KULeuven - Antonia Arnaert

Processing data to produce understanding in the health care environment

Some things are not measurable in terms of 'yes' or 'no' answers, or meters, kilograms, ... Sometimes very subjective feelings also have to be assessed. When health and social services management take decisions on which type of care to invest in, they need a reliable way of measuring the success of the care - the real effect it has on a person's wellbeing. This is a difficult enough task when dealing with target groups of people. But when it comes to assessing how a particular type of support can help the wellbeing of an individual or a specific sub-segment of customers, information needs to be treated very carefully, and powerful help is needed to mine the data in the right way. Antonia Arnaert's PhD work has used SAS software to pioneer a way of gathering, calibrating and processing data to provide a reliable, objective measurement of how the introduction of new technology and particular sciences can improve care for specific elderly.

"There is a way to quantify what until now has been a very subjective way of measuring. SAS Enterprise Miner has helped me extract reliable information from a whole range of data."

Antonia Arnaert

PhD Student, Centre for Nursing and Health Research, Catholic University of Leuven

How do we measure how a particular technology is affecting quality of life?

Antonia Arnaert is a specialist in care for the elderly. A fully qualified nurse and MBA, she has also worked as Director of a nursing home in Ieper, in the west of Belgium, and in the Centre for Nursing and Health Research at the Catholic University of Leuven. She is currently finalizing a PhD project at the university, which looks into the heart of the problem, of how we measure the effect of particular types of care for specific older people on their wellbeing. She was conscious that management investment decisions on the use of a particular type of technology for care were not based on particularly solid ground. "They don't base their decision on figures: they base it on opinions and experience of so-called experts from a subject. If someone says, 'this is good', what do we mean by 'good'? We can only prove that something is good if we have tested it in a statistical way." Her preliminary conclusions showed that great care needs to be taken in selecting and preparing data, and that SAS Enterprise Miner™ provides the help needed to process this data into knowledge.

Arnaert's research focuses on findings collected during a European Community-funded project designed to promote the use of information technology in various sectors, including healthcare. A number of elderly people were linked up to care providers via a video telephone system, in an initiative designed to allow people where possible to remain at home, rather than face the prospect of being placed in a home for the aged. A camera placed on their TV set at home meant that two-way communication was possible using the TV cable and the phone line. This was not simply a matter of providing and monitoring healthcare services, but was also an important source of social contact for people who often live in a certain degree of isolation.

Measuring change in wellbeing

Antonia Arnaert's project attempted to measure the change in the wellbeing of a test market sample of elderly people in Kortrijk, Belgium, which was brought about by the introduction of the video-telephony system.

Her method involved measuring the diversity of the clients (in this case, the elderly people) against the variability of the video-telephony care to produce an assessment of how the care was functioning. Arnaert's project set eight areas for rating wellbeing particularly relevant to old people, such as morale, social network, activities of daily life, using recognized methods from the world of psychology and medicine. Changes in an individual's ratings were then assessed in relation to the introduction of the video-telephony system, and how much it was used by the person in question.

However, her aim was not to look at the improvement in any particular individuals' condition, but to provide an objective plan view of how this new technology actually helped this specific target group of elderly. A difficult task, as in the case of video-telephony, the added social benefits brought are difficult to evaluate. Her method could then be used as a reliable tool for social services and healthcare management to take scientific decisions. As Arnaert puts it, "The literature on this subject produced in the past has all been qualitative. Today there is no quantitative information available."

Using SAS software to help policy-makers and decision-takers in sensitive areas such as personal services, which often involve investment of public money.

The need for accurate and comparable data

Arnaert's research, to be finalized and presented as her doctorate thesis in 2001, shows the pitfalls, which need to be avoided when data is being refined to create understanding. It became clear during the research that a great deal of care needs to be taken to ensure that the data is accurate, relevant and, above all, comparable, if data mining software is going to be able to extract insight. "Data exists, but we have to create knowledge: above all, the problem is one of gauging and calibrating data. A simple average does not work."

Deciding which is the relevant data to select was the first part. Next came a decision on how to collect the data, and the provisions required to clean the data so that it represented a basis for processing. Once the data was ready, it required sophisticated techniques for analysis and data mining if the knowledge produced was really going to be of help for decision-makers soon. After taking an introductory course in SAS Enterprise Miner™, Arnaert was able to harness its data mining power and flexibility, using a decision-tree modelling tool to process the whole range of data into results.

Arnaert hopes that her research findings, and the methodology she adopted, can be used to help policy-makers and decision-takers in sensitive areas such as personal services, which often involve investment of public money. She finds that her work shows that there is a way of measuring and quantifying reliably what until now has been a very subjective way of producing numbers.

"This sort of model is by no means restricted to assessing the impact of video-telephony. It could be adapted to evaluate the impact of any form of care on the well-being of elderly people - or indeed on other target groups - and thereby be a key tool for decisions as to the way public and private resources are used for care in the future."

Reliable statistics for end-users and providers alike

Once Arnaert has formally presented her PhD work, she will be looking for possible partners to develop the methodology and publishing articles in the specialist world of care for the elderly. But she is also conscious that measuring of this sort will be important for service providers. Technology can provide an extra level of care, and can give elderly people another, fuller, view on the world: tomorrow's old people will certainly not be the technophobes they sometimes might seem today. But the providers of the social services and of the technology need an objective view of the results of what they are doing. "Now we have a way of showing the difference this can make," says Arnaert.

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