Utilizing Institutional Research to Influence Improvement of University Staff Activities and to Make Plans for the University:
A Case Study of Saga University

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Abstract

We describe two functions of institutional research (IR) by using a case study at Saga University, a national university in Japan. One function is to provide information; the other is to influence members of the institution. The IR office at our university was established under the office of the president with a directive to analyze and visualize all relevant university-wide data and to support institutional decisions taken on the basis of the obtained information. In this paper, we focus in particular on the influence-related functions of IR because few case studies focusing on these functions have been published. The purpose of IR for influence is to motivate staff members to improve their activities on their own initiative. We also describe the quality indicator (QI) and the two aspects of the key performance indicator (KPI), namely, the performance driver and the outcome. We present how to set the KPIs, utilizing the performance driver, outcome, and QI with respect to the medium-term objective / medium-term plan for our university.

Keywords: Institutional Research, Key Performance Indicator (KPI), Quality Indicator (QI), Information-providing Function, Influencing Function, Performance Driver, Outcome

1   Introduction

According to [1], institutional research (IR) is "research conducted within an institution of higher education to provide information which supports institutional planning, policy formation and decision-making." Recently, IR has been rapidly introduced to many universities in Japan, and many cases of IR according to the above definition have been conducted [2]. Specifically, many cases have been implemented in which IR focuses on the information-provision function, which includes providing information to support any planning initiatives, policy issues, faculty evaluations, and institutional decisions. In Japan, the use of IR is typically limited to teaching and learning. The information-provision function is important at many of the universities establishing an IR organization.

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We regard IR as having, in addition to the information-provision function, a role in influencing academic and clerical staff at universities to improve their activities (teaching, research, office work, etc.). These influence-related functions focus on increasing the motivation among staff through experiences that make members feel as though those who do their best are well-rated on faculty evaluations.

Every national university in Japan must establish a Plan–Do–Check–Act (PDCA) cycle that visualizes and confirms the level of progress on reforms targeted in accordance with the National University Reform Plan [4] released by the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT), and the results of the reforms are a factor in budget distribution. As part of this reform plan, each national university must develop new measures to assess their activities, and all university-wide academic and clerical staff are expected to act independently. Therefore, the influence-related functions of IR can play an important role in realizing the reform plan, and in this paper we focus on the influence-related functions of IR and describe two aspects of these functions. In addition, "The system of the management expenses grants for national universities during the third mid-term target period (Conclusion)" was published in June 2015 by MEXT, and all national universities are required to set meaningful, quantifiable KPIs. We introduce the concepts of the performance driver and the outcome for the KPI as well as the that of the quality indicator (QI) to set appropriate KPIs with respect to the medium-term objective / medium-term plans for our university.

The remainder of this paper is organized as follows. In Section 2, we briefly describe the background and progress of our IR office. In Section 3, we describe the characteristics of our IR office and present some key performance indicators (KPIs). We describe two aspects of influence-related functions of IR in Section 4, introduce the performance driver and the outcome for KPI in Section 5 and introduce the QI in Section 6. Then, after presenting the method for setting KPIs using the QI and the concept of the performance driver and the outcome for KPI in Section 7, a summary and conclusion are given in Section 8.

2   Background and Progress

Several years ago, a new hospital cost-management system to influence employees toward independent profit-consciousness was developed at our university's hospital. This system is called a tenant-type cost accounting system. Commercial tenants typically pay the costs of installing shop fixtures and fittings, and this cost accounting system is similar in spirit. In this system, the related divisions bear their own costs and offer services to one another; this type of system enables each division to evaluate its own costs, which the widely used medical expense system 'DPC' (Diagnosis Procedure Combination) cannot inherently evaluate [3]. Figure 1 shows a concept diagram of the tenant-type cost accounting system in use at Saga University's hospital.

To influence employee and to support decision-making, KPIs that are narrowly focused on each target item are introduced to visualize the current situation. Because of this system, each medical division tends to achieve a profit by itself.

In light of this success and the growing use of IR in Japan, the IR office was set up directly under the president at Saga University in July 2012. The IR office is expected to analyze and visualize all relevant university-wide data and to support institutional decisions made on the basis of the obtained information. There are 17 staff members in the IR office including its chief and sub-chief, and four sections: management foundation, learning
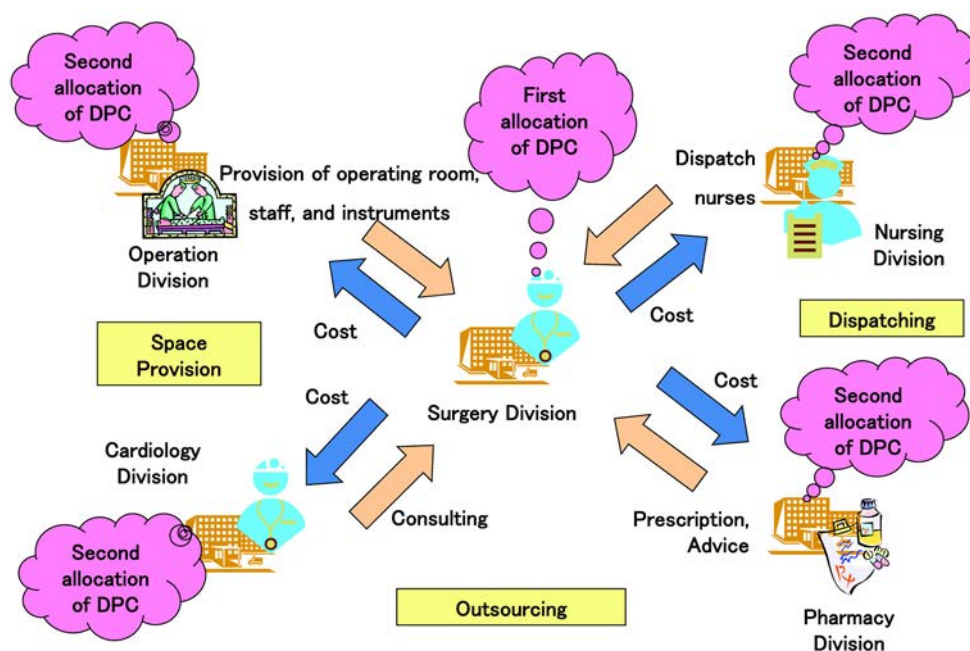
Figure 1: Tenant-type cost accounting system. Sharing of expenses and providing services to one another within related divisions.

and teaching, research, and social contribution. KPIs are developed in each section and university-wide data are visualized in accordance with the KPIs (Figure 2). We would like to emphasize that our IR office is developed around the concept of the tenant-type cost accounting system, which is different than conventional IR offices.

Since the IR office can provide accurate information directly to executives, Saga University is able to respond to the requirements described in the National University Reform Plan by using the KPIs. A typical requirement is that "an environment will be created in which educational research organizations and the allocation of resources within the university will be regularly verified through reforming the distribution method of the management expenses grants for national universities."

3   Characteristics of our IR Office

Conventionally, it is very difficult to access data from other divisions at universities in Japan. In contrast to this situation, the IR office can access all data at the university. That is, all divisions (educational division, research support division, finance division, etc.) are obligated to provide all information requested by the IR office. However, this does not mean that the IR office seeks data under only a presidential directive. The IR office visualizes the data managed by each division without requiring direction from the president. From the viewpoint of compliance, the president does not request information arbitrarily or indiscriminately, but instead uses the data visualized by the IR office to assist in running the university. Therefore, although the IR office is set up to report directly to the president, its activities are independent of the president. This is one of the characteristics of the IR office at Saga University.
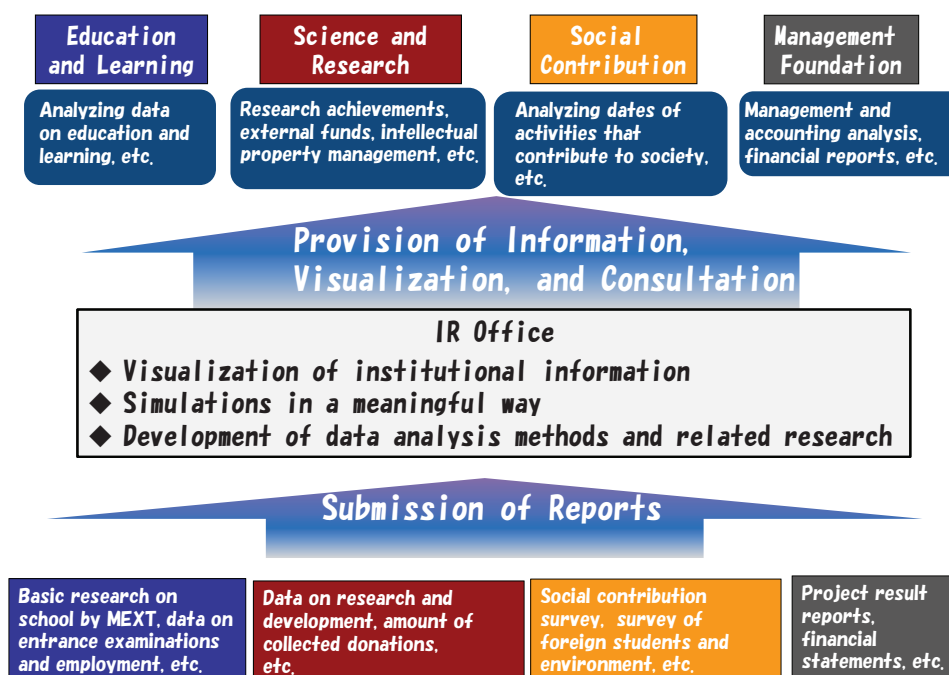
Figure 2: Diagram illustrating Saga University's IR office.

The IR office retrieves all the relevant data from all divisions, and analyzes and visualizes that data from four viewpoints—management foundation, education and learning, science and research, and social contribution—and provides the results on the IR office's website (Figure 3). We call the results of visualization and analysis of the relevant university data by the IR office the "IR data". All staff can access this website from inside of university network. This is the information-provision function of IR. We would like to emphasize that IR data have been used to support some evaluations and institutional decisions.

As described in Section 2, Saga University's IR system is based on the successful system introduced in the university hospital, and the KPIs are an important factor in influencing staff toward self-guided improvement. Therefore, the IR office also develops the KPIs with the aim of influencing faculty and staff.

Here, for the sake of simplicity we focus on the topic of education and learning and show several related KPIs. Because all universities in Japan annually report their activities and other data to MEXT, which prepares the *Basic Research on School* report, the simplest way to decide on KPIs is to use the indicators provided by MEXT. As examples, repetition rate, dropout rate, gross graduation rate, and leave of absence rate are published by MEXT along with the formulae to calculate these values. In addition to these, we have created several KPIs to evaluate teaching and learning activities. Examples of KPIs of learning and teaching are shown in Table 1.

To strengthen the influence of the IR office, a special expenditure fund (50 million Japanese yen in FY2015) of the president is distributed each fiscal year among those faculty members achieving assessment goals on KPIs.

In summary, IR at Saga University focuses on not only providing information but also influencing members of the institution.
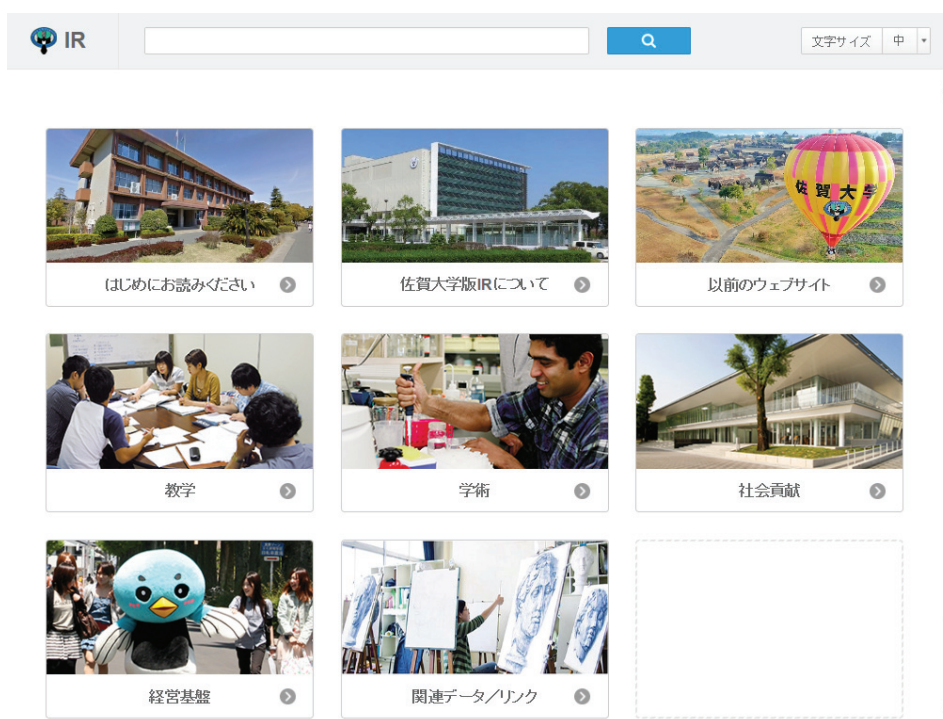
Figure 3: Our IR office home page.

4 Two aspects of the influence-related functions

There are two aspects to the influence-related functions of IR. First, institutional information and the visualization of that information can be used to attract the attention of all relevant staff and evoke motivation or act as incentive for action or choice. For example, showing data that make it easy to understand the prevailing performance levels and results achieved by a faculty or department at a glance to the deans of faculty may foster candid discussion with their faculty members on ways to further improve on their identified strengths. In the contrasting case, when deans are presented with results that show an apparent lack of effort, the deans can press their faculty members to explain the reason for the unsatisfactory results and to improve. That is, although there is neither legal force nor administrative penalty, people involved in university departments tend to modify their actions in the type of situation mentioned above. Thus, an ideal method of influence is to provide IR data that both motivates and assists the relevant people in self-guided thought, discussion, and action.

A second aspect of the influence-related functions is the powerful effect of using IR data in decision-making and evaluation. IR data with the impact described above are not easy to aggregate. In general, the results obtained by analyzing various data are used as only internal IR data, and hence the effect of data collection as limited as reporting these IR data to only executives or within only the faculty or department. To broaden the effect, it is important to make members of the institution more interested in IR data. Since the IR office at Saga University reports directly to the president, the president checks almost all IR data. This gives IR data an important role in university management, and the data shared with faculty members are also provided at meetings of the board of directors or councilors when necessary. Here, we note that the important thing is to get the appropriate people

Table 1: Examples of KPIs of education.

Indicator Name	Description
Employment success rate	Number of graduates offered a job, as a proportion of all job-seeking graduates
Written syllabus rate	Number of syllabuses as a share of all subjects
Written teaching portfolio rate	Number of teaching staff who have written a simplified teaching portfolio, as a proportion of the number of teaching staff
Learning portfolio comment rate	Per-student average of number of comments by teaching staff in learning portfolios

to recognize that the university not only provides and shares IR data but also uses IR data in decision-making and evaluations. Although the direct influence of the IR data is quite limited, we expect that the IR data will become more influential as a synergistic effect of combining decision-making, evaluation, and other such tasks with IR data.

Figure 4 presents a successful example of the influence-related function. In our university, teaching staff must write a report on teaching improvement each term. By showing the deans the written report on teaching improvement rate, this rate has been improved.
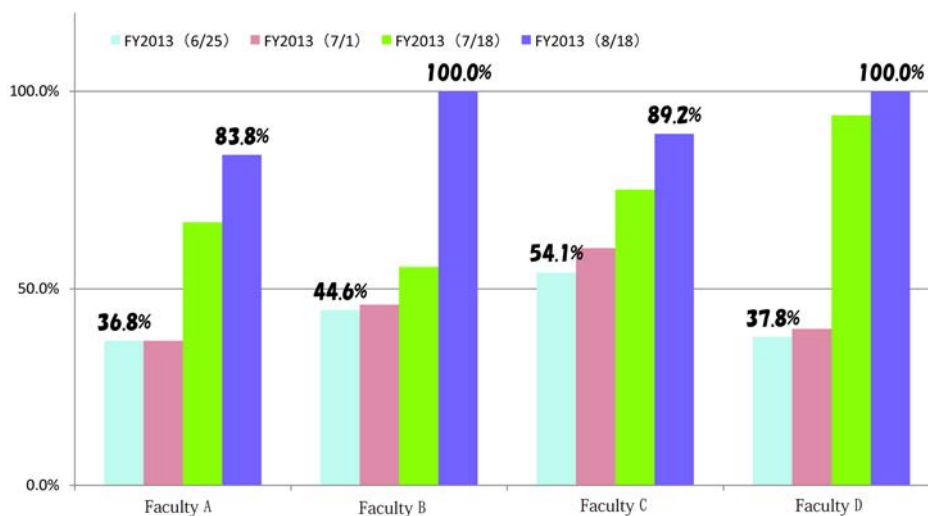

Figure 4: The written report on teaching improvement rate.

5   Two aspects of KPI

"The system of the management expenses grants for national universities during the third mid-term target period (Conclusion)" was published in June 2015 by MEXT. All national universities are required to lay out meaningful, measurable KPIs in this document.

From the point of view of management accounting [5], we focus on two aspects of KPI: outcome and performance driver. Outcome is the targets to be achieved, and performance

driver is the preceding targets for achieving the outcomes. Hence, outcomes are following indices that can be evaluated by all related activities, and performance drivers are preceding indices that are activities and systems for attaining the final targets. Therefore, the virtual outcome at each division will be the corresponding performance drivers.
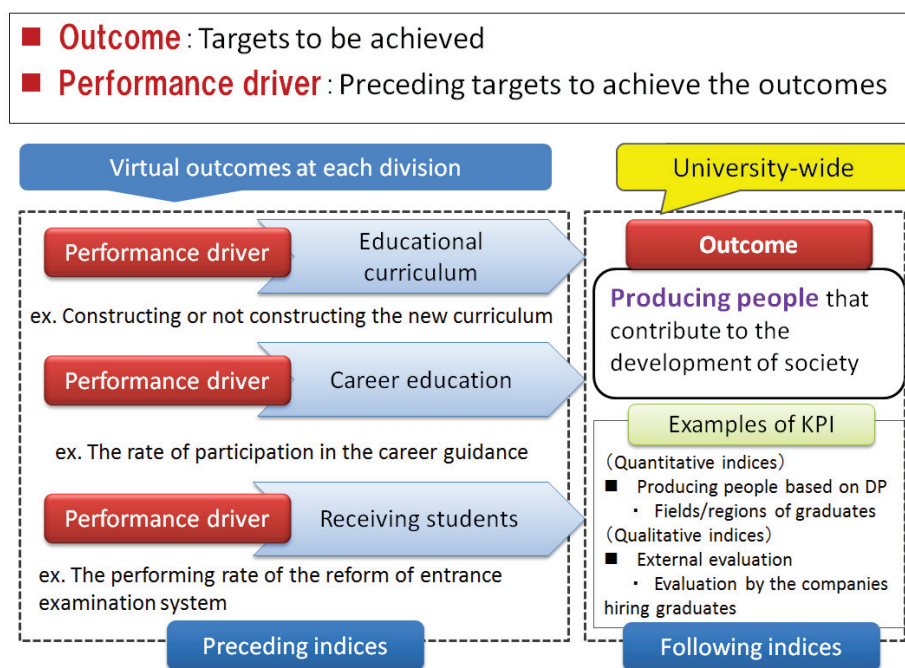

Figure 5: Two aspects of KPI.

We consider utilization of this concept to support the planning of the third medium-term objective / medium-term plan. As shown in Figure 5, for example, setting one of the university-wide targets as "Producing people that contribute to the development of society", a possible outcome of the university is the contribution to society by producing people according to the diploma policy. In this case, possible KPIs, as specific outcomes, are not just quantitative indices such as employment success rate and post-graduation work placement / region, but also qualitative indices such as evaluations from the companies hiring graduates and stakeholders.

6   The Quality Indicator and its relation to KPI

If we focus on only KPIs, we may fail to see the full intricate web of other factors, over-looking them in favor of KPI alone. Because monitoring only KPIs will lead to a one-sided evaluation of progress, we need a new index that is capable of many-sided monitoring to check and modify the activities. For this purpose, we introduced the quality indicator (QI).

The relationship between QI and KPI is shown in Figure 6, and we remark that QI and KPI are not independent. University authorities are decision-makers who set appropriate KPIs from various indices developed by each section's IR office or division. In general, the indices set up as KPIs are representative, such as dropout rate and grant adoption rate. For example, setting one of the KPIs as "dropout rate is less than 3%", it is not sufficient to
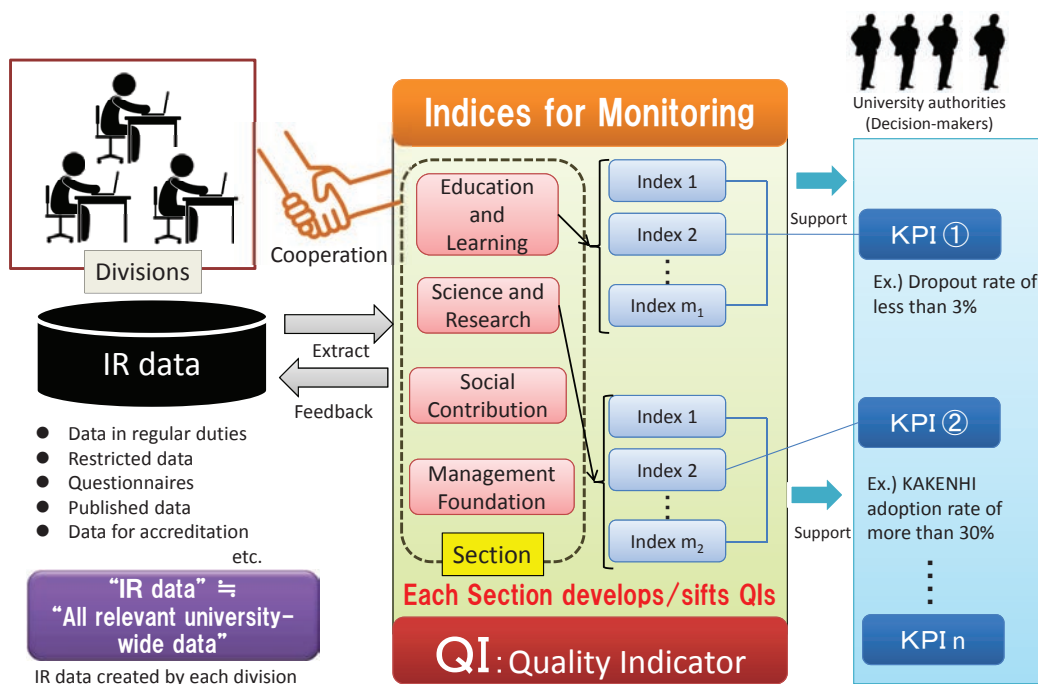
Figure 6: Relationship between KPI and QI.

monitor the rate, and attendance records, unwilling admission rate, and other such indices should be monitored as well. These are the QIs that should be monitored to check the activities for attaining the KPIs values. At Saga University, each section in the IR office extracts QIs from IR data, and develops and reviews each QI in succession.

In preparation for the National University Corporation Evaluation, we have evaluated the attainment of our mid-term objectives, mid-term plans, and annual plans for education, research, and management based on evidence accumulated since 2004.

Although the concepts of KPI and QI are relatively new, they have several conceptual commonalities with the evidence-based evaluation used to date at Saga University. We therefore feel that our faculties will agree with KPI and QI assessment.

7   Planning based on KPI and QI

We describe how to apply KPI and QI to formulating medium-term objectives / medium-term plans and related action plans with respect to each year. Figure 7 shows the relationships between these elements.

Generally, in the process of making plans, the highest-level plans are made at first, and then middle- and lower-level plans subsequently. Hence, the outcomes for higher-level plans exert a direct influence of the achievement states of the corresponding performance drivers. That is, the achievement state of the higher-level plans is a kind of outcome, and the outcome for lower-level plans in turn becomes a performance driver for the higher-level plan.

QI involves the three factors of structure, process / activity, and outcome. Moving
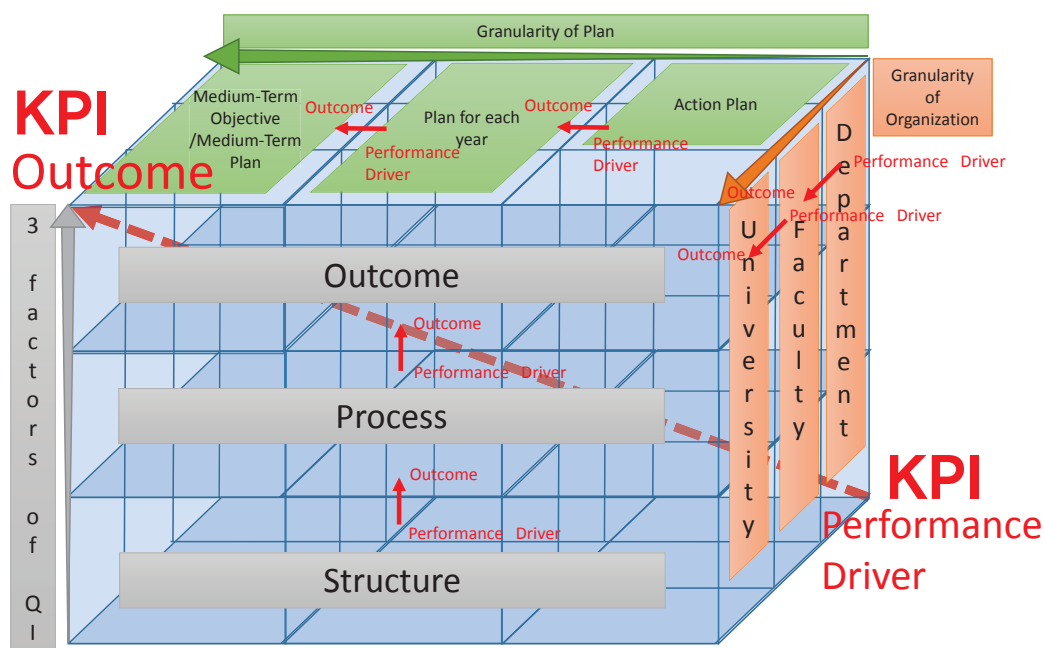
Figure 7: Applying KPIs and QIs to planning.

forward with the plan, based on KPI and QI, we check the KPI and monitor and revise the QI as necessary.

When we evaluate our education targets and achievements for the plan, we will focus on the outcomes. However, during implementation in particular, we must focus on process, rather than outcome. Some problems are revealed when checking the process of QI at this stage, and it may be possible that reviews of the structure, such as in terms of budget, organization, and educational systems, are needed to solve them. In summary, we monitor the QI related to the KPI for each plan, and check the process, structure, and outcome in order, finally improving activities as necessary.

From the point of view of effectiveness, efficiency of operation Processing, and having easy-to-understand explanations, it is not always good to increase the number of KPI and QI, and they should be limited to at least some extent.

It seems that there is risk in making medium-term objectives / medium-term plans that include KPI and QI, because the plan is essentially a contract with the government and is therefore difficult to amend. However, the National University Corporation Evaluation Committee, which is responsible for evaluating the performance of national university corporations, requires all national universities to make plans so as to guarantee evaluability, and the use of KPI and QI enables us to measure progress towards outcomes. Although there is always the chance that a plan ultimately cannot be achieved due to changes in social conditions or other factors, this problem is hardly unique to Saga University, and similar problems may occur at other institutions. We therefore think it is important to explain the process and results based on KPI and QI in more detail to ensure that our activities are received well.

8   Summary and Conclusion

We described the two functions of IR, which are summarized as follows.

- Information-provision function
    - Assessment of present situation
    - Reasonable assessment
    - Proper strategies and tactics

- Influence-related functions
    - Increase the motivations of staff
        * Ensure that staff who do their best are evaluated well.
        * Staff who are motivated cannot help but to do more and improve.

We describe how to make plans using KPI and QI. More specifically, when making the third medium-term objective / medium term plan, we set outcome and performance driver of KPIs, respectively, for each part of the plan based on the concept described in the previous section, We are planning on making action plans with respect to each year based on the medium-term objective and the medium-term plan, and the outcome for the action plan will become the performance driver for the medium-term plan. We will also monitor the corresponding QI.

The third medium-term plan will commence in FY2016. We believe that many universities will consider the setting of KPIs and their incorporation with individual university's strengths and characteristics. Our procedure for making plans based on outcome and performance driver for KPI and QI will be helpful in setting KPIs for many universities.

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