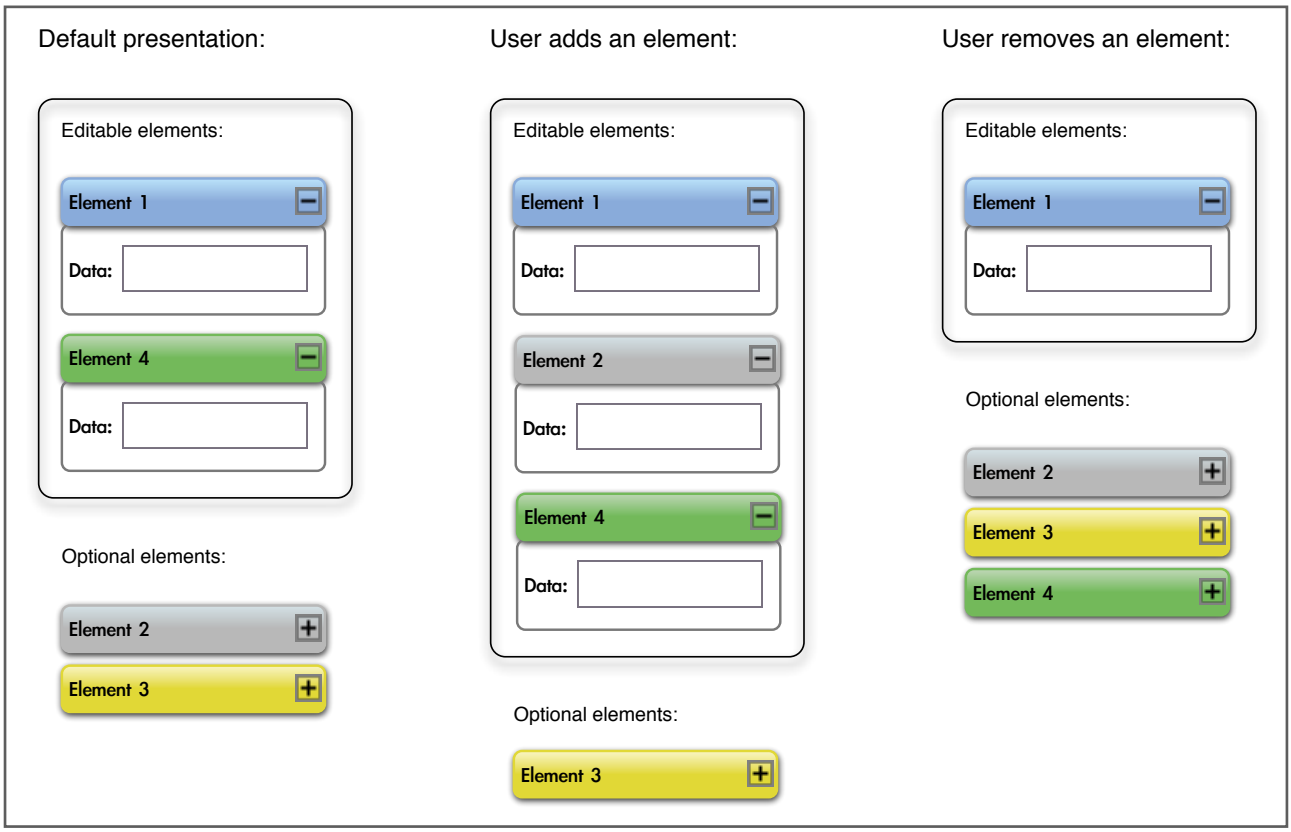
The status can be changed in two ways;

- The saving of an event. For example the saving of an operation note event would change the status from 'Booked' to 'Post-op'.
- Manual intervention. For example, a patient who telephones in cancelling their operation would need their status changed from 'Booked' to 'Follow up'.

Presentation of Elements

Edit mode

When editing the examination event, the user will be presented elements in one of two areas. The 'edit area' contains a selection of elements which can be edited. The 'optional area' contains all the other examination elements. The user is able to add and remove elements from the edit area according to the circumstances of the patient. The following figure illustrates the layout diagrammatically (NB this is not intended to indicate any design features of an actual layout).



The behaviour of the examination event follows the following rules

- All elements are displayed on the page, either in the edit area, or in the optional area of the page indicating what elements may be added.
- Within each section, the elements are displayed in a natural order (the order is fixed and does not vary according to sub-speciality, site or status).
- Elements are displayed in edit mode while in the edit area, but with titles only in the optional area (NB Toby has an excellent preview function in the mockup).
- An element added from the optional area appears in the edit area in the correct position according to its natural order, and then is no longer visible in the optional area.
- An element removed from the edit area then re-appears in the optional area.
- Elements may be removed from the editable area, even if data has been entered.
- Saving the event saves the data entered into all the elements within the edit area at the time the save button is clicked.

Display Mode

In display mode, the event should display the contents of all elements that were in the editable section at the time of saving, and had some data entered. In other words the default presentation only applies to a new examination event in edit mode.

The Default set

The set of elements that are displayed in the edit area when an event is displayed in edit mode depends on whether the event is new or already exists, and is determined by the following rules;

New event

The default set for a new event is determined by the site, sub-specialty, and the status of the episode, by a relationship defined in database tables, and therefore able to be configured by the user. The relationship between status and elements is many to many, so can be defined by a simple join table. There will be a standard set of status values, but the user will also need the ability to add new status values to the system. The exact set of elements corresponding to each status value will need to be configurable according to site.

Existing event

The elements displayed when an existing event moves into edit mode are only those for which data has been entered (i.e. the identical selection for display mode).

Pre-edit actions

Some elements in the examination page will need to be be pre-populated by data derived from elsewhere. For example, a new visual acuity element will check for a recent measurement on the Complog visual acuity testing software, and pre-populate the values in the element with any data it finds.

Post-save actions

Data saved in some elements may have implications for data elsewhere in the system. For example, the examination event (for the first examination in the episode) may include a diagnosis element. When saved, this diagnosis should be associated with the episode, as well as being added to the patient's diagnosis list.

Layout

The broad layout of the page will reflect current usage with paper notes as much as possible. Given the wide range of elements that will need to be included, this event type will make full use of the maximum event width of

1080 pixels. Elements which contain information for both right and left eyes will be presented according to conventional Ophthalmic practice, with the page representing the patient looking at you. In other words, the right eye data is presented on the left, and the right eye data is presented on the right.

The order of elements will reflect that standard order of collection. That is history, then examination findings, then conclusion elements.

References

1. Aylward GW. OpenEyes - Glossary. OpenEyes Foundation 2011.
2. Anderson P, Raettig C. OpenEyes - Developing Element Types for Event Types. OpenEyes Foundation 2011.