The Institution of Engineering and Technology

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Please Note:

Figures are rounded and do not always add to 100%
Multiple choice questions add to more than 100%
Means and averages are calculated in the data tables, therefore overall totals do not always add to 100%
With a sample size of 400 the data accuracy is +4% or 0.2 on a scale of 1 to 5
Different organisations are surveyed each year
Contents

1. Executive summary
2. Key trends
3. The engineering workforce today
   3.1 Sector profiles
   3.2 Gender
   3.3 Age of employees
4. Training and retaining the existing skills base
   4.1 Training
   4.2 Retaining the existing skills base
5. Current recruitment
6. Recruitment plans over the next 12 months
   6.1 Levels of recruitment
   6.2 Career level of new recruits
   6.3 Anticipated recruitment challenges
7. Looking to the future
   7.1 Anticipated recruitment challenges over the next five years
   7.2 The future of apprenticeships
   7.3 Concerns over the future shortage of engineers
8. Addressing skills shortages
   8.1 Skills gaps amongst new recruits
   8.2 Content of engineering degrees
   8.3 Perception of engineering
9. Survey methodology and sample profile
   9.1 Methodology
   9.2 Sample
1. Executive summary

This is the ninth Engineering and Technology: Skills and Demand in Industry report from the Institution of Engineering and Technology (IET), based on telephone interviews with 400 employers of engineering and IT staff in the UK.

Main findings from the report

- The 2014 study shows that the demand for engineers remains high, with more than half of companies looking to recruit engineers and more reporting difficulties in finding the people they need.
- This year 59% of companies indicated concerns that a shortage of engineers would be a threat to their business in the UK.
- 23% of organisations said that they do nothing at all to improve workforce diversity and a further 20% stated that they hire the best candidate. This suggests that 43% of employers are not taking any specific action to improve diversity within their workforce.
- There appears to be a growing inconsistency between the skills employers expect school leavers to possess and what the curriculum delivers. 30% of employers felt that school leavers do not have enough practical experience and 25% believe that they do not have sufficient technical expertise.
- Since 2013 the number of Level 2 Intermediate apprenticeships offered by employers has more than doubled, but the number of Level 4 Higher apprenticeships has remained static.

Current recruitment:
The level of recruitment of engineering staff has remained consistent for the last three years, with 51% of organisations recruiting engineers in 2014. Recruitment of IT staff has fallen from 16% in 2013 to 13%. The sectors that are recruiting most actively this year are Defence, Computing & IT, and Electronics. Difficulties in recruiting experienced staff, particularly senior engineers, has increased by 8% on last year, with increases also seen for the recruitment of engineering technicians and apprentices. For the IT sector, the biggest concern was recruiting IT apprentices, an 8% increase since 2013. However, employers have reported that they are finding it increasingly easy to recruit IT managers this year.

Recruitment plans over the next 12 months:
41% of organisations are planning to recruit engineering, IT or technical staff in the next 12 months, up 5% from 2013. The highest proportion of engineering, IT and technical recruitment is expected to be in the Defence, Broadcast & Media and Electronics sectors. The demand for experienced staff continues to increase rather than postgraduates (10%), graduates (18%) or school leavers (11%).

Business expansion in the UK remains the top reason for recruitment and accounts for 80% of planned recruitment.

Training and retaining the existing skills base:
Employers have reported that they are moving away from offering external courses in favour
of providing training in-house, which has increased this year by 16% compared with 2013. There has been a significant decrease in the number of short technical courses, soft skill and amount of formal training being offered. The results show that 13% of companies do not offer any training support this year compared to just 2% last year.

**Skills gaps amongst new recruits:**
For the ninth year running the skills gap has increased and now stands at 44% of employers stating that engineering, IT and technical recruits did not meet reasonable expectations for levels of skill. The most notable skills shortages are for graduates (54%) followed by school leavers (44%) for whom the issues are significantly more pronounced than in previous years. Employers are becoming increasingly dissatisfied with standards of numeracy and literacy amongst school leavers. In line with previous years, graduates’ main shortfalls are their lack of practical experience, leadership skills and technical expertise.

**Improving perceptions of engineering:**
For the first time this year, employers were asked how they could promote engineering to young people. Over half of employers suggested working more closely with education providers and 9% believed work experience would help to promote engineering to young people. 56% were either unaware or knew of no initiatives to help promote engineering to young people. Where they were aware, it was typically through visiting schools and universities to promote engineering.

**Looking to the future:**
Over the next 4 to 5 years, a third of organisations have indicated that they will focus their efforts towards recruiting apprentices and graduates (30%). A smaller proportion of organisations (14%) said that they plan to train existing staff compared to 20% last year. There has been a significant increase this year in plans to recruit from within the EU, with 20% of employers looking to do so in the next 4-5 years (6% more than in 2013). 12% are planning to recruit from outside the EU.

**The engineering workforce today:**
The number of women in engineering remains very low at 6%, which has not significantly changed in all the years this survey has been carried out. Encouragingly the number of organisations which claim to have a positive attitude to flexible/part time working and who offer structured career paths with breaks has increased threefold since 2013.

23% of organisations said that they do nothing at all to improve workforce diversity and a further 20% stated that they hire the best candidate. This suggests that 43% of employers are not taking any specific action to improve diversity within their workforce.

Broadcast & Media, Computing & IT and Energy were the youngest workforce. The sectors with the oldest workforce are Electrical, Defence and Pharma & Health.
## 2. Key trends

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
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<tbody>
<tr>
<td><strong>The current workforce</strong></td>
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<tr>
<td>Gender</td>
<td></td>
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</tr>
<tr>
<td>Proportion of engineering technicians who are women</td>
<td>4%</td>
<td>3%</td>
<td>4%</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>Proportion of engineers who are women</td>
<td>5%</td>
<td>6%</td>
<td>6%</td>
<td>7%</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Training and retaining the existing skills base</strong></td>
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<td>Training</td>
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<tr>
<td>Proportion of organisations offering formal on-the-job training</td>
<td>59%</td>
<td>75%</td>
<td>48%</td>
<td>62%</td>
<td>78%</td>
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<tr>
<td><strong>Current Recruitment</strong></td>
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<td>Skills gaps amongst new recruits</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of Engineering, IT and technical recruits that do not meet reasonable levels of skill</td>
<td>33%</td>
<td>31%</td>
<td>39%</td>
<td>42%</td>
<td>44%</td>
</tr>
<tr>
<td><strong>Recruitment plans over the next 12 months</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of recruitment dedicated to engineering, IT or technical staff</td>
<td>41%</td>
<td>24%</td>
<td>39%</td>
<td>36%</td>
<td>41%</td>
</tr>
<tr>
<td>Proportion of new recruits who will be experienced staff</td>
<td>51%</td>
<td>49%</td>
<td>57%</td>
<td>56%</td>
<td>61%</td>
</tr>
<tr>
<td>Proportion of new recruits who will be school leavers</td>
<td>9%</td>
<td>12%</td>
<td>13%</td>
<td>13%</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Looking to the future</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of organisations who anticipate employing more apprentices in 4 to 5 years’ time</td>
<td>38%</td>
<td>39%</td>
<td>49%</td>
<td>45%</td>
<td>52%</td>
</tr>
</tbody>
</table>
3. The engineering workforce today

3.1 Sector profiles

Figure 1 shows a breakdown of the number of engineering staff employed by sector. The highest average number of engineering staff per organisation is in the Defence sector where engineering professionals make up over half of all staff. The highest proportion of engineering apprentices are found in the Electrical sector which accounts for 10% of total staff.
Figure 2 shows a breakdown of the number of IT staff employed by sector. Again, the Defence sector employs the most IT staff, followed by the Computing sector. This could be due to some large defence companies being surveyed this year.
Summary of 2014 Survey findings: Engineering and Technology Skills and Demand in Industry

This year’s survey shows that gender imbalance continues to be a major issue for the UK engineering workforce. Only 6% of engineering staff are female and the proportion of female engineering apprentices and professional engineers remains at very low levels: 1% and 4% respectively as shown in Figure 3.

Figure 4 shows the proportion of female engineering and IT staff analysed by sector. Pharma & Health, Energy and Electronics all have the highest proportion of women employed in engineering roles (8%). Computing & IT has the highest proportion of women in IT roles (11%) followed by Broadcast & Media (10%).

3.2 Gender
For the second year running, we asked respondents if they have taken any actions to improve the diversity of their engineering, IT and technical workforce. Figure 5 shows that 16% of employers have sent female ambassadors into schools and colleges and 16% ran specific campaigns to encourage diverse groups. 23% said that they were not taking any actions to improve their workforce diversity and a further 20% indicated their policy was to hire the best candidate. This suggests that 43% of employers are not taking any specific action to improve diversity within their workforce.

### 3.3 Age of employees

This year has seen a slight increase in the number of technical employees aged 30-39 and a slight decrease in those aged over 50, see Figure 6.
Figure 7 shows the variation in age across sectors. The oldest workforces are the Electrical, Defence and Pharma & Health sectors where a third of their workforces are aged 50 years or over. The youngest sectors appear to be Computing & IT, Communications and Broadcast & Media.
4. Training and retaining the existing skills base

4.1 Training

Respondents were asked what type of staff training or development they were providing for their engineers and technicians. The level of external training offered to staff has dramatically decreased to the levels previously seen in 2011. The types of qualifications which were offered to employees are shown in Figure 8. Short technical courses are still the most popular, but are now only offered by 61% of organisations in 2014 compared to 92% in 2013, with a preference to provide in-house training. Figure 8 also shows that there has been a significant increase in the amount of lower cost support offered to staff, such as mentoring (up 26%) and formal on the job training (up 16%).

Organisations were asked specifically how many apprenticeship places they are offering. The overall number has increased; particularly for Level 2 apprenticeships which have more than doubled compared to 2013, but the number of Level 4 apprenticeships has remained static as seen in Figure 9.
4.2 Retaining the existing skills base

48% of employers were aware of the proposed government reforms to apprenticeships, when asked this year for the first time. The Aerospace sector was the most aware of the proposed reforms (66%) compared to the Energy sector, which was the least aware (37%) as shown in Figure 10. When asked their opinion, 36% saw no positives to their organisation and 19% did not know how it would benefit them. Only 11% thought the reforms would raise the quality of apprenticeships and would help to meet their future skill requirements. Figure 11 shows that 7% of employers think the reforms will help to increase the number of apprentices in their business, make funding models clearer and help them to plan for the future.
5. Current recruitment

In line with previous years, 51% of respondents reported that they are currently recruiting engineering staff whilst 13% of respondents reported that they are currently recruiting IT staff as can be seen in Figure 12. This is not significantly different to last year, however, employers have indicated that they are finding it more difficult to recruit the people they want, in particular, those with 5-10 year’s work experience (76%). See Figure 13.

Figure 12: Current recruitment activity of IT and engineering staff

Are you currently recruiting the following staff?

<table>
<thead>
<tr>
<th>IT staff</th>
<th>Not recruiting</th>
<th>Recruiting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>80%</td>
<td>20%</td>
</tr>
<tr>
<td>2012</td>
<td>60%</td>
<td>40%</td>
</tr>
<tr>
<td>2013</td>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td>2014</td>
<td>20%</td>
<td>80%</td>
</tr>
</tbody>
</table>

Base: All respondents (n=400)

<table>
<thead>
<tr>
<th>Engineering staff</th>
<th>Not recruiting</th>
<th>Recruiting</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td>2012</td>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td>2013</td>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td>2014</td>
<td>40%</td>
<td>60%</td>
</tr>
</tbody>
</table>

Base: All respondents (n=400)
Summary of 2014 Survey findings: Engineering and Technology Skills and Demand in Industry

15

This is illustrated in more detail in Figure 13, which conveys the difficulties that organisations have in filling engineering vacancies at different career levels. As in previous years, the most serious concerns relate to recruiting senior staff, particularly for engineering; a 28% increase since 2011. Recruitment of engineering managers also appears to be significantly more challenging (46%), a 25% increase upon 2011.

Figure 14 shows recruitment of technical staff by sector. This year’s results show that the Defence (93%) and Broadcast & Media (69%) sectors are the most active engineering recruiters. The Computing & IT sector is the top recruiter of IT staff (40%) followed closely by the Defence sector, which is also the top recruiter of engineers.
6. Recruitment plans over the next 12 months

6.1 Levels of recruitment

Surveyed organisations were asked whether, in addition to current recruitment, they plan to recruit further new staff over the coming 12 months. The results are shown by year in Figure 15 and by sector in Figure 16. 63% of companies are planning to employ staff in the next 12 months, of which 41% will be for engineering, IT or technical roles. The highest proportion of technical recruitment is expected to be in the Defence, Electronics and Broadcast & Media sectors.

Figure 15: Future technical recruitment plans

In addition to current recruitment, across the organisations as a whole, are you planning to recruit for any new roles over the next 12 months? What percentage of those new recruits do you consider will be engineering, IT or technical roles?

Figure 16: Proportion of new recruits who will be technical by sector

What percentage of those new recruits do you consider will be engineering, IT or technical roles?

Base: All respondents (n=400)
Base: Planning to recruit over next 12 months (n=253)
The key driver for recruitment in technical and engineering roles is reported to be business expansion, particularly within the UK (80%), up 5% from last year. Staff turnover and expansion overseas are also contributory factors for recruitment, as shown by Figure 17.

6.2 Career level of new recruits

The organisations which plan to recruit additional engineering, IT and technical staff over the coming 12 months were asked what proportion of these would be school leavers, graduates, postgraduates or experienced staff. The highest demand continues to be for experienced staff (61%), whilst demand for graduates is 18%. Demand for school leavers and postgraduates remains consistently low at 11% and 10% respectively, as illustrated in Figure 18.
6.3 Anticipated recruitment challenges

Respondents were also asked whether they expect to be able to recruit suitably qualified engineers, IT staff and technicians to meet their needs this year. 37% of companies said ‘No’, which shows that the confidence in recruiting suitably qualified staff over the next 12 months has continued to decline towards pre financial crash levels. See Figure 19.

Amongst those who do not expect to recruit sufficiently qualified staff, the two most cited reasons were: a lack of suitably qualified candidates (65%) and shortages or difficulties with specific skills (50%). Figure 20 also shows a further 42% believed candidates lacked the right experience. This perhaps explains why more employers are training and mentoring in-house, which can be tailored to their specific needs. 9% more employers have stated in 2014 that not being able to offer sufficient salary is a reason for their lack of confidence in being able to recruit in the next 12 months.
7. Looking to the future

7.1 Anticipated recruitment challenges over the next five years

Confidence in recruiting suitably qualified engineering, IT and technical staff over the next 4-5 years has continued to drop. This is particularly marked for the next 12 months, down 4% since 2013, illustrated by Figure 21. However, employers remain more optimistic about the medium-term compared to the next 12 months.

Organisations which were not confident of meeting skills demands were asked why they were uncertain. A deficiency of suitably qualified candidates has remained a significant reason, increasing by 18% since 2013. The lack of specific skills is less of a concern than last year (51%) however, finding candidates with the right experience is now a greater concern in the medium-term as shown in Figure 22.

Figure 21: Confidence in recruiting sufficient qualified staff in longer term

Do you expect to be able to recruit sufficient suitably qualified engineers, IT staff and technicians to meet your needs over the next 4 to 5 years? Do you expect to be able to recruit sufficient suitably qualified engineers, IT staff and technicians to meet your needs over the next 12 months?

Figure 22: Reasons for lack of confidence in future recruitment

Why do you not expect to be able to recruit suitable candidates over the next 4 to 5 years?

Base: All respondents (n=400); All respondents which are planning on recruiting technical staff in the next 12 months; (2014, n=234), (2013, n=201), (2012, n=211), (2011, n=127), (2010, n=219), (2009, n=125)

Base: All respondents who do not expect to recruit sufficient suitably qualified staff in 4 to 5 years; (2014, n=128), (2013, n=125), (2012, n=99), (2011, n=72), (2010, n=81), (2009, n=57)
For the second year running, respondents who said they do not expect to be able to recruit suitable candidates over the next 4 to 5 years were asked how they are planning to address this problem. 30% of organisations are shifting their focus towards recruiting apprentices and graduates, 20% are intending to recruit within the EU with a further 12% looking to recruit outside the EU. 17% of companies have no planned actions to address recruiting difficulties. Only 14% said that they plan to retrain existing staff, which is down from 20% in 2013. A full breakdown of the results can be found in Figure 23.

### 7.2 The future of apprenticeships

Respondents were asked whether, over the next 5 years, they expected to employ more or fewer apprentices than they had in the past. The responses are shown in Figure 24. 52% of respondents believe they will employ more apprentices in technical roles than they have in the past, which is up 7% since 2013.
7.3 Concerns over the future shortage of engineers

This year 59% of companies indicated concerns that a shortage of engineers would be a threat to their business in the UK. For the first time they were asked specifically about what more they could do as employers to address this issue. Figure 25 shows that 28% thought they should promote engineering to graduates and school leavers more and 16% thought they could review their training regimes to raise standards. However, 28% do not believe that they can do anything further to ameliorate the trend.

Figure 25: Actions organisations can take to address the shortage

What more could you do, as an employer, to address the potential shortage of engineers and the threat to your business?

Promote to graduates
We can do no more
Promote to school leavers
Review our training courses and regimes
Invest in apprenticeships / recruit training
Don’t know
Schools/colleges/universities work experience
Employ Engineers from overseas
Grow the business
Pay higher salary/ offer rewards

Base: All respondents (n=400)
8. Addressing skills shortages

8.1 Skills gaps amongst new recruits

Respondents were asked whether new recruits to engineering, IT and technical roles are typically meeting reasonable expectations for levels of skill and areas for concern.

The overall skills gap has slightly increased since last year and now stands at 44%, with graduates showing the largest gap between level of skill and employer expectations. However, the biggest increase is seen for school leavers, as shown in Figure 26.

Looking in more detail, Figure 27 shows a breakdown of the particular skills gaps of all new recruits. There appears to be a clear inconsistency between the skills employers expect school leavers to possess and what the curriculum delivers. For example, 30% of employers felt that school leavers do not have enough practical experience and 25% believe that they do not have sufficient technical expertise. Graduates are perceived to lack practical experience (42%), leadership skills (24%) and technical expertise (23%). New experienced staff mostly lack technical expertise, a 7% increase on 2013. They are also perceived to fall short on practical experience and leadership skills.

Figure 26: Skill shortages of recruits - Summary
Do you find that the typical ______ recruit to an engineering, IT or technical role does not meet your reasonable expectations in any of the following particular skill areas?

Figure 27: Skill shortages of recruits
Do you find that the typical new school leaver / experienced staff / postgraduate / graduate recruit to an engineering, IT or technical role does not meet your reasonable expectations in any of the following particular skill areas?
Summary of 2014 Survey findings:
Engineering and Technology Skills and Demand in Industry

8.2 Content of engineering degrees

2014 results are very similar to last year, with 66% of organisations agreeing that technical degrees meet their needs (64% in 2013). Figure 28 gives the reasons why technical degrees did not meet expectations for the 26% of employers that said ‘No’.

Figure 28: Reasons technical degrees don’t suit needs

Does the content of engineering, IT and technical degrees suit the needs of your organisation?

- Yes, it does suit the needs of our organisation
- No, it doesn’t
- Don’t know

Why are engineering, IT and technical degrees not suiting the needs of your organisation?

- Does not develop practical skills
- Specific technical content missing
- Insufficient depth of content
- Insufficient breadth of content
- Courses not up to date with industry
- Don’t know
- Field-specific skills lacking
- Lack of basic skills/experience
- Absence of soft skills
- Software skills lacking
- Don’t want/need graduates
- Graduates do not want to start at the bottom

Base: All respondents who don’t believe the content of technical degrees suit the need of their organisation, or don’t know. 2014 (136), 2013 (144), 2012 (76), 2011 (87)
8.3 Perception of engineering

For the first time in 2014 employers were asked about the perception of engineering amongst young people. It appears that employers have mixed opinions, as an equal proportion thought that it was generally positive (31%), negative (31%) and neutral (33%). Employers were also questioned about their awareness of initiatives to promote engineering to young people. 56% were not aware or did not know of any initiatives to help promote engineering to young people. 11% said they were aware but could not name any specifically. The activity which had the most recognition was school and university visits.

When asked what a business like theirs could do to promote engineering to young people, the most popular answer was greater involvement with schools, universities and colleges (53%). However 10% did not think there was anything their business could do and a further 9% did not know. A full breakdown can be seen in Figure 29.

![Figure 29: Initiatives to promote engineering to young people](image-url)
9. Survey methodology and sample profile

9.1 Methodology

The report is based on a survey carried out by the independent research agency 2Europe Limited. The information was collected by computer assisted telephone interviews with representatives from 400 employers of engineering and IT staff in the UK. The interviews took place in April 2014 using a 24 minute questionnaire.

Interviews were conducted with those within the organisation responsible for the recruitment of engineers and other technology staff; in most cases these were manager level respondents.

Results for 2014 were compared to results for the 2013, 2012, 2011, 2010 and 2009 surveys, which followed the same methodology.

9.2 Sample

All respondents had to be responsible for recruitment, management and/or development of technical staff in their organisation.

Figure 30 shows the size of employers surveyed, by number of employees and annual turnover. A range of organisation sizes were interviewed with the majority (40%) coming from the 51-250 employee size bracket. We did not interview any businesses with fewer than 20 employees or less than £2 million annual turnover.
Figure 31 shows the proportion of organisations from each industry sector. The most represented sectors were Energy (14%), Aerospace (12%), Pharma & Health (11%) followed by Electronic and Transport (both 10%). This year, we removed the Education & Skills sector as it was not deemed relevant for this survey.

Employers were also asked about the core function(s) and sectors that they operate in. This year there has been a 10% reduction in Development and Design but there has been a significant increase in organisations that carry out Manufacturing, a 7% increase since 2013. There has also been a marked decrease in Consulting, which is down 17%. The results can be seen in full in Figure 32.
Finally, surveyed employers were asked in which area of the country they employed the most engineering, IT and technical staff. The responses are shown in Figure 33, which shows the largest proportion of engineers are located in the South East of England (25%), South West of England (14%) followed by London (10%). The graph also shows that employment in the South East of England which is also where the most recent recruitment has taken place has dramatically increased since 2013 (7%).
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