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# The optimization research of the college graduation design management workflow

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## ABSTRACT

In this paper, the beginning phase and the final phase of the traditional workflow and the new workflow based on graduate design management system in college is introduced, the concept of proposal concerning number (PCN) is defined to reflect the optimization effect. This research will be helpful to improve the quality of college graduation design and the educational administration management efficiency, ensure the entire graduate teaching quality and the realization of high-quality personnel training objectives.　　© 2014 Trade Science Inc. - INDIA

## KEYWORDS

Optimization research;
College graduation design;
Management workflow.

## INTRODUCTION

College graduation design is the process that the students under the guidance of supervisors conduct scientific research with basic theory and knowledge by hands-on experiments or designs, find a problem, discover a problem and ultimately solve the problem, this process is not only the comprehensive examination for students' four-year learning outcome, innovation ability and general quality, but also the overall test for supervisors' four-year teaching qualities[1, 2]. Therefore, to carry out optimization research of college graduation design management workflow will be important to improve the quality of graduation design and the educational administration management efficiency, ensure the entire graduate teaching quality and the realization of high-quality personnel training objectives[3, 4]. The study will be helpful for decision-making departments to formulate policy guidelines in standardization, modernization and scientism.

## EXPERIMENTAL SECTION

The college graduation design period lasts nearly six months, the beginning phase and the final phase both play important roles in the college graduation design management workflow, the beginning phase decides how the student spend the next six months, and the final phase shows the score result after the student spend the time. Supervisors, students, office of academic affairs and experts are involved in the workflow in different status whose focus of attention is not the same, the management workflow is complicated and energy-consuming.

Figure 1 shows the traditional beginning phase of the college graduation design management workflow, firstly, the office of academic affairs issues documents of the college graduation design to the departments, and then supervisors get these files
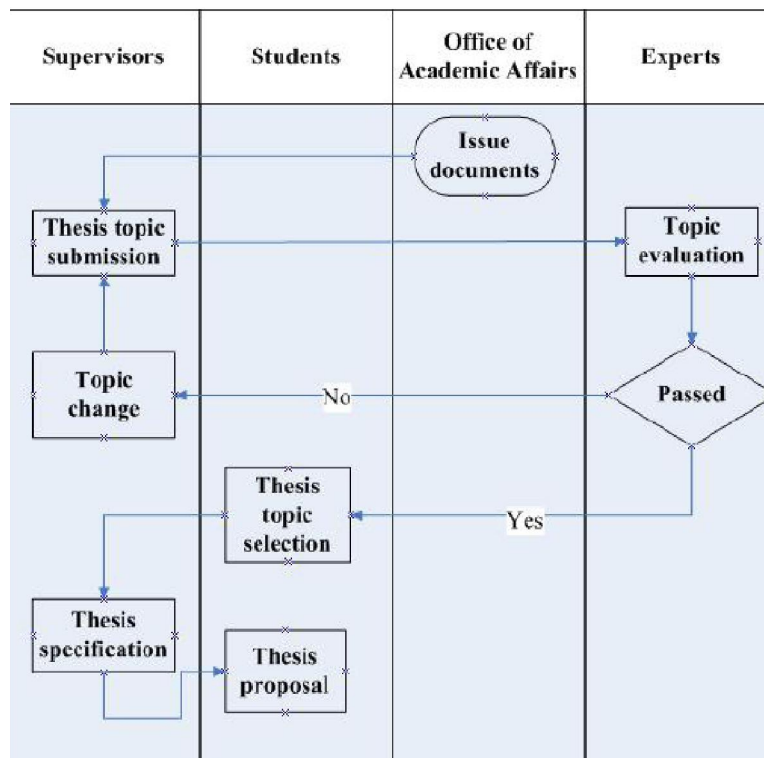
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**Figure 1 : The traditional beginning phase of the college graduation design management workflow**

and submit their thesis topics, normally the numbers of topics are more than the numbers of students, after the topics are checked by the experts, the evaluation results are transferred to experts, if the result is No, then the topic need to be changed, otherwise the topic can be selected by students, finally, supervisors will submit the thesis specifications and students will start their thesis proposal.

But the negative feedbacks for the traditional beginning phase of the college graduation design management workflow are the following:

1) the transmission of information is not timely, paper version need to be transferred by different status face to face and round-trip many times;

2) the workflow is difficult to manage, supervisors need to spend a lot of energy on it, it's time-consuming;

3) cross-department and inter-discipline thesis topic selection is not easy to make;

4) the topics that students can select are few, most topics are determined privately by the supervisors and assigned to students, so the students are more passive, if they are assigned to a non-interested or very difficult topic, the initiative

and enthusiasm is missing, passing the line of thesis defense becomes the only dream which are far away from the supervisor's requirement.

Figure 2 shows the new beginning phase of the college graduation design management workflow based on graduate design management system which seems to be a documents transfer station, all of the documents are produced as data storage, all the modification and the selection are operated by the system, it's very quick to upload and download data for supervisors, students, the office of academic affairs and experts, lots of time and energy are saved for other important things, the data can be updated and synchronized immediately, all the participants can read the data at the same time. The graduate design management system also makes the cross-department and inter-discipline thesis topic selection possible, as all the students in the college use the same system and read the same data, as the same, the graduate design management system emphasizes two-way choice between supervisor and student, student can choose interested supervisor and topic, supervisor can also choose interested student, topic is no longer mandatory assigned to the fixed student,
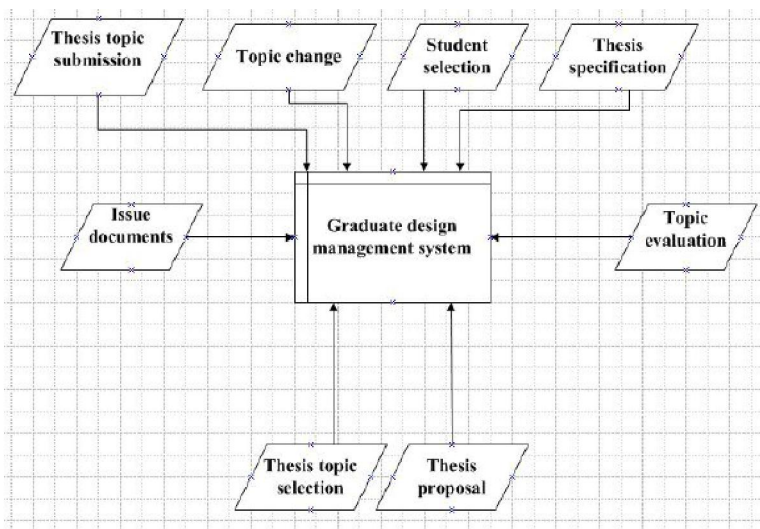
**Figure 2 : The new beginning phase of the college graduation design management workflow**
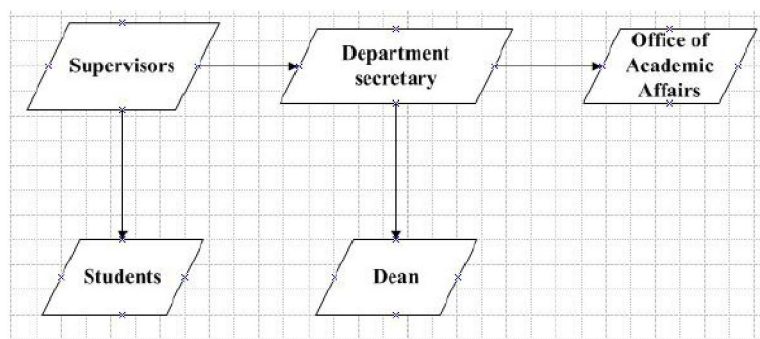


**Figure 3 : The traditional final phase of the college graduation design management workflow**

the two-way choice can enhance the interaction between supervisors and students which give students more opportunities to choose, the students' initiative and enthusiasm in graduation design are greatly improved.

Figure 3 shows the traditional final phase of the college graduation design management workflow, firstly, supervisors send the score results of students to department secretary and students, and then department secretary collects all the score results of students from all the supervisors, finally the score results of department are sent to the dean and the office of academic affairs, the huge data of scores are a big workload to department secretary, in a meanwhile, so many scores statistics are likely to cause the input errors from department secretary who takes the huge responsibility.

Figure 4 shows the new final phase of the college graduation design management workflow based on graduate design management system, supervisors

upload the score results of students to graduate design management system, at the same time, students, the dean of department and the office of academic affairs can all download the real-time score data from the system, it's fast for score results collect and data statistics. Clearly, the supervisors will be the only person who is responsible for the score data input, and the department secretary disappears from the workflow which means the management efficiency is highly improved.

## RESULTS AND DISCUSSION

The concept of proposal concerning number (PCN) is defined, this parameter is used for describing the time and energy that the supervisor consumed, and the smaller the value is, the less time and energy the supervisor consumes, the better optimization the workflow is.

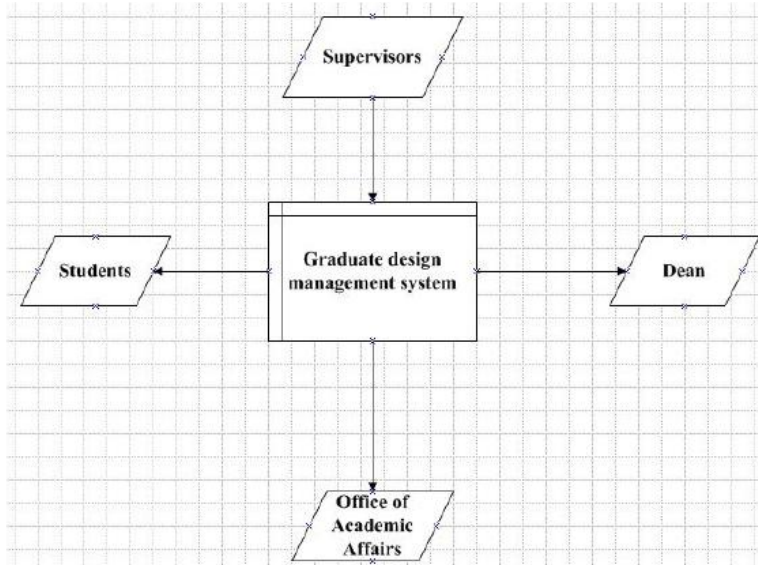For the traditional beginning phase of the col-

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**Figure 4 : The new final phase of the college graduation design management workflow**

**TABLE 1 : The data from one supervisor with one student**

| | $PCN_2$ | Su | $K_2$ | $K_3$ |
|---|---|---|---|---|
| **Supervisor 1** | 4 | 1 | 2 | 1 |
| | $PCN_1$ | St | $K_1$ | $K_2$ |
| | 8 | 1 | 2 | 2 |
| $PCN_2$: $PCN_1$ | 1:2 | | | |

**TABLE 2 : The data from one supervisor with two students**

| | $PCN_2$ | Su | $K_2$ | $K_3$ |
|---|---|---|---|---|
| **Supervisor 2** | 4 | 1 | 2 | 1 |
| | $PCN_1$ | St | $K_1$ | $K_2$ |
| | 16 | 2 | 2 | 2 |
| $PCN_2$: $PCN_1$ | 1:4 | | | |

**TABLE 3 : The data from Department 1**

| | $PCN_2$ | Su | $K_2$ | $K_3$ |
|---|---|---|---|---|
| **Department 1** | 45 | 10 | 1.5 | 1.5 |
| | $PCN_1$ | St | $K_1$ | $K_2$ |
| | 216 | 60 | 1.2 | 1.5 |
| $PCN_2$: $PCN_1$ | 1:4.8 | | | |

**TABLE 4 : The data from Department 2**

| | $PCN_2$ | Su | $K_2$ | $K_3$ |
|---|---|---|---|---|
| **Department 2** | 90 | 20 | 1.5 | 1.5 |
| | $PCN_1$ | St | $K_1$ | $K_2$ |
| | 540 | 120 | 1.5 | 1.5 |
| $PCN_2$: $PCN_1$ | 1:6 | | | |

lege graduation design management workflow, apply the following formula:

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**PCN$_1$=St*K$_1$*K$_2$*2**

St: number of Students those supervisors mentored

K$_1$: paper number scale factor [1, 2]

K$_2$: paper modified coefficient [1, 2]

For the new beginning phase of the college graduation design management workflow based on graduate design management system, apply the following formula:

**PCN$_2$=Su*K$_2$*K$_3$*2**

Su: number of supervisors

K$_2$: paper modified coefficient [1, 2]

K$_3$: two-way selection coefficient [1, 2]

TABLE 1 shows the data from one supervisor who mentors only one student, TABLE 2 shows the data from one supervisor who mentors two students, TABLE 3 shows the data from Department 1 which owns ten supervisors and each supervisor mentors six students, TABLE 4 shows the data from Department 2 which owns twenty supervisors and each supervisor mentors six students.

## CONCLUSION

Comparing TABLE 1 with TABLE 2, for the traditional workflow, Supervisor 2's proposal concerning number is double to Supervisor 1's, but for the new workflow based on graduate design management system, Supervisor 2's proposal concerning number is the same to Supervisor 1's.

Comparing TABLE 3 with TABLE 4, for the new workflow based on graduate design management system, Department 2's proposal concerning number is double to Department 1's, but for the traditional workflow, Department 2's proposal concerning number is nearly 2.4 times to Department 1's.

The more the number of the supervisors and students are, the bigger difference between the new workflow based on graduate design management system and the traditional workflow, the more optimization reflection on the new workflow based on graduate design management system.

## ACKNOWLEDGEMENTS

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