

Bim Essential Guide Corenet

Discover BIM: A better way to build better buildings Building Information Modeling (BIM) offers a novel approach to design, construction, and facility management in which a digital representation of the building product and process is used to facilitate the exchange and interoperability of information in digital format. BIM is beginning to change the way buildings look, the way they function, and the ways in which they are designed and built. The BIM Handbook, Third Edition provides an in-depth understanding of BIM technologies, the business and organizational issues associated with its implementation, and the profound advantages that effective use of BIM can provide to all members of a project team. Updates to this edition include: Information on the ways in which professionals should use BIM to gain maximum value New topics such as collaborative working, national and major construction clients, BIM standards and guides A discussion on how various professional roles have expanded through the widespread use and the new avenues of BIM practices and services A wealth of new case studies that clearly

Download Ebook Bim Essential Guide Corenet

illustrate exactly how BIM is applied in a wide variety of conditions Painting a colorful and thorough picture of the state of the art in building information modeling, the BIM Handbook, Third Edition guides readers to successful implementations, helping them to avoid needless frustration and costs and take full advantage of this paradigm-shifting approach to construct better buildings that consume fewer materials and require less time, labor, and capital resources.

This book gathers the latest advances, innovations, and applications in the field of information technology in civil and building engineering, presented at the 18th International Conference on Computing in Civil and Building Engineering (ICCCBE), São Paulo, Brazil, August 18-20, 2020. It covers highly diverse topics such as BIM, construction information modeling, knowledge management, GIS, GPS, laser scanning, sensors, monitoring, VR/AR, computer-aided construction, product and process modeling, big data and IoT, cooperative design, mobile computing, simulation, structural health monitoring, computer-aided structural control and analysis, ICT in geotechnical engineering, computational mechanics, asset

Download Ebook Bim Essential Guide Corenet

management, maintenance, urban planning, facility management, and smart cities. Written by leading researchers and engineers, and selected by means of a rigorous international peer-review process, the contributions highlight numerous exciting ideas that will spur novel research directions and foster multidisciplinary collaborations.

The Death of Drawing explores the causes and effects of the epochal shift from drawing to computation as the chief design and communication medium in architecture. Drawing both framed the thinking of architects and organized the design and construction process to place architects at its center. Its displacement by building information modeling (BIM) and computational design recasts both the terms in which architects think and their role in building production. Author David Ross Scheer explains that, whereas drawing allowed architects to represent ideas in form, BIM and computational design simulate experience, making building behavior or performance the primary object of design. The author explores many ways in which this displacement is affecting architecture: the dominance of performance criteria in the evaluation of design decisions; the

Download Ebook Bim Essential Guide Corenet

blurring of the separation of design and construction; the undermining of architects' authority over their projects by automated information sharing; the elimination of the human body as the common foundation of design and experience; the transformation of the meaning of geometry when it is performed by computers; the changing nature of design when it requires computation or is done by a digitally-enabled collaboration. Throughout the book, Scheer examines both the theoretical bases and the practical consequences of these changes. The Death of Drawing is a clear-eyed account of the reasons for and consequences of the displacement of drawing by computational media in architecture. Its aim is to give architects the ability to assess the impact of digital media on their own work and to see both the challenges and opportunities of this historic moment in the history of their discipline.

"Ready or not, it's high time to make BIM a part of your practice, or at least your vocabulary, and this book has as much to offer beginners as it does seasoned users of building information modeling software." –Chicago Architect The first book devoted to the subject of how BIM affects individuals and

Download Ebook Bim Essential Guide Corenet

organizations working within the ever-changing construction industry, BIM and Integrated Design discusses the implementation of building information modeling software as a cultural process with a focus on the technology's impact and transformative effect—both potentially disruptive and liberating—on the social, psychological, and practical aspects of the workplace. BIM and Integrated Design answers the questions that BIM poses to the firm that adopts it. Through thorough research and a series of case study interviews with industry leaders—and leaders in the making out from behind the monitor—BIM and Integrated Design helps you learn: Effective learning strategies for fully understanding BIM software and its use Key points about integrated design to help you promote the process to owners and your team How BIM changes not only the technology, process, and delivery but also the leadership playing field How to become a more effective leader no matter where you find yourself in the organization or on the project team How the introduction of BIM into the workforce has significant education, recruitment, and training implications Covering all of the human issues brought about or exacerbated by the advent of BIM into the architecture

Download Ebook Bim Essential Guide Corenet

workplace, profession, and industry, BIM and Integrated Design shows how to overcome real and perceived barriers to its use.
The Practical Approach to Building Information Modeling : Integrated Practice Done the Right Way!
The New Science of Human Relationships
BIM Development and Trends in Developing Countries: Case Studies
Ontologies in Urban Development Projects
Strategies for Architectural Practice
Integrating Project Delivery

Questa edizione italiana del testo di riferimento internazionale sul BIM è nata dall'esigenza, condivisa con gran parte del mondo della progettazione e produzione edilizia, di fornire al panorama della committenza pubblica o privata, delle professioni e delle imprese, un volume che fosse capace di mettere in evidenza la grande novità rappresentata dall'adozione del BIM all'interno dei propri processi ideativi, produttivi e gestionali. Nella prima parte il volume affronta le tematiche relative alla gestione contrattuale del settore delle costruzioni e di come l'introduzione del BIM stia spostando l'attenzione degli attori su processi collaborativi; esamina quindi tutto l'apparato tecnologico (hardware e software) in termini di interoperabilità e di piattaforme BIM. I capitoli successivi riguardano rispettivamente i proprietari o i gestori dell'edificio, i progettisti, le imprese esecutrici e infine i subappaltatori e i fornitori;

questi capitoli evidenziano gli sforzi richiesti dallo sviluppo del BIM all'interno dei processi aziendali, i possibili elementi di resistenza, ma soprattutto permettono di intravedere le ottimizzazioni di quegli elementi di scarsa produttività che la gestione tradizionale mantiene fortemente in essere. Un intero nuovo capitolo introduce l'importante punto di vista offerto dagli autori su come il BIM sia destinato a modificare questo settore nel breve e nel medio termine, cui fa seguito un capitolo che presenta il livello di diffusione del BIM nei diversi continenti, riportando una scheda riepilogativa per paese da cui è possibile estrarre sia norme tecniche sia report applicativi o linee guida. L'ultimo capitolo offre, tra gli altri, alcuni casi studio afferenti alla realtà italiana, a riprova dell'attenzione che anche nel nostro Paese va rivolgendosi nei confronti del BIM.

A practical look at extending the value of Building Information Modeling (BIM) into facility management—from the world's largest international association for professional facility managers Building owners and facility managers are discovering that Building Information Modeling (BIM) models of buildings are deep reservoirs of information that can provide valuable spatial and mechanical details on every aspect of a property. When used appropriately, this data can improve performance and save time, effort, and money in running and maintaining the building during its life cycle. It can also provide information for future modifications. For instance, a BIM could reveal everything from the manufacturer of a light fixture to its energy usage to maintenance instructions. BIM

for Facility Managers explains how BIM can be linked to facility management (FM) systems to achieve very significant life-cycle advantages. It presents guidelines for using BIM in FM that have been developed by public and private owners such as the GSA. There is an extensive discussion of the legal and contractual issues involved in BIM/FM integration. It describes how COBie can be used to name, capture, and communicate FM-related data to downstream systems. There is also extensive discussion of commercial software tools that can be used to facilitate this integration. This book features six in-depth case studies that illustrate how BIM has been successfully integrated with facility management in real-life projects at: Texas A&M Health Science Center USC School of Cinematic Arts MathWork's new campus Xavier University State of Wisconsin Facilities University of Chicago Library renovation BIM for Facility Managers is an indispensable resource for facility managers, building owners, and developers alike.

This open access book describes a BIM-based toolkit that has been developed according to the latest research activities on building information modelling and semantic interoperability to optimize the building process. It highlights the impacts of using such new tools to fast renovation activities starting from the decision-making and design stages to the construction site management with the possibility to monitor occupants' and owners' feedback during the realization process. In this process, a framework has been developed and implemented to allow stakeholders involved in a

renovation project to efficiently compile, maintain, and add data about (i) building elements, (ii) building services systems, (iii) tenants, operators, and owners of the building, and (iv) current and predicted performance of the building from the various data sources available. The framework applies and specializes the existing practices in the Semantic Web, Linked Data, and ontology domain to the management of renovation projects. It has been designed to be open so that any system which implements the required functions and uses the specified conventions will be able to achieve semantic interoperability with other framework-compliant systems in the renovation domain. Finally, this book represents the validation process of the toolkit that has been held in three demo sites: a social housing building in Italy and two private residential buildings in Poland and Finland. The outcome shows that the toolkit facilitates the renovation process with relevant reductions of time, costs, and energy consumption and that the inhabitants can take advantage of the increase in building performances, quality, and comfort.

"The BIM Handbook presents the technology and processes behind BIM and how architects, engineers, contractors and sub-contractors, construction and facility owners (AECO) can take advantage of the new technology and work process. Unlike CAD, BIM is a major paradigm shift in the documentation, work processes and exchange of project information. It facilitates collaboration and further automation, in both design and construction. AEC professionals need a handbook to guide them through the various

BIM technologies and related processes. The collaborative nature of BIM requires professionals to view BIM from various industry perspectives and understand how BIM supports multiple project participants. The BIM Handbook reviews BIM processes and tools from multiple perspectives: the owner, architects and engineers, contractors, subcontractors and fabricators"--

Guida completa al Building Information Modeling per committenti, architetti, ingegneri, gestori immobiliari e imprese

7th International Workshop, SOFL+MSVL 2017, Xi'an, China, November 16, 2017, Revised Selected Papers

II BIM

Proceedings of the 3rd International Conference on Sustainability in Energy and Buildings (SEB ?11)

Case Studies

A Guide to Building Information Modeling for Owners, Designers, Engineers, Contractors, and Facility Managers

This book adopts a multidimensional approach to explain current practices and trends in facility management. Presenting both research and practical insights from around the globe and providing definitions, examples and case studies, it allows readers to gain an understanding of corporate real estate, as well as asset, property, and facility management in the context of digital transformation,

sustainability practice and process optimisation. The authors also discuss the latest trends in workplace management, the use of emerging technologies to optimise provision of facility services, and change management to implement new processes and reporting. A good mix of theory and practice, including a diverse set of examples, provide a constructive learning experience to the reader. A revolutionary, collaborative approach to design and construction project delivery Integrated Project Delivery is the first book-length discussion of IPD, the emergent project delivery method that draws on each stakeholder's unique knowledge to address problems before they occur. Written by authors with over a decade of research and practical experience, this book provides a primer on IPD for architects, designers, and students interested in this revolutionary approach to design and construction. With a focus on IPD in everyday operation, coverage includes a detailed explanation and analysis of IPD guidelines, and case studies that show how real companies are applying these guidelines on real-world projects. End-of-chapter questions help readers quickly review what they've learned, and the online forum allows them to share their insights and ideas with others who either have or are in the process of implementing IPD themselves. Integrated Project Delivery brings together the owners, architect, engineers, and contractors early in the development stage to ensure that problems are caught early, and to address them in a collaborative way. This book

links between facility management practice and the organisation's business objectives are emphasised. Readers worldwide will find this fourth edition a valuable and thought-provoking blend of the principles and practice of facility management.

Applications and Practices in the AECO Industry

Building Product Models

A Strategic Implementation Guide for Architects, Engineers, Constructors, and Real Estate Asset Managers

Proceedings of the 18th International Conference on Computing in Civil and Building Engineering

*Innovative Tools and Methods Using BIM for an Efficient Renovation in Buildings
Social Intelligence*

Based on twenty years of successful integrated projects, this book shows how to leverage resources, compete in a worldwide market, and become more efficient and productive in the planning, design, construction and operation of facilities.

What is BIM and how does it affect the health and safety professional? How are BIM technologies used on a practical

level? What opportunities are there for the use of BIM in the health and safety arena? This concise and practical guide aims to answer all these questions and more. The health and safety role is evolving towards collaboration, structured data and sharing of information as BIM – the incarnation of these sensibilities – increasingly underpins construction practice. As the industry begins to see how these two topics can and should intersect this guide provides context and practical advice by explaining the basic principles of BIM, how it will shape the health and safety professional's role and what tools and processes will need to be embedded in the future. It also highlights the wealth of opportunities that BIM provides to improve health and safety standards and effective coordination – the means to exploit the potential of BIM.

This book provides in-depth results and case studies in innovation from actual work undertaken in collaboration with industry partners in Architecture, Engineering, and Construction (AEC). Scientific advances and innovative

technologies in the sector are key to shaping the changes emerging as a result of Industry 4.0. Mainstream Building Information Management (BIM) is seen as a vehicle for addressing issues such as industry fragmentation, value-driven solutions, decision-making, client engagement, and design/process flow; however, advanced simulation, computer vision, Internet of Things (IoT), blockchain, machine learning, deep learning, and linked data all provide immense opportunities for dealing with these challenges and can provide evidenced-based innovative solutions not seen before. These technologies are perceived as the “true” enablers of future practice, but only recently has the AEC sector recognised terms such as “golden key” and “golden thread” as part of BIM processes and workflows. This book builds on the success of a number of initiatives and projects by the authors, which include seminal findings from the literature, research and development, and practice-based solutions produced for industry. It presents these findings through real projects and case studies developed by the

authors and reports on how these technologies made a real-world impact. The chapters and cases in the book are developed around these overarching themes:

- BIM and AEC Design and Optimisation: Application of Artificial Intelligence in Design
- BIM and XR as Advanced Visualisation and Simulation Tools
- Design Informatics and Advancements in BIM Authoring
- Green Building Assessment: Emerging Design Support Tools
- Computer Vision and Image Processing for Expediting Project Management and Operations
- Blockchain, Big Data, and IoT for Facilitated Project Management
- BIM Strategies and Leveraged Solutions

This book is a timely and relevant synthesis of a number of cogent subjects underpinning the paradigm shift needed for the AEC industry and is essential reading for all involved in the sector. It is particularly suited for use in Masters-level programs in Architecture, Engineering, and Construction.

This book constitutes the thoroughly refereed workshop proceedings of the 7th International Workshop on Structured

Object-Oriented Formal Language and Method, SOFL+MSVL 2017, held in Xi'an, China, in November 2017. The 13 revised full papers included in the volume were carefully reviewed and selected from 21 submissions. They are organized in the following topical sections: animation and prototyping; graph theory; model checking; modeling and specification; and verification and validation.

Computer Environments, Supporting Design and Construction
National Guidelines for Digital Modelling

Computer Integrated Construction

The Death of Drawing

Building Information Modeling

Sustainability in Energy and Buildings

"The BIM Handbook is an extensively researched and meticulously written book, showing evidence of years of work rather than something that has been quickly put together in the course of a few months. It brings together most of the current information about BIM, its history, as well as its potential future in one convenient place, and can serve as a handy reference book on BIM for anyone who is

involved in the design, construction, and operation of buildings and needs to know about the technologies that support it. The need for such a book is indisputable, and it is terrific that Chuck Eastman and his team were able to step up to the plate and make it happen. Thanks to their efforts, anyone in the AEC industry looking for a deeper understanding of BIM now knows exactly where to look for it."

—AECbytes book review, August 28, 2008

(www.aecbytes.com/review/2008/BIMHandbook.html) **DISCOVER**

BIM: A BETTER WAY TO BUILD BETTER BUILDINGS Building

Information Modeling (BIM) offers a novel approach to design,

construction, and facility management in which a digital

representation of the building process is used to facilitate the

exchange and interoperability of information in digital format. BIM is

beginning to change the way buildings look, the way they function,

and the ways in which they are designed and built. The BIM

Handbook, Second Edition provides an in-depth understanding of BIM

technologies, the business and organizational issues associated with

its implementation, and the profound advantages that effective use of

BIM can provide to all members of a project team. Updates to this

edition include: Completely updated material covering the current practice and technology in this fast-moving field Expanded coverage of lean construction and its use of BIM, with special focus on Integrated Project Delivery throughout the book New insight on the ways BIM facilitates sustainable building New information on interoperability schemas and collaboration tools Six new case studies Painting a colorful and thorough picture of the state of the art in building information modeling, the BIM Handbook, Second Edition guides readers to successful implementations, helping them to avoid needless frustration and costs and take full advantage of this paradigm-shifting approach to construct better buildings that consume fewer materials and require less time, labor, and capital resources.

"Many researchers and software developers have put a lot of effort into finding solutions for automated code checking. This book is a good summary of these efforts and provides readers with a comprehensive understanding of the status of such technologies in the industry. It also guides readers on implementation of such techniques using the platforms and tools currently available in the industry." —

Issa Ramaji, University of North Florida, USA Building Information Modeling: Automated Code Checking and Compliance Processes covers current and emerging trends in automating the processes of examining building design against codes and standards of practice. The role of Building Information Modeling (BIM) technologies in these processes is thoroughly analyzed and explains how this new technology is significantly transforming modern architecture, engineering, and construction (AEC) domains. The book also introduces the theoretical background of computerizing compliance verification, including domain knowledge representations, building model representations, and automated code checking systems. An underlying goal for the material covered is to present the use of BIM technology as an integral part of the automated auditing process that can lead to a more comprehensive, intelligent, and integrated building design- a design where an optimized solution can be achieved in harmony with the current codes and standards of practice. This new proposed BIM-based framework for automating code conformance checking is one of the most powerful methods presently available to reflect actual building code requirements, and the methods described

*in the book offer significant benefits to the AEC industry such as:
Providing consistency in interpretation of regulatory provisions
Reducing code compliance validation errors, and the cost and time associated with compliance checking
Allows for the ability to self-check required aspects before bidding
Reduces the amount of time and resources required during design review
Allows for optimal design, along with faster turnaround on feedback, and potentially faster approvals for construction permits by building and infrastructure authorities*

Integrated Design and Delivery Solutions (IDDS) represent a significant new research trajectory in the integration of architecture and construction through the rapid adoption of new processes. This book examines the ways in which collaboration and new methods of contracting and procurement enhance skills and improve processes in terms of lean and sustainable construction. Based on high quality research and practice-based examples that provide key insights into IDDS and its future potential, this book surveys the technologies that are being employed to create more sustainable buildings with added value for clients, stakeholders and society as whole.

This book sets out the innovative practices that have been introduced from other industries and shows how the construction industry has learnt from these.

Social Network Analysis in Construction

Structured Object-Oriented Formal Language and Method

A Paradigm of New Opportunities

BIM for Construction Health and Safety

Using Lean and Shared Mental Models

Waste Reduction in Precast Construction

Building Information Modeling (BIM), or the process of generating and managing digital information about physical representations of constructions, has been effectively adopted and benefited numerous civil engineering projects across the globe, particularly in developed countries. BIM Development and Trends in Developing Countries addresses the philosophies and practices for improved application of BIM in developing countries. Two case studies are presented in this reference: one from Malaysia and another representing Sri Lanka. Readers are given an introduction and background of the Malaysian and Sri

Lankan construction industry and a critical review of BIM's philosophies, development and applications in different stages of a construction project. The authors present their recommendations on the way forward for BIM practices articulated from the two perspectives, namely, academia and industrial BIM practice. The case studies in this book highlight the role of adequate BIM software techniques and the importance of governmental support in facing building challenges at the moment. . BIM Development and Trends in Developing Countries provides readers useful insights on the evolution of BIM practice in emerging countries and is a unique report on two specific scenarios in BIM development. Engineers, architects, urban planners and policy makers around the globe seeking to understand practical BIM implementation and trends will find this reference invaluable.

The contributions in this volume portray, in terms of the current state of the art, research on computer-aided construction in the building industry. A complete overview is given within the areas of computer-aided design, product modelling in construction, and robot-oriented design and

construction together with a summary of the commercial developments in computerized systems within those areas. The papers will be essential reading for all those interested in future automation in relation to the building construction industry with the accent on design and engineering.

This edited book gathers research studies presented at the 5th International Symposium on Formal Methods in Architecture (5FMA), Lisbon 2020. Studies focus on the use of methodologies, especially those that have witnessed recent developments, that stem from the mathematical and computer sciences and are developed in a collaborative way with architecture and related fields. This book constitutes a contribution to the debate and to the introduction of new methodologies and tools in the mentioned fields that derive from the application of formal methods in the creation of new explicit languages for problem-solving in architecture and urbanism. It adds valuable insight into the development of new practices solving identified societal problems and promoting the digital transformation of institutions in the mentioned fields. The primary audience of this book will be from the fields of architecture, urban

planning, civil engineering, AEC, landscape design, computer sciences and mathematics, both academicians and professionals. Emotional Intelligence was an international phenomenon, appearing on the New York Times bestseller list for over a year and selling more than five million copies worldwide. Now, once again, Daniel Goleman has written a groundbreaking synthesis of the latest findings in biology and brain science, revealing that we are “wired to connect” and the surprisingly deep impact of our relationships on every aspect of our lives. Far more than we are consciously aware, our daily encounters with parents, spouses, bosses, and even strangers shape our brains and affect cells throughout our bodies—down to the level of our genes—for good or ill. In Social Intelligence, Daniel Goleman explores an emerging new science with startling implications for our interpersonal world. Its most fundamental discovery: we are designed for sociability, constantly engaged in a “neural ballet” that connects us brain to brain with those around us. Our reactions to others, and theirs to us, have a far-reaching biological impact, sending out cascades of hormones that regulate everything from our hearts to our immune systems,

making good relationships act like vitamins—and bad relationships like poisons. We can “catch” other people’s emotions the way we catch a cold, and the consequences of isolation or relentless social stress can be life-shortening. Goleman explains the surprising accuracy of first impressions, the basis of charisma and emotional power, the complexity of sexual attraction, and how we detect lies. He describes the “dark side” of social intelligence, from narcissism to Machiavellianism and psychopathy. He also reveals our astonishing capacity for “mindsight,” as well as the tragedy of those, like autistic children, whose mindsight is impaired. Is there a way to raise our children to be happy? What is the basis of a nourishing marriage? How can business leaders and teachers inspire the best in those they lead and teach? How can groups divided by prejudice and hatred come to live together in peace? The answers to these questions may not be as elusive as we once thought. And Goleman delivers his most heartening news with powerful conviction: we humans have a built-in bias toward empathy, cooperation, and altruism—provided we develop the social intelligence to nurture these capacities in ourselves and

others.

Value Beyond Cost Savings: How to Underwrite Sustainable Properties

ND Modelling

Industry 4.0 Solutions for Building Design and Construction

A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers and Contractors

Processes, Implementation and Digitalisation

Integrated Design and Delivery Solutions

Welcome to the proceedings of the Third International Conference on Sustainability in Energy and Buildings, SEB'11, held in Marseilles in France, organised by the Laboratoire des Sciences de l'Information et des Systèmes (LSIS) in Marseille, France in partnership with KES International. SEB'11 formed a welcome opportunity for researchers in subjects related to sustainability, renewable energy technology, and applications in the built environment to mix with other scientists, industrialists and stakeholders in the field. The conference featured presentations on a range of renewable energy and

sustainability related topics. In addition the conference explored two innovative themes: the application of intelligent sensing, control, optimisation and modelling techniques to sustainability and the technology of sustainable buildings. These two themes combine synergetically to address issues relating to The Intelligent Building. SEB'11 attracted a significant number of submissions from around the world. These were subjected to a two-stage blind peer-review process. With the objective of producing a high-quality conference, only the best 50 or so of these were selected for presentation at the conference and publication in the proceedings. It is hoped that you will find this volume an interesting, informative and useful resource for your research.

Building Product Models thoroughly presents the concepts, technology, and methods now used to work out what will become the building product model - a new, digital representation for architecture, civil engineering, and building construction. Organized into three sections (history, current tools and concepts, and existing efforts and research issues),

this resource provides the field of building product modeling with a standard reference as well as a single, comprehensive text for university courses. Until now, all the efforts in building modeling have been reported in research journals and conference proceedings or been made available as draft standards on the Internet. Building Product Models is the only book available on this vital field, bringing together essential aspects of major efforts from the early 1970s to the present. The objective of the book is to make accessible the ways in which social network analysis (SNA) may be used to observe, monitor and analyse systems and relationships in major construction project coalitions. Although this has been an established analytical technique in the US for some time, it is only now being developed in the UK. Having spent nearly two decades investigating major project relationships using SNA, the author has brought together mathematical and sociological methods, and major project relationships in a manner that will inspire both academic interest and a desire to apply these concepts and techniques to live construction projects. Case

studies include projects from two of the UK's largest property developers, the UK Ministry of Defence and a County Council. SNA is innovative - but potentially inaccessible to project management analysts and practitioners. This book will provide clear and relevant explanation and illustration of the possibilities of using SNA in a major project environment. In addition to offering the potential; for sophisticated retrospective analysis of a wide range of systems associated with construction and engineering project coalitions, the author looks at how we might apply the network analysis findings to the design and management of project and supply chain networks.

This essential book introduces the concept of nD modelling, which takes the theory of computer modelling of the built environment to n dimensions. nD modelling utilizes a decision support tool for systematic assessment and comparison between various design parameters such as cost, accessibility, maintainability, sustainability, crime, energy, whole life costing, acoustics and scheduling among others. Constructing

the Future is a comprehensive book which provides a global perspective on the concept of nD modelling and examines its impact on construction, from development to application. The text offers a critique of competing views that seek to justify (or ignore) the role of nD modelling in the future of construction as well as describing developments in this area which are already happening worldwide. Presenting a thorough critique of competing views as well as providing guidance on best practice, Constructing the Future is a bold, well-grounded and illustrated title introducing construction management professionals and researchers to this exciting new development in the quest for a single building and product model.

Automated Code Checking and Compliance Processes

BIM and Integrated Design

Modern Facility and Workplace Management

Constructing the Future

Architecture in the Age of Simulation

Construction Innovation and Process Improvement

The optimal approach to design, build, operate, and maintain buildings With this

strategic guide to building information modeling(BIM), you'll learn how to implement this new technology aspart of a comprehensive systems approach to the design,construction, management, operation, maintenance, and use ofbuildings. The authors, among the leading experts andpioneers in BIM, show you how BIM supports more streamlined,integrated, and efficient business processes throughout the lifecycle of buildings, from their initial conception through their eventual retirement or reuse. The result is better qualitybuildings, lower construction and operating costs, shorter projectturnaround times, and a higher quality of building information tosupport better business decisions. Moreover, they set forth aplan for incorporating BIM into every organization's existingworkflows, enabling you to take full advantage of all the benefitsthat BIM offers. Everything you need to implement a BIM approach is setforth in detail, including: The business case for BIM, demonstrating how it can improvecollaboration, facilitate better design and construction, optimizeworkflow, and help reduce risk Guidance for meeting the challenges of BIM such as an entrenched business culture, the proliferation of BIM tools, andthe uneven rates of BIM adoption The "big picture" view showing how yourorganization can work with business partners and fit into thebuilding life cycle in a BIM-enabled industry Throughout the book, sample documents and figures help youbetter understand the principles of BIM and how it works

inpractice. In addition, first-hand accounts show you exactlyhow adopters of BIM have gained a competitive edge. Architects, engineers, constructors, building owners, andfacility managers can turn to this book to realize the fullpotential of BIM and radically improve the way buildings aredesigned, built, operated, and maintained.

A systemic transformation is underway in architectural design, engineering and construction. The discipline and profession of architecture is being reshaped in a moment where information, insight and predictions generated during the design process move into construction no longer essentially via drawings. Other, more profound digital techniques yield fundamentally different workflows, responsibilities and business models for architects. This book offers a comprehensive framework, detailed analysis and critical assessment of the challenges and opportunities inherent in those changes. The author sets out to provide direction for a new era in architectural creation that can be understood and managed by a profession which must become better equipped to direct its future.

This open access book focuses on the development of methods, interoperable and integrated ICT tools, and survey techniques for optimal management of the building process. The construction sector is facing an increasing demand for major innovations in terms of digital dematerialization and technologies such as

the Internet of Things, big data, advanced manufacturing, robotics, 3D printing, blockchain technologies and artificial intelligence. The demand for simplification and transparency in information management and for the rationalization and optimization of very fragmented and splintered processes is a key driver for digitization. The book describes the contribution of the ABC Department of the Polytechnic University of Milan (Politecnico di Milano) to R&D activities regarding methods and ICT tools for the interoperable management of the different phases of the building process, including design, construction, and management. Informative case studies complement the theoretical discussion. The book will be of interest to all stakeholders in the building process - owners, designers, constructors, and facility managers - as well as the research sector.

Waste Reduction in Precast Construction Using Lean and Shared Mental Models Springer Nature

International BIM Implementation Guide

Industrywide Voluntary Product Standards

Digital Transformation of the Design, Construction and Management Processes of the Built Environment

BIM for Facility Managers

Total Facility Management

Ontologies are increasingly recognized as essential tools in information science. Although the concepts are well understood theoretically, the practical implementation of ontologies remains challenging. In this book, researchers in computer science, information systems, ontology engineering, urban planning and design, civil and building engineering, and architecture present an interdisciplinary study of ontology engineering and its application in urban development projects. The first part of the book introduces the general notion of ontology, describing variations in abstraction level, coverage, and formality. It also discusses the use of ontologies to achieve interoperability, and to represent multiple points of view and multilingualism. This is illustrated with examples from the urban domain. The second part is specific to urban development. It covers spatial and geographical knowledge representation, the creation of urban ontologies from various knowledge sources, the interconnection of urban models and the interaction between standards and domain models. The third part presents case studies of the development of ontologies for urban mobility, urban morphological processes, road systems, and cultural heritage. Other cases report on the use of ontologies to solve urban development problems, in construction business models, building regulations and urban regeneration. It concludes with a discussion of key

challenges for the future deployment of ontologies in this domain. This book bridges the gap between urban practitioners and computer scientists. As the essence of most urban projects lies in making connections between worldviews, ontology development has an important role to play, in promoting interoperability between data sources, both formal (urban databases, Building Integrated Models, Geographical Information Systems etc.) and less formal (thesauri, text records, web sources etc.). This volume offers a comprehensive introduction to ontology engineering for urban development. It is essential reading for practitioners and ontology designers working in urban development.

This book presents the adaptation of lean principles to the precast construction industry to eliminate or minimize construction wastes, by modeling the precast construction process influencing manpower requirements. This is done using the shared mental models theory to understand how the lean principles enable people to work together to complete the tasks and work together effectively as a team throughout the entire precast construction process from the design, production and logistics to installation stages. Besides the theoretical concepts, this proposed book also presents the practical aspects faced by contractors through the conduct of questionnaire surveys to understand how the

implementation of lean principles and shared mental models will affect the occurrence of construction wastes and hence the changes in the total man days used during the precast construction process. This book also presents a neural network model for developing leading indicators that classify precast construction projects in accordance with the manpower changes achieved through the construct of lean principles and shared mental models. This is to help the construction industry to predict the risk of low construction productivity and enable effective lean implementation to optimize the manpower effort required.

Building Information Modeling (BIM) refers to the consistent and continuous use of digital information throughout the entire lifecycle of a built facility, including its design, construction and operation. In order to exploit BIM methods to their full potential, a fundamental grasp of their key principles and applications is essential. Accordingly, this book combines discussions of theoretical foundations with reports from the industry on currently applied best practices. The book's content is divided into six parts: Part I discusses the technological basics of BIM and addresses computational methods for the geometric and semantic modeling of buildings, as well as methods for process modeling. Next, Part II covers the important aspect of the interoperability of BIM software products and

describes in detail the standardized data format Industry Foundation Classes. It presents the different classification systems, discusses the data format CityGML for describing 3D city models and COBie for handing over data to clients, and also provides an overview of BIM programming tools and interfaces. Part III is dedicated to the philosophy, organization and technical implementation of BIM-based collaboration, and discusses the impact on legal issues including construction contracts. In turn, Part IV covers a wide range of BIM use cases in the different lifecycle phases of a built facility, including the use of BIM for design coordination, structural analysis, energy analysis, code compliance checking, quantity take-off, prefabrication, progress monitoring and operation. In Part V, a number of design and construction companies report on the current state of BIM adoption in connection with actual BIM projects, and discuss the approach pursued for the shift toward BIM, including the hurdles taken. Lastly, Part VI summarizes the book's content and provides an outlook on future developments. The book was written both for professionals using or programming such tools, and for students in Architecture and Construction Engineering programs.

Proceedings of the 5th International Symposium on Formal Methods in Architecture (5FMA), Lisbon 2020

