

Aleksi Heinonen partner, Vison Oy

2012 – 2016 Ship Cabin refurbishment



MAKINEN



- Lead time -80%
- Work hours -75%
- 0-defect deliveries

www.iglc.net/Papers/Details/1338

2016 – Construction management coach

- 40 cases, five continents
 - 50% lead time reductions
 - 0 defect deliveries
 - Happier workers
- Collaboration with Helsinki University of Technology and Berkeley

www.iglc.net/Papers/Details/1762



aleksi.heinonen@vison.fi

Helsinki Airport T2, 400 M€

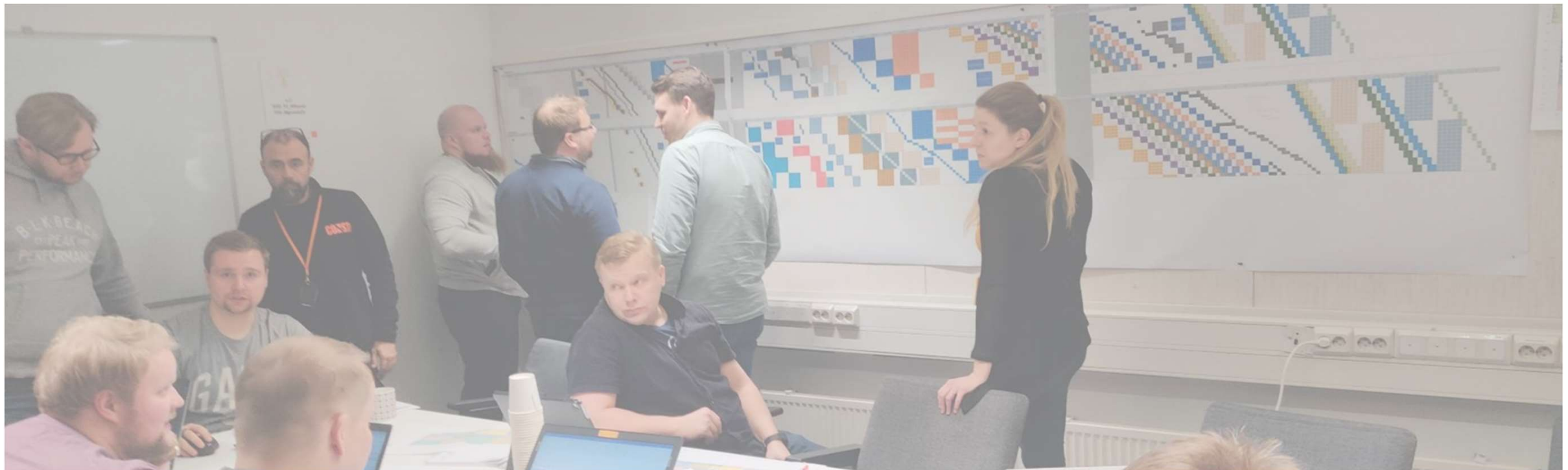
Two-month Lead time reduction using takt



- Finnish construction site of the year award by [Rakennuslehti](#)
- Almost all the construction site of the year finalists were using takt production, with
 - lead time reduction
 - quality improvement
 - workers salary increased
- "Takt production has made breakthrough in only five years" [Jan Elfving, SVP, Skanska]

Two Key Insights

- Takt area workload variance is important, but not the whole picture
- Early mega project master takt planning is a huge opportunity



Takt area workload variance

The background of the slide is white with a complex pattern of thin, yellow lines. These lines are arranged in a way that creates a sense of depth and perspective, resembling a grid or a series of overlapping planes that recede into the distance. The lines are most dense in the lower-left and middle-right areas, creating a dynamic, geometric composition.

Design

- IV
- LI
- SPR
- SÄH
- VV

2020
2019

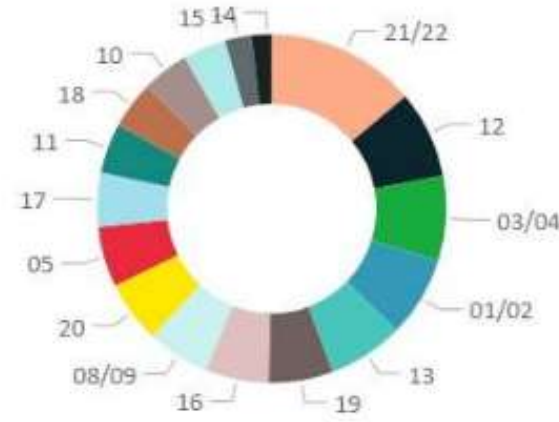
Location

- Valitse kaikki (lohko)
- H1
- IVKH
- KUILUT
- KULJ
- LÄMM

Distribution per big takt area (length)



Distribution per takt area (length)

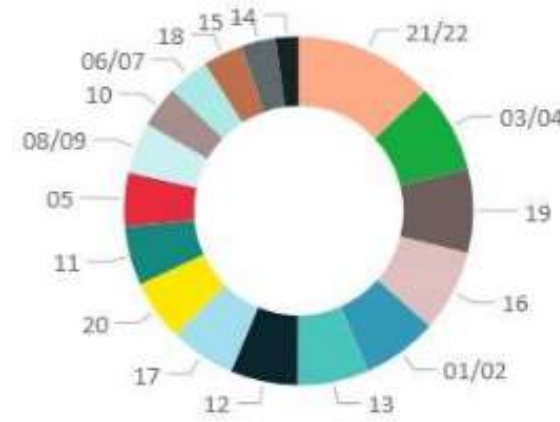


01_SRV Tunnus	05_SRV Pituus
SPR-haaraputket	1 059,75
SPR-runkoputket	316,28
Yhteensä	1 376,03

Distribution per big takt area (number)



Distribution per takt area (number)

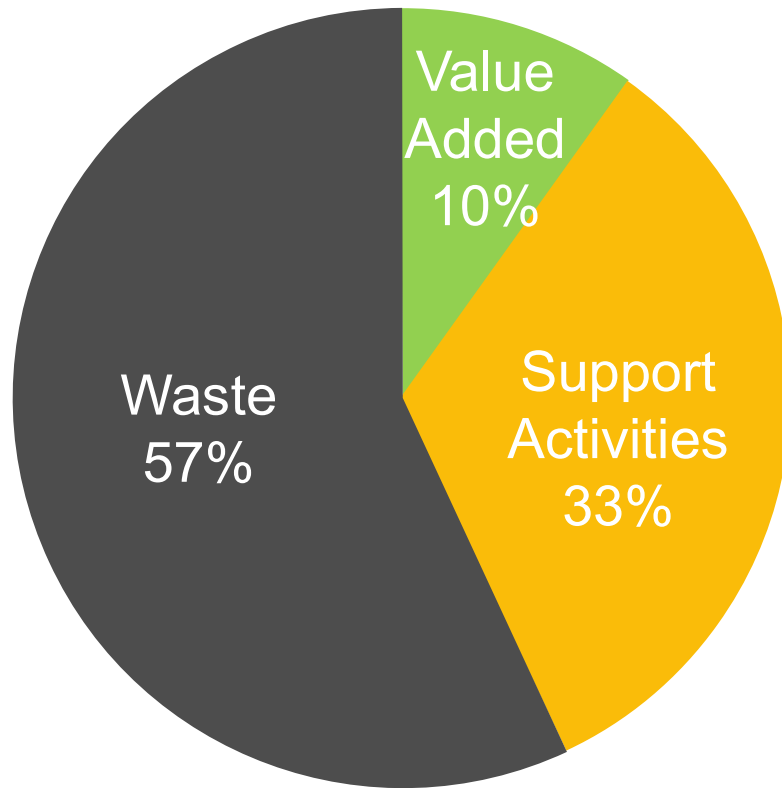


01_SRV Tunnus	05_SRV Lukumäärä
SPR-haaraputket liitososat	980
SPR-muut osat	4
SPR-runkoputket liitososat	238
SPR-suuttimet	407
SPR-suuttimet alakatto	20
Yhteensä	1649

Takt areas and quantities information

Takt areas were entered into BIM which allowed to measure and compare quantities in different areas.

Which workloads can we estimate?



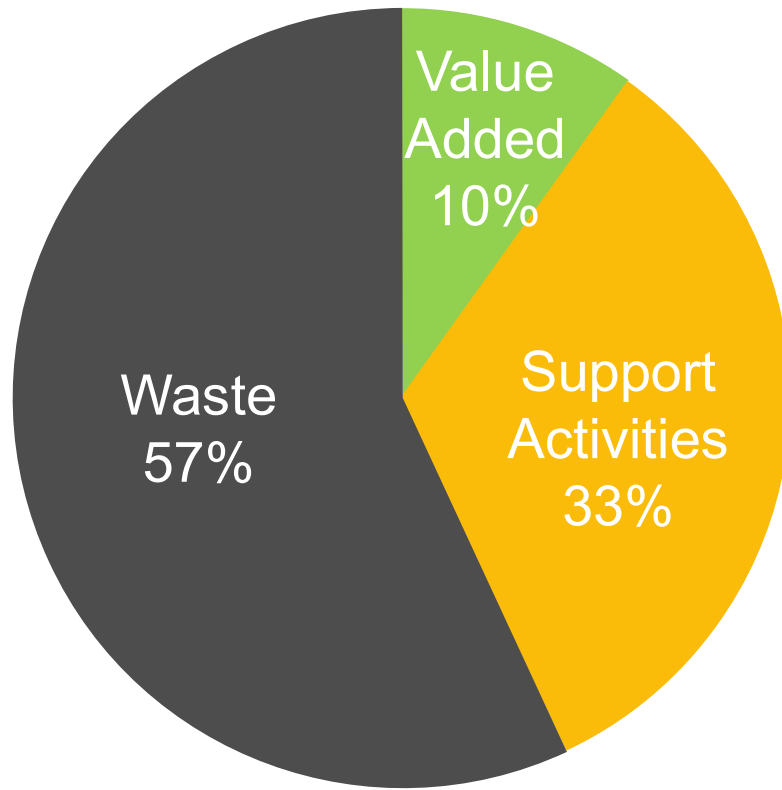
Waste and value in construction

Source: US Bureau of Labour and Statistics

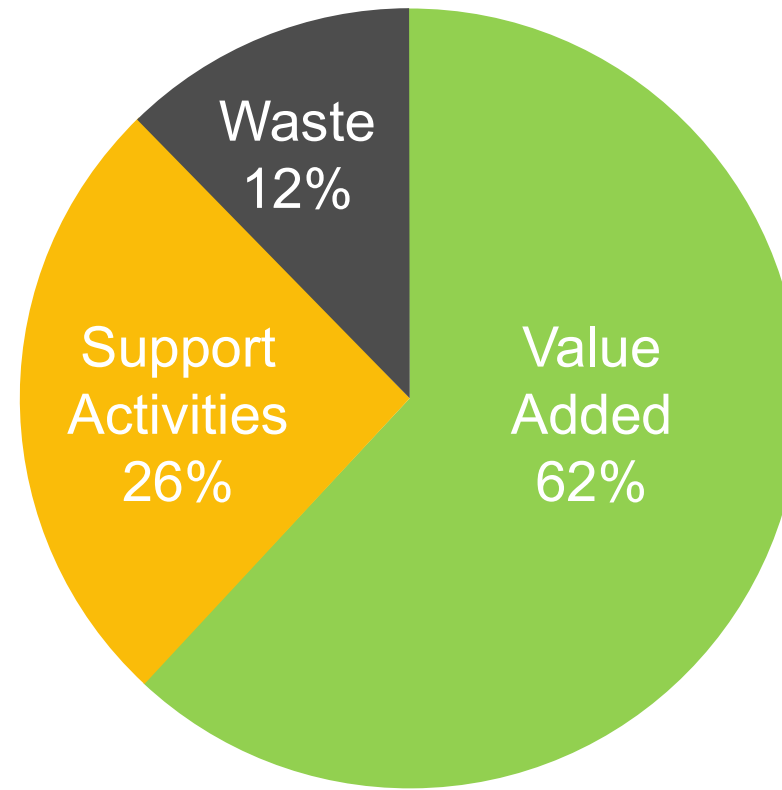


Workload per takt area

Waste and Value



Construction



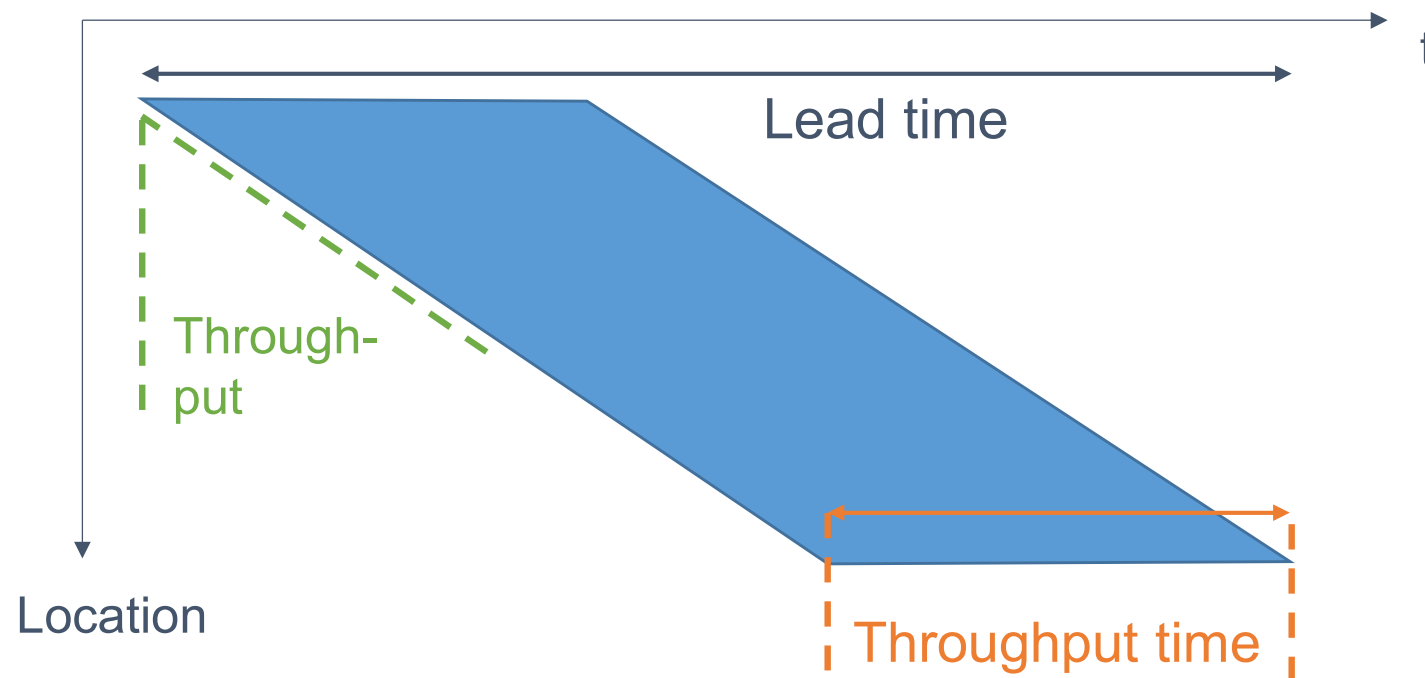
Manufacturing

The background of the slide is a complex, abstract graphic composed of numerous thin, light yellow lines. These lines intersect to form a dense, grid-like pattern that appears to be a perspective view of a large, multi-dimensional structure, possibly a project network or a data visualization. The lines are most concentrated in the lower-left and middle-right areas, creating a sense of depth and complexity.

Early mega project master takt planning

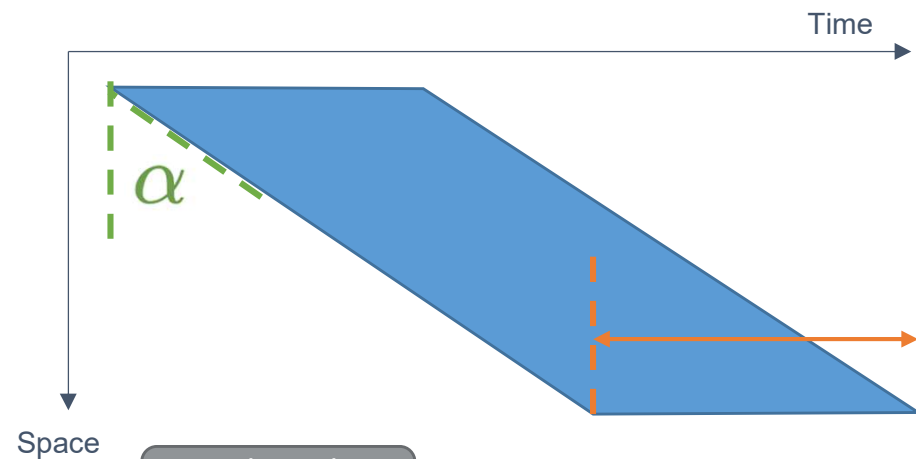
Construction Production System

Lead time = Throughput x Scope + Throughput time



Hospital schedule comparison

- Short lead-time is client value and reduces overhead costs
- **Small and long resource need** helps in **bidding** and improves quality and productivity
- **Short single area duration, i.e. throughput time**, provides feedback faster and enhances learning



Takt planning helps minimize

- **Throughput time**
- **Max / average production rate**
- **Total / max daily site headcount**

Bottleneck > 300 sqm / day

	Max production rate sqm/day	Average production rate sqm/day	Max / Average	Site max daily headcount	Total site headcount	Total / max daily	Average activity duration (months)	Throughput time: Masonry walls to final cleaning (months)
Hospital 1	670	222	3,0	512	5 028	9,8	15,0	23,2
Hospital 2	-	339	-	798	6 419	8,0	14,9	18,7
Hospital 3, refurbishment & extension	-	106	-	169	1 475	8,7	5,7	8,8
Hospital 4	457	233	2,0	410	3 707	9,0	9,4	18,0
Hospital 5, goal setting	300	270	1,1	777	3 000	3,9	16,5	11,0

Guesstimates

Thanks!

We are hiring trainees