A psychological approach to the computer handling of historical information

Reynolds, Christopher F.

Veröffentlichungsversion / Published Version
Zeitschriftenartikel / journal article

Zur Verfügung gestellt in Kooperation mit / provided in cooperation with:

GESIS - Leibniz-Institut für Sozialwissenschaften

gesis
Leibniz-Institut
für Sozialwissenschaften

Mitglied der
Leibniz-Gemeinschaft

Diese Version ist zitierbar unter / This version is citable under:
https://nbn-resolving.org/urn:nbn:de:0168-ssoar-51581

A Psychological Approach to the Computer Handling of Historical Information

*Christopher   Finch   Reynolds**

Introduction

This paper is concerned with the provision of flexible knowledge bases for the individual historian. It looks at a comparatively simple source document and discusses the problems of coding the information in psychological terms. It then examines an educational package called MicroCODIL (Reynolds 1984, 1985, 19881, 1988b). This system involved psychological and human factors aspects in its design (Reynolds 1978, 1987). It is very suitable for historical applications (Reynolds 1987a, 1988b, d) and its main frame precursor, CODIL, has been used for setting up a historical data base containing 4 million bytes of biographical information on nearly 6000 individuals (Reynolds 1988b). Parts of this computer file have been issued in printed form (Reynolds 1988e, f, g).

A »Simple« Example

Figure 1 is an extract from »The Court and City Register; or, Gentleman's Complete Annual Calendar, For the Year 1788« which shows the entry for the members of parliament for the county of Devon. As far as historical source documents are concerned it is relatively well structured. For example there is a well defined structure and a number of clearly stated conventions.

Psychological Factors

In order to design a knowledge base which represents the interests of a historian it is essential to realise how he thinks about his information.

(a) Selectivity and Individuality: A historian collecting information on a particular topic will find that the majority of most documents examined are irrelevant to his needs and he will need to be very selective. What is selected will depend on the actual project concerned and the approach

* Address all communications to Christopher Finch Reynolds, Brunel University, Dep. of Comparative Science, Kingston Lane, Uxbridge UB8 3PA, Great Britain.

taken by the individual historian. A historian studying the interaction between the armed forces and parliament would select different information to one who was interested in how many Members lived in or near their constituency. One might think the reference to the six-penny receivers office provided a bit of light relief to cheer up a historical account, while another might reject such irrelevancies.

(b) Chunks of information: Human beings think about information in »convenient sized« chunks. In this case convenient chunks would be something like »Borough of Plymouth« or the number of parliaments in which the a particular member served (bearing in mind the special coding for new members). Superficially such chunks can resemble the fields in a conventional data base and most structured historical data bases take that approach. However, if information is being collected from a wide variety of source documents, with inexact information, more flexibility is required. Dates may only be available as ranges or approximate values, or may be missing altogether. Thus meaning of an occupational term may depend on the context in which it was recorded. Any system that separates single items of »data« from their source is throwing away potentially vital information.

(c) Short Term Memory: Human beings can process about seven chunks of information at any one instant (Miller, 1956). This makes a good target for the amount of information that will pass between historian and computer at any one time. It is interesting to note that the longer entries are close to the capacity of short term memory, in term os the number of chunks involved.

(d) Events: Many historical documents have information about several separate »events« and »observations«. For instance a UK census return can contain information relevant to an individual's birth, marriage, the birth of children (which may indicate geographical movement of the family), and the time of the census. Other documents, such as letters, newspaper articles, etc., will also contain information about events. Any individual historian will only be interested in a subset of these events.

(e) Decisions: Humans make decisions by comparing chunks of information. Any system that helps the historian in this areas must recognise that the chunks are far more that the formless data found in a conventional data base. Hierarchical relationships must be recognised. For instance any useful system must know that »son« and »daughter« are both »relative«, while a »relative« and a »landlord« are both »people«. In addition it may be useful to consider someone who lives on a farm and paid the rates to be a »farmer«.

MicroCODIL

MicroCODIL is an educational software package which is implemented to run on the British Broadcasting Corporation series of microcomputers. It is designed to demonstrate a wide range of advanced information technology ideas in the classroom, and its ability to handle poorly structured information, combined with powerful retrieval facilities, make it ideal for historical data bases. A teaching example based on the farms and farmers of the village of Sandridge, Hertfordshire, is used to show how schools can use the package to set up their own local history data base (Reynolds, 1987a, 1988d).

Another teaching example is based on the Devonshire Members of Parliament data given in figure 1 (Reynolds 1987a, 1988b). A version of part of this data is shown in MicroCODIL format in figure 2, and will be discussed in terms of the psychological features mentioned above.

(a) In this example an attempt has been made to select all the possible relevant information, and it can readily be seen that the information structure associated with each Member of Parliament is different. This kind of flexibility allows for the variation of information content found both within a single source, as we have here, and also the much larger differences that occur between different type of source. How comprehensively the information is selected will depend on the requirements of the historian concerned.

(b) It is very easy to compare figures 1 and 2 and see that the information has been broken down into convenient sized chunks which are meaningful to the historian. Items can have a more complex structure and, for example, it is possible to represent a range of dates with a range such as:

$$YEAR >= 1785; \ YEAR - < 1790$$

(c) Each description in the source document contains a memorable amount of information in terms of human short term memory considerations. This means that the information can be translated directly from the source document to the computer file.

(d) While this document can be easily coded in this way it is important to realise that the information on each Member covers several different »events«. For instance the statement on John Pollexson Bastard indicates that he was member for the County of Devon, he had a country seat at Kitley, Modbury, Devon, and another at Lockynge in Berkshire. Someone processing a lot of information about this individual might well decide to hold this information as three »events«, as it is very unlikely that the start and end dates will correspond when more information is known.

(e) The system provides a wide range of facilities to help resolve decisions. For example it is possible to make the following definitions:

COUNTRYSEAT (ISA) COUNTRYADDRESS
TOWNLIVES (ISA) COUNTRYADDRESS
COUNTYADDRESS (ISA) COUNTRYADDRESS

Once this has been done it is possible to ask questions about the COUN-TRYADDRESS without knowing which items make up the address.

In fact there are a wide range of aids of this kind, designed to allow human-like decision making. The control routines handle null values (for instance questions about OCCUPATION for MPs with no recorded occupation), multiple values (for MPs with two COUNTRYSEATs), and ranges (if date ranges had been included). Approximate matching of numeric and text data (i.e. spelling variations) are also catered for. Alternative definitions can be provided (for example lists of similar occupations), and if information is uncertain it is possible to associate probabilities/weights with the suspect items of information.

Conclusions

Conventional data base systems are designed for handling well structured data which can easily be fitted into tables. Historical information rarely fits into such nice categories, even if it looks »tidy«, as in the case of the Devon Members of Parliament text described here. This paper has shown that if you think in simple psychological terms, and have suitable software, it is possible to provide flexible tools for the individual historian, collecting data for his own use.

References

MILLER, G.A. 1956. »The magical number seven, plus or minus two: Some limits on our capacity for processing information.« Psychological Review 63, pp. 81-96.

REYNOLDS, C.F. 1978. »A psychological approach to language design«, Proceedings, Workshop on Computing Skills and Adaptive Systems, pp. 77-87.

REYNOLDS, C.F. 1984. »MicroCODIL as an information technology teaching tool.« University Computing 6, pp. 71-75.

REYNOLDS, C.F. 1985. »A microcomputer package for demonstrating information processing concepts.« Journal of Microcomputer Applications 8, pp. 1-14.

REYNOLDS, C.F. 1987a. MicroCODIL and History. CODIL Language Systems, Tring.

REYNOLDS, C.F. 1987b. »Human factors in systems design: a case study.« People and Computers III, Cambridge University Press, pp. 93-102.

REYNOLDS, C.F. 1988a. introducing expert systems to pupils.« Journal of Computer Assisted Learning 4, pp. 79-92.

REYNOLDS, C.F. 1988b. MicroCODIL Manual. CODIL Language Systems, Tring.

REYNOLDS, C.F. 1988c. »CODIL as a knowledge base system for handling historical informations, in S P Q Rahtz (ed) Computer and Quantitative Methods in Archaeology, BAR, pp 425-434.

REYNOLDS, C.F. 1988d. »A flexible approach to local history data bases in the classroom.« Proceedings, International Conference on Computers in the History Classroom, (in press).

REYNOLDS, C.F. 1988e. The Rendell Family of South Devon, CODIL Language Systems, Tring.

REYNOLDS, C.F. 1988f. The Phipson One-name Study, CODIL Language Systems, Tring.

REYNOLDS, C.F. 1988g. The Ancestors of Lucy Ann Reynolds, CODIL Language Systems, Tring.

REYNOLDS, C.F. 1989. »CODIL, the architecture of an information languages Computer Journal, (in press).

Figure 1: Devon Members of Parliament for 1788

DEVONSHIRE 26.

John Rolle, esq; (Tydwell, near Sidmouth, in the county)   3
John Pollexsen Bastard, esq; *(Kitley, near Modbury, in this county, and Lockynge, Berks)*   *2*

Borough   of Ashburton

Robert Mackreth, esq; *(Ewhurst, Hants)*   3
~ Lawrence Palk, esq; son of sir Robert Palk, bart. *(Haldon-House, in this   county)*

Borough   of Tiverton

Sir John Duntze, bart. *(Rockbere House, near Exeter)*   4
Hon. Dudley Ryder, eldest son of Lord Harrowby (Sandon, Staffordshire)

Borough   of Clifton-Dartmouth   Hardness

Richard Hopkins; esq; one of the lords of the admiralty *(Oving, near Aylesbury, Bucks.)*   5
- Edmond Bastard, esq; brother to the member for the county

Borough   of Oakhampton

- Humph. Minchin, esq; *(Holywell, near Walsham, Hants)*   3
- Rt. Hon. George (Capel) viscount Maiden, son of the earl of Essex 3

Borough   of Ho nit on

Rt. Hon. Sir George Yonge, bart. secretary at war (Escott, near Ottery St.
Mary, in this county)
Sir George Collier, km, a captain in the royal navy (West Hill, Surrey)

Borough   of Plymouth

Robert Fanshaw, esq; a captain in the royal navy
John Macbride, esq; a captain in the royal navy

Borough   of Beeralstone

Rt. Hon. William Robert (Fielding) vise. Fielding, eldest son of the earl
of Denbigh
- Charles Rainsford, esq; a lt. gen. in the army, and col. of the 44th
regiment of foot.

Borough   of Plympton-Earle

John Stephenson, esq; *(Brentford Butts, Middlesex)*
- John Pardoe, jun. esq; (Leyton, Essex)

Borough   ofTotnes

Sir Philip Jennings Clerke, Bart. *(Duddleston Hall, Shropsh.)*
*Hon. Henry Phipps, second brithe to lord Mulgrave, and a colonel in the
first regiment of foot guards*

Borough   of Barnstable

John Cleveland, esq; accomptant of the six-penny receivers office, and
one of the directors of Greenwich-Hospital *(Tapley, near Bide ford)* 4
Wm. Devaynes, esq.

Borough   of Tavistock

* Rt. hon. Richard Rigby, master of the rolls in Ireland for life, one of
the deputy-rangers of Pheonix Park near Dublin *(Mistleyhall, near Man-
ningtree, Essex)*   4
* Rt. Hon. Rich. Fitzpatrick, junior, bro. to the earl of Upper Offory,
aid-de-camp to the king   4

City   of Exeter

Sir Charles Warwick Bampsylde, bart. (Poltimore, near this city)   3
John Baring, esq; *(Mount Radford, near this city)*   3

The Figure after the Name shews in how many Parliaments the Member
has served. Those printed in *Italic Characters* (without any figures) were
new Members at the late General Election.
  * Privy-Counsellors. ^Chosen since the General Election.

Figure 2: Devon Members coded in MicroCODIL

```
1SURNAME  -  Rolle,
2   FORENAME  -  John,
3     AFTER  -  esq,
4        COUNTY  -  Devon,
5          COUNTRYSEAT  -  Tydwell,
6             TOWNLIVES  -  Sidmouth,
7                COUNTYLIVES  -  Devon,
8                   RETURNED  -  3.
1SURNAME  -  Bastard,
2   FORENAME  -  John,
3     FORENAME  -  Pollexson,
4        AFTER  -  esq,
5           COUNTY  =  Devon,
6              COUNTRYSEAT  -  Kitley,
7                 TOWNLIVES  =  Modbury,
8                    COUNTYLIVES  -  Devon,
9                       COUNTRYSEAT  -  Lockynge,
10                         COUNTYLIVES  =  Berks,
11                            RETURNED  -  2.
1SURNAME  -  Mackreth,
2   FORENAME  =  Robert,
3     AFTER  -  esq,
4        BOROUGH  -  Ashburton,
5           TOWNLIVES  =  Ewhurst,
6              COUNTYLIVES  -  Hants,
7                 RETURNED  =  3.
1SURNAME  =  Palk,
2   FORENAME  =  Lawrence,
3     AFTER  =  esq,
4        BOROUGH  -  Ashburton
5           COUNTRYSEAT  =  Haldon House,
6              COUNTYLIVES  -  Devon,
7                 HEIROF  =  Sir Robert Palk,
8                    BYELECTION.
1SURNAME  -  Duntze,
2   FORENAME  -  John,
3     BEFORE  -  Sir,
4        AFTER  =  baronet,
5           BOROUGH  =  Tiverton,
6              COUNTRYSEAT  =  Rockbeare House,
```

```
7                     TOWNLIVES  -  Exeter,
8                       COUNTYLIVES  =  Devon,
9                         RETURNED  -  4.
1 SURNAME  -  Ryder,
2    FORENAME  -  Dudley,
3      BEFORE  -  Hon,
4        BOROUGH  -  Tiverton,
5          TOWNLIVES  -  Sandon,
6            COUNTYLIVES  =  Staffordshire,
7              HEIROF  =  Lord     Harrowby
1 SURNAME  -  Hopkins,
2    FORENAME  -  Richard,
3      AFTER  -  esq,
4        BOROUGH  =  Clifton-Dartmouth Hardness,
5          COUNTRYSEAT  =  Oving,
6            TOWNLIVES  -  Aylesbury,
7              COUNTYLIVES  -  Buckinghamshire,
8                RETURNED  -  5,
9                  OCCUPATION  -  Lord  of  the  Admiralty.
```