



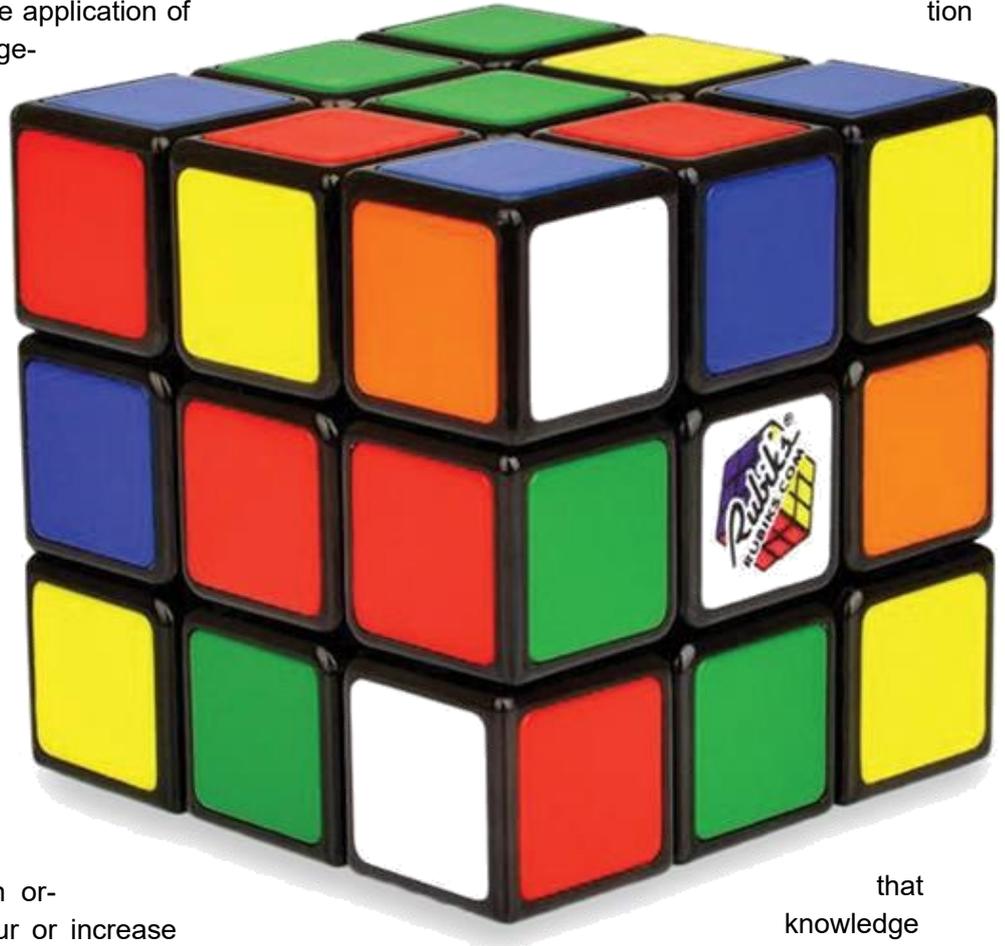
Knowledge Puzzles

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Does lean need knowledge management? Can lean programs succeed without organizations building knowledge management processes into the organizational lean framework? What about encouraging knowledge sharing? The application of lean tools requires knowledge management to support the sustainability of practices and usage (Zhang, Niu, & Liu, 2020). One of the wastes of lean is not knowledge management, but, instead, when knowledge management is missing from the organizational process.

forming lean cannot happen without a knowledge management process in place within an organization (Zhang et al., 2020).

Based on the individual definitions and the assumption



Will using knowledge puzzles support the reduction of wastes?

When workers and their leaders may manage knowledge as an organizational asset, wastes can occur or increase from their current state. Viewing knowledge management as a critical business strategy is of utmost importance for workforce retention through corporate human resource initiatives (Rigoni & Adkins, 2015). Inspiring employees to solve knowledge puzzles has the potential to help teams to become more reliable, and from that, the increase organizational strength and sustainability of the organizational lean framework will occur.

Knowledge Management and Lean Implementation

Managing knowledge and lean occurs in parallel within an organization and with similar objectives. While knowledge management includes creating, sharing, and transferring knowledge, management of lean implementation also includes sharing and transferring specific lean knowledge. Integrating and trans-

that knowledge management and lean management support similar functions, integration of knowledge management into a lean management plan should be part of an overall strategic plan.

Knowledge management outcomes support lean culture development through continual learning processes (Giridhar, Gaikwad, & Lad, 2017). Using knowledge management purposefully to meet objectives or desired end states of lean can go far to reduce or eliminate wastes. Integrating a game-based learning initiative may also bring individuals together to transform into a culture of a team mindset of using knowledge to support organizational lean implementation with fun.

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Learning through Education

Games can be exciting for individuals and in teams. Blochl, Michalicki, and Schneider (2017) wrote about and presented the development of a simulation game developed as part of a research project at Landshut University of Applied Sciences to teach Accounting for Lean. The purpose of this instructor-led game called “Lean Leadership” is to

ensure knowledge of production output, machine utilization, turnover, and profits through lean principles to include accounting management

(Blochl, Michalicki, & Schneider, 2017). Instructor-led games such as “Lean Leadership” support the classroom or groups of individuals reinforcing the knowledge necessary to achieve set goals while attaining a team-knowledge mindset.

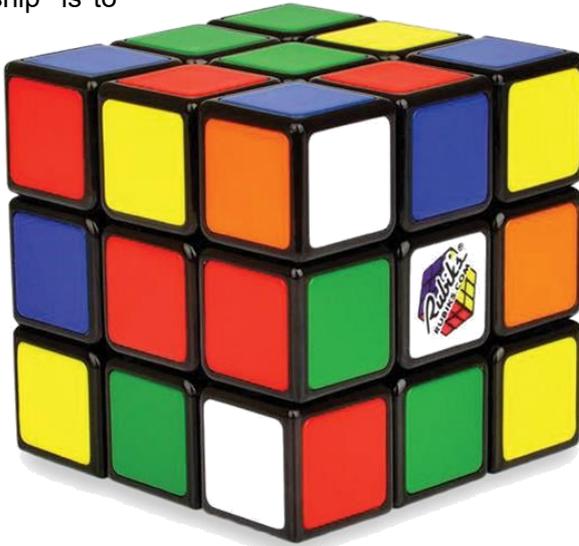
There is also a board game created to supporting learning and retaining an understanding of Kanban. Kanban, a workflow management method, is reinforced through a game called “GetKanban”

(<http://getkanban.com>), which is used not just for workflow but has the added benefit of supporting collaboration and strategy towards a common goal (Heikkliä,

Paasivaara, & Lassenius, 2016).

With any team building event comes a sense of *esprit de corps*.

Esprit de corps is the spirit a team feels when working towards a common goal. This feeling of esprit de corps supports the reduction of waste since the comradery of the team will also feed into preventing mistakes because of the sharing of a common goal.



Waste Reduction and Gamification

Waste reduction requires knowledge of people, processes, and techniques.



Since knowledge management also supports people, processes, and techniques, it is reasonable that knowledge management supports waste reduction or lean.

How can we use our understanding of waste reduction and knowledge management to solve the knowledge puzzles of life? Landers (2015) summarized the Theory of Gamified Learning as learning, which increases learning by making a process better through pre-existing instructions or mediation through positive be-

havioral reinforcement. These align with waste reduction by addressing process improvement through standardized, pre-existing directions, and support personnel with the objectives and rewards system that is understood by the workforce.

Gamification, or game-based learning, has been around since the late 1960s and continues to trend upwards in both education and commercial aspects (Deif, 2017).

Through gamification, a reward system is in place to reward the strategy used or objectives met by the player as they begin to achieve the goals with fewer errors or, with less time, permanently remove the barriers to waste of the process (Landers, 2015).

Knowledge puzzles help people to learn how to answer the question quickly and confidently, which carries over to solving customer problems quickly and confidently, requiring strategic thought for the placement of pieces and order of operations.

Knowledge Puzzles Support Team Strategic Thinking

General examples of these knowledge puzzles are available as television game shows, board games, video games, role-playing games, books, toys, and other mind exercises support knowledge management. People of all ages participate, but most knowledge puzzles categories fall under educational games.

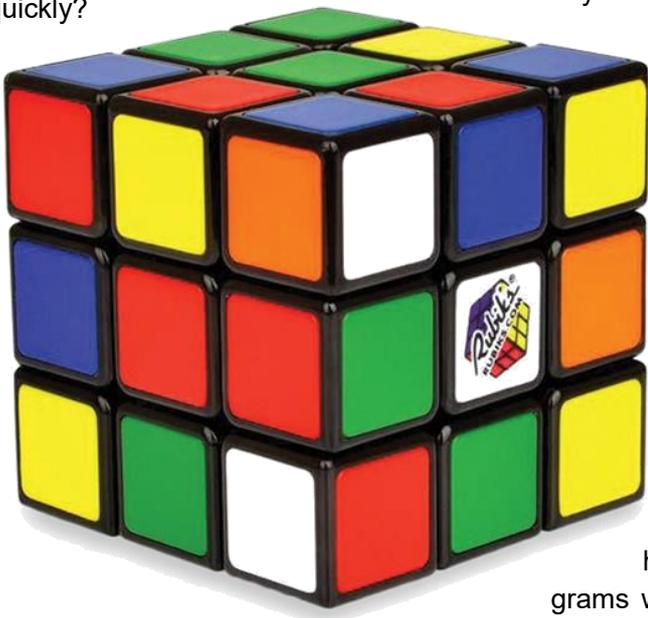
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The following is a list of some examples of knowledge puzzles or games which support individual and team learning, deductive reasoning, and strategic thinking:

- * **Television Game Shows** – Jeopardy, Price is Right, Survivor, The Masked Singer
- * **Board Games** – Trivial Pursuit, Boggle, Scrabble, Monopoly
- * **Video/Phone/Tablet Games** – PacMan, Mario Brothers, Tetris, Minecraft, Candy Crush
- * **Role-Playing Games** – World of Warcraft, Magic: The Gathering
- * **Books** – Nancy Drew, Trixie Belden, The Hardy Boys, Encyclopedia Brown, Choose Your Adventure
- * **Toys** – Rubik’s Cube, Operation
- * **Structures/Engineering** – LEGOs, Lincoln Logs, Tinker Toys, Marshmallow Challenge, Blocks
- * **Puzzles** – Jigsaw and Crossword puzzles, Sudoku, Word Searches, Brainteasers

Does a time constraint help to solve knowledge puzzles more quickly?



For instance, when people solve a Rubik’s Cube, it’s impressive, but when it’s solved faster than someone else, people are even more interested in solving the cube. When I was in sixth grade, I entered a Rubik’s Cube contest to solve it faster than any other student. I don’t remember what the prize was, but I wanted to win, so I joined the competition. I was one of many kids who wanted to win. The key to winning was that you had to solve the Rubik’s Cube faster than any other student.

Once the contest started, I was nervous, but as the seconds passed, I could feel myself getting more confident. In the end, I finished the Rubik’s Cube faster than a lot of the contestants, but not the fastest. The key to my confidence was with successful repetition.

However, I had no one to compete against as I practiced, so I did not have anyone to baseline a time as a goal.

Children’s educational games have gained popularity through computers and tablets that have become less expensive over recent years. As a child, my favorite computerized educational toy was the Texas Instruments’ Speak and Spell, which came out on the market in 1978. I enjoy spelling contests, and this game made it fun and easy for me to learn to spell more quickly with fewer errors. These days, we have tools and programs which identify spelling

or word usage errors and autocorrect for us, reducing rework in the process of writing processes, proposals, or standard operating procedures.

Conclusion

Playing a game does not have to end with adulthood, nor should it end at all. Game playing intends to be a fun challenge that builds skills. As the repetition supports increased memory of the brain and muscle memory, there is less rework of the task required to win the game. Strategy grows from one person through the entire team as knowledge of the game or knowledge puzzle is transferred, shared, and practiced.



From this, one can deduce that gamification or the use of knowledge puzzles supports the reduction of waste and improves lean practices throughout an organization.

