

# Confronting Complexity

A holistic design approach best for  
projects and people

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### **Confronting Complexity: a holistic design approach best for projects and people**

What prevents us from achieving projects that are best fit for common purpose? In today's complex landscape of project development within the built environment, wicked problems often result in building what nobody wants, or projects that derail. Even the most advanced project management practices can hit impasses, leaving decision-makers struggling with multifaceted challenges. Traditional engineering and management sciences do not provide a constructive way out either, causing society to miss valuable opportunities towards a common ideal within reach. If only they realized that their puzzle was part of a bigger puzzle.

What's needed is a holistic design approach capable of confronting complexity, supported by robust decision-making systems. Odesys and Odycon, pioneering methodologies developed by Prof. Wolfert at TU Delft, offer an open design systems approach to handle these complex hurdles. Their three-step 'systems thinking slow' process—(1) agree first, (2) act feasibly, (3) adapt flexibly— aims for synthesis to arrive at best-fit for common purpose solutions.

Odesys and Odycon build 'actionable bridges to anywhere,' proven effective in fostering project management practices across various sectors. They untangle wicked problems whilst balancing individual design freedom, human equality, and stakeholder fraternity, to ultimately achieve purposeful outcomes best for projects and people.

Explore in this book how Odesys and Odycon's innovative methodologies applied to real-world complex projects, inciting you to awaken your inner designer and transform stalled projects into success!

#### **Dr. A.R.M. (Rogier) Wolfert**

A distinguished leader in infrastructure design and management, Dr. Wolfert brings over 30 years of experience from leading service providers, including VolkerWessels, Hochtief, Fluor, T-Mobile, and Huawei. Currently, he is a project director at Boskalis and managing associate at Odesys cv, where he pioneers data-driven management approaches using open design systems and educates 'young stars' in handling complex engineering management challenges.

As a former professor at Delft University of Technology, he effectively bridges the gap between engineering and management, academia and industry, as well as research and development. His unique blend of academic rigor and real-world expertise drives significant improvements, enhancing performance, participation, and purpose across various sectors. Lastly, he considers both 'outer' observation and 'inner' experience essential companions on his journey into the emerging future.

[www.odesys.nl](http://www.odesys.nl)

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## Preface

Why are we still unable to deliver a best project fit for common purpose? In today's complex landscape of project development within the built environment, **wicked problems** often result in building what nobody wants, stalled developments or projects that derail. Even the most advanced project management practices can hit impasses, leaving decision-makers struggling with multifaceted challenges. Furthermore, while **management science** provides valuable insights, it primarily examines projects retrospectively and often lacks concrete tools for moving forward. As we know, past results do not always guarantee future success.

State-of-the-art **systems engineering design disciplines** do not offer a sufficiently comprehensive approach either. Their methodologies are often one-sided, ignoring the dynamic interplay between multi-stakeholder preferences -**'what they want'**- and system performances -**'what it can'**-. Moreover, the actual optimisation methods typically fail to reflect the design process and do not yield a single best-fit solution.

As a society, we miss opportunities by not involving stakeholders early and transparently and by lacking the ability to control projects dynamically on-the-run. This hinders our ability to move fully towards a common ideal within reach. What is needed is an **actionable, human-driven approach** that can effectively confront complexity. This approach should be supported by **transparent decision support systems** that foster best for both projects and people.

In recent years, under the **leadership of Prof Wolfert at TU Delft**, the open design systems methodology known as **'Odesys'** has been developed to optimally unite 'desirability' and 'capability' as an active response to complexity. Odesys is a pure form of **socio-technical systems integration** that proactively unlocks creative conflicts of multiple interests, right from the start rather than after the fact. By considering all perspectives, Odesys leads to a best-fit for common purpose solution, where value extends beyond money or technology alone. It embraces the social threefold principles of individual design **freedom**, human **equality**, and stakeholder **fraternity**, promoting a purposeful and balanced project compass.

Odesys delivers this through its novel integrative multi-objective optimisation method, called **IMAP**, which maximises the aggregated preferences as functions of objectives and design performances within a multi-dimensional solution space. IMAP **integrates** people's preference with physical performance, and **associates** different stakeholder weighted interests. In this dynamic search for the highest group preference, Odesys employs a robust and **mathematically rigorous** decision-support tool called the **Preferendus**. IMAP/Preferendus outperforms traditional (parametric) optimisation methods by achieving an optimal synthesis, avoiding suboptimal compromises and invalid Pareto front solutions.

Most recently, an Odesys-based project management method called **Odycon** has been developed for dynamic project planning and control. It combines IMAP optimisation with probabilistic Monte-Carlo simulation, offering an optimal synthesis for different complex project phases.

Odycon and Odesys are both **holistic design** approaches that generate optimal project plans and dynamic planning and control strategies, surpassing human limitations to fully conceive them. They employ a three-step **'systems thinking slow'** process: (1) **agree first**, (2) **act feasibly**, and (3) **adapt flexibly**, aiming for **synthesis** to arrive at best-fit for common purpose solutions.

Lastly, Odesys and Odycon goes a step beyond single-loop (DI) and double-loop (DII) learning by integrating its methodology into **open-loops learning** as part of the **Odesys U-model**. This process brings together the technical, social and purpose-driven design cycles. The Odesys/Odycon way of working have been successfully applied, validated with people and further developed in public and private projects within the infrastructure and built environment sectors.

Odesys and Odycon build **'actionable bridges to anywhere'**, proven effective in fostering engineering asset management, project management, and construction management. They unlock wicked problems by navigating with their project compass, to ultimately achieve purposeful outcomes best for projects and people.

For more info, see the following latest key publications:

<https://doi.org/10.48550/arXiv.2409.10549>

<https://doi.org/10.48550/arXiv.2408.12422>

<https://doi.org/10.48550/arXiv.2304.07168>

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- Van Gunsteren, L. A. (2011). *Stakeholder-oriented project management*. IOS Press.
- Vanhoucke, M. (2018). *The Data-Driven Project Manager*. Apress
- Wolfert, A. R. M. (2023). *Open Design Systems*. IOS Press & TU Delft OPEN Books.

Additionally, I found inspiration in works available in other languages:

- Arendt, H. (2021). *Het leven van de geest*. Ten Have. (in Dutch, originally 'the life of the mind').
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## Short Bio (inside cover at the end)

Dr. A.R.M. [Rogier] Wolfert has established a unique combination of proven academic and industrial track records in which he has been involved in the design and management of various types of infrastructure.

Over the past 30 years, he has worked at various companies and universities, developing state-of-the-art concepts and methods, producing numerous significant publications, and establishing and lecturing in newly created MSc courses on systems design and management through his Open Design Learning (ODL) teaching concept. He has contributed to innovative projects and pioneering people by fostering an open design systems approach, called Odesys, to confronting complexity. He has strong experience in project management practices with services providers such as VOLKERWESSELS, HOCHTIEF, FLUOR, T-MOBILE, and HUAWEI, among others. He is currently project director at BOSKALIS, where he drives new developments in data science and engineering to enhance project management and business operations.

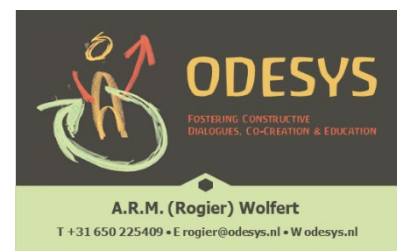
He is also the founder and managing associate of ODESYS CV, which originated from a dedicated group of former TU DELFT students who recognized the potential of the Odesys methodology during their projects at leading companies such as TOTALENERGIES, MICROSOFT, AND BOSKALIS. Through ODESYS CV, he aims to effectively cultivate the 'Odesys philosophy' in real-world project management offices, utilizing their systems of interest while educating the next generation of Odesys enthusiasts. Moreover, he is eager to further develop and promote the Odesys and Odycon methodologies within international engineering management faculties and renowned business schools at leading universities.

He is highly adept at bridging traditional gaps between engineering and management, academia and industry, research and development, as well as the realms of mind and matter. As a true systems integrator, he is very much able to connect different domains and parties while retaining their strong individual values.

He is a former professor from DELFT UNIVERSITY OF TECHNOLOGY where he also received his Doctor (PhD) and Master (MSc) degrees. He held the chair in Engineering Asset Management and lectured in project management systems, engineering systems design, engineering asset management, information systems and R&D methodology. Renowned for his innovative educational approach, he is the founding father of the Open Design Learning (ODL) concept.

For more info:

<https://www.linkedin.com/in/a-r-m-rogiere-wolfert-a108b9303/>  
<https://ebooks.iospress.nl/volume/open-design-systems>



## Selection of my recent publications related to this book:

Teuber, L. G., Wolfert, A. R. M. (2024). Confronting project conflicts into success: a complex systems design approach to resolving stalemates. *ArXiv*, <https://doi.org/10.48550/arXiv.2409.10549>

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