

# Concurrent Engineering Design

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## Concurrent Engineering Through Parallelization of the Design-analysis Process - Eric J. Wardell 2015

The disconnect between the way CAD and analysis applications handle model geometry has long been a hindrance to engineering design. Current industry practices often utilize outdated forms of geometry transfer between these different engineering software applications such as neutral file formats and direct translations. Not only to these current practices slow the engineering design process but they also hinder the integration of design and analysis programs. This thesis proposes a new, multi-user, integrated design-analysis architecture which allows auxiliary functions such as analysis and computer-aided manufacturing to be better connected with the computer-aided design. It is hypothesized that this new architecture will reduce the time of design-analysis iterations and create more parallelization between CAD and auxiliary programs. A prototype of the proposed architecture was constructed and then tested to evaluate the hypotheses, from which it was discovered that the proposed architecture does indeed reduce the time of iterations in the design-analysis cycle and allows for the parallelization of some design and analysis tasks.

## *Design for X* - Charles M. Eastman 2012-12-06

Bringing together the expertise of worldwide authorities in the field, *Design for X* is the first comprehensive book to offer systematic and structured coverage of contemporary and concurrent product development techniques. It features over fifteen techniques, including: design for manufacture and assembly; design for distribution; design for quality; and design for the environment. Alternative approaches and common elements are discussed and critical issues such as integration and tradeoff are explored.

## *Implementing Concurrent Engineering in Small Companies* - Susan Skalak 2002-07-17

Presenting a systematic approach to concurrent engineering (CE), this reference accommodates the small corporation's quest to incorporate better design management practices. The author provides an easy-to-follow methodology that eliminates the need for costly consultants and promotes environmentally friendly solutions and introduces three main design models to aid in new, evolutionary, and incremental product design. She examines how the adoption of CE practices improves overall performance. Topics include: engineering specifications for product parameters, conceptual and embodiment design, vendor selection and approval, prototyping, line and equipment installation, and more.

## *Concurrent Engineering Design* - Landon C. G. Miller 1995

## *Concurrent Engineering Design* - Landon C. G. Miller 1993

Increasing intensity surrounding globalization of manufacturing and its competitive environment force a much higher 'expectation' of design as falling within the 'optimum range of parameters.' This new book explains how the CE Design process provides a stable, repeatable process through which increased accuracy is achieved. Section I: The Business Environment Surrounding Concurrent Engineering Design includes an introduction, asks 'Why' CE Design, explains how CE

Design can create a competitive advantage, and addresses CE Design as a world class manufacturing enabler. Section II: Concurrent Engineering Design Business Process Framework looks at CE DesignAs relationship to process management, the design process, and manufacturability process. Section III: Concurrent Engineering Design Architectural and Implementation Framework focuses on CE DesignAs automated infrastructure, and implementation planning for engineering design.

## Concurrent Engineering Design - CASA/SME Technical Council 2000

## Design for Manufacturability - David M. Anderson 2014-02-04

*Design for Manufacturability: How to Use Concurrent Engineering to Rapidly Develop Low-Cost, High-Quality Products for Lean Production* shows how to use concurrent engineering teams to design products for all aspects of manufacturing with the lowest cost, the highest quality, and the quickest time to stable production. Extending the concepts of design for manufacturability to an advanced product development model, the book explains how to simultaneously make major improvements in all these product development goals, while enabling effective implementation of Lean Production and quality programs. Illustrating how to make the most of lessons learned from previous projects, the book proposes numerous improvements to current product development practices, education, and management. It outlines effective procedures to standardize parts and materials, save time and money with off-the-shelf parts, and implement a standardization program. It also spells out how to work with the purchasing department early on to select parts and materials that maximize quality and availability while minimizing part lead-times and ensuring desired functionality. Describes how to design families of products for Lean Production, build-to-order, and mass customization Emphasizes the importance of quantifying all product and overhead costs and then provides easy ways to quantify total cost Details dozens of design guidelines for product design, including assembly, fastening, test, repair, and maintenance Presents numerous design guidelines for designing parts for manufacturability Shows how to design in quality and reliability with many quality guidelines and sections on mistake-proofing (poka-yoke) Describing how to design parts for optimal manufacturability and compatibility with factory processes, the book provides a big picture perspective that emphasizes designing for the lowest total cost and time to stable production. After reading this book you will understand how to reduce total costs, ramp up quickly to volume production without delays or extra cost, and be able to scale up production rapidly so as not to limit growth.

## Design for Manufacturability & Concurrent Engineering - David M. Anderson 2003

## Improving Engineering Design - National Research Council 1991-02-01

Effective design and manufacturing, both of which are necessary to produce high-quality products, are closely

related. However, effective design is a prerequisite for effective manufacturing. This new book explores the status of engineering design practice, education, and research in the United States and recommends ways to improve design to increase U.S. industry's competitiveness in world markets.

*Product Design and Concurrent Engineering* - 1992

**Design Function Deployment** - Nosayaba Francis Osa Ebuomwan 1994

*Concurrent Engineering In Product Design And Development* - I. Moustapha 2006

This Book Is Written By A Group Of International Experts On Concurrent Product And Process Design And Development. It Reflects Modern Trends And Approaches In Concurrent Engineering, With Particular Emphasis On Product Development Cycle. A Multi-Disciplinary Approach Is Adopted Throughout The Book. The Book Highlights Concurrent Engineering Organization; Enabling Tools And Techniques For Successful Concurrent Engineering; Manufacturing Strategy Decision Support Tools; Measure Of Manufacturing Performance For Concurrent Engineering; Economic Justification In A Concurrent Engineering Environment; Product Data Requirements In Concurrent Engineering. All These Features Make This Book An Extremely Valuable Reference Source For Practising Professionals And Engineering Students. A Number Of Prominent Scientists And Experts From Different Countries Have Jointly Worked To Compile The Chapters Of This Book Reflecting The Latest Developments And Modern Approaches To Concurrent Engineering.

**Concurrent Design of Products, Manufacturing Processes and Systems** - Ben Wang 1999-01-27

Methods presented involve the use of simulation and modeling tools and virtual workstations in conjunction with a design environment. This allows a diverse group of researchers, manufacturers, and suppliers to work within a comprehensive network of shared knowledge. The design environment consists of engineering workstations and servers and a suite of simulation, quantitative, computational, analytical, qualitative and experimental tools. Such a design environment will allow the effective and efficient integration of complete product design, manufacturing process design, and customer satisfaction predictions. This volume enables the reader to create an integrated concurrent engineering design and analysis infrastructure through the use of virtual workstations and servers; provide remote, instant sharing of engineering data and resources for the development of a product, system, mechanism, part, business and/or process, and develop applications fully compatible with international CAD/CAM/CAE standards for product representation and modeling.

**A Concurrent Engineering Design Environment for Generative Process Planning Using Knowledge-based Decisions** - Yui Wei 1990

Report proposes a computerized communication for engineers which facilitates concurrent engineering.

**Product Design and Concurrent Engineering** - CASA/SME Technical Council 2000

*A Graphical User Interface for Concurrent Engineering Design of Mechanical Parts* - Kun-Hur Chen 1997

**Concurrent Engineering in the 21st Century** - Josip Stjepandić 2015-01-30

Presenting the gradual evolution of the concept of Concurrent Engineering (CE), and the technical, social methods and tools that have been developed, including the many theoretical and practical challenges that still exist, this book serves to summarize the achievements and current challenges of CE and will give readers a comprehensive picture of CE as researched and practiced in different regions of the world. Featuring in-depth

analysis of complex real-life applications and experiences, this book demonstrates that Concurrent Engineering is used widely in many industries and that the same basic engineering principles can also be applied to new, emerging fields like sustainable mobility. Designed to serve as a valuable reference to industry experts, managers, students, researchers, and software developers, this book is intended to serve as both an introduction to development and as an analysis of the novel approaches and techniques of CE, as well as being a compact reference for more experienced readers.

*Development of an Information Interchange Support System for Concurrent Engineering Design* - Atul Deosthali 1995

**Concurrent Engineering** - Andrew Kusiak 1993-01-12  
Presents a top-down approach to the design, development, testing and recyclability of products, components and systems across a wide range of industries. Starting with the desired result and working back through the details, it shows how to produce goods, taking into account the challenges of actual manufacture, what the reliability requirements should be, quality control, associated costs, customer needs and more. Additional features include case studies and team negotiating. Also well-illustrated with figures, photographs, charts and tables and includes an extensive bibliography.

*Design for Manufacturability & Concurrent Engineering* - David M. Anderson (Engineer) 2010

**Concurrent Engineering** - Chanan S. Syan 1994  
One Concurrent Engineering: Concepts, Definitions and Issues.- 1 Introduction to concurrent engineering.- 2 Concurrent engineering case studies: lessons from Ford Motor Company experience.- Organizational and managerial issues.- Design maturity.- Two Essential Techniques for Concurrent Engineering.- 5 Quality function deployment: an overview.- 6 Design for manufacture.- Design for assembly.- Rapid prototyping of physical parts.- Rapid prototyping of software and hybrid systems.- Three Product Design, Support and Management Tools for Concurrent Engineering.- 10 Software tools for the product development process.- 11 The role of knowledge-based systems in concurrent engineering.- 12 Software solutions for concurrent engineering II.- 13 Strategies for concurrent engineering and sources of further information.

*Supplying Concurrent Engineering Information to the Designer* - William Holmes Wood 1996

*Concurrent Engineering and Design for Manufacture of Electronics Products* - Sammy G. Shina 2012-12-06

This book is intended to introduce and familiarize design, production, quality, and process engineers, and their managers to the importance and recent developments in concurrent engineering (CE) and design for manufacturing (DFM) of new products. CE and DFM are becoming an important element of global competitiveness in terms of achieving high-quality and low-cost products. The new product design and development life cycle has become the focus of many manufacturing companies as a road map to shortening new product introduction cycles, and to achieving a quick ramp-up of production volumes. Customer expectations have increased in demanding high-quality, functional, and user-friendly products. There is little time to waste in solving manufacturing problems or in redesigning products for ease of manufacture, since product life cycles have become very short because of technological breakthroughs or competitive pressures. Another important reason for the increased attention to DFM is that global products have developed into very opposing roles: either they are commodities, with very similar features, capabilities, and specifications; or they are very focused on a market niche. In the first case, the manufacturers are competing on cost and quality, and in the second they

are in race for time to market. DFM could be a very important competitive weapon in either case, for lowering cost and increasing quality; and for increasing production ramp-up to mature volumes.

**What Every Engineer Should Know about Concurrent Engineering** - Thomas A. Salomone 2019-03-13

This work offers a step-by-step approach to the overall concurrent engineering (CE) development process, presenting both fundamental principles and advanced concepts, while focusing on rapid product development and cost-effective designs. The book also provides an introduction to Cost Driven Design, with specific examples on how to minimize expenses by understanding the basis of product costs. The process of concurrent engineering is explained from initial planning to production start-up.

*Design for Manufacturability* - David M. Anderson 2020-05-11

Achieve any cost goals in half the time and achieve stable production with quality designed in right-the-first-time. *Design for Manufacturability: How to Use Concurrent Engineering to Rapidly Develop Low-Cost, High-Quality Products for Lean Production* is still the definitive work on DFM. This second edition extends the proven methodology to the most advanced product development process with the addition of the following new, unique, and original topics, which have never been addressed previously. These topics show you how to: Cut cost from 1/2 to 1/10 in 9 categories—with ways to remove that much cost from product charges and pricing Commercialize innovation—starting with Manufacturable Research and learning from the new section on scalability, you will learn how to design products and processing equipment to quickly scale up to any needed demand or desired growth. Design product families that can be built "on-demand" in platform cells that also "mass customize" products to-order Make Lean production easier to implement with much more effective results while making build-to-order practical with spontaneous supply chains and eliminating forecasted inventory by including an updated chapter on "Designing Products for Lean Production" The author's 30 years of experience teaching companies DFM based on pre-class surveys and plant tours is the foundation of this most advanced design process. It includes incorporating dozens of proven DFM guidelines through up-front concurrent-engineering teamwork that cuts the time to stable production in half and curtails change orders for ramps, rework, redesign, substituting cheaper parts, change orders to fix the changes, unstable design specs, part obsolescence, and late discovery of manufacturability issues at periodic design reviews. This second edition is for the whole product development community, including: Engineers who want to learn the most advanced DFM techniques Managers who want to lead the most advanced product development Project team leaders who want to immediately apply all the principles taught in this book in their own micro-climate Improvement leaders and champions who want to implement the above and ensure that the company can design products and versatile processing equipment for low-volume/high-mix product varieties Designing half to a tenth of cost categories can avoid substituting cheap parts, which degrades quality, and encourages standardization and spontaneous supply chains, which will encourage Lean initiatives. Using cellular manufacturing to shift production between lines for mixed production of platforms and build-to-order to offer the fastest order fulfillment can beat any competitors' delivery time.

Multi-Agent Systems for Concurrent Intelligent Design and Manufacturing - Weiming Shen 2019-09-17

Agent Technology, or Agent-Based Approaches, is a new paradigm for developing software applications. It has been hailed as 'the next significant breakthrough in software development', and 'the new revolution in

software' after object technology or object-oriented programming. In this context, an agent is a computer system which is capable of act

**Application of Concurrent Engineering Design** - Chance Ballard 2014

**Design For Manufacturability** - Martin Helander 1992-06-18

This work on a systems approach to ergonomic design-manufacturing includes information on ease of manual/automatic assembly, biomechanical, cognitive and perceptual workload, task allocation, job satisfaction, socio-technical systems design,

**Integrating Manufacturing and Process Design Into a Concurrent Engineering Model** - Johanne C. Phair 1999

**Concurrent Engineering Techniques and Applications** - C. T. Leondes 2014-12-01

*Concurrent Engineering Techniques and Applications* reviews advances in concurrent engineering techniques and applications. An in-depth treatment of the quantitative and economic aspects of concurrent engineering is presented, with emphasis on techniques for measuring the performances of concurrent engineering and for comparing its economic effectiveness with that of traditional engineering. Open systems software standards in concurrent engineering are also discussed. Comprised of 12 chapters, this volume begins with an introduction to techniques for measuring the performances of concurrent engineering and for comparing its economic effectiveness with that of traditional engineering. The next chapter deals with open systems software standards and how to use open systems products effectively in concurrent engineering. The discussion then turns to concurrent product design and manufacturing; the essential issues involved in design-decision support in concurrent/simultaneous engineering; design for manufacturing and assembly and concurrent engineering in electro-optical systems; and the use of visualization in concurrent engineering. The use of multimedia presentation techniques and technology in the concurrent engineering process is also considered, along with techniques in technical documentation. This monograph will be useful to students, academicians, practicing professionals, and research workers.

*Concurrent Engineering* - Hamid R. Parsaei 2012-12-06

In the area of computer-integrated manufacturing, concurrent engineering is recognized as the manufacturing philosophy for the next decade.

**Concurrent Engineering Fundamentals: Integrated product development** - Biren Prasad 1996

A thorough, original guide to using Concurrent Engineering principles to develop products that meet customer needs -- and to do so as quickly and efficiently as possible. This book shows how CE encompasses manufacturing competitiveness, life-cycle management, process reengineering, cooperative workgroups, systems engineering, information modeling, and product, process and organization integration. This book also identifies, for the first time, 25 fundamental CE metrics and measures. These are categorized into four groups: simulations and analysis, product feasibility and quality assessment, design for X-ability assessment, and process quality assessment. The book describes the new process of Concurrent Function Deployment, which allows workgroups to work concurrently on conflicting values and compare notes and common checkpoints. Extensive exercises and illustrations are included throughout. Managers involved in any type of product development.

Design for Manufacturability - David M. Anderson 2014

*Design for Manufacturability: How to Use Concurrent Engineering to Rapidly Develop Low-Cost, High-Quality Products for Lean Production* shows how to use concurrent engineering teams to design products for all aspects of

manufacturing with the lowest cost, the highest quality, and the quickest time to stable production. Extending the concepts of design for manufacturability into to an advanced product development model, the book explains how to simultaneously make major improvements in all these product development goals, while enabling effective implementation of Lean Production and quality programs. Illustrating how to make the most of lessons learned from previous projects, the book proposes numerous improvements to current product development practices, education, and management. It outlines effective procedures to standardize parts and materials, save time and money with off-the-shelf parts, and implement a standardization program. It also spells out how to work with the purchasing department early on to select parts and materials that maximize quality and availability while minimizing part lead-times and ensuring desired functionality. Describes how to design families of products for Lean Production, build-to-order, and mass customization Emphasizes the importance of quantifying all product and overhead costs and then provides easy ways to quantify total cost Details dozens of design guidelines for product design, including assembly, fastening, test, repair, and maintenance Presents numerous design guidelines for designing parts for manufacturability Shows how to design in quality and reliability with many quality guidelines and sections on mistake-proofing (poka-yoke) Describing how to design parts for optimal manufacturability and compatibility with factory processes, the book provides a big picture perspective that emphasizes designing for the lowest total cost and time to stable production. After reading this book you will understand how to reduce total costs, ramp up quickly to volume production without delays or extra cost, and be able to scale up production rapidly so as not to limit growth.

**A Reactive Object Model for Concurrent Engineering Design** - T. Nguyen 1995

CE, Concurrent Engineering - Donald E. Carter 1992

*20th ISPE International Conference on Concurrent Engineering* - C. Bil 2013-09-12

As a concept, Concurrent Engineering (CE) initiates processes with the goal of improving product quality, production efficiency and overall customer satisfaction. Services are becoming increasingly important to the economy, with more than 60% of the GDP in Japan, the USA, Germany and Russia deriving from service-based activities. The definition of a product has evolved from the manufacturing and supplying of goods only, to providing goods with added value, to eventually promoting a complete service business solution, with support from introduction into service and from operations to decommissioning. This book presents the proceedings of the 20th ISPE International Conference on Concurrent Engineering, held in Melbourne, Australia, in September 2013. The conference had as its theme Product and Service Engineering in a Dynamic World, and the papers explore research results, new concepts and insights covering a number of topics, including service engineering, cloud computing and digital manufacturing, knowledge-based engineering and sustainability in concurrent engineering.

**Concurrent Engineering** - John R. Hartley 2017-09-20

By simultaneously examining the concerns of design, production, purchasing, finance, and marketing from the very first stages of product planning, concurrent engineering makes doing it right the first time the rule instead of the exception. This should be the first book managers read when they are ready to eliminate waste in the product development process. An introductory handbook, it gives managers 16 clear guidelines for achieving concurrent engineering and contains abundant case studies of Japanese, U.S., and European company success stories. The book also: Defines the concurrent engineering task force as a full-time, multidisciplinary unit of operation. Discusses the necessary interdependence of concurrent engineering, Quality Function Deployment, Total Quality Control, and CAD/CAM. Shows how concurrent engineering can be structured to fit your company and used to gain flexibility and efficiency.

**Concurrent Engineering: Tools and Technologies for Mechanical System Design** - Edward J. Haug 2012-12-06

These proceedings contain lectures presented at the NATO Advanced Study Institute on Concurrent Engineering Tools and Technologies for Mechanical System Design held in Iowa City, Iowa, 25 May -5 June, 1992. Lectures were presented by leaders from Europe and North America in disciplines contributing to the emerging international focus on Concurrent Engineering of mechanical systems. Participants in the Institute were specialists from throughout NATO in disciplines constituting Concurrent Engineering, many of whom presented contributed papers during the Institute and all of whom participated actively in discussions on technical aspects of the subject. The proceedings are organized into the following five parts: Part 1 Basic Concepts and Methods Part 2 Application Sectors Part 3 Manufacturing Part 4 Design Sensitivity Analysis and Optimization Part 5 Virtual Prototyping and Human Factors Each of the parts is comprised of papers that present state-of-the-art concepts and methods in fields contributing to Concurrent Engineering of mechanical systems. The lead-off papers in each part are based on invited lectures, followed by papers based on contributed presentations made by participants in the Institute.

**Engineering Design Graphics Workbook** - Ronald E. Barr 1997

*Concurrent Engineering* - John R. Hartley 2017-09-20

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