

1. Record Nr.	UNINA9910830959903321
Autore	Frahm Michael
Titolo	Designing intelligent construction projects // Michael Frahm and Carola Roll
Pubbl/distr/stampa	Hoboken, New Jersey ; ; Chichester, West Sussex : , : Wiley Blackwell, , [2022] ©2022
ISBN	1-119-69069-2 1-119-69084-6
Descrizione fisica	1 online resource (259 pages)
Disciplina	006.3
Soggetti	Artificial intelligence - Industrial applications Construction industry - Technological innovations Cybernetics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover -- Title Page -- Copyright -- Contents -- Preface -- Acknowledgements -- About the Authors -- Chapter 1 Complexity, Cybernetics, and Dynamics -- 1.1 Complexity -- 1.1.1 Complexity in the Mathematical Sciences -- 1.1.2 Complexity in Sociology -- 1.1.3 Complexity in Management -- 1.1.4 Complexity in Construction Management -- 1.1.5 How to Cope with Complexity -- 1.1.6 Interaction and Autopoiesis -- 1.2 Viable System Model -- 1.2.1 The Static Perspective on the VSM -- 1.2.1.1 System 1: Operation -- 1.2.1.2 System 2: Coordination -- 1.2.1.3 System 3: Operational Management -- 1.2.1.4 System 3*: Monitoring/Audit -- 1.2.1.5 System 4: Strategic Management -- 1.2.1.6 System 5: Policy -- 1.2.2 Ashby's Variety -- 1.2.2.1 The Variety Number -- 1.2.2.2 The Degree of Variety -- 1.2.3 The Dynamic Perspective on the VSM -- 1.2.3.1 Variety Balance 1: Workload -- 1.2.3.2 Variety Balance 2: Line Balancing -- 1.2.3.3 Variety Balance 3: Autonomy vs. Cohesion -- 1.2.3.4 Variety Balance 4: Change Rate -- 1.2.3.5 Variety Balance 5: Change vs. Status Quo -- 1.3 Modelling with the Viable System Model -- 1.3.1 Modelling Steps -- 1.3.2 Create a VSM Model Using an Example -- 1.4 System Dynamics -- 1.4.1 Systemic Archetypes -- 1.4.2 Modelling with System Dynamics

-- 1.4.3 Example: Managing Risks with System Dynamics -- 1.5 Findings, Criticism, and Reflective Questions -- 1.5.1 Findings -- 1.5.2 Criticism -- 1.5.3 Reflective Questions -- Chapter 2 Lean Management and Lean Construction -- 2.1 Pioneers of Lean Management -- 2.2 Toyota Production System and Tools -- 2.2.1 Waste, Kanban, and Just intime Principle -- 2.2.2 Jidoka and Related Elements -- 2.2.3 Heijunka -- 2.2.4 Single Minute Exchange of Die (SMED) -- 2.2.5 Kaizen and Standards -- 2.3 Lean Management and Its Principles -- 2.3.1 Resource and Flow Efficiency -- 2.3.2 Examples for Resource and Flow Efficiency.
2.3.2.1 The Machine and Plant Manufacturer -- 2.3.2.2 The Vacation Flight -- 2.3.2.3 The Healthcare System -- 2.3.2.4 The Automotive Industry -- 2.3.3 Four Important Principles -- 2.3.3.1 Flow Principle -- 2.3.3.2 Takt Principle -- 2.3.3.3 Pull Principle -- 2.3.3.4 Zerodefekt Principle -- 2.3.4 Lean Leadership -- 2.3.4.1 Excursion: Kata -- 2.4 Lean Construction and Tools -- 2.4.1 Last Planner System -- 2.4.1.1 Milestone Planning -- 2.4.1.2 Collaborative Programming -- 2.4.1.3 Making Ready -- 2.4.1.4 Production Planning -- 2.4.1.5 Production Management and Learning -- 2.4.2 Takt Planning and Control -- 2.4.2.1 Takt Planning -- 2.4.2.2 Takt Control -- 2.4.3 Last Planner System and Takt Planning and Control -- 2.4.4 Lean Construction Case Study -- 2.4.4.1 Takt Planning -- 2.4.4.2 Takt Control -- 2.5 Tools, Tools, Tools -- 2.5.1 Firstrun Study -- 2.5.1.1 Phase Plan -- 2.5.1.2 Phase Do -- 2.5.1.3 Phase Study -- 2.5.1.4 Phase Adjust -- 2.5.2 Waste Walks -- 2.5.2.1 5 Why and 6W Questioning Technique -- 2.5.3 Ishikawa Diagram -- 2.5.4 A3 Method and Report -- 2.5.5 Visual Management -- 2.5.6 5S/5A -- 2.5.6.1 Seiri - Sort -- 2.5.6.2 Seiton - Set in Order -- 2.5.6.3 Seiso - Shine -- 2.5.6.4 Seiketsu - Standardise -- 2.5.6.5 Shitsuke - Sustain -- 2.5.7 Plus/Delta Review -- 2.5.8 Big Room -- 2.6 Practice Insights from Martin Jäntsche -- 2.6.1 Infrastructure Railway - Introduction of Lean Construction in Large Projects -- 2.6.2 Implementing Change in an Infrastructure Organisation -- 2.6.3 Conclusion -- 2.6.3.1 To Section -- 2.6.3.2 To Section -- 2.7 Findings, Criticism, and Reflective Questions -- 2.7.1 Findings -- 2.7.2 Criticism -- 2.7.3 Reflective Questions -- Chapter 3 Cybernetics and Lean -- 3.1 VSM and Lean (Construction) Thinking -- 3.2 Mapping the Viable System Model with Lean Construction Methods -- 3.2.1 Mapping VSM and the Last Planner System.
3.2.2 Mapping VSM and Takt Planning and Control -- 3.2.3 Mapping Information Channels and Lean Construction -- 3.3 Mapping the Viable System Model with Lean Management Methods -- 3.4 Performance Measurement -- 3.4.1 General Measurement -- 3.4.2 Lean Measurement Construction -- 3.4.3 Beers' Triple -- 3.5 Case Studies and Practice Insights -- 3.5.1 Case Study: Planning Project -- 3.5.2 Case Study: Major Project (Planning and Execution) -- 3.5.2.1 Design Phase and Approval Phase -- 3.5.2.2 Tendering and Awarding Phase -- 3.5.2.3 Construction Phase -- 3.5.3 Case Study: Megaproject (Execution)6 -- 3.5.3.1 Boundary Conditions -- 3.5.3.2 Analysis of the Megaproject -- 3.5.3.3 Section Analysis -- 3.5.4 Practice Insights from a Mediumsized Mechanical Engineering Company -- 3.5.4.1 Challenges for the Industry -- 3.5.4.2 The Solution: The Creation of a Hybrid Corporate Form Based on the VSM -- 3.5.4.3 From Theory to Practice: The Organisational Structure -- 3.5.4.4 Levels of Complexity -- 3.5.4.5 Process Organisation -- 3.5.4.6 Role Profiles -- 3.5.4.7 Organiplastic as a Base for the Management Cockpit -- 3.5.4.8 Conclusion -- 3.5.4.9 Adaptability -- 3.6 Findings, Criticism, and Reflective Questions -- 3.6.1 Findings -- 3.6.2 Criticism -- 3.6.3

Critical Reflection to Practice Insights from a Mediumsized Mechanical Engineering Company -- 3.6.4 Reflective Questions -- Chapter 4 Beyond Cybernetics and Lean -- 4.1 Control, Regulate, Steer -- 4.2 Selforganisation -- 4.3 Viable, Lean, ... and What About Agile? -- 4.4 Digital Transformation -- 4.5 Phases of Digital Change -- 4.6 Digitalisation in the Construction Industry -- 4.6.1 Status Quo -- 4.6.2 Phase 1: BIM, VR, AR, MR -- 4.6.3 Phase 2: Intelligent Project Management -- 4.6.4 Phase 3: Artificial Intelligence in Construction -- 4.6.5 Phase 4: Autonomous Project Management -- 4.7 Changing the Game. 4.7.1 Nudge Management -- 4.7.2 Tit for Tat -- 4.8 Partnering -- 4.9 Success Patterns in Projects -- 4.10 Findings, Criticism, and Reflective Questions -- 4.10.1 Findings -- 4.10.2 Criticism -- 4.10.3 Reflective Questions -- Chapter 5 Summary and Closing Remarks -- 5.1 Complexity, Cybernetics, and Dynamics -- 5.2 Lean Management and Lean Construction -- 5.3 Cybernetic and Lean -- 5.4 Beyond Cybernetic and Lean -- References -- Glossary -- List of Figures -- List of Tables -- List of Equations -- List of Abbreviations -- Index -- EULA.
