In this paper, we describe the IMTKU (Information Management at Tamkang University) question answering system for Japanese university entrance exams at NTCIR-12 QA-Lab2. We proposed a question answering system using a hybrid approach that integrates natural language processing and machine learning techniques for Japanese university entrance exams at NTCIR-12 QA-Lab2. In phase-1, we submitted 6 End-to-End QA run results for English subtask for National Center Test for University Admissions and Secondary exams subtask. In phase-3, we submitted 7 End-to-End QA run results for English and Japanese subtask for Nation Center Exams and Secondary exams subtask. In NTCIR-12 QA-Lab2 phase-1, the IMTKU team total score achieved 31, 27 and 0 in the English subtask. In NTCIR-12 QA-Lab2 phase-3, the IMTKU team total score achieved 20, 20 and 14 in the English subtask, 24, 12 and 8 in the Japanese subtask and 31 in a combination run with KitAi.

**System Architecture**

**IMTKU QA System Components**

- **Question Analysis**
  - Question (XML)
  - Complex Essay
  - Simple Essay
  - True-or-False
  - Factoid
  - Slot-Filling
  - Unique
  - Answer Generation
  - Question Analysis Result (XML)
  - Answer Validation
  - Answer Extraction Result (XML)
  - Machine Learning
  - Simple Essay
  - Combination and Matching Strategy
  - Document Retrieval
  - Document Retrieval Result (XML)
  - Combining & Generation
  - True-or-False
  - Finalization
  - Unresolved
  - Sentence Scoring
  - Correct
  - Incorrect
  - Unresolved
  - Validation Result (XML)
  - Question Analysis Result (XML)
  - Answer Extraction Result (XML)
  - Factoid

**Performance**

<table>
<thead>
<tr>
<th>IMTKU National Center Test</th>
<th>Correct</th>
<th>Incorrect</th>
<th>Unanswered</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center-1999-WorldHistoryB_IMTKU_EN_FA_01</td>
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<tr>
<td>Center-1999-WorldHistoryB_IMTKU_EN_FA_03</td>
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<table>
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<tr>
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<th>Incorrect</th>
<th>Unanswered</th>
<th>Withholding</th>
<th>Score</th>
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<tbody>
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<td>0</td>
<td>22</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Discussion**

- Systematic Error of XML output (IMTKU EN FA run03 on Phase-1)
- Limitations of the IMTKU System

**DEMO**: [http://rite.im.tku.edu.tw/qalab](http://rite.im.tku.edu.tw/qalab)

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  - True-or-False
  - Finalization
  - Unresolved
  - Sentence Scoring
  - Correct
  - Incorrect
  - Unresolved
  - Validation Result (XML)
  - Question Analysis Result (XML)
  - Answer Extraction Result (XML)
  - Factoid

**Performance**

<table>
<thead>
<tr>
<th>IMTKU National Center Test</th>
<th>Correct</th>
<th>Incorrect</th>
<th>Unanswered</th>
<th>Score</th>
</tr>
</thead>
<tbody>
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<tr>
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<td>8</td>
<td>28</td>
<td>0</td>
<td>24</td>
</tr>
</tbody>
</table>

**Discussion**

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