Design Guidance
Email Address Input and Display

Tuesday, 25 March 2008
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Prepared by
Microsoft

Microsoft®

PREFACE

Documents replaced by this document

Document Title	Version
None	

Documents to be read in conjunction with this document

Document Title	Version
Design Guidance – Accessibility Principles	1.0.0.0
Design Guidance – Accessibility Checklist	1.0.0.0

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Prepared by Microsoft, Version 1.0.0.0
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1 INTRODUCTION

This document describes the design guidance for input and display of 'Email address' data. It describes the area of focus, provides guidance and recommendations, and explains the rationale behind the guidance and recommendations.

This document is intended for the use of anyone whose role includes screen design, implementation, or assessment of a clinical application. This document can be used as guidance for the:

- Specification of an input control and a display control for an email address in a user interface (UI)

- Implementation of an input control and a display control for an email address within an application

- Assessment of an input control and a display control for an email address in a clinical application user interface

Note

Elements used within a software application are commonly referred to as a 'control'. These can take many forms but the types referred to in this document will either be 'input controls' that can receive input from a user, such as a button, text box, option button (radio button) or check box, or 'display controls' such as a label, which can only display information.

Important

The visual representations used within this document to display the guidance are illustrative only. Stylistic choices, unless otherwise specified, are not part of the guidance and are therefore not mandatory requirements for compliance with the guidance in this document.

1.1 Customer Need

Electronic mail (email) is increasingly being used in the healthcare industry by clinical and non-clinical users. Email is used both within and across organisations, for example, between a practice manager and other staff members in a surgery. The information exchanged may vary from administrative data, such as the day's schedule, to clinical data, such as a patient's test results.

Some of the advantages of email include quick and efficient information delivery, bypassing manual handling, and direct communication between the relevant parties, bypassing a mail room. Email reduces, but does not eliminate, the possibility that confidential information will be compromised, for example, by being delivered to the wrong or unauthorised person.

In the future, we can also expect email usage to grow amongst patients, who will be able to contact their General Practitioner's surgery and hospital, and receive their test results electronically.

Therefore, there is a need for clinical applications to support the input and display of email addresses in a consistent and efficient manner, to enable users of different applications to use email systems confidently and securely.

1.2   Scope

This section defines the scope of this guidance document.

1.2.1   In Scope

This guidance is applicable to UIs such as those displayed on desktop or laptop computers. It is assumed that, as a minimum, these computers are capable of operating at a display resolution of 1024 x 768, and have a keyboard and pointing device.

The following items are in scope:

- Input of fully-specified email addresses where a fully-specified address has a string of characters known as a local-part, identifying a single person, or a group of users with a shared job, followed by an '@' symbol, and an Internet domain name
- Display of fully-specified email addresses

1.2.2   Out of Scope

The following items are out of scope:

- **Name display** – Often the recipient's name is displayed in angle-brackets, immediately before the email address
- **Validation of email address as a real address** – Techniques to determine whether an entered address is an actual address
- **Validation that a given email address is that of the stated person** – Methods for determining this are beyond scope
- **Multi-language applications** – Languages that use right-to-left writing, such as Arabic, the Cyrillic alphabet, such as Russian, or ideograms, such as Japanese
- **International keyboards** – Some keyboard layouts do not have an obvious '@' symbol
- **Labels** – An important factor for clarity, is the display of unambiguous and consistent labels for email addresses, for example, whether the label should be 'Email Address' or 'Email ID'
- **Display styles** – Choice of display font size, background and foreground text colour will affect the readability of email addresses, as with all other displayed text
- **Reduced-size form factors** – Handheld devices, such as personal digital assistants (PDAs) and other such mobile devices
- **Data storage and transmission** – This guidance relates only to the display layer of a clinical application, and does not prescribe how email addresses should be stored. It is assumed that all applications will be capable of transforming an email address stored in an arbitrary format, into that prescribed by this guidance, without error. Additionally, this guidance does not consider aspects relating to the transmission of messages, such as the Internet Message Access Protocol (IMAP), Post Office Protocol version 3 (POP3) and Simple Mail Transfer Protocol (SMTP), or the storage of messages
- **Message body and attachments** – All matters relating to the size and format of messages, and permissible attachments, are governed by *Internet Message Format RFC 2822*[1], and by local policies and systems

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[1] The Internet Engineering Task Force: Internet Message Format, RFC 2822 **{R1}**:
http://www.ietf.org/rfc/rfc2822.txt

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- **Data history and provenance** – The recording of dates for when an address is valid is left to the designer of the clinical application

- **Address Types** – Entering multiple email addresses, for example an Office email address or a Home email address, is left to the designer of the clinical application

- **Method of providing help text and user messages** – There are many ways of providing the user with assistance, for example, tooltips, watermarks, Frequently Asked Questions (FAQ) files, and online help. This guidance does not explore the pros and cons of these methods and does not provide guidance on the wording for such text

- **Form design** – Typically, an email address will be entered in a form in which a user is asked to enter additional information, such as name and contact address. This guidance does not address form-level aspects such as the positioning of labels, error messages, or how mandatory fields should be displayed

- **Allocation of new email addresses** – In addition to Internet protocols, IT policies used by Internet Service Providers (ISPs) and systems administrators govern permissible user names and thus, valid email addresses

1.3   Key Principles

The following key principles have shaped the guidance in this document:

- Conforming to convention and existing best practice with which clinicians are already familiar, so as to reduce the training requirements of clinical applications

- Promoting data quality so as to reduce occurrences of errors

- Balancing the need for consistency and commonality across clinical applications with the need to support Independent Software Vendor (ISV) requirements for flexibility

2 RECOMMENDATIONS AND GUIDANCE

The guidance provided in this document is based upon a programme of user research, including:

- A desk-based research project looking at a range of information entry Web pages and clinical applications

- A Web-based survey of 41 respondents drawn from Independent Software Vendors (ISVs), healthcare administrative staff and healthcare professionals, including clinicians and community pharmacists

- A patient safety assessment

Important

An email address consists essentially of two parts, a local-part and a domain, separated by the '@' symbol. The local-part usually, though not exclusively, corresponds to the user name. The domain consists of a dot-separated list of hosts that act as intermediate destinations involved in routing the message to the local-part.

2.1 Email Address Display

Email addresses should be displayed in a form that is easy to read, and which can be used with an email application. In this section, the guidance to support these requirements is described.

2.1.1 Guidance

ID	Guideline	Status
EMA-0001	Display the email address without changing the case of any character	Recommended
EMA-0002	Display the email address in full, in a single line, without truncation or wrapping	Recommended
EMA-0003	Support the copying of email addresses by the user as part of the 'Copy and Paste' task	Recommended
EMA-0004	Display email addresses as links to facilitate their efficient use for initiating email communication	Recommended

Table 1: Guidance for Email Address Display

2.1.2 Examples of Correct Usage

Usage	Format	Example	Comments
✓	Username@Domain	JoeBloggs@ms.net	The email address is complete, clear and unambiguous

Table 2: Correct Email Address Example

2.1.3 Examples of Incorrect Usage

Usage	Format	Example	Comments
✘	Username	JoeBloggs	The email address has been truncated; only the user name is displayed. The address is ambiguous
✘	Username@partial-domain	JoeBloggs@ms	The email address is not complete as the domain name is not entered in full. It is not possible to send an email using the address as supplied

Usage	Format	Example	Comments
✘	Username@Domain- Domain-continued	JoeBloggs@ms- .net	The email address has wrapped to two lines

Table 3: Incorrect Email Address Examples

2.1.4   Rationale

This section discusses the reasons underlying the guidance for displaying email addresses.

2.1.4.1   Case Sensitivity

When displayed, an email address will be visually scanned by the user to check for any typographic errors. This is most efficiently achieved when the text is in mixed case; this format allows text to be read easily.

Text in all caps is the most difficult format to read as visual shape cues are absent. Readability problems are further compounded by the prohibition on the use of space characters in email addresses, which makes it difficult to distinguish between parts of an email address. An example of this type of email address is ADAMARMSTRONG@SOMEWHERE.CO.UK.

Text that is entirely in lowercase and in which compound words are joined without delimiting characters, also makes for poor readability, although not as acutely as that which comprises text in all caps. An example of this type of email address is adamarmstrong@somewhere.co.uk.

Therefore, to improve readability, many email addresses contain mixed case lettering, also known as 'camel case'. An example of this type of email address is AdamArmstrong@SomeWhere.co.uk. The case of the email address should therefore be preserved as entered.

The *Simple Mail Transfer Protocol, RFC 2821*[2] states that unlike the formatting of the domain name, the local-part of the email address should be treated as case-sensitive, and in addition, SMTP implementations should preserve the case of the local-part.

In summary, because clinical applications should support the display of any email address, and as email addresses may have mixed case lettering, this guidance recommends that the case of an email address is preserved.

2.1.4.2   Wrapping and Truncation

Readability is further enhanced when a contiguous item, such as an email address, can be read in its entirety. If the address is split over two lines, a hyphen will be inserted at the point at which the line breaks. This could potentially cause the reader to think the email address contains the hyphen. This could result in a failed transmission or more severely, a transmission to the wrong person, thereby compromising confidentiality. Similarly, where an email address is not displayed fully but is arbitrarily truncated, the user is left to guess the missing portion, again raising the possibility of failed transmission or transmission to the wrong person.

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[2] The Internet Engineering Task Force: Simple Mail Transfer Protocol, RFC 2821 **{R2}**:
http://www.ietf.org/rfc/rfc2821.txt

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2.1.4.3   Displaying Addresses As Links

The probability of sending an email to the wrong person can be reduced by eliminating the need for users to type an email address, as typographic errors can be introduced when an email address is typed. Instead, if valid email addresses are displayed as links, users only need select the required address to launch the default email application. An example of an email address displayed as a link is the use of "mailto:" prepended to an email address, as described in *The mailto URL scheme*, RFC 2368[3]

2.1.4.4   Copy and Paste

When composing emails, users of clinical applications may wish to be able to copy an email address displayed by one application, and paste it into their preferred email application, letter or other document. In such cases, only displaying addresses as links will not be sufficient; the text needs to be able to be copied. The user can then launch their preferred email application, paste in the email address, and then continue with the task.

2.2   Email Address Input

The purpose of the email address input control is to enable the user to enter a single email address. The control is a 'Text Input Box' as shown in Figure 1. Typically, it would be preceded by a label as shown in Figure 2. As noted previously, the wording and positioning of the label is outside the scope of this guidance.

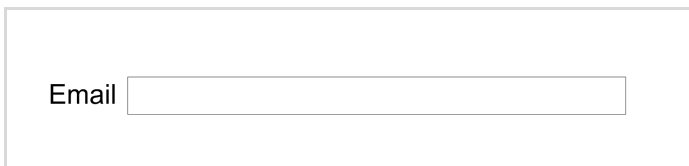Figure 1: Example of an Email Address Control Without a Label

Email

Figure 2: Example of an Email Address Control with a Label

2.2.1   Hints, Prompts and Tooltips

The input control may provide a hint, prompt, or tooltip. Hints are instructional text placed outside, but adjacent to, the text input box. Prompts are commonly known as watermarks and comprise instructional text placed within the text input box. Tooltips are instructional text that appear when the mouse pointer is placed over the text input box. The wording of hints and prompts will depend on how the control is to be used by the clinical application. A suggestion is to use: 'e.g. somebody@somewhere.co.uk'. A suggestion for a tooltip is: 'Enter the Email address'. Examples of hints, prompts, and tooltips are shown in

Figure 3, Figure 4 and Figure 5 respectively.

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[3] The Internet Engineering task Force: The mailto URL scheme, RFC 2368 **{R3}**:
http://www.ietf.org/rfc/rfc2368.txt

Email [   ]   e.g. somebody@somewhere.co.uk

Figure 3: Example of an Email Address Control with a Hint

Email [e.g. somebody@somewhere.co.uk]
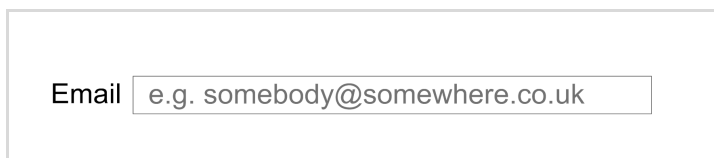
Figure 4: Example of an Email Address Control with a Prompt

Email [   ]

Enter the Email address.
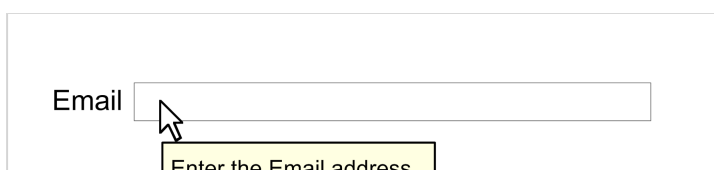
Figure 5: Example of an Email Address Control with a Tooltip

2.2.2   Guidance

ID	Guideline	Status
EMA-0010	Provide a single text input box for email address entry	Mandatory
EMA-0011	Permit only one email address to be entered in an email input box	Mandatory
EMA-0012	Set the height of the email address input box to the largest character height in the currently active display font, taking the user's settings into account	Recommended
EMA-0013	Do not change the case of any character in the email address as entered by a user	Recommended
EMA-0014	Do not permit the case to differentiate between local-parts for different users' email addresses; in other words, when validating a local-part, ignore its case	Recommended
EMA-0015	Permit email address input via all the mechanisms supported on a platform such as, but not limited to, typing on a keyboard, copy and paste, and handwriting with a stylus	Recommended
EMA-0016	Provide instructional text, for example, a tooltip, advising users of the required format for email addresses	Recommended

Table 4: Guidance for the Input of Email Addresses

2.2.3   Examples of Correct Usage

Usage	Format	Example	Comments
✓	Correctly sized input box	See Figure 1	The email address can be entered and read in full

Table 5: Correct Email Address Display Examples

2.2.4   Examples of Incorrect Usage

Usage	Format	Example	Comments
✖	Small input box	somebody@so	The length of the box is not adequate and an email address cannot be read in full, forcing the user to scroll within the box
✖	Tall input box		The height of the box could confuse the user who may think that an email message is to be entered, when an actual email address is required

Table 6: Incorrect Email Address Display Examples

2.2.5   Rationale

This section discusses the reasons underlying the guidance for the email address control.

2.2.5.1   Height and Length of the Email Input Box

The height of the input box should be adequate to accommodate a single line, not a paragraph, to indicate that the text that constitutes a message is not to be entered.

The length of the box should be sufficient to permit the user to read an email address of usual length, in its entirety. Users will want to check the address they have just entered. This will be a cumbersome task when the input box is too short, as the initial characters will scroll to the left side of the box, and therefore, will not be visible. Users will then be forced to scroll back to the start of the box to reveal the initial characters of the address. To do this, keyboard users will either have to locate and press the left arrow or the HOME key, thereby reducing task efficiency. Precise guidance on lengths is difficult to formulate as the email addresses in question can be allocated by any Internet service provider. However, looking at some leading applications is instructive: in Microsoft® Office Outlook® 2007, when creating a new contact, the email input box is 51 characters long; the equivalent box in Windows Live™ Mail is 34 characters. Designers of clinical applications may be constrained by the screen size available and should decide on a size for the email address input box accordingly.

2.2.5.2   Permissible Characters

The *Internet Message Format, RFC 2822* **{R1}** permits in the local-part uppercase and lowercase letters, numbers, a full stop (provided it is surrounded by a letter or number) and the following characters: !, #, $, %, &, ', *, +, -, /, =, ?, ^, _, `, {, |, } and ~.

Some permitted characters such as ^, | and ~ are rarely, if ever, used. Users are unlikely to know where these characters are on the keyboard, making the entry of these characters an inefficient task. Their use also makes it difficult to give one's email address to another person verbally as the names of the #, ^, | and ~ characters, are not widely known. Users of screen readers may not recognise the words for these characters when spoken by the software, introducing further opportunities for error.

Email addresses are often shared in handwritten notes in which it would be difficult to distinguish between characters such as – and ~, and between ' and `. The _ (underscore) character is also obscured if the email address is underlined. Donald M Berwick and David E Winickoff's paper, *The truth about doctor's handwriting: a prospective study* **{R4}** has shown that doctors' handwriting is no less legible than that of other executives, and that safety may require not improving writing, but rather replacing it with computerisation and other innovations.

Diacritical marks are the marks made above or below a character to denote an accent for correct pronunciation. An example of the use of diacritics is in the name Pérez-Miñana. The keyboard entry of such marks may not be supported as standard, and therefore may require either special keyboards or the selection from an additional character set, imposing additional costs in either hardware or time and task-efficiency. Additionally, the sharing of such addresses in verbal discourse would be error prone.

Notwithstanding the above comments, the scope of this guidance regards the input and display of email addresses only, and not their original allocation. There is a need to support the whole range of email addresses that are already being used, but we do not make any recommendations regarding the characters permissible in an email address.

2.2.5.3 Alternative Designs

An alternative design for the email address input control is shown in Figure 6.

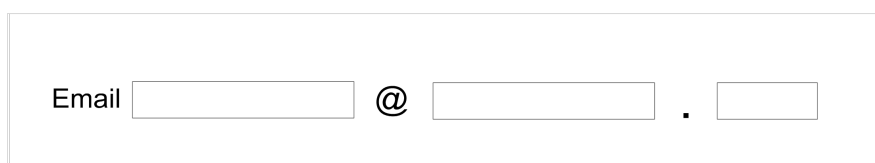Email [   ] @ [   ] . [   ]

Figure 6: A Rejected Design – Multiple Boxes

This design was rejected for a number of reasons. It assumes that the domain part can only consist of two parts, forcing the user to guess how to enter common address formats. Additionally, it would make it more cumbersome to enter an email address, as a keyboard user would have to move their hand to the mouse, click into the next text box, and move their hand back to the keyboard to type that part of the address, and so on. It would not be obvious to the user if, or how, such a control supported 'copy and paste'. Finally, in our research, we found no instance of such a design being used.

3 DOCUMENT INFORMATION

3.1 Terms and Abbreviations

Abbreviation	Definition
FAQ	Frequently Asked Question
IMAP	Internet Message Access Protocol
ISP	Internet Service Provider
ISV	Independent Software Vendor
PDA	Personal Digital Assistant
POP3	Post Office Protocol 3
SMTP	Simple Mail Transfer Protocol
UI	User Interface

Table 7: Terms and Abbreviations

3.2 Nomenclature

This section shows how to interpret the different styles used in this document to denote various types of information.

3.2.1 Body Text

Text	Style
Code	`Monospace`
Script	
Other markup languages	
Interface dialog names	**Bold**
Field names	
Controls	
Folder names	Title Case
File names	

Table 8: Body Text Styles

3.2.2 Cross References

Reference	Style
Current document – sections	Section number only
Current document – figures/tables	Caption number only
Other project documents	*Italics* and possibly a footnote
Publicly available documents	*Italics* with a footnote
External Web-based content	*Italics* and a [hyperlinked footnote](#)

Table 9: Cross Reference Styles

3.3   References

Reference	Document	Version
R1.	The Internet Engineering Task Force: Internet Message Format, RFC 2822 http://www.ietf.org/rfc/rfc2822.txt	April 2001
R2.	The Internet Engineering Task Force: Simple Mail Transfer Protocol, RFC 2821 http://www.ietf.org/rfc/rfc2821.txt	April 2001
R3.	The Internet Engineering Task Force: The mailto URL scheme, RFC 2368 http://www.ietf.org/rfc/rfc2368.txt	July 1998
R4.	Donald M Berwick, David E Winickoff, The truth about doctor's handwriting: a prospective study BMJ NO 7072, Volume 313	December 1996

Table 10: References