

Supplementary information

Considerations for implementing electronic laboratory notebooks in an academic research environment

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Supplementary Information:

Considerations for Implementing Electronic Laboratory Notebooks in an Academic Research Environment

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Supplementary Method

Figure 1 in the main article was generated by surveying 172 different ELN products. These were identified by cross-referencing multiple primary and secondary sources, along with web searches, as referenced in the figure caption.

For an ELN to be included the product had to prominently include ELN capability, be designed with the explicit purpose of being operated in the laboratory environment and/or be described by the vendor as an ELN; the latter discriminating ELNs from Laboratory Information Management Systems (LIMS) with limited or no notetaking capability. General note-taking software packages (e.g. Microsoft OneNote [Microsoft Corporation, Redmond, WA, U.S.], Evernote [Evernote Corporation, Redwood City, CA, U.S.], Google Workspace [Google, Mountain View, CA, U.S.], etc) are not included under this designation, nor are purely computational notebooks (e.g., Jupyter Notebook [Project Jupyter], R Notebook [RStudio, Boston, MA, U.S.]).

In order to estimate the year of creation and cessation both current product websites and the Wayback Machine (Internet Archive) were used. The latter is a digital archive of websites that have been captured from 1996 onwards. The first and last mention of a product name on a company website, or the existence of the website itself was used to estimate the release and defunct years. For open-source software, repository commit dates were also used. Journal articles relating to ELNs were found using keyword searchers in Google Scholar. Where multiple references existed, precedence was given to those with greater authority, e.g. a journal article referring to the system, a product launch press release, or published company history.

ELNs that ceased or that appear to have been significantly rebranded/changed as a result of company mergers were considered separate products, unless there was clear indication of a continuity of service. Open-source software packages that had not been maintained or modified in the past 5 years (as indicated by updates to code repositories) were considered defunct unless there was indication of ongoing support on the software website. This methodology will have captured the majority of ELNs, however may under report pre-1996 ELNs (which were not captured by the Wayback Machine) or those with little to no web presence.

The raw survey data and analysis notebooks are provided via a data repository at: <https://dx.doi.org/10.5281/zenodo.5012729>. This consists of a comma-separated values file containing the results of the search, along with the URLs of the corresponding websites (including from the Wayback Machine) used to determine dates. Data were analysed using the R programming language (version 4.0.3, R Foundation for Statistical Computing, Vienna, Austria) via an R Notebook (version 1.3.1093, RStudio, Boston, MA, U.S.). The repository linked above includes the R Notebook file and a pre-rendered HTML version for easy viewing in a web browser. Software citations are provided in the main manuscript file. Figures were constructed in Affinity Designer (version 1.9.3, Serif Europe Ltd, Nottingham, U.K.).