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# Difficulties in Enterprise System Implementation: Lessons Learned from Projects in Poland

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## ABSTRACT

The goal of this paper is to examine the difficulties experienced by organizations during the process of enterprise system (ES) implementation. This study builds on research conducted among a few dozen experts representing ES suppliers and dealing with numerous ES implementations in Poland. The discovered difficulties in ES implementations are divided into the following categories: economic, technical, organizational, and social. Drawing from the results of research on Polish organizations, the study discusses the characteristics of ES projects in emerging economies. Furthermore, the analysis relates this study's findings with prior research and examines the differences between problems experienced by ES projects in emerging economies and highly developed countries. Finally, on the basis of the research, conclusions were drawn for the researchers and practitioners dealing with ES implementation projects in emerging economies.

## Keywords

Enterprise System, implementation, difficulties, emerging economies, Poland.

## INTRODUCTION

The implementation of an enterprise system (ES) is an enormous effort for the organization. During this usually lengthy process, the company undergoes many difficulties and has to remove various impediments to project success. The ultimate effects of ES can be varied, from overall success manifested in the increase of a company's profitability, to complete failure and the firm's bankruptcy. Therefore, it is valuable to examine implementation projects and try to discover issues having an influence on implementation outcome. In particular, it is important to investigate the difficulties experienced by the practitioners and learn from their experience.

Much of the literature dealing with ES implementations originates from and describes application contexts in North America, and to a lesser extent Western Europe, where most ES developers are located and implementations have occurred (Davison, 2002). As a result, the existing literature mostly builds on the experience of developed countries. Meanwhile, in the process of information technology implementation, organizations in developing and developed countries experience different implementation issues, human resource problems, and socio-political considerations (Bingi, Leff, Shipchandler and Rao, 2000). In particular, ES implementations in developing countries experience specific conditions resulting from both national/environmental characteristics and organizational/internal factors (Huang and Palvia, 2001).

Therefore, it is necessary to conduct research among ES projects taking place in emerging economies and enrich the existing body of knowledge. An example of an emerging economy is Poland, which is classified as a developing country with an upper-middle-income economy (The World Bank, 2006). Naturally, Poland does not face the problems of the poorest countries and recently, in 2004, joined the European Union. However, the difference between Poland and the "old" members of the EU, such as Germany or France, is still very big, when we take into consideration such items as Gross National Product, work efficiency, unemployment rate, road infrastructure, etc. Hence, the examination of ES adoption in Poland should give us the insight into the specificity of ES projects in emerging economies.

The goal of this study is to examine the difficulties experienced by organizations during the process of ES implementation. The analysis builds on research conducted among professionals dealing with numerous ES implementations in Poland. The discovered difficulties are carefully analyzed, categorized, and related with prior research findings.

## RESEARCH METHODOLOGY

This study builds on exploratory research conducted among experts representing ES suppliers and dealing with numerous implementations in Poland. A field study was used as a general research approach and a questionnaire was employed as a

data-gathering technique. The examination of difficulties experienced during ES implementation was conducted from the perspective of ES system and services suppliers.

The study used a questionnaire, which was sent by regular mail or by email to the respondents. In order to recognize the respondent opinions, an open question was asked about the most important problems occurring during ES implementation projects. This approach allowed respondents to honestly express their beliefs and to gather a broad range of opinions regarding difficulties in ES projects.

The questionnaire was directed to the specialists with experience in implementing various ES systems. They were leading implementation projects from the supplier perspective and taking part in many implementations. As a result, they provide a broad view of ES implementations' conditions gained in various projects.

The respondents were recruited in two ways. Firstly, experts were contacted individually using opportunities arising from professional activities. Secondly, a number of ES packages' suppliers were contacted and asked for help in data gathering. Phone calls were used in order to initiate the contact and were then followed by questionnaires' dispatched by email or regular mail. In a number of cases, successive phone calls and/or emails were made in order to encourage people to fill in the questionnaire. Two things seemed to motivate the prospective respondents: the promise that they will receive the research results and the author's business background as an ES consultant.

### Research Sample

During the research, 45 people were questioned and 31 (69%) experts' opinions were gathered. The experts were involved in a total of over 350 ES implementation projects in Poland, which gives an average value over 11. They represented 22 firms supplying ES and implementation services. Their experience covers a wide range of ES systems, which include internationally known packages such as SAP, IFS, JDEdwards or Oracle, as well as systems developed and known in Poland like Digitland Enterprise. The respondent's experience in dealing with ES projects ranges from 2 to 15 years with a 6.7 average value. The information about the participants' experience is provided in Table 1 and demonstrates that the people inquired are reasonably experienced. In addition, the vast majority of them held managerial positions within their companies, which is illustrated in Table 2.

ES experience	% of respondents
to 4 years	19%
5 years	13%
6 years	19%
7 years	13%
8 years	13%
9 years	13%
over 10 years	10%

**Table 1. Experts by Experience in Dealing with ES Projects**

Position	% of respondents
director	29%
project manager	16%
consultant	16%
manager	13%
senior consultant	10%
other (managerial)	16%

**Table 2. Experts by Organizational Position**

### Classification of Difficulties

Prior studies examining difficulties in ES projects employed various methods of element groupings. The number of distinguished categories of problems experienced by ES adopters varies from two (Themistocleous, Irani, O’Keefe and Paul, 2001), through three (O’Leary, 2000) to five (Kim, Lee and Gosain, 2005). The distinguished groups cover issues of various nature and scope, e.g. technical, operational, legal, business/economic, organizational, managerial etc. There are also studies that do not use categorization (e.g. Kremers and van Dissel, 2000; Wong, Scarbrough, Chau and Davison, 2005; Wright and Wright, 2002) or group the issues on the basis of ES project lifecycle (Markus, Axline, Petrie and Tanis, 2000).

Hence, since there does not appear to be any rigorous method of difficulty categorization; this study adopts its own division of problems. The classification draws from the framework used in categorization of implementation goals (Soja, 005a) and effects (Soja, 2005b). The discovered difficulties in ES implementations are divided into the following categories: economic, technical, organizational, and social.

- *Economic problems* concern issues related to the company’s economic condition and they are usually connected with scarce financial resources and high costs incurred.
- *Technical problems* refer to the particular system solution and surrounding IT infrastructure. They “arise largely because of information processing technology” (O’Leary, 2000).
- *Organizational problems* concern issues related to the aligning of corporate organizational structure and its procedures to an enterprise system’s needs. These problems are derived from the environment in which the system is chosen and implemented<sup>1</sup> (O’Leary, 2000). This group also covers issues related to the organization and execution of an implementation project.
- *Social problems* are connected with the people involved in a project and their attitudes. They relate to multiple stakeholders from an organization introducing an ERP package, as well as to the system provider’s representatives.

During the process of mapping difficulties onto the defined categories, some reported issues were found to be connected with more than a single category. In these cases, those “blurred” elements were assigned to a category which seemed to better reflect the cause of a problem situation.

### RESEARCH RESULTS

Experts’ opinions regarding the difficulties observed in ES projects, divided into the described categories are presented in Table 3. Within each category, various difficulties are listed together with a short description and the percentage of respondents indicating the given problem or problem category (column %). The reported difficulties are listed in decreasing order of frequencies inside the appropriate category; also, the categories are listed starting from the most frequently reported.

The experts recognized organizational and social problems as the most serious difficulties in ES implementation. Simultaneously, technical and economic problems attracted their attention to a much lesser extent. From the organizational perspective, the experts most frequently recognized issues connected with project goals, and, to a lesser extent, problems with a company’s bad organizational condition and difficulties with communication and decision making.

Considering social issues, problems connected with employees’ knowledge and education appeared to be the most frequently reported. The experts also recognized problems with the attitudes and qualifications of top management’s representatives and implementation team members. The respondents also pointed to users’ resistance to change and a new system.

As regards technical problems, it turns out that the experts did not frequently point to difficulties related with the system and surrounding infrastructure. Interestingly, they practically did not recognize problems with the system itself but rather perceived the real problem in the lack of awareness of the system’s drawbacks. Finally, the economic issues consist of difficulties related with high costs incurred, which were reported by one third of the respondents.

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<sup>1</sup> In the division proposed by O’Leary (2000), this group covers issues connected with both organisation structure and personnel. In the framework adopted in this study, issues related to personnel are moved to a separate group named „Social problems”.

%	Problem category / Problem	Details
84%	Organizational problems	
29%	project goals	lack of clearly defined goals of the implementation project; incorrectly defined goals; lack of priorities
19%	company's condition	bad organization of a company; unclear organizational procedures; unclear strategy; company inadequately prepared for the project
19%	communication	problems with communication and information flow; different understanding of the same ideas by different departments
19%	decision making	problems with decision making (e.g. regarding personnel); indecisiveness of a company's representatives
16%	personnel availability	key employees unavailable; workers' lack of time
16%	inadequate project plan	wrong or unrealistic implementation plan; too short of a time planned for the implementation; bad project schedule
13%	project vision	lack of vision of implementation and required changes in company's processes
13%	retention of company's actual situation	willingness to keep the actual state of an organization and adjust ES to its requirements
10%	conflicts	conflicts between a company's departments; conflicts during organizational change
6%	implementation management	mistakes in project management; lack of risk control; lack of implementation tasks' coordination
6%	changes in a company	serious organizational and ownership changes during the project; changes in top management
6%	burden to employees	workers burdened by additional work required by implementation tasks, trainings etc.
6%	training	inadequate training phase of a project; cutting training
6%	changes in requirements	escalation of requirements during the project; lack of requirement coordination
3%	organizational structure	changes in company organizational structure imposed by the introduced system
81%	Social problems	
35%	employees' knowledge and education	lack of management's competence; lack of personnel's computer literacy; lack of knowledge about company's operations, enterprise systems and their implementation; unrealistic expectations
32%	top management	lack of top management support and involvement; lack of project understanding by top management
23%	implementation team	lack of implementation team members' commitment; inadequate composition of implementation team (e.g., too few people, people not empowered to decision making)
19%	resistance to new system	resistance of middle management, IT staff, and system users; people avoiding implementation duties
19%	reluctance to change	people highly accustomed to existing solutions and unwilling to change
16%	project manager	lack of a project manager; inadequate person appointed as a project manager; necessity of sharing time between implementation tasks and organizational duties
13%	system provider's competence	consultants lacking competence, knowledge, and experience; problems with the availability of system provider's services
10%	motivation	lack of employees' motivation to perform implementation tasks and learn new skills
10%	project acceptance	people not convinced about the project; lack of general acceptance for the project; problem with project acceptance by people not involved in implementation duties
10%	personnel's fear	fear about possible consequences of implementation project: loss of job, position, and status
6%	personnel turnover	employees changing their job positions or leaving the company
6%	users' responsibility	lack of responsibility and care among people entering data into the system

**Table 3. Problems Occurring During Enterprise System Implementations in Experts' Opinions**

%	Problem category / Problem	Details
32%	Technical problems	
13%	data	problems with completing and ordering system data; problems with transferring data from legacy systems to ES
10%	system drawbacks	implementers unaware of program's errors and shortcomings; system's poor quality; lack of efficient application testing; system does not fit company's needs
6%	system efficiency	users unable to enter data in on-line mode; problems with customer and provider orders' handling
3%	infrastructure	lack of adequate infrastructure for the system
32%	Economic problems	
32%	high costs	inadequate financial budget for the project; loss of financial resources; company's financial problems; lack of financial flexibility and resource allocation

Table 3. (cont.)

## DISCUSSION OF FINDINGS

### The Most Important Difficulties

Table 4 summarizes the difficulties most often reported by the experts and those not present in prior studies. The problems are listed in decreasing order of frequency, which is given in column %. For each listed problem, the corresponding category was indicated by placing the first letter of the category name, i.e. e for economic, s for social etc.

Difficulties	% of respondents	Category
Topmost		
employees' knowledge and education	35%	(s)
top management	32%	(s)
high costs	32%	(e)
project goals	29%	(o)
implementation team	23%	(s)
Unreported by prior studies		
employees' knowledge and education	35%	(s)
decision making	19%	(o)
project manager	16%	(s)
personnel availability	16%	(o)
company's condition and stability	16%	(o)
users' responsibility	6%	(s)
system efficiency	6%	(t)

Table 4. The Most Important Difficulties Reported by the Experts

The experts emphasize, first and foremost, the social difficulties which occur during ES implementation project. The discovered problems refer to practically all stakeholders involved in the project: employees, implementation team members (who are typically functional departments' managers), and top management representatives. Next, the organizations suffered from the high costs involved and problems connected with goals definition.

The picture of ES implementation as a social problem related initiative is completed by difficulties recognized by the experts and not reported by prior studies<sup>2</sup>. These difficulties cover mainly social and organizational problems. Two issues from the latter group, decision making and personnel availability, although classified as organizational, are also connected with people and thus, in a way, have a social nature.

### Prior Studies' Results

There are several studies dealing with difficulties in enterprise system implementation. The researchers use different concepts, which have various scope and meaning. As a result, comparing and integrating their findings is relatively difficult. Furthermore, there are studies based on research conducted among adopters and experts dealing with ES implementation, as well as those representing the viewpoint based mostly on literature review. In the analysis of prior works, this study focuses on research conducted among practitioners in highly developed countries.

Markus et al. (2000) conducted research among a few dozen respondents from North America and Europe, both adopters and experts representing system suppliers. The discovered problems were divided into groups on the basis of project phase and listed without any specified ranking. Another research based on field study is a survey of Fortune 500 organizations performed by Kim et al. (2005). The authors use a few dozen impediments identified from the previous ERP implementation studies and extract the five most critical impediments to ES success.

Kremers and van Dissel (2000) focused on the issues connected with migrations of ERP systems. They conducted research among 24 Baan customers, the majority of which came from highly developed countries from Europe and from the USA and Australia. Wright and Wright (2002) conducted interviews with 30 experts from Big 5 consultancy firms, who specialized in assessing risks for ERP systems. Themistocleous et al. (2001) performed an Internet survey and gathered 50 responses from adopters mainly from Europe, North America, and Australia. The difficulties reported by the three above-mentioned studies were ranked on the basis of the frequencies reported.

Difficulties*	Cat	Study
Most important difficulties		
time over-run	(o)	Kremers and van Dissel 2000; Themistocleous et al. 2001
business processes not redesigned	(o)	Kim et al. 2005; Wright and Wright 2002
system drawbacks	(t)	Kremers and van Dissel 2000; Wright and Wright 2002
users not involved	(s)	Kim et al. 2005; Wright and Wright 2002
Important difficulties		
inter-departmental conflicts	(o)	Kim et al. 2005
organizational change expertise^	(o)	Kim et al. 2005
inadequate training	(o)	Wright and Wright 2002
integration	(t)	Themistocleous et al. 2001
customization^	(t)	Themistocleous et al. 2001
cost over-run	(e)	Themistocleous et al. 2001
user resistance	(s)	Kim et al. 2005

Note:

\*The rule for extracting the topmost problems: the top 5 and reported by more than 25% of respondents (when frequency provided)

^Not mentioned by this study's respondents

**Table 5. Topmost Difficulties Reported by Prior Studies**

Table 5 contains the most important difficulties reported by prior research. The list was prepared on the basis of the results of those studies, which were conducted among practitioners and somehow ranked their findings or extracted the most

<sup>2</sup> The prior studies considered in the comparison are described in the next section.

important/critical issues. The most important difficulties include those reported by more than one study, while the problems reported by single works were classified as important.

Table 6 contains the difficulties distinguished by prior studies but not mentioned by the Polish experts. The previous studies recognize first and foremost technical problems related with the system's customization, security, and integration with other applications. Other technical problems deal with the quality of applications and information provided by the system. Organizational issues cover those connected with inappropriately cutting project scope and lack of organizational change management expertise. Finally, one of the prior studies reported the social problem with users' involvement in the ES design.

Difficulties	Study
Technical	
Software modifications and customization	Markus et al. 2000 Themistocleous et al. 2001
System security / Lack of adequate controls	Themistocleous et al. 2001 Wright and Wright 2002
The ERP system did not provide information needed to do the task	Wright and Wright 2002
Quality of the migration support tools	Kremers and van Dissel 2000
Integration with other applications	Themistocleous et al. 2001
Organizational	
Inappropriately cutting project scope	Markus et al. 2000
Lack of organizational change management expertise	Kim et al. 2005
Social	
Users were not adequately involved in the design of the ERP system	Wright and Wright 2002

**Table 6. Difficulties from Prior Studies Not Mentioned by This Study's Respondents**

### Emerging Economies versus Developed Countries

It should be noticed that all the topmost difficulties reported by the Polish experts, except for high costs, have not been indicated in prior studies as topmost problems during ES implementation. The majority of those problems is constituted by social difficulties and, what is worth noting, includes the most frequently indicated problem – employees' knowledge and education. This difficulty has not been reported by prior studies conducted in developed countries. Moreover, some other problems connected with people taking part in the project are listed by the Polish experts and absent in prior studies. Therefore, it seems that social difficulties experienced during ES implementation may be the characteristics of ES projects in emerging economies.

It is worth noting that among social problems only those connected with users' involvement and resistance are perceived by previous studies as serious difficulties during ES implementation. Other social difficulties reported by prior research include problems with top management and implementation/product consultants. While the first issue is highly appreciated by the Polish experts, the latter is rather underestimated and perceived by only 13% of the respondents.

There are difficulties reported by the Polish experts which are "purely organizational", i.e. not connected with people's attitudes and skills. These include difficulties connected with project goals setting, problems arising from the company's poor organizational condition and troubles caused by serious changes in the company during the implementation process. The problem with project goals is perceived by the Polish experts as one of the topmost difficulties. It is reported by prior research; however, it is not indicated among the most important impediments. On the other hand, the issue related to a company's state seems to be unique to this research. However, it is mentioned by only 16% of respondents.

Practitioners from highly developed countries mainly perceive difficulties of an organizational and technical nature. The vast majority of organizational difficulties were to a certain extent recognized by the Polish experts, except for lack of organizational change expertise. However, this difficulty was indicated by only one of the prior studies and seems to be a special manifestation of general difficulties with implementation project management. From among the technical problems, the Polish experts did not notice difficulties connected with system customization and integration, and to a very small degree reported system drawbacks. This can suggest that technical problems seem to be underestimated by the respondents.



This raises the issue of the population inquired, which consists of experts dealing with ES projects from a system supplier's perspective. These experts most often use a single particular ES package without the possibility of changing the system solution. Therefore, they may treat the system deficiencies as something natural and, in a sense, get accustomed to them. As a result, the experts may underestimate technical problems connected with the system and surrounding IT architecture. Meanwhile, research conducted among Polish organizations adopting ES packages suggests, that issues connected with system reliability seem to have a paramount importance for the ES implementation outcome (Soja, 2004). Hence, we should not rather firmly conclude that the lack of technical problems is the typical feature of ES projects in Poland.

It turns out that practitioners from both groups of respondents acknowledge the difficulties connected with the high costs involved. However, this problem is listed among the topmost impediments by Polish experts and recognized as topmost by only a single study from those conducted in developed countries. Hence, we can state that the high costs involved appear to be a common characteristic of ES implementation regardless of the type of market and business environment. Nevertheless, the projects taking place in emerging economies seem to suffer more from this reason.

### Lessons Learned

Considering the opinions of Polish experts, the most significant difficulties experienced by the organizations in emerging economies include:

- Ÿ Social problems connected with the knowledge, education, and attitudes of all stakeholders involved in the ES project within the company. The studies conducted in highly developed countries recognize the problems mainly connected with system users' involvement and resistance.
- Ÿ High costs connected with ES implementation. Although present among projects in highly developed countries, this issue seems to be more severe for the projects in emerging economies.
- Ÿ Organizational problems connected with planning activities of ES implementation, such as goal setting and the assessment of a company's condition. In highly developed countries, organizational problems tend to focus on the actual implementation phases.

The findings of this research partially support the results of other studies conducted among emerging economies. Namely, the study of Wong et al. (2005) builds on four case studies conducted in organizations in China and Hong Kong and thus to a certain extent describes the situation of firms in emerging economies. The authors propose 14 critical failure factors and all of these factors are reported by this study's respondents, except for the factor "over-reliance on heavy customization". The absence of this factor, as discussed earlier, can be attributed to the research sample characteristics.

Huang and Palvia (2001) in their characteristics of ERP implementation in developing countries from an organizational and internal perspective emphasize: (1) low IT maturity, (2) small firm size, which raises the issues of affordability and availability, and (3) lack of process management orientation and BPR experience. All these characteristics were reflected in the difficulties reported by the Polish experts. Namely, low IT maturity is connected with people's computer literacy and knowledge, rather than with IT infrastructure. The second issue is illustrated by complaints about the high costs incurred. Finally, the third characteristic is reported through the problems with a company's organizational condition, which not only refer to the lack of process management, but also to fundamental problems with a company's organizational order.

### IMPLICATIONS AND FURTHER RESEARCH

On the basis of this study's results, we can formulate some recommendations for ES adopters in emerging economies. Firstly, the implementers should pay special attention to the organizational/initial phase of the ES project. At this stage, the implementers should assess organizational readiness for the ES project and the availability of sufficient financial resources for the project. Further, once the decision about the project is made, the adopters ought to ensure that the ES project is a business-driven initiative, which should be reflected in the definition of appropriate project goals.

The assessment of the project feasibility should also consider the human resources needed for the ES implementation. The organization must assess the capabilities of the available people, their knowledge, and education. The Polish experts emphasize the difficulties connected with people's knowledge and education, while practitioners from highly developed countries stress the problems arising from people's wrong attitudes. This illustrates the vital necessity of evaluating people's competence before the project starts in the case of emerging economies. The supporting reason is that building people's knowledge requires a substantial amount of time, while personnel's attitudes can be monitored and changed in a shorter time.

The analyzed studies of ES implementations represent the viewpoints of various stakeholders and this diversity may have an influence on the research outcome. The view of the problem depends on the "experts" that have been chosen and how they

are represented in the sample (O'Leary, 2002). For instance, Wright and Wright (2002) emphasize the vital role of users' involvement in the design of the system, which is unnoticed by other studies. Furthermore, the responding Polish experts seem not to perceive the difficulties with system reliability and the problems with system supplier's competence, which could be attributed to the characteristic of the sample. The respondents represent one group of stakeholders and it would be very valuable to supplement their viewpoint with other stakeholders' opinions. This could be a direction of further research.

Another issue is connected with the type of difficulties experienced by ES implementations. O'Leary (2000) argues that when companies discuss problems with ERP implementations, it generally involves one of the following problems: budget over-run, time over-run, lack of benefits, and meeting business plan criteria. However, all given issues seem to be rather the consequences of earlier impediments or mistakes and they usually appear during the final stages of the project. Meanwhile, it is valuable to focus on the problems, which are the reasons of other difficulties, and, when discovered, it would be possible to undertake some preventative actions.

Therefore, there is a need for the research on understanding more fully the nature of the problems in order to create a coherent framework of difficulties/impediments to ES implementation success. Further research may focus on investigating the interrelations between problems and discovering causal relationship, which should yield the categorization of difficulties into types. This should result in a clear distinction of what is the real problem in ES implementation, and what is the manifestation or the consequence of the other problem.

This study's results, naturally, have some limitations. Their scope seems to cover countries from Eastern and Central Europe which belonged to the Soviet Block after the Second World War and are now experiencing economic transition. In particular, Poland appears to be representative of those countries which joined the European Union in 2004, mainly due to the similar levels of economic growth, GNP and comparable standard of living. Findings from this study may also be applicable to emerging economies from other parts of the world; however, we must then consider other factors influencing ES projects, such as cultural differences, which is particularly important in the case of Asian countries.

## CONCLUSION

This study examines the difficulties in enterprise system (ES) implementation projects and builds on the experience of a few dozen ES practitioners from Poland. Analyzing the difficulties reported by the responding experts, this paper employs the problems' categorization into economic, technical, organizational, and social issues. The study relates its results with the findings of prior research conducted in developed countries and formulates recommendations for the practitioners dealing with ES implementation in emerging economies.

The results suggest that the main difficulties in ES implementation in emerging economies are connected with human resources involved in the project and the high costs incurred. The findings also illustrate the importance of a planning stage of ES implementation and a company's readiness for the project. Drawing from this study's results, practitioners may better anticipate possible problems and assess potential threats to their projects.

This study's findings should also benefit the academic community, as they illustrate the need for incorporating multiple stakeholders' perspectives in ES projects research. Moreover, the results also suggest the importance of further work in order to discover the types of problems and determining the causal relationship among them. The main limitation of this study is that it is based on the opinions of one group of stakeholders, i.e. ES suppliers' representatives. However, the experts involved in this research comment on a few hundred implementations of various ES systems, which adds credibility to the results.

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