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# RESEARCH AND DEVELOPMENT, SKILLS REQUIREMENTS, AND ACHIEVING EXCELLENCE IN CONSTRUCTION

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The contribution from R&D to the development of the construction industry is immense as it leads the path to enhance the effectiveness of construction organisations and to raise the international competitiveness through technological advances and managerial developments. Further, R&D acts as a valuable input for the construction organisation by developing new products, materials, advanced construction processes, to meet the customer requirements and to address the economic, environmental and resource constraints. One of the essential inputs for successful R&D has been identified as skilled personnel. However, lack of skilled people particularly graduates and post graduates in the construction industry have led to a skills shortage to develop R&D activities. Further, lack of skilled people in construction organisations has resulted in reducing the absorption capacity and thereby the outcomes of R&D activities are not properly absorbed and put into practice. Therefore, skills shortage in the construction industry has been seen as the greatest threat to the long-term stability of the UK research base. Accordingly, the aim of this presentation is to visit the reasons behind the skills shortage in R&D organisations. Further, it will review the factors that can be contributed to success of the R&D personals and to identify the ways of managing them for the future advantage of the organisation.

**Keywords:** recruitment and retention, research and development, skilled people

## WHY R&D IS IMPORTANT TO THE CONSTRUCTION INDUSTRY

The built environment should be accessible and comfortable for all, durably enjoyable, efficient and flexible to changing demands, and available and affordable (European construction platform, 2005). According to Fairclough (2002), the construction processes, desirability, cost, sustainability and utility of finished products have an effect on the quality of life of the general public. Therefore, Fairclough (2002, p30) argues that the “Construction industry has a key role to play in society in providing a better built environment”.

The challenges placed upon construction industry are forcing the industry to change its traditional approaches to design, construction, refurbishment, and maintenance (Fairclough, 2002). These challenges are setting new targets and creating new scope for designers, engineers, manufacturers, contractors, technologist, and researchers (Fairclough, 2002). Further, these challenges demands innovation and effective research and development (R&D) activities for construction organisations to compete in the market and to meet the social needs (Laing, 2001). At the same time the

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industry is under tremendous pressure both internally and externally to re-examine its activities and to improve its performance and reach the excellence standards (Anumba *et al.*, 2000). Accordingly, the following section describes the role of R&D in achieving the construction excellence.

## **ROLE OF R&D IN ACHIEVING EXCELLENCE IN CONSTRUCTION**

### **EXCELLENCE IN CONSTRUCTION**

According to Oakland (2002) business excellence is “achieving world-class performance’. There are different ways and means of achieving the “world class performance” or the “excellence”. The main themes behind the construction excellence can be summarised as follows (European construction platform, 2005; OGC, 2003, Fairclough, 2002; Respect for people working group, 2002; DCMS, 2000; Egan, 1998, Latham, 1994):

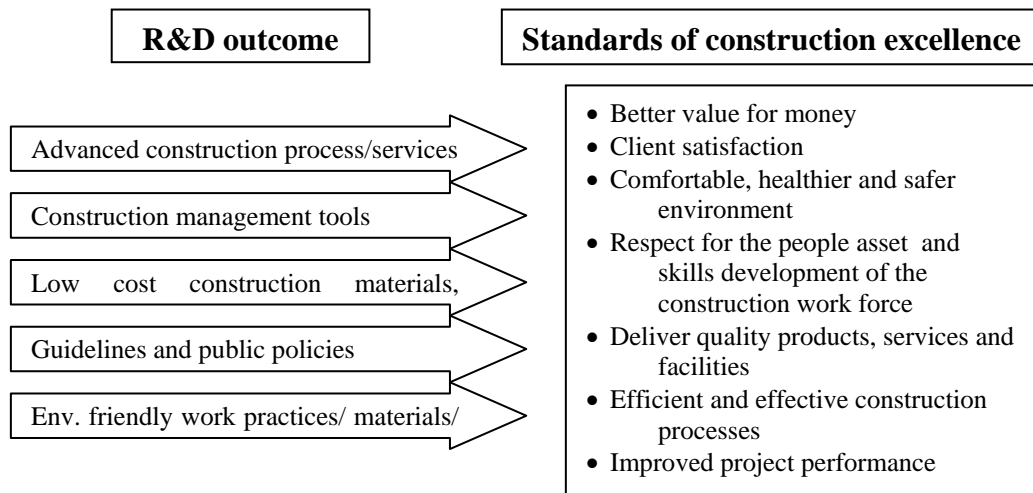
- Better value for money;
- Client satisfaction;
- Comfortable, healthier and safer environment;
- Respect for the people asset and skills development of the construction work force;
- Deliver quality products, services and facilities;
- Efficient and effective construction processes;
- Improved project performance, and;
- Meeting the sustainable goals.

### **ROLE OF R&D AND CONSTRUCTION EXCELLENCE**

Construction research varies from highly technical studies of properties of materials to “soft” research such as management relationships (Courtney, 1999). According to Fairclough (2002), construction research takes two forms; to develop new products and processes and to provide the capabilities needed to absorb lessons and ideas from elsewhere. By evaluating the requirement and various categorisations of construction R&D, the outcome can be divided into the followings (DTI, 2004; Hampson and Brandon, 2004; Fairclough, 2002; Fraser and Fraser, 2001; Courtney, 1999):

- Development of advanced construction processes and services;
- Development of construction planning and management tools;
- Development of low cost construction materials, products;
- Development of environmental friendly work practices and construction materials and products, and;
- Development of guidelines and public policies.

The above outcomes of R&D activities able to deliver quality and environmental friendly products and services via incorporating improved construction processes, materials, and products. Further, such developments will address the aspirations and needs of the construction stakeholders and provide a better built environment. Accordingly, the construction excellence standards will be properly met by effective R&D activities as shown in Figure 1.



**Figure 1:** Evaluation of R&D outcome against the construction excellence standards

The above section highlighted the importance of R&D in achieving the construction excellence standards. Is the construction R&D equipped with the necessary resources to bring about the excellence in construction? The section below will look into this matter with particular reference to the availability of human resources within the construction research base.

### **DOES THE CONSTRUCTION RESEARCH BASE HAVE CAPABLE R&D PROFESSIONALS? ARE THE NUMBERS SUFFICIENT ENOUGH?**

In construction, to get involved in high quality research, organisations require resources such as necessary equipment, adequate funding and skilled individuals (Seaden, 2002). Among these resources, Roberts (2002) state that success of R&D is highly dependent upon the availability and talent of scientists and engineers. Accordingly Fairclough (2002) raised several questions:

“Is the construction research base in a fit state to tackle the most critical issues of the 21<sup>st</sup> century? Does it have the right people, the right organisation, the right vision? Does it have the right skills?” (Fairclough, 2002, p.17).

These are some key issues which the construction industry has to answer.

Lack of skilled people particularly graduates and post graduates in the construction industry have lead to a skills shortage in supporting R&D activities (Fairclough, 2002). Lack of skilled people in construction organisations has further resulted in reducing the absorption capacity and thereby the outcomes of R&D activities are not properly absorbed and put into practice. Fairclough (2002) states that the supply of professional skills does not match with the demand which requires to facilitate and maintain a healthier built environment. This skills shortage in the construction industry has been seen as the greatest threat to the long-term stability of the UK research base.

One of the main reasons behind the skills shortage in the construction research base as well as in the construction industry as whole can be considered as lack of respect for the people factor (Respect for people working group, 2002). According to Egan (1998) “construction does not yet recognise that its people are the greatest asset and treat them as such”. The negative attitude and lack of respect has failed to recruit and

retain the talented personnel to the construction organisations (Respect for people working group, 2002).

The above section revealed that the UK construction research base is suffering with a skills shortage negatively affecting the R&D activities. The below section will look into the measures which the construction industry can adhere, in terms of attracting and retaining higher calibre employees to its research base.

## **HOW COULD CONSTRUCTION RESEARCH BASE ATTRACT AND RETAIN RESEARCHERS?**

It has been identified that construction research takes time to provide benefits. Thus, project by project recruitment of researchers hinders the development of in depth research skills. Further such recruitments affect the job security of the employees. Therefore, it is essential to provide longer term focus and ensure more certainty of employment for those who engage in R&D activities (Fairclough, 2002).

The career development plans for R&D employees should be flexible enough to accommodate the expectations and changes encounter at different stages of their careers (Chen *et al.*, 2004). For instance, at the “exploration” stage, a researcher would expect to settle down to a stable professional field where as at the “establishment” stage, the employees are ambitious, keen to improve their knowledge. During the “maintenance” stage, they have gained experience and considerable amount of knowledge and looking forward to direct the subordinates. Failing to address these different needs would result negatively in attracting and retaining R&D employees to construction organisations (Chen *et al.*, 2004).

Since scientists and engineers are with high demand right across the economy and employers, competitive conditions of employment should be offered to attract them (Roberts, 2002). Accordingly, the employers should improve the attractiveness of the jobs they offer, by providing attractive starting salary packages and by providing competitive salary progressions (Roberts, 2002). Moreover, providing opportunities for career development of R&D personnel via facilitating time and resources to engage in higher education will motivate the employee as well as give an opportunity to stay in line with the subject matter (Roberts, 2002). Further, to attract and retain the R&D employees, organisations can show clear career development plans and has to provide adequate training and development to enhance the professional skills.

Fairclough (2002) suggest several ways to meet the skills shortage in the UK research base:

- By providing excitement for researchers by defining programmes of work in terms of quality of life issues and sustainability, rather than traditional narrow construction and engineering problems;
- Encourage centres of excellence, and provide certainty of work in longer term programmes to allow research centres to plan manpower and resources;
- Demand more people interchange between industry and academe;
- Help to facilitate the development of a high profile generalist construction qualification which will attract the best young talent interested in a career in construction.

## CONCLUSIONS

Along the way towards achieving a better built environment and excellence standards in the industry, R&D plays a significant role acting as a driver for innovation to develop advanced construction products, processes etc. However, a shortage of skilled people has been identified as one of the main barriers towards delivering effective and efficient R&D activities. This presentation discusses the way to attract and retain higher calibre researchers to the industry's research base. Providing clear career development plans, attractive and competitive salary scales, opportunities for higher education, providing challenging roles, adequate training, and development have been identified as some of the important ways of attracting and retaining talented people to the construction research base.

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