To Generate Automatic Caption for E-book Based on Abstractive and Extractive Algorithm

Shanthi.P, Uma devi.V

M.E Student, Dept. of C.S.E, Arunai Engineering College, Thiruvannamalai, India

Assistant Professor, Dept. of C.S.E, Arunai Engineering College, Thiruvannamalai, India

ABSTRACT: The news images of automatically headline making. computer vision and natural language processing from task fuses the multimedia applications, holds the image recovery, news media manage men sustaining the development tools, and for individuals with diagram impairment. dimly labeled data of headline generation model from without costly manual involvement. The image captions are treated as labels for the reflection. admittedly deafening of headline words compared to traditional human-created keywords, we show that they can be used to learn the correspondence between image texts modalities, the headline production task as a platinum average. the production models of abstractive and extractive .our approach is to tolerate both the image and texts modalities to influence the production task as the type aspects.

KEYWORDS: Knowledge acquisition, domain engineering, ontology design

I.   INTRODUCTION

Question repositories (QR) are organised collections of assessment questions (items) that serve many purposes.. Teachers can utilize the questions and generate an assessment instrument. Questions required may vary widely along many dimensions such as cognitive level, difficulty level, content and question type depending upon the context in which it is used .Apart from the summative assessment where we test the students' understanding of knowledge on completion of the course, questions are also required by teachers for formative and diagnostic type of assessment .For formative assessment, teachers pose specific questions to individual or groups of students during the learning process to determine what specific concepts or skills they may be having trouble Diagnostic assessments are taken at the beginning of a topic, where teachers can ask questions to students to determine prior knowledge of a particular subject .Many instructional strategies irrespective of their mode of implementation require questions catering to varying specifications in different situations. For example, Problem Based Learning, Think-Pair-Share (TPS) , Peer Instruction (PI) ,etc require questions with different attributes.

Moreover, not only teachers, but students also require questions for self-learning and self-assessment. So, teachers need different types of questions. Their usability in a particular context depends on parameters such as cognitive level, difficulty level, type of question, content / topic, etc. Hence it is important to tag questions in a QR with such a set of tags. Many existing LMS like Moodle, Blackboard, Sumtotal, Sakai, etc contain assessment management system for the generation of tests, quizzes, etc. They also facilitate the creation of question repositories. These systems provide user defined custom tags which the teachers can use to manually tag each question at the time of creation of assessment instrument for tests. For example in Moodle, a question can be organised into categories and can also be associated with user defined tags .Even though the question creation interface may support introduction of user defined tags, the creators of question repositories generally did not seem to use this feature extensively.

The 'higher order' tags, such as cognitive level, and so on, are missing in these questions. Moreover, large number of questions in a repository have only 'basic-level' tags such as topic, subject and so the teacher has to now verify the suitability of the question with respect to required attributes such as its Blooms level, type of question, difficulty level, the content or topic of the question, etc. for the desired assessment instrument. If these repositories

contain questions that are tagged with such properties, then the process of selection becomes simply querying the Question Repository with required attributes.Most of the questions created by teachers have insufficient tags. And without adequate tagging, they are difficult to use in practical scenarios. So, it is desirable to have enough tags for all questions in repository. These annotations can either be done manually or automatically or semi-automatically. Manually tagging the question is an additional overhead for teachers. Moreover, it is essential that the people who tag questions should be expert in both subject knowledge and educational technology. Thus, it is highly desirable to have an automatic tagging system .

II.   RELATED WORKS

Allows a teacher to create, preview, and edit questions in a database of question categories. For example, Moodle and Totara provides the facility of question bank creation and management and each question is annotated with the question type and category / topic to which it is associated . Test and Surveys option in Blackboard LMS allows users to manually add metadata such as categories, topics, levels of difficulty, and keywords to each question . In the Test and Quizzes Tool of Sakai LMS, user can tag each question with its question type that includes essay, multiple choice, fill in the blank, etc .

Sum total also has a randomized Quizzes feature Assessment should be aligned with the learning objectives intended for a course . As the learning objectives can span across all the cognitive levels, the assessment also should consist of questions of varying cognitive levels to achieve intended outcomes. We have considered cognitive levels defined by Blooms taxonomy.There are internationally accepted standards for question / item and repositories, e.g. IMS QTI.

It provides commonly used question types such as multiple choice/response, true and false, image hot spot, fill the blank, select text, slide, drag object/target, order objects, match items and connect points . Questions are broadly grouped into three classes namely short answer questions, long answer questions and others which are further tagged with their degree of difficulty and deep reasoning or knowledge deficit questions on the basis of Blooms level .

Teachers should ask wide variety of questions in terms of cognitive level and question type, which should be aligned with the education objectives defined for the curriculum. In order to distinguish between the different categories of questions, the need for classification scheme was emphasized and a semi-hierarchical classification scheme consisting of six categories spanning across question based on simple concepts to highest level of scientific research question was proposed.In, the authors have used difficulty level as the metric to operationalize the quality of questions generated. They developed evaluation rubrics to rate the difficulty level of the question as high, medium, or low. Based on the literature survey, varieties of questions are needed for different types of assessments and instructional strategies. Even though existing repositories provide the facility of associating user defined tags to a question, they are insufficient and are to be manually put by the user. This motivated to go for a semi-automated tagging system. From the literature surveyed and commonly used set of tags recommended by teachers, our present work focuses on four set of tags namely, cognitive level, difficulty level, question type and content / topic.

III.   PROPOSED ALGORITHM

A. Vector Space-Based Sentence Selection:
The keywords and sentences are represent in vector space and compute the resemblance between the two vectors on behalf of the image keywords and texts sentences, respectively. A word-sentence medium must be shaped where each row represent a word, each article represents a sentence and each admission the frequency with which the word appears within the ruling. The Vector-Space based sentence selection algorithm is defined as:
1. For each word Wi,
i. From sentence S1 to Sn, Find the number of incidence of the word Wi.
ii. Choose the sentence that has the largest number of incidence.
2. rescue all the sentences for all the keywords
B. Word-based Caption Generation:
Content selection is modeled as the chance of a word appearing in the star given that the equal word appears in the corresponding paper and is independent of other terms in the headline. The probability of different surface realization is estimated using a *bigram* model. Since the personage words cannot frame a significant caption, the phrase-based caption cohort technique is used.
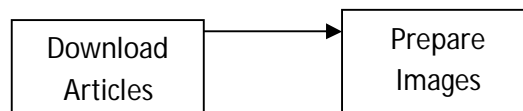
C. Phrase-Based Caption Generation:

phrases are obviously associated with purpose words and may potentially capture long-range dependency. The recovery of phrases are done using the trigram selection model.

1. For each keyword Wi, Choose the words Wi-1 and Wi-2
2. Form a cluster of Wi, Wi-1 and Wi-2
3. repossess the most commonly occurring cluster as a phrase.

IV. SYSTEM ARCHITECTURE

1.Data Collection:
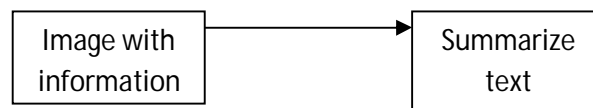
```
┌──────────────┐        ┌──────────────┐
│   Download   │───────▶│   Prepare    │
│   Articles   │        │   Images     │
└──────────────┘        └──────────────┘
```
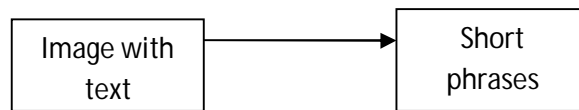
I create our own dataset by downloading articles from the information websites. The dataset covers a wide range of topics including state and global political affairs, technology, sports, teaching and so on. News articles normally use color similes which are approximately 200 pixels wide and 150 pixels high. The captions tend to use half as many words as the text sentences and more than 50 percent of the time contain words that are not attest in the paper

2.Input preparation:

The document should contain the essential backdrop information which the image describe or supplements. And also can use the rich linguistics information inherent in the text and address caption age group with methods relative to manuscript summarization without wide knowledge engineering. The caption generation job is not forced in besides, language and syntactic structure are chosen with the aim of creating a good caption rather than depiction the task satisfactory to current vision and words generation technique.

```
┌──────────────┐        ┌──────────────┐
│  Image with  │───────▶│  Summarize   │
│ information  │        │    text      │
└──────────────┘        └──────────────┘
```

3.Abstractive caption:

```
┌──────────────┐        ┌──────────────┐
│  Image with  │───────▶│    Short     │
│    text      │        │   phrases    │
└──────────────┘        └──────────────┘
```

To turn to abstractive caption generation and present model based on distinct words but also phrase. Content selection is modeled as the probability of a word appearing in the title given that the same word appears in the corresponding document and is free of other terminology in the headline. They also take the division of the duration of the headlines into description in an effort to relative to the model toward generate output of logical length.

4.Extractive caption

```
┌──────────────┐        ┌──────────────┐
│    Short     │───────▶│   Extract    │
│   phrases    │        │   caption    │
└──────────────┘        └──────────────┘
```

This Extractive caption mostly focus on ruling extraction. The idea is to create a précis simply by identify and subsequently concatenating the most central sentence in a article. Without a great deal of linguistic examination, it is possible to create summary for a wide range of documents, independently of style, text kind, and subject matter. For our caption generation job, we need only extract a single sentence. And our guiding theory is that this sentence must be maximally similar to the account keywords generated by the footnote model.

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(An ISO 3297: 2007 Certified Organization)
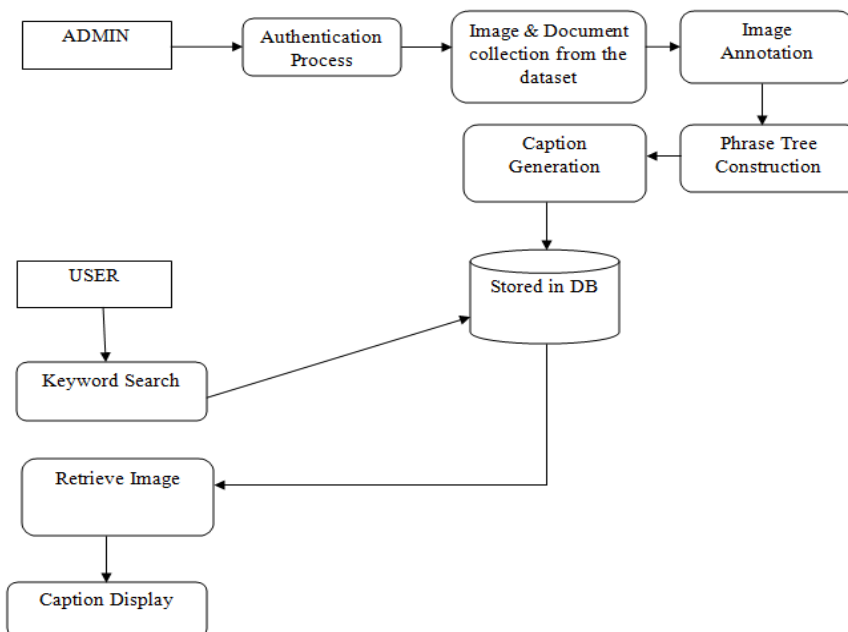
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Fig 1 caption generation

V.   EXPERIMENTS

To options to enter a new question, delete existing question, edit tags of any question manually and save the changes in question bank. If an option for entering a new question is selected by the teacher then the new window opens where he can enter a question as shown in . After entering a question, the user will be asked whether he wants to reform the question. This is optional. If User selects "Yes" then Question reformulation window
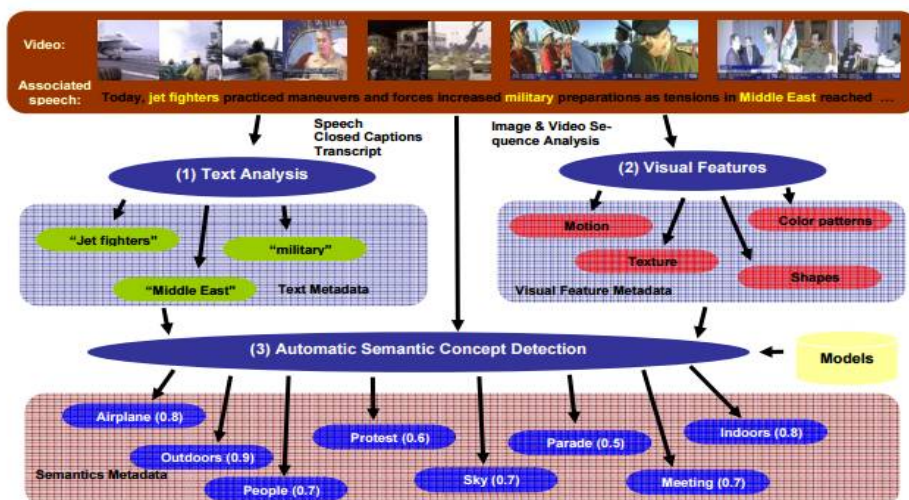

Fig 2 semantic detection

VI.   SIMULATION RESULTS

The dataset describe serves two purpose. primary, the system uses the images, captions and associated articles as training data to gain knowledge of an image annotation model that will present description keywords for the picture. Second, the human authored captions will function as a gold set for the image annotation model and for the end-to-end caption generation assignment. In the former holder, the stop terms are removed and the caption is treated as a bag of comfortable terms. As the image annotation acting a key role in this generation process, it is important to access the value of the titles as labels and whether they do indeed capture some of the image's content. There is no point in culture an image explanation model on labels that are extremely noisy and plainly wrong. The training set of the scheme consists of picture-caption pairs, that is automatically examined whether the content language there in the captions could in standard explain the figure. It was found that the captions spoken the picture's satisfied 90 percent of the occasion. Figure.1 shows the amount of caption words given a score of 1, 2, 3, and so on. As can be seen, the mass of the words were given a rating of 4 or senior
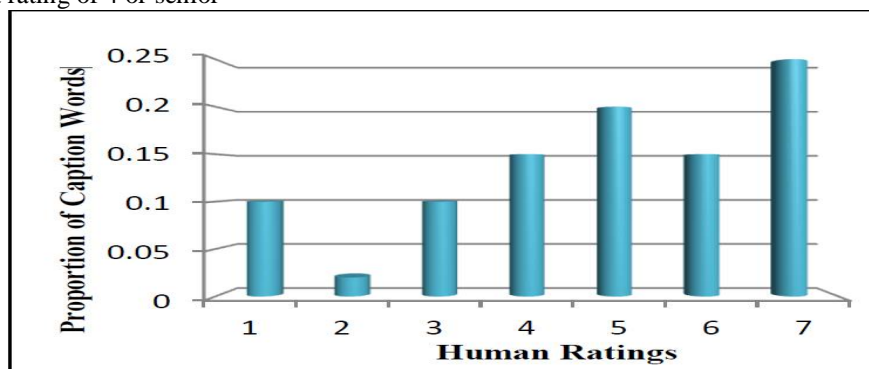

Fig.3 proportion of Caption Words

VII.   CONCLUSION AND FUTURE WORKS

To collect system requirements, we surveyed literatures and identified various attributes related to assessment questions. The identified attributes were Cognitive level, Difficulty level, Question type and content / topic. The Semi-Automatic Question Tagging system was built which tags each question with the value of these attributes. Usability testing has shown that the system is consumer pleasant and useful in multiple ways. In the current system, the "content" and the "question form" tag making use techniques like keyword matching, semantic dictionary and domain ontology. Still there are challenges that needs to be addressed such as the inherent ambiguities present in the question framed, inability of the system to tag the question with cognitive level if question keywords do not match with any of the words associated with the Blooms taxonomy. Sometimes, the keywords present in the question itself may be misleading. For example, the question "list the distinction between queue and stack" will be classified into "Recall level" by our scheme because of the keyword "catalog" but it is at an "analyse level". The tagging accurateness could be further enhanced by more stylish algorithms. The current hub was really building a semi automatic tagging system with a practical truth which is confirmed by our beginning testing. It would be highly desirable if we can reduce the need of physical intervention and maximize the accuracy of fully machine based tagging system. Our next research objective is to investigate further and do an extensive and rigorous usability test. In order to do that, we would combine the system into an open source . The future scope includes extending this work to other subject domains of engineering curriculum and also strive towards improving the accuracy of category

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