
NHS CUI Design Guide and Toolkit Workstream

Abbreviations and Acronyms in Free Text Input

Prepared for
NHS Connecting for Health
Tuesday, 23 June 2015
Version 1.0.0.0 Baseline

Prepared by
Mark A. Wilson-Thomas
Program Manager
cui-stakeholder.mailbox@hscic.gov.uk

Contributors
Jarnail Chudge

This document was prepared for NHS Connecting for Health which ceased to exist on 31 March 2013. It may contain references to organisations, projects and other initiatives which also no longer exist. If you have any questions relating to any such references, or to any other aspect of the content, please contact cui-stakeholder.mailbox@hscic.gov.uk

Table of Contents

<i>Table of Contents</i>	2
1 <i>Introduction</i>	1
1.1 Design Suggestion.....	1
1.2 Design Details.....	1
1.3 Patient Safety	2
2 <i>Sample Views</i>	3
3 <i>Accessibility</i>	4
4 <i>Research</i>	5
5 <i>Assumptions and Dependencies</i>	6
5.1 Assumptions	6
5.2 Dependencies	6
6 <i>Document Information</i>	7
6.1 Terms and Abbreviations.....	7
6.2 Definitions	7
6.3 Nomenclature	7
6.4 Audience.....	7
6.5 Open Issues Summary	8
6.6 References	8

1 INTRODUCTION

This document is Annex D to "*Abbreviations and Acronyms*" and proposes a possible design approach for handling free text input in NHS clinical applications. This approach conforms to current practices within safety critical systems.

Note

This document does not present a fully researched proposal. The information is presented here as a suggested starting point for research to prove its validity more fully.

1.1 Design Suggestion

The suggested design is that when a user enters free text into an NHS clinical application, the application should:

- Alert the user to any unexpanded abbreviations and acronyms
- Avoid restrictions that could cause the user to circumvent the clinical application
- Warn other application users of any remaining unexpanded abbreviations and acronyms

This design would notify all users about any abbreviation and acronym ambiguities in free text input and prompt them to take appropriate action.

1.2 Design Details

To conform to this design approach, clinical applications which provide free text input should:

- Alert a user to the presence of unexpanded abbreviations and acronyms in the text input after he finishes entering the information but before storing the text.
- Offer potential expansions for unexpanded abbreviations and acronyms in a simple fashion.
- Insert expansions for abbreviations and acronyms into the text once the user selects the correct term
- Avoid errors by not offering default expansions for abbreviations and acronyms, which the user could select by accident.
- Preserve the flow of user input when offering expansions and alerts. For example, a background task could check text on entry but only alert the user to ambiguities when he stores the text or moves to the next input field.
- Prevent the storage of known dangerous acronyms or abbreviations. For more information, see the Abbreviations and Acronyms feature area.
- Alert users to the presence of unexpanded abbreviations and acronyms. These alerts make users aware of the risk and prompt them to make an informed decision about interpretation of the unexpanded acronym.

1.3 Patient Safety

Unambiguous presentation of abbreviations and acronyms promotes patient safety by minimising the probability of confusion between similar terms. The approach that this document suggests significantly enhances patient safety by enabling clinical applications to:

- Display a warning when users enter text containing ambiguous or misleading abbreviations or acronyms.
- Avoid display of ambiguous or misleading abbreviations and acronyms.
- Display a warning when reading text that ambiguous items are present. This warning helps the user to avoid acting on an incorrect interpretation of the original author's intent, with possible undesirable consequences for the patient.

2 SAMPLE VIEWS

The following figure shows an illustration of this design.

As the authoring clinician enters the text, the system does not interrupt the flow of his text entry but a background process may be parsing the input looking for unexpanded abbreviations and acronyms, and ranking them as known dangerous or not.

48 year old m. c/o chest pain. Began 1.5 hrs. ago, pain is burning in character, no radiation.
Self medicated m.of magnesia susp. 10ml.

On completion (e.g. when the authoring clinician moves to another field or attempts to save the data) the interface highlights the unexpanded items and shows the dangerous ones. On selecting a highlighted phrase, expansions are offered.

48 year old m. c/o chest pain. Began 1.5 hrs. ago, pain is burning in character, no radiation.
Self medicated m.of magnesia susp. 10ml.

The authoring clinician responds to the prompts by using a mixture of the suggested expansions and his own, but does not have time to address them all. Some remain unexpanded (but not the known dangerous one). He stores the text.

The view shown to other clinicians opening the record would show the remaining ambiguity, e.g. by highlighting as shown here.

48 year old male c/o chest pain. Began 1.5 hours ago, pain is burning in character, no radiation.
Self medicated milk of magnesia susp.(suspension) 10ml(millilitres).

Figure 1: How Unexpanded Abbreviations and Acronyms May Be Handled

Note

Figure 1 is only a simple illustration of the design principles; It is not intended to prescribe any particular interaction. This design suggestion does not mandate the use of a text box or this highlighting style, nor does it specify the interaction for selecting the correct expansion for an abbreviation or acronym.

3 ACCESSIBILITY

The detailed accessibility considerations for this guidance depend on the precise design adopted to adhere to the guidance. However this design must address several issues:

- The interface that alerts the user to the presence of unexpanded terms and allows users to select the next unexpanded term must allow use by screen reader users, and those who prefer or require keyboard or other input devices rather than mouse input.
- The difference between non-dangerous and dangerous unexpanded terms must be apparent to users that cannot distinguish colours.

4 RESEARCH

Free-form patient notes are one of the most common areas of medical record-keeping, and are likely to become increasingly computerised over the coming years. This change requires free text input handlers in clinical applications that can deal with abbreviations and acronyms.

The challenge of interpreting shorthand terms is particularly evident in handover scenarios in hospitals. In these scenarios, misinterpretation of abbreviations or acronyms can endanger patient safety.

V.Hoban {R1} makes the following observation:

"When handing over information between colleagues, the avoidance of jargon and explanation of abbreviations is essential".

The Junior Doctor's Committee guidance on clinical handover for clinicians and managers {R2} echoes this advice. Clinical applications need to address this potential hazard and should reduce the possibility of misinterpretation.

Clinical applications should allow busy clinicians to use abbreviations during note-taking, while preventing or mitigating the consequences that could result from the display of abbreviations and acronyms which users can misinterpret. Research in safety critical systems by Professor James Reason {R3} presents a useful approach to thinking about how such systems work with people in those organisations with the best safety records. Professor Reason calls these "High Reliability Organisations".

"High reliability organisations are the prime examples of the system approach. They anticipate the worst and equip themselves to deal with it at all levels of the organisation. It is hard, even unnatural, for individuals to remain chronically uneasy, so their organisational culture takes on a profound significance. Individuals may forget to be afraid, but the culture of a high reliability organisation provides them with both the reminders and the tools to help them remember."

"For these organisations, the pursuit of safety is not so much about preventing isolated failures, either human or technical, as about making the system as robust as is practicable in the face of its human and operational hazards. High reliability organisations are not immune to adverse events, but they have learnt the knack of converting these occasional setbacks into enhanced resilience of the system."

This observation implies that computerised systems achieve the best safety results when they put "reminders and tools" in place which aid the organisational culture in helping clinicians remember when to be "afraid" at the right time.

Thomas Nolan extends this idea {R4} and states that:

"Although errors cannot be reduced to zero, the aim of the system should be to reduce to zero the instances in which an error harms a patient. A safe system has procedures and attributes that make errors visible to those working in the system so that they can be corrected before causing harm."

This statement leads to the conclusion that safe handling of abbreviations and acronyms should ensure that the application highlights potentially hazardous unexpanded items to the user. Even a time pressured user should then be aware of any ambiguity and be able to view possible alternative meanings.

5 ASSUMPTIONS AND DEPENDENCIES

This section identifies project-oriented assumptions and dependencies that have been identified in the process of developing this specification.

5.1 Assumptions

ID	Working Assumption
A1.	None.
A2.	
A3.	
A4.	
A5.	
A6.	

5.2 Dependencies

ID	Dependency
D1.	None
D2.	
D3.	

6 DOCUMENT INFORMATION

6.1 Terms and Abbreviations

Abbreviation	Definition
CSA	Clinical Spine Application
CUI	Common User Interface
ISV	Independent Software Vendor
LSP	Local Service Provider
NHS	National Health Service
NHS CFH	NHS Connecting for Health

Table 1: Terms and Abbreviations

6.2 Definitions

Term	Definition
NHS Entity	Within this document, defined as a single NHS organisation or group that is operated within a single technical infrastructure environment by a defined group of IT administrators.
The Authority	The organisation implementing the NHS National Programme for IT (currently NHS Connecting for Health)
Current best practice	Current best practice is used rather than best practice, as over time best practice guidance may change or be revised due to changes to products, changes in technology, or simply the additional field deployment experience that comes over time.

Table 2: Definitions

6.3 Nomenclature

All content subject to completion, agreement or verification is denoted with **highlighting**.

Code, script and markup languages are denoted with **monospace text**.

6.4 Audience

The audience for this document includes:

- **Authority CUI Manager / Project Sponsor.** Overall project manager and sponsor for the NHS CUI project within the Authority.
- **Authority NHS Design Guide Workstream Project Manager.** Responsible for ongoing management and administration of the workstream.
- **The Authority Project Team.** This document defines the approach to be taken during this assessment and therefore must be agreed by the Authority.
- **Microsoft NHS CUI Team.** This document defines the approach to be taken during this assessment, including a redefinition of the Design Guide Workstream strategy.

6.5 Open Issues Summary

Issue	Raised By	Action to Resolve
None		

Table 3: Open Issues Summary

6.6 References

Reference	Document	Version	Date
R1.	"How to...handle a handover", Hoban V., The Nursing Times 99(9): 54-5		4 March 2003
R2.	"Safe handover: safe patients. Guidance on clinical handover for clinicians and managers", Junior Doctors Committee of the BMA, with the National Patient Safety Agency, http://www.bma.org.uk/ap.nsf/Content/Handover/\$file/Handover.pdf		August 2004
R3.	"Human error: models and management", James Reason, BMJ 2000;320:768-770 http://bmj.bmjjournals.com/cgi/content/full/320/7237/768		18 March
R4.	"System changes to improve patient safety", Thomas W Nolan, BMJ 2000;320:771-773 http://bmj.bmjjournals.com/cgi/content/full/320/7237/771		18 March

Table 4: References

REVISION AND SIGNOFF SHEET

Change Record

Date	Author	Version	Change Reference
31-May-2005	Mark A.Wilson-Thomas	0.0.0.1	Extracted from "Abbreviations and Acronyms in Quick Wins Phase" v.0.5 for inclusion in Design Guide
01-Jun-2005	Anthony Steven	0.0.0.2	Developmental Edit
01-Jun-2005	Mark A.Wilson-Thomas	0.0.0.3	Reviewed and made minor corrections to Developmental Edit
02-Jun-2005	Anthony Steven	0.0.0.4	Version released to customer at conclusion of Quick Wins phase.
30-Jun-2005	Anthony Steven	0.0.1.0	Quick Wins Release
31-Mar-2006	L Boardman-rule	0.0.1.1	First copy edit.
01-Jun-2006	Vivienne Jones	1.0.0.0	Cleansed and Baselined ready for converting to PDF.

Document Status has the following meaning:

- **Drafts 0.0.0.X** – Draft document reviewed by the Microsoft CUI project team and the Authority designate for the appropriate workstream. The document is liable to change.
- **Working Baseline 0.0.X.0** – The document has reached the end of the review phase and may only have minor changes. The document will be submitted to the Authority CUI project team for wider review by stakeholders, ensuring buy-in and to assist in communication.
- **Baseline Candidate 0.X.0.0** – The document has reached the end of the review phase and it is ready to be frozen on formal agreement between the Authority and the Company
- **Baseline X.0.0.0** – The document has been formally agreed between the Authority and the Company

Note that minor updates or corrections to a document may lead to multiple versions at a particular status.

Reviewers

Name	Version Approved	Position	Date
Jamail Chudge	0.0.0.1	UX Lead	

Distribution

Name	Position

Document Properties

Item	Details
Document Title	NHS CUI Design Guide and Toolkit Workstream Abbreviations and Acronyms in Free Text Input
Author	Mark A. Wilson-Thomas
Restrictions	RESTRICTED – COMMERCIAL; MICROSOFT COMMERCIAL; Access restricted to: NHS CUI Project Team, Microsoft NHS Account Team
Creation Date	
Last Updated	23 June 2015

Copyright:

You may re-use this information (excluding logos) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence, visit
nationalarchives.gov.uk/doc/open-government-licence or email psi@nationalarchives.gsi.gov.uk