



2007

# Profile of IEEE Consultants

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# Profile of IEEE Consultants 2007

## Introduction to a Consultant's Profile

**A**s a consultant is preparing a proposal or negotiating a contract, one of the ongoing concerns is deciding how much to charge. To establish a fixed price or a fee that is both competitive and fair, the consultant needs to know what other consultants working in similar fields charge. In response to this need, the Alliance of IEEE Consultants' Networks (AICN) conducts national fee surveys of their members. Completed in late 2007, this survey is AICN's fifth comprehensive survey.

This survey provides the profile of typical self-employed and independent consultants, including their education, experience, business practices and specialty. Of particular interest are the data regarding the typical consultant's median earnings and hourly fee.

## Scope of the Survey

The survey was conducted by e-mail and solicited responses from a random sampling of IEEE members who had indicated "Consultant" in their member database.

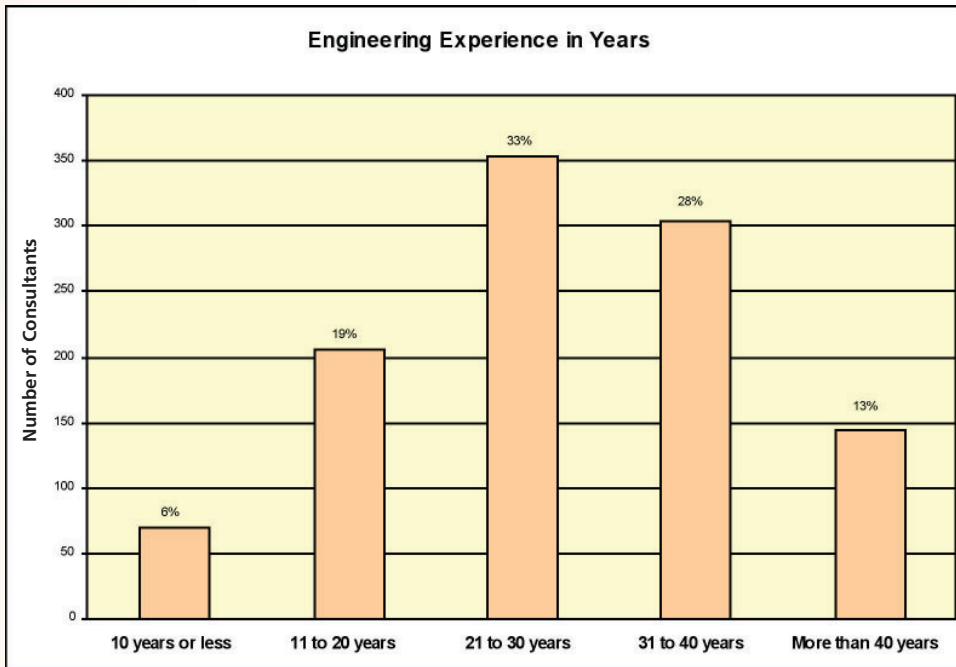
More than 1,900 consultants responded, but only those who are self-employed or independent consultants were selected for this survey. This selection was made because the AICN is primarily concerned with those consultants who work as independent contractors. A filter removed those engineers who work more than half-time as contract engineers (job shoppers) and/or as regular employees of other companies. The remaining 1,130 consultants are classified as "independent," and their responses are used in developing this consultants' profile.

The overwhelming majority of respondents live and work in the United States, although 24 other countries are represented in the respondent pool.

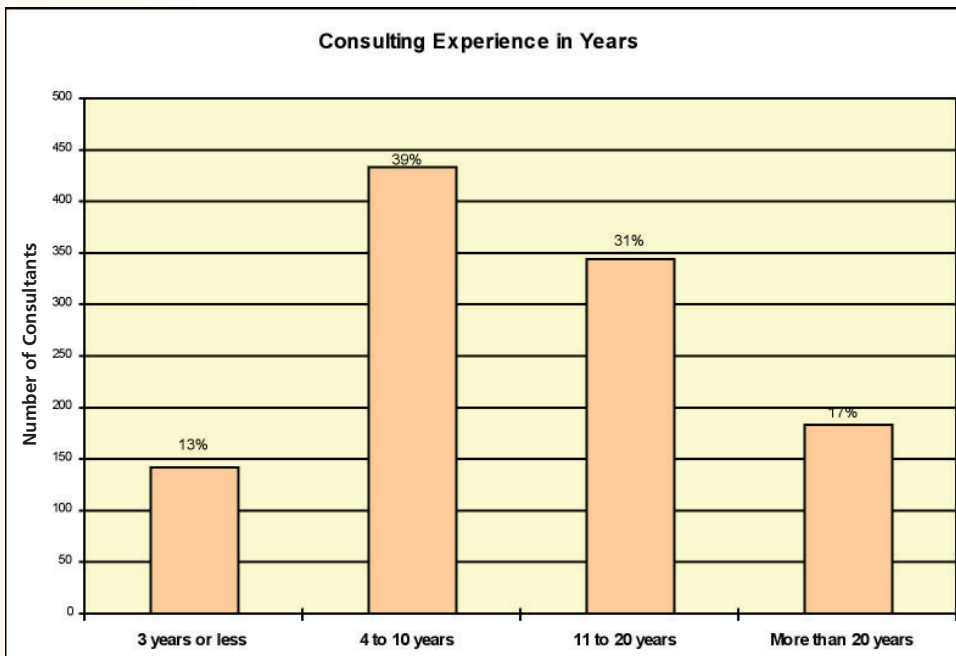
Given that the IEEE is the world's largest technical professional society, it's not surprising that these surveys provide the largest technical consultant fee survey available.

## Previous Engineering and Consulting Experience of an IEEE Consultant

The respondents show a wide range of experience, with four reporting more than 60 years in the engineering field. Of the total, 14 reported more than 40 years. Others reported only one or two years. The median is 30 years of engineering and 10 years of consulting.

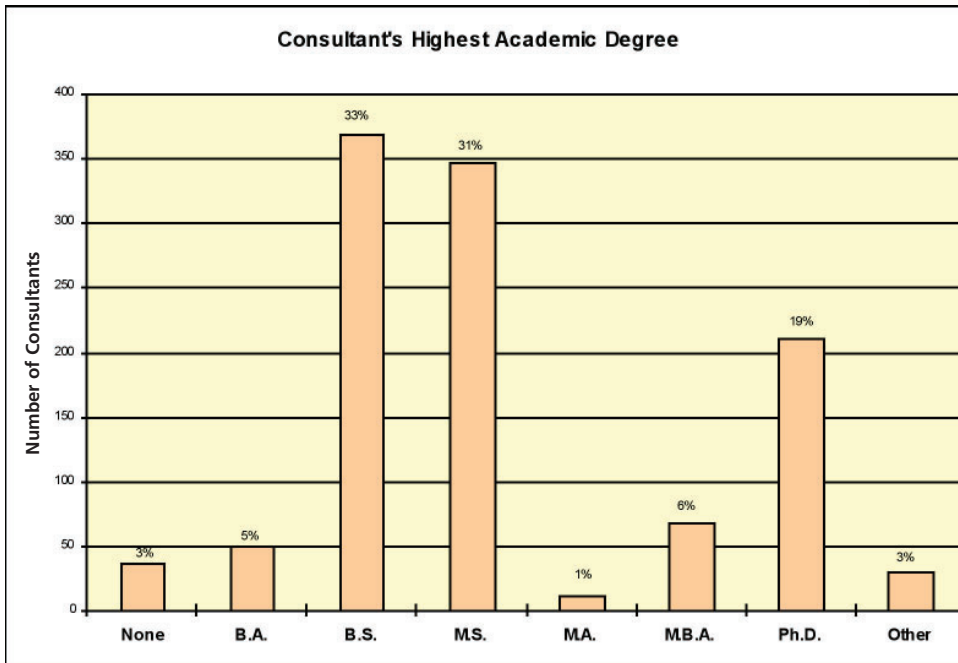


For many of the engineers, consulting represents a second career or an opportunity to continue their career on a part-time basis.

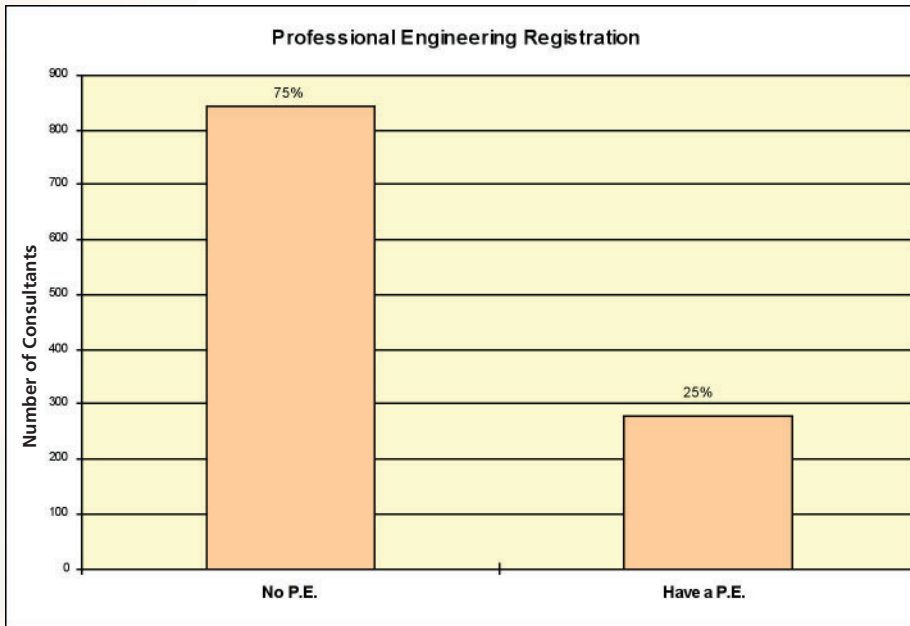


## The Education and Registration of an IEEE Consultant

Experience, advanced degrees, and professional registration all aid in establishing a consultant's image as an "expert" in the engineering field. Most of the IEEE consultants have at least a Bachelor of Science or a Master of Science degree and 19 percent have a Ph.D.



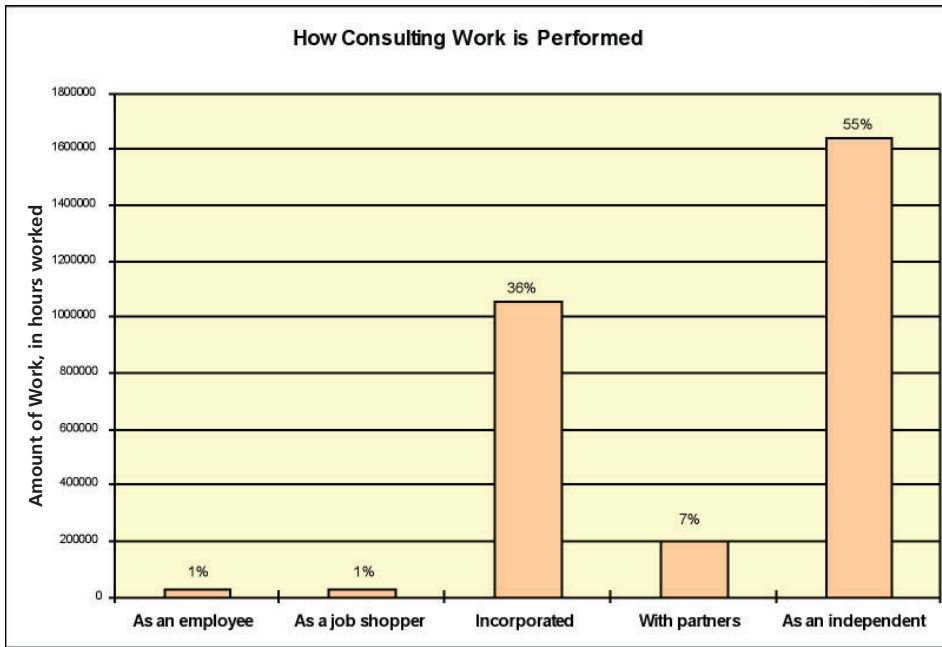
In some engineering fields, such as power, a professional engineering (P.E.) license aids in establishing credibility. In other engineering fields, a P.E. offers little advantage. In this survey, 25 % of the IEEE consultants are registered professional engineers.



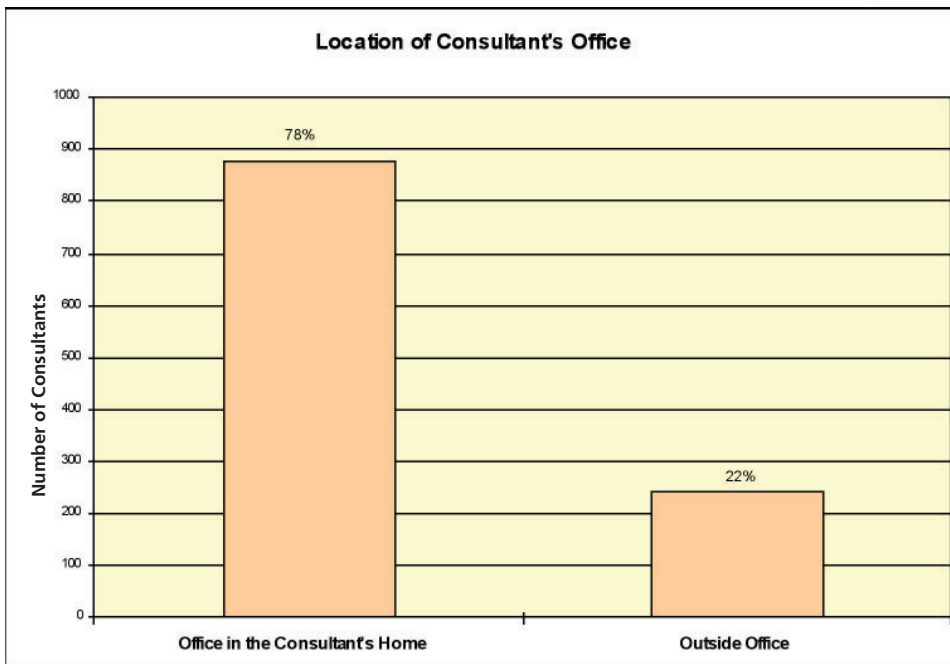
### How an IEEE Consultant Works

The survey shows that most of the IEEE consultants work under more than one organizational structure. Whether they do so may depend on their client or the contract they are working on. Other factors are the tax advantages and the freedom of management that can be realized by operating as a corporation, with partners, or as an independent.

As noted earlier, any consultants who perform more than half of their work as contract engineers (job shoppers) and/or as employees of another company have not been included in this profile and these graphs. For the engineers included, the bars on the next graph show the fraction of all the engineering work performed in each organizational format.

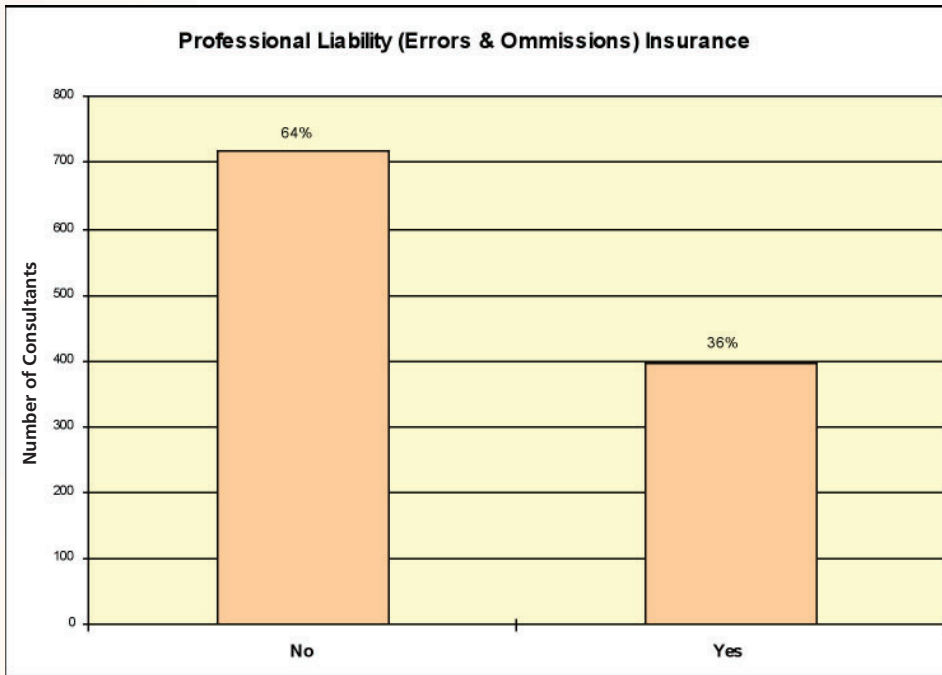


Most IEEE consultants report that they have their offices in their homes.

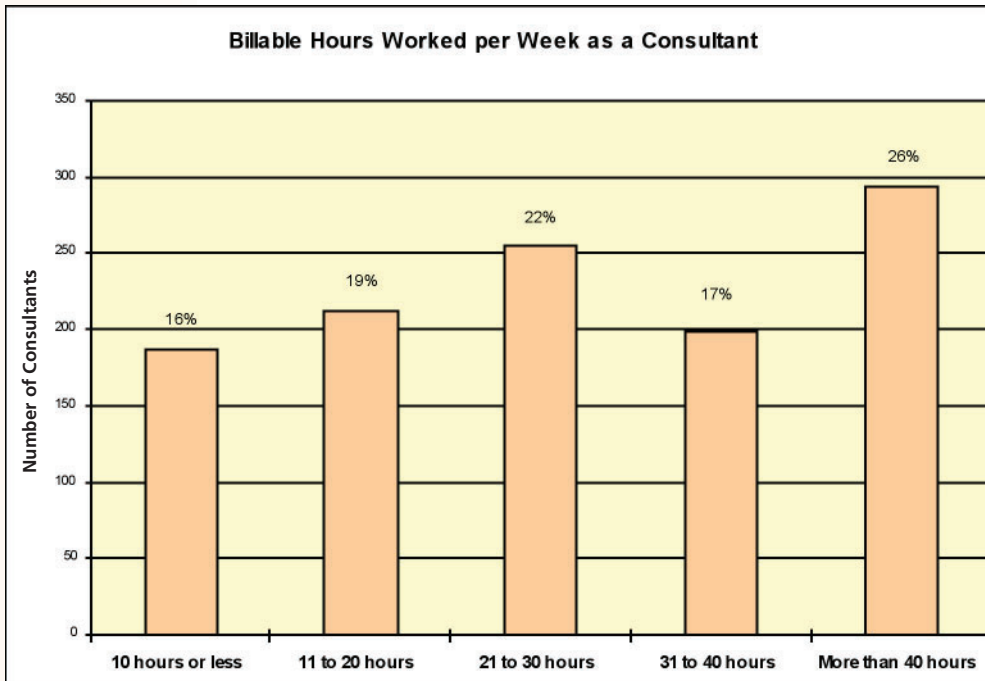


When working on their own as self-employed consultants, engineers are at risk of being sued by their client or a third party. Because of this risk, professional liability insurance, also known as errors and omissions insurance, is usually recommended. As can be seen below, most of the IEEE consultants do not carry such insurance.

The survey did not ask the insured consultants what policy they carried. It should be noted that the IEEE does offer U.S. members a professional liability policy.



The IEEE survey shows that most consultants bill for much less than 40 hours per week. The data shows that four percent of them bill for only one or two hours per week. Such billing indicates that many of them are part-time consultants, either in partial retirement, or using consulting as a second career.

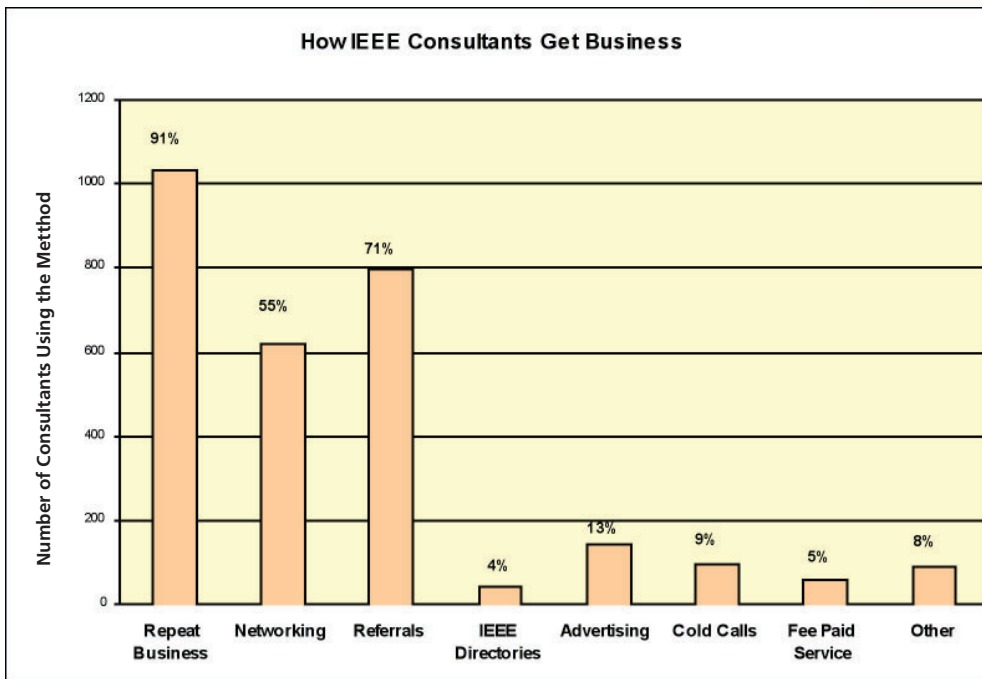




## How IEEE Consultants Get Their Business

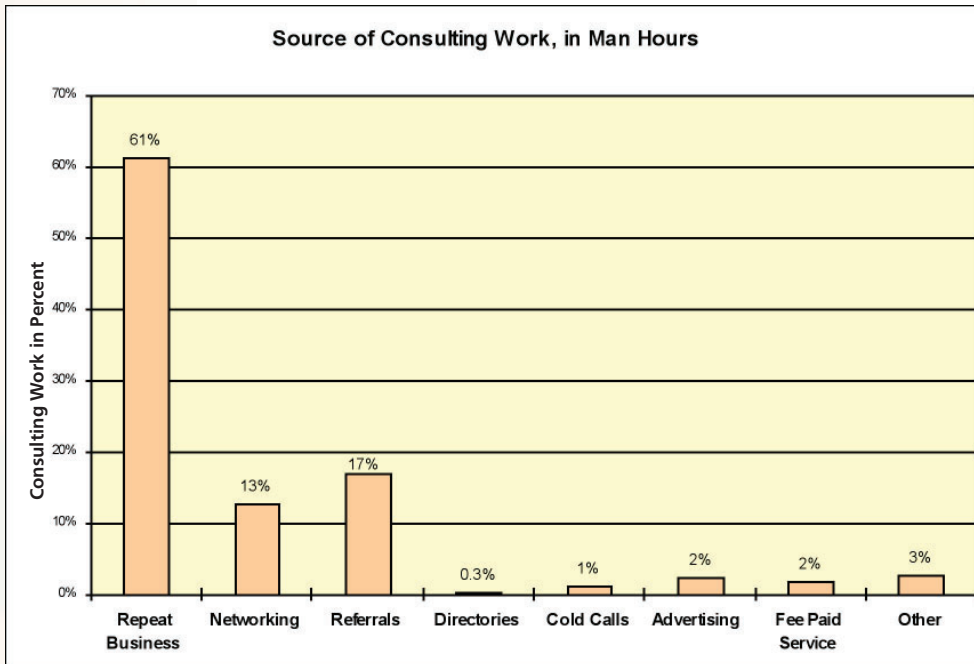
The IEEE consultants were asked what methods they use to get business, and to estimate how much of their work is obtained by each method. This first chart shows what methods they are using. For example, 91% of the consultants get repeat business; 55% receive business from networking; and referrals provide business for 71%.

Note that most consultants use more than one method to get their business. Therefore, the percentages on the bars total to more than 100 percent.



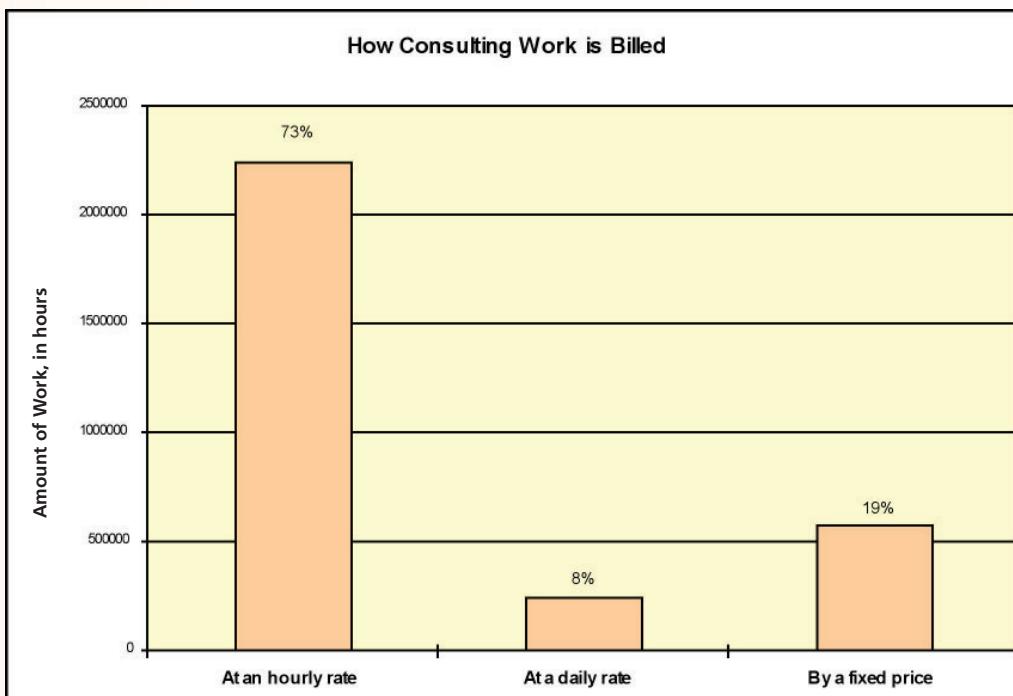
The next chart shows the survey results in terms of the man-hours of work received. On this basis, repeat business is by far the most important source of work.

Surprising in this report is that only four percent of the consultants use IEEE directories and databases, and that this use accounted for only a third of one percent of the consulting work. This result is probably misleading. Only 9.4% of the consultants included in this survey are members of the IEEE-USA Consultants Database and could use the IEEE directory. To make a fair comparison, it would have been necessary to multiply the directory results by a factor of ten.



## How IEEE Consultants Bill for Their Work

If the total hours needed to complete a consultant's assignment is difficult to estimate, the contract with the client is often based on an hourly rate. An alternate method, used for eight percent of the contracts, is to bill the client by the day. For those assignments where the scope of work can be well defined, the clients usually prefer that the consultant quote a fixed price. Nineteen percent of the consulting is billed this way.

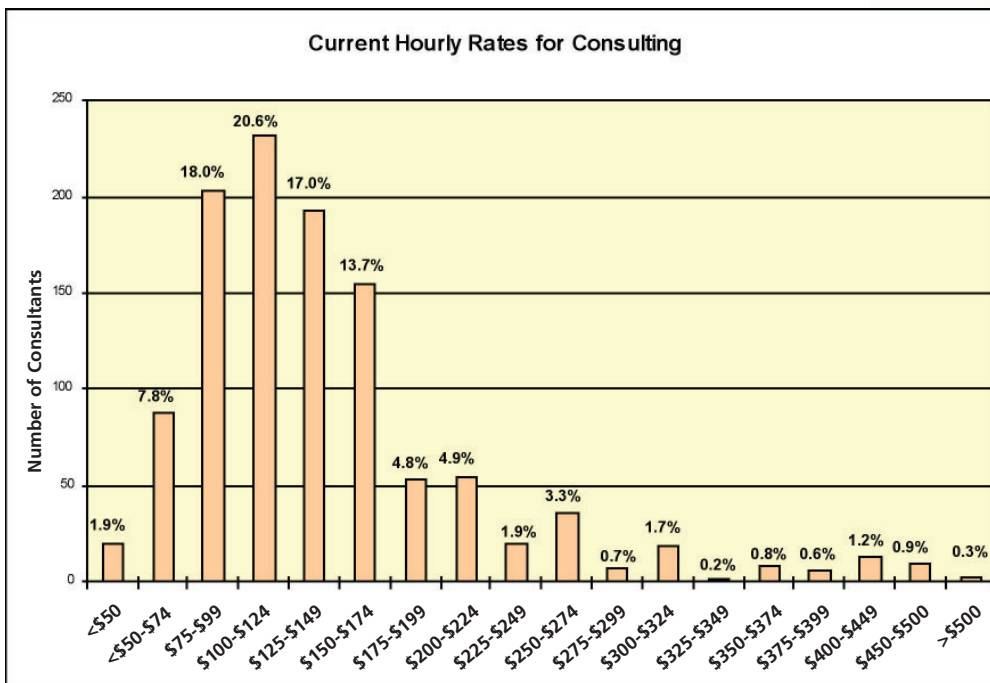


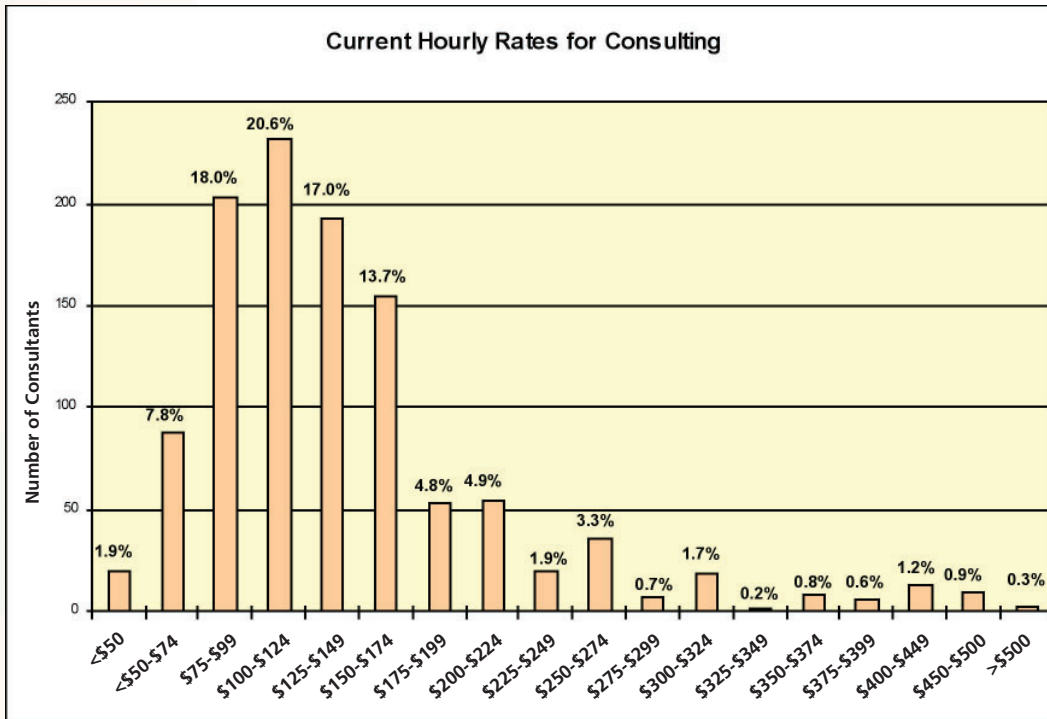
## How Much Do IEEE Consultants Get Paid?

The prime purpose of this survey is to determine what fees other consultants are charging. Every consultant needs to know this information to prepare a proposal or negotiate a contract that is competitive, yet fair.

This IEEE survey of 1,130 independent consultants provides the most recent nationwide profile. Engineers doing more than half of their consulting as job shoppers or employees are not included in this database as independent contractors typically need to charge a higher hourly fee to cover taxes and overhead that would otherwise be paid by a job shop or an employer.

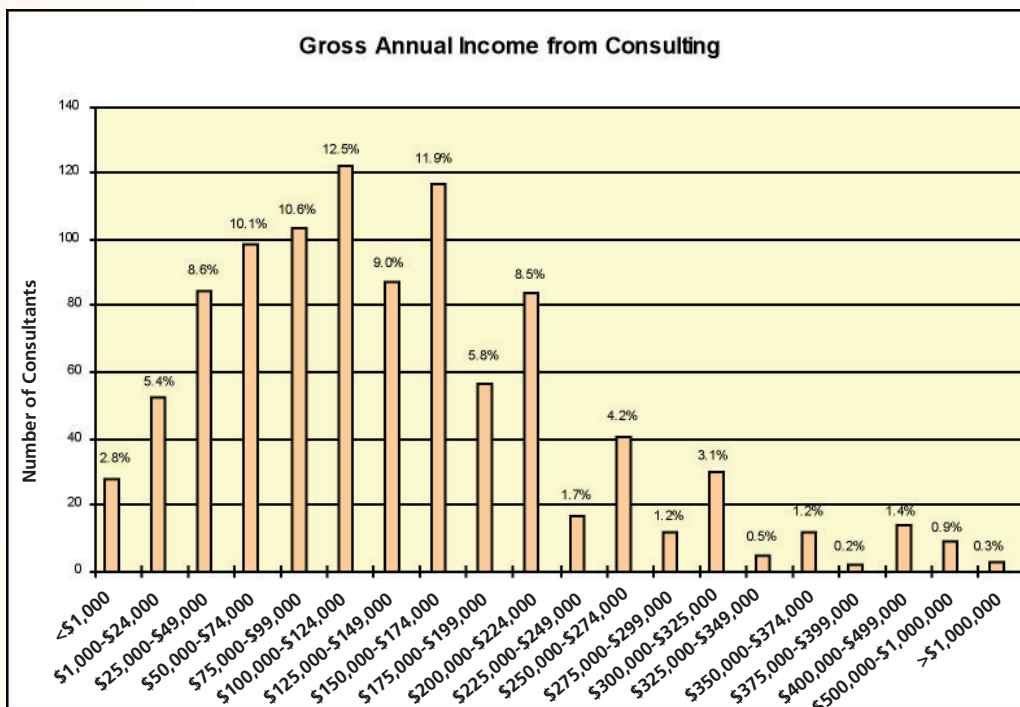
The following chart illustrates the range of fees charged. The median fee is \$125 per hour. This amount is unchanged from the 2006 fee survey.





The IEEE fee survey asked the respondents for their gross income in calendar year 2006 from consulting. Most provided this information, but some considered it private and reported no income or a very low value.

The median income for a consultant is \$126,700 per year, with many of the part-time or occasional consultants reporting an annual consulting income of less than \$50,000.

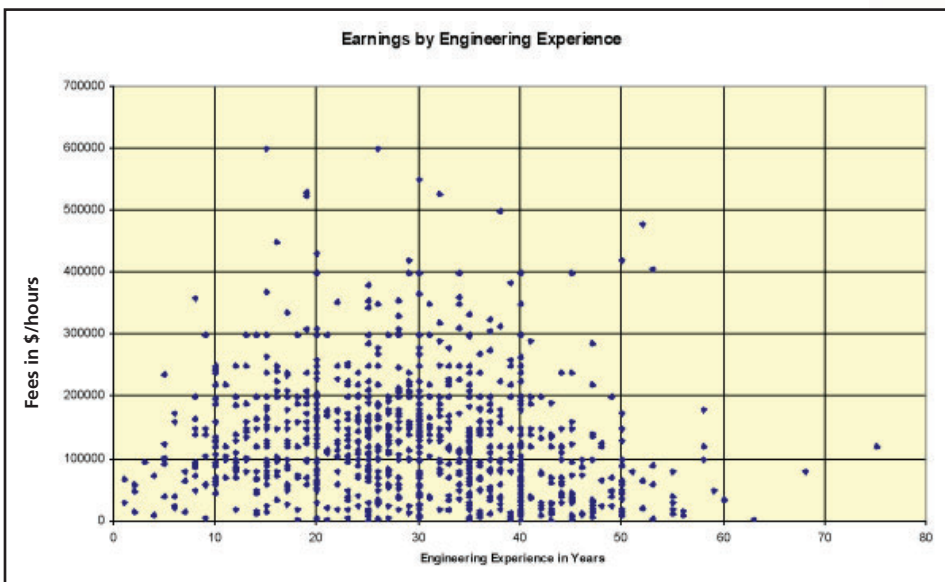
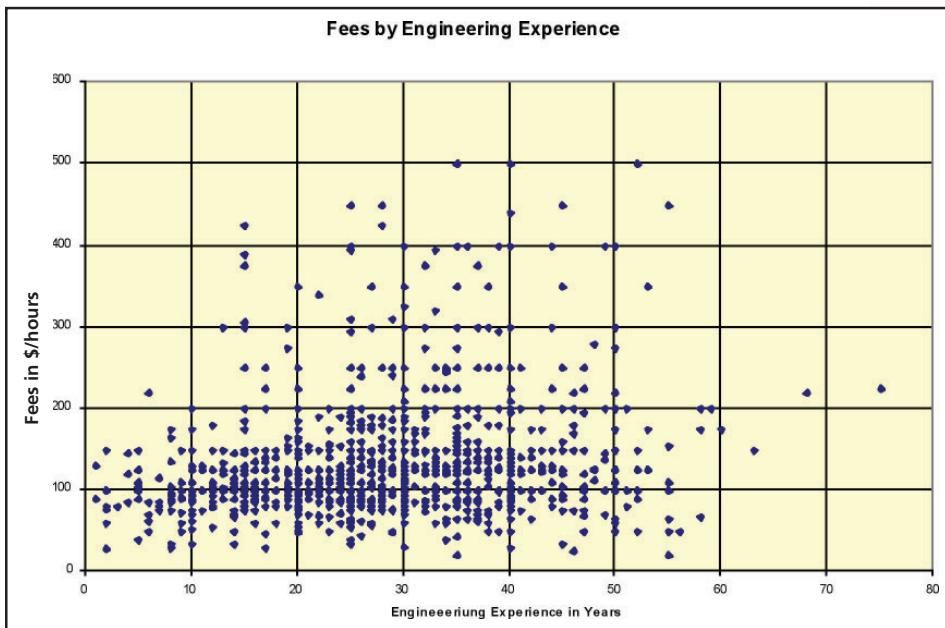


## What is Engineering Experience Worth?

This question is best answered by the next two scatter plots that show hourly fees and consulting earnings plotted vs. years of experience. Scatter plots are used here, as they provide more visual information than can be obtained from tables or bar charts.

Two of the consultants reported fees in excess of \$600 per hour and are not shown in the scatter plots of fees. The plots were capped at \$600 per hour to show more detail.

The plots show that the maximum hourly fees for the consultants tend to increase slightly with added experience, though the typical fee remains in the \$125 range.

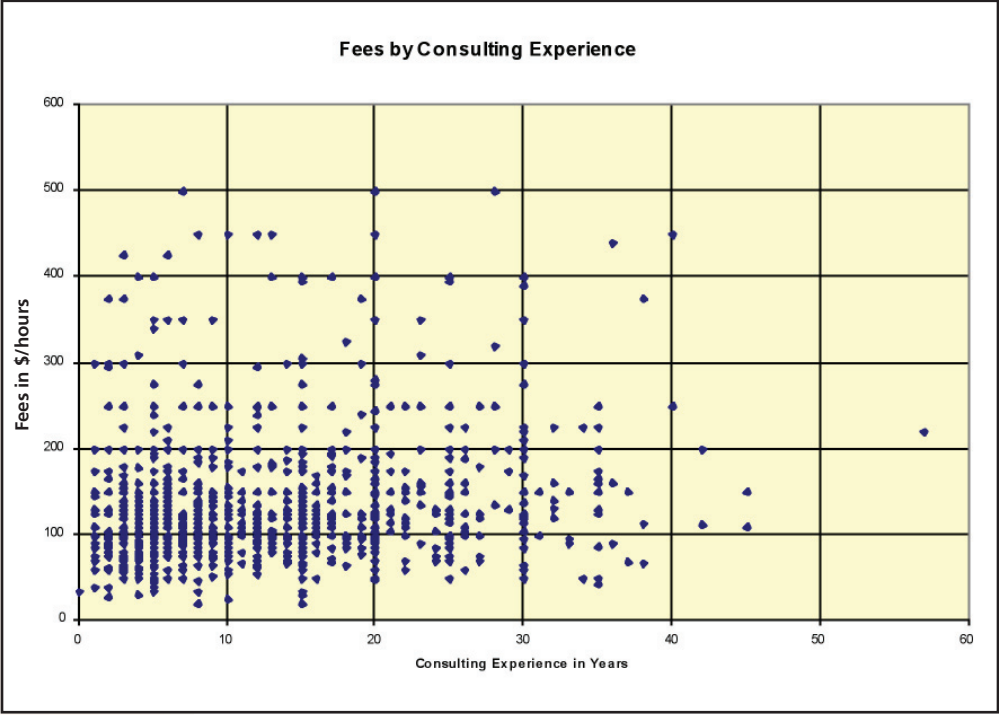


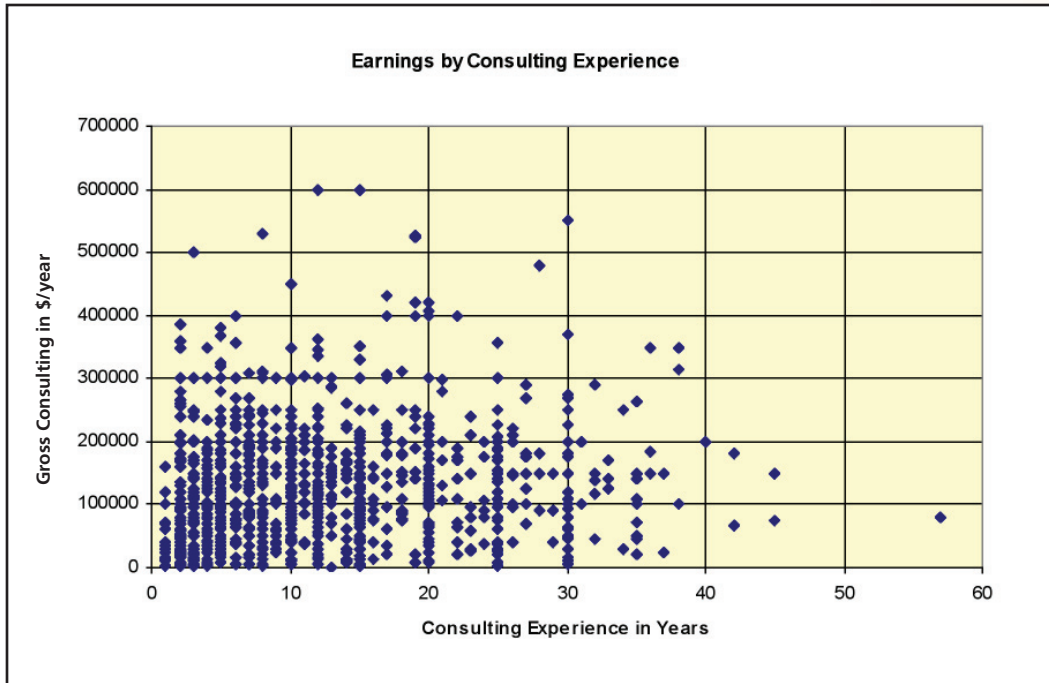
As might be expected, not all consultants were willing to provide their gross consulting income. Of those reporting, four consultants reported earnings in excess of \$600,000 per year. These four outlying data points are not plotted.

### What is Consulting Experience Worth?

This question is answered by the next two scatter plots. Both are based on the same fee and earnings data as the two previous plots, but this time the fees and earnings data are plotted vs. the years of experience in the consulting field.

In this chart of fees vs. consulting experience, the maximum fees tend to increase with consulting experience.

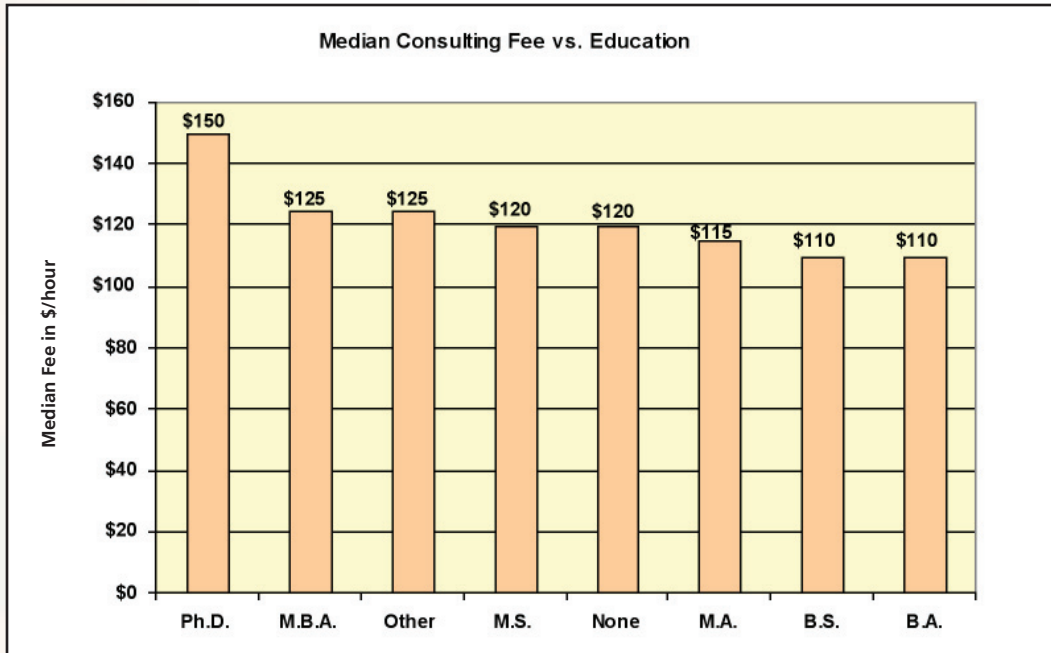




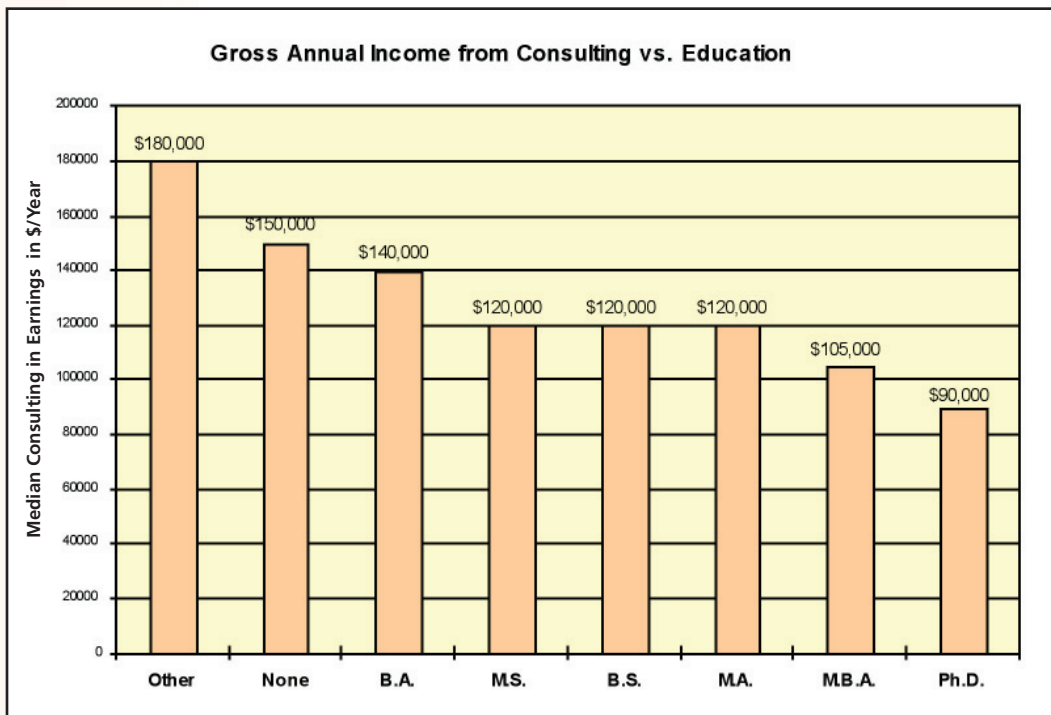
The total earnings from consulting again increase with the years of consulting experience for the first few years and then level off.

### How Does Education Affect Earnings?

The survey asked for the consultant's highest academic degree. The response from each of the independent consultants was then compared with their hourly rate and their earnings. The results are presented in the following two charts. They show that a Ph.D. degree commands an extra \$25 to \$40 per hour.



In total earnings, the Ph.D. consultants have the lowest consulting income. This metric indicates that many Ph.D.s are really part-time consultants and work fewer hours per week.





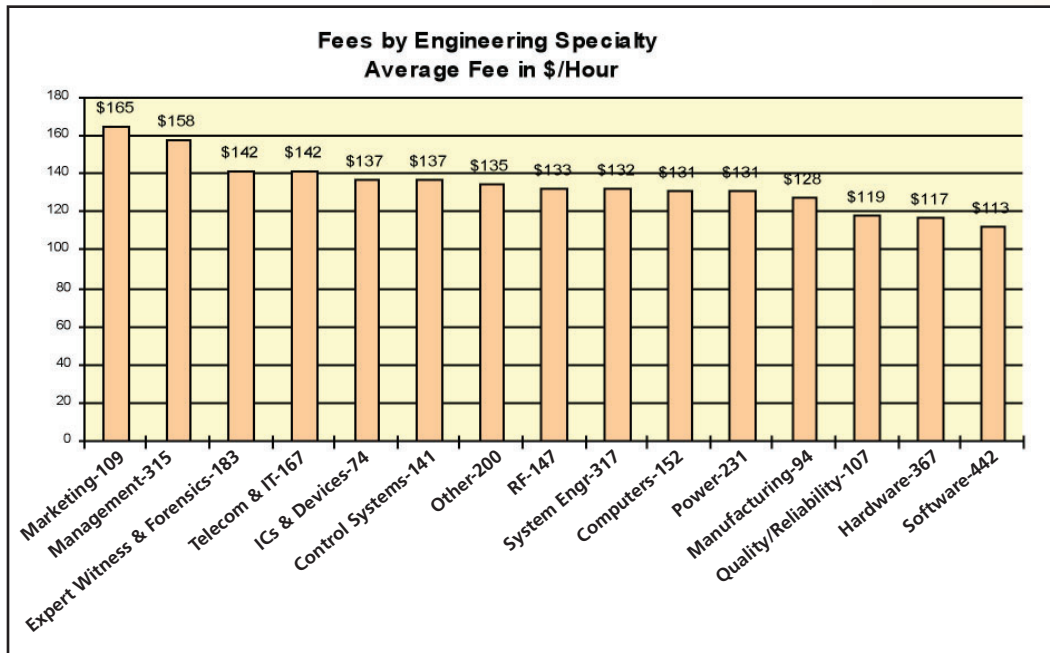
## What Is a P.E. Worth?

Though the IEEE encourages professional engineering registration, this survey showed that only 25% of the respondents were registered. An earlier survey showed the dollar value of a P.E. registration to be about \$18 per hour. In this survey, there was no significant difference and both P.E. and non-P.E. consultants showed median fees of \$125 per hour.

## Which Engineering Field Pays the Highest Hourly Rate?

Starting with the 2004 AICN survey, the results have provided enough data for the IEEE to begin to answer this question. These surveys cannot provide an exact answer, as most consultants work in more than one field, and they were not asked for separate fees for each field. For 2007, the respondents were again asked to estimate their percentage of work in each field, as well as their billable work hours per year. The responses provided the data needed to estimate the relative amount of consulting work being done in each field.

The results are shown graphically. The number after each specialty category (for example, Power-231) indicates that 231 consultants reported work in that specialty. The numbers are statistically significant, with 74 consultants in the IC field being the smallest entry.



## Comparison of the Fees by State

Many of the previous IEEE fee surveys were conducted on a regional basis or at regional workshops. These particular surveys indicated some variation from region to region. In an attempt to provide data for both state-to-state and international comparisons, all consultants were again asked to designate the location of their offices. Caution should be used when evaluating the reports from a state with few consultants reporting.

Location of the Consultant's Office	Number of Consultants Reporting	Minimum and Maximum Fees Reported in \$/Hour	Median Fee Reported in \$/Hour
Alabama	13	\$85 - \$300	\$100
Alaska	1	\$100	-
Arizona	16	\$50 - \$300	\$115
Arkansas	4	\$75 - \$135	\$100
California	222	\$20 - \$450	\$125
Colorado	53	\$50 - \$450	\$120
Connecticut	18	\$60 - \$275	\$125
Delaware	2	\$115 - \$125	-
District of Columbia	1	\$295	-
Florida	43	\$60 - \$500	\$125
Georgia	27	\$70 - \$250	\$100
Hawaii	3	\$43 - \$200	\$90
Idaho	8	\$85 - \$150	\$120
Illinois	36	\$50 - \$280	\$95
Indiana	15	\$85 - \$300	\$134
Iowa	3	\$85 - \$96	\$90
Kansas	6	\$40 - \$157	\$97
Louisiana	6	\$95 - \$200	\$135
Maine	7	\$50 - \$250	\$100
Maryland	34	\$50 - \$375	\$135
Massachusetts	62	\$40 - \$625	\$125
Michigan	70	\$60 - \$500	\$120
Minnesota	18	\$62 - \$250	\$140
Mississippi	4	\$65 - \$140	\$125
Missouri	6	\$75 - \$140	\$90
Montana	8	\$60 - \$175	\$105
Nebraska	4	\$49 - \$275	\$125
Nevada	7	\$35 - \$150	\$145
New Hampshire	13	\$60 - \$500	\$150
New Jersey	53	\$20 - \$400	\$125
New Mexico	10	\$80 - \$250	\$115
New York	52	\$30 - \$350	\$105
North Carolina	27	\$62 - \$450	\$140
Ohio	22	\$35 - \$250	\$100
Oklahoma	7	\$55 - \$150	\$125
Ontario	1	\$69	-
Oregon	31	\$60 - \$350	\$120
Pennsylvania	42	\$31 - \$400	\$115
Rhode Island	2	\$100 - \$200	-
South Carolina	4	\$75 - \$150	\$105
Tennessee	14	\$30 - \$200	\$140
Texas	63	\$30 - \$250	\$130
Utah	8	\$28 - \$300	\$85
Vermont	3	\$122 - \$150	\$125
Virginia	43	\$60 - \$450	\$115
Washington	37	\$35 - \$450	\$120
West Virginia	2	\$100 - \$450	-
Wisconsin	18	\$75 - \$151	\$125
Wyoming	2	\$150 - \$150	-

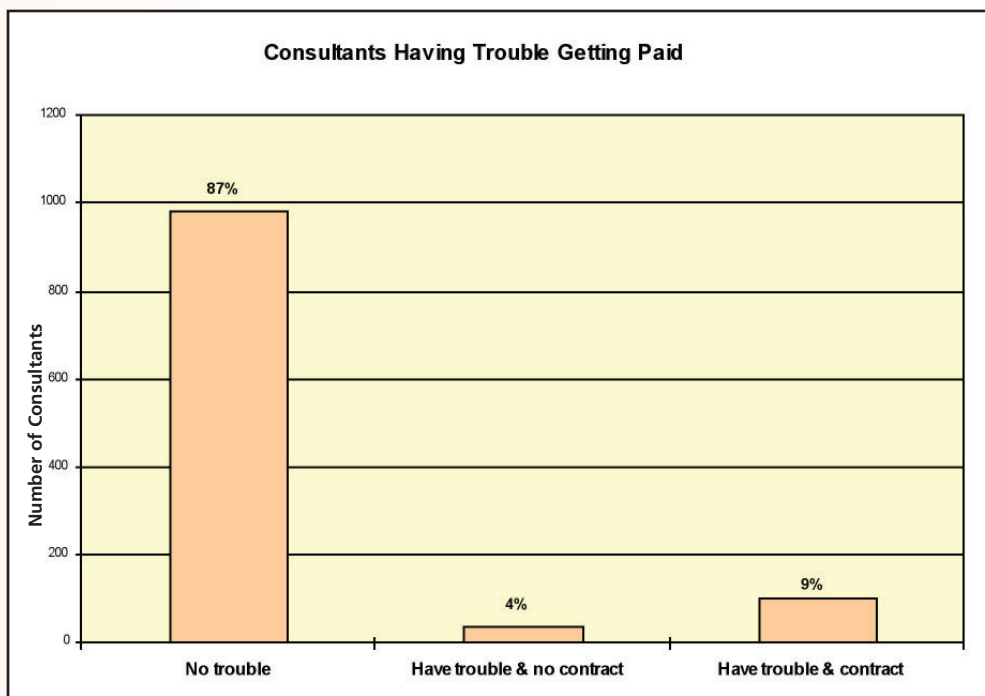
Similarly, the consultants were asked to designate the state, province, or country of the clients for whom they do most of their consulting.

Area Where the Consultant Has the Most Clients	Number of Consultants Reporting	Minimum and Maximum Fees Reported in \$/Hour	Median Fee Reported in \$/Hour
Alabama	9	\$65 - \$390	\$100
Alaska	3	\$94 - \$115	\$100
Arizona	12	\$50 - \$300	\$120
Arkansas	5	\$75 - \$150	\$100
California	262	\$20 - \$625	\$125
Colorado	21	\$53 - \$306	\$125
Connecticut	11	\$65 - \$350	\$120
District of Columbia	29	\$60 - \$450	\$125
Delaware	3	\$95 - \$125	\$100
Florida	24	\$60 - \$250	\$110
Georgia	25	\$65 - \$300	\$100
Hawaii	2	\$90 - \$150	-
Idaho	4	\$85 - \$125	\$105
Illinois	40	\$50 - \$350	\$105
Indiana	13	\$75 - \$295	\$130
Iowa	4	\$43 - \$96	\$88
Kansas	7	\$40 - \$157	\$98
Kentucky	2	\$75 - \$85	-
Louisiana	4	\$100 - \$175	\$137
Maine	3	\$50 - \$100	\$70
Maryland	22	\$50 - \$200	\$110
Massachusetts	64	\$40 - \$375	\$125
Michigan	21	\$50 - \$340	\$122
Minnesota	15	\$62 - \$250	\$140
Mississippi	1	\$200	-
Missouri	7	\$75 - \$135	\$110
Montana	2	\$60 - \$109	-
Nevada	3	\$35 - \$350	\$150
New Hampshire	4	\$65 - \$150	\$105
New Jersey	33	\$20 - \$250	\$102
New Mexico	10	\$80 - \$200	\$125
New York	64	\$30 - \$500	\$125
North Carolina	16	\$62 - \$225	\$120
North Dakota	2	\$92 - \$250	-
Ohio	19	\$50 - 250	\$100
Oklahoma	7	\$75 - \$150	\$110
Oregon	21	\$60 - \$250	\$120
Pennsylvania	34	\$31 - \$300	\$110
Rhode Island	1	\$70	-
South Carolina	2	\$75 - \$85	-
Tennessee	7	\$30 - \$185	\$150
Texas	61	\$30 - \$350	\$125
Utah	6	\$28 - \$150	\$85
Vermont	1	\$150	-
Virginia	55	\$50 - \$450	\$125
Washington	40	\$35 - \$450	\$120
Wisconsin	16	\$75 - \$150	\$104
Wyoming	1	\$184	-
British Columbia	1	\$250	-
Ontario	3	\$69 - \$250	\$150
Quebec	2	\$175-\$200	-
Afghanistan	2	\$105- \$150	-
Albania	6	\$43-\$150	\$107
Algeria	3	\$100 - \$140	\$130

Area Where the Consultant Has the Most Clients	Number of Consultants Reporting	Minimum and Maximum Fees Reported in \$/Hour	Median Fee Reported in \$/Hour
Anguilla	1	\$400	-
Armenia	1	\$80	-
Australia	2	\$100-\$500	-
Brazil	2	\$248-\$500	-
China	5	\$150-\$250	\$150
Denmark	1	\$310	-
France	1	\$125	-
Germany	4	\$98 - \$120	\$100
Israel	1	\$150	-
Jamaica	1	\$85	-
Japan	4	\$130 - \$250	\$170
Korea	3	\$28-\$175	\$95
Netherlands	1	\$105	-
Peru	1	\$110	-
Russia	1	\$125	-
Saudi Arabia	2	\$200-\$400	-
Singapore	1	\$150	-
Sweden	1	\$250	-
Taiwan	2	\$50-\$125	-
United Kingdom	5	\$65-\$120	\$105

## Problems Getting Paid

In the past, there have been reports of consultants having difficulty getting paid. Questions were included in this survey to determine how serious the problem is. The results: 147 consultants reported having trouble getting paid, but 41 of the 147 were not covered by a written contract.



## Comparison of the 2007 Data with Data from 2002, 2004 and 2006 Surveys

Of the 27 questions asked in the survey, most are essentially the same as were asked in 2002, 2004 and 2006. This repetition makes a direct comparison for these years possible. At least one factor has some effect on the responses obtained. Until 2004, the population surveyed was exclusively made up of AICN members; since then, the survey samples have been taken from the IEEE Member database. A second factor is that engineering salaries, in general, are higher than they were in 2002 and 2004.

Comparing the returns shows:

- Compared to 2006, the median consulting fees are essentially the same, but the median consulting earnings have increased by \$1,700.
- The maximum fees and the maximum earnings are essentially unchanged.
- The consultants in this 2007 survey are probably older; at least, they reported two years more engineering experience.
- The P.E. registration did not affect the consultants' fees.
- Consultants with a Ph.D. degree earn an additional \$25 to \$40 per hour.

Finding	From the 2002 Survey	From the 2004 Survey	From the 2006 Survey	From this 2007 Survey
Number of independent Consultants Providing Data	333	756	622	1130
Median Years of Engineering Experience	25	26	28	30
Median Years of Consulting Experience	7	8	10	10
Median Fee	Median consulting fee of \$100/hour	Median consulting fee of \$110/hour	Median consulting fee of \$125/hour	Median consulting fee of \$125/hour
Highest Fee	Four of 333 consultants (1.2%) received \$500/hour or more.	Highest fee was \$475/hour	Eight (1.3%) of the consultants received \$500 or more per hour. Two percent of the consultants received more than \$400/hour.	Five (0.4%) of the consultants receive \$500 or more per hour. Only fourteen (1.2%) of the consultants receive more than \$400/hour.
Median Earnings as a Consultant (with earnings of <\$1000/year excluded)	Median consulting earnings of \$120,000/year	Median consulting earnings of \$100,000/year	Median consulting earnings of \$125,000/year	Median consulting earnings of \$126,700/year
Highest Earnings Reported from Consulting	Seven of 333 consultants (2.1%) reported consulting earnings of a million dollars/year or more.	The highest reported earning from consulting was \$900,000	Consulting earnings of \$4,500,000, \$800,000 and \$675,000 were reported.	Five respondents (0.48%) report consulting earning in excess of \$600,000. All others are shown in the scatter plot.

Finding	From the 2002 Survey	From the 2004 Survey	From the 2006 Survey	From this 2007 Survey
Comparison of Median Fees for Consultants with a Higher Education	The highest education degrees of PhD and MBA received the highest fees at \$125/hour. "None" (no degree) showed \$90/hour.	Highest education designated as "Other" shows the highest fee at \$130/hour. In comparison, the PhD was \$127/hour and MA is \$125. "None" was \$100/hour.	The level of education showed less effect than in previous years.	The median fees of the PH.D. consultants are \$25 - \$40 over the others.
Fees for P.E. vs. Non-P.E.	Median fee for a P.E. was \$5/hour more than for a non-P.E.	Median fee for a P.E. was \$18/ hour more than for a non-P.E.	There is no difference in fees.	There is again no difference in fees.

## Review of the Fee Data from Earlier Surveys

The first AICN consultant fee survey for which we have data was made in Philadelphia in 1992. Since then, we have conducted at least one fee survey every year, with the first national survey made in 1998.

The 1992 survey was a limited survey of only 19 members. The average fee was \$72/hour. A later fee survey in Orlando showed \$66/hour.

In 1993, a Los Angeles area survey showed \$75/hour.

In 1994, a survey of 15 consultants in Northern New Jersey showed an average of \$68/hour.

A 1994 Long Island survey of 18 members showed a median fee of \$77.50/hour.

A 1994 San Diego survey of 27 members reported an average of \$76/hour.

A 1994 Orlando survey of 24 consultants showed \$68/hour.

Another West Coast survey, that also included the San Francisco, Los Angeles, and San Diego areas, reported \$76/hour for 1994.

A small 1995 survey in Boston showed \$93/hour for independent consultants.

An Orlando area survey, taken in 1996, showed \$94/hour. A second Orlando survey, but with a smaller sample size, showed \$88/hour.

The first national survey was taken in 1997/1998. It had a much larger sample size (177 AICN members) from across the country. The average fee was \$98.50.

A 1998 joint IEEE/PATCA (Pacific Area Technical Consultants Association) survey of the Silicon Valley Area showed fees of \$110/hour, and confirmed that fees in Silicon Valley area were typically \$10-\$15/hour higher.

In 1998, IEEE Region 3 and the Orlando area, made another survey. Based on a small sample, they showed fees of \$113/hour.

In 1999, Region 3 repeated their survey. This time, the result was \$82/hour. A Hartford area survey of 17 members in 1999 showed an average of \$90/hour.

Two surveys were made in the year 2000. A Los Angeles area survey showed an average of more than \$100/hour. A Boston survey reported only \$80/hour, but included some job shoppers.

The comprehensive 2002 survey, based on 2001 data from 333 independent consultants, showed a median fee of \$100/hour.

The comprehensive 2004 survey, based on 756 independent consultants, showed \$110 hour.

The comprehensive 2006 survey showed \$125/hour.

This 2007 survey, based on reports for 1128 independent consultants, again shows a median fee of \$125/hour.

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