SCIRT Rebuilding Infrastructure

LEARNING LEGACY

Lessons learned from one of New Zealand's most challenging civil engineering projects: rebuilding the earthquake damaged pipes, roads, bridges and retaining walls in the city of Christchurch 2011 - 2016.

Learning from Innovation

Story: Academic Studies – Driving Innovation in the Construction Industry

Theme: Programme Management

An article published in the August/September 2015 issue of BRANZ Build magazine. It summarises SCIRT's approach to innovation management and suggests some areas for improvement.

This document has been provided as an example of a tool that might be useful for other organisations undertaking complex disaster recovery or infrastructure rebuild programmes.

For more information about this document, visit www.scirtlearninglegacy.org.nz

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Learning from innovation

The New Zealand construction industry needs to be more innovative to improve its poor productivity. Analysis of the drivers boosting innovation while rebuilding Canterbury's infrastructure has lessons for all.

THE NEW ZEALAND construction industry is critical to the economy, but it's slow to innovate. The diverse nature of construction sector work, combined with complexities such as bespoke building, temporary construction projects, on-site production and hefty regulation, results in a low innovation environment.

Looking at a successful system

Researchers at the University of Auckland and the University of Canterbury have been researching innovation development and management in the BRANZ-funded Stronger Christchurch Infrastructure Rebuild Team (SCIRT) innovation project.

The researchers wanted to understand the drivers for innovation at SCIRT and how the industry could learn from its processes to deliver better innovations.

Innovations reported monthly

Under SCIRT, innovations were given special consideration. Members of the SCIRT alliance reported on their innovations monthly as one of their key performance indicators (KPIs).

These KPIs were linked directly to pay and reward in the contract, motivating alliance members to innovate. To date, more than 600 innovations have been reported by SCIRT. The researchers were given full access to SCIRT's innovation database.

Trends and benefits found

For each reported innovation, the database contained a unique identification number, description of the innovative idea, its potential benefits and information regarding which member organisation had initiated the innovation.

The research team analysed and categorised each of the reported innovations.

Classification of the innovations in the SCIRT database using type, novelty and benefit revealed an interesting trend.

Most innovation types were changing tools or functions. This included the development of novel construction equipment, machinery or tools and functional changes in management processes.

In terms of novelty, most innovations were small changes that had a change on the system (architectural innovation) or a significant change in one area that had no impact on the system (modular innovation).

The SCIRT innovations deliver a wide spread of performance benefits, dominated by quality, time and cost (see Figure 1).

Relationships show greatest impact

The data was analysed to identify emerging trends that would provide more insight into the relationship between the three dimensions of the innovation classification system. For instance:

- architectural and modular categories of innovation are more focused on delivering a single benefit
- the system category of innovation seems to be the one that mostly delivers a combination of quality, time and cost benefits.

Type and novelty alter the impact of a given innovation. For instance, an incremental change has less impact on performance than a more radical (system) change, and different innovation types deliver different benefits in time, cost, quality, safety and environmental improvements.

Most innovations to tools and functions

Under SCIRT, most of the reported innovations were tools or functions developed to overcome immediate problems facing the operational teams. Most of the innovations were modular or architectural in terms of novelty, indicating they were developed to solve local problems.

The data also shows that, when architectural and modular innovations were dominant, the reported innovations were mainly focused on a single aspect of performance improvement.

In contrast, when more sophisticated types of innovation such as technology and new methods were developed, the impact was more widespread and significant. These delivered benefits along multiple dimensions of performance such as quality, time and cost.

A more targeted approach

The KPI system used by SCIRT for innovations was not sophisticated and counted innovations produced without regard for benefit, type or novelty.

To guide and direct future innovation, a more targeted innovation KPI system could be adopted to consider the transformations required.

For innovations producing maximum impact, a KPI system that identifies type, benefits and novelty of innovation would target specific aspects of productivity improvement.

The research team is currently developing a mechanism that influences the types of innovation developed in construction projects to maximise productivity improvements.

Note The researchers would like to thank Rod Cameron from SCIRT for supporting this research.

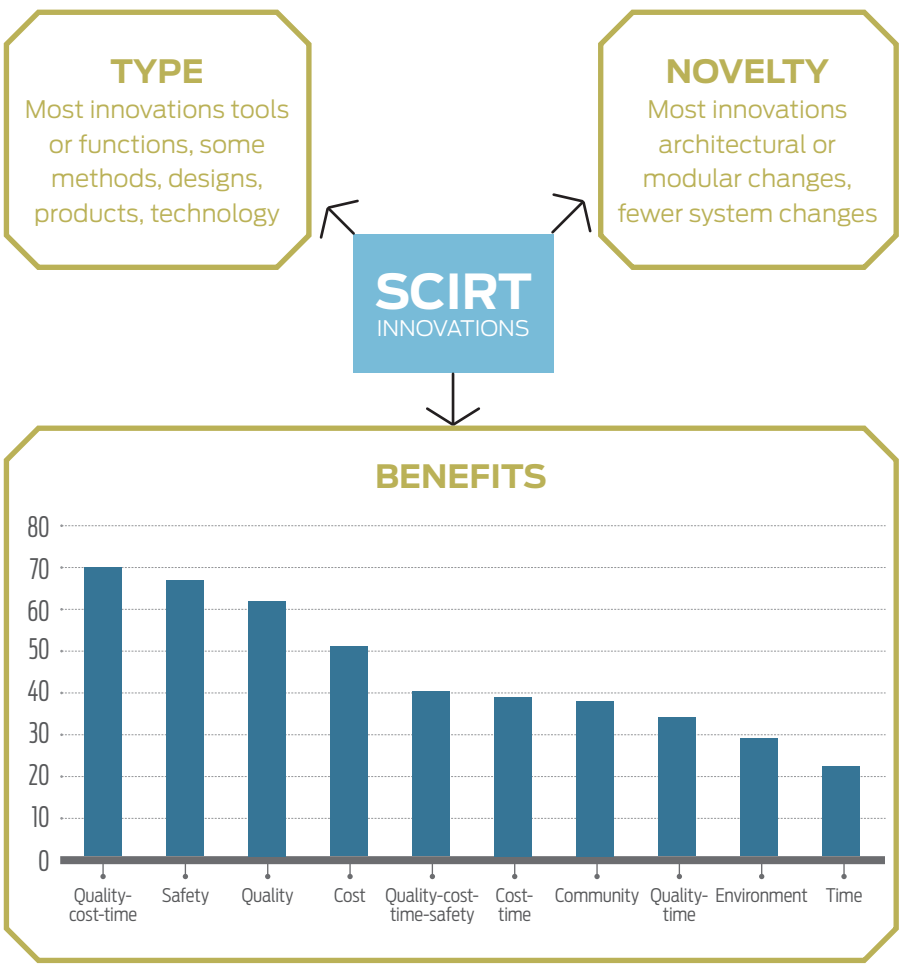

Figure 1: SCIRT innovations delivered widespread benefits.