

**Total Cost of Ownership:**  
*A Comparison of C/C++ and Java*

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## **Total Cost of Ownership: A Comparison of C/C++ and Java**

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### **Executive Summary**

Programming language preference is a favorite debate among developers. Because different languages offer different coding styles, as well as different resources and tools, choosing between languages like C/C++ and Java can come down to developers' personal preference and comfort. But for businesses looking to implement one of these languages, how are they supposed to decide which language to go with? In most cases, it comes down to the bottom line.

Determining the total cost of ownership of C/C++ versus Java development is a complex equation that involves a number of factors, including development time, ease of maintenance, availability of developers, and hard costs like licensing and support. A recent survey of C/C++ and Java developers conducted by Evans Data Corporation reveals that Java is generally seen as being cheaper. This is because, in their experience, Java allows for quicker deployment and maintenance—compared to C/C++ which can take 50% longer. With a development team of twenty people, this can add up to over \$800,000 a year. In the opinion of many, Java tools have more features and allow for greater productivity. Developers familiar with both languages also gauge C/C++ licensing and support to be more expensive than Java licensing and support.

In summary, Java presents a compelling business case for business looking to choose a development language. For more detail on the findings of this report, please refer to the full article.

### **Full Article**

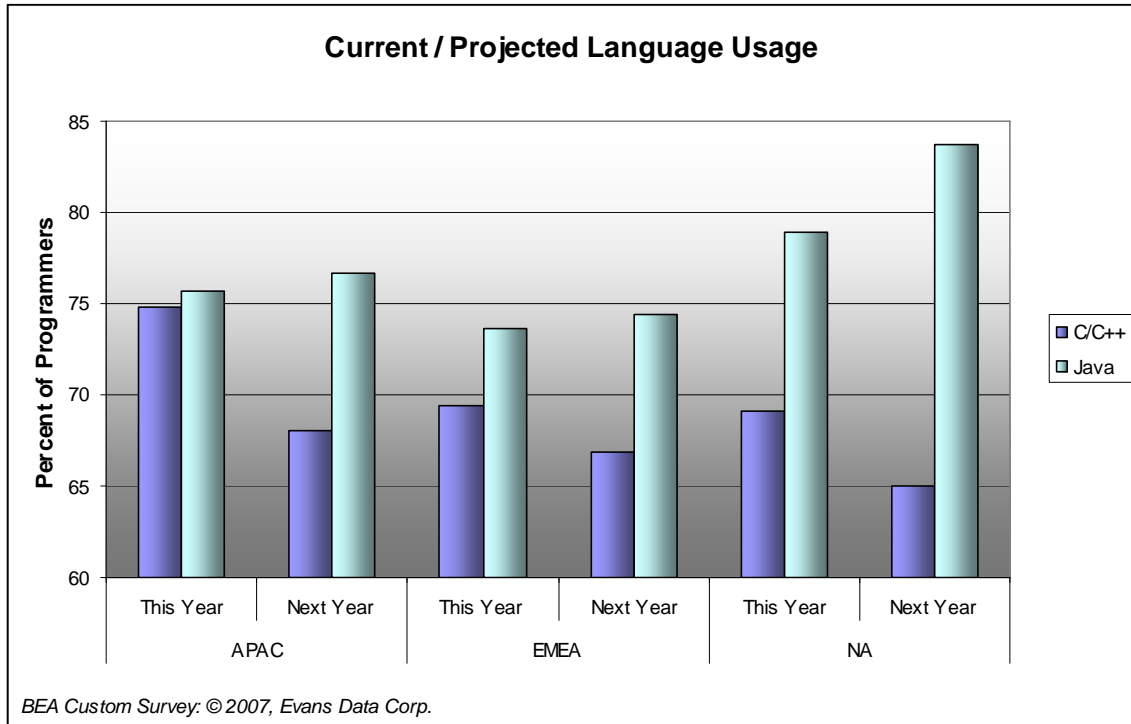
A recent Evans Data Corporation survey addresses the value proposition of using Java versus C/C++. This survey, comprised of approximately 350 developers from around the world, definitively shows Java to have a number of cost advantages.

Respondents in this survey include developers with experience in both C/C++ and Java. On average, developers have more years of experience with C/C++ than with Java. This is to be expected, considering the difference in maturity of the two languages: the C family came into currency in the 1970s, while Java was only released twelve years ago. But developers in North America tend to have the most experience with either language. This is especially noticeable with Java: 56% of respondents there report more than five years of Java experience (compared with 33% in EMEA and 16% in APAC).

Interestingly, however, the way in which a developer defines him or herself is not necessarily predicated on the language that they have the most experience with. To be specific, developers are more likely to identify themselves as Java programmers than C/C++ programmers. This tendency is again especially apparent in North America. Possible reasons for calling oneself a Java developer rather than a C/C++ developer may include comfort with the language and its community, the percent of time spent using the language today compared to the past, and even a perception of which language is cooler.

Developers report that it is harder to find a skilled C/C++ developer than a skilled Java developer. This disparity is likely to be further exacerbated by migration from C/C++ even as Java hits its stride in its maturation cycle and continues to add new users.

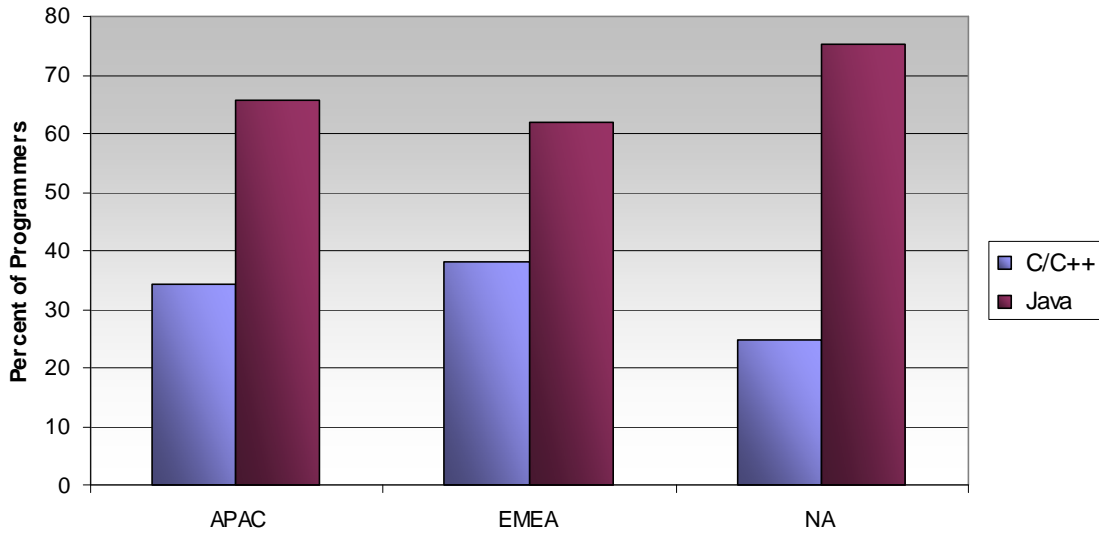
Mirroring trends found in EDC research on the greater development community, the chart below clearly demonstrates widening deltas between C/C++ and Java as developers’ project attrition for the former and further growth for the latter.



There are several explanations for this level of migration to Java. In addition to basic availability of tools, quantifiable productivity gains and hard cost savings—critical components of any TCO calculation—can be associated with Java.

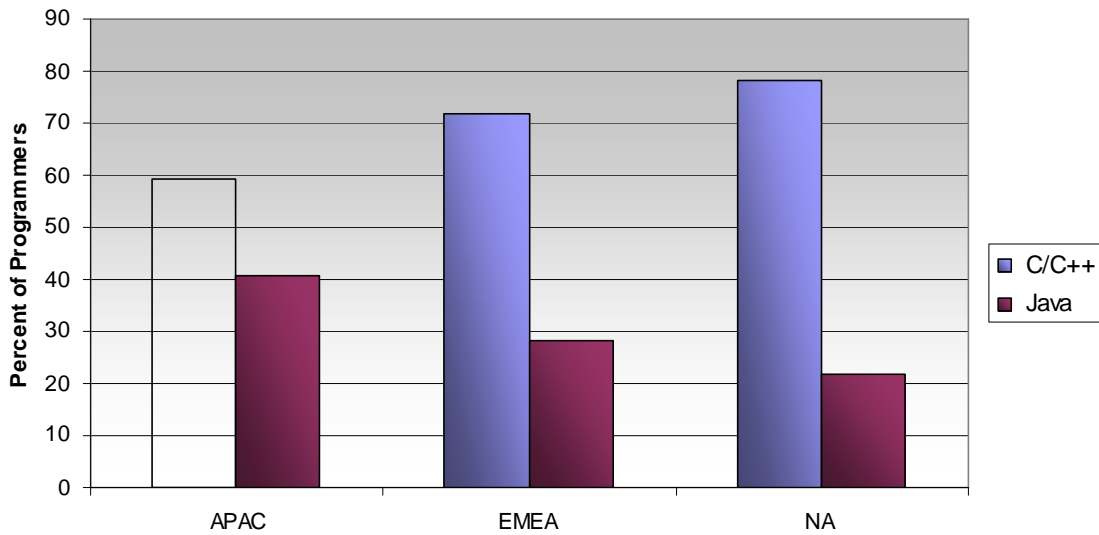
Developers who have experience with both languages are generally inclined to report a faster development cycle for Java applications. Accordingly, they assert that applications written with Java entail easier post-production maintenance than those written with C/C++. This is true, both in general and as regards a specific application-type (e.g., order management system). The charts below demonstrate the respondents’ perceptions on this issue.

### Which language allows for applications to be rolled out quicker?



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### Which language is more difficult to maintain?



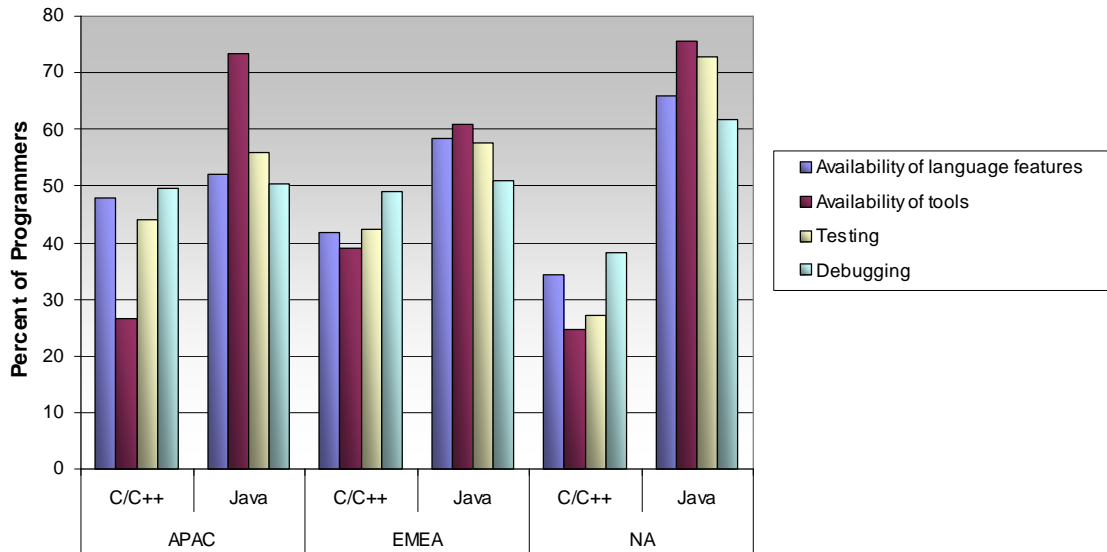
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When asked simply which language allows for quicker application roll out and easier post-production maintenance, twice as many respondents chose Java as C/C++. Of these, the perception was that on average, C/C++ applications take 52% longer to develop and 44% longer to maintain. Based on the fact that the average C/C++ developer earns \$83,707, and that using C/C++ takes approximately 50% more time, using C/C++ costs \$41,853 more per year than using Java (per developer).

From the EDC *Global Development Series*, which samples IT professionals from a range of company sizes, it is possible to approximate an average of twenty developers on a project. If all were involved with C/C++, and if using C/C++ takes 50% more time than using Java, then using C/C++ would have a total cost of ownership that is \$837,060 more per year than if the same number of developers were using Java on the same project. This estimate does not even take into consideration hard costs like licensing and support.

One reason for the significant difference in development time between these two languages is the level of tools that are available. According to a majority of developers, Java tools allow for greater productivity. This perception is most pronounced vis-à-vis features and testing, especially in North America.

**Which language offers greater productivity in terms of language features, tool availability, testing and debugging?**



BEA Custom Survey: © 2007, Evans Data Corp.

Hard costs are another significant factor in the overall total cost of ownership for these languages. In the developer community the perception that C/C++ is more expensive than Java is based on actual experience paying for licenses, support, training, updates, and so forth. Two thirds of all respondents say that C/C++ licensing and support costs more than Java. In EMEA and North America, this number approaches as many as three quarters of respondents! It is important to remember here that perceptions of cost

are based on actual experience and that veteran C/C++ programmers are among the first to admit to the higher cost of that language.

To be sure, C/C++ continues to be a vital force in the world of IT and it is not expected to go anywhere soon. Developers with skill in this powerful language will remain in demand. Looking to the future, though, Java is the horse to bet on. Its superior level of tools appeal to developers, but even more importantly, Java can now definitively be said to offer a clear set of advantages of total cost of ownership over C/C++.

## **About Evans Data Corporation**

- Evans Data Corp provides market research for the development community. Our goal is to represent the views, attitudes, desires and opinions of the community of developers to those companies who create devices, tools, operating environments and other systems that developers use. We strive to help our clients be as successful as possible and to make the right choices regarding strategic direction and tactical product marketing. EDC offers three primary services including Multi-Client Surveys, Custom Surveys, and Targeted Analytics.
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