

with a "census cube", observations could be the total numbers of males and females, and selecting dimensions age group, place of residence, ethnicity, occupation, and so on.

Cubes require the existence of a superstructure that allows them to be approached via hierarchical menus ("drill-down") and logical combinations of keywords. Meta-data need to be available too, preferably stored while avoiding redundancies. Other storage formats than the data cube should also be accommodated by the data warehouse.

While practical applications exist, and can be accessed through the websites of several national statistical agencies, the subject remains a work in progress. Data warehouses are by no means restricted to statistics, and the topic is much broader than can be described here.

Taking this concept to a further level, one could impose that after completion of a census or survey the information gathered is to be stored in the data warehouse first, and that periodic or one-off publications are generated only by retrieving data from this central storage system. Several national statistical agencies have done important work on these issues, such as Statistics Canada (CANSIM II), Statistics Sweden (PC-Axis) and Statistics Netherlands (StatSuite). Visitors to their websites can see this software in action.

As regards the applicability of data cubes, it would seem that the principal problem is not so much their storage and retrieval, but logical design of these information containers. Formulating a comprehensive set of cubes that fulfil the various requirements of (i) easily accommodating the results of statistical collections, (ii) satisfying the information needs of a wide variety of users, and (iii) fully respecting confidentiality concerns, is not a simple assignment.

Whatever new or revised data dissemination product is being envisaged, the importance of extensive prototyping and launching "beta" versions - among real and critically minded users - cannot be overemphasized.

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