References

1. *Romanova, I. V.* The Influence of Social Networks on Language and Communication / I. V. Romanova, O. V. Konnova, A. V. Glazkova // Russian Linguistic Bulletin. – 2024. – № 3 (51). – P. 20.

2. *Thurlow, C.* Computer-mediated communication. In The Handbook of Language and Media / C. Thurlow, M. Poff. – John Wiley & Sons, 2013.

I. Gritsuk, A. Zeinalov
И. А. Грицук, А. Р. Зейналов
БНТУ (Минск)
Научный руководитель Е. В. Слесаренок

DATA ECONOMICS: A COMPARATIVE ANALYSIS OF THE ROLES OF SSDS AND HDDS IN MODERN STORAGE SYSTEM ARCHITECTURE

Экономика данных: сравнительный анализ ролей SSD и HDD в архитектуре современных систем хранения

The concept of data economics is gaining significant momentum in modern information systems, affecting how storage systems are designed and managed across almost all sectors today. With the volume of data increasingly thought of as a resource instead of a byproduct, companies have to balance cost efficiency and technological effectiveness.

The main goal of this work is to analyze and prove the economic and operational benefits of a hybrid storage solution which combines SSDs (Solid State Drives) and HDDs (Hard Disk Drives) within one system. The research work aims at investigating their performance, costs, and energy consumption under various workloads to demonstrate that an effective trade-off between performance and cost can be achieved in these data systems through smart integration of both kinds of technology.

SSDs are best suited for «hot» data: dynamic information that is accessed frequently and forms the basis of real-time operations. In applications such as database clusters, transactional systems, and analytics platforms, SSDs enable seamless flows of information with minimum latency. HDDs, on the other hand, have a continuing role in storing «cold» data: archives, backups, and large historical volumes of information that must be safely retained but seldom accessed. Because of this, the majority of companies operate today on a hybrid model of storage that reflects the varied needs of their data. Here, rather than in competition, SSDs and HDDs work together.

Energy efficiency also favors the use of both drive types. SSDs consume less power and produce less heat, thereby increasing the ecological and operational efficiency of data centers-something that is becoming increasingly important as energy costs go on

to increase and ecological awareness spreads. Whereas SSDs have a higher upfront cost, savings from reduced energy consumption and reduced cooling requirements can balance out over time. On the other hand, HDDs are still very good value when considering cost per terabyte. A mix of these economic and technical factors dictates how companies develop their storage systems, balancing immediate performance needs with ongoing budgetary and sustainability challenges.

The performance and cost dynamics of hybrid storage were quantified by experimental analysis. A total of four drives were tested with fio under the same conditions, comprising two 1 TB SSDs using NVMe and SATA and two 2 TB HDDs using 7200 rpm and 5400 rpm, respectively. Random 4 KB tests simulated hot workloads, while 1 MB sequential tests represented cold storage; each was repeated five times for consistency.

Economically, the price of a 1 TB HDD was about US$60 versus US$90 for a 1 TB SATA SSD. The performance was different: SSDs reached ~50,000 IOPS at ~0.05 ms of latency, while HDDs could provide up to 150 IOPS at 8-10 ms. Power draw also favored SSDs, reaching ~6 W compared to ~8 W for HDDs.

A five-year TCO model demonstrated that on a $1,000 budget, the optimal mix is approximately 30 % SSD and 70 % HDD capacity-ensuring speed for critical tasks and low-cost storage for infrequent data.

On the whole, these findings confirm that actual storage efficiency is a combination of SSDs and HDDs: SSDs provide speed, while HDDs provide economical capacity. It is their balance, rather than the dominance of one technology over another, that defines sustainable and effective data architecture.

E. Gross
Е. А. Гросс
БГЭУ (Минск)
Научный руководитель И. В. Ивашкевич

INTERNET COMMUNICATION AS A POWERFUL FACTOR IN THE TRANSFORMATION OF THE MODERN LINGUISTIC AND CULTURAL ENVIRONMENT

Интернет-коммуникация как мощный фактор трансформации современной лингвокультурной среды

Internet communication is radically changing the way people interact and is a powerful catalyst for the transformation of the linguistic and cultural environment. It influences language and culture, forming new genres, styles, and norms of communication.

The purpose of this article is to analyze how the unique features of Internet communication create new genres, styles, and norms, as well as to examine how specific digital tools (memes, emoticons, hashtags) influence everyday language.