

Lean Design Springer

This book collates the main research developments around Lean Construction over the past 25 years with contributions from many seminal authors in the field. It takes stock of developments since the publication of Koskela's (1992) *Application of the New Production Philosophy to Construction* and, in doing so, challenges current thinking and progress. It also crystallises theoretical conceptualisations and practically situated learning whilst identifying future research challenges, agendas and opportunities for global collaborative actions. The contributors present the development of Lean Construction as a fundamental part of improving construction productivity, quality and delivery of value to clients and users of built infrastructure. In doing so, the book introduces the reader to the foundational principles and theories that have influenced the way we now understand Lean Construction and has provided very useful insights to students, practitioners and researchers on key junctures over the last 25 years. Highlighting the key contemporary developments and using global case study material the chapters demonstrate good practice but also help introduce new thinking to both lay readers and experienced practitioners alike. This book is essential reading for undergraduate and postgraduate students, researchers and practitioners with an interest in Lean Construction and construction management, providing a general understanding of the area, current state of the art knowledge as well as providing an insight into areas for future research.

The book presents a mixed research method adopted to assess and present the Toyota Way practices within construction firms in general and for firms in China specifically. The results of an extensive structured questionnaire survey based on the Toyota Way-styled attributes identified were developed and data collected from building professionals working in construction firms is presented. The quantitative data presented in the book explains the status quo of the Toyota Way-styled practices implemented in the construction industry, as well as the extent to which these attributes were perceived for lean construction management. The book highlights all the actionable attributes derived from the Toyota Way model appreciated by the building professionals, but alerts the readers that some attributes felled short of implementation. Further findings from in-depth interviews and case studies are also presented in the book to provide to readers an understanding how these Toyota Way practices can be implemented in real-life projects. Collectively, all the empirical findings presented in this book can serve to enhance understanding of Toyota Way practices in the lean construction management context. The readers are then guided through to understand the gaps between actual practice and Toyota Way-styled practices, and the measures that they may undertake to circumvent the challenges for implementation. The book also presents to readers the SWOT analysis that addresses the strengths, weaknesses, opportunities and threats towards the implementation of the Toyota Way in the construction industry. The book

prescribes the Toyota Way model for use in construction firms to strategically implement lean construction management. The checklist presented in the book enables readers to draw lessons that may be used additionally as a holistic assessment tool for measuring the maturity of firms with respect to their Toyota Way implementation. Consequent to this, management would then be in a better position to develop plans for Toyota Way implementation by focusing on weak areas, strengthening them, and thus increasing the likelihood of success in the implementation of the Toyota Way. In a nutshell, this book provides a comprehensive and valuable resource for firms not only in the construction industry but also businesses outside of the construction sector to better understand the Toyota Way and how this understanding can translate to implementation of lean construction/business management to enhance profitability and survivability in an increasingly competitive global market place. Rapid prototyping is used to design and develop medical devices and instrumentation. This book details research in rapid prototyping of bio-materials for medical applications. It provides a wide variety of examples of medical applications using rapid prototyping, including tissue engineering, dental applications, and bone replacement. Coverage also discusses the emergence of computer aided design in the development of prosthetic devices.

This book presents the latest developments in optimization and optimal control models; exact, approximate and hybrid methods; and their applications in lean and green supply chains. It examines supply chain network design and modeling, closed loop supply chains, and lean, green, resilient and agile or responsive networks, and also discusses corporate social responsibility and occupational health and safety. It particularly focuses on supply chain management under uncertainty – employing stochastic or nonlinear modeling, simulation based studies and optimization – multi-criteria decision-making and applications of fuzzy set theory, and covers various aspects of supply chain management such as risk management, supplier selection or the design of automated warehouses. Lastly, using experimental applications and practical case studies, it shows the impact of lean and green applications on vehicle/fleet management and operations management.

This handbook charts the new engineering paradigm of engineering systems. It brings together contributions from leading thinkers in the field and discusses the design, management and enabling policy of engineering systems. It contains explorations of core themes including technical and (socio-) organisational complexity, human behaviour and uncertainty. The text includes chapters on the education of future engineers, the way in which interventions can be designed, and presents a road map for the future. This book follows the emergence of engineering systems, a new engineering paradigm that will help solve truly global challenges. This global approach is characterized by complex sociotechnical systems that are now co-dependent and highly integrated both functionally and technically as well as by a realization that we all share the same: climate, natural

resources, a highly integrated economical system and a responsibility for global sustainability goals. The new paradigm and approach requires the (re)designing of engineering systems that take into account the shifting dynamics of human behaviour, the influence of global stakeholders, and the need for system integration. The text is a reference point for scholars, engineers and policy leaders who are interested in broadening their current perspective on engineering systems design and in devising interventions to help shape societal futures. This book focusses on the challenges and changes organizational management faces in an era when the need to develop environmentally aware processes meets high levels of competition. It covers the synergetic effects, how re-use, recycling, waste reduction, and other sustainable production strategies can add value, low costs and time of production. Sustainable business behavior is not only an environmental perspective on management, but more and more contains an organizational perspective. Taking into account these issues, green and lean management appears as the way managers can drive their employees to continuously improve the management processes that add value to the organization and costumers. This book provides information on principles, strategies, models, and applications of green and lean management, and at the same time communicates the latest research activity relating to this scientific field world-wide.

This book constitutes revised selected papers from the 3rd International Conference on Lean and Agile Software Development, LASD 2019, and the 7th Conference on Multimedia, Interaction, Design and Innovation, MIDI 2019, which took place under the umbrella of the 14th Federated Conferences on Computer Science and Information Systems, FedCSIS, in Leipzig, Germany, in September 2019. LASD 2019 received a total of 30 submissions, of which 6 full and 1 short paper are included in this volume. For MIDI 2019 one short paper was accepted for publication in this book, from a total of 6 submissions.

This book covers a variety of topics in material, mechanical, and management engineering, especially in the area of machine design, product assembly, measurement systems, process planning and quality control. It describes cutting-edge methods and applications, together with exemplary case studies. The content is based on papers presented at the 5th International Scientific-Technical Conference (MANUFACTURING 2017) held in Poznan, Poland on 24-26 October 2017. The book brings together engineering and economic topics, is intended as an extensive, timely and practice-oriented reference guide for researchers and practitioners, and is expected to foster better communication and closer cooperation between universities and their business and industry partners.

This book contains all refereed papers that were accepted to the “Complex Systems Design & Management” (CSDM 2010) international conference that took place in Paris (France), October 27 – 29, 2010 (Website: <http://www.csdm2010.csdm.fr>). These proceedings covers the most recent trends in the emerging field of complex systems sciences & practices from an industrial and academic perspective, including the main industrial domains (transport, defense & security, electronics, energy & environment,

health, communications & media, e-services), scientific & technical topics (systems fundamentals, systems architecture & engineering, systems metrics & quality, systemic tools) and system types (transportation systems, embedded systems, software & information systems, systems of systems, artificial ecosystems). The CSDM 2010 conference is organized under the guidance of the CESAMES non profit organization (Website: <http://www.cesames.net>).

Apply lean frameworks and other concepts of software development to the process of your game development. Resistance to Agile methodologies in the gaming industry is most often due to frustrated attempts to use lean tools and frameworks. Lean Game Development teaches you how to apply frameworks and concepts successfully to benefit you and your team. You will see how to manage, develop and coexist in a lean game development environment. You'll understand what lean is and how it helps the gaming industry. You'll see how to apply MVP concepts and why you should. The concepts taught are used not only in the design of the software code but also in all stages of the development process. Ideal for any game development company, including indie and small studios, Lean Game Development offers new opportunities for streamlining your workflow and benefiting your game development overall. What You'll Learn Discover how lean helps the gaming industry Understand the value of lean over Agile Apply MVP concepts to gaming industry Work with basic automated testing for gaming environment Who This Book Is For Game developers, artist, designers and project managers

The book provides a holistic and practical approach to lean management throughout the business value chain. The lean management framework and tools demonstrate the optimal design and use of methods, tools and principles for companies and organisations. The author describes comprehensively how lean management enables companies to concentrate on value-adding activities and processes to achieve a long-term, sustainable competitive advantage. A wealth of best practices, industry examples and case studies are used to reveal the diversity and opportunities of lean management methodologies, methods and principles. Moreover, the book shows how lean management principles are ultimately applied in industries like automotive, healthcare, education and services industries.

In times of declining economic growth, companies have to control their costs more than ever to save resources needed in the future. Regardless of the economic size of the company, the processes of production and logistics play a decisive role in stabilizing procedures and avoiding waste. Both are important cost drivers in manufacturing companies and therefore they offer large potential savings. Pervasive networking in the last years has contributed to a hitherto unknown transparency of global markets. This harmonization opened up new possibilities of entering foreign markets for procurement and sales to the companies. The emerging global procurement strategy was understood as a chance to rethink the relocation of existing production facilities to profit from existing differences in price and performance as a resource-saving factor. Many companies tended towards a reduction of their vertical integration by outsourcing sections of their value chain. These contracted services of production result in higher transport volumes, increased complexity of supply processes and new requirements on logistic networks. This trend of outsourcing has not stopped, but is slowing down noticeably.

Additionally, there is an increasing proportion of companies restoring business units that

were outsourced before. Reasons for turning back decisions are often to be found in missed goals. It is not unusual that important cost factors were disregarded in the original basis of decision-making. In the meantime many companies have realized that it is easier to achieve stability of processes and therewith a control of costs by increasing their own contribution to production. Especially in times of under-utilized capacities like in the current crisis, insourcing can be a strategic option.

This book constitutes the refereed post-conference proceedings of the 15th IFIP WG 5.1 International Conference on Product Lifecycle Management, PLM 2018, held in Turin, Spain, in July 2018. The 72 revised full papers presented were carefully reviewed and selected from 82 submissions. The papers are organized in the following topical sections: building information modeling; collaborative environments and new product development; PLM for digital factories and cyber physical systems; ontologies and data models; education in the field of industry 4.0; product-service systems and smart products; lean organization for industry 4.0; knowledge management and information sharing; PLM infrastructure and implementation; PLM maturity, implementation and adoption; 3D printing and additive manufacturing; and modular design and products and configuration and change management.

The book shows readers exactly how to use Lean tools to design healthcare work that is smooth, efficient, error free and focused on patients and patient outcomes. It includes in-depth discussions of every important Lean tool, including value stream maps, takt time, spaghetti diagrams, workcell design, 5S, SMED, A3, Kanban, Kaizen and many more, all presented in the context of healthcare. For example, the book explains the importance of quick operating room or exam room changeovers and shows the reader specific methods for drastically reducing changeover time. Readers will learn to create healthcare value streams where workflows are based on the pull of customer/patient demand. The book also presents a variety of ways to continue improving after initial Lean successes. Methods for finding the root causes of problems and implementing effective solutions are described and demonstrated. The approach taught here is based on the Toyota Production System, which has been adopted worldwide by healthcare organizations for use in clinical, non-clinical and administrative areas.

Digital Twin Driven Smart Design draws on the latest industry practice and research to establish a basis for the implementation of digital twin technology in product design. Coverage of relevant design theory and methodology is followed by detailed discussions of key enabling technologies that are supported by cutting-edge case studies of implementation. This groundbreaking book explores how digital twin technology can bring improvements to different kinds of product design process, including functional, lean and green. Drawing on the work of researchers at the forefront of this technology, this book is the ideal guide for anyone interested in digital manufacturing or computer-aided design. Provides detailed case studies that explore key applications of digital twin technology in design practice Introduces the concept of using digital twins to create the virtual commissioning of design projects Presents a framework to help engineers incorporate digital twins into their product design process

Production Systems Engineering (PSE) is an emerging branch of Engineering intended to uncover fundamental principles of production systems and utilize

them for analysis, continuous improvement, and design. This volume is the first ever textbook devoted exclusively to PSE. It is intended for senior undergraduate and first year graduate students interested in manufacturing. The development is first principle-based rather than recipe-based. The only prerequisite is elementary Probability Theory; however, all necessary probability facts are reviewed in an introductory chapter. Using a system-theoretic approach, this textbook provides analytical solutions for the following problems: mathematical modeling of production systems, performance analysis, constrained improvability, bottleneck identification and elimination, lean buffer design, product quality, customer demand satisfaction, transient behavior, and system-theoretic properties. Numerous case studies are presented. In addition, the so-called PSE Toolbox, which implements the algorithms developed, is described. The volume includes numerous case studies and problems for homework assignment.

The Toolset is a comprehensive collection of the relevant Design for Six Sigma+Lean tools, which are necessary for successfully implementing innovations. All tools are presented in a clear structure, providing a good overview of the methodology. The chronology of the listed tools corresponds to the procedure in a Design for Six Sigma+Lean development project with the stages Define, Measure, Analyze, Design, and Verify. Due to this unique structure by which tools can be found and applied quickly we created a book that facilitates project work in practical use enormously.

The book is divided into three parts. Part I. The Rising economy of “one” gives an overview of what is changing in the social system of production, it refers to the weakening role of central planning and the rising power of individuation in the value creation chain. Part II. Lean Enterprise in theory refers to the principles of lean thinking, the transfer of lean philosophy from East to West and discusses the necessary adaptation to the Western way of thinking and practice. It presents a practice proven method for achieving a lean integrated demand and supply chain and analyses in detail the related implementation steps. Criteria for a successful displacement of a company to a lean state are presented. Part III. Lean Enterprise in practice provides a number of implementation cases in different types of production companies using the method presented in Part II. The goal is to help the reader comprehend how the method can be applied to real lean implementation situations in resolving various issues, ranging from production to the supply chain. A vision of implementation to lean electricity completes the book.

In this book, leading international experts explore the emerging concept of the zero energy mass custom home (ZEMCH) – designed to meet the need for social, economic, and environmental sustainability – and provide all of the knowledge required for the delivery of zero energy mass customized housing and community developments in developed and developing countries. The coverage is wide ranging, progressing from explanation of the meaning of sustainable development to discussion of challenges and trends in mass housing, the

advantages and disadvantages of prefabricated methods of construction, and the concepts of mass customization, mass personalization, and inclusive design. A chapter on energy use will aid the reader in designing and retrofitting housing to reduce energy demand and/or improve energy end-use efficiency. Passive design strategies and active technologies (especially solar) are thoroughly reviewed. Application of the ZEMCH construction criteria to new buildings and refurbishment of old houses is explained and the methods and value of building performance simulation, analyzed. The concluding chapter presents examples of ZEMCH projects from around the world, with discussion of marketing strategy, design, quality assurance, and delivery challenges. The book will be invaluable as a training/teaching tool for both students and industry partners.

This book presents a series of high performance product design (PD) and development best practices that can create or improve product development organization. In contrast to other books that focus only on Toyota or other individual companies applying lean IPD, this book explains the lean philosophy more broadly and includes discussions of systems engineering, design for X (DFX), agile development, integrated product development, and project management. The “Lean Journey” proposed here takes a value-centric approach, where the lean principles are applied to PD to allow the tools and methods selected to emerge from observation of the individual characteristics of each enterprise. This means that understanding lean product development (LPD) is not about knowing which tools are available but knowing how to apply the philosophy. The book comes with an accompanying manual with problems and solutions available on Springer Extras.

The Toolset is a comprehensive collection of the relevant Design for Six Sigma+Lean tools, which are necessary for successfully implementing innovations. All tools are presented in a clear structure, providing a good overview of the methodology. The chronology of the listed tools corresponds to the procedure in a Design for Six Sigma+Lean development project with the stages Define, Measure, Analyze, Design, and Verify. Due to this unique structure by which tools can be found and applied quickly we created a book that facilitates project work in practical use enormously. Migrating from a tool based approach to a question based approach is a decisive success factor in our opinion enabling firstly, increased efficiency of project work for the Project Leader, his team and the associated Stakeholders, and secondly, significantly increasing the probability of success for the respective innovation projects. This book provides an accessible one-volume introduction to Lean Six Sigma and statistics in engineering for students and industry practitioners. Lean production has long been regarded as critical to business success in many industries. Over the last ten years, instruction in Six Sigma has been linked more and more with learning about the elements of lean production. Building on the success of the first and second editions, this book expands substantially on major topics of increasing relevance to organizations interested in Lean Six Sigma. Each chapter includes summaries and review examples

plus problems with their solutions. As well as providing detailed definitions and case studies of all Six Sigma methods, the book uniquely describes the relationship between operations research techniques and Lean Six Sigma. Further, this new edition features more introductory material on probability and inference and information about Deming's philosophy, human factors engineering, and the motivating potential score – the material is tied more directly to the Certified Quality Engineer (CQE) exam. New sections that explore motivation and change management, which are critical subjects for achieving valuable results have also been added. The book examines in detail Design For Six Sigma (DFSS), which is critical for many organizations seeking to deliver desirable products. It covers reliability, maintenance, and product safety, to fully span the CQE body of knowledge. It also incorporates recently emerging formulations of DFSS from industry leaders and offers more introductory material on experiment design, and includes practical experiments that will help improve students' intuition and retention. The emphasis on lean production, combined with recent methods relating to DFSS, makes this book a practical, up-to-date resource for advanced students, educators and practitioners.

This book offers a unique guide to the three-dimensional (3D) printing of metals. It covers various aspects of additive, subtractive, and joining processes used to form three-dimensional parts with applications ranging from prototyping to production. Examining a variety of manufacturing technologies and their ability to produce both prototypes and functional production-quality parts, the individual chapters address metal components and discuss some of the important research challenges associated with the use of these technologies. As well as exploring the latest technologies currently under development, the book features unique sections on electron beam melting technology, material lifting, and the importance this science has in the engineering context. Presenting unique real-life case studies from industry, this book is also the first to offer the perspective of engineers who work in the field of aerospace and transportation systems, and who design components and manufacturing networks. Written by the leading experts in this field at universities and in industry, it provides a comprehensive textbook for students and an invaluable guide for practitioners

Design for Six Sigma + Lean Toolset Mindset for Successful Innovations Springer
Science & Business Media

This book provides a stage-by-stage integration of lean and green manufacturing paradigms to achieve environmental and economic benefits. The book includes chapters on conceptual development for incorporating the lean and green paradigm, and methods, tools and techniques for developing and integrating lean manufacturing. Several case studies which demonstrate the benefits of integrating lean and green manufacturing techniques are also covered here. The contents of this book are expected to support researchers and practitioners in the implementation of integrated lean and green manufacturing technologies.

This book offers a comprehensive reference guide to customer-oriented product design and intelligence. It provides readers with the necessary intelligent tools for designing customer-oriented products in contexts characterized by incomplete information or insufficient data, where classical product design approaches cannot be applied. The respective chapters, written by prominent researchers, explain a wealth of both basic and advanced concepts including fuzzy QFD, fuzzy FMEA, the fuzzy Kano model, fuzzy

axiomatic design, fuzzy heuristics-based design, conjoint analysis-based design, and many others. To foster reader comprehension, all chapters include relevant numerical examples or case studies. Taken together, they form an excellent reference guide for researchers, lecturers, and postgraduate students pursuing research on customer-oriented product design. Moreover, by extending all the main aspects of classical customer-oriented product design to its intelligent and fuzzy counterparts, the book presents a dynamic snapshot of the field that is expected to stimulate new directions, ideas, and developments.

Value stream design is increasingly asserting itself as the key approach for production optimization, but there has never been a detailed and systematic presentation of the value stream method before – a gap that has now been filled by this book. The author provides an easily comprehensible code of practice for the effective analysis of production processes, product family-oriented factory structuring and the target-oriented development of an ideal future state of production. The book plausibly conveys ten design guidelines for production optimization with corresponding equations, descriptive illustrations and industrial examples well-proven in numerous industrial projects. It addresses the professional public, practitioners wishing to avoid waste and systematically improve their factories' value streams, and students - tomorrow's practitioners. In contrast to other publications, this book complements the value stream analysis and its unique compact visualization of the entire production process by a detailed illustration of the information flow and a comprehensive discussion of the operator balance chart. The »traditional« concept of value stream design is significantly expanded with a view to its applicability in complex productions by way of methodological innovation and further development concerning campaign formation, value stream management and technological process integration. The method is embedded in a comprehensive procedural approach for factory planning, starting with the definition of the desired lean production goals.

Lean production, has long been regarded as critical to business success in many industries. Over the last ten years, instruction in six sigma has been increasingly linked with learning about the elements of lean production. Introduction to Engineering Statistics and Lean Sigma builds on the success of its first edition (Introduction to Engineering Statistics and Six Sigma) to reflect the growing importance of the "lean sigma" hybrid. As well as providing detailed definitions and case studies of all six sigma methods, Introduction to Engineering Statistics and Lean Sigma forms one of few sources on the relationship between operations research techniques and lean sigma. Readers will be given the information necessary to determine which sigma methods to apply in which situation, and to predict why and when a particular method may not be effective. Methods covered include: • control charts and advanced control charts, • failure mode and effects analysis, • Taguchi methods, • gauge R&R, and • genetic algorithms. The second edition also greatly expands the discussion of Design For Six Sigma (DFSS), which is critical for many organizations that seek to deliver desirable products that work first time. It incorporates recently emerging formulations of DFSS from industry leaders and offers more introductory material on the design of experiments, and on two level and full factorial experiments, to help improve student intuition-building and retention. The emphasis on lean production, combined with recent methods relating to Design for Six Sigma (DFSS), makes Introduction to Engineering

Statistics and Lean Sigma a practical, up-to-date resource for advanced students, educators, and practitioners.

This book highlights some of the latest research advances and cutting-edge analyses of real-world case studies on Industrial Engineering and Operations Management from diverse international contexts, while also identifying business applications for the latest findings and innovations in operations management and the decision sciences. It gathers a selection of the best papers presented at the XXII International Conference on Industrial Engineering and Industrial Management, which was promoted by ADINGOR (Asociación para el Desarrollo de la Ingeniería de Organización) and held at the Escola Politècnica Superior of the Universitat de Girona, Spain, on July 12th and 13th, 2018.

This Minibook is a brief guide for Green Belt during a Lean Six Sigma project management or for Kaizen Leader during a process improvement activity.

Through both its theoretical concepts and practical examples it is a pocket book for a quick consultancy. Authors idea comes from companies needs in order to analyze information useful to know in depth different kind of processes. The set of Six Sigma tools are explained through Minitab 16, the last release of the most widely used statistical software.

This edited book describes new trends in supply chain design and management with an emphasis on technologies and methodologies. It contains guidelines detailing the real-world applications of these technologies and methodologies.

This book is of interest to researchers and practitioners and can also be used as a reference handbook by lecturers and postgraduate students in this field.

The current, second edition of this book reflects the 15 years of practical experience with the Six Sigma+Lean toolbox. It is a comprehensive collection of all the tools necessary for project work and running workshops when improving processes. All tools have been illustrated in a clear and comprehensible structure with examples and tips for applying the tools included. The chronology corresponds to the procedure of an improvement project comprising the steps D(efine), M(easure), A(nalyze), I(mprove) and C(ontrol). The most important innovation of this edition is the fact that it guides the user to select the appropriate tool using questions. The paradigm change from a Toolset to a Mindset has proven worthwhile in project work and ensures that corporate problems are addressed with the goal of achieving efficient solutions rather than having a large quantity of perfect tools to choose from. The efficiency factor of work in projects and workshops will therefore improve significantly. Through this paradigm change, connected with its unique structure, this book provides an effective tool not only for project and workshop leaders but also for the executives/sponsors involved who will be guided to solve the given task formulation quickly and in a sustainable way.

This book goes beyond searching for Muda by Gemba walk; the aim is to industrialize the office environment in view of the new digitalization challenge by applying the same principles of Lean industry. Whereas the basic process theory

remains valid, the Lean tools have to be adapted and transposed to the office characteristics where not machines but employees are at the center of the transactions. Here, a new, already successfully applied, integrated, industry-derived, and systematic approach is presented. It will not only boost office effectiveness and productivity as well as shortening lead-time of office routines far beyond simple Muda elimination, but it will also prepare the processes in view of the upcoming digitalization era.

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