Technological Forecasting & Social Change xxx (2013) xxx–xxx

Contents lists available at ScienceDirect

Technological Forecasting & Social Change

Collective intelligence systems and an application by The Millennium Project for the Egyptian Academy of Scientific Research and Technology ☆

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ARTICLE INFO

Article history:
Received 28 February 2013
Received in revised form 3 October 2013
Accepted 5 October 2013
Available online xxxx

Keywords:
Collective intelligence
Egypt
Millennium Project
Foresight
Futures research
Global Futures Intelligence System

ABSTRACT

There are several definitions for "collective intelligence" and its applications. We define collective intelligence as an emergent property from synergies among three elements: 1) data/information/knowledge; 2) software/hardware; and 3) experts and others with insight that continually learns from feedback to produce just-in-time knowledge for better decisions than any of these elements acting alone. This paper will briefly discuss what collective intelligence is, why it is needed, some early approaches, how The Millennium Project (MP) is creating its own system — Global Futures Intelligence System (GFIS), and how MP is applying the elements of GFIS for the creation of ISIS (Integrated Synergistic Information System) for the Egyptian Academy of Scientific Research and Technology. ISIS is adapted from GFIS to provide a common platform for Egyptians to explore possible futures for input to national short- and long-term strategy.

1. Introduction

Neither Egypt, nor any other nation has a system that makes it easy to see their nation's situation as-a-whole, its future options, and the full range of the citizens' and expert's views, government programs, and feedback on priorities. While working with the Egyptian Academy of Scientific Research and Technology (ASRT), it became clear that there is a desire among many Egyptians to "put everything on the table," to organize all the positions, priorities, and strategies, in a way that the public and the government can have a more constructive conversation, to help bring greater coherence to planning Egypt's future.[1] This requires a neutral common ground for a system to bring together the key information sources of the country, with the expert scholars, scientists, thought leaders, and the general public. The system has to help organize all these elements with software to improve decision-making, citizen participation, and social cohesion; and hence, improve the prospects for the future of the revolution. At the same time, it has to be very simple and user-friendly to involve the public.

To this end, The Millennium Project (MP) was asked in 2013 to create ISIS — Integrated Synergistic Information System adapted from MP's Global Futures Intelligence System (GFIS) at www.themp.org. The development of ISIS is in process as this article is being written. The system is being designed to make future challenges, strategies, and positions on these clear and user-friendly so that citizens can access and comment anywhere in the system, helping it evolve. It is intended to provide a neutral center under the ASRT, accessible by the Egyptian government, private sector, universities, industry associations, and the public. ISIS is designed to continually improve, evolving rapidly as better approaches are found to address the acceleration of change and complexity, information explosions, and the many actors involved in or affected by decision-making.

GFIS and ISIS are based upon the principles of "collective intelligence." The term "intelligence" is used in the sequence

☆ This article is drawn in part from articles by the author in *Futura* 4/2009 and the *World Future Review* (Fall 2013).

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[1] This judgment is based on a series of meetings the author had in Egypt during March 2013 with senior government officials, activists in Tahrir Square, influential Copts and Moslem thought leaders, and an inter-Ministerial meeting. As a result of these meetings, The Millennium Project has been asked by the Egyptian Academy of Scientific Research and Technology to create a collective intelligence system for Egypt; work is expected to begin in July 2013.

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http://dx.doi.org/10.1016/j.techfore.2013.10.010

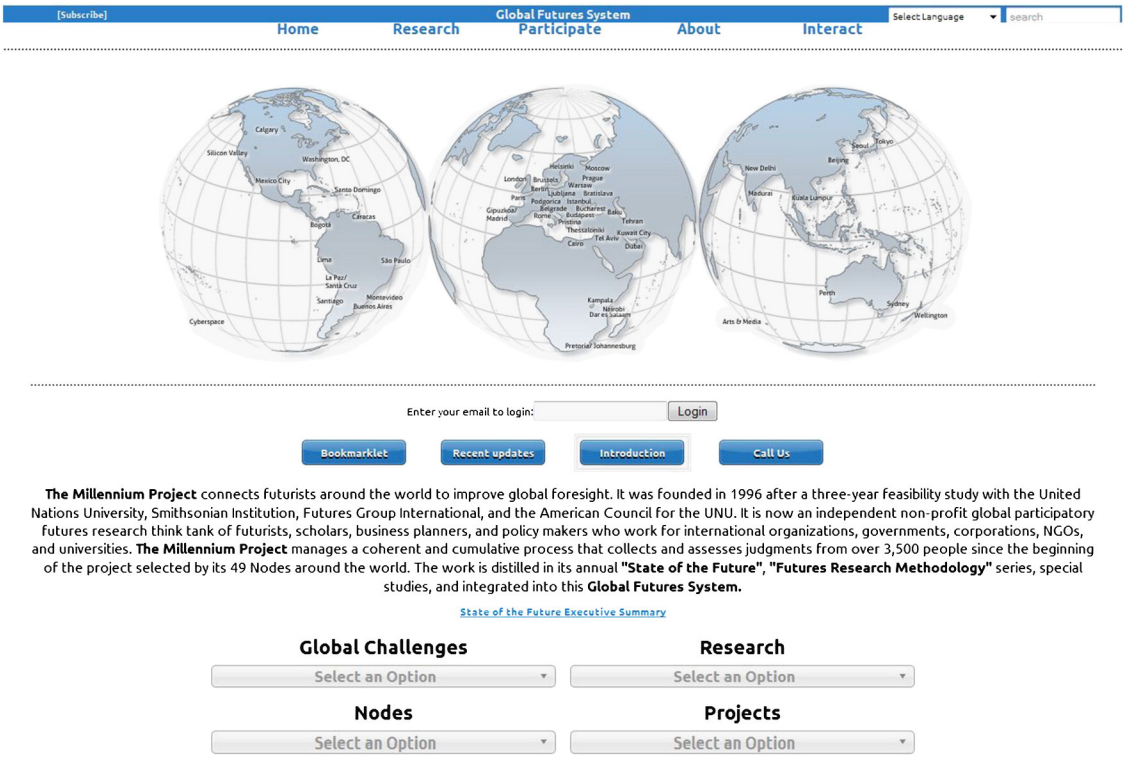

Fig. 1. Front page of the Global Futures Intelligence System at www.themp.org.

of understanding leading to wisdom: data, information, knowledge, intelligence, and wisdom.[2] The term "intelligence" is used in this article as knowledge or information that informs action.

2. What is collective intelligence?

In the past, leaders would often gather wise elders and favorite consultants to discuss a problem until a solution was found. Then along came the Internet and Google, allowing leaders to have staff search through vast sources of information and distill these to provide intelligence for a decision. Meanwhile, the mathematically-inclined might say, "give me your data and I will build a model to help you make the right decision." A collective intelligence system involves all of these three approaches, enabling each to improve the other in an ongoing feedback improvement system.

The Millennium Project defines collective intelligence as:

> *An emergent property from synergies among three elements: 1) data/info/knowledge; 2) software/hardware; and 3) experts and others with insight that continually learns from feedback to produce just-in-time knowledge for better decisions than any of these elements acting alone* [3].

Hence, collective intelligence can be thought of as continually emerging from changing synergies among its elements on an ongoing basis, as illustrated in Fig. 1.

A useful and efficient collective intelligence system should connect these three elements into a single interoperable platform. The products and processes of each of these three elements can be changed by the others. Participants should be able to comment on any information or software or computer model in the system. These comments read by reviewers and editors can then lead to changes in the system. For example, new insights from a person in an online group discussion can lead to changes or edits in the text of some part of the information in the system. This change of text might illustrate the need for new decision-making software or changes in one of the online computer models or the requirement to add a link to a new online computer model. Running the new model could produce results that when given to the appropriate discussion group, could stimulate addition discussions leading to better insight that would lead to new edits in a situation chart. Decision support software like Delphi could add to the mix and result in changes in the information in the system and help identify new experts to add to the discussion groups. These changes in turn can lead to new questions in a Delphi, which in turn can change the text of information in the system.

Many of the features of a collective intelligence system (CIS) have existed before, but their integration into one platform creates a different experience; just as telephones and computers existed separately before email, but once integrated the email experience was unique. A CIS can be thought of as a common platform of interlinked systems of people, information, and software.

[2] I. Tuomi, Data Is More than Knowledge: Implications of the Reversed Knowledge Hierarchy for Knowledge Management and Organizational Memory, Journal of Management Information Systems, Vol. 16, No. 3 (Winter, 1999/2000), pp. 103–117, M.E. Sharpe, Inc. Armonk NY 1999.

Please cite this article as: J.C. Glenn, Collective intelligence systems and an application by The Millennium Project for the Egyptian Academy of Scientific Research and T..., Technol. Forecast. Soc. Change (2013), http://dx.doi.org/10.1016/j.techfore.2013.10.010