

## Supporting older adults to make better choices in complex decision tasks involved in e-commerce

The demographics of developed societies have a strong and durable trend: ageing. In 2030, 25% of citizens in the USA or in the EU will be of age 60+. Over 20% will be older than 65 years. In some countries, such as Japan, this trend is even stronger: one citizen in three will be at least 60 years old in 2030. In Poland, the percentage of 60+ citizens in 2030 will be 28,9%. Moreover, demographic forecasts are usually extremely stable and accurate.

For these reasons, policy makers, for example in the EU, have long recognized the problem of ageing societies. This has resulted in several initiatives, programs, and efforts to improve the well-being of senior citizens. The UN Global Age Watch shows how much well-being of senior citizens differs from country to country. Poland has the 32<sup>nd</sup> position in this ranking (2015), close to countries of Latin America. Japan and USA are 8<sup>th</sup> and 9<sup>th</sup>, the leading countries are Switzerland, the Scandinavian countries, and Germany.

In the XXIst century, the Web has become intertwined with human societies, and almost any social or personal activity – work, leisure, learning, banking, and shopping – can take place on the Web. In particular, e-commerce is a large and growing part of the economy. Online shopping (B2C e-commerce) generates from 10% (China) to 25% of commerce turnover in various countries. There is still a large potential for growth: from 2012 to 2013, the online shopping market has grown by double-digit rates in the USA (12%), the UK (13%), Germany (12%), Japan (10%), and 64% in China.

However, e-commerce sites are usually designed with the goal of maximizing revenue, and not from the point of view of special needs of customers. This concerns older consumers as well. These two trends: the ageing of societies and growth of e-commerce, point to the need of special consideration when designing e-commerce sites and services for older consumers. Such special services can become part of the growing *silver economy*, an economy of services and markets dedicated to the needs of older consumers.

Research from psychology, conducted at the SWPS University of Social Sciences and Humanities, has demonstrated that *age-related cognitive changes can affect older consumers' behavior*. This is because the e-commerce process requires dealing with complex decision making problems that are due to information overload. For example, choosing a product from popular e-commerce sites requires dealing with several product attributes at the same time, as well as making a choice from hundreds of possibilities. Psychologists of ageing have demonstrated that older adults have difficulty dealing with such decision problems when compared to younger adults. *Older adults also search for less information than younger adults* before making a decision, due to age-related decrease in cognitive resources and changes in motivational processes.

In a recent experiment, researchers of the Polish-Japanese Academy of Information Technology together with University of Zurich have shown that older consumers are much more influenced by affect-rich negative consumer reviews, even if these reviews are not representative for the product. These and similar research results demonstrate the need for a special design of *silver e-commerce services*, supported by specialized user interfaces and algorithms, which is the main goal of this project.

Next to results of deliberate search, e-commerce users are usually confronted with a set of products selected and proposed by recommendation algorithms and displayed along results of searching. These recommendation algorithms are based on purchasing decisions previously made by a user and by similar users. When older consumers make wrong, biased, or sub-optimal shopping decisions due to age-related cognitive limitations, they teach the recommendation algorithm to make wrong decisions. *Older consumers are trapped into a vicious circle of wrong decisions driven by wrong recommendation caused by wrong decisions*. Breaking this vicious circle is one of the goals of this project.

To evaluate and test new proposals of adaptive interfaces or recommendation algorithms for older consumers, we will build an *experimental e-commerce platform*. This platform will be used to test the cognitive abilities of older consumers who will buy virtual products using a virtual currency. New proposed solutions and support methods will be implemented in the platform. Their effects on older consumer's purchase decisions will be evaluated experimentally.

The research in this project is particularly challenging because of its *interdisciplinary character*: it requires a *combination of expertise in psychology and computer science*. However, it is worthwhile and exciting to make this effort, for new decision support methods, interfaces, and recommendation algorithms developed in this project will be published in research literature and can be potentially adopted by global commercial enterprises. Because of this, our project has a potential *global impact on improving the silver economy* and older consumer's satisfaction and well-being.