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| Titolo                  | Principles of Innovative Design Thinking : Synergy of Extenics with Axiomatic Design Theory // by Wenjuan Li, Zhenghe Song, C. Steve Suh   |
| Pubbl/distr/stampa      | Singapore : , : Springer Nature Singapore : , : Imprint : Springer, , 2022   |
| ISBN                    | 981-19-0485-5  |
| Edizione                | [1st ed. 2022.]  |
| Descrizione fisica      | 1 online resource (176 pages)  |
| Disciplina              | 733  |
| Soggetti                | Engineering design<br>Industrial engineering<br>Production engineering<br>Industrial design<br>Technical education<br>Technology - Sociological aspects<br>Algorithms<br>Engineering Design<br>Industrial and Production Engineering<br>Industrial Design<br>Technology and Design education<br>Emerging Technologies<br>Design and Analysis of Algorithms   |
| Lingua di pubblicazione | Inglese  |
| Formato                 | Materiale a stampa   |
| Livello bibliografico   | Monografia   |
| Note generali           | Description based upon print version of record.  |
| Nota di bibliografia    | Includes bibliographical references and index.   |
| Nota di contenuto       | Introduction -- Need Identification and Analysis -- Axiomatic Design Principles -- Extenics -- Design Innovation by Synergy -- Innovative Design Methodology -- Design Decoupling Methodology -- Closures.   |
| Sommario/riassunto      | The book presents a comprehensive treatment on a novel design theory that fosters innovative thinking and creativity essential for addressing wicked problems. Wicked problems are ill-defined, ambiguous in both aims and solutions, and complex with interconnected and intertwined (coupled) factors. While being ubiquitous and difficult, however, wicked problems share characteristics common to science and design in three regards, namely agent finitude, system complexity, and problem |

normativity. These fundamental attributes allow a core cognitive process common to design and science to be identified and a strategic problem-solving conception of methodology be formulated as a result. The theory facilitates new opportunities for synergetic cross-disciplinary research and practice by incorporating the essences of Extenics to axiomatic design. Innovative thinking is enabled by exploring Extenics for problem reframing, paradigm shift, and abductive reasoning and by engaging axiomatic design in the co-evolution (iteration) of the need and viable design concept. The theory is unique in that it is a framework for quantifying imprecise and vague design information available during the conceptual design stage as mathematical expression and algorithm early in the design effort and enables the objective evaluation and emergence of an optimal design concept from among multitude of viable ones. The book is conceived for students and real-world practitioners in engineering, natural and social sciences, business, and fine arts who seek to develop powerful design thinking for solving problems in a creative and innovative way. .

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