The Ambleside Survey: Important Topics in DB/HCI Research

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Abstract

In 1989, and again in 1993, panels of database researchers were surveyed about which research areas they considered promising. In both cases, the area of user interfaces was chosen more than any other. This paper describes a follow up survey conducted in 1994 at the 2nd International Workshop on User Interfaces to Databases. The aim of this survey was to refine the results of the earlier panels, giving a better picture of work in the Database/Human-Computer Interaction field.

1 Introduction

In 1989, and again in 1993, Michael Stonebraker surveyed panels of database researchers about which research areas they considered promising, and also which areas they considered the least likely to produce significant results [1]. The panels' conclusions were somewhat controversial because of their dismissal of several active research areas as unimportant. On the positive side, however, both panels chose user interfaces as the most promising area. This outcome indicates an awareness of the importance of Database/Human-Computer Interaction (DB/HCI) research. It also suggests that more work in the area needs to be done, and that the work that is done needs more exposure in the database community (user interfaces was the only topic from the first survey that maintained its importance in the second survey; all of the other important areas listed in 1989 saw many papers published and reduced importance by 1993).

In order to refine the results of these panels with respect to user interfaces, a survey was conducted of the participants at the 2nd International Workshop on User Interfaces to Databases (IDS '94) in Ambleside, U.K. The survey's goal was to obtain a snapshot of work in the area, and highlight important subareas and problems. Unlike the surveys by Stonebraker, the results are intended to *describe* rather than *direct*; the sample size is too small and geographical distribution too narrow to mark any topics as the most important, or as unsuitable for further work.

2 The Survey

This survey was initially performed during IDS '94 to provide data for a panel discussion. The survey results and the discussion that followed were sufficiently

interesting to warrant a follow-up survey by e-mail, providing more comprehensive results. Participants were asked to list the areas of their own research, and outside those areas to vote for three topics within DB/HCI that they consider important. In order to maximize the breadth of responses, the survey did not list specific topics (though general categories were listed to suggest the breadth of the field). The survey also asked respondents to optionally specify if they believe that a formal or empirical approach is needed for each of their chosen topics. Twenty people responded, representing about half of the workshop participants.

3 The Results

Survey respondents voted for about 30 distinct topics within DB/HCI. To organize this large number of topics, I have created a framework of categories, subcategories, and topics. These topics, subcategories, and categories are listed in the following outline; each is followed by the number of votes it received. Some answers covered two topics, and thus are listed as half votes for each. Votes varied in generality; some votes were for a specific topic, some were for a subcategory, and some were for a category as a whole. In the case of the User Issues category, two votes were cast for that category as a whole, so the total for that category is greater than the sum of the votes of its subcategories.

- Issues of better interfaces for traditional DB tasks (20)
  - Data Visualization (Traditionally Read-only) (8)
    - Data visualization in general (6)
    - Interfaces to manage visualization (1)
    - Formal approaches to visualization (.5)
    - New techniques for visualization (3-D, VR, etc.) (.5)
  - Querying (6.5)
    - Query interfaces in general (3)
    - Querying based on user's view of the data (1)
    - Metaphors for data access/querying (1)
    - Query visualization (1)
    - Formal approaches to query interfaces (.5)
  - Schema Design/Viewing (3.5)
    - Interfaces for schema design (2.5)
    - Schema visualization (.5)
    - New Techniques for visualization (3-D, VR, etc.) (.5)
  - Other DB Tasks (2)
    - DB administration (1.5)
    - DB distribution (.5)

- Issues of better interfaces for new types of DB or new DB functions (15)
  - CSCW and DBs (4)
    - Interfaces for cooperative DBs in general (4)
  - Interactive Data Visualization (3)
    - Interactive visualization in general (1)
    - Direct manipulation of data (1)
    - Interactive 3-D and multimedia views (1)
  - Handling Multimedia (3)
    - Multimedia in general (2)
    - Integrating multimedia into the DB and the interface (1)
  - Other Issues (6)
    - New types/applications of DB in general (2)
    - Visualization of hypertext information (1)
    - Interfaces for heterogeneous multi-DBs (1)
    - Interfaces for fuzzy pattern matching in queries (1)
    - Extending the human-computer interaction paradigm for multi-modal systems (1)
- User Issues (13.5)
  - Evaluating Usability (5.5)
    - Evaluating usability in general (3)
    - Empirical usability evaluation (1)
    - Defining evaluation criteria for DB interfaces (1)
    - Formal usability evaluation (.5)
  - Different Types of User (3)
    - Walk up and use DB interfaces (1)
    - Formal basis for defining suitable visualizations for different types of users (1)
    - Maintaining functionality for different types of users though different interfaces created using user-centered design (1)
  - User Behavior (3)
    - Models of User Behavior (2)
    - User Studies (1)
- Assorted Interface Design Issues (5.5)
    - Architecture of distributed interfaces (1)
    - Facilitating the production and integration of multiple interfaces (1)
    - Standardizing interface behavior (1)
    - Formalize properties of user interfaces in the context of DBMSs (1)
    - Intergration of DB interfaces with those of other software (1)
    - Formal basis to keep different interfaces mutually consistent (.5)

In addition, two votes were cast for formal approaches to all aspects of DB/HCI work.

When describing the areas of their own research, the survey respondents listed topics found in all of the above categories, and all of the subcategories except evaluating usability and user behavior.

The most popular topics are data visualization (6), cooperative databases (4), evaluating usability (3), and query interfaces (3). Six votes specified that a formal approach is needed, and only one vote (for usability evaluation) mentioned an empirical approach.

4 Conclusions

This survey has a sample size too small to state with any certainty the opinions of the DB/HCI community. Nevertheless, it does give a good picture of the area and its popular topics. DB/HCI is a broad area, stretching from mainly HCI topics, such as user studies, to mainly DB topics, such as query interfaces. Research into improving traditional DB tasks is popular, but novel DB types and tasks are also receiving attention. In addition, the database user is being studied to understand how these interfaces should be oriented. Finally, there is interest in formal approaches to several topics.

Personally, I believe that some of the less popular topics will prove to be of greater importance in the future. Schema design and visualization has received much less attention than other traditional database tasks, and I see important problems remaining to be solved within that topic. Similarly, I think there is much work to be done in studying database users and forming models of their behavior. In my experience, interfaces are often designed without a clear understanding of the end-user.

5 Acknowledgements

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References

[1] Stonebraker, M., et. al., DBMS Research at a Crossroads: The Vienna Update, Proceedings of the 19th VLDB Conference, Dublin, Ireland, 1993, pp. 688-692.