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Challenges to Establish Internal Quality Assurance with An Information System to Create Self-assurance Report

Masao Mori, Eiichi Takata, Tetsuya Oishi, Toshie Tanaka
Office of Institutional Research, Kyushu University, (Japan)
mori@ir.kyushu-u.ac.jp, takata@ir.kyushu-u.ac.jp, oishi@ir.kyushu-u.ac.jp, tanaka@ir.kyushu-u.ac.jp

Abstract
After corporatization of Japanese national universities in 2004, they have been obliged to conduct two kind of university evaluation based on self-assessment. They are called "institutional certified evaluation and accreditation" (accreditation, for short), and "national university corporation evaluation" (corporation evaluation, for short). They are aimed at different objectives. Accreditation is to judge universities whether their educational activities meet criteria of education. Corporation evaluation is to show excellence of activities of universities. However, both share common items to describe in their reports, so that an efficient method for creation of reports is expected.
On the other hands, in the process of self-assessment, faculty would discover excellence and improvement of their education. As a result, they are expected to assure quality of their education. Though criteria of accreditation are set from viewpoints to assess institution comprehensively, it is difficult to clarify contribution of the criteria for improvement of educational activity by individual faculties. Based on the two above problems, we proposed, developed and are using an information system to support creation of self-assessment reports from standpoint of coordinator of accreditation and corporation evaluation.

1. Introduction
Efforts to the internal quality assurance of European higher education following the Bologna Process promote universities to reform their educational activities. The internal quality assurance of education has had influence, not only on Europe, but also on Japan. The obligation of institutional certified evaluation and accreditation for Japanese universities is a significant example of the influence. On the other hand, another university evaluation, called national university corporation evaluation, is obliged to national universities after corporatization of all Japanese national universities in 2004. In this paper, we address these evaluation and assessment as *university evaluations*.
The university evaluations require establishment of PDCA cycle based on monitoring education from viewpoint to verify its outcomes – this process is called *internal quality assurance,* because universities are required reasonable management, for instance, individual improvement by each faculty, organizational reformation of curriculum and reorganization inside of a university.
However, lots of painful operations are necessary to conduct university evaluation and to create those reports, so that efficient technique and method are expected. For example, authors belong to the office of institutional research, which support university evaluations and create the reports [11]. For the previous national university evaluation, we needed to over 200 numerical data tables in over 1000 pages of the evaluation report. Moreover, as we are currently preparing the accreditation report, we need to request data collection and self-assessment to 30 departments and schools in Kyushu University. The data collection consists of over 220 items. No one deny that only data collection is not easy task.
As Japanese national universities must conduct each university evaluation every 6 or 7 years, substantially every 3 years, they must keep continuity and consistency with respect to the contents of university evaluations reports. But it is very difficult and not realistic to storage enormous evidence data and digital files for long-term period by human power. So we need to propose an information

system to support creation of reports and as a result of utilizing the system, it promotes improvement in stakeholders.

In this paper, we introduce an information system supporting creation of university evaluation reports and internal quality assurance. The discussion is based on the practical experience to support university evaluations by office of institutional research of Kyushu University. The proposing system is used to prepare the current institutional certified evaluation and accreditation. Also we study its issues from users' opinions.

2. Related studies

1.1 Models in University Management

There are many studies which have pointed out that "*collegiality*" is one of traditional characteristics, and one of noticeable issues, especially in Deem [3] and Clark [2]. Kerr [6] coined the term "*multiversity*" to denote that a university consists of many communities and lacks harmony. Clark [2] identified "organized anarchies" and "garbage-can situations" to describe the irrationality of university organization management.

1.2 Contexts of Japanese National Universities

As Japanese national universities have been corporatizatized aiming at autonomous management and deregulation, simultaneously all universities are obliged to institutional certified evaluation and accreditation from 2004. Accreditation is a criteria assessment with respect to education on the legal basis, the *Standards for Establishment of Universities*. On the other hand, corporation evaluation is an achievement evaluation comprehensively with respect to research, education, social relevance and institutional management on the basis of their *mid-term plans*. Corporation evaluation is obligation to all of national university corporations. Creating reports of university evaluations essentially consist of two processes: collecting and analysing data, and self-assessment based on the results.

1.3 General Methodologies in Document Creation

In this subsection, we review general theories about enterprise report creation including university evaluation and assessment reports.

There are some solutions proposed to administrate documents of a big organization, DITA [9] is one of those solutions. DITA is a document-architecture for extraction and management of documents. DITA enables users to extract and update information efficiently in large amounts of documents [4]. In order to adopt DITA, it is required to define ontology for knowledge of enterprise. Since it is difficult to apply ontology to present progressive enterprise processes and legacy systems, we decide to extract text from digital document by hand and to collect minimum concrete information as meta-data about digital documents.

Accumulating daily reports ensures enterprise reports. It is advisable to study how to obtain meanings and attributes of documents, like [7]. If an enterprise report is required to be prompt, integration of document creation with OLAP is suitable [8]. In the case of university evaluation reports, frequency of reports is much lower than daily reports like in companies. Actually evaluation report is usually conducted every year or every month at most. A long-term vision rather than promptness is necessary for university management. One of important requests in university evaluations is to select documents efficiently and to organize them effectively rather than automatic reporting function. The proposing system provides users with an interactive interface to select documents and organize reports.

Integration of structured data in data warehouse and unstructured data in texts on news sites and blogs has been studied in [1], [8], [5] and [10]. Most of them are based on information retrieval and assume that ontology for structured data is given, whereas we assume that ontology is not given but the design of enterprise reports is given, like university evaluations. Our approach is different from those related work in terms of these assumptions.

3. Issues

To establish internal quality assurance of higher education the following three processes are necessary: monitoring activity, self-assessment and improvement based on the assessment. Especially it is necessary to storage data for long-term period. Data collection to prepare evaluation reports can become a trigger to form a habit of monitoring. The following issues are considered:

(1) What is the efficient method to create reports? Especially more effort is necessary to collect numerical data than description. In general, numerical and statistical data are stored in a unified operational information system, so that statistics should be separated from description.

(2) What is the useful way to take business over from a predecessor in charge? Files saved individually should be archived in a unified storage.

These issues can be considered as general problems of report creation in a large-scale organization. In this paper, we propose a information systems for these issues assuming such university cultures as collegiality and autonomy.

4. Introducing Our Information System

4.1 Classification of Institutional Information

Various kinds of institutional information can be classified by the following criteria.

	Unstructured data (ex. PDF texts)	Structured data (ex. numerical table)
Individual	・ Individual web pages ・ Textbook or hand-out of lectures	・ Syllabus ・ Faculties' database
Organizational	・ Materials in committee ・ Formal reports to the outside	・ School register, Grades and marks ・ Information of personnel affairs

Organizational-structured data is the most important. Data of this type involve significant indicators of education, for instance, enrollment, situation of students' grade and employment rate of graduates. Secondly organizational-unstructured data includes various evidences about activities and consensus in the institution. Organizational data is reliable because they are archived by the headquarters' office to support institutional management.

4.2 Characteristics of The System

The following features of our system (Figure 1) are remarkable:

(1) Generally speaking, contents of an enterprise report form a tree structure. Leaf nodes are topics and themes and internal nodes are sections and chapters. So we define a "*report component*" as a leaf node, which is a data structure with some attributes, and chapters and section as internal nodes. When users create multiple reports in such as our case of two university evaluations, what user have to do is setting each report tree corresponding to a configuration of each report.

(2) Except some numerical data and statistics, what users have to do is to describe self-assessment and to attach digital documents as evidence. The system offers visualization function of data obtained from data warehouse through "*data analysis query*". The query is URL of a CGI program in data warehouse. Each report component has visualizing function for CSV or JSON data obtained from data analysis queries. The window on the right in Figure 1 is an example of report component. The graph is generated from numerical table data, which is obtained from data warehouse through data analysis queries.

4.3 Current Issues of the System

Kyushu University has utilized the system in order to prepare an accreditation report which will be submit in 2014. Currently there are some issues suggested, in which the system does not clarify the goal and achievement of report creation, that is "*progress indicator*".

5. Conclusion

We introduce state-of-the-art about Japanese universities evaluations and an information system which support report creation and conduct internal quality assurance. We will discuss the post-situation after university evaluations.

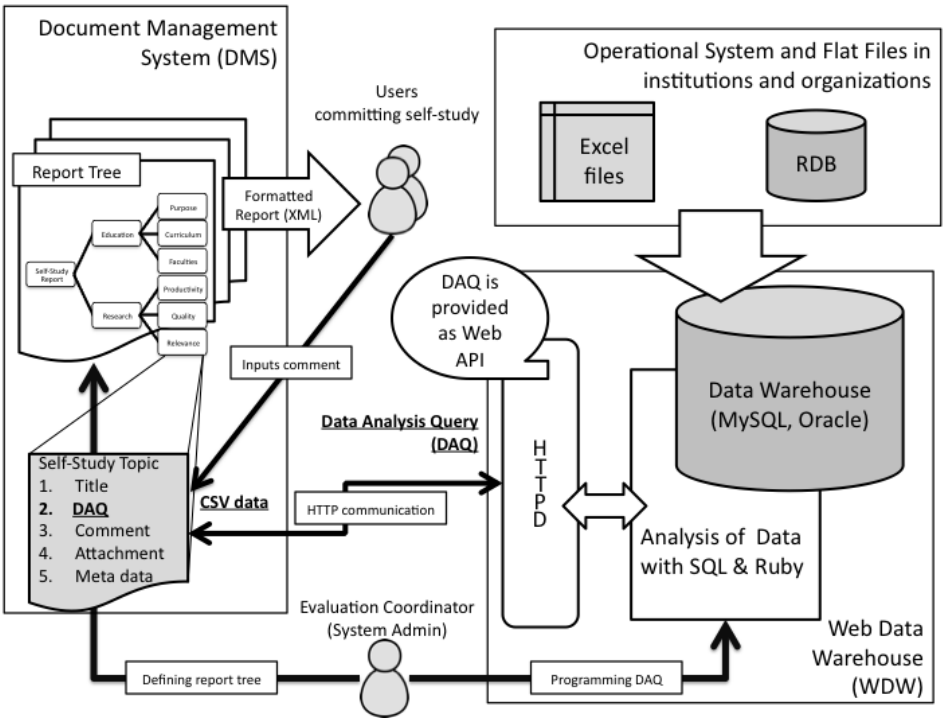

Figure 1. Overview of the system

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