EzyForms: Form-Based Process Automation Through Annotation

INTRODUCTION

Business processes that are highly specific to the organisations often rely on using paper-based forms for running their processes due to its low cost, flexibility, and easy-of-use. However, using paper-based forms puts a burden on more important tasks. Automating these processes requires heavy customisation of commercial software tool such as BPMS, and building a new system to replace these form-based processes is also not cost-effective.

EzyForms is a Web-based system that aims to help non-technical people automate long-tail processes that involves multiple forms, approvers, and conditions. Our approach is (i) to collect information regarding each form from its form owners via various types of annotations, and (ii) to utilise this information to semi-automate the process modelling and execution.

FORM ANNOTATION APPROACH

EzyForms is a system to support end-to-end lifecycle of form-based processes. Our approach to automate the form-based processes is comprised of 4 main steps which are form upload, form annotation, process modelling, and process execution.

When a form is uploaded to the system, FormSys automatically generates two matching Web services [1]:

- `soap2pdf`: receives data from an application, fills a form with it, and returns the form via email or an URL where the filled form can be downloaded.
- `pdf2soap`: extracts the data from a filled form, assembles and sends a SOAP message to an application.

When the process is initiated, EzyForms presents form images as an interface to interact with the system.

The end-users can fill in the form and the data being entered into the form are passed on to the next forms to save end-users from typing same information repeatedly.

`soap2pdf` web service is invoked to fill in the form when the user submits the process.

RESULTS/OUTCOMES

Our initial evaluation focuses on how well input field tag recommendation algorithm works in selecting proper tags from the tag library. We adopted two metrics, that captures the accuracy of tag recommendation at different aspects:

- **Success at rank k (S@k):** probability of finding a good descriptive tag among the top k recommended tags.
- **Average Match Score(AMS):** match score of first relevant tag returned by the system, averaged over all input fields that found a relevant tag.

<table>
<thead>
<tr>
<th>Organisation</th>
<th># of forms</th>
<th># of input fields</th>
<th>S@1</th>
<th>S@5</th>
<th>AMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNSW FIPRAS</td>
<td>6</td>
<td>31</td>
<td>90%</td>
<td>97%</td>
<td>0.81</td>
</tr>
<tr>
<td>NSW Licence</td>
<td>3</td>
<td>30</td>
<td>47%</td>
<td>73%</td>
<td>0.41</td>
</tr>
<tr>
<td>OSU HR</td>
<td>5</td>
<td>33</td>
<td>61%</td>
<td>84%</td>
<td>0.65</td>
</tr>
<tr>
<td>Ontario</td>
<td>3</td>
<td>42</td>
<td>64%</td>
<td>86%</td>
<td>0.66</td>
</tr>
<tr>
<td>BNZ</td>
<td>7</td>
<td>49</td>
<td>88%</td>
<td>98%</td>
<td>0.80</td>
</tr>
<tr>
<td>ARC</td>
<td>7</td>
<td>37</td>
<td>100%</td>
<td>100%</td>
<td>0.99</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td></td>
<td></td>
<td>76%</td>
<td>90%</td>
<td>0.68</td>
</tr>
</tbody>
</table>

The results shows that 90% of the time, the proper tag was found amongst top 5 tag recommendations [2], and lead us to believe that form annotation approach can significantly contribute to the automation of form-based processes.

OBJECTIVES

The current form-based processes bombard the end-users with tedious manual labour, and make them liable for the proper execution of the process. Our objective is to enable form owners (who we assume to be non-technical) to automate the processes so that the processes are no longer impromptu, but modelled and deployed on to the server by people who know exactly how the processes should be proceeded.

FURTHER WORK

- Expansion of current KB to support annotation of conditions, approvers, and email templates to enable end-to-end execution.
- Semi-automated input field mapping between annotation artefacts to reuse input data.
- Comparison with existing products in terms of functionality and applicability.
- End-user evaluation of the system in terms of usability.

REFERENCES

2. Sung Wook Kim. Form Annotation Framework for Long-Tail Process Automation. Accepted for publication in USECA’11

ACKNOWLEDGEMENTS/CONTACT

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