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EXTENDING THE ANALYSIS OF KEY ISSUES IN INFORMATION TECHNOLOGY MANAGEMENT

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Abstract

The key issues of Information Technology (IT) managers of Brazilian banking, a highly advanced industry, were assessed. The resulting priorities are comparable to those found in developed countries. As well as the usual key issues method of rating, two other methods were used: Q-sort and interpretive structured modeling (ISM). Respondents Q-sorted issues, and a factor analysis on these data identified four groups of banks with similar IT managerial issues. ISM provided a deeper understanding of the relationship among the top issues, and some previously lesser ranked issues were recognized as more important. This study demonstrates how other approaches to assessing key issues provide additional insights into the key concerns facing IT managers.

1. INTRODUCTION

The management of IT is becoming increasingly complex due to the diversity of available technologies and the strategic importance of this resource to the achievement of business goals. One approach to understanding the challenges of this area is to consult IT managers about their key issues. The insights gained from these analyses are useful both in understanding the concerns of IT managers, suggesting areas for research, and educating IT managers.

With the support of Brazilian banks, the traditional key issues survey was complemented by Q-sort and interpretive structural modeling ISM. These approaches allowed a deeper understanding of the relationships among the key issues. It led to a revision of IT managers' perceived priorities and proved to be a significant contribution to their understanding of their key concerns. A factor analysis on the Q-sort data identified groups of banks with similar IT situations and strategies.

2. THE BRAZILIAN BANKING INDUSTRY

The Brazilian banking industry is characterized by a small number of financial conglomerates with a large nationwide network of branches. There are also many small banks that provide corporate and investment banking services to external customers or their parent industrial groups. The banking industry has been highly profitable, allowing significant investment in infrastructure, including branches and IT, which the banks have always seen as strategic.

3. RESEARCH METHODOLOGY

The research was carried out in the following phases:

1. **Questionnaire validation.** The key issues questionnaire was translated into Portuguese and submitted in a series of meetings to bank IT managers, who revised and refined some of the wording. We also tested complete instructions for using Q-sort.

2. **The survey.** The questionnaire was sent to the highest ranked IT manager in each participating bank. The answers were tabulated using standard statistical techniques.
3. **ISM workshop.** A group of bank IT managers, who had participated in the survey, were invited to a meeting to discuss the results of the survey and to participate in an ISM session to review and structure the top ten key issues.
4. **Factor analysis.** The results of the Q-sort were factor analyzed to identify homogeneous groups of respondents and patterns of management concern or focus.

Q-sort. The distinguishing feature of Q-sort, a ranking technique, is that respondents are required to sort the supplied statements so that they fall into a predefined, usually approximately normal, distribution. In this case, respondents sorted the twenty-five key issues into nine piles.

ISM. ISM forces participants to relate the issues to the larger problem, defining explicitly their interrelations. IT builds directed graphs of these issues, based on a previously agreed-upon relation. In our research, after much debate, the group chose the relation "The correct approach to (issue A) helps solve (issue B)."

4. THE SURVEY RESULTS

The traditional key issues survey produced 69 usable questionnaires, a response rate of 49.3%. The response rate was higher for private and large banks. Thus, the results can be considered to be more representative of the opinions of IT managers in private and large Brazilian banks than Brazilian banking IT managers in general.

The ranking (see Table 1) of the key issues reveals that the top concern is building an architecture that enables a bank to react quickly to changing circumstances. This is not surprising given the necessity for Brazilian banks to adapt rapidly to the consequences of high inflation. For example, the banks had to create systems that could handle multiple Brazilian currencies. The remaining top ten issues, overall, reflect the concerns of a mature IT business. The issues deal with strategic rather than operational concerns. There is a general theme of getting better value from the existing IT capabilities rather than creating IT capabilities.

A comparison of the rankings from this study to some other key issues suggests more similarity with those of the USA and Australia, indicating that Brazilian banking IT managers see beyond the technical aspects and have a broader organizational IT perspective linked to business strategy. This is not surprising. Brazilian banks had to invest heavily in IT to survive in the turbulent Brazilian financial environment. Brazilian banking is a large, well-established industry serving the largest economy in

South America. The conditions were appropriate for Brazilian banking to emerge as highly advanced and technologically competent. Thus, Brazilian IT banking managers share the same concerns as their counterparts in countries, such as the US and Australia, that have been investing in IT for decades.

5. RESULTS OF THE ISM

The eleven participating IT managers received the full rankings from the key issues survey at the beginning of the session, but were told to focus only on the top ten issues. Participants were presented with pairs of issues (A and B) for which they had to evaluate the relation: "The correct approach to (issue A) helps solve (issue B)." The group then discussed whether the relationship was true or false. After some deliberation, which at times was quite heated, the group made a decision and moved on to the next pair of issues. The entire process took two hours. The resulting graph is presented in Figure 1.

As could be expected, planning and infrastructure issues have precedence over issues related to business results. There are some significant differences between the implicit ISM priorities and the rankings from the key issues survey. In particular, notice how the ninth ranked issue from the survey appears as a key driver of other issues. The solution of many other problems is dependent on recruiting and planning human resources for IS. Furthermore, the third ranked survey issue appears to the far right of the ISM model. Using IS for competitive advantage cannot occur until many other issues are resolved.

The display of the ISM diagram provoked considerable controversy, which focused extensively on issue 9 (human resources development). The group had to reconcile the low ranking of the issue with its key position in the ISM diagram.

These results indicate the practical usefulness of complementing a key issues study with ISM, exposing important relationships among the issues that are not apparent in the survey ranking. ISM reveals how independent rating of issues, the *modus operandi* of key issue studies, does not reveal how one key issue can impact another. As a result, managers gain greater insights into the sequence of activities necessary to solve problems.

6. RESULTS OF THE FACTOR ANALYSIS

The goal of the Q-factor analysis was to identify groups of banks with a similar Q-sort ranking of key issues. Using SAS, we performed a principal component method factor extraction followed by varimax rotation. The analysis indicates the existence of four distinct management foci as related to the key issues.

- **Business:** Issues related to support of the business. These issues predominate in organizations that have already solved internal management issues, being now involved with the improvement, development and implementation of products and services, and therefore involved with the competitive strategy of organization.

Table 1. Key Issues Survey Findings

Rank	Description
1	Building an IT architecture of prompt reaction
2	Improving the strategic planning of IS
3	Using IS to achieve competitive advantage
4	Developing a data architecture
5	Improve decision making through Decision Support Systems
6	Integrating IS and telecommunications systems in diverse platforms
7	Using the IT to leverage the organizational resources
8	Planning, implementing and managing telecommunication systems
9	Recruiting and developing human resources to IS
10	Improving the productivity of IS development
11	Improving the information security and control
12	Improve the effectiveness of data resources use
13	Integration with customers and suppliers
14	Build an effective ability to recovery facing disasters
15	Planning the change toward global systems
16	Facilitating the organizational change and use of IT technologies
17	Developing distributed systems
18	Relationship with the users
19	Planning and managing the application portfolio
20	Reduction of unitary costs
21	Planning and using of CASE technologies
22	Positioning IS area on the organizational structure
23	Improving the understanding of IS role and contribution
24	Facilitating and managing the end-user computing
25	Outsourcing

Note: An issue's ranking is used to refer to it within this paper.

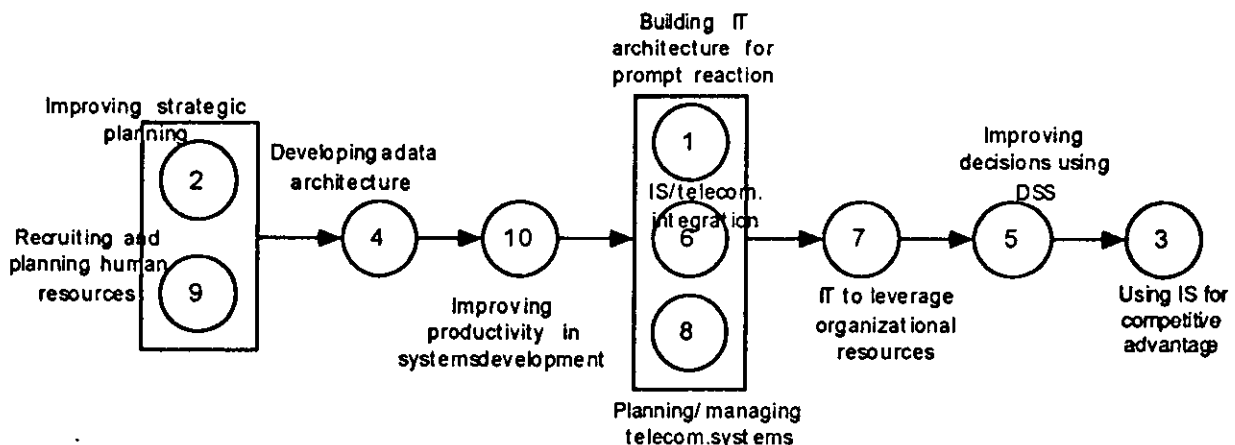


Figure 1: ISM Diagram

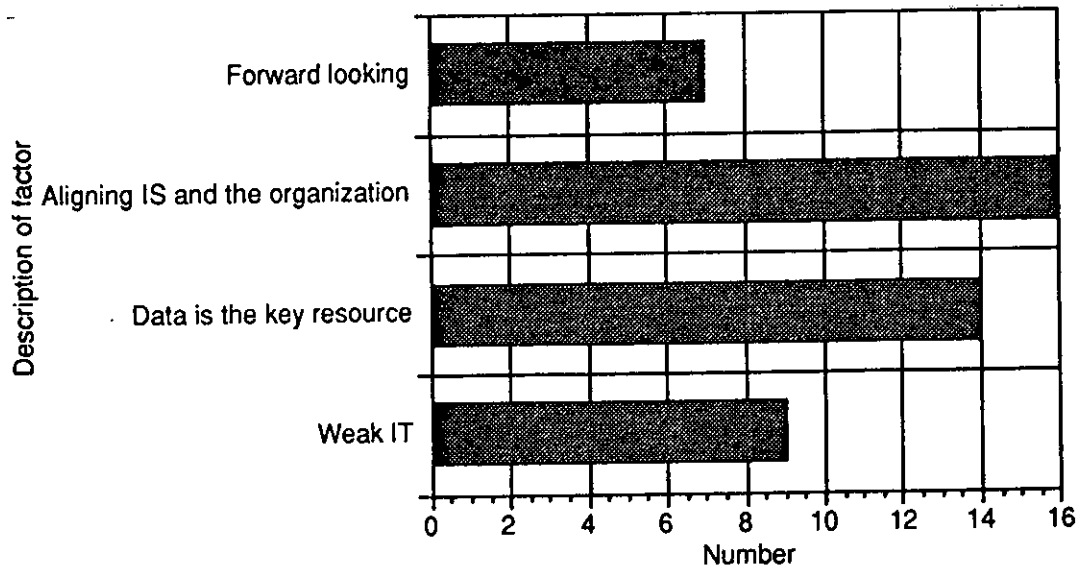


Figure 2. Phase of IS Unit Development

- **Organization:** Issues related to the political and managerial relationships of the IT function within the organization. Questions related to the positioning of the IT function in the organization, activity control, and relations with other areas reflecting the pursuit of power, autonomy and recognition of IT contribution.
- **Technology:** Issues related to information technologies needed for delivering services to the organization.
- **Efficiency:** Mostly internal management issues, often related to technical aspects of management of the IT function.

The four factors, representing different types of IS units, can be arranged by the phase of development of the IS unit. This arrangement is similar to the concept of stages of growth. The least developed IS units are those where IT is weak. At the next level, IS units have established their role but are still internally focused with an emphasis on data. The third stage represents a shift from an internal data focus to recognition that IS needs to align with the organization. Finally, we have organizations that are planning the change to global systems. Most organizations are in the middle two phases (see Figure 2).

Our interpretations are presented as conjectures based on the factor analysis of the Q-sort data and knowledge of Brazilian banking. We did not have access to individual respondents to collect additional data to support or refute our interpretation.

7. CONCLUSIONS

Brazilian banks have a highly developed IT function, whose key managerial issues are comparable to those in developed countries. IT is perceived as a strategic resource and aligned with the bank's business.

The paper presents some useful additions to the traditional key issues methodology:

- The use of Q-sort provides a more detailed dissection of key issues. This analysis highlights that the consensus reported by the traditional key issues approach is somewhat illusory. Without Q-sort, we would not have discovered that IS managers concerns fell into four distinct categories.
- The use of ISM provides a deeper understanding of the relationships among the key issues. The resulting model, showing a partial inversion of the key issues survey's priorities, gives managers valuable insights for the implications of these issues. ISM forces IT managers and researchers to move beyond independent consideration of key issues to evaluation of how issues interact.

Our findings suggest that the traditional single method approach to key issues analysis can be readily extended to a multimethod approach. Additional insights into the key concerns of IS managers were gained because Q-sorting enabled grouping of managers with common concerns and ISM produced a model showing the relationship between key issues.

A complete version of this paper is available at

<http://www.cba.uga.edu/faculty/rick.html>

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