



# Case study: developing graduate engineers at Kentz Engineers & Constructors

Developing  
graduate  
engineers

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## Abstract

**Purpose** – The aim of this paper is to outline the approach and process in place within Kentz Engineers & Constructors to develop graduate engineers on an international basis.

**Design/methodology/approach** – The approach adopted is that of a case study which describes activities and processes within the organization and the rationale behind them, supported by appropriate material. The case study is based upon threads of experiences within the organization over an extended period of some years.

**Findings** – Findings include the need to facilitate experiential learning and provide mentoring within a socialization as well as developmental process.

**Research limitations/implications** – This is a case study focusing on the experiences and practices of one organization. It does not represent an empirical study. However, it contains insights that may be of practical value within businesses and other organizations seeking to develop graduate engineers, or, more broadly, seeking to manage the transition of new workers.

**Originality/value** – This paper illustrates the approach of one international organization to the development of graduate engineers within the construction industry.

**Keywords** Graduates, Construction industry, Experiential learning, Mentoring, Human resource development

**Paper type** Case study

## Introduction

The construction industry boom of the last few years and corresponding global shortage in skills has been well documented (e.g. Clarke and Herrmann, 2007; Pearman, 2007). Engineering skills are at a particular premium across the world and the dwindling supply of qualified graduate engineers is a particular concern, not just in construction but across industry sectors.

In the drinks industry a general manager from Britvic, Chris Spray, has noted that:

One way of attracting young people into engineering is to show them the cool technology they'll get to work with.

The fact that the issue is being reported at all indicates levels of concern with skills shortages and the efforts being taken by employers to address this.



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In an environment of both rapid growth and competition for the best people, sound policies and practices are needed to recruit and retain the right people with a view to the medium-to-long-term. Vicky Skene, Head of HR at Balfour Beatty, is correct to identify that looking for and finding a differentiator is the key to attracting and keeping people, stating:

It's recognizing that people don't just leave for the money. We need to help them have a sense of belonging – once we have them hooked, we need to build a relationship so they feel they belong. It sounds so best-practice, but it works!

This paper examines how Kentz Engineers and Constructors is addressing these issues by focusing on the development process that is in place to make the company desirable for young engineers to join, while seeking to retain them through investing in their development and providing the foundations and framework within which they can develop their career.

It is a case study written by the team who designed and implemented the process. It is in the main a descriptive paper outlining the processes adopted, underpinned by supporting literature. It reports upon practice, but is not an empirical study. The authors would suggest that this is an important area for academic research and such research should be encouraged.

### **Kentz Engineers and Constructors and the focus on skills**

Kentz Engineers and Constructors began life in the early twentieth century as an electrical contractor in Ireland. Rapid growth since the 1990s has seen the company transform itself into an international player, primarily serving clients within the upstream and downstream hydrocarbon industries, as well as other sectors such as mining and healthcare. The demand for oil and gas, together with price rises for mining commodities, has led to strong demand for Kentz offerings, which have developed over the years into a sophisticated set of services with the all-encompassing approach of engineering, procurement and construction (EPC) contracts becoming an increasingly important part of the mix.

The vision of the company is “to be recognized globally as the specialist service provider of choice”. which defines how Kentz wishes to be seen by its clients. Kentz non-negotiable values are the principles that define how business is done. These are safety, reputation, pride, tenacity, loyalty and respect. The construction industry is potentially a hazardous environment and, as a result, safety will top any discussion around the company and its activities. The phrase “nobody gets hurt and everybody goes home safe” is used to explain the culture of the organization in protecting its people.

Kentz is active in 22 different countries, from the heat of the Middle East to the intense cold of arctic Russia. Kentz employed 10,500 people in 2006, generating revenues of US\$428,701,000. 57 percent of revenue was generated in the Middle East region, 21 percent in sub-Saharan Africa. Major growth markets are in Australia (7 percent of revenue in 2006) and Russia (9 percent of revenue in 2006). Kentz also has established businesses in Ireland, the Far East/Pacific Rim, the Americas (primarily USA and the Caribbean) and the Caspian region (*Aviation Week & Space Technology*, 2007).

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The construction industry has its ups and downs in line with oil and commodity price changes and fluctuations in the global economy in general. It is an industry that demands flexibility in terms of its workforce. People need to be able to go to wherever the work is, and contract work is the norm. Currently, an even more pressing need is for employees to work with the company in the ongoing development of their capabilities and skills. Within the Kentz Group HR function a dedicated group recruitment activity is in place to create the global framework for recruitment, and staff are recruited from 23 countries around the world. A group training and development activity, again working with Kentz regional and country-level management, creates the framework within which development of people takes place.

In simple numerical terms, 9,698,161 man hours were spent on Kentz projects in 2004, rising dramatically to 20,348,888 in 2005. The rise in 2006 was more modest, but the demand is growing rapidly once more and despite uncertainties in global financial markets the strong oil price is driving industrial construction growth. At the same time, process industries are becoming increasingly sophisticated and clients more demanding of innovation from their providers.

### **Development, support and loyalty**

Retaining people is the starting point which is why Kentz values are so important. The company has to be a safe place to work and show respect for its people. The record is good – the top 100 core management of the company have an average of 18 years of service. The focus of this paper is on the development of those starting out in their careers, in particular the newly qualified engineering graduates so vital to the organization's long term vitality.

It is a competitive hiring market for employers offering serious opportunities to develop and progress. The better companies, such as PCL in Canada, have outstanding facilities to develop people. For Kentz the work of Noel Tichy at General Electric (GE) is where the fundamental lessons lie – the utilization of action learning within the Crotonville centre providing the foundations for the inspired leadership of Jack Welch. It is work further developed by Prestoungrange *et al.* (2000) in organizations such as Marriott Hotels and by Sodexo (Lenderman and Sandelands, 2005). Action learning had been first formalized by Revans (1971) who famously pioneered the process in the British coal mines of the 1950s.

In fact the 1950s were a more innovative period than contemporary managers and researchers might imagine. As O'Donnell *et al.* noted on the occasion of the 50th anniversary of *Education + Training*, companies back then noted that:

- organizations compete and create advantage through the talents and application of their people;
- processes, techniques and designs from the past will not meet the challenges of the future;
- attracting, retaining and developing craft apprentices and engineering graduates are vital to business growth; and
- entry point must be no barrier to success within organizations.

This last point was emphasized by Sir Willis Jackson of Metropolitan-Vickers Electrical Company in *Technical Education* (Hawkins, 1959) which later morphed into this journal and a concern of Laycock Engineering Ltd of Sheffield in the same journal (Hawkins, 1959).

It is a principle that is vitally important to Kentz. The company is a meritocracy and any employee who has the skills, ability, experience and tenacity can reach the top of the organization. There is no glass ceiling on the various disciplines and specialisms that make up a complex organization. Progression will not be handed on a plate, it will be on the basis of merit. As the company expands there are many opportunities to gain international experience, as well as necessary project exposure.

The transition from higher education into work is notoriously difficult for both the new employee and those seeking to manage them within the organization (e.g. Holden and Hamblett, 2007). Within Kentz the Supervisory Management Development Programme has been developed (see Figure 1) to facilitate a range of formal and experiential learning objectives over an 18-24 month period, supported by a fully trained mentor from within the ranks of Kentz experienced managers. This represents a major commitment from both the candidate and the organization, designed to build understanding of the business and develop the employee for future progression.

The Supervisory Management Development Programme (SMDP) consists of a number of routes. These are:

- Rotation Exposure Experience Programme (REEP) – for graduate engineers;
- Quantity Surveying Exposure Experience Programme (QEEP) – for graduates in QS;
- Financial Exposure Experience Programme (FEEP) – for graduates in finance;
- Business Development Exposure Experience Programme (BEEP) for graduates in business;
- Entry Management Supervisory Programme (EMSP) – for newly qualified trades people and for Hi-Potential Kentz employees.

The SMDP consists of different routes. All are designed to provide the same level of training and development, but by different means. REEP, for graduate engineers, focuses on exposure to and experience of several aspects of the business – this being

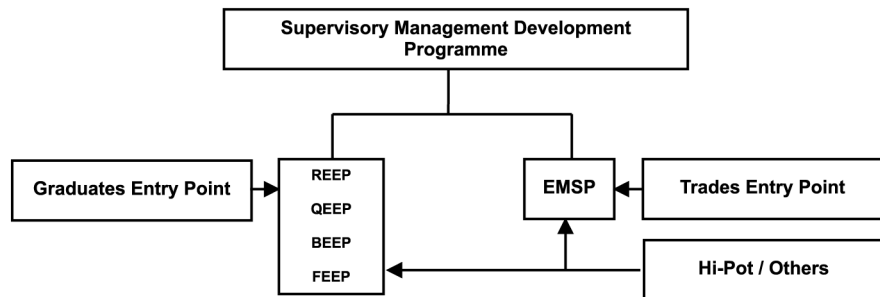


Figure 1.  
The SMDP routes

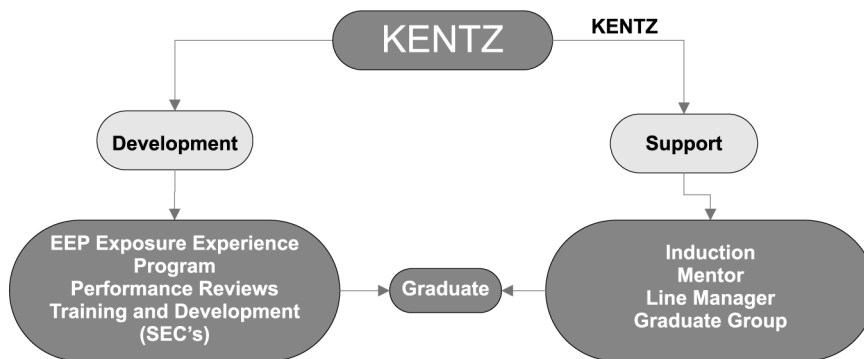
more important to their development than formal training. For junior trades people (qualified apprentices), a greater focus is on exposure to the business through training workshops. For the other routes, completion of workshops is required. However, for everyone, appropriate completion of work rotations is encouraged. Rotation is the major focus of the graduate engineer's experience in order that they understand the business.

The scarcity of graduate engineers means that they have numerous employment options. The construction industry offers a rewarding career choice but can seem like a hard environment; graduates will often be expected to work overseas, and will be potentially stationed in work camps that provide comfortable surroundings but are well away from the bright lights.

Within Kentz, interrelated processes of both development and support have been embedded with a focus on the completion of the REEP process (see Figure 2): Development through exposure to business issues and experience of different departments, with performance reviews and the provision of training and development courses, including skills enhancement courses (SECs); and support through an induction process, including country orientation when travelling overseas. Formal mentoring is a key part of the development activity and essentially a triangular relationship is built up between mentor, line manager and graduate.

Peer support is seen as an important component facilitated through the Kentz InTouch social networking site, which combines discussion with collaborative working and access to literature through the Emerald online library.

Through the REEP process Kentz is seeking to help engineering graduates perform as junior engineers and be ready to step up into design engineer, field engineer or project engineer positions. Their understanding of the business will enable them to make informed career choices. At the same time a focus on their management skills, leadership skills and identified soft skills will help them to direct people and become strong managers as well as good engineers. The support processes combined with the developmental pathway are designed to aid transition from education to the world of work, promoting the retention of graduate engineers and building the foundations for loyalty.



**Figure 2.** Development and support for graduate engineers

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**Rotation, exposure, experience and workshops**

Kentz typically recruits around 50 engineering graduates across the group per annum. Their retention and development are vital, and key to this is assimilation within the organization. The rotation element of their development programme is hard to organize and can be politically difficult, as results-oriented managers are often asked to give up one of their key people for the greater good of the individual and the firm. The rotation objectives are to:

- expose the graduate to key areas of the business and reach a level of understanding and competence in each area;
- provide broad experience of the business;
- understand the interfaces between functions and departments in building up a bigger picture of the business; and
- have enough exposure and experience to make informed career choices.

Figure 3 shows schematically the Rotation Exposure Experience Programme (REEP). After an initial introduction to Kentz, the graduates must spend time in the following areas:

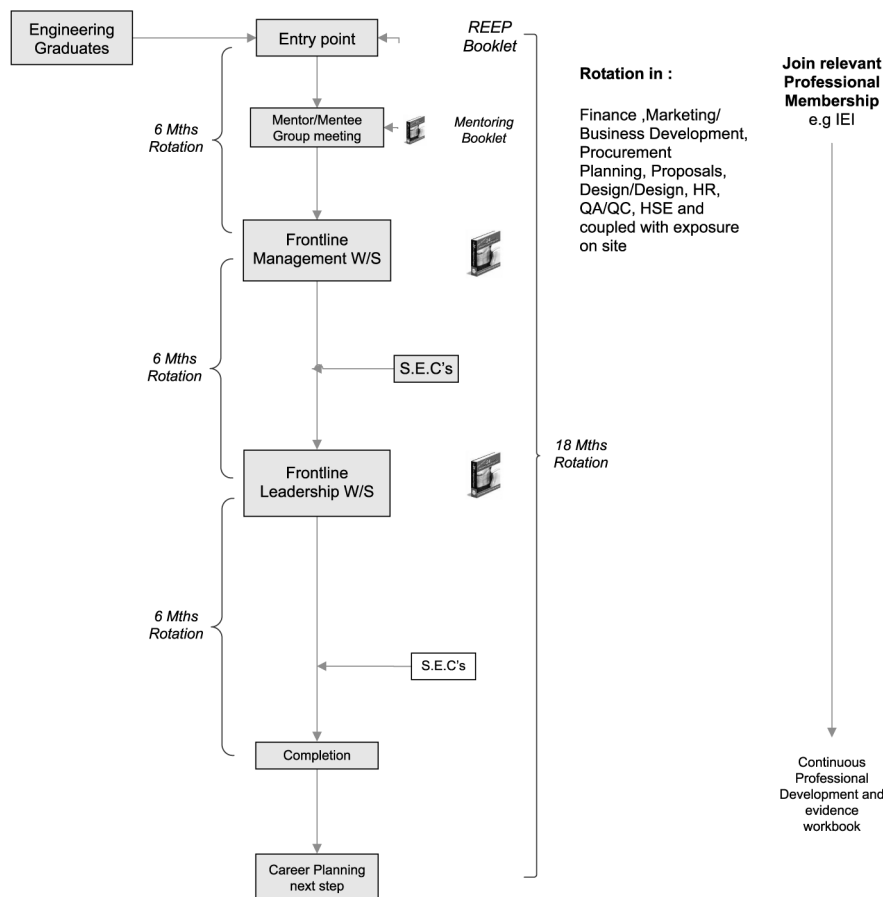
- Planning and contract validation.
- Finance and administration.
- Marketing and business development.
- Proposals and estimating.
- Quality assurance and quality control.
- Health, safety and environment (HSE).
- Human resources.
- Design engineering.
- Other areas as determined by the region or country.

Additionally, the Kentz Engineering Training Policy and a Kentz Glossary of terms must be understood and signed off (REEP, 2007).

For the programme to be effective the rotation and experience process must work, yet is very difficult to achieve. There are tensions between the short term needs of the line to keep people in positions where they are being effective versus the longer view that requires ongoing development in preparation for career progress and succession.

Like JCB (Benefer, 2007) the objectives are to develop employees to their maximum capabilities, enable career progression and succession planning, and improve company performance over the medium- to long-term. It is relatively easy to articulate, but the success of this type of initiative lies in embedding it carefully and providing consistent monitoring and control.

The time spent within each rotation varies depending upon the needs of the graduate and the business realities at that time. Tasks to be performed and standards to be reached are agreed between the graduate, the line manager and the mentor and formally signed off. These forms, together with an overview progress checklist are



**Figure 3.**  
The Rotation Exposure Programme

contained within the manual issued to each graduate, form part of the basis for discussions with the mentor, and are formally auditable.

To be effective within Kentz, engineers need to develop both managerial and leadership skills – such soft skills being a key part of their development. They quickly find themselves managing people, working with clients, overseeing sub-contractors and influencing other stakeholders. There are two capstone workshops:

- (1) Frontline Management Skills, which graduates participate in after six months at the company; and
- (2) Frontline Leadership Skills, which occurs after 12 months.

Both workshops last for three days and combine content with discussions and the sharing of experiences. Participants are drawn from across the SMDP, be they quantity surveyors, business graduates, finance graduates and those qualifying as trades people from apprenticeships. All are invited to participate in roundtable discussions and small group work and presentations. Peer support is facilitated and the Kentz

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InTouch infrastructure is there for all to use in setting up communities. Self-awareness is a key component with Honey and Mumford's Learning Styles Questionnaire (Honey and Mumford, 1992) being completed prior to and discussed within the Frontline Management Skills Workshop. Peter Honey Publications Motivating Others Questionnaire is similarly used for leadership skills.

Between workshops the needs of each graduate are discussed and assessed by their line manager and mentor. On this basis skills enhancement courses are recommended, which may be in team building, interpersonal effectiveness, communications skills or other areas from a calendar published and maintained by Group HR.

All graduates are invited to keep a learning log to capture their learning beyond the sign-off of progress. It is a personal document for them, addressing for identified learning opportunities:

- their description of what happened;
- their conclusions/lessons learned; and
- their plan to do something different/better.

*The mentoring relationship.* The mentoring process is referred to throughout this paper. A mentor is appointed very early within the graduate development process and the same mentor stays with their mentee throughout the completion of their SMDP process – a significant commitment from each experienced manager. It is a critical success factor for the early career development process.

Scandura *et al.* (1996) talk about mentoring creating more satisfying organizations one relationship at a time. It is a nice image and contains a lot of truth. The appointment of a mentor to each SMDP participant is a major element that has been designed into the process to support each individual. It is a method that has a long and proven record of being successful, but requires both the mentor and the mentee to work at the relationship.

Clutterbuck (2004) identifies an effective mentor as someone who:

- Manages the partnership.
- Encourages and empowers.
- Nurtures.
- Teaches the mentee.
- Offers mutual trust and respect.
- Responds to the Mentee's needs.

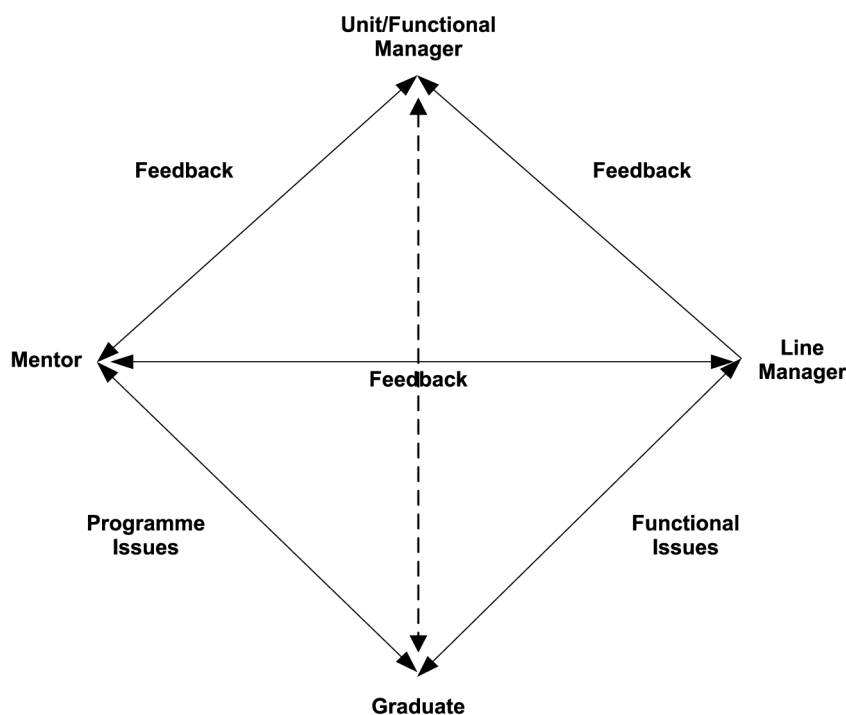
It is a handy mnemonic and succinctly states the role. Within Kentz, mentors are drawn from a cadre of experienced engineers and managers from across the group. All are volunteers. They have a major role to play in the socialization of the graduate engineer at work, but also have quite specific duties in relation to facilitating the development of their mentee. These include:

- meeting the mentee monthly and completing a short, structured report on their progress, identifying any issues;
- agreeing objectives and standards with the mentee and the line manager for each rotation, signing off the process and progress;

- monitoring of progress through work rotations against a check list to ensure that necessary exposure and experience is being achieved; and
- agreeing a slightly longer report on a quarterly basis with the mentee and submitting to group and regional HR.

The triangular nature of the mentor, graduate, line manager process can be more accurately portrayed as a diamond in which the business unit manager or functional manager has a broader interest in progress (see Figure 4). The role of the mentor needs to be seen within context. It relates to programme issues, with each participant's line manager there to manage functional issues, and the regional manager there to oversee both strands of the process. This distinction is important as mentors must not be an alternate powerbase; it is the line manager who will handle contractual issues (such as pay, holidays, new computers, new mobile phones, access to broadband and so on).

Mentors are specially trained to support the mentee and their development within the company but, for the relationship to work, mentees must be proactive, clear and realistic in what they are seeking to achieve. In short, they must drive their own learning and progression process. They are additionally advised that their mentor will:



Source: Karallis (2008)

Figure 4.  
The Kentz Mentor role  
in context

- meet with them face-to-face each month;
- listen to their experiences and identify any issues in need of action;
- assess their performance – completion of courses and experiential learning (documented in the workbook);
- agree next actions in relation to progression through their smdp pathway, plus any related issues that have been identified; and
- complete the forms required for monitoring and tracking of the process and submit to your regional mentoring co-ordinator.

The mentors themselves are trained and supported, including a peer support community of practice. The elements are:

- A two-day workshop for new mentors focusing both on the soft skills and the systems issues. Where possible, mentoring practice is conducted on the second day with the first monthly meeting being conducted with new mentees.
- A one-day annual mentoring review workshop providing a knowledge sharing and discussion forum focusing on best practice and sustaining the mentoring system.
- An online community of practice, together with articles and resources through the Kentz Mentor Community of the InTouch system.
- Reports feed into the Talent Management System and are ultimately monitored by Group HR.

Within Kentz, informal mentoring is encouraged at all levels. However, the formal mentoring process that has been introduced focuses on supporting those early in their careers, including newly recruited engineering graduates. It is an 18 to 24-month commitment. The requirements for reports and the system elements have been introduced and embedded as an auditable process within Kentz ISO 9001 accreditation to help sustain the process as part of a package that blends reporting with ongoing feedback, discussion and support.

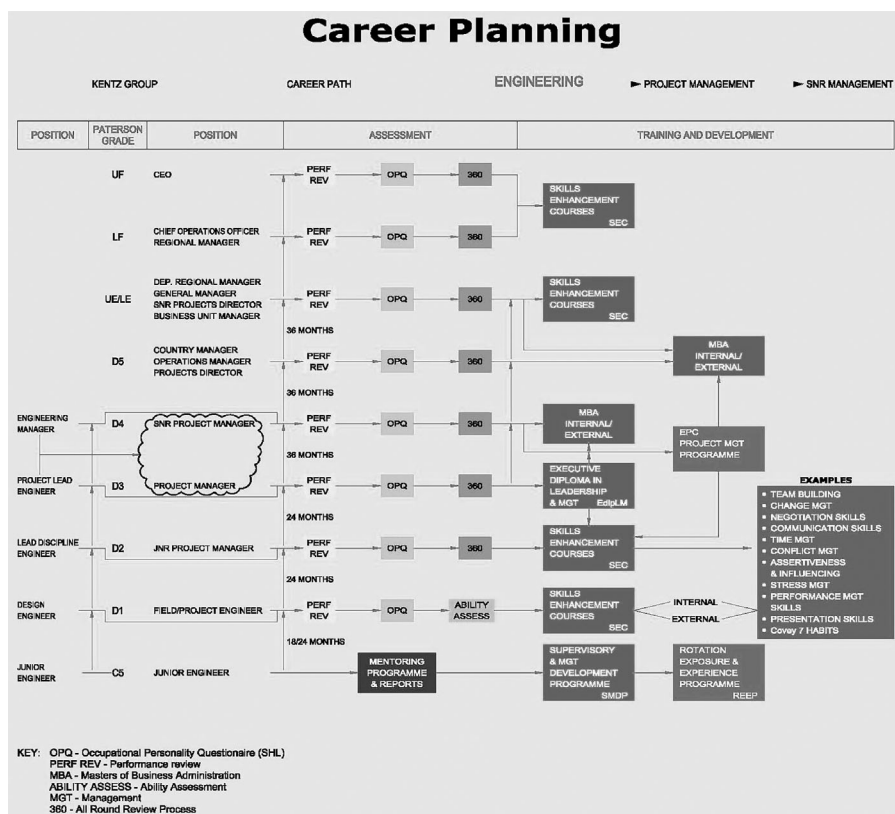
Mentors are charged with overseeing the rotation and experience process, a potentially difficult area needing diplomatic and influencing skills within the organization.

### **Ongoing career development**

The Rotation Exposure Experience Programme outlined is designed to provide firm foundations from which a career can be built within Kentz. Career planning is an inexact science, but Figure 5 provides a potential career path for a graduate engineer.

Within the career planning process, ability, tenacity, experience and the luck of being in the right place at the right time are sure to play a part. However, through a combination of learning and development activities, assessment, and an understanding of roles and grades the graduate can begin to see the possibilities and come to understand how they might achieve their goals within the organization.

As regards training and development, the SMDP routes include the REEP process, the skills enhancement courses, a post-graduate diploma, MBA options and specific



Notes: Current KENTZ employees can enter the career path at any level and at any time. Progression on a career path depends on the ability, drive and competence of the individual (promotion beyond the individuals level of competence is detrimental to the company and the individual).

Figure 5. Potential career path for a graduate engineer

development for Engineering, Procurement and Construction (EPC) project managers. Within the regular assessment process there is ability assessment, use of the Occupational Personality Questionnaire (OPQ), performance appraisal and review, and later on 360-degree appraisal and feedback.

Kentz uses the Paterson Grades system to structure roles and identify equivalences. Within the section of Figure 5 covering positions and grades a “cloud” appears. This is used to signify that engineers may choose to follow a specialist path. However, it is likely that they will need to move into more general project management roles if they wish to reach the very top of the organization. This is a decision that can be taken at different stages of a career and will be discussed regularly, including during performance appraisal and review.

All employees joining Kentz have the potential to reach the very top.

### Summary

To return to where this article started, employees are rarely motivated purely by money, and organizations such as Kentz need to get new hires hooked. The early

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months of the graduate engineer's experience of the organization is when there is a maximum opportunity to do this. Mentoring, peer support, rotation through functions and departments and a sense of the long term potential and rewards can assist in this.

The socialization process matters, as does the understanding of values. Collins (2001) argues:

Enduring great companies preserve their core values and purpose while their business strategies and operating practices endlessly adapt to a changing world. This is the magical combination between 'preserve the core and stimulate progress.

Just as the mentor scheme can be seen as creating a more satisfying workplace one relationship at a time, the values of Kentz will be maintained and applied to new circumstances one employee at a time. Kentz values matter, and engineering graduates will know of them prior to joining the organization, and come to understand them more deeply through the development process.

To summarize the learning process, the SMDP pathways are based upon a blend of established methodologies. The process has been crafted to meet the unique needs of people within the early stages of the development of their career within Kentz. The key elements are:

- *A focus on experience* – much of the learning will be driven by experiences at work. The SMDP process is designed to help maximise these benefits.
- *A mentored process* – successful people the world over attribute much of their success to the mentors in their lives.
- *Pragmatic skills development* – the Frontline Management Skills and Frontline Leadership Skills and Skills Enhancement Workshops all focus on practical skills for graduates to use at work.
- *Collaborative learning* – learning with others, helping each other and sharing ideas developing teamwork.
- *Self-awareness* – recognizing that all of us behave differently and find our own way to lead. The Learning Styles Questionnaire and Motivating Others Questionnaire helps develop personal understanding.

The work began with the need to attract and retain engineering graduates. The process designed has sought to be sustainable. It is a major undertaking for Kentz and people within the organization at all levels. But it is an important component of enabling the company to meet its strategic growth objectives.

### **In conclusion**

This case study is primarily the authors' description of the extensive learning and development process for graduate engineers, that has been developed and embedded within Kentz Engineers and Constructors. However, some evaluative conclusions can reasonably be drawn. These are:

- In global engineering and construction skills shortages are real and the largest constraint on growth in the sector.
- Companies are competing for skills, and within this context those seeking to be "preferred employers" are investing in learning and development and the

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infrastructure to support career development. Engineering graduates are in a strong position when choosing employers.

- Creating learning and development architecture requires “joined up thinking”. It starts with alignment with corporate values and vision, then with strategies and objectives. It must embrace corporate culture, and also the realities of the business at the operational level. There is a necessary tension between short-term business expediency and longer term objectives.
- Developing the learning and development architecture is an opportunity for engagement with managers and engineers across the company – it helps the embedding process later – but to be successful, unstinting support from the CEO and Board of Management is needed.
- The effort required to sustain the process should not be underestimated – it is an exercise in organization, anticipation, and will, supported by systems and infrastructure. For example, a carefully planned experiential learning programme is vital, yet difficult to sustain without a combination of on the ground buy-in and support with reporting and monitoring.

Some of the best business decisions are made in times of scarcity when the value of resources becomes fully understood. Investment in the development of graduate engineers and indeed in all Kentz employees is a strategic priority, and the company is the better for it.

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