Semantic Interoperability for Enhancing Sharing and Learning through E-Government Knowledge-Intensive Portal Services

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ABSTRACT

E-Government emerges from web sites that offer static information, documents and forms for employees and citizens, enquiries, and process automations to many types of stakeholders. Increasingly, different layers of government services are being consolidated into a knowledge portal, providing on time and online services. Such knowledge portals not only provide a platform for integrating applications and information from all government sources, but also provide platforms for knowledge sharing and learning to the public with the objective to improve the efficiency and the quality of E-Government processes and services. However, due to the heterogeneity of applications and information across different levels of government agencies, a significant amount of work is needed to re-configure such applications and services into a new platform. However, semantics are often deficient, which results in problems establishing effective knowledge sharing and learning in E-Government. This paper confers how knowledge-intensive portals can be used for enhancing sharing and learning in E-Government. The authors discuss how advancements in Semantic Web and Web 2.0 technologies can be applied in providing interoperability to leverage knowledge sharing and learning activities.

Keywords: E-Government, Knowledge Sharing and Learning, Ontology, Semantic Web, Web 2.0

1. INTRODUCTION

With the advent of the Internet, E-Government has developed immensely since the end of the 90s. Most countries all over the world are implementing E-Government services to facilitate a range of services to citizens, public sectors and other authorities. E-Government provides a convenient way for citizens to access and obtain the information they desire,
without having manually to locate and filter out the content that is not needed (Wagner et al., 2006). Hence, E-Government encompasses the largest volume of web documents over the Internet as shown in Figure 1 and the volume of web documents has indeed grown within 3 years from 2005 to 2008. The rapid increase of E-Government web documents over the Internet has been partly due to the government of China; its documents have increased from 2.6 million to 184 million, following China in the proliferation of web documents is the Thailand government and the New Zealand government with increases of 2702% and 1055% of increments respectively. With such a massive build-up of codified assets, the problem of “information overlook” can no doubt easily occur, leading to valuable information being ignored and missed by the citizens (Misra, 2006).

One approach to solve this problem is to develop a one-stop knowledge-intensive government portal service to unify all government agency websites, and to allow access to all government agencies’ webpage services and information. Such a knowledge portal enables the public to access the Government’s knowledge sharing and learning activities. Knowledge sharing and learning are important activities in E-Government which enhance and improve the efficiency and quality of E-Government processes and services and also improve interaction and the relationship between the public and government. Despite the recent uptake in the adoption of service-oriented architectures (SOA) (Bloomberg, 2003) among enterprise applications, much of the needed contextual knowledge about the provided application, which is crucial for providing concise and personalized knowledge, is still lacking. The core focus of SOA has been, up to now, on issues concerned with business and IT alignments.

Semantic interoperability in E-Government remains a crucial issue in E-Government due to the heterogeneity problem which has arisen in applications and knowledge repositories in different levels of agencies in government. Hence, knowledge sharing and learning activities have failed to take place in government processes and services. A potential solution can be the use of Semantic Web and Web 2.0 technologies for

**Figure 1. Page count of selected E-Government sites available through Google on June 2005 vs. May 2008**

<table>
<thead>
<tr>
<th>Country</th>
<th>Government domain</th>
<th>June 2005(1)</th>
<th>May 2008</th>
<th>% Increment number of web pages</th>
<th>Website link</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>.gov</td>
<td>368,000,000</td>
<td>855,000,000</td>
<td>132%</td>
<td><a href="http://www.usa.gov/">http://www.usa.gov/</a></td>
</tr>
<tr>
<td>Canada</td>
<td>.gc.ca</td>
<td>12,100,000</td>
<td>22,400,000</td>
<td>85%</td>
<td><a href="http://www.canada.gc.ca/">http://www.canada.gc.ca/</a></td>
</tr>
<tr>
<td>UK</td>
<td>.gov.uk</td>
<td>9,280,000</td>
<td>62,200,000</td>
<td>570%</td>
<td><a href="http://www.direct.gov.uk/">http://www.direct.gov.uk/</a></td>
</tr>
<tr>
<td>Australia</td>
<td>.gov.au</td>
<td>7,200,000</td>
<td>37,300,000</td>
<td>418%</td>
<td><a href="http://www.gov.au/">http://www.gov.au/</a></td>
</tr>
<tr>
<td>China</td>
<td>.gov.cn</td>
<td>2,630,000</td>
<td>184,000,000</td>
<td>6896%</td>
<td><a href="http://www.gov.cn/">http://www.gov.cn/</a></td>
</tr>
<tr>
<td>New Zealand</td>
<td>.gov.nz*</td>
<td>1,290,000</td>
<td>14,900,000</td>
<td>1055%</td>
<td><a href="http://newzealand.govt.nz/">http://newzealand.govt.nz/</a></td>
</tr>
<tr>
<td>South Africa</td>
<td>.gov.za</td>
<td>816,000</td>
<td>1,810,000</td>
<td>122%</td>
<td><a href="http://www.gov.za/">http://www.gov.za/</a></td>
</tr>
<tr>
<td>Hong Kong</td>
<td>.gov.hk</td>
<td>887,000</td>
<td>4,430,000</td>
<td>399%</td>
<td><a href="http://www.gov.hk/">http://www.gov.hk/</a></td>
</tr>
<tr>
<td>Thailand</td>
<td>.gov.th*</td>
<td>728,000</td>
<td>20,400,000</td>
<td>2702%</td>
<td><a href="http://www.thaigov.go.th/">http://www.thaigov.go.th/</a></td>
</tr>
<tr>
<td>Slovenia</td>
<td>.gov.si</td>
<td>388,000</td>
<td>1,080,000</td>
<td>178%</td>
<td><a href="http://www.gov.si/">http://www.gov.si/</a></td>
</tr>
</tbody>
</table>

**Remark:** * indicated the government domain has changed (May, 2008). .gov.nz changed to .govt.nz and .gov.th changed to .go.th
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