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Editors

Disrupting Buildings

Digitalisation and the Transformation of Deep
Renovation

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ISSN 2662-1282

ISSN 2662-1290 (electronic)

Palgrave Studies in Digital Business & Enabling Technologies

ISBN 978-3-031-32308-9

ISBN 978-3-031-32309-6 (eBook)

<https://doi.org/10.1007/978-3-031-32309-6>

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This Palgrave Macmillan imprint is published by the registered company Springer Nature Switzerland AG.

The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

ACKNOWLEDGEMENTS

This book was partially funded by the European Union's Horizon 2020 Research and Innovation Programme through the RINNO project (<https://rinno-h2020.eu/>) under Grant Agreement 892071, and the Irish Institute of Digital Business.

BOOK DESCRIPTION

The world's extant building stock accounts for a significant portion of worldwide energy consumption and greenhouse gas emissions. In 2020, buildings and construction accounted for 36% of global final energy consumption and 37% of energy-related CO₂ emissions. The European Union (EU) estimates that up to 75% of the EU's existing building stock has poor energy performance, 85–95% of which will still be in use in 2050.

To meet the goals of the Paris Agreement on Climate Change will require a transformation of construction processes and deep renovation of the extant building stock. The World Economic Forum, World Business Council for Sustainable Development, and the European Commission are amongst the many global organisations that recognise the important role ICTs can play in construction, renovation, and maintenance, as well as supporting the incentivisation and financing of deep renovation. Technologies such as sensors, big data analytics and machine learning, building information modelling (BIM), digital twinning, simulation, robots, cobots and unmanned autonomous vehicles (UAVs), additive manufacturing, smart contracts, and the Internet of Things are transforming the deep renovation process, improving sustainability performance, and developing new services and markets.

This book defines a deep renovation digital ecosystem for the twenty-first century, providing a state-of-the-art review of current literature, suggesting avenues for new research, and offering perspectives from business, technology, and industry.

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ABBREVIATIONS

4M	Mapping, Modelling, Making and Monitoring
API	Application Programming Interface
AR	Augmented Reality
AWS	Amazon Web Services
B2B	Business-to-Business
B2B2C	Business-to-Business-to-Consumer
B2C	Business-to-Consumer
BACS	Building Automation and Control Systems
BEMS	Building Energy Management Systems
BIM	Building Information Modelling
CIB	International Council for Research and Innovation in Building and Construction
CO ₂	Carbon Dioxide
CSP	Cloud Service Provider
EC	European Commission
EU	European Union
GDP	Gross Domestic Product
GHG	Greenhouse Gas
HVAC	Heating, Ventilation, Air Conditioning
IAAS	Infrastructure as a Service
ICT	Information and Communications Technologies
IDDS	Integrated Design and Delivery Solutions
IEEE	Institute of Electrical and Electronics Engineers
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organisation for Standardisation
ISV	Independent Software Vendor
KPI	Key Performance Indicator

kWh	Kilowatt Hour
m ²	Metres Squared
NZEB	Near Zero Energy Building
OSS	One Stop Shop
PV	Photovoltaic
QoE	Quality of Experience
QoS	Quality of Service
RES	Renewable Energy Source
SDG	Sustainable Development Goal
UN	United Nations
VR	Virtual Reality

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