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**Article Sammary:**

**INFORMATION TECHNOLOGIES FOR KNOWLEDGE  
MANAGEMENT: THEIR USAGE AND EFFECTIVENESS**

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The research article, "**Information Technologies for Knowledge Management: Their Usage and Effectiveness**," was published in **August 2002** in the journal *ITcon*. The study is co-authored by two experts in the field of project management and the built environment:

- **Charles O. Egbu:** is a British professor specializing in [construction and project management](#) with over 30 years of experience in UK universities. He earned his degree from Leeds Metropolitan University and a PhD from University of Salford, and his research focuses on [knowledge management and sustainable development in construction](#).
- **Katherine Botterill:** is a researcher in the field of the built environment who worked as a Research Associate at the Centre of the Built Environment at Leeds Metropolitan University, UK. She is also a Senior Lecturer in Human Geography at the University of Glasgow, and her research [focuses on migration, citizenship, and the social and political experience](#).

The article discusses the increasing importance of knowledge as a key economic resource in modern organizations, especially in advanced economies. It explains that knowledge management (KM) has become essential for improving competitiveness and organizational performance. However, there is still ambiguity about the concept of KM and many people mistakenly believe that knowledge management is the same as information technology (IT).

The authors clarify that KM is broader than IT. Knowledge management involves processes such as creating, acquiring, sharing, communicating, and applying knowledge within an organization. Knowledge can exist in different forms, including symbolic, embodied, and encultured knowledge, and it often develops through social interaction and experience.

The paper also highlights that managing knowledge in organizations is complex and requires the integration of several factors, including people, organizational culture, processes, and technology. Although IT plays an important role in supporting knowledge management, it should be seen as a tool that facilitates knowledge sharing rather than replacing human interaction.

Finally, the study focuses on the construction industry, which has been relatively slow in adopting IT for knowledge management. The purpose of the research is to analyze the technologies used in construction organizations and evaluate their effectiveness in managing knowledge.

- **Research Methodology**

The study utilized a **mixed-methods approach**, combining qualitative and quantitative data collected between October 2000 and October 2001:

- **Qualitative Phase:** 19 ethnographic interviews were conducted across five UK project-based organizations of varying sizes (small to large). Participants

included senior, middle, and junior-level personnel. These interviews served as multiple case studies to provide contextually rich insights into knowledge management practices.

- **Quantitative Phase:** A postal questionnaire was distributed to organizations in the construction, manufacturing, aerospace, and utilities sectors, resulting in 55 usable responses, 40 of which were from the construction sector.

Analysis Tools: Qualitative data were analyzed using NVIVO software to identify relationships between variables, while quantitative data were analyzed statistically using SPSS.

### • **Using Information Technology for Knowledge Management**

Organizations use IT to manage knowledge, primarily to store and transfer explicit knowledge, but it also facilitates the sharing of tacit knowledge through tools such as video-conferencing, intranets, and collaborative software.

Knowledge Management focuses on mobilizing intangible assets, particularly intellectual capital, which is considered more valuable than IT alone. While IT supports collaboration and cooperation, human expertise remains the core asset of an organization.

Examples of advanced IT applications include **Teltech's Expert Network**, which connects thousands of technical experts, and **BP's Virtual Teamwork initiative**, which integrates video-conferencing, Lotus Notes, electronic whiteboards, and intranet systems to enable global knowledge sharing. Combining technology with human interaction fosters an empowered culture and allows organizations to manage knowledge effectively across boundaries.

### • **IT and Construction Industry**

IT is becoming more important in knowledge management (KM) for construction organizations, but the industry has been slow to use it as a key communication tool. Project-based work, being short-term and task-focused, often causes loss of specialist knowledge between projects, limiting learning and innovation.

There are information infrastructure technologies: For example,

- **BP Virtual Teamwork** used desktop video conferencing to help employees share knowledge remotely.
- **Hewlett-Packard** had a system called Web-Connex to identify experts in its research and development laboratories, allowing employees to search for experts in specific areas of specialization.
- **Real-time knowledge systems**, such as Case-Based Reasoning (CBR) technology, help solve problems by comparing the current problem with previously stored cases.

There are also other technologies used in knowledge management, such as **intranets, portals, semantic search engines, and ontology-based tools.**

In addition, **neural networks** and **data mining tools** are important for transforming data into knowledge.

Technology alone cannot turn a company into a knowledge-creating organization; people and their expertise are essential for successfully using knowledge technologies.

- **Using it in context: EVIDENCE FROM ETHNOGRAPHIC INTERVIEWS**

The ethnographic interviews revealed that the use of information technology (IT) in construction organizations varies according to company size and context. Large organizations tend to use formal IT systems, such as corporate intranets and email, for storing and sharing knowledge, while informal tools like the telephone remain essential for collaboration and building rapport.

Medium-sized organizations employ tools like **Lotus Notes** and web-based platforms (e.g., **Quick place**) to facilitate knowledge exchange among project teams. Smaller organizations focus primarily on using IT for document storage and repositories.

The effectiveness of IT depends on employees' understanding and willingness to use it, the absence of a formal IT strategy or reluctance among older staff can limit its benefits. Effective IT use depends on employee understanding and willingness, highlighting that IT alone cannot ensure successful knowledge Management it must be complemented by human interaction and a culture of knowledge sharing.

- **The Future of IT for KM in construction**

The study examined the future usefulness of IT tools for Knowledge Management in the construction industry over the next five years. Results show that **Internet, Intranet, and e-mail** are expected to be the most useful technologies due to their communication capabilities. However, traditional knowledge-sharing methods such as telephone calls and face-to-face meetings remain highly valued.

Overall, IT is seen as an important support tool for managing knowledge, but it cannot replace the role of people and social interaction. IT should enable employees to work more efficiently and help organizations gain competitive advantage.

➤ **An Italian case study of a construction company**

- **About the company**

Company A is a large construction company founded in 1910 in the Emilia-Romagna region. It operates in major infrastructure projects such as highways, railways, bridges, airports, tunnels, and pipelines. The company has over 1,500 employees and a turnover of about €800 million.

- **Before the use of IIS**

Before introducing an **Integrated Information System (IIS)**, the company had five main departments:

- 1- Equipment.
- 2- Purchasing.
- 3- Engineering.
- 4- Competitive tender studies.
- 5- Safety/Quality/Environment.

Each department held important knowledge related to projects.

However, communication between departments was irregular and knowledge sharing was limited. Information was stored in separate databases, which made access slow, especially for external workers, causing project delays.

The company tried to document lessons learned from projects using audio and video, but employees often lacked time due to urgent work. Because construction projects are unique and rarely repeated, management decided to improve knowledge management by organizing project processes and introducing an Integrated Information System. This system centralized information and improved knowledge sharing across departments.

- **After the use of IIS**

The company adopted a six-step phased approach supported by an **Integrated Information System (IIS)** to manage knowledge during projects.

- When a call for tender appears, the project manager assigns it a code and keywords (step1).
- Using the IIS, the tender department retrieves knowledge from similar past projects (step2).
- During project planning and construction, employees access necessary information quickly through the intranet (step3-4).
- New knowledge created during the project (e.g., new suppliers or strategies) is reviewed
- and validated by experienced managers (step5).
- After validation, the knowledge is stored in the IIS and becomes available for future projects (step6).

- **The result of the use**

The system significantly improved performance:

- Knowledge access time reduced from days to a few hours.
- Forecast accuracy improved (error decreased from 12% to 3%).
- Project costs reduced by about 45% in some cases.
- Collaboration improved through an e-room, enabling communication with suppliers and customers.

The IIS is a client–server system based on Lotus Notes that allows real-time knowledge sharing between departments. It stores both new and old documents and provides different access levels for employees and external partners.

- **Benefits**

Main benefits of IIS:

- 5–10% reduction in project and administrative costs.
- Faster knowledge access and response time.
- Improved quality (fewer errors and defects).
- Better company image.
- Reduced site setup time and higher productivity.
- More efficient online tender management.

Company A became an example of excellence in knowledge management (KM) for other construction firms. Other companies recognized the importance of ICT in managing construction projects, and experts from construction and ICT fields were proposed to develop similar systems.

➤ **Case study about MICROSOFT**

- **Problem**

Before 2014, Microsoft faced significant knowledge management challenges.

- Internally, teams worked in silos, communication between departments was limited, and employees often duplicated work. A rigid culture and “know-it-all” attitude discouraged collaboration and innovation, reducing the company’s ability to leverage organizational knowledge.
- Externally, Microsoft was lagging behind competitors like Amazon and Google in cloud computing, AI, and mobile technology, highlighting the need for effective knowledge management tools and processes.

- **Usage of Information Technologies**

Under Satya Nadella’s leadership, Microsoft implemented information technologies to improve knowledge management:

- **Microsoft SharePoint:** centralized storage and organization of documents, best practices, and project knowledge.
- **Microsoft Teams:** real-time collaboration and communication across global teams.
- **Microsoft Azure:** secure, cloud-based access to organizational knowledge.
- **Internal portals and wikis:** facilitated expert discovery, knowledge sharing, and reuse of past project learnings.

These IT systems were combined with a cultural shift toward curiosity, learning, and collaboration, enabling employees to share knowledge more effectively.

- **Effectiveness**

The implementation of these technologies and cultural initiatives resulted in:

- Enhanced collaboration across teams and departments.
- Faster and better decision-making.
- Innovation in products like **Microsoft Teams**, **Office 365**, and growth of **Azure cloud** services.
- A more knowledge-driven organizational culture that supports learning and adaptability.