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Experience Sharing System for Sustainable Urbanization Projects

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Experience Sharing System for Sustainable Urbanization Projects ARC DECRA Application DE130100381 (2012)

OVERVIEW

The world's urban population reached 50% of the total population for the first time in 2009. Urban population is expected to be 70% by 2050, at which point 6.3 billion people will be living in cities (United Nations, 2010). In Australia, the total population is expected to rise 60% by 2050, reaching 35 million people. Such rapid growth in urban communities has led to many negative outcomes across the world including environmental degradation, climate change, poverty and inequity. According to UN-Habitat (2011), it is expected that 3 billion people will live in slums by 2050 if our existing unsustainable urbanization practices continue to prevail.

Sustainable urbanization has become a priority for many national and local governments around the world (Shen et al., 2011). Successful practice cases have been documented and sharing their experiences has demonstrated to help urban centres mirror good results (United Nations, 2010; Shen et al., 2011). Nevertheless, the increasing proliferation of good experiences gained from best practices around the world, together with an increasing demand for the knowledge gained from these experiences, have raised the challenge to develop innovative experience sharing instruments. Recent efforts designed to meet this challenge have been oriented towards the development of databases containing a large number of actual sustainable urbanization practices, which are then made publicly available on the Internet.

The content of most databases available on the internet is fragmented and, therefore, their 'database applications' only serve as a reporting mechanism rather than being an interactive system where best-match experiences can be extracted according to users' needs. Although online databases can make best practices widely available, their limited functionality typically makes them ineffective as an experience sharing system.

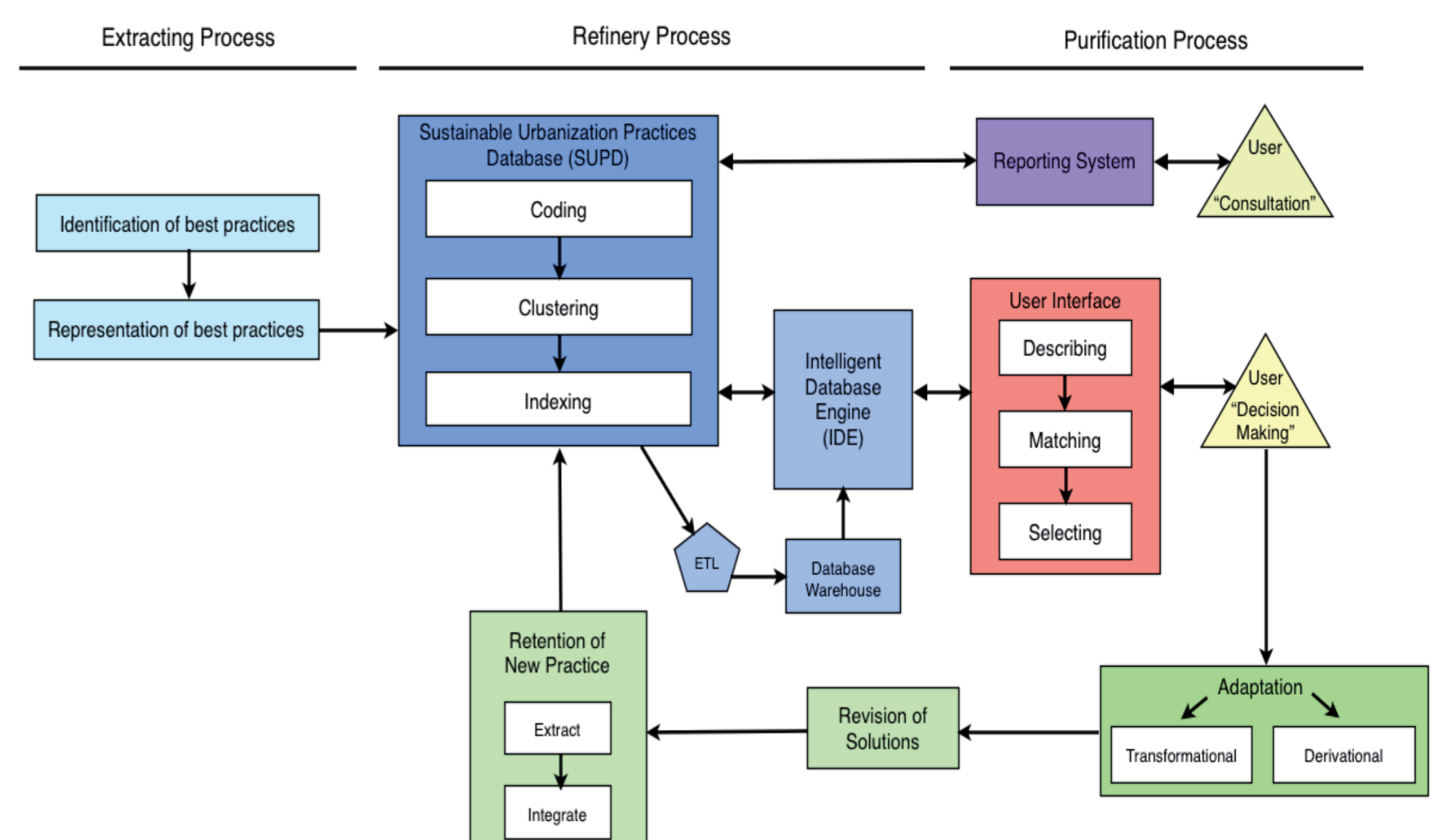
There are a number of innovative methods for enhancing the capacity of experience sharing. Particularly, the application of experts systems has been found to be effective in managing knowledge and supporting decision-making processes. The basic idea behind experts systems is the transference of human knowledge to a computer; this knowledge is stored, reasoning models are developed for managing this knowledge, and the users of the system call upon the computer for specific advice as needed (Liao, 2005).

Expert Systems have been developed to meet particular needs in a wide range of areas such as in academia as demonstrators, in legal reasoning for criminal sentencing, in hospitals for the diagnosis of patients, in mechanical design for retrieving previous successful designs while avoiding previous failures, in architectural design for helping architects in the high-level task of conceptual design, and in manufacturing for solving complex manufacturing planning problems.

There is no evidence of the application of experts systems for assisting the development of sustainable urbanization plans. Therefore this research addresses a gap in current knowledge that is crucial for the successful attainment of urban sustainability (Shen et al., 2011).

Thus, this project proposes to develop an experience sharing system (ESS) based on advanced experts system methods, such as the intelligent database engine (IDE) and an intelligent user interface (IUI). Reasoning modules will be developed to assist in the decision-making process when selecting strategies and methods for implementing sustainable urbanization based on existing best practices. An effective experience sharing system will assist the development of optimal sustainable urbanization plans or a specific context (i.e. one with unique characteristics).

The objectives for the successful development of the ESS are: (1) to conduct an extracting process for identifying and representing sustainable urbanization practices; (2) to develop a refinery process for optimizing practices into experiences; (3) to develop a purification process for selecting the best-match experiences; and (4) to measure ESS support performance.



The expected results will aid in the identification of instruments for effectively implementing sustainable urbanization, as well as in the process by which that information is disseminated. The ESS is also expected to contain the largest database available of best practices in sustainable urbanization, which will not only work as the ESS's memory, but also as a tool for studying practices as 'data sets'. Capturing practices as data sets will provide the opportunity to carry out a wide range of analyses such as comparative, correlation and trend analyses of practices, methods, outcomes and urban sustainability indicators.

The knowledge sharing nature of this study contributes to the 'smart information use' and 'an environmentally sustainable Australia' national research priority areas. The outcomes of this research will help in tackling specific threats arising from climate change, increasing levels of mobility, greater urbanization, diverse demographics and population growth, which lead to greater stress on ecological systems and require changes in urban design.

KEY REFERENCES

- Liao, SH. (2005), 'Expert system methodologies and applications: a decade review from 1995 to 2004', *Expert Systems with Applications*, 28, 93-103.
- Shen LY., Ochoa JJ., Shah MN. and Zhang XL. (2011), 'The application of urban sustainability indicators: a comparison between various practices', *Habitat International*, 35(1), 17-29.
- UN-Habitat (2011), *Global report on human settlements 2011: cities and climate change*, London.
- United Nations (2010), *World urbanization prospects: the 2009 revision*, Department of Economic and Social Affairs, New York.