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## Proposal Profile

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### **Proposal title: Meaning-based *Smart Companion* for Mindful Exploration**

#### **Strategic Objective addressed:**

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##### **Objective ICT-2009.8.0 FET-Open: Challenging Current Thinking**

*FET-Open targets foundational breakthroughs that open the way towards radically new forms and uses of information and information technologies. It flexibly accommodates the exploration of new and alternative ideas, concepts or paradigms that, because of their radical, fragile or high-risk nature, may not be supported elsewhere in the ICT Workprogramme. Research under FET-Open is aimed at achieving a first proof-of-concept and at developing its supporting scientific foundation. The novelty of this research comes from new ideas rather than from the refinement of current ICT approaches.*

#### **Project abstract**

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This project proposes to develop innovative dynamic methodology and technology that will support the future development of **Smart Companion** computer tools to improve user decision-making on a wide range of life activities. Guided by the humanistic vision for human development, the envisioned tools will enhance individual autonomous development through an ongoing process of *mindful exploration* (rather than ad hoc assessment of choices), leading to greater self-fulfillment and well-being. This will be achieved through breakthrough research in Artificial Intelligence oriented towards enabling computers to understand and convey meaning, as implemented in the envisioned Smart Companion tools. The project will actualize a new kind of dialogue and collaboration between computer science and the humanities leading to a humanistic approach to digital environments. The project will bring together complementary research groups from the fields of computer science (CS), artificial intelligence (AI), psychology and philosophy.

#### **Proposal concept**

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The aim of the development of the *Smart Companion* is to harness cutting edge CS/AI technology to augment human cognition and support motivation in the processes of planning and reflection-based exploration in all life domains (career, leisure, family, social

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network,, finance, health, home design, etc.), and as a result to achieve heightened effectiveness and satisfaction, and ultimately improve well-being.

#### Humanistic tradition

The enhancement of well-being through individual autonomy and self-fulfillment is the core concept of Humanism; Humanism emerged as a radically new worldview in Europe during the Renaissance and has continued to develop since then. The goal of enhanced autonomy guides EC policies in many areas. According to the humanistic tradition, individual autonomous development happens through **an ongoing exploratory process aimed at learning about ourselves and our environment and, on the basis of the acquired knowledge, directing ourselves to form and implement life plans that advance our goals.** Thus a process of *mindful exploration* is the engine of the humanistic methodology for well-being.

#### Mindful Exploration

However, *mindful exploration* is a difficult process, particularly where complex alternatives are involved. Instead of a systematic process of *mindful exploration*, many humans explore intuitively or in an **ad hoc** manner. The results are often poor decisions and dissatisfaction with results. For example when faced with choosing a course of study or a career, a person needs to answer the question, “which choice is right for me now?” *Mindful exploration* is aimed at answering this question through a structured process of learning about ourselves, i.e., our interests, capacities, activity styles and worldviews (our personal profile); examining the alternatives in question; and ranking alternatives in light of the person’s profile. Mindful exploration consists of an iterative process of reflection and planning → experimentation → reflection and re-planning. It improves self-knowledge and self-direction, both of which are essential for well-being. *Mindful exploration* involves high-level cognitive abilities such as storing, retrieving, memorizing, characterizing/annotating, questioning, hypothesizing, examining, scrutinizing, criticizing (through refutation), analyzing, comparing and deducing. **This complex and demanding iteration process needs to be meaningfully supported by new technological tools** because human cognitive limitations render the systematic

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implementation of *mindful exploration* very challenging to carry out. **Today, on their own, humans do not perform *mindful exploration* well.**

**The envisioned Smart Companion** will be a computer-based personal dynamic companion whose ultimate goal is to enhance the well being of its users through processes of *Mindful exploration* which support the user's ability for self-knowledge and self-direction.

The main objectives of the Smart Companion are therefore to assist a user:

- to deeply and meaningfully learn her/his personality profile by focusing on the profile parameters relevant to her/his interests in a certain life area and the interactions between the relevant parameters; in other words, to gain self-knowledge;
- To plan her/his activity on the basis of this self-knowledge, or in other words, to act in a self-directed manner

The system will function in various forms to engage the user in the identification of his or her self profile and the formation of relevant plans. Two major levels to varying degrees are:

- I. **Automatic functioning:** presenting to the users an “automated constructed” profile and plan stemming from the analysis of ongoing information on users gathered from external sources (e.g., monitoring internet surfing behavior or other digital activities) and information gathered on relevant areas of life from all possible sources.
- II. **Ongoing Open dialogue:** Maximal engagement of the user in any step through ongoing open dialogue by requesting user responses, comments, corrections and supplementation to the picture achieved from external sources.

It should be stressed that our vision ***stresses the empowerment and augmentation of a user's*** abilities for self-knowledge, self-direction and thus self-fulfillment through the aid of technology. Our vision stands in opposition to the *replacement of user independent self-directed activity by the exponentially more “capable” technology*. Our humanistic vision to empower users *with the aid* of technology, rather than yielding human independent self-direction to technology, is clearly reflected in the second level. Hence a certain engagement with the user is deemed necessary. Yet, since too extensive engagement can be either

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irritating or cause the user to remain in her comfort zone, the optimal level of engagement or the “zone of proximal development” (in Vygotskian terms) will be “calculated” by the system according to the given context and the user’s conscious or unconscious reactions.

### **Breakthrough innovation**

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The user-system dialogue in the exploration process can best be portrayed as one between a user and an ideal “life coach” or “mentor”, whose main purpose is to support the individual in pursuit of self-fulfillment and a meaningful life (on two levels: facilitating a short-term exploration or planning activity and the long-term enhancement of the user’s ability for such activities). A meaningful “Dialogue” here can mean various different modes of interactions, all in support of the realization of a person’s personal profile. Several possibilities include:

- **Raising the user’s awareness and reflection** of consistencies as well as tensions between the persons’ actions and his or her own profile (thus for example: if a user defines himself as a “night person” (to give a simple example) and his external actions prove that he is mainly active in the morning and noon, the system engages with the user to rethink his profile or point to a failure in the system’s “conclusions”. Awareness and reflection may be promoted on various levels such as: 1) identification of relevant past experiences, 2) identification of one's emotional responses to these experiences, 3) analysis of characteristics of one or more parameters of one’s personality that are reflected in one's responses to these experiences.
- **User-initiated dialogue** – the former level of dialogue is initiated by the system in response to user’s activities. The system may also be responsive to questions raised by the user as to difficulties that he or she encounters. The vast data collected by the system as well as **its ability to integrate and interpret information**, makes it a valuable source for structured assistance and guidance. For example: a user may assist the system in search for the best or optimal manner to realize him or herself in the business world. The system may be a valuable source for identifying strengths and weaknesses, thus instigating a dialogue on these matters. It should be stressed that the system cannot serve as a final judge on matters, but must engage the user to mindfully and thoughtfully make meaningful choices for him or herself.

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**The dialogue of the system with the user should be as open as possible using methods of meaning construction, which is the main technological challenge in the project.** Most research in Artificial Intelligence is based either on statistical approaches or on behavioral models. Thereby, most systems and tools have no understanding of the meaning of human concepts, utterances and texts. In order to be able to significantly support users in the taxing and complex process of *mindful exploration*, the Smart Companion technology will have to be able to rely on the **understanding of human meaning** rather than resorting to conventional methods of AI.

This project aims to confront the challenge of understanding and conveying “meaning” in artificial information systems, and to develop a demonstrator of such ability within the context of *mindful exploration*.

### **Long term vision**

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The long term vision driving the project is the flowering of a new dialogue between computer science and the humanities. The humanities have taken advantage of achievements in computer science for some time, in such enterprises as “Humanities Computing”, “Digital Humanities” or “Humanistic Informatics”, in which the guiding principle is of applying existing digital paradigms in various humanities fields. This one-sided state of affairs turns humanities scholars into consumers of knowledge produced by computer scientists and fails to exploit the potential of the humanities to influence computer scientists and challenge them to new ways of thinking and to the development of new computing paradigms. Research in computer science can benefit from knowledge in the humanities, for example of how people communicate, how they behave and how they form social relationships, and, more fundamentally, from philosophical accounts of the Good Life. The question of the Good Life, i.e., life which leads to the full flourishing of our humanity has been in the last 2500 years the core question of philosophy. It was deemed in the last 400 years the “queen of the sciences” (namely, the framework that rationally integrating all sciences). Today when all scientific disciplines have gained full independence, the traditional promise of philosophy to supply absolute knowledge is being rejected. Still, even today, philosophy is the only discipline which can aspire to - tentatively and iteratively - integrate knowledge coming from many psychological, sociological, historical, and literary disciplines

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and sub-disciplines and form coherent views of the good life. The view concerning SF and well being presented here is the result of such holistic integration efforts of updated knowledge from a variety of psychological and methodological theories and fields or empirical research in light of the humanistic vision which has evolved in the last few centuries in Europe. Since this view is necessary for supplying digital sciences with guidelines for personal development that can enhance human flourishing, computing from a humanistic point of view, as proposed in this project, constitutes a fundamental shift in perspective that can bring to the emergence of a new mindset and challenge current CS/AI thinking and assumptions.

Furthermore, such new paradigms may be essential for computers to understand meaning (in both the semantic and psychological senses of the term) and perform human-like reasoning and analysis in the service of human flourishing. Such capabilities are central for the Smart Companion and for *mindful exploration*.

### **Coordinator Profile**

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The Center for Futurism in Education (CFE) was founded at Ben-Gurion University in 1992. The Center's long term goal is to contribute to the design of desired educational futures by way of critically structuring the theoretical discourse as well as the practice of educational change processes, and in particular those that are driven by incorporation of ICT. The Center engages in R&D on the national and European level, basic research, conceptual and philosophical research, evaluation of processes, support to policy makers, and leadership of educational change processes. Since 2001 CFE have been involved in the development of digital platforms for enhancing the development of autonomous personality in all age groups within the framework of R&D programs of the European Commission (FP5-FP7).

### **Contact persons**

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**Dr. Ariel Sarid**, Head of Research and Development, The Center for Futurism in Education, Ben-Gurion University of the Negev, Phone: +97236721790, Mobile: +972525700004, Email: [sarida@bgu.ac.il](mailto:sarida@bgu.ac.il), [arielsarid@gmail.com](mailto:arielsarid@gmail.com)

**Ms. Adi Sapir**, Consultant, ARTTIC Israel, Phone: +972-3-7534488 Mobile: +972-50-7461264 Email: [sapir@arttic.com](mailto:sapir@arttic.com)