

# An Index System for the Evaluation of Commercial Information Systems

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## 1 Introduction

Nowadays, the automation systems (mainly computer and information system) in commerce are developed rapidly in China, so the state organization wishes to guide and control the trends for the rapid development of the automation systems. There is a project for the evaluation of such commercial automation systems carried in China. The main aim of this project (called the evaluation project) is to put forward the indices system for the evaluation, select the comprehensive evaluation methods, operate the real data from some pilot organizations (six large department stores in different cities) and establish the computer evaluation support system. This paper proposes a new index system for the evaluation of commercial information systems contributed to the evaluation project of commercial automation systems using the *Wuli-Shili-Renli* (WSR) system approach.

## 2 Index System for Evaluation

To run the evaluation project we use the WSR system approach showed in Fig. 1.

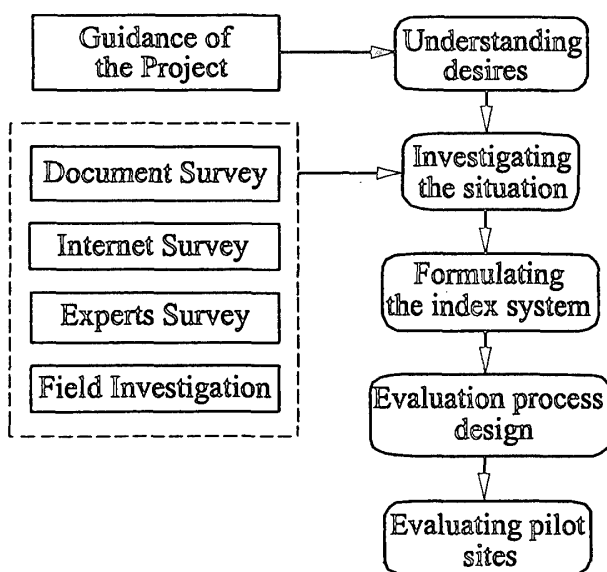


Figure 1: The WSR system approach.

In this stage we first use the document survey, Internet survey, expert survey and field investigation. Then we use the Delphi-like method to collect the opinions in several runs. Finally we design a index system according to the WSR approach for the evaluation with three layers showed in Fig. 2 for three kinds of evaluation and more than 60 indices. The three kinds of evaluation are given as follows:

- (1) Physical evaluation (*Wuli*);
- (2) Performance evaluation for system (*Shili*);
- (3) Economic, social and user's evaluation (*Renli*).

Fig. 2 shows three layers of evaluation indices.

Top layer ( <i>Renli</i> layer)	Effectiveness: 14	
Middle layer ( <i>Shili</i> layer)	Implemented Functions: 17	
Bottom layer ( <i>Wuli</i> layer)	Commerce Mechanism: 6	Supported Environment: 23

Figure 2: Three layers of evaluation indices.

In Fig. 2, the bottom layer (*Wuli* layer) is consisted of commerce management mechanism (6 indices) and supported environment (23 indices). The middle layer (*Shili* layer) and the top layer (*Renli* layer) are the implemented functions (17 indices) and applied effectiveness (14 indices), respectively.

Fig. 3 shows the framework of the index system according to the WSR approach for the evaluation of commercial information systems.

## 3 Valuation of Indices

We use different methods for valuation in indices. For the indices in the *Wuli* layer we usually use the test and estimation method. In the *Shili* layer the queuing network method is presented specifically for matching the requirement of commerce business. In the queuing network method

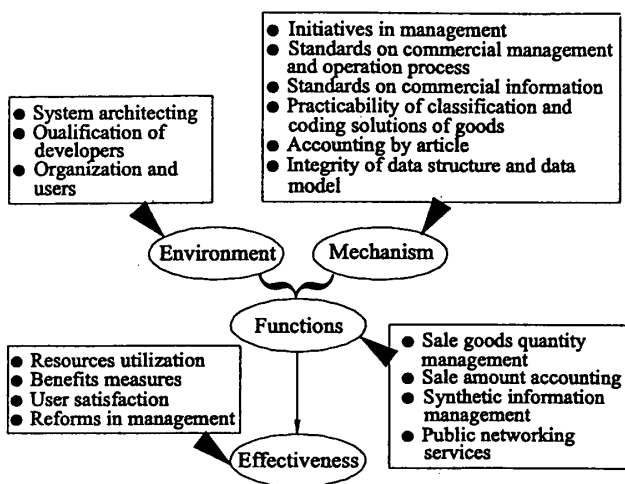


Figure 3: Framework of the index system.

we present the theoretical studies and development of the network modeling, and give some efficiency analytical methods to numerically evaluate the system performance and test the analysis results by computer simulations. In the *Renli* layer we use the estimation and expert assessment methods. Table 1 gives valuation methods of the indices.

Table 1: Valuation methods of the indices.

Index	What are the meanings?	Where to collect?	How to give a value?
<i>Wuli</i>	(input) technical indices	document, Internet, pilot sites	testing, estimating
<i>Shili</i>	(output) system performances	document, expert survey, pilot sites	testing, calculating
<i>Renli</i>	(outcome) user participation, user satisfaction	document, expert survey, pilot sites	testing, experts' scoring

#### 4 Evaluation Methods

The evaluation methods will can divided into two kinds: (1) individual evaluation; (2) comprehensive evaluation. For the first kind evaluation we just select at first all indices for evaluation, then make valuation for each index, finally just show them in some table format in the computer. For the second kind evaluation which usually is in the case of more than two indices we should make integration or synthesis for them. We often use following evaluation methods to deal with these indices, such as comprehensive scoring approach,

order number approach, ideal point methods, analytical hierarchy process (AHP) and aspiration interactive method (AIM) etc. There are some software used for some evaluation methods.

#### 5 Computer Support System

In the computer support system for the evaluation we design DataBase, Index Base and Method Base and interface. The idea of installing the Index Base originated from the expert survey. This evaluation project will be faced to the different users. These users will be in the top level (state organization), middle level (local government) and low level (department store). Also in the low level there are different types of business users, like department stores, supper markets and shops with selling by whole-sale etc. So for carrying the evaluation work for different users from different levels and different types of shops we can choose the appropriate indices system from the Index Base at first. The computer tool is implemented by Visual PoxPro 5.0. We use also object-oriented programming and direct manipulation techniques to help the interaction between the end users and evaluation aids, and facilitate the user's participation in the evaluation.

#### 6 Conclusions

There is an evaluation project for commercial automation systems carried in China in recent year's. The main aim of the project is to put forward the index system for the evaluation, select the comprehensive evaluation methods, operate the real data from some pilot organizations and establish the computer evaluation support system. In this paper we proposed a new index system for the evaluation of commercial information systems using the WSR system approach to contribute to the evaluation project of commercial automation systems. The index system will be widely used in China, not only during design and development, but also for configuration, tuning, and capacity planning purposes.

#### References

- [1] J. Gu, X. Tang, L. Wang et al., "WSR system approach to the study of synthetic evaluation of commercial information system in China," Proc. of *ICSSSE'98*, pp.252-256, 1998.
- [2] W. Yue, X. Wang, M. Koga and J. Gu, "Analytical methods to evaluate the performance of computer and communication networks for commercial business," Proc. of *ICCT'98*, pp.S34-07-1-S34-07-5, 1998.