Web-based Support Systems (WSS):
A Report of the WIC Canada Research Centre

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1. WIC Canada Research Centre

The WIC Canada Research Centre[1] is one of the centres under the Web Intelligence Consortium[2]. Dr. Yiyu Yao[3] serves as the Director and Dr. JingTao Yao[4] serves as the Co-ordinator of WIC Canada. Currently, there two affiliated centres, the WIC Regina Center[5] under the directorship of Dr. Cory Butz[6] and the WIC Halifax Centre[7] under the co-directorship of Dr. Dawn Jutla[8] and Dr. Pawan Lingras[9]. Additional centres are in the process of formation and will join WIC Canada in the future.

WIC Canada promotes the collaboration between Canadian researchers on Web Intelligence, facilitates exchange with other WIC centers. WIC Canada researchers work on a diversity of WI related research areas: foundations of Web Intelligence, Web-based support systems, Bayesian networks, and Intelligent Web Information Systems (IWIS). Their results have appeared in reputable journals and the annual IEEE/WIC/ACM International Conference on Web Intelligence.

In the next few years, WIC Canada will focus on promoting Web Intelligence research, attracting new members, and forming new centres. The WIC Canada will play the role of coordinating those activities. WIC Canada needs your input for its growth. Your participation will be greatly appreciated. All questions and suggestions should be directed to our Co-ordinator, Dr. Jingtao Yao, at jtyao@cs.uregina.ca.

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1   http://www.cs.uregina.ca/∼wi
2   http://wi-consortium.org/index.html
3   http://www.cs.uregina.ca/∼yyao/
4   http://www.cs.uregina.ca/∼jtyao/
5   http://www2.cs.uregina.ca/∼wi/regina/index.html
6   http://www.cs.uregina.ca/∼butz/
7   http://cs.stmarys.ca/∼pawan/wi/
8   http://husky1.stmarys.ca/∼djutla/
9   http://cs.stmarys.ca/∼pawan/

2. Web-based Support Systems

Web-based support systems[10] is one of the research areas of WIC Canada. In 2003, Dr. JingTao Yao and Dr. Lingras co-organized the Workshop on Web-based Support System[11]. The response and feedback were very positive and encouraging. The second workshop is under preparation[12].

As a field of study, computerized support systems is an interdisciplinary research area. A particular support system with specific domain knowledge provides support to a specific field. The most popular and successful example is the decision support systems (DSS). DSS was defined as *"computer-based information systems that combine models and data in an attempt to solve non-structured problems with extensive user involvement through a friendly user interface"* [8]. It can be viewed as a hybrid product of two domains of studies. DSS are derived from management science and computer science. The same principle applies to other types of support systems. For instance, a medical support system or a medical expert system is the product of the marriage between medical science and computer science. Research support systems are the combination of research methodology and computer science [11]. In general, a specific support system aims to support activities and operations of the specific domain.

Various support systems have been studied for a long time. Schematically, suppose $\mathcal{A}$ is a specific domain, a support system for domain $\mathcal{A}$ can be termed as an $\mathcal{A}$ support system. Following this scheme, we have examples such as decision support system(s), business support system(s), negotiation support system(s) and medical support system(s). There are also emerging needs for moving support systems

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10   http://www2.cs.uregina.ca/∼wss/
11   http://www2.cs.uregina.ca/∼wss/wss03/index.html
12   http://www2.cs.uregina.ca/∼wss/wss04/index.html

to the Web platform. This leads to the introduction of the notion of Web-based Support Systems [9].

Web-based support systems can be classified into three levels. The first level is support for personal activities. An example of such support is research support for individuals [11]. Personal research activities such as search, retrieval, reading and writing are supported. The second level is the organizational support, such as research support on an institute level [7]. The top level is the network level. The collaborations between organizations or decision making by a group of people like in group decision support systems fall in this level. The group decision support room may be a virtual room on the Web.

The research of Web-based support systems is a natural evolution of the existing research. The first step is the extension of decision support systems to computerized support systems. With the emergence of Web technology and Web Intelligence, the need to study Web-based support systems are obvious. As a new identified research area, WSS will attract more research interest.

3. Computational Web Intelligence

Computational intelligence (CI) is a sub-area of artificial intelligence (AI) that focuses on the computational aspects of intelligence and intelligent systems. CI covers probabilistic reasoning, Bayesian networks, neural networks, genetic algorithms and evolutionary computing, and many others. Similarly, computational Web intelligence (CWI) studies the computational side of Web Intelligence.

The first edited book on CWI has been published [12]. The main objective of CWI is to study computational theories and explore their implications for the design and implementation of intelligent Web information systems (IWIS). It is expected that CWI will have a huge potential for intelligent e-business applications.

Bayesian networks, in particular, have been the focus of some of our researchers. More specially, theoretical [1], practical [2], and applications [3] have been studied. As referenced in [3], many Web Intelligence researchers have utilized Bayesian networks. The focus of the Halifax Centre has been on identifying clusters of Web users and their actions [5, 6], privacy issues and semantic Web ontologies [4].

4. Conclusion and Future Direction

The two related topics, WSS and CWI, are some of the initiatives of WIC Canada. They share the same goal of building intelligent Web information systems. The two topics cover both the theoretical and practical sides of Web Intelligence. CWI focuses on theoretical investigation. Its results can be easily applied to WSS.

Web Intelligence provides many new research issues and promises a bright future for new and more effective Web systems, applications, and services. At WIC Canada, we believe that future of WI depends on, to a large extent, the timely delivery of successful WI systems. The study of CWI and WSS aims at this goal. In fact, more specific WSS, such as Web-based information retrieval systems [10] and Web-based research support systems [11], have been studied. These concrete and special task focused systems can be used to demonstrate the potential of Web Intelligence.

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