CIRCULAR BUILDING AND AREA DEVELOPMENT

A PATTERN CATALOGUE

Interdisciplinary thesis lab
2022-2023

Circular Building and Area Development

LDE CENTRE FOR SUSTAINABILITY

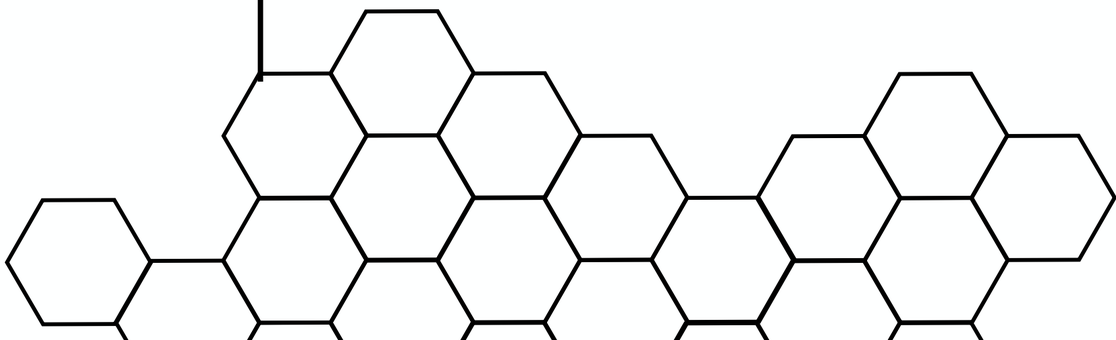
#

INTRO: THE PATTERNS

A Pattern Language is a set of interconnected patterns

Each pattern describes a problem and a solution that can be applied in a specific context

By grouping them in a pattern language, patterns can be used to create a coherent and holistic design



CONTENT

G

TRANSITION GOVERNANCE

Pattern G3: Capitalizing upon Governmental Support

- Involving policymakers in pilots
- Forming working groups to discuss the difficulties and method to overcome the challenges
- Implementing tax incentives
  - Tax boost for non-circular practice
  - Subsidy for circular practice
- Government to facilitate and steer the transition
  - Coordinating existing networks of frontrunners
  - Adapting circular practice internally

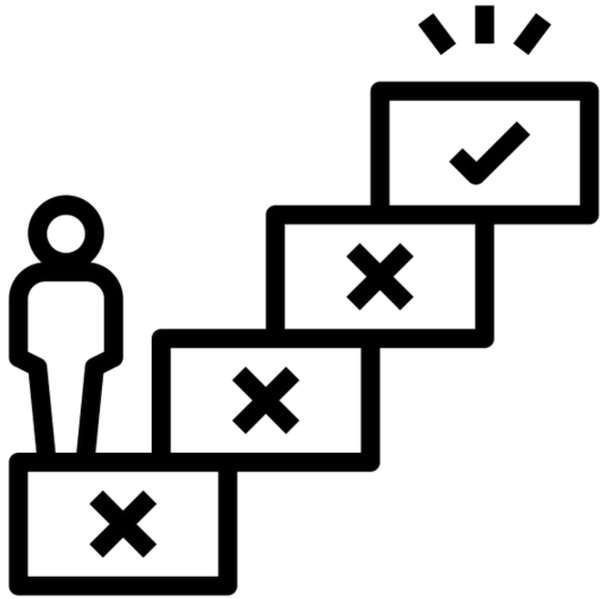
K

KNOWLEDGE

Pattern K1: Experimentation as a driver of innovation

By experimenting, you gain more knowledge and find out what works wel and what doesn’t work well.

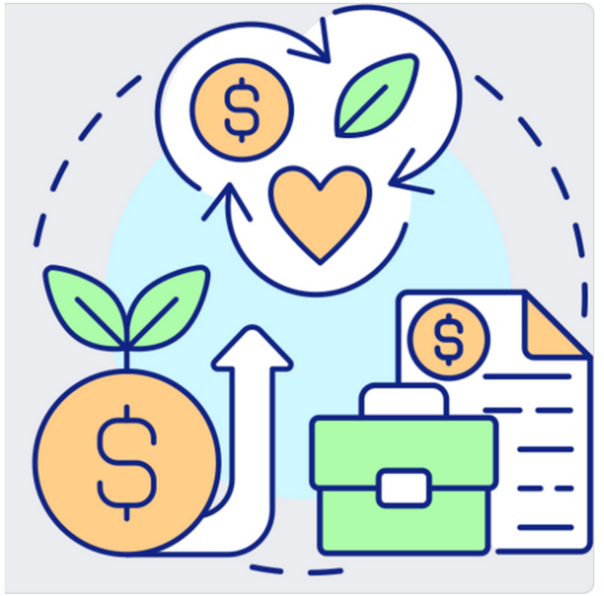
- Having a deeper understanding can lead to even smarter solutions.
- It may take several attempts to find a solution that works.
- By experimenting, a process or product can be fine-tuned step by step until a satisfactory end product is achieved.



F

FINANCIAL

Pattern F1: Cost Optimisation Though Simplified Processes and Accounting True Environmental Cost/Benefit For Commercial Viability

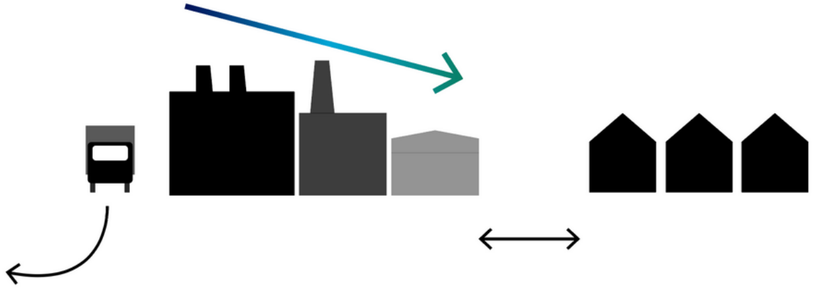


- Looking for avenues to minimize cost and time
- Taking into account real environmental costs and benefits (e.g. Pattern F2: A "Cheaper" Green Roof LifeCycle)
- Taking a lifecycle perspective
  - Life Cycle Assessment + Life Cycle Cost Analysis
- Intrinsic value gain

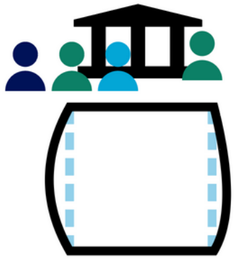
S

SYSTEM CHANGES

Pattern S8: Involving the surroundings & cooperation



- Beyond the border of the development
- Investing in the relationship with surrounding areas: fostering (circular) relationships
  - exchange of (waste) resources
  - infrastructure for circularity
- Flexibility of developers & public parties
  - to scale up experiment
    - multi-use zoning
    - combining productive with residential & commercial



M

MINDSET CHANGES

Pattern M2: Gamifying Circular Building Goals

- Shifting the narrative from 'mandatory' to fun
- Assign quantifiable targets for circular building and give respective awards
- The awards can be linked to the Het Nieuwe Normaal categorization system
    - A relative system which is updated on an annual basis
- It enriches accountability and serves as marketing for the private sector
    - Improves the current business case

D

MATERIALS & DESIGN

Pattern D1&D3: Bio-based materials and how to use them

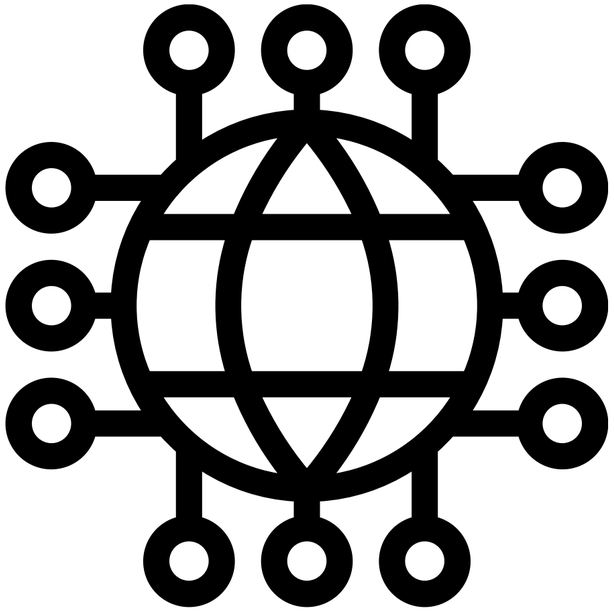
- Circular design:
  - use recycled materials
  - use regenerative design principles
  - use modular design
  - use dismountable design
- Sustainable buildings design requires complex multidisciplinary solutions

T

TECH-NOLOGIES

Pattern T5: Use Digital Technologies

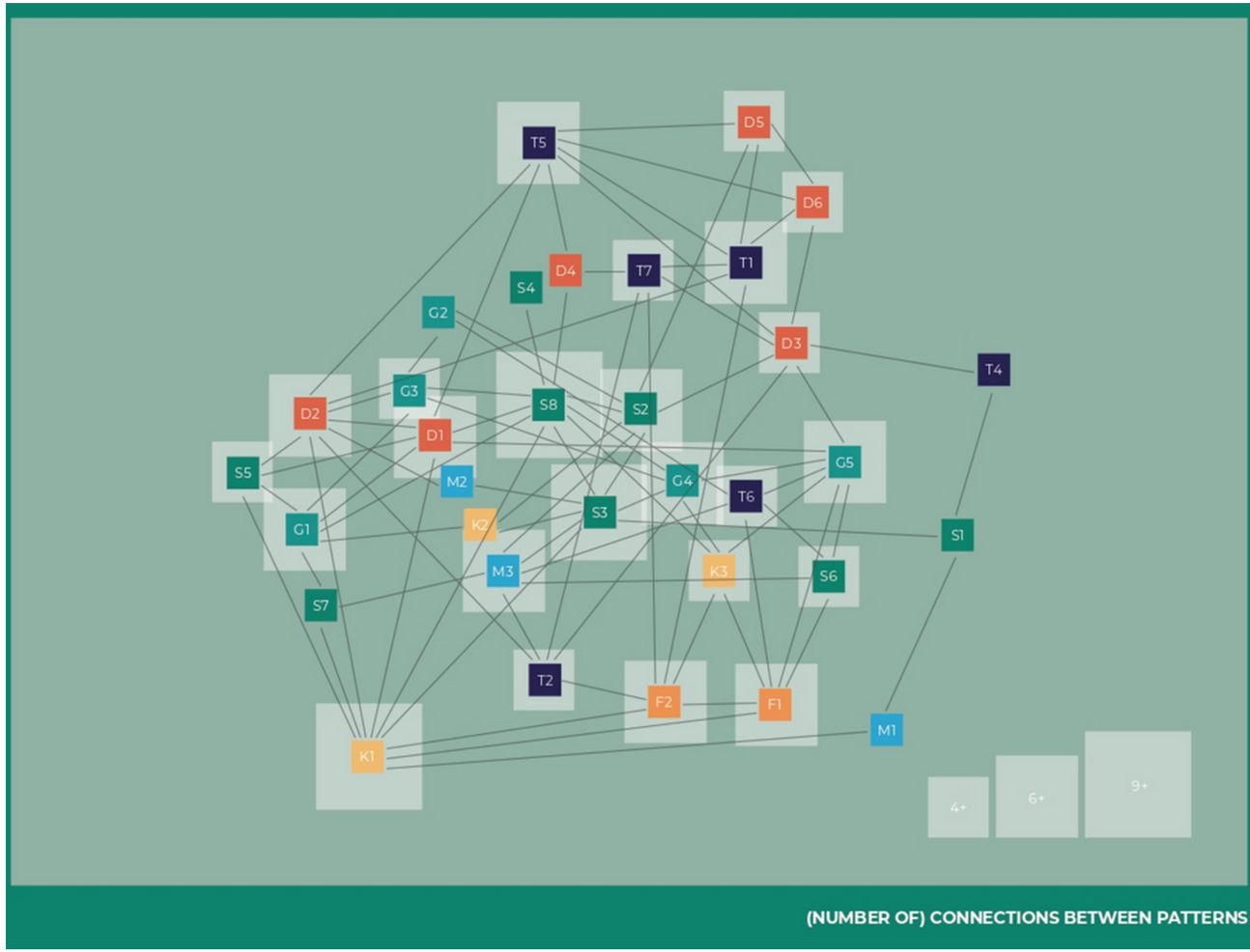
- Advanced tech used to optimize building design and operation (BIM).
- Material passports.
- Software to value real estate.
- Robots in construction.
- AI in building design.
- Quantum technology in building design.



NETWORK DIAGRAM

(S8) & (K1) have more than 9 connections showing “experimentative knowledge” and “context based application of system change approach” as imperative for making the circular transition possible.

(S2, S3), (T5), (D1, D2), (G1, G5), (F1, F2), and (M3) have more than 6 connections, showing importance of cluster approach, resource sharing, digital technology, complex and multi-disciplinary solutions, bio-based materials, early collaboration, regulatory changes, cost optimisation and life-cycle cost consideration as enabler for circular transition.



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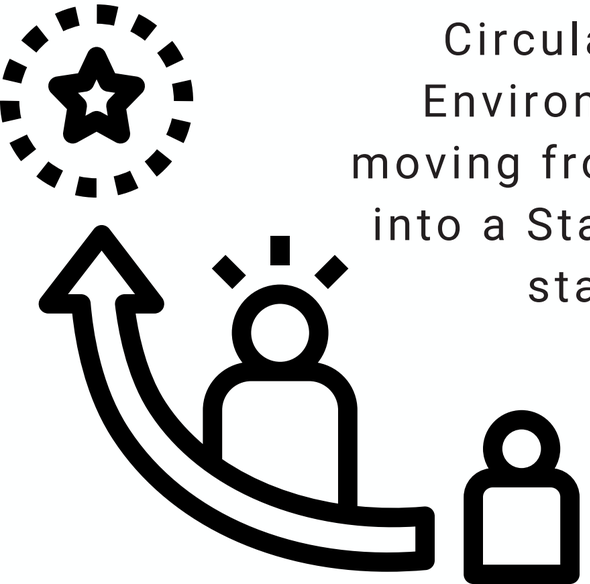
CONCLUSION



The transition to a Circular Built Environment is moving from a Niche into a Stabilization stage

The solutions provided in this pattern would help to further stabilize the Circular Paradigm, and prepare it for a market disruption

Given the complexity in addressing a diverse array of stakeholders to foster systemic change, collaboration is of utmost importance for the success of the process

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QUESTIONS