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## Influential Factors in Project Knowledge Management of Public Library Projects Using the System Dynamics Approach

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### Abstract

**Purpose:** This study aims to identify the factors influencing the knowledge management of public library projects in Iran.

**Methodology:** The system dynamics method was employed, which is descriptive and practical in nature. The statistical population consisted of 10 project knowledge specialists and experts in Iran, selected using the snowball method.

**Findings:** Cause and effect loops were established, considering modes of learning before, during, and after the project, as well as learning from external sources. The parameters were determined through interviews with project knowledge management specialists. The findings indicated that a ten percent increase in system integrity over five years led to a 1.4 percent increase in project knowledge. Scenario building was conducted based on these results.

**Conclusion:** To enhance the knowledge management system of public library projects, it is essential to plan for effective knowledge transfer before, during, and after the project, integrate systems, measure performance, extract new knowledge, and utilize external resources, as well as establish organizational networks.

**Value:** This research fills a gap in the literature by examining the factors influencing project knowledge management using the system dynamics approach. It has the potential to enhance organizational performance and serve as a basis for future research.

**Key Words:** *Knowledge, Project, Project Knowledge Management, System Dynamics*

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## Extended Abstract

**Introduction:** The initiation of a project represents a significant reservoir of knowledge with the potential to enhance capabilities and organizational assets. Project knowledge management plays a crucial role in integrating knowledge within the project management profession, bridging the gap between knowledge management principles and project management practices. Swift access to the knowledge derived from past projects is essential for effectively managing project intricacies. Objectives of project knowledge management encompass knowledge development, sharing experiences, avoiding redundant work, facilitating knowledge acquisition, maximizing knowledge utilization, fostering a culture of knowledge exchange, and leveraging expertise for project maintenance. The neglect of project knowledge management in public libraries poses a challenge, where despite the numerous projects undertaken, there has been a lack of effort in extracting knowledge for informing subsequent projects. This oversight, viewed through a system dynamics lens, highlights a complex issue requiring a comprehensive understanding to discern the root causes and provide suitable solutions.

**Purpose:** This study aims to identify the factors influencing project knowledge management in public library projects in Iran through a systematic evaluation using the system dynamics methodology.

**Methodology:** Utilizing the system dynamics approach, rooted in computer-based problem-solving strategies, this study methodically collected data through literature reviews and semi-structured interviews with knowledge management and project specialists. The resulting causal effect model was analyzed in conjunction with organizational documents to delineate scenarios. The statistical population comprised ten experts identified through the snowball method, with the triangulation method enhancing reliability.

**Findings:** The study focused on the indicators of the knowledge management cycle within a project, first identified by theorists and researchers and then confirmed by experts. Cause-and-effect relationships between these indicators were established through interviews with knowledge management specialists in public libraries in Tehran. The results showed a positive loop of learning motivation leading to increased search for information and utilization of guidance, ultimately enhancing knowledge acquisition.

The study also identified the importance of a conducive organizational structure for effective project management, emphasizing the need for proper documentation, information dissemination, and knowledge transfer. Additionally, findings revealed the significance of fostering a culture of learning, encouraging knowledge production and retention among employees during and after the project.

Furthermore, collaboration with internal and external stakeholders was highlighted as essential for knowledge acquisition from external sources. The study emphasized the role of experienced individuals in facilitating knowledge transfer and forming informal networks to support continuous learning.

The study employed the parameter validation test (CVI) to ensure the robustness of the obtained parameters, showing good validity. Additionally, the limit test confirmed the model's ability to detect changes in project knowledge variables.



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Scenario building was conducted to explore different aspects of upgrading the comprehensive knowledge management system within the project, illustrating the importance of system integration for effective knowledge management.

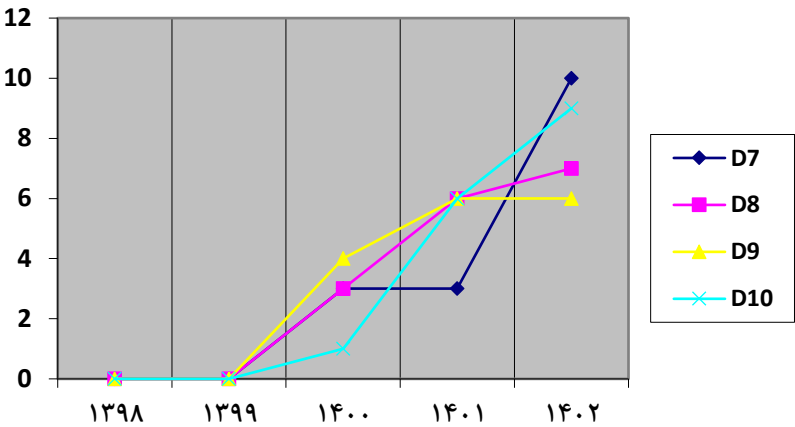
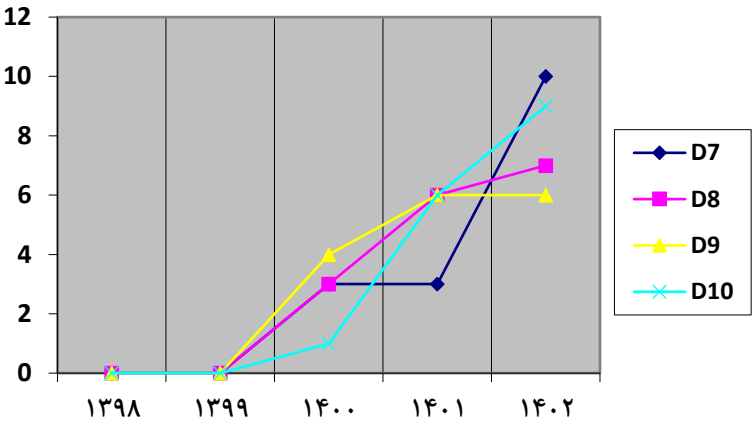


Figure of the effect of increasing the system integration parameter in the learning mode before the project



The figure of the effect of increasing the system integration parameter in the learning mode during the project

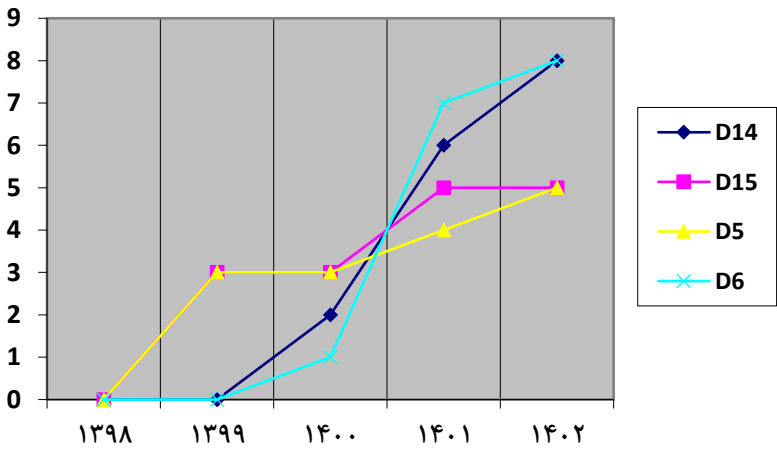
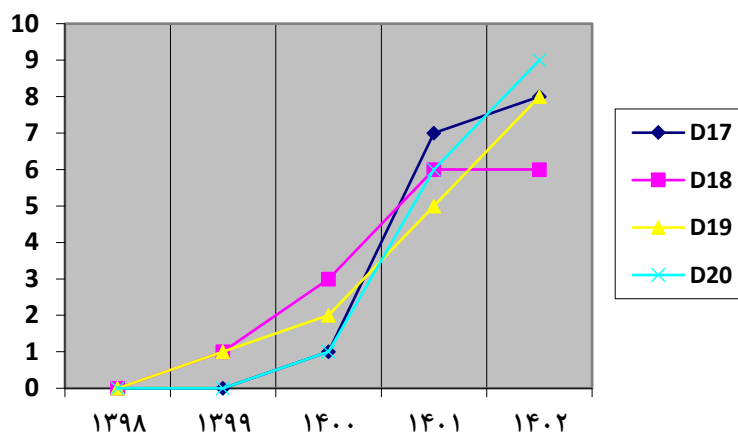


Figure of the effect of increasing the system integration parameter in learning mode after the project





The shape of the effect of increasing the system integrity parameter in the mode of learning from external sources

The scenarios highlighted the need for a structured approach to learning, both within the project and through external sources, to ensure ongoing knowledge enhancement and organizational development.

**Conclusion:** The study underscores the significance of structuring knowledge management processes before, during, and after projects, emphasizing system integration, enhanced performance evaluation, and external stakeholder engagement as pivotal strategies for comprehensive project knowledge management.

**Value:** This research contributes novel insights into project knowledge management by employing a system dynamics approach, offering a blueprint for enhancing organizational performance and setting the stage for future research endeavors in this domain.

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