ABSTRACT
This study intends to verify, through the perception of professionals in the naval industry, the presence of evidence indicating the generation of competitive advantage through the use of Enterprise Resource Planning - ERP in Brazilian companies. To attain this goal, two factors related to the subject were analyzed: the level of maturity of the system's application in the company and the perception of ERP as a source of competitive advantage. The results obtained point to an association between the level of maturity of the ERP system in the organization and the likelihood that managers will perceive the system as a generator of competitive advantage.

INTRODUCTION
Several studies have been conducted on the competitive advantages of IT (Clemens & Row, 1991; Kettinger et al., 1994; Mata et al., 1995; Porter & Millar, 1985) and the pros and cons of the implementation of ERP systems in organizations (Davenport 1998; Holland & Light, 2001; Krumbholz & Maiden, 2001; Wood & Caldas, 2001). It is estimated that 30 thousand companies around the world have implemented ERP systems and that there are more than 100 integrated management software suppliers (Mabert et al., 2001).

This study seeks a better understanding of the possibility of ERP systems being perceived by the professionals of the companies that implement them as sources of competitive advantage. The question that guided the study was: “Could the level of maturity of the ERP systems implementation influence the perception of these systems as sources of competitive advantage in the companies that implement them?”

ERP SYSTEMS MATURITY
The model proposed by Holland & Light (2001) identifies three stages in the ERP systems maturation cycle. In the first stage, organizations are managing legacy systems and starting implementation of the ERP project; in the second stage, implementation is complete, and the company begins to enjoy the functionality of the ERP system in its activities; in the third stage, the organization has normalized the system and is engaged in the process of obtaining additional value by using additional management systems.

The authors classify the stage of maturity of an ERP implementation process using five theoretical constructs:

a. Use of Information Technology - the importance of the technology function within the company;

b. Organizational Sophistication - how the organization structure has evolved as a result of the ERP system implementation;

c. Penetration of the ERP System - how extensively the system is used, including organizational and technical penetration and employee acceptance;

d. Vision - strategic potential for and use of the system itself;

e. Drivers and Lessons - the lessons learned during the implementation process and the drivers behind the adoption of the ERP system.

Although Holland & Light (2001) admit that organizations may present characteristics of more than one stage and that the stages are superposed in practice, the authors state that one stage will prove to be dominant as the company implements concurrent projects and gradually moves towards maturity of the ERP system implementation process.

COMPETITIVE ADVANTAGE THROUGH INFORMATION SYSTEMS
According to Kettinger et al. (1994), the contemporary view of the competitive use of Information Technology holds that it must be a component of overall business strategy and that its application depends more on understanding unique business opportunities than on competitive benefits attained through technological features.

Through a vast review of literature, the authors sought to identify factors that contributed to the sustainability of an achieved competitive advantage. Three categories of factors were observed:

a. Environmental factors - reflect the environmental and unique situations that affect sustainability;

b. Foundation factors - exist by virtue of the company’s infrastructure and have evolved over time;

c. Action factors - reflect strategic measures to leverage the foundation factors to a level of strategic application capable of creating sustainable competitive advantage.

Classically, a competitive advantage is achieved when the company receives returns on its investment that are above average for the industry, and the sustained advantage, over a long enough period of time, ends up altering the industry structure (Porter, 1985). The impact of implementing a system considered a source of sustainable competitive advantage was evaluated by Kettinger et al. (1994) through a study of events, in which the company’s performance in periods preceding and following the system launch were analyzed. As a result of their study, they concluded that, in a sample of 30 businesses reported in the literature as possessing information systems capable of providing them with sustainable competitive advantage, only 15 were consistent in the analysis of the evolution of the relative performance factors in the chosen periods.

METHOD
This paper investigates the possibility that the competitive potential of standardized ERP systems is perceived differently depending on the level of development of the application within the organization. It seeks to relate the stage maturity model proposed by Holland & Light...
The comparison of the companies in the light of each of the model’s constructs appears to furnish the means to classify them into the different stages of maturity. Company A seems to be in the second stage, where it has achieved a satisfactory level of operation, solved the problems that motivated the adoption of the technology, such as lack of budget control, but still requires more sophisticated uses and applications that will improve the company’s main business, especially in the areas of project management and maintenance.

Company B appears to be in the third stage and, therefore, more likely to present competitive capabilities and advantages in comparison with the competition. This statement is backed by the pioneering quality and inventiveness of the application, the high level of complexity that a decentralized system requires, the use of sophisticated tools to extract value from routine transactions, the concern with restructuring the configuration of the system, and all of the cultural and organizational transformations that took place along with the implementation of the system.

### Analysis of the Companies According to the Questionnaire Based on Kettinger et al (1995)

The model presented by Kettinger et al. was particularly interesting to reveal the interviewees’ perception of the possibility that the implemented system would generate a competitive advantage for the company, although, as in all models created to simplify and make feasible the analysis of a reality through the selection of a few variables, the authors point out the didactic and experimental nature of their endeavor.

The mean results presented in Table 2 revealed a higher tendency for the ERP system to be perceived as a generator of competitive advantage in company B, when compared to company A (paired samples T-test p=0.068). This perception is stronger in the comparison between the foundation factors (paired samples T-test p=0.021), which are more difficult to acquire, imitate, or implement over a short period of time, giving the acquired advantage a quality of sustainability. Company B

### Table 2: Summary of the Results of the Questionnaire Based on Kettinger et al. (1995)

<table>
<thead>
<tr>
<th>Domain</th>
<th>Company A</th>
<th>Company B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation Factors</td>
<td>3.73</td>
<td>3.67</td>
</tr>
<tr>
<td>Active Factors</td>
<td>3.20</td>
<td>3.67</td>
</tr>
<tr>
<td>Environmental Factors</td>
<td>3.00</td>
<td>2.46</td>
</tr>
<tr>
<td>Total</td>
<td>3.41</td>
<td>3.03</td>
</tr>
</tbody>
</table>

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presented a significant difference among its factor’s means (one way ANOVA: F=12.410; p=0.000)

DISCUSSION

The data analysis in the previous section seems to provide an affirmative answer to the question: “Could the level of maturity of the ERP systems implementation influence the perception of these systems as sources of competitive advantage by the companies that implement them?” We found that the company that is at a more advanced stage of ERP system maturity is more likely to perceive itself as possessing a competitive advantage resulting from the implementation of the system.

Company B, a pioneer in implementation of the system, underwent a profound organizational transformation process, makes use of advanced resources integrated to the system, and possesses a decentralized IT structure. It has the characteristics that allow it to be classified in the most advanced stage of the maturity model, having reported perceptions that reflect more awareness of the potential for generating competitive advantage through the ERP system. Company A, on the other hand, has yet to implement functions that are essential to its business, even though the initial goal of gaining control over costs and budgets while maintaining its entrepreneurial characteristics dating back to the foundation of the company was achieved.

The indications that back up the confirmation of the original supposition appear to be in accordance with what authors already confirmed, such as Wood & Caldas’ (2001) theory that companies that perceive themselves as possessing a competitive advantage used the implementation of ERP systems as a broader process of organizational transformation. This was made particularly clear by the changes that took place in company B. The company’s management transition, decentralization of the decision-making process, autonomy, and widespread business- and technology-oriented profile are indications that the transformation process, although acknowledgedly traumatic and risky, generated distinctive competencies that the competition has difficulty achieving. In addition, company B higher results for the impact of the ERP system on the foundation and action factors appears to support Clemons & Row’s (1991) theory on the importance of a company’s structural differences for obtaining competitive advantage over its competitors.

CONCLUSION

The results obtained in this study point to an association between the maturity stage of the ERP system implementation and the generation of competitive advantage for the company, thus the higher the level of maturity of ERP system usage in an organization, the more likely its managers are to see the system as a generator of competitive advantage.

The study also allowed us to verify the existence of a few elements highlighted as indicators of competitive advantage resulting from IT applications, such as the technology managers’ managerial abilities and the occurrence of considerable structural transformations as a consequence of the implementation of the information systems.

It is important to emphasize that the external validity of this research is limited to the studied companies. Future studies may continue using the models discussed here, seeking to use the instruments in such a way as to validate them, carrying out research in more companies and industries, in Brazil and abroad.

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