Re-thinking the Social Acceptability of Decision Support Systems for Career Choice

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CHI'18 Workshop on (Un)Acceptable!?!—Re-thinking the Social Acceptability of Emerging Technologies, April 21, 2018, Montreal, QC, Canada.

Abstract
Choosing a career is one of the most important decisions in life and many people face difficulties during the career choice process. A large number of decision-aid tools can be found online, providing the user with all different types of information. However, people might have to deal with individual problems these systems cannot address and therefore prefer personal one-to-one counseling [6]. This paper aims at identifying problems the user could be confronted with and discusses the question how the research community could improve online-based career decision aids in order to gain a higher social acceptability for those systems. We found *trust issues*, *human characteristics*, *indecisiveness* and *individual needs* to be the most important sources for problems and reflect on them with regard to other research areas in HCI. However, further research is necessary to find out how these problems are interconnected and which of the proposed ideas are really suitable to improve the social acceptability of online-based decision-aid tools.

Author Keywords
Social acceptability; Decision Support Systems, DSS, In-person counseling, Career choice, Career decision-making

ACM Classification Keywords
K.4.m [Computers and Society]: Miscellaneous

Introduction

Choosing a career is one of the most important decisions in life and for most people it is a complex process that goes along with several learning experiences. A common way of dealing with this problem is consulting a personal career counseling service. Professional advisers can respond to the questions of the clients individually and help them define criteria for their career choice. The major problem of this approach is the large effort of one-to-one counseling. This is one of the reasons why a large number of online decision support systems (DSS) for career choice have been developed over the last decade. These tools can reach a wider audience and range from information portals to online self-assessments and knowledge tests. However, most of the systems only deliver general information and cannot respond to the personal needs of an individual user. This could be a reason for people to decide for a personal appointment rather than exclusively using a technical solution. In order to design systems with an improved social acceptability, we should take a closer look at the difficulties in career-decision making and take into account the unique factors of personal counseling.

Difficulties in Career Decision Making

Many people are indecisive or have problems to choose the right career. Amir et al. state that “difficulties in career decision making are among the most prevalent vocational problems” [1]. In the literature, a number of theories regarding career indecision can be found and different types of career decision-making difficulties are discussed. Gati et al. provide a “Difficulties Taxnonomy” [5], defining three main problems that can occur during the career decision process: lack of readiness, e.g. missing motivation, indecisiveness, dysfunctional beliefs; lack of information (about the process, about self, about occupations); and inconsistent information, e.g. unreliable information or internal or external conflicts. Kelly et al. [12] conducted further research on this taxonomy and identified affective experiences during the decision-making process, such as choice anxiety, and disagreements and conflicts with others as main groups of career indecision next to information deficit and identity diffusion. Germeijs et. al. [7], who examine career indecision from the position of (normative) decision theory, identify three major groups for problems in career related decision-making: lack of information, valuation problems and uncertainty about the expected outcomes.

In general, we can roughly distinguish two categories of possible problems: (1) lack of information and (2) psychological difficulties, like for example motivational problems or anxiety. Our theory is that existing technical systems are well-designed to support the user in obtaining information, but we assume that they cannot keep up with personal counseling when it comes to individual problems. As a consequence, we think that if we do not re-think our way of designing those systems, online-tools will not be able to reach the same social acceptability as personal counseling.

Technical Solutions to Support Career Choice

Computer-assisted career guidance (CACG) systems have been implemented since the 1960s [10]. SIGI (PLUS) and DISCOVER were two of the first CACG systems that were widely used in universities and colleges in the US. A lot of research has been conducted on these early systems and evaluation is showing an overall positive effect on the career decision process [2, 17] and the attitude of students towards such programs [3, 9, 21].

Of course, technology has evolved a lot since the 1960s. Today, the internet can be used in various regards for career assessment and planning: It addresses self-assessment, but also informational purposes, for example for finding the

right occupation [18]. Internet-based career planning systems have several advantages in comparison to traditional computer-based programs, like helping to “overcome geographical, psychological, physical, and financial obstacles” [11]. Using the internet in career planning also means that technical career choice solutions get more interactive and offer a better user experience, which enhances the overall attractiveness of such systems [19]. However, modern systems, mostly provided by private companies, have also received some criticism regarding ethical and professional concerns from the research community [2, 17]. Guidance provided by internet-based systems is “rarely supervised, controlled or monitored by a professional career counselor” [1]. The tools often “vary considerably in quality and level of sophistication” [17] and do not pay enough attention to individual differences. The result may be that people who are already facing personal problems regarding their career decision get even more discouraged.

To sum up, state-of-the-art systems still seem to have problems coping with psychological difficulties as mentioned in the previous section and therefore do not seem to be able to reach an equal social acceptability as in-person counseling.

Designing for Social Acceptability

In order to reach a high social acceptability for online-based DSS for career choice, we should concentrate on the factors why people might prefer in-person counseling to using a web-based solution. In the following, we will shortly discuss the reasons of which we think that they are worthy of consideration.

Trust issues

The users might have trust issues and would rather rely on the experience of a human professional than on a technical system. This is a well-known problem in HCI [4], which is addressed in various research fields. There has also been some work done in the area of decision support systems [16], but findings are very general and we have to find specific solutions for career counseling.

We think that in this case, trust could be improved by having a main brand (also a well-known university) behind a DSS, by having reports form peers who have undergone the same process, and by a high coincidence between personal judgements and recommendations at least in parts of the test. This of course needs to be investigated in detail.

Human characteristics

One major advantage of personal counseling is obviously the contact with a human professional who can sympathize with the client. Especially graduates, who have to deal with major life decisions, might want to talk to an experienced advisor, who can empathize with them.

It is probably not the right solution to try to mimic human personality, although this has been tried in commercial products. The path for success might rather be a system giving the impression to adapt to the individual situation of the user. This idea can be derived from the early experiences with the ELIZA system [20]. Having in mind our possibilities nowadays, we could think about creating the illusion of a system which shows that it has information about the user but clearly presents itself as objective and neutral, maybe even more than a human would do.

Indecisiveness

Because of the variety of provided systems, users might be overwhelmed by the large amount of information and therefore not be able to (1) chose a DSS that fits their needs and (2) finally make a career decision.

Similar to the trust issues, (1) could possibly be resolved by having a main brand and a clear advertising strategy. The

purpose of a system should clearly be communicated to the users. To find a solution for (2), we should think about trying to design more (inter-)active systems, rather than only providing information passively. We think that research on DSS for career choice can highly benefit from the interactive and dynamic possibilities of modern web-based technologies.

Individual needs
There are a number of different theories on career decision making [14, 13]. All of them have in common that career choice is a complex progress, depending on multiple internal and external factors. This means that everyone facing a career decision has individual needs in counseling. Personal advisers are experienced to adapt to those needs. When designing technical solutions for career choice, we should have a closer look at current research in personalization and try to learn from different application areas like for example e-commerce [8] or learning [15]. We can probably improve traditional personalization methods by modern machine learning techniques and maybe by resorting to models of human behaviour like personality traits.

Discussion

In order to design user-oriented decision support systems for career choice, we should adapt approaches from research areas in HCI that are already dealing with the topics presented above. However, a lot of work needs to be done to find out how the named problems are interconnected and which of the proposed ideas are really suitable to improve online-based decision-aid tools. How can we develop trustworthy, personalized decision-aid tools that engage users in interacting with them? Is it possible to eliminate all concerns about the use of online-based systems so that they become a viable alternative to in-person counseling? Is it desirable that a technical system brings the same qualities as a human counselor such as empathy and experience or can we even take advantage of the neutral and objective characteristics of a technical system? Trying to answer these questions will take us one step further to increasing the social acceptability of technical solutions for career choice.

Conclusion

Making a career decision is a complex task, many people are struggling with. Currently, there are two ways of getting assistance for this problem: in-person counseling and online-based decision aid tools. While the latter are a cost-effective way of providing information to a large number of users, they cannot react to individual problems and therefore have not reached the same level of social acceptability as one-to-one counseling. In this paper, we identified *trust issues*, *human characteristics*, *indecisiveness* and *individual needs* as possible reasons for this and gave first ideas how we could improve design for social acceptability in the future. However, research in this area is still in its infancy and the mentioned factors need to be investigated in detail to draw precise conclusions.

REFERENCES

1. Tamar Amir, Itamar Gati, and Tali Kleiman. 2008. Understanding and Interpreting Career Decision-Making Difficulties. (2008).
2. Azy Barak. 2003. Ethical and Professional Issues in Career Assessment on the Internet. (2003).
3. Warren Chapman, Martin R. Katz, Lila Norris, and Laura Pears. 1977. SIGI: Field test and evaluation of a computer-based System of Interactive Guidance and Information. (1977).
4. Kari Chopra and William A Wallace. 2003. Trust in electronic environments. In *System Sciences, 2003.*

Proceedings of the 36th Annual Hawaii International Conference on. IEEE, 10–pp.

5. Itamar Gati, Mina Krausz, and Samuel H. Osipow. 1996. A Taxonomy of Difficulties in Career Decision Making. (1996).
6. Itamar Gati, Noa Saka, and Mina Krausz. 2001. 'Should I use a computer-assisted career guidance system?' It depends on where your career decision-making difficulties lie. (2001).
7. Veerle Germeijs and Paul De Boeck. 2003. Career indecision: Three factors from decision theory. (2003).
8. Anna Goy, Liliana Ardissono, and Giovanna Petrone. 2007. Personalization in e-commerce applications. In *The adaptive web*. Springer, 485–520.
9. D. F. Grant. 1985. Effects of System of Interactive Guidance and Information (SIGI) on career indecision in college students (Decision Scale). (1985).
10. JoAnn Harris-Bowlsbey. 2013. Computer-Assisted Career Guidance Systems: A Part of NCDA History. (2013).
11. S. Herman. 2010. Career HOPES: An Internet-delivered career development intervention. (2010).
12. Kevin R. Kelly and Wei-Chien Lee. 2002. Mapping the Domain of Career Decision Problems. (2002).
13. John D. Krumboltz, Anita M. Mitchell, and G. Brian Jones. 1976. A Social Learning Theory of Career Selection. (1976).
14. Robert W. Lent, Steven D. Brown, and Gail Hackett. 1994. Toward a Unifying Social Cognitive Theory of Career and Academic Interest, Choice, and Performance. (1994).
15. Ilya Levin and Andrei Kojukhov. 2013. Personalization of Learning. *Social media in higher education: Teaching in Web* 2 (2013), 105.
16. Bonnie M. Muir. 1987. Trust between humans and machines, and the design of decision aids. *International Journal of Man-Machine Studies* 27, 5-6 (1987), 527–539.
17. Jeffrey P. Prince, Robert B. Most, and Diane G. Silver. 2003. Self-Help Career Assessment: Ethical and Professional Issues. (2003).
18. David M. Reile and JoAnn Harris-Bowlsbey. 2000. Using the Internet in Career Planning and Assessment. (2000).
19. Branimir Sverko, Natasa Akik, Toni Babarovic, Ana Brcina, and Iva Sverko. 2002. Validity of E-Advice: The Evaluation of an Internet-Based System for Career Planning. (2002).
20. Joseph Weizenbaum. 1966. ELIZA-a computer program for the study of natural language communication between man and machine. *Commun. ACM* 9, 1 (1966), 36–45.
21. S. J. Yang. 1993. The Effects of Two Computer-Assisted Career Guidance Programs - DISCOVER and SIGI PLUS - on the Career Development of High School Students. In *Paper presented at the AARE Annual Conference Fremantle*, Australian Association for Research in Education (Ed.).