

Digitalized and Automated OSC Project Planning and Management

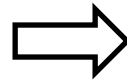
Tae Wan Kim, Ph.D.

Associate Professor, Incheon National University, Korea

ConsMa 2023
April 10, 2023

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Current production system

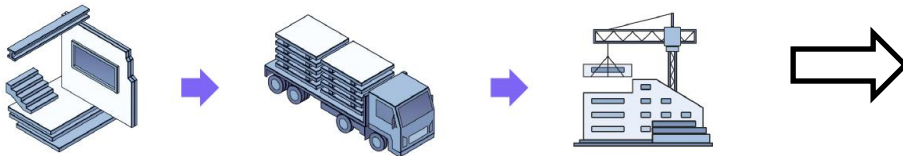


Issues in Korea

- Labor shortage/ageing
- Workhour limited to 52h
- 4000+/year defects
- 400+/year fatalities
- 48% of total wastes

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Korea's drive towards Offsite production system



Potential benefits

- Reduced labor hours
- Manufactured products
- Controlled environment
- Sustainable production

*MiC, PPMOF, Industrialized construction,
Prefabrication, Modular construction,
MMC ...*

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Opportunities and challenges of modular methods in dense urban environment

Jin Ouk Choi^a, Xing Bin Chen^b and Tae Wan Kim ^c

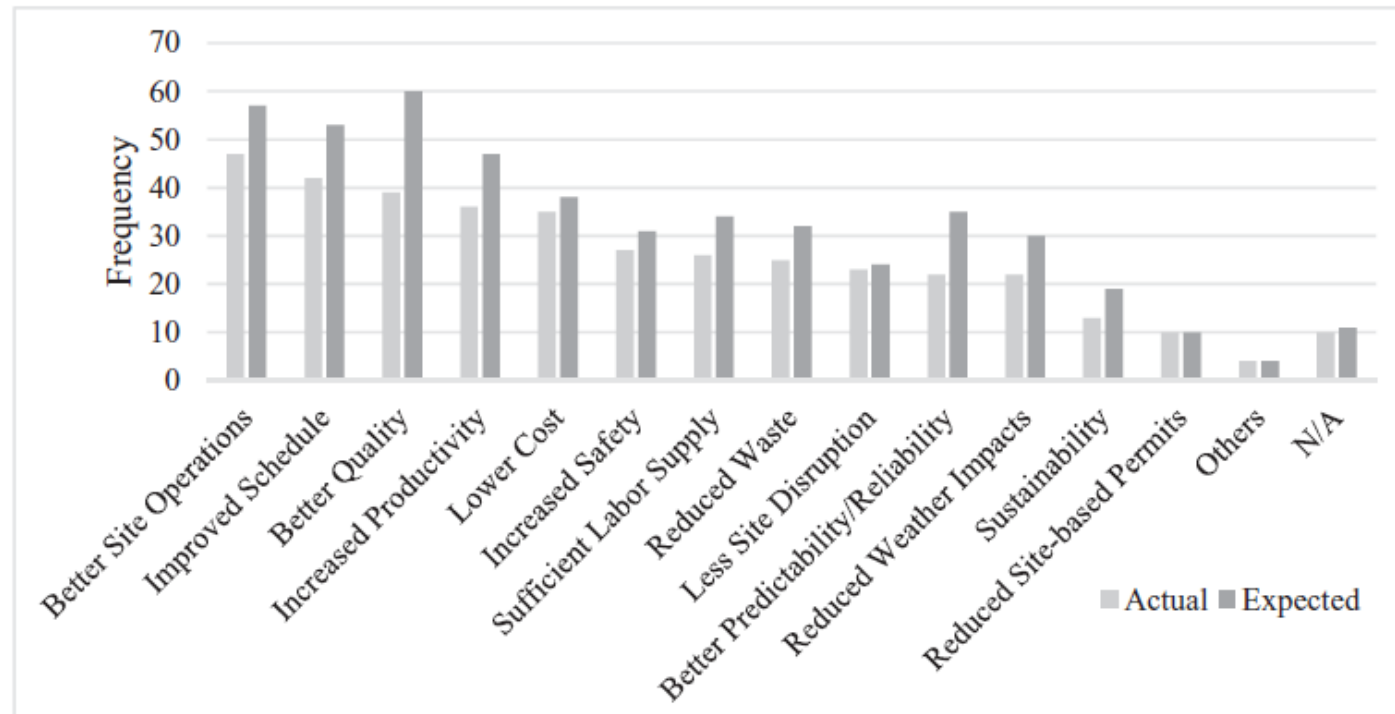
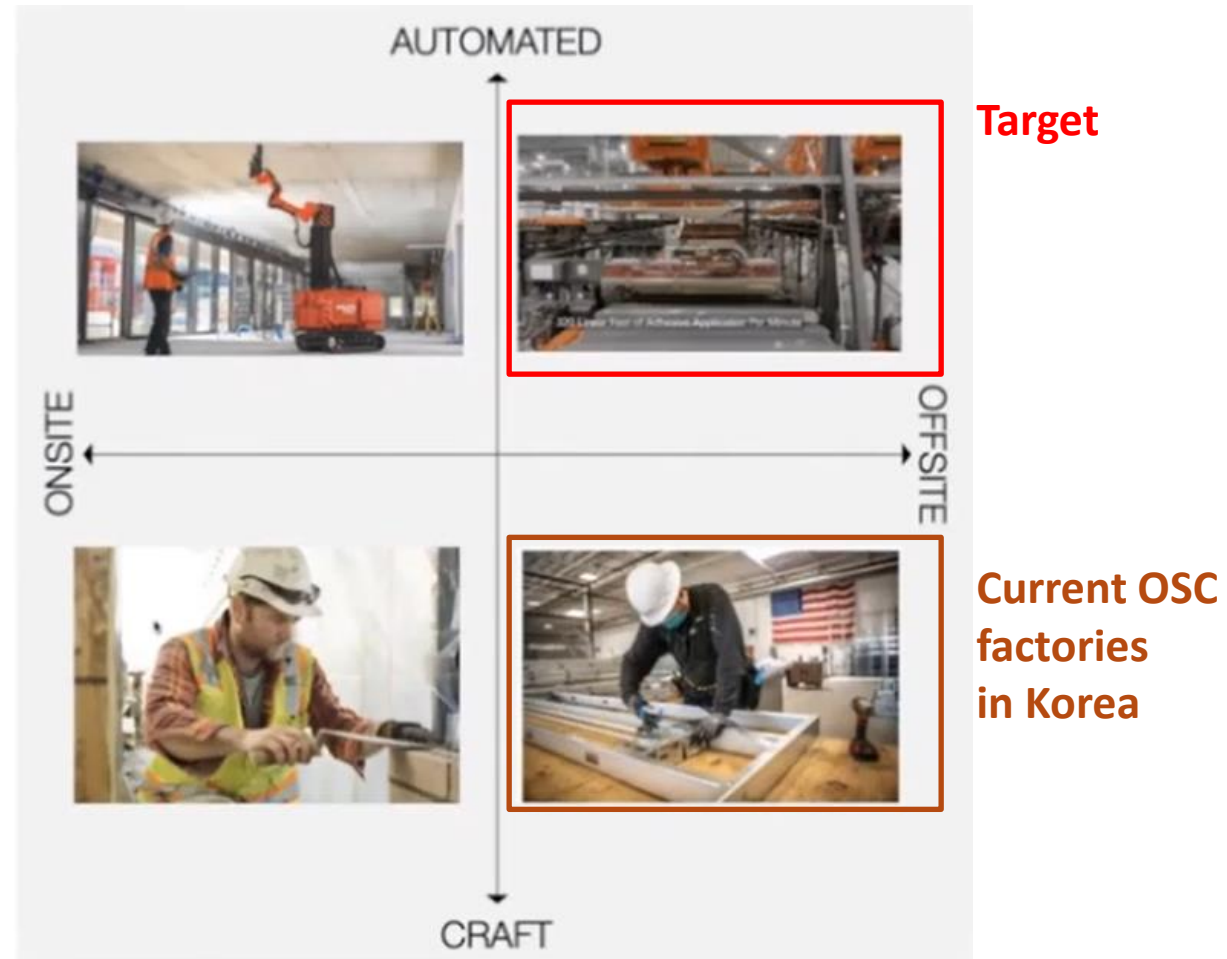


Figure 3. Actual and expected benefits of modular methods ($N = 106$).

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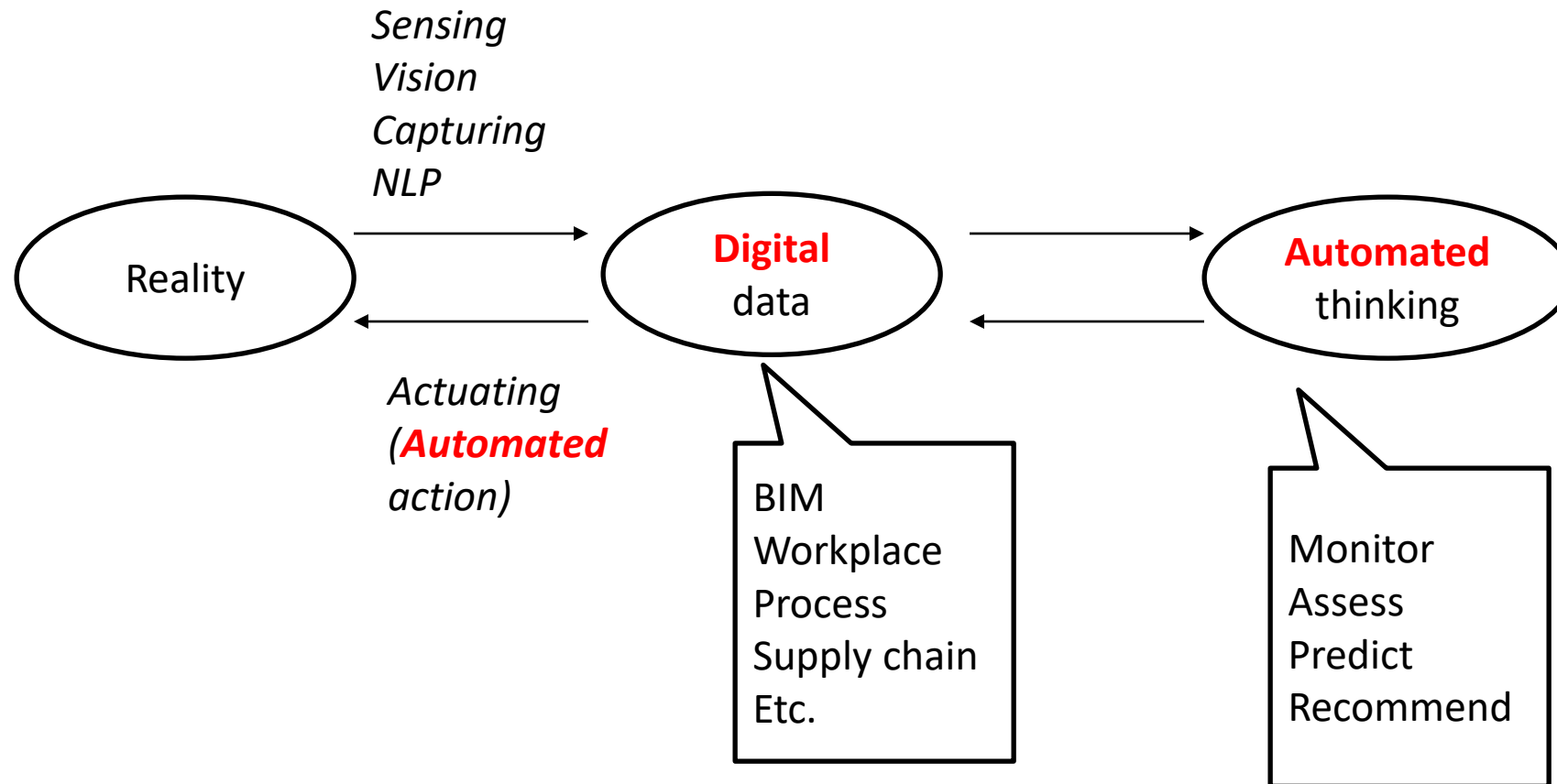
Project Planning and Management



(from Project Production Institute)

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Schedule Delay Leading Indicators in Precast Concrete Construction Projects: Qualitative Comparative Analysis of Korean Cases

Kyeongwoon Cho¹; Seungjun Ahn, A.M.ASCE²; Kyungmo Park³; and Tae Wan Kim⁴

ID	ID explanation
IPC1	Location
IPC2	Project type
OF1	Experience of contractor
OF2	Handling of adverse weather conditions
OF3	Use of BIM
PIF1	Critical path
PIF2	Multitude of PC types
PIF3	Supply of PCs

Table 6. Sufficient conditions for outcome (delay)

ID	Configuration	Raw coverage	Unique coverage	Consistency
1	PIF2 × OF3	0.694	0.076	1.000
2	PIF1 × OF1 × OF3	0.618	0.000	0.890
3	IPC2 × OF1 × OF3	0.618	0.000	0.890

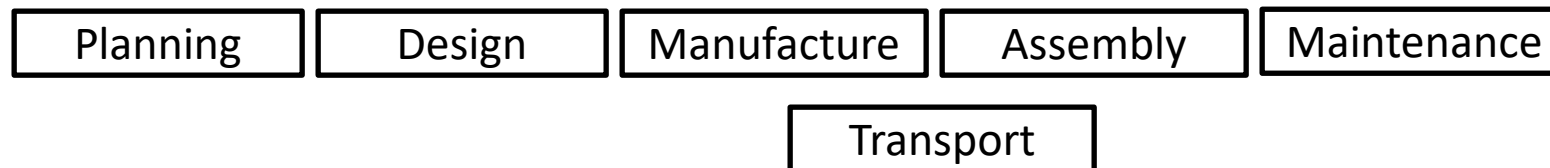
Use of BIM

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Phases of



Phases of



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Toward productivity in future construction: mapping
knowledge and finding insights for achieving
successful offsite construction projects

Junyoung Jang¹, Seungjun Ahn², Seung Hyun Cha³, Kyeongwoon Cho¹,
Choongwan Koo¹ and Tae Wan Kim^{1,*}

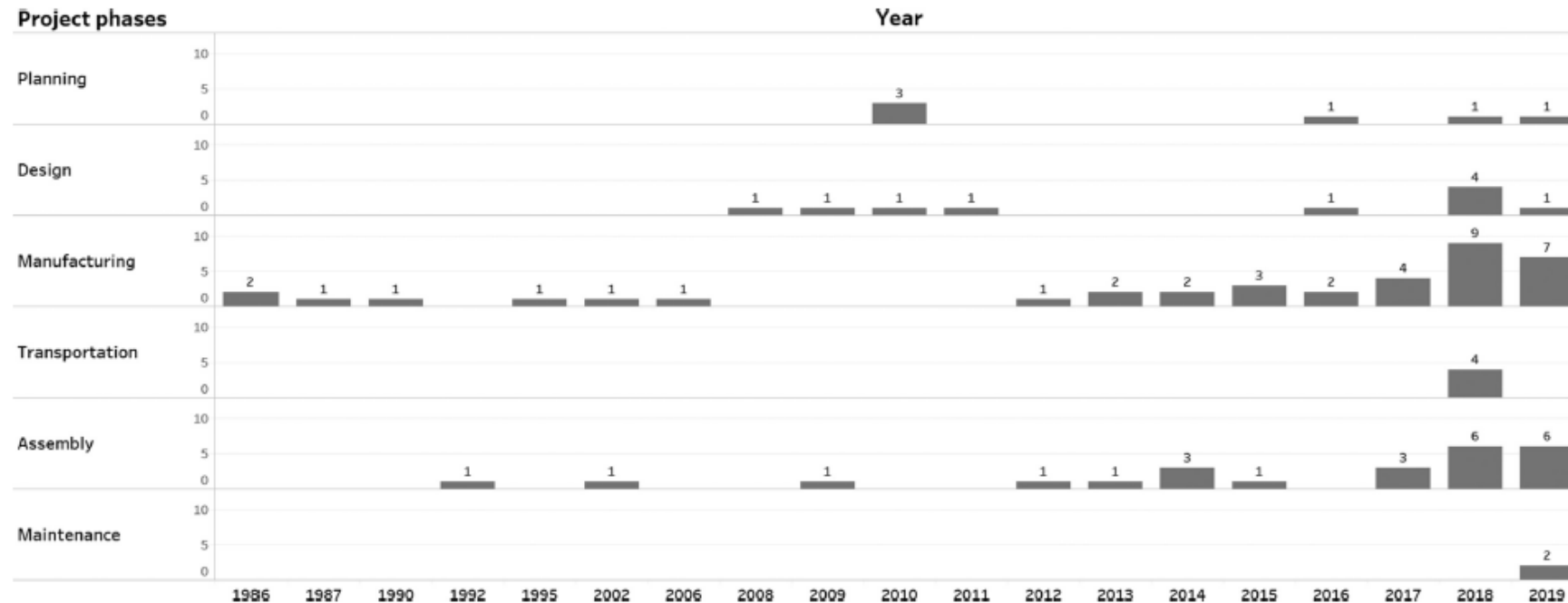
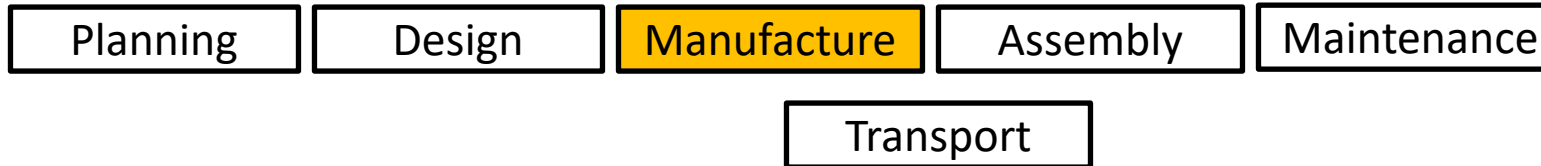


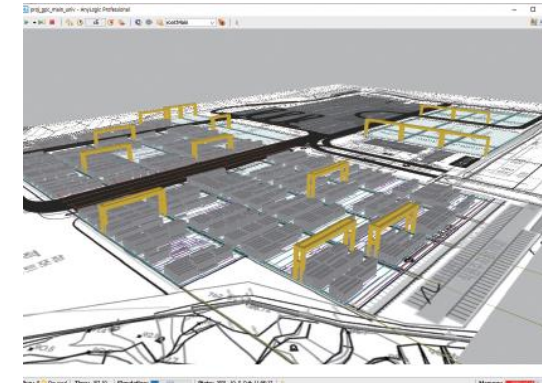
Figure 4: Trends of OSC management papers by project phases (total: 83).

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Planning and Managerial issues

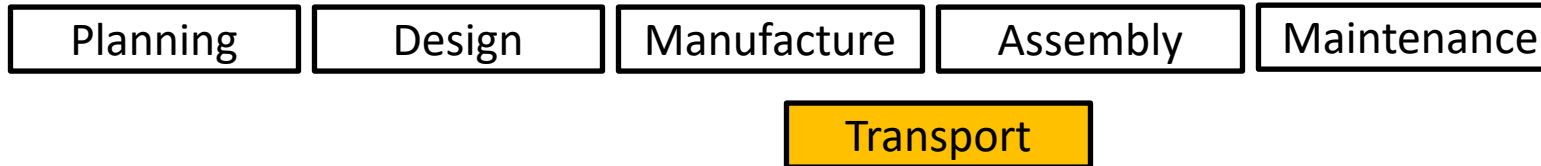


- Mould scheduling
- Factory yard utilization
- Quality/safety management in production

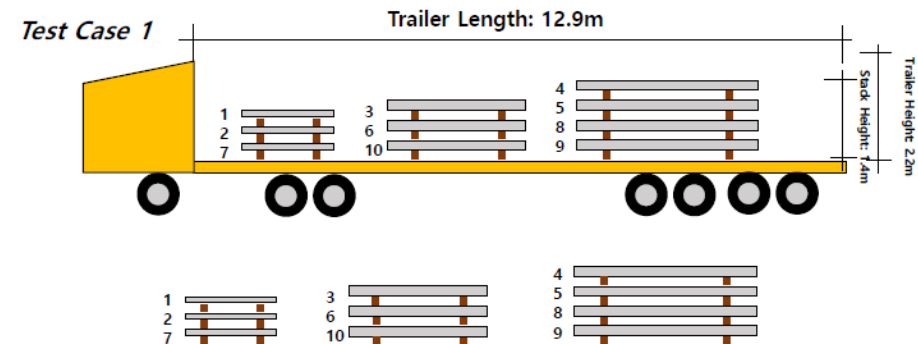


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Planning and Managerial issues



- Supply chain and logistics management
- Routing and tracking
- Component-vehicle allocation
- Loading with stacks



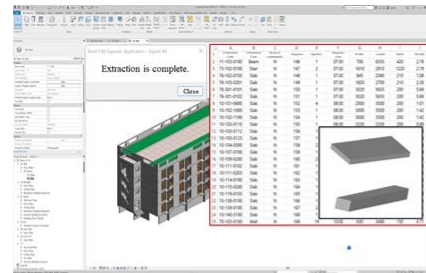
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Automated Components–Vehicle Allocation Planning for Precast Concrete Projects

Jun Young Jang¹; Jung In Kim, Ph.D., M.ASCE²; Choongwan Koo, Ph.D., A.M.ASCE³; and Tae Wan Kim, Ph.D.⁴

Automated Generation of Precast Concrete Slab Stacks for Transportation in Offsite Construction Projects

Gang Ho Lee¹; Jung In Kim, Ph.D., M.ASCE²; Choongwan Koo, Ph.D., A.M.ASCE³; and Tae Wan Kim, Ph.D.⁴



1. 웹 기반 PC운송계획 시스템 회원가입



2. PC부재 운송계획 프로젝트 관리



4. PC부재 운송계획 결과 및 3D 시각화

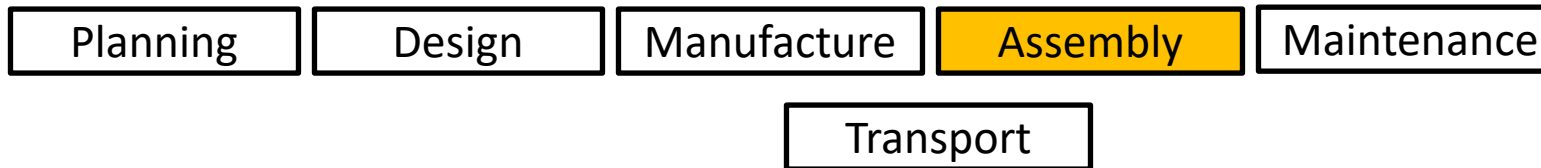


3. PC부재 운송계획 수입

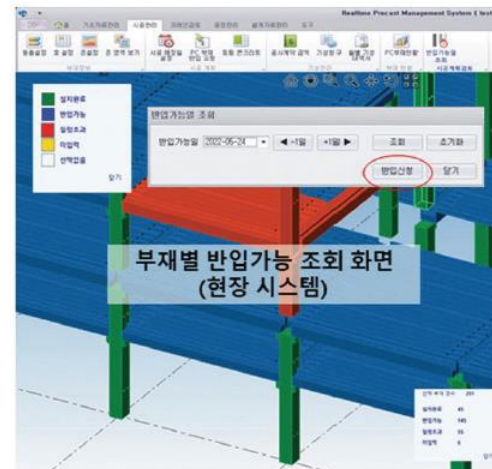


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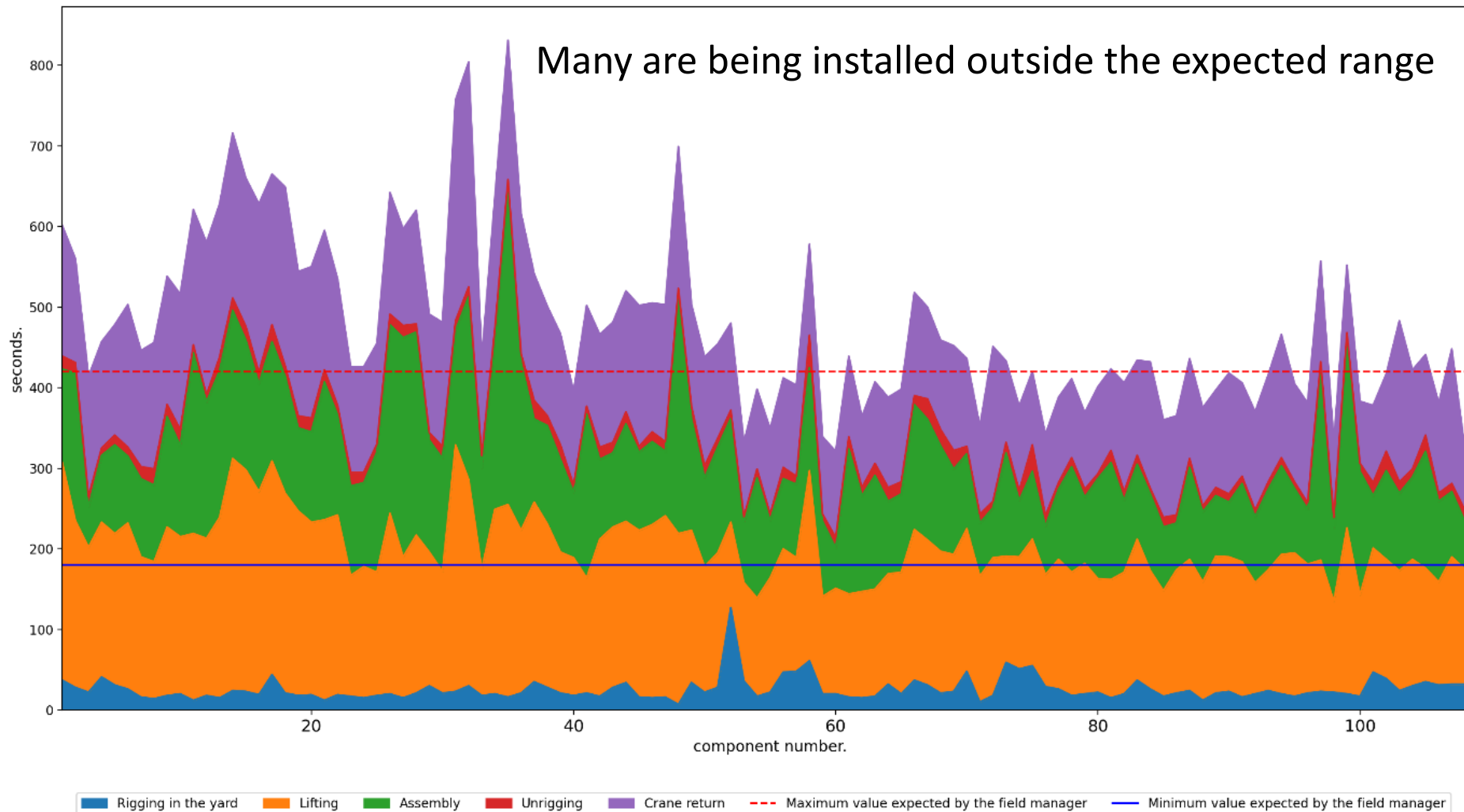
Planning and Managerial issues



- Assembly modeling and guidance
- Productivity and installation scheduling
- PMIS for OSC
- Safety/quality management in assembly

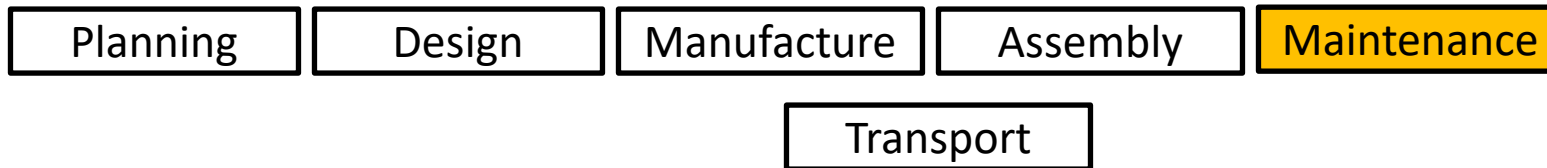


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Planning and Managerial issues



- User satisfaction
- POE
- Reuse for circular economy



리버센 SK뷰 롯데캐슬 모듈러 사무실 설치 모습. <사진=SK에코플랜트>

Way to go for

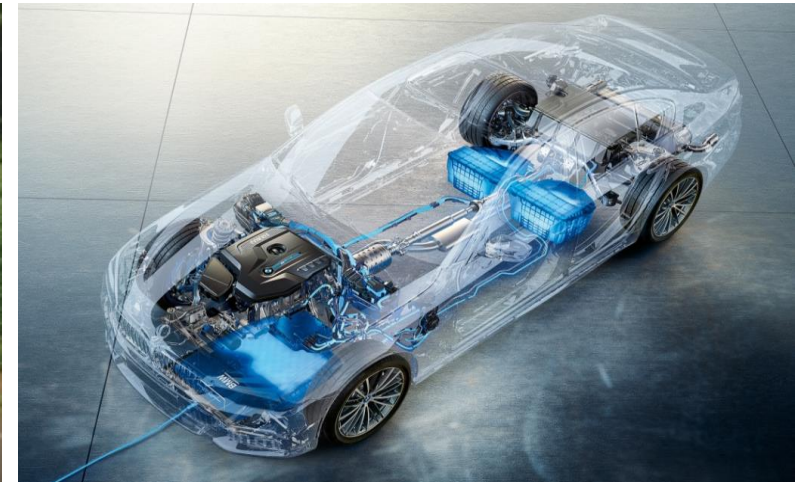
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Paradigm shift,
Challenges and
resistance



Paradigm shift,
Challenges and
resistance



Thank you!

Tae Wan Kim, Ph.D.

Associate Professor, Incheon National University, Korea
taewkim@inu.ac.kr