

The Embedded Muse 108

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Editor's Notes

There are no current plans to host a public Better Firmware Faster seminar, but I often do this seminar on-site, for companies with a dozen or more embedded folks who'd like to learn more efficient ways to build firmware. See <http://www.ganssle.com/onsite.htm>.

My apologies. The picture in the last Muse is a fraud, a Photoshopped picture of a nuclear submarine's control panel. I was taken in by one of those Internet hoaxes. Many – and I mean MANY – of you wrote in with the snopes link (<http://www.snopes.com/inboxer/hoaxes/computer.asp>). Now we know what those two concentric wheels are for.

Dan Nordell wrote (with what I hope isn't yet another urban legend!) that the man posed in the faux picture is Joss Ackland, a British actor that Hollywood often casts as a Russian politburo member. In the movie K19 he plays Marshal Zelentsov. He played Ambassador Andrei Lysenko in the movie "Hunt for Red October". What is most interesting – and perhaps whoever made up the hoax was purposely playing tricks on us – is that both K19 and Hunt for Red October are movies about nuclear submarines.

Computer History

Thanks to Slashdot I've run across a couple of interesting computer history web sites recently. It seems someone with too much time on his hands created a replica (using the

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word loosely) of the Apollo Guidance Computer used on the moon missions. See http://klabs.org/history/build_agc/ . Doctor Dobb's (<http://www.ddj.com/documents/s=1494/ddj0006hc/>) has a quite fascinating description of the machine.

Another great history site with good links is <http://www-106.ibm.com/developerworks/library/pa-microhist.html?ca=dgr-lnxw01MicroHistory> . Recommended.

Salary Survey

Thanks to the more than 1200 people who responded to the salary survey. I've tabulated the results – a much bigger project than expected, but simplified by writing a pile of code to reduce the data. The results are interesting.

Average salaries, not surprisingly, vary quite a lot by region:

Australia/New Zealand	49644
Brazil	20333
Canada	63337
Eastern Europe	11914
India	15725
Mexico	13000
Pakistan	6000
Philippines	6800
Singapore	33540
South Africa	44942
United Arab Emirates	7000
USA	80383
Western Europe	59927

One consultant reported 2004's income at \$1m, saying he'd had a really good year. I left that data point out of the mix as it skewed the results. But what a job!

Developers are mostly young, averaging 37.5 years old worldwide with a standard deviation of 8.8 years. But in the USA we're older, 39.5. Respondents in Western Europe reported ages up to 54, and in the USA up to the late 60s. No where else in the world did anyone respond with an age over 49.

There's lots more data, far too much to pack into this newsletter, at <http://www.ganssle.com/salsurv2004.pdf> .

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More on Testing

A couple of people had some interesting thoughts on my testing comments in the last Muse. Christian A. Schreiner wrote:

A number of the Deming books I have read emphasize that testing is very necessary for processes that one can't control well enough to eliminate defects in advance. He even noted that electronic products tend to need thorough testing. He does emphasize, though, that this doesn't mean that testing can make up for bad (or no) designs, uncontrolled manufacturing, or misunderstanding how the product will be used.

I also find it interesting that most of the quality rhetoric we run into (including most of Deming's writings) focuses on the manufacturing process-- "Once we've designed a new car, how do we make 1,000,000 of them with high quality in each?" For embedded software, the manufacturing process is almost trivially simple-- you duplicate CD's or download firmware over the internet. You have to read closer to find Deming's quality-by-design writings, which teach engineers (and software developers) how to design products that don't break easily. Amazingly enough, a lot of what he says sounds like a mechanical-engineering-oriented variant of having design reviews, having a well planned architecture, having well understood requirements, and all the other things the Muse preaches.

A slogan I've often used in the workplace is, "We want the software to work by design, not by luck." I find it appalling that heavy equipment manufacturers like Cat and Deere require a new axle on a bulldozer to spend a full year (that's 24x7) in a giant machine that jiggles and twists it in every conceivable way, yet expect a few afternoons of poking a few convenient values into memory to suffice for software testing!

Glenn Dixon wrote: I received your Embedded Muse with your rant on testing, and appreciate your insights. One comment on the Deming quote you used, that said you 'can't test in quality.'

Of course you can. I have great respect for Deming, but he was wrong (or better, misinterpreted) on this one. Bob Pease points out that testing is one way the semiconductor industry, which can have IC yields as low as 50% off a wafer, guarantees their exceptional out-of-the-door quality. Even in Deming's world testing is an essential part of the quality mechanism as part of the data collection necessary to keep the process in control.

I think Deming meant testing cannot change the product being tested (sorry, Heisenberg)-if the product was bad to begin with it will still be bad after it is tested. But he, likely

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more than anyone, advocated testing as an essential part of the quality mechanism. The very existence of his data shows that.

Deming's quote is famous enough that it qualifies as one of the 'things managers use to do stupid things'--in this case to justify spending less money on testing (I wonder how many times NASA managers have used it?). Another is that weird HP study (now myth) that still pops up occasionally, which says 'money doesn't motivate engineers.'

Software development is different from hardware manufacturing as well--here testing comes very close to actually being able to change the product itself if the developer is in a tight test-and-correct loop.

Jobs!

Let me know if you're hiring firmware or embedded designers. I'll continue to run notices for embedded developers as long as the job situation stays in the dumper. No recruiters please.

There are no listings this week.

Joke for the Week

For the first bug of Christmas, my manager said to me
See if they can do it again.

For the second bug of Christmas, my manager said to me
Ask them how they did it and
See if they can do it again.

For the third bug of Christmas, my manager said to me
Try to reproduce it
Ask them how they did it and
See if they can do it again.

For the fourth bug of Christmas, my manager said to me
Run with the debugger
Try to reproduce it
Ask them how they did it and
See if they can do it again.

For the fifth bug of Christmas, my manager said to me
Ask for a dump...

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Run with the debugger
Try to reproduce it
Ask them how they did it and
See if they can do it again.

For the sixth bug of Christmas, my manager said to me
Reinstall the software
Ask for a dump...
Run with the debugger
Try to reproduce it
Ask them how they did it and
See if they can do it again.

For the seventh bug of Christmas, my manager said to me
Say they need an upgrade
Reinstall the software
Ask for a dump...
Run with the debugger
Try to reproduce it
Ask them how they did it and
See if they can do it again.

For the eighth bug of Christmas, my manager said to me
Find a way around it
Say they need an upgrade
Reinstall the software
Ask for a dump...
Run with the debugger
Try to reproduce it
Ask them how they did it and
See if they can do it again.

For the ninth bug of Christmas, my manager said to me
Blame it on the hardware
Find a way around it
Say they need an upgrade
Reinstall the software
Ask for a dump...
Run with the debugger
Try to reproduce it
Ask them how they did it and
See if they can do it again.

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For the tenth bug of Christmas, my manager said to me
Change the documentation
Blame it on the hardware
Find a way around it
Say they need an upgrade
Reinstall the software
Ask for a dump...
Run with the debugger
Try to reproduce it
Ask them how they did it and
See if they can do it again.

For the eleventh bug of Christmas, my manager said to me
Say it's not supported
Change the documentation
Blame it on the hardware
Find a way around it
Say they need an upgrade
Reinstall the software
Ask for a dump...
Run with the debugger
Try to reproduce it
Ask them how they did it and
See if they can do it again.

For the twelfth bug of Christmas, my manager said to me
Tell them it's a feature
Say it's not supported
Change the documentation
Blame it on the hardware
Find a way around it
Say they need an upgrade
Reinstall the software
Ask for a dump...
Run with the debugger
Try to reproduce it
Ask them how they did it and
See if they can do it again.

About The Embedded Muse

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