



# TAKT MATURITY MODEL: FROM INDIVIDUAL SUCCESSES TOWARDS SYSTEMIC CHANGE IN FINLAND

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# Background: Takt production is gaining momentum in Finland



- Within the last 5 years dozens of successful implementations
- Interest among GCs, trades, designers, clients, researchers
- Primarily positive testimonials with wide media attention

A collage of three news articles from the Finnish construction industry. The top article is titled "Onko tahtituotanto työmaalle riski? – 25 mestarin kokemukset kertovat joustavuudesta ja laadun paranemisesta" (Is takt production a risk for the construction site? – 25 master builders' experiences tell of flexibility and quality improvement). The middle article is titled "Rakentamisessa on löytymässä uusi tahti" (A new rhythm is being found in construction). The bottom article is titled "Mistä puhumme, kun puhumme tahtituotannosta?" (What are we talking about when we talk about takt production?). Each article includes a small image of a construction site or a project plan.

**RAKENTAMINEN**  
**Onko tahtituotanto työmaalle riski? – 25 mestarin kokemukset kertovat joustavuudesta ja laadun paranemisesta**  
Läpimenoaika korostetaan aivan liikaa tahtituotannossa. "Tilajalle se tietenkin kuulostaa kivalta, mutta toteuttajaa se voi pelottaa", kertoo 30:ssä hankkeessa mukana ollut tahtituotannon pioneeri Aleksi Heinonen. Tahtituotannon joustamattomuus tai joustavuus on ollut kysymys, johon hän on joutunut viime aikoina vastaamaan uusissa megaprojekteissakin.  
Seppo Mölsä · 7.11.2019 · 9

**TOIMITUKSEN BLOGI** · 18.1.2019 · 7 · Pääkirjoitus  
**Rakentamisessa on löytymässä uusi tahti**

**UUTISET RAKENTAMINEN**  
**Mistä puhumme, kun puhumme tahtituotannosta?**  
Rakennuslehti on tänä vuonna seurannut erityisesti tahtituotannon jalkautumista rakennustuotantoon. Tulokset ensimmäisistä piloteista ovat olleet varsin rohkaisevia, mutta riskinä on, että muodikasta tahtituotantosanaa aletaan käyttää löysästi ja harhaanjohtavasti.  
Seppo Mölsä · 30.12.2019 · 6

# Research Gap: How to systematically implement takt?



- However, a shared understanding on how advance takt over single cases is scarce
- In Finland, but also globally, model describing takt production maturity would offer a solid starting point for improvement
- Aim of the study: *to conceptualize the requirements and steps to systematically implement takt production within construction projects and organizations*

# Methodology

- Grounded theory approach to form a maturity model
- Multiple-case study with 26 Finnish takt cases



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Case	Project status	Project type	Key learning aspects in brief
1	Finished	Commercial	Effective technical takt planning key aspect for success
2	Finished	Commercial	Effective takt control with daily management key aspect for success
3	Finished	Commercial	Subcontractor integration key aspect for implementing technical takt plan
4	Finished	Commercial	Social integration key aspect for success
5	Finished	Industrial	Effective takt planning key aspect for success
6	Finished	Industrial	Effective takt planning key aspect for success
7	Finished	Infrastructure	Effective takt control with daily management key aspect for success
8	Finished	Infrastructure	Effective takt control with social integration key aspect for success
9	Finished	Residential	Effective takt control with daily management key aspect for success
10	Finished	Residential	Effective takt control with daily management key aspect for success
11	Finished	Residential	Effective takt control, subcontractor integration key aspect for success
12	Finished	Residential	Effective technical takt planning key aspect for success, opportunities in batch size reduction
13	Finished	Residential	Effective takt planning, client integration key aspect for success
14	Finished	Residential	Effective takt control, subcontractor integration key aspect for success
15	Finished	Residential	Effective takt planning key aspect for success
16	Finished	Residential	Effective takt planning key aspect for success
17	Finished	Residential	Subcontractor integration key aspect for success
18	In progress	Car Park	Opportunities in integrating subcontractors
19	In progress	Commercial	Opportunities in technical takt planning in general
20	In progress	Commercial	Opportunities in technical takt planning in general
21	In progress	Commercial	Subcontractor integration key aspect for success
22	In progress	Hospital	Opportunities in master plan integration
23	In progress	Hospital	Opportunities in taktung critical phases
24	In progress	Infrastructure	Opportunities in batch size reduction to reduce lead time

# Three Maturity Levels



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<b>Level i)</b>	<b>TECHNICAL TAKT PLANNING (project-level)</b>
R1	The production plan fits the client's requirements
R2	Takt areas, takt time and wagons with resourcing are unambiguously determined
R3	Effective visual management is ensured
<b>Level ii)</b>	<b>SOCIAL INTEGRATION &amp; TAKT CONTROL (project and organizational level)</b>
R4	Training and involvement of the project participants is ensured
R5	The logistics are integrated and takted with the production plan
R6	The design process is integrated and takted with the production plan
R7	The common situational awareness during production is ensured
R8	Barriers are tackled through continuous and collaborative improvement
R9	Quality control is systematic and takted
<b>Level iii)</b>	<b>CONTINUOUS IMPROVEMENT (organizational and regional level)</b>
R10	Formulation and development of teams
R11	Contractual integration
R12	Systematic waste elimination over projects
R13	Industrialized logistics and material flow
R14	Standardized, takt-based work quantity libraries
R15	Improving through KPI's and data-driven decision making

# Level i) Technical takt planning



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- R1. The production plan fits the client's requirements
- R2. Takt areas, takt time and wagons with resourcing are balanced and unambiguously determined
- R3. Effective visual management is ensured

- Level i) is quite well achieved in Finland
- Has resulted in shortened durations but quite chaotic implementation

# Level ii) Social integration & Takt control



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- R4. Training and involvement of the project participants is ensured
- R5. The logistics are integrated and takted with the production plan
- R6. The design process is integrated and takted with the production plan
- R7. The common situational awareness during production is ensured
- R8. Barriers are tackled through continuous and collaborative improvement
- R9. Quality control is systematic and takted

- Pioneering companies in Finland are succeeding with level ii) requirements
- Level ii) calls for more holistic production system change
- Has resulted in reduced duration, but also stability and transparency of the process



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# Level iii) Continuous improvement

- R10. Formulation and development of teams
- R11. Contractual integration (if not already)
- R12. Systematic waste elimination over projects
- R13. Industrialized logistics and material flow
- R14. Standardized, takt-based work quantity libraries
- R15. Improving through KPI's and data-driven decision making

- Few successful interventions, but not systematically achieved in Finland
- Flow measurement interventions indicate that a vast amount of waste is hidden within even the best takt production systems



# Conclusions



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- The proposed model sets guidelines for more structured manner of takt production improvement
- After the initial benefits, a holistic change within organizations is needed
- Further validation of the model with industry players in Finland, but also in other locations





**Thank You!**