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**Warsaw University
of Technology**

LEAN CONSTRUCTION





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5S

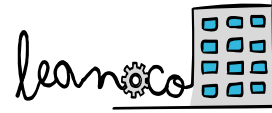
5S. Definition

Lean manufacturing (LM) comprises a set of tools and practices, which when implemented properly and fully, help to improve system performance. The 5S Lean tool is one of such.

5S helps to reduce non-value adding time, increase productivity and improve quality. It has been used in the design of efficient facilities.



5S. Definition



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•Sort- To organize things in order, for ease of storing and retrieval.

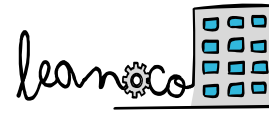
•Set- To designate and clearly label where everything should be stored. Everything should be kept in its rightful place to eliminate the need for searching.

•Shine- To keep everything cLean and neat.

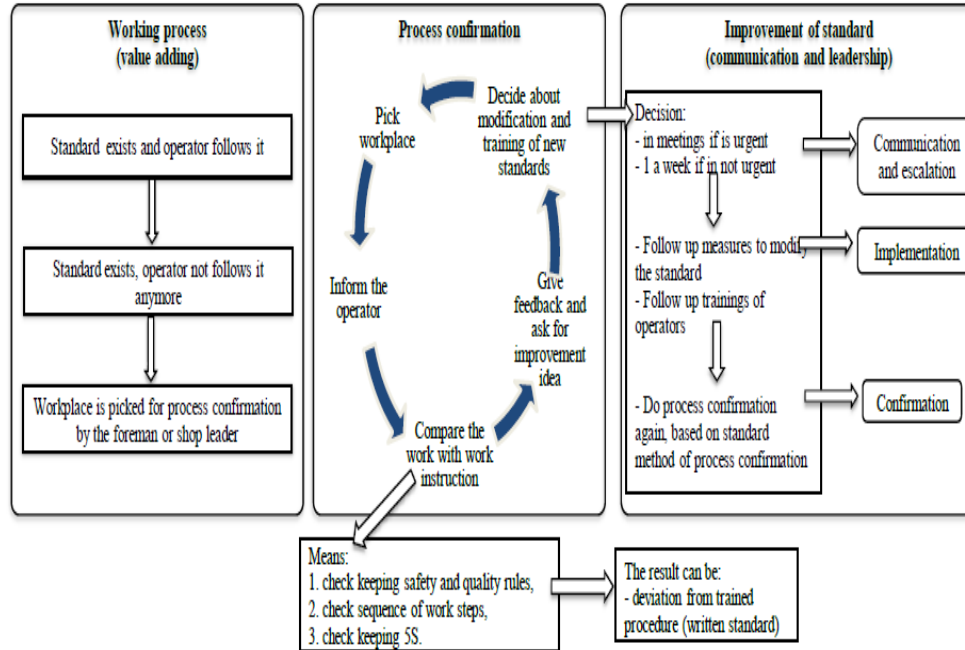
•Standardize- To document the work methods and make the 5s part of the culture of the organization.

Sustain- To form a habit of continuous improvement procedures

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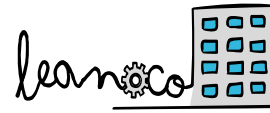




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References

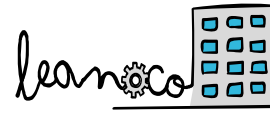
References



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of the European Union

- A., A., Diekmann, J. E., & Brown, A. D. (1999). Simulation of the construction processes, traditional practices versus LEAN practices. *Proceedings IGLC-7*, (págs. 39-50). California.
- Ahmed, L. H. (2011). *Modern Construction Lean Project Delivery and Integrated Practices*. Floria, USA: Taylor and Francis Group, LLC.
- Alireza, A., Yusof, I., Seyed, M., & Hossein, H. (2011). A Study on Total Quality Management and Lean Manufacturing: Through Lean Thinking Approach. *World Applied Sciences Journal*, 1585-1596.
- Ari, V. R. (2011). *Value Stream Mapping of Information Flow in Infrastructure Projects*. Cleveland.
- Ballard, G. (1994). *Lean Construction and EPC Performance Improvement*.
- Ballard, G. (2000). *The Last Planner System of Production Control*. Birmingham.
- Ballard, G. a. (2004). Competing Construction Management Paradigms. *Lean Construction Journal*, 38-45.

References



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of the European Union

Ballard, G., & Howell, G. (1994). Implementing Lean Construction: Stabilizing Work Flow. 2nd Annual Conference on Lean Construction at Catolica Universidad de Chile Santiago. Chile.

Banawi, A. A. (2011). IMPROVING CONSTRUCTION PROCESSES BY INTEGRATING LEAN, GREEN, AND SIX-SIGMA. Pittsburgh: University of Pittsburgh.

Bhosale, P., & Hemant, S. (2015). VALUE STREAM MAPPING: CASE STUDY ON RESIDENTIAL CONSTRUCTION SECTOR. INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH, 353-360.

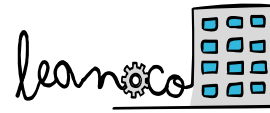
C MacKinsey & Company. (10 de 10 de 2015). MacKinsey & Company.

Cwik, K., Nowak, P., & Roslon, J. (2017). Introduction to Lean Construction. Warsaw.

Daniel, H., Afroz, A., Teemu, L., Levitt, R. E., Christine, L., & Padachuri, P. (2014). The Role of Integrated Project Delivery Elements in. Engineering Project Organization Conference. Colorado.

Dunlop, P and Smith, D. (2004). Planning, estimation and productivity in lean concrete pour. Engineering, Construction and Architectural Management, 55-64.

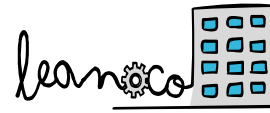
References



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- F. C., F., & V, M.-K. (2015). The 5S lean method as a tool of industrial management performances. *IOP Conference Series: Materials Science and Engineering*.
- Gao, S., & Sui, P. (2014). The Last Planner System in China's construction industry – A SWOT analysis on implementation. *International Journal of Project Management*, 1260-1272.
- Howell, G. (1999). What is lean construction. *Proceedings IGLC*.
- Johansen, E. a. (2007). Lean construction: Prospects for the German construction industry. *Lean Construction Journal*, 17-32.
- Kilpatrick, J. (2003). *Lean Principles*. Utah: Utah Manufacturing Extension Partnership .
- Koskela, L. (1993). Lean Production in construction. *VTT Building Technology*. Finland.
- Koskela, L. (2001). *Introducing Lean Construction: Reforming Project Mangement*. Lean Construction Institute.
- Loosemore, M. (2014). Improving construction productivity: a subcontractor's perspective". *Engineering, Construction and Architectural Management*, 245-260.

References



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of the European Union

Oleghe, O., & Salontisa, K. (2017). The implementation of 5S lean tool using system dynamics approach. *27th CIRP Design*, 380-385.

Pooja, B., & Hemant, S. (2015). VALUE STREAM MAPPING: CASE STUDY ON RESIDENTIAL CONSTRUCTION. *INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH*, 353-360.

Rother, M., & Womack, J. (2008). *Learning to See: Value Stream Mapping to Add Value and Eliminate Muda*. Cambridge.

Seppänen, O., 1, M. R., & Ballard, G. (2015). INTEGRATION OF LAST PLANNER SYSTEM AND LOCATION-BASED MANAGEMENT SYSTEM. *ResearchGate*, 123-132.

The Economist Intelligence Unit Limited. (2015). *Rethinking productivity across the construction industry: The challenge of change*. USA.

University of Berkeley. (1999). Seventh Conference of the Lean Thinking. California.

