

The commercial and strategic value of design to transport businesses

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Introduction

Creative Design is an award-winning expert design and engineering consultancy to the rail industry, based in the UK.

Our team designs and engineers all aspects of railway vehicles, carriage interiors and exteriors, for rail operators and manufacturers.

This approach is driven by our knowledge of the customer. Only by understanding customer needs, can we develop functional, enduring, cost-effective and attractive trains.

The commercial and strategic value of design to transport businesses

This paper discusses how design is viewed and used by the various players in a rail business and the challenge of meeting these different expectations on a new train project.

We will demonstrate with a case study how these challenges are met and the value added.

We look at the benefits for the strategic use of design early in the development process, with the positive outcomes being:

- A significant improvement in the performance of a business, by working smarter not harder
- Improving the commitment and productivity of each team

It is likely the only significant impact on workload, will be:

- Undertaking activities earlier in the process rather than later – these are activities which will have to be undertaken anyway.

Delivering these earlier in the design process should bring further benefit to the scheme.

In summary, design is essentially a planning activity and the approach we outline addresses design as both a planning and strategic resource, rather than solely as a commodity.

“Designers have a unique role in being able to present the visual business case. As part of the proposition process, it is an extremely powerful skill-set.” *source: Maxine Horne, British Design Innovation, Turning Propositions Into Profit, report 2005*

Having introduced the paper, we will look at what it all means.

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The commercial and strategic value of design to transport businesses

Simple title, difficult concept.

Difficult because value means different things to different people.

Commercially. In the near future, design values are likely to be defined in the process; this will impact on everything from procurement and its activities through to functionality and the need to work with specialist suppliers in order to meet changing customer expectation. Adding real tangible values are one of the few ways Europe is able to compete in the wider marketplace.

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We believe the biggest gains are to be made in:

- coordination (i.e. all parties involved in the process are successful)
- specification
- project direction and – importantly –
- customer values which will have to be embraced in the design process

This should impact positively by:

- the reduction of risk
- significantly reducing wasted effort
- quantifying the emotional drivers in a project, which can lead to delay

Data on the strategic value design can bring to a business identifies:

Strategy

To maintain success and competitive ability we must substantially improve the effectiveness of design and innovation activity.

source: competitive innovation environment development programme, sitra, finland

In most rail businesses r+d spend is often at a good level but the amounts spent are small, when compared to the rail sector as a whole.

This is not about seeking more funds but is more about increasing the success rate of innovation activity.

A success indicator for this area is the numbers of new competence based businesses (SME's to use UK parlance) that grow to support the major players. When measured in this way, the transport sector has serious shortcomings. Larger players should perhaps identify meaningful partnership approaches to seed early-growth businesses. Without careful early-stage nurturing, a big-business approach can only reduce new, innovative businesses and suppliers.

This is not in anyone's interest. So how can the success rate be improved?

Success

We will use a case study where design is an integral part of the business case.

Design was a tactical element of a new train build for new IC DMUs, which was eventually secured by a Japanese/Korean consortium.

Design and the use of the design process was essential at a number of key stages:

- Initially, in securing an invitation to pitch for the contract
- Bid support and assistance, which eventually led to winning the contract
- Detail design and implementation of the ITT, to meet success criteria

The third stage - design services - which is where design usually makes its most significant contribution, was important but the greatest value was the use of the initial design activity, which helped to win the business. As such, this paper is more interested in the two earlier phases of design involvement.

Only 41% of manufacturers see design as integral to their business.

Given the earlier paragraph, this may seem surprising. In a design-orientated event such as this one, it may not be a typical percentage, but in the wider rail market, it will not be a surprise that many businesses still see design as a cost.

Design is not a cost it is an investment.

Innovation is not only about r+d, or technological improvement: technological development 'push' is not much use in isolation, unless there is a demand or 'pull' from the customer.

There are clear links between creativeness, design and research and development, they are all ways of channelling manufacturing effort for commercial advantage. However, we believe:

The most significant impact we made was the use of design to ensure the consortium was given an opportunity to tender. Originally, they were not taken seriously in the tender and had to work hard to be considered. Our first phase of work was to identify the values the three companies in the consortium would bring to the project.

Structure

The three companies:

- Rotem
- Tokyu Car Corporation (TCC)
- Mitsui

The project

A new Inter City DMU fleet for Iarnród Éireann

- 120 cars, 100 mph, two classes of travel, full Irish breakfast
- Competing with regional airlines, long distance coach and bus networks

The marketplace

Ireland and Dublin in particular is unusual.

Within the European Union the population is only substantially increasing in two countries, Ireland and France (Current growth of 2% per annum with forecasted increase from 3.8m to 5.4 m from 2000 to 2050).

The consortium

Rotem will use their technical and manufacturing expertise to deliver a cost effective & quality solution to the customer's requirements.

Tokyu Car Corporation would bring much valued experience from their 2600 & 2800 series DMU, and 8500, 8510, & 8520 series vehicles in Dublin. Their reputation for technical integration significantly reduces risk.

Mitsui will manage all commercial aspects of the project, and ensure its smooth delivery through overall project management.

Creative were identified as their design team, as we have extensive experience of working in Asia - most notably Japan - and having worked on similar vehicles in Europe. Our customer led approach, complements the in-house skills of each of the consortium members.

Importantly, Rotem, TCC, and Mitsui recognised the need to use design to help secure an opportunity to bid.

The phases

Pre-tender

- Pre tender capability, credentials pitch to secure an opportunity to bid

Design was used to demonstrate

- Potential
- Capability
- Sense of place

The pre-tender phase is much more to do with demonstrating to the client that we are a plausible bid-team. During the bid the emphasis is much more focused as it has to address the requirements of an ITT, with clear deliverables against a prescriptive schedule.

Bid

Sketchbook produced, ensuring the proposed contract values are clearly identified in the documents.

Design was used to demonstrate

- The offer, visually defining the commercial offer
- The quality of design and manufacture
- How we would work with IE and its customers to meet their expectation

Creative identified an approach which IE found difficult to refute. *IE Quote: "Their 'visual proof of concept' perfectly communicated our business case in simple, direct terms."*

120 cars are worth a couple of hundred million Euro, and the order is now for 150 cars.

The final phase - implementing the scheme - is different again. The most significant difference is we were now able to work closely alongside the client as an integral part of their team.

Contract

- Post contract design work with IE
- Customer research on the overall design direction
- Post research design definition
- Project implementation

There is a significant difference in the application of design skills in each phase, although the skills are inherently the same. The major difference lies in the involvement of the client and the impact of corporate values, which can only take place following contract award.

Research is an essential part of the formula. It offers a significant opportunity to 'prove' the design against the demands of the end-user.

Team

- IE
- Customer
- Contract and consortium

It was important the vehicles were designed to suit the needs of the end-user. This formative work was undertaken post contract so that IE could be fully involved in the process and that we could work with the in-house IE team, allowing them to shape the offer.

The sense of place issue was extremely important, as IE wished to make sure the vehicles were felt to be more European than Asian in detail, a small point but an important emotional driver.

Local content

- IE and definition of 'Irishness' for the new trains
- Customer research and how we would address demographics
- Positive outcome within IE corporate requirements

Much of our work focused on how we interpret 'Irishness' and with a young customer profile, we identified with IE how we would involve a wide range of customers in the design process.

We undertook user group research in Ireland to ensure we had correctly interpreted the brief and the needs of the end user were factored in to the workload.

"This is some of the most valuable research we have ever undertaken. The feedback was very enthusiastic and productive." *Source: Tim Grosvenor, CD user group research undertaken in Galway and Dublin, Summer 2005*

Value

- Value added for each player in the process
- The train Iarnród Éireann wants to operate
- The train the customer wants to use
- The train the manufacturer wants to build

An improved travel experience has to be convincing, enduring and aspirational. As we identified, it has to be successful for each of the participants.

- It has to be the train Iarnród Éireann wants operate. Value to IE
- The train the customer wants to use, value to the end user, the customer
- The train the manufacturer wants to build, value to Rotem, TCC, Mitsui

To reconcile these conflicting requirements we identify simple success criteria. Each of the players has to recognise the value design brings to the manufacturing process which is used to make the subsequent manufacturing phases more straightforward and prescriptive. In the future for example, procurement is likely to embrace a 'creative' approach, to ensure that value as whole is considered and that issues of cost do not skew decisions.

We will not add any further on the later stages. Manufacture is well under way and the final adjustments are being made before the first cars are shipped to Europe early in the New Year.

Programme

December 2004:	Prequalification design support
February 2005:	Bid support and the design business case
March 2005:	Post contract design work, now involving IE
Summer 2005:	Scheme design
September 2005:	Design freeze
December 2005:	Mock up models
December 2005:	Manufacture begins in korea
June 2006:	Test train completed
April 2007:	Delivery of first train to Ireland
May 2007:	Testing
July 2007:	Trains enter service as they become available
May 2008:	Last trains delivered
	New customers and orders secured

Summary

A difficult subject, as value clearly means different things to different people. But in absolute terms, has design involvement had a positive outcome and can it be calculated?

For the end user, undoubtedly yes. They have steered the process and we have drawn heavily on their feedback.

It is difficult for the client to offer an endorsement, as they await the arrival of the trains before they pass judgement. However, they are employing Creative separately.

For Rotem, TCC, and Mitsui, it helped the team do the most important thing at the time: participate in and win the tender! It then facilitated bringing together the often-conflicting requirements of the various stake holders to deliver the best overall solution.

- Design was a major factor in winning this contract. However, it was only a small part of the huge resources required by the consortium, who crafted the bid
- It demonstrates that trains built overseas can have local character
- Each player has benefited from the approach we have outlined
- The consortium team will use this approach again
- It illustrates the value of design

The last word goes to our clients.

"Simple, classy and comfortable." *Dublin, Younger research respondent.*

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