

Driving Innovative Thinking in NZ Construction Industry

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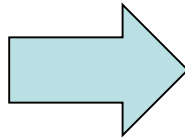
Prof. Suzanne Wilkinson

03 September 2014

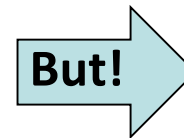


Construction Industry and Innovation

**Construction
needs to be more
productive**



**Those who
innovate are more
productive**



**Construction is the
least innovative
sector**

Innovation & Productivity



- Productivity: well defined, easy to measure
- Innovation: not so specific, hard to measure

Definition of Innovation

“Intentional introduction and application within a role, group or organisation of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, the organisation or the wider society”

(West & Farr, 1990)

Definition of Innovation

- There are 3 critical elements in all definitions of innovation: Type, Novelty and Benefit

Innovation → Productivity

Depends on

- Type
- Novelty
- Benefit

Construction Innovation Classification Model

Innovation Type	Innovation Novelty	Innovation benefit
Tool	Incremental	Cost
Product		Time
Function	Modular	Quality
Design		Safety
Method	Architectural	Community
Technology	System	Environment

Construction Innovation Classification Model

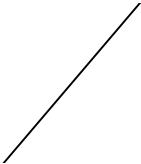
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Innovation Type
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Product
Function
Design
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Technology

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Innovation Novelty
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Architectural
System

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Innovation benefit
Cost
Time
Quality
Safety
Community
Environment



Analysis of SCIRT innovation database

Programme funded by



New Zealand Government



EXAMPLE

TOOLS:

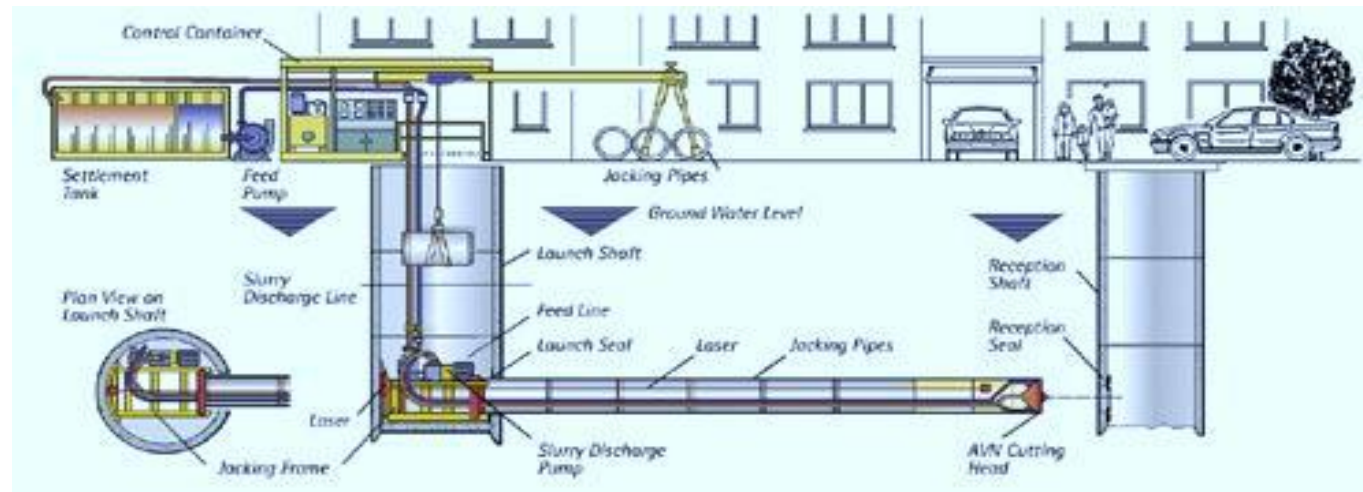
Hydraulic Aluminium Shoring



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EXAMPLE METHODS:

Micro tunnelling to be an accepted practice



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Analysis of SCIRT innovation database

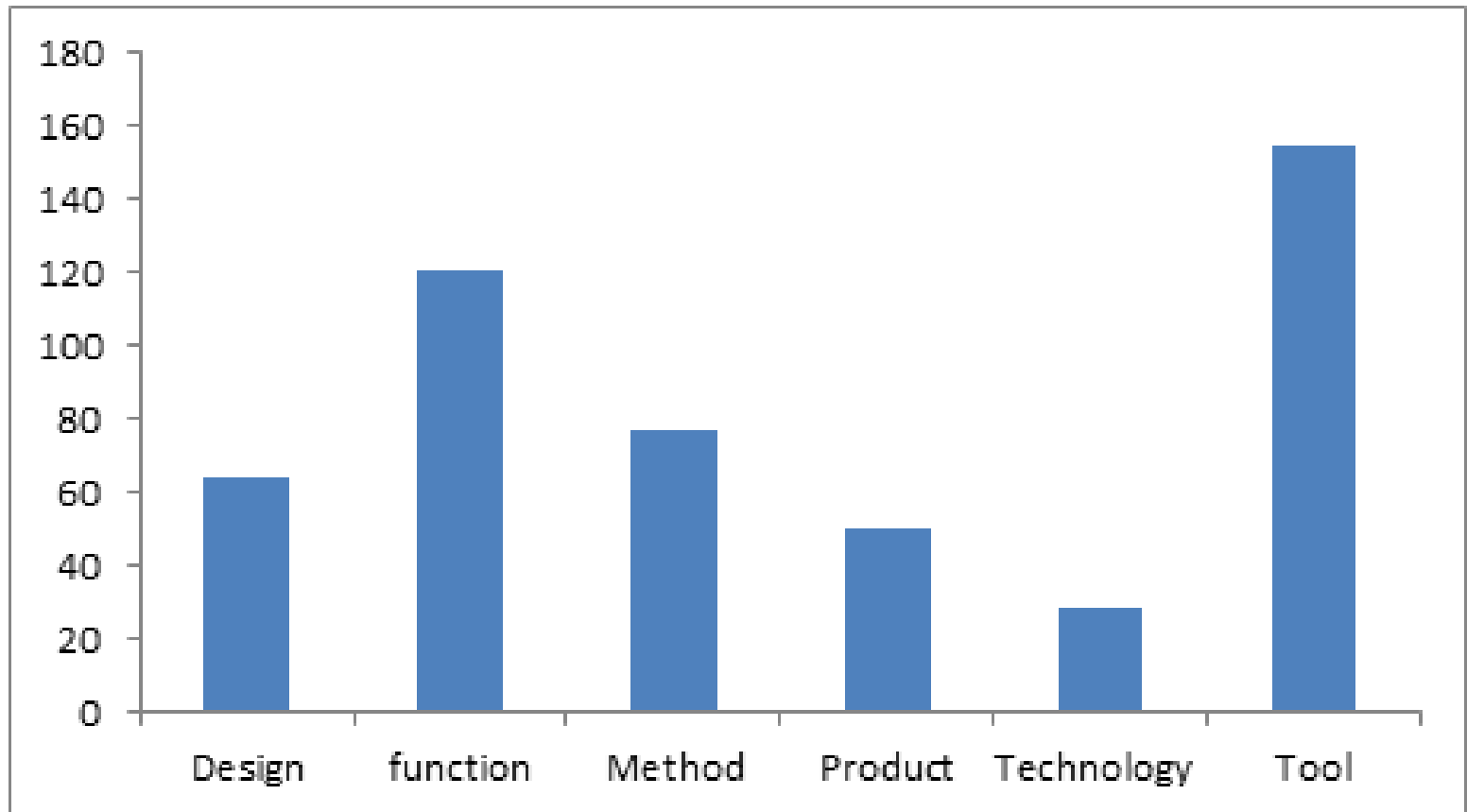


Figure 1. Innovation classification based on Type

Analysis of SCIRT innovation database

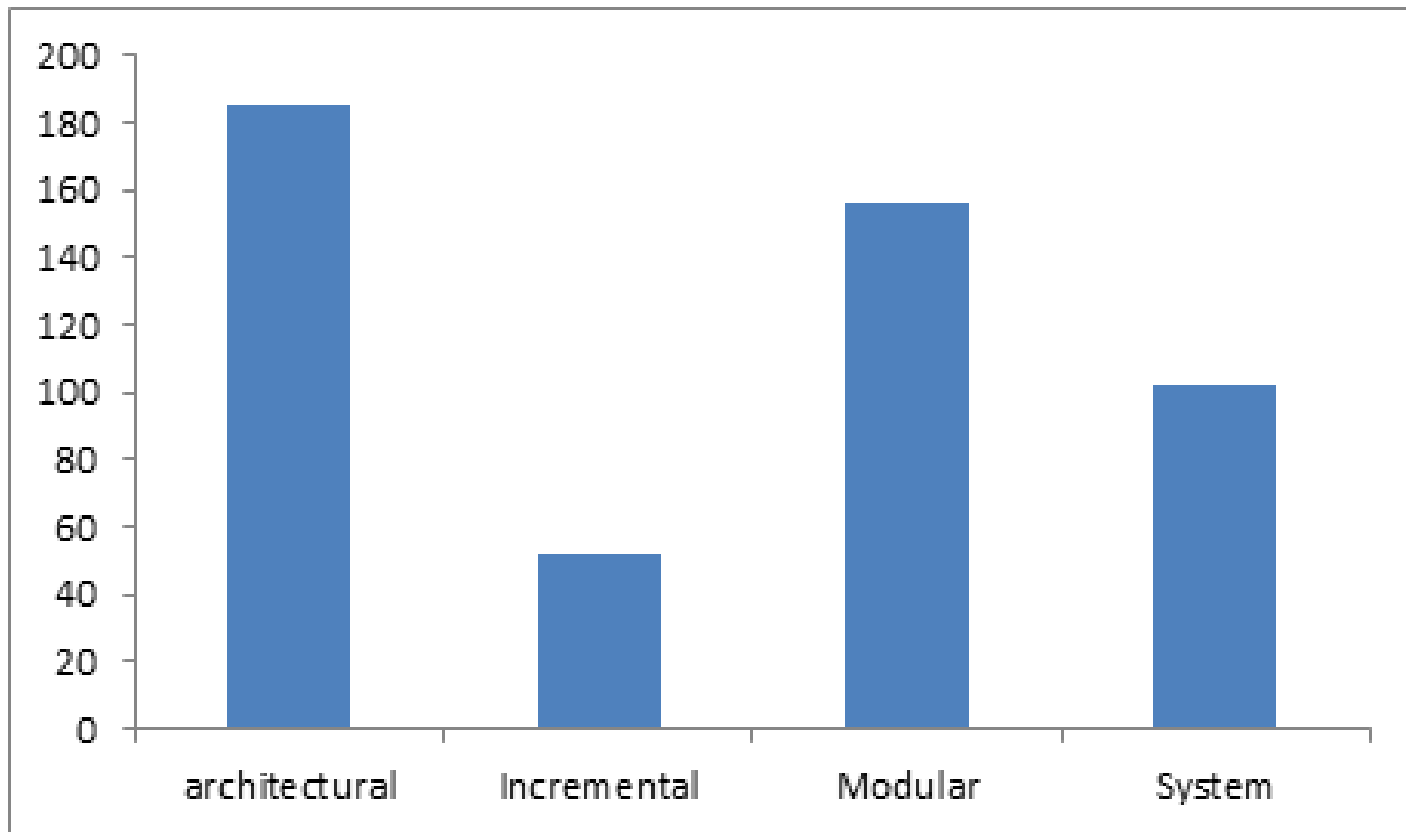


Figure 2. Innovation classification based on Novelty

Analysis of SCIRT innovation database

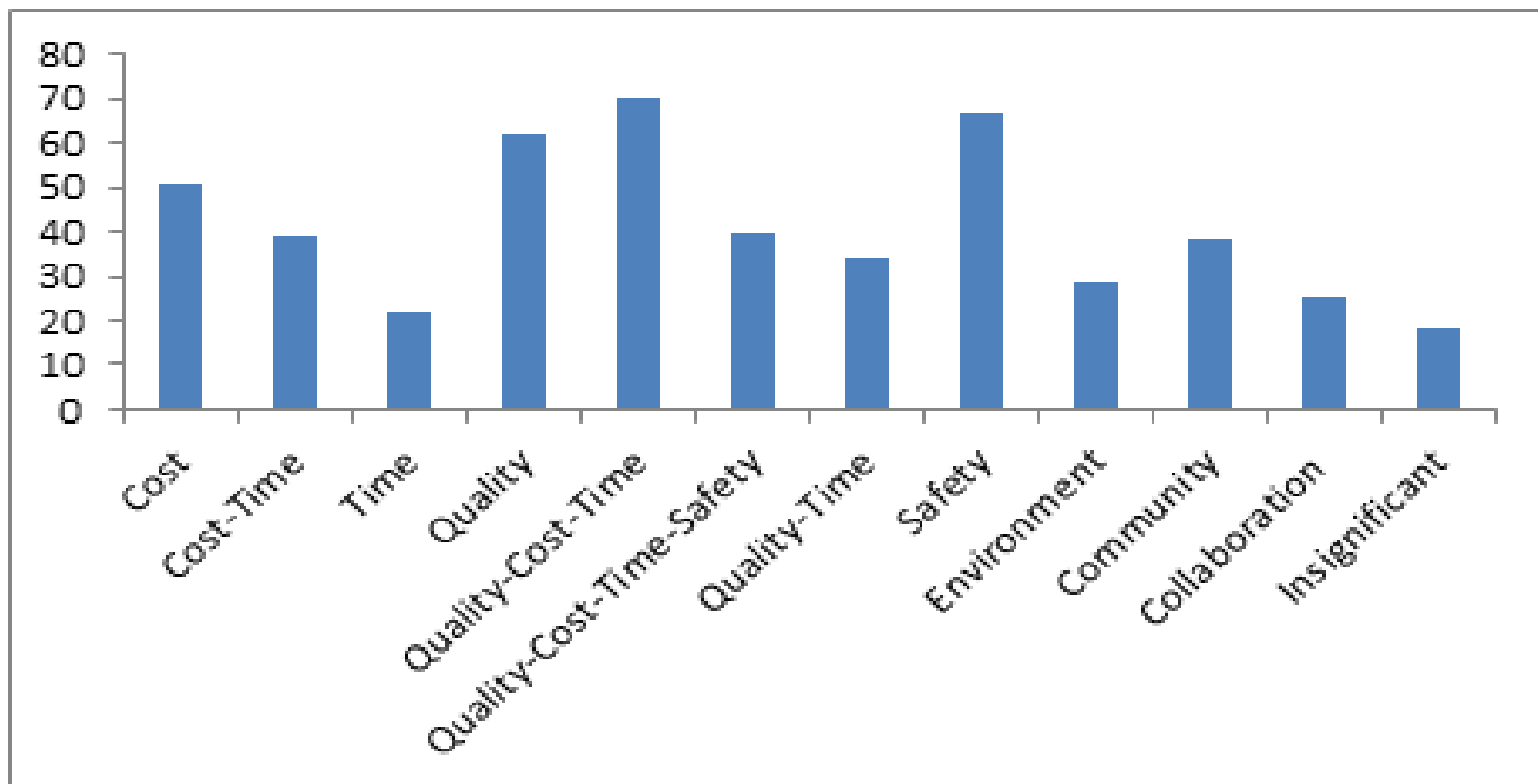


Figure 3. Innovation classification based on Benefits

Analysis of SCIRT innovation database

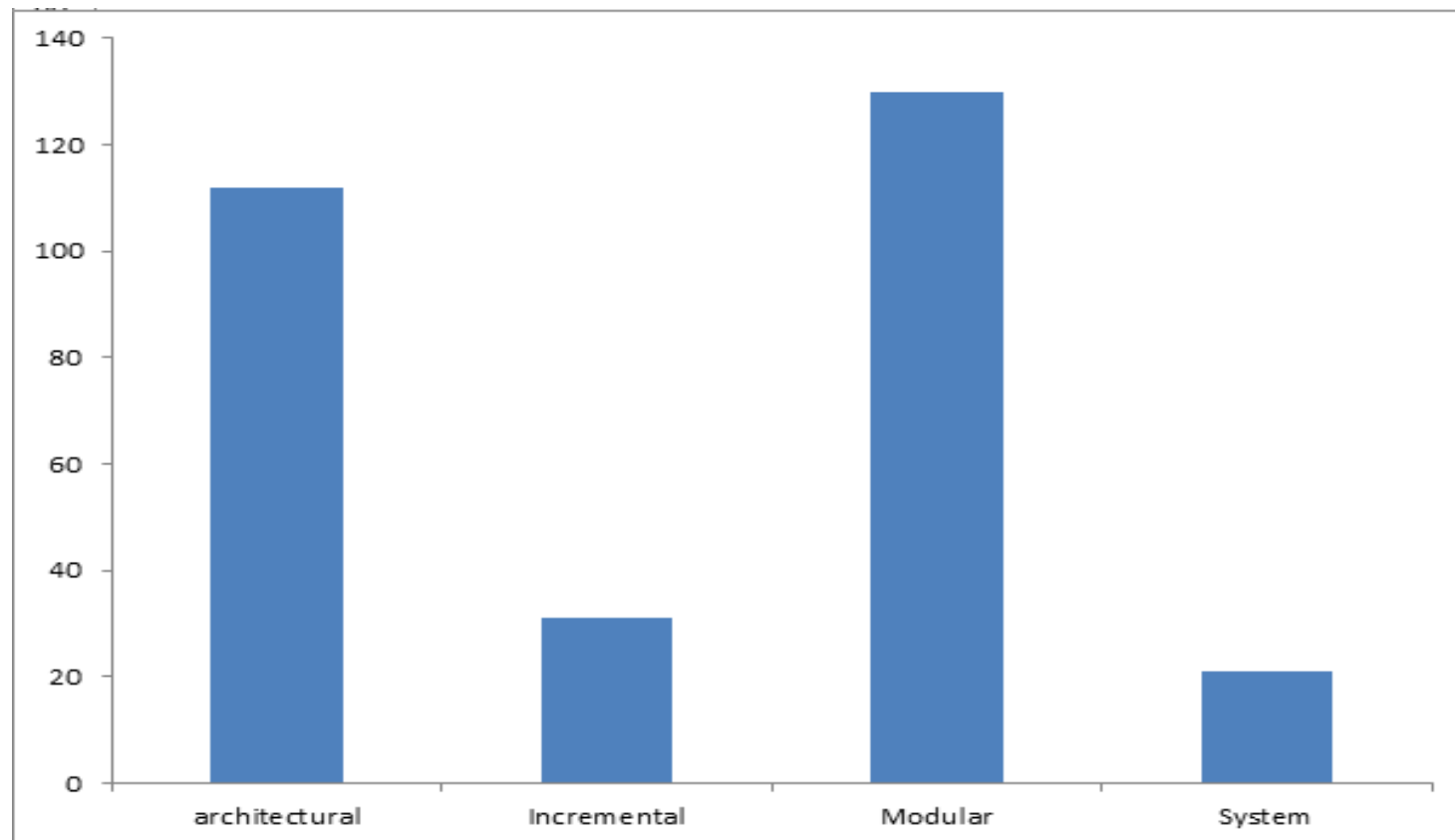


Figure 4. Innovation novelty categories that focused on delivering a single benefit

Analysis of SCIRT innovation database

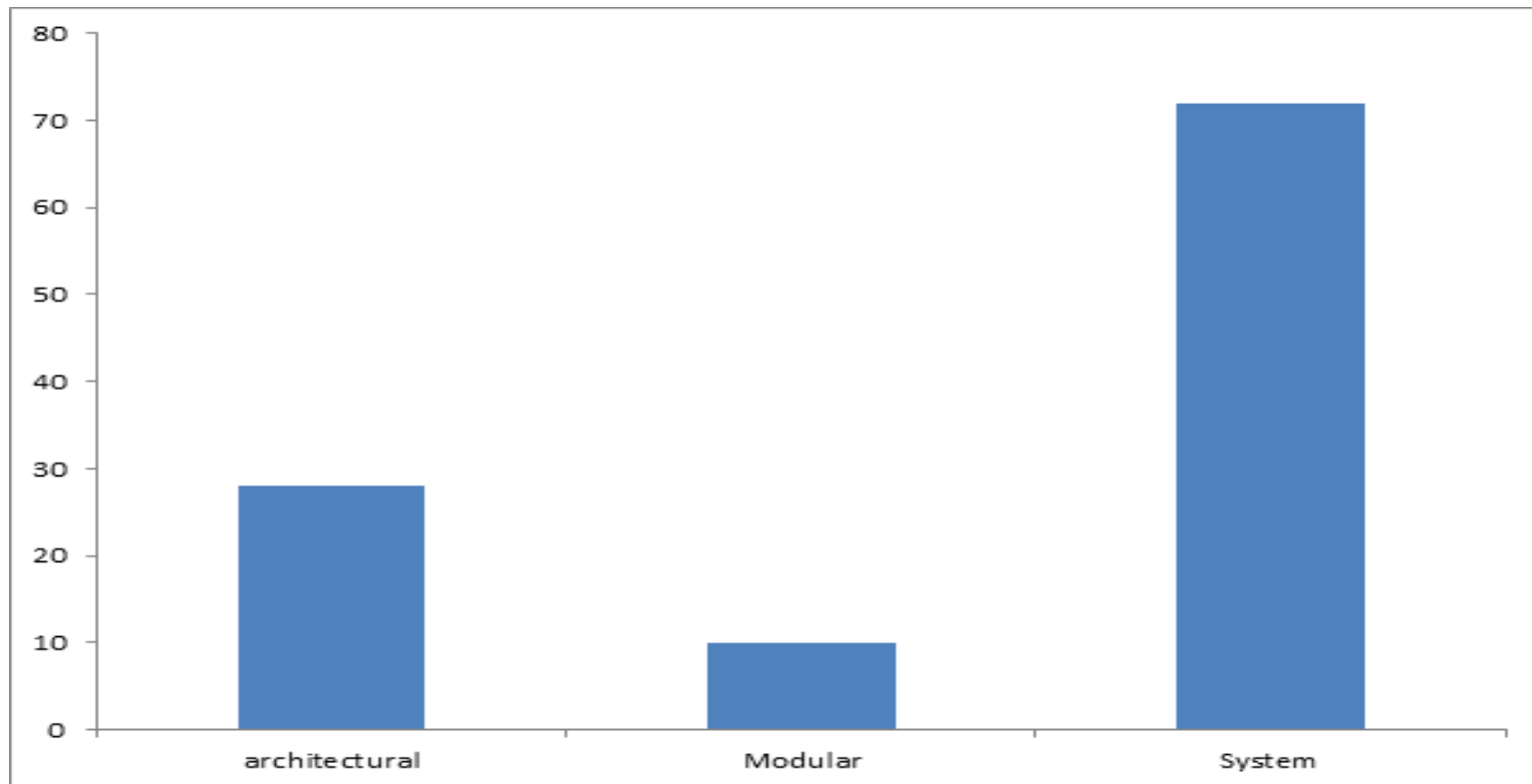


Figure 5. Innovation novelty categories that delivered combination of quality-time-cost benefit

Analysis of SCIRT innovation database

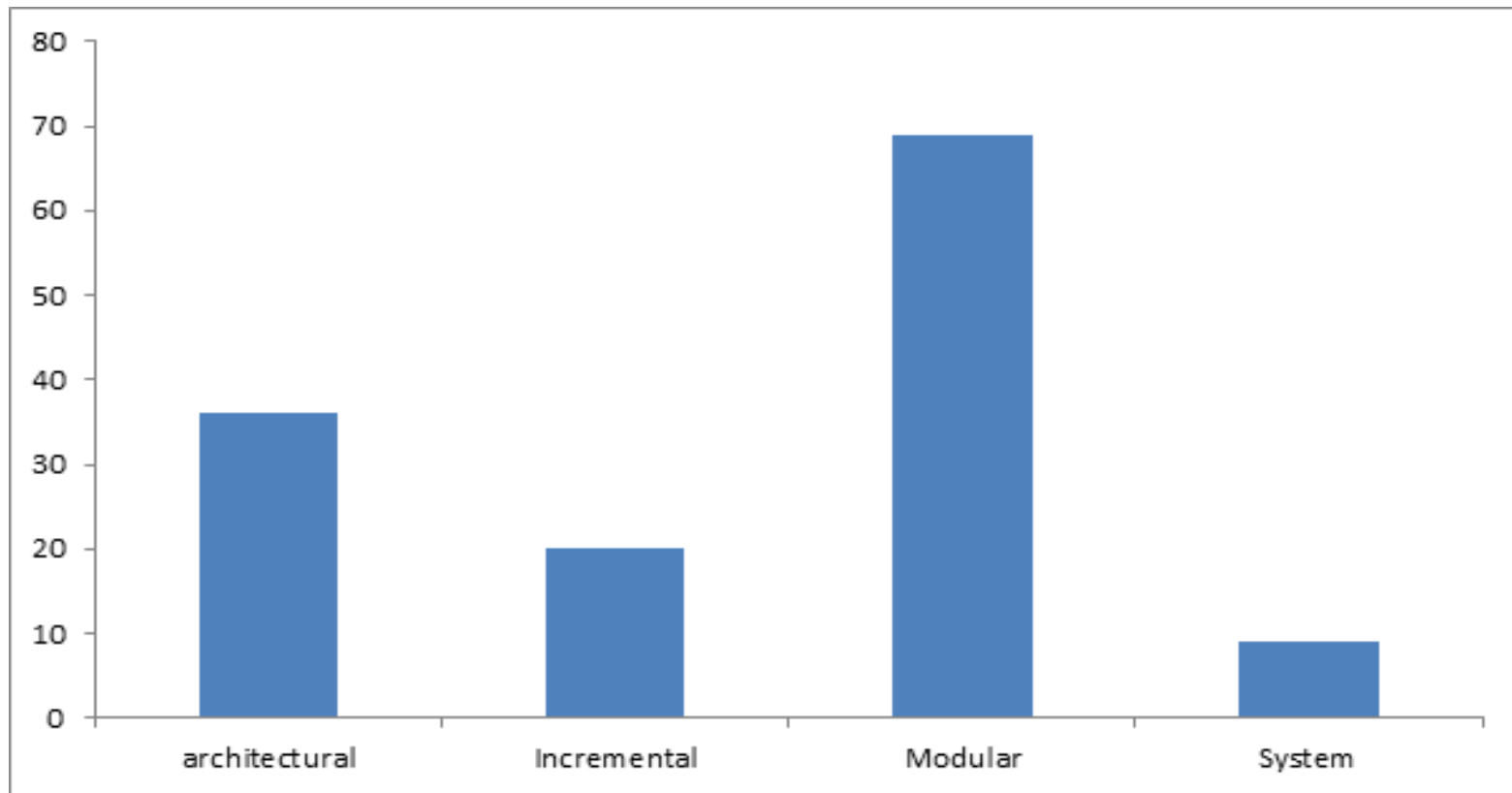


Figure 6. Innovation novelty categories that delivered either sustainability, safety or community

Analysis of SCIRT innovation database

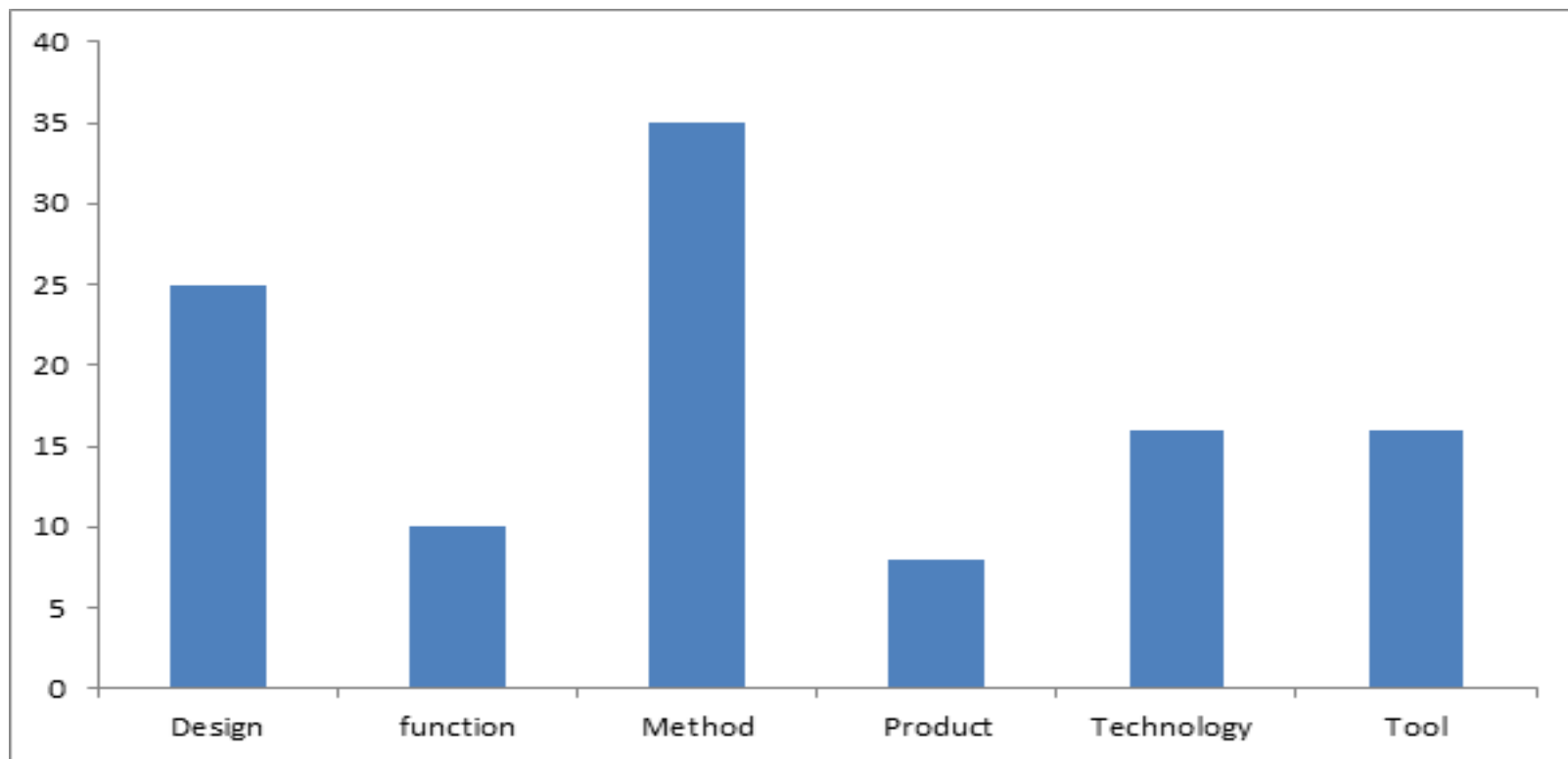


Figure 7. Innovation types that delivered a combination of quality-time-cost benefits

Analysis of SCIRT innovation database

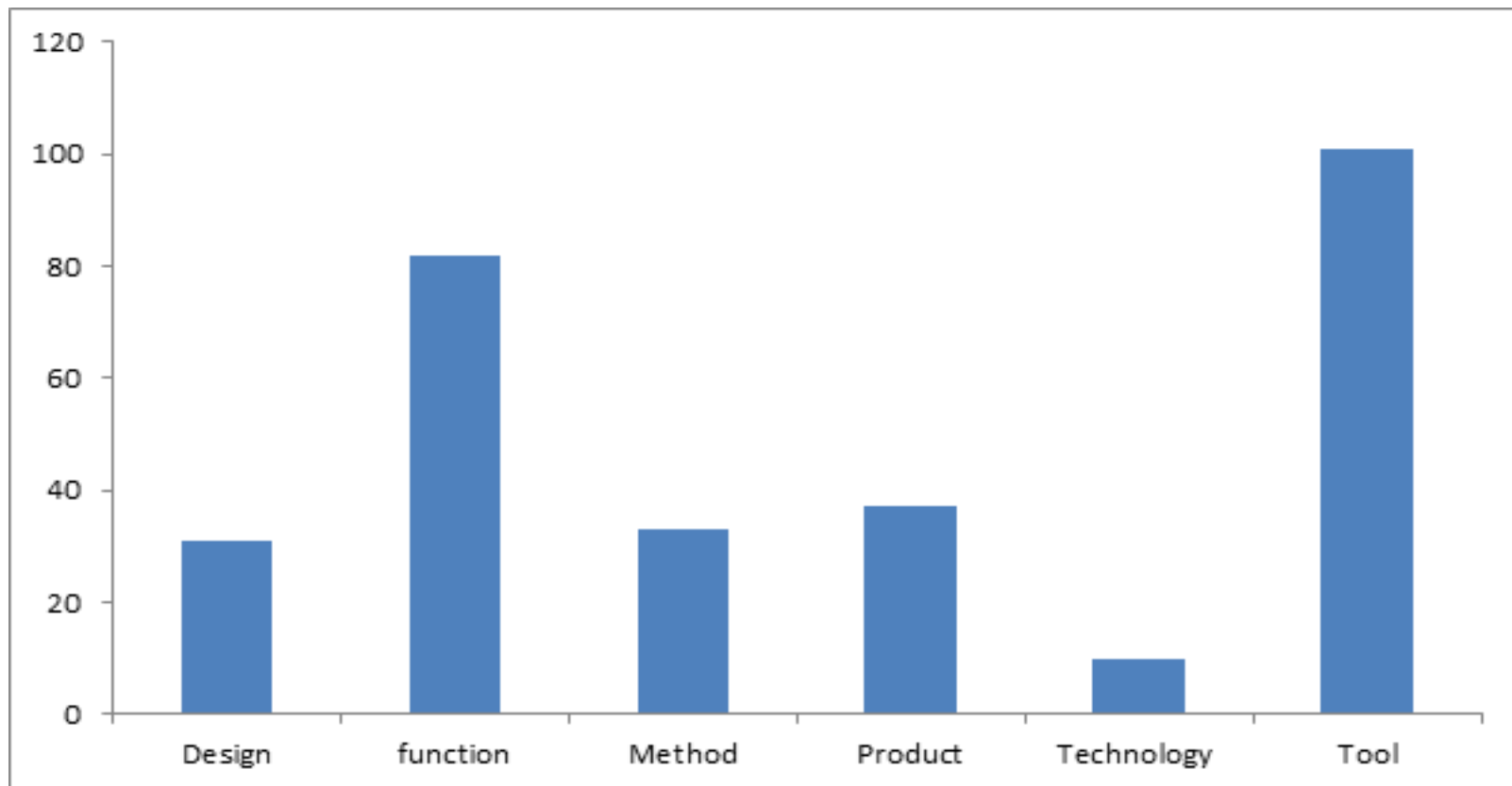


Figure 8. Innovation types that delivered a single benefit

Analysis of SCIRT innovation database

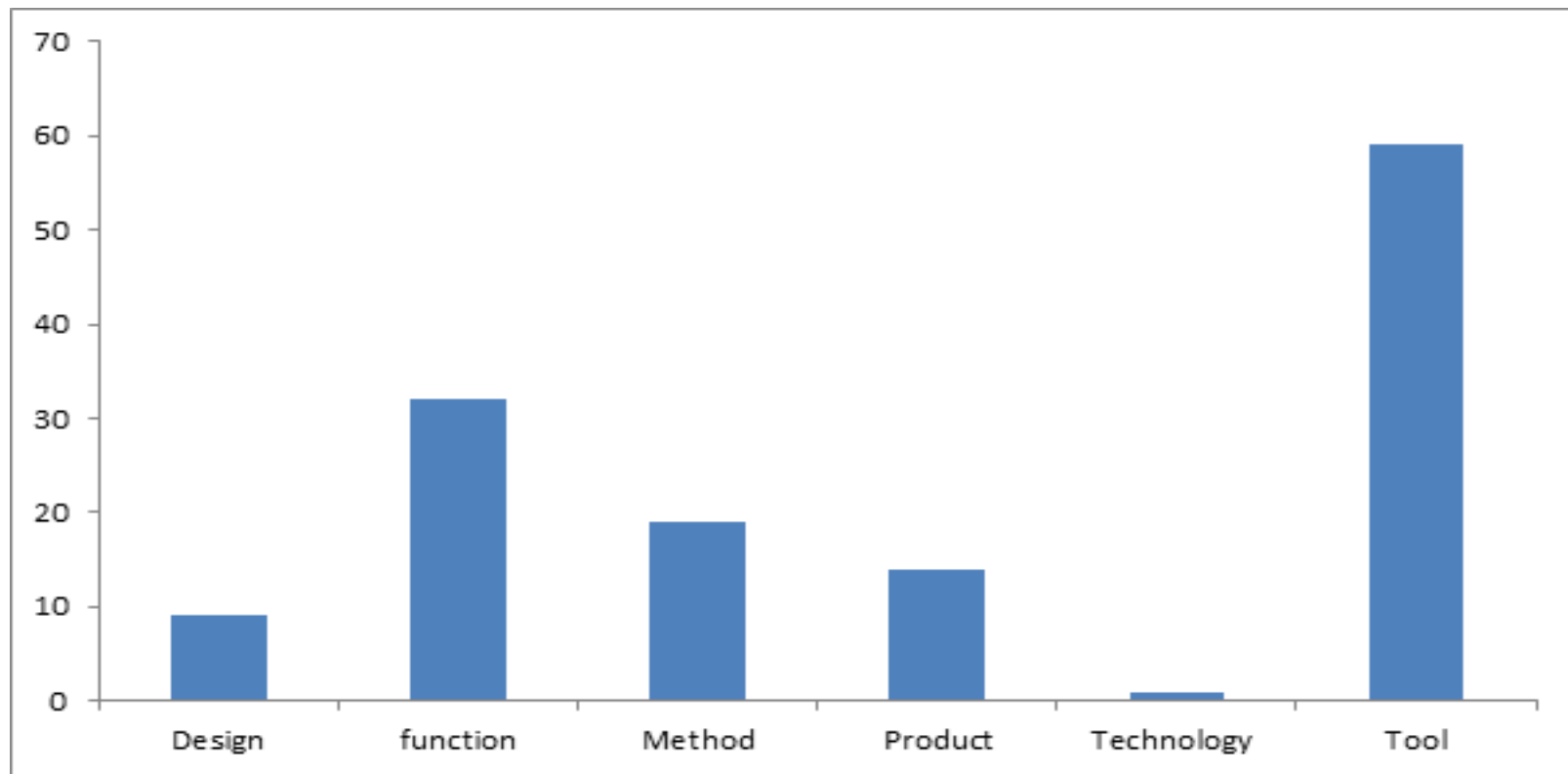


Figure 9. Innovation types that delivered either sustainability, safety or community

Analysis of SCIRT innovation database

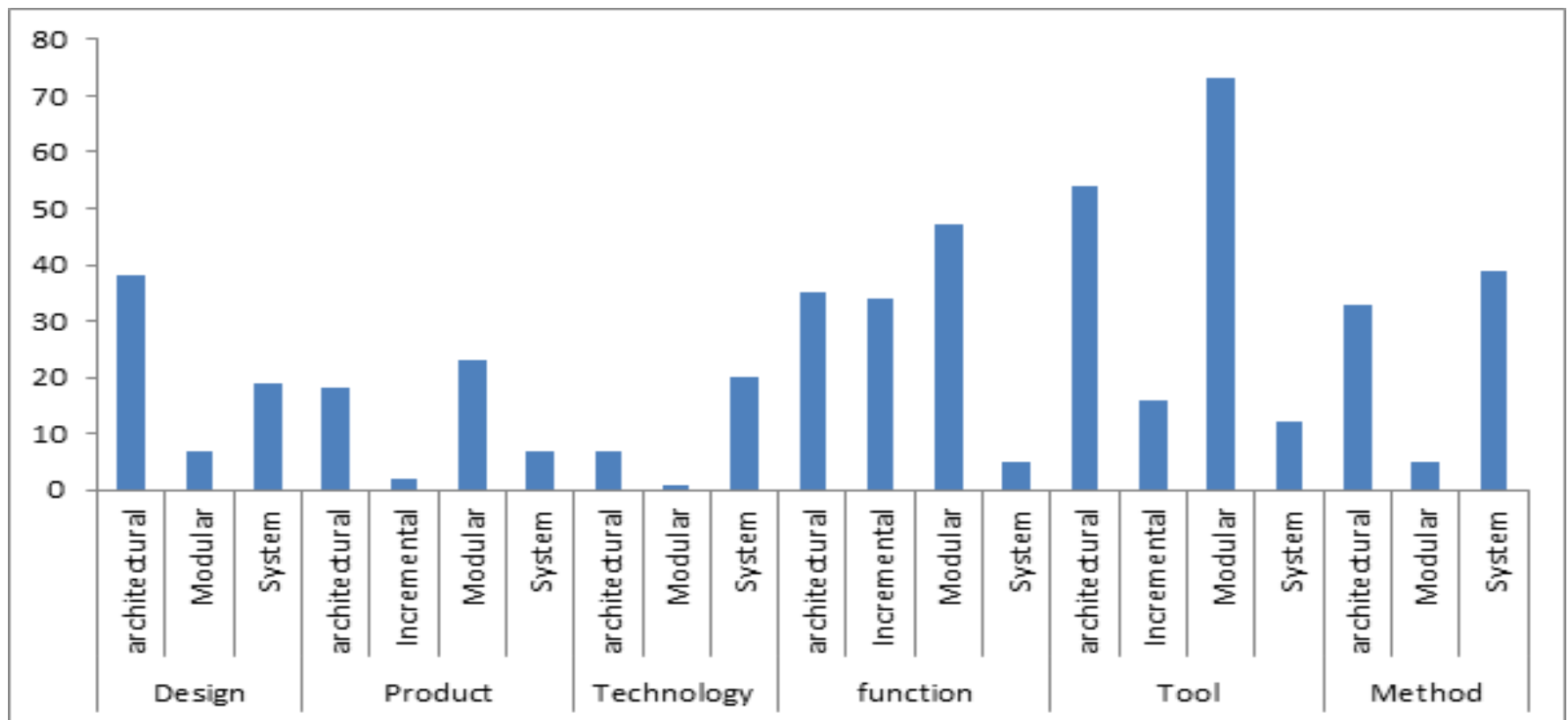


Figure 10. Degree of novelty of various types of innovation

Analysis of SCIRT innovation database

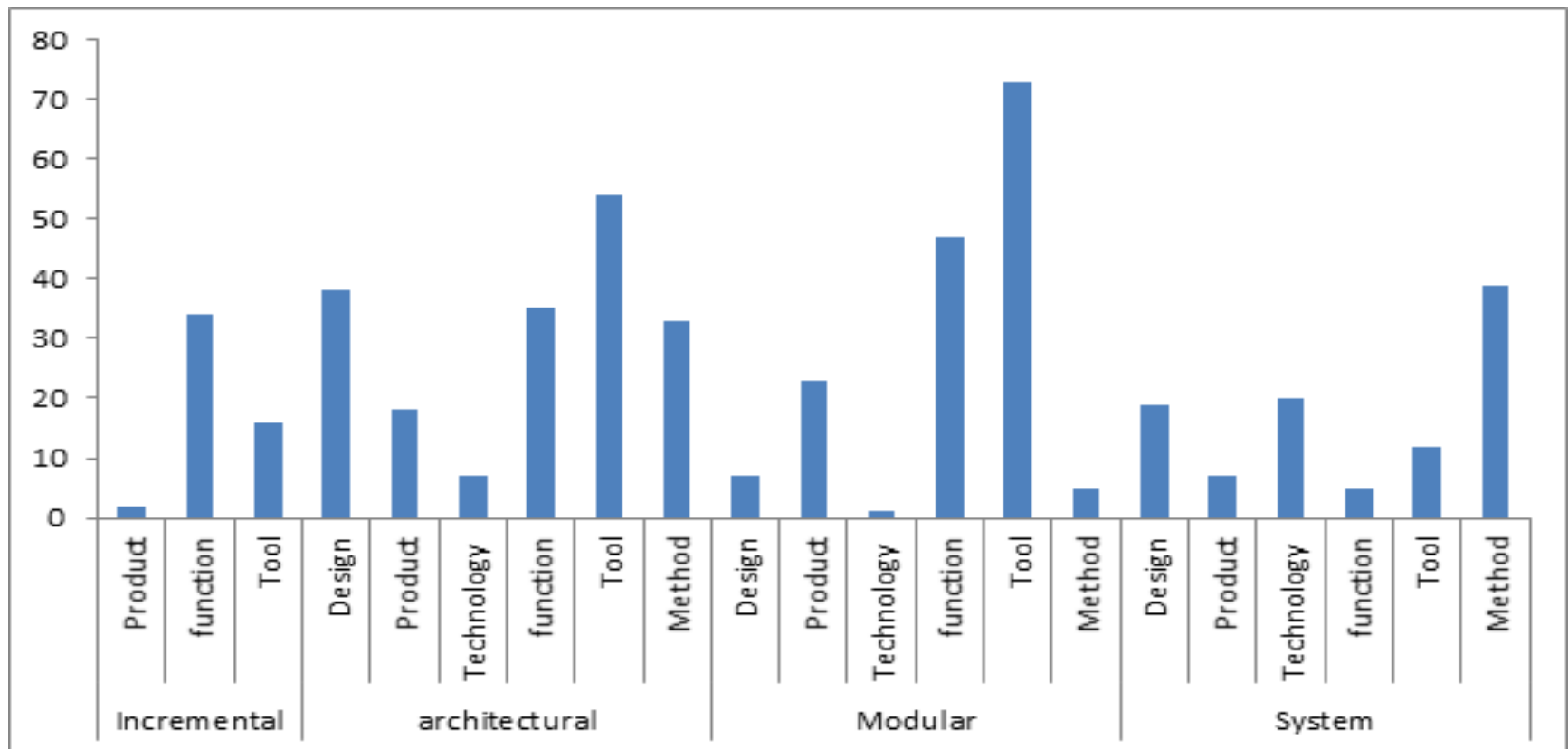


Figure 11. Spread of innovation types for each level of novelty

Analysis of SCIRT innovation database

- Diversity of types, degree of novelty and performance benefits.
- Most of the reported innovations were tools or functions in response to immediate problems faced by the operational teams.
- Most innovations were modular or architectural, developed through localised problem solving or at the interface of operational sub-systems.

Conclusions

- There are large differences among different categories of innovation, and their impact on productivity are of different levels of significance.
- This classification system can be used to develop more detailed innovation KPI system tailored to the specific requirements of the construction project.
- The classification system can be used to study the relationship between organisational factors and various categories of innovation

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