

# COMPARISON OF COLLABORATION AND TRADE PARTNER COMMITMENT IN TAKT IMPLEMENTATION CASES

Kujansuu, P., Lehtovaara, J., Grönvall, M., Seppänen, O. and Peltokorpi, A.

# Research background

- Tools for production planning in construction have developed significantly during the past two decades.
- The possibility of turning the construction from resource to flow-efficient production has been demonstrated with tools such as Last Planner System (LPS) (Ballard 2000) and takt production methods such as Takt Time Planning (Frandsen et al. 2013) and Takt Planning and Takt Control (Dlouhy & Binninger 2016).
- Previous results indicate that understanding social aspects better in takt production could lead to remarkable benefits (Tommelein 2017).

## Research gap

- Little research yet exists on the broader collaboration aspect of takt production, and the research has been mostly focusing on developing technical methods in use.
- The comparison of the collaboration of different stakeholders between different takt implementation cases has also been limited.

## Research aim

- Therefore, more research is needed on how the collaboration is utilized in takt cases, and how different social barriers and enablers affect on implementation of takt methods.

### Research questions:

- *1) What kind of social barriers, enablers, and drivers effect collaboration in takt projects between different cases?*
- *2) How the working culture in takt projects in Finland could be improved by implementing Californian takt practices*

# Research methods – a multiple case study

- **Cases:** 4 takt implementation cases from 2 different countries.
- **Data sources:** Observations, interviews, site visits and project documentation
- **Focus areas:** Social aspects concerning planning, control, management, visualization, involvement and leadership
- **The analysis** focused on finding the social aspects in takt implementation cases and how the maturity level of takt production effects on the level of collaboration.



# Case descriptions

- A multiple case study with purposeful sampling.
- Cases were chosen to represent different working cultures and different maturity level in takt implementation.

Information	Finland case 1	Finland case 2	California case 1	California case 2
<b>Type of project</b>	Residential building	Residential building	Multi-storey medical & research facility	Multi-storey medical & research facility
<b>Takt time</b>	1 day	1 day	5 days	4 & 5 days
<b>Takt implementation phase</b>	Interior and finishes	Interior and finishes	Core, interior, and finishes	Core
<b>Objective of takt</b>	Shorter duration compared to projects executed without takt	Shorter duration compared to projects executed without takt	Shorter duration compared to projects executed without takt and better stability	Shorter duration compared to projects executed without takt and better stability

# Results and Analyses

- The data was collected as a triangulation of interviews, observation and document familiarization.
- The data collected from the different cases were evaluated and analyzed by the authors, and the social aspects were divided into three different clusters:
  - Plusses
  - Deltas
  - Drivers

Finland	California	Both
<p><b>Plusses:</b>            Technical capability in production planning            Potential of technological development</p> <p><b>Deltas:</b>            Ineffective contract models            Lack of leadership and knowledge in lean principles</p> <p><b>Drivers:</b>            Proactivity and commitment of project crew and key subs</p>	<p><b>Plusses:</b>            Trust between GC, trade partners, and client            Lean leadership</p> <p><b>Deltas:</b>            Trade partner resourcing            Trade partner commitment at the beginning</p> <p><b>Drivers:</b>            Knowledge in takt production            Lean culture</p>	<p><b>Plusses:</b>            Quick results            Increased stability</p> <p><b>Deltas:</b>            Understanding of resource vs flow efficiency            Resistance towards new methods</p> <p><b>Drivers:</b>            Takt experts            Project crew            Daily huddles            Visualization of plans</p>

# Discussion

- The Californian cases focused and relied more on the social aspects and trust between stakeholders.
- The Finnish cases focused on the technical side of production planning by the general contractor.
- The strong lean culture imposed by the general contractor from the California cases were a big factor in the building of collaboration between stakeholders, and the proving ground for the creation of transparent processes.
- The strong knowledge in the technical side of production planning was seen as a good base for takt production development in Finland.
- In contrast, the biggest development areas in Finland seem to be on the social side and in the collaboration between trade partners and especially between subcontractors.

## Conclusion and recommendations

- Finnish cases provided excellent results for pilots by radically reducing the duration while the quality and costs remained the same. However, it is clear that in order to develop the process further a better collaboration between the stakeholders is vital.
- The maturity level of takt production in the construction industry in Finland is currently low and the use of old fashioned and strict contract models were seen as a problem.
- While the maturity level in takt production increases, a possibility to a better trade partner commitment increases as well.