

# Forrester Consulting

HELPING BUSINESS THRIVE ON TECHNOLOGY CHANGE

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## Open Source Software's Expanding Role in the Enterprise

Companies Adopt Open Source as Standard

A Forrester Consulting Study Commissioned By **Unisys Corporation**

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### Headquarters

Forrester Research, Inc., 400 Technology Square, Cambridge, MA 02139 USA  
Tel: +1 617/613-6000 • Fax: +1 617/613-5000 • [www.forrester.com](http://www.forrester.com)

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### Executive Summary

Open source has emerged as one of the more important IT trends in this young century. The application of open source methodologies has grown significantly in scope, as has its usage, over a relatively short period of time. Once evaluated by companies, open source software is frequently adopted and has taken its place alongside commercial software, often without regard to the ways in which it is different. In this study, more than half the companies that are using open source are using it for mission critical applications. However, because there are differences between open source and commercial software, customers want their concerns about open source software addressed before they incorporate open source more completely in their IT portfolios. Forrester Consulting, under Unisys sponsorship, undertook an in-depth study of how open source software is being used in North America and Europe to better understand the important role it is playing in IT. The study also examined the barriers and benefits that open source software represents to enterprise customers.

The value that customers find in open source can be traced to those attributes they see as most important. This study found the leading attributes to be the support for open standards characteristic of open source, its ability to be used without restrictions, and its ability to prevent software vendor lock-in. Among the concerns that customers have about open source, the biggest concern is where to find appropriate support services. Open source software produced by open source projects does not automatically have a source of support for users. However, service providers have taken advantage of the opportunity presented by freely accessible source code and transparent communities to create service offerings that address customer concerns such as integration and maintenance. Surprisingly, there were relatively few concerns expressed about intellectual property issues.

As a result of the value and maturity customers perceive in open source, it has begun to be adopted as a part of application infrastructure, as software development tools, and in many other workloads. Open source is playing a key role in helping companies achieve greater efficiency in their IT operations and in developing their service-oriented architecture (SOA) strategies.

The survey shows that, while cost savings was the most typical benefit desired, there are other economic and technology benefits as well, including improving overall efficiency of IT, quality of products and processes, time-to-market, greater innovation, increased competition among service offerings, and more efficient use of resources across the industry. Forrester recommends that customers first identify and break down internal barriers to open source; Lack of knowledge and the prevalence of misinformation have to be addressed with education and training. In addition, arranging for required services before deployment is important for facilitating adoption. Finally, open source capabilities should be proven in a pilot before rollout, in part to familiarize everyone with how open source is different, particularly in the relationship to the open source community.

### Study Methodology

In order to more fully understand how open source software is being used in companies in the US and Europe, Forrester Research conducted a study, sponsored by Unisys, in which we interviewed 486 open source decision-makers (those involved in influencing decisions, setting strategy, authorizing purchases, and setting budgets).<sup>1</sup> Forrester designed the survey with input from Unisys, although the respondents were not aware of Unisys' involvement. In order to get the most valid data possible, only companies that indicated that they had at least evaluated open source software were included.<sup>2</sup> The survey was conducted by phone to ensure high-quality respondents and responses, as respondents can be better screened and questioned and responses can be reviewed and clarified. Forrester analysts conducted eleven follow-up telephone interviews to get more detail and qualitative information from survey participants who had volunteered to be contacted.

### Introduction: The Evolving Role Of Open Source

#### Open Source Had Humble Roots

Open source has emerged as one of the more important IT trends in this young century. The application of open source methodologies has expanded significantly in scope, as has its usage, over a relatively short period of time. Even though the concept of an open source software license was first introduced in 1989, many of the concepts behind open source have been around for much longer.<sup>3</sup> Particularly within research and academic communities, the notion of open sharing of work helped to move the computer software and networking industries forward. The formalization of that approach into what is now called open source software has broadened its appeal and its application.

In the early days, open source software focused on developing implementations of Unix software utilities and networking protocols that were unencumbered by proprietary licensing restrictions. Compilers, editors, transport protocols, and the like were the focus of the activity. Over time, developers found that by openly sharing resources and code they could develop software that was almost functionally equivalent to commercial software. Their work spread to complete database management systems and computer operating systems. As more developers participated in open source communities, the projects became more varied and ambitious. Open source communities encourage active participation by many individuals, building on one another's work and ideas, rapidly adding new functionality, and releasing it for use. This differs dramatically from the long release cycles and closed processes of traditional software. In addition, the communities have a life beyond the participation of any individual, imparting a high degree of confidence in the technologies produced.

#### Twenty-First Century Acceptance

In the later part of the 20th century, open systems and open standards became important parts of IT. Building on that foundation, open source software has also become an important part of enterprise architecture. As the range of software applications that open source projects addressed expanded, the profile of organizations that chose to use open source software spread from academic, defense, and scientific research organizations, to commercial companies. As the 21st century began, use of open source software has spread to all geographies and industries — although some have adopted open source faster than others. Expansion has been driven by investments, contributions, and participation by major vendors. These activities validated the open source approach and helped customers feel comfortable that open source was a mainstream approach to software development. This observation is consistently supported by the survey findings, which show that products and services from a trusted supplier are important to companies.

### Taking On Mission-Critical Attributes

Forrester has observed a pattern: Once companies start using open source software, usage expands from simple applications (e.g., file and print serving and email) to mission-critical application areas including customer-facing applications. Data from the survey on which this report is based indicates that a large majority of companies that considered open source ended up adopting it, and more than half have adopted it for mission-critical applications. Each industry has its own definition of mission-critical, of course, but the key point is that enterprises feel confident enough in the quality and security of the technology to use open source in areas that affect revenue and customers. Customers Forrester interviewed were more cautious about the applicability of open source software to high-volume transaction processing and legacy integration, although there are no obvious barriers to its spread into those areas.

### While Moving Into The Mainstream

Our data and interviews show that once open source has been adopted for a range of applications and workloads within a company, it begins to be treated the same way as commercial software rather than as a unique phenomenon. Just as with commercial software, business requirements are identified, often by the business unit, and passed on to IT. Then IT determines the corresponding technical requirements. Open source isn't an issue during this process. From that point, the choice of what software to use depends on many factors, but whether or not a particular piece of software happens to be open source is not a factor. When open source software is considered for use, it is evaluated against the same criteria as commercial software and must meet the same requirements and standards. As a result, companies that have experience using open source make few distinctions between different kinds of software and just pick the best tool for the job at hand.

*"We evaluate open source the same way we evaluate other solutions, and whichever is the best wins." — Architect, applications and systems*

### Using Open Source With Existing Applications

Open source software is not used in isolation. Forrester knows of no companies that use open source software to the exclusion of commercial software. Open source is generally used in a hybrid model — in combination with commercially licensed software and with software that has been developed in-house or under contract. This requires integration of multiple software components that is facilitated by common support for open industry standards. This is one example where open source components are chosen because they are right for the job, not solely because they are open source.

## The Appeal Of Open Source Software

### Perception Is Key

What makes open source software appealing to companies? The typical way of explaining the appeal is that it is free of cost. However, while open source software licenses can be obtained for zero or low cost, the total cost of ownership for open source is not zero. The appeal for those that adopted it came from many sources. Open source is a complex concept with many dimensions, including freedom, intellectual property, business models, development approach, collaboration and sharing among competitors, and even views about the intrinsic nature of software.<sup>4</sup> Getting everyone in the industry or within a single company to agree on a single definition — "Is that what we are doing?" — is not likely to happen and really isn't necessary, as long as we understand people's perceptions about the basic attributes of open source software.

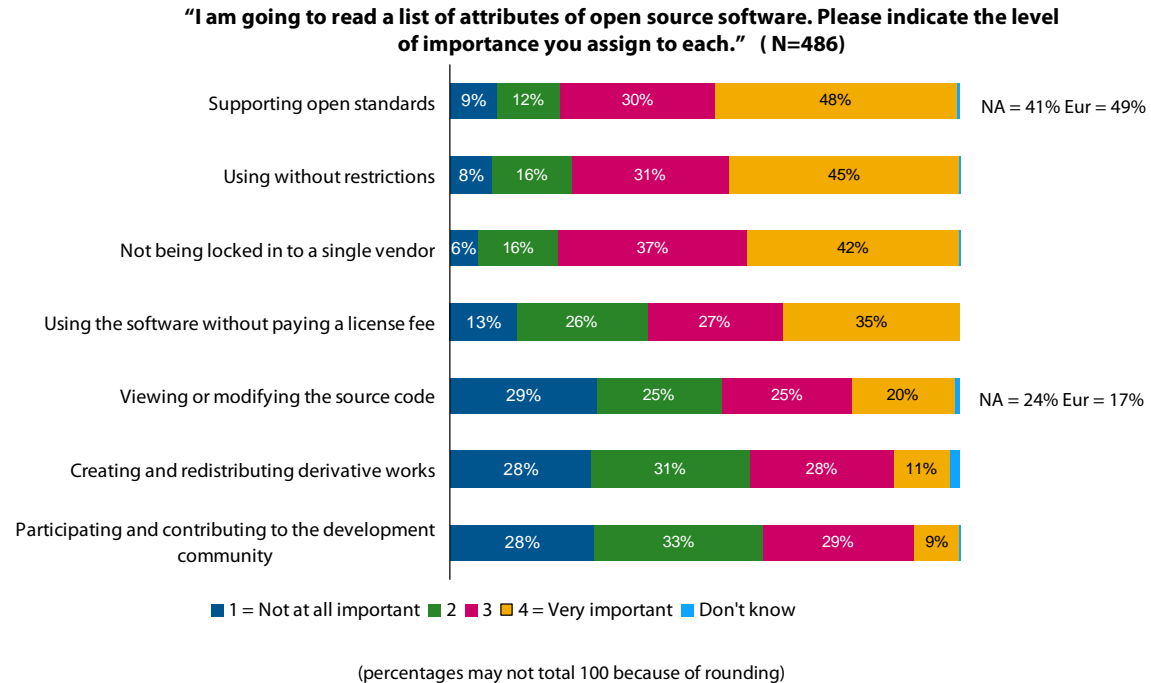
## Open Source Software's Expanding Role in the Enterprise

When survey respondents were asked about the level of importance assigned to various attributes of open source software, an overwhelming margin of more than 75% indicated that support for open standards, the ability to use without restriction, and not being locked in to a single vendor were either important or very important attributes of open source (see Figure 1). None of these attributes are the exclusive domain of open source software, of course, but the importance placed on these attributes — compared with the lower importance placed on the ability to view source code for example — shows that customers place greater weight on the openness and vendor-neutral attributes of open source than its other unique aspects.

An aspect of open source software that customers don't consider important is participating directly in open source development communities. Almost two-thirds of our sample replied that this was unimportant to them. This stems both from lacking relevant skills and placing a higher priority on matters more directly related to the business. Most companies do not have developers who are capable of writing complex infrastructure software, such as databases or application servers. They are more capable of developing and customizing business applications developed on top of an underlying platform.

Similarly, more than half of the respondents didn't feel that the ability to view source code or to create derivative works were important to them. Again, businesses are focused on their business applications and not on developing the infrastructure. Creating derivative works of open source projects would probably create more headaches than opportunities.

**Figure 1: Attributes Of Open Source Software**



Source: A commissioned study conducted by Forrester Consulting on behalf of Unisys

## Customer's Open Source Concerns

### Users Want Comprehensive Service Providers

Companies currently using open source software still have concerns. Their leading concern is the availability of service and support for the open source software that they are using. Almost 75% of the respondents selected this as an ongoing concern (see Figure 2). While many popular packages, such as Linux, JBoss, and others have support services readily available from commercial open source companies, there are hundreds of open source projects for which the source of support is unclear or for which support is provided by suppliers previously unknown to the customer. The desire to engage a trusted supplier for services came through clearly in our follow-up interviews as well.

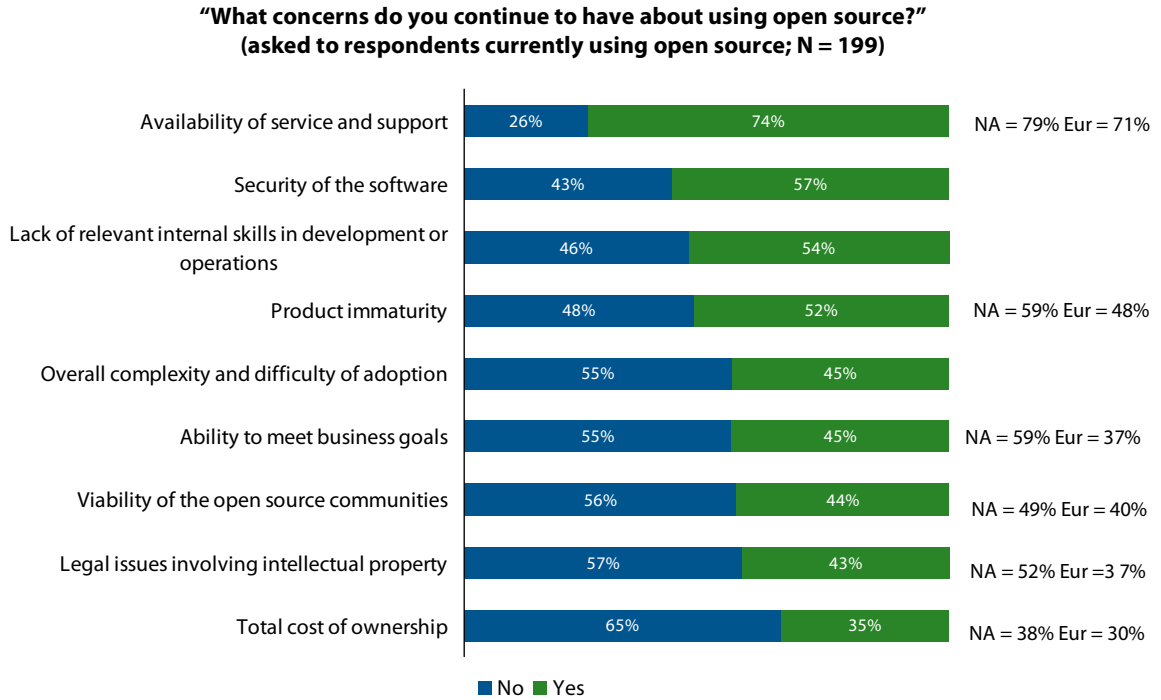
*"The comfort with the [open source provider] was far more important than any technical capabilities. We still make decisions that way. Sometimes that's the wrong decision, but bringing along the decision-makers with confidence is paramount." — CIO*

Respondents had a very broad range of services they expected from providers (see Figure 3). More than two-thirds of the sample felt that a service provider should provide open source application development, integration of open and closed source software, consulting, open source component integration, open source application life-cycle management, and software maintenance. More than half of the respondents also felt that a services provider should assist in open source operations and software selection. The breadth of services that the sample felt should be offered would indicate that larger, more fully staffed service providers would have an advantage in being able to provide a broad array of coordinated and integrated services. This kind of one-stop shopping would be hard for a small supplier to provide just because of the range of skills and the resources required.

Forrester found a few differences between North America and Europe in how firms want service providers involved in the selection, certification, and operation of their open source stacks. Europeans were more likely to want service suppliers to provide assistance in selecting open source software and to offer operations assistance, but the North American group was more interested in vendor certification of an integrated stack of open source software (Figure 3).

## Open Source Software’s Expanding Role in the Enterprise

Figure 2: User Concerns About Open Source Software



\*Percentages of “Yes” answers for North America and Europe identified by “NA” and “Eur” percentages  
Source: A commissioned study conducted by Forrester Consulting on behalf of Unisys

### Security Concerns Are A Red Herring

A second major concern is the security of open source software. Just more than half of the survey respondents who were currently using open source indicated that they had concerns about the security of the software. This stems from the fact that the source code of open source software applications is available to anyone, including those with bad intentions, theoretically giving those users the ability to more easily create viruses or to intrude into secure environments. On the other hand, almost half of the sample did not share this concern, reflecting the fact that the same code is open to inspection by security experts who can identify potential vulnerabilities and report them to the project without having to be employed by a vendor. This can greatly increase the amount of resources available for detecting security flaws and improving the software’s security.

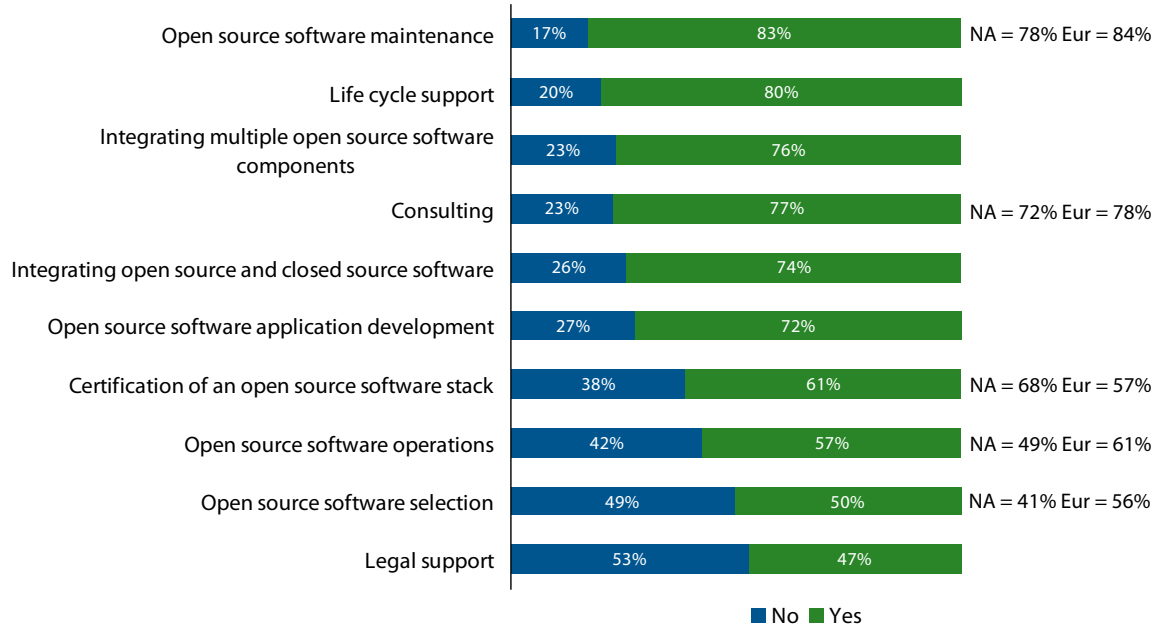
Our discussions with users indicated that individuals generally see the security issue as a red herring. They believe that the two sides of the issue balance out, and that open source software is probably neither more nor less secure than commercial software.

*“We find security has less to do with the tool than the way it’s implemented and managed.”  
— Manager, data center*

## Open Source Software's Expanding Role in the Enterprise

Figure 3: IT Services Expectations

**"What services do you expect from an IT services company regarding open source software?"**  
(N = 486)



(percentages may not total 100 because of rounding)

\*Percentages of "Yes" answers for North America and Europe identified by "NA" and "Eur" percentages

Source: A commissioned study conducted by Forrester Consulting on behalf of Unisys

## Intellectual Property Concerns Fade

The extent of legal liabilities for copyright and patent infringement that customers may face is often believed to be a barrier to adoption, as open source software frequently comes without warranties, indemnification, or other protection. However, less than half of our respondents had these concerns, and it ranked among the lowest areas of concern. There are several reasons for concerns about IP fading:

- Vendors are unlikely to bring suits against current or potential customers — any suits would more likely be brought against infringing vendors.
- The risk of patent infringement is no greater or lesser for open source than for commercial software.
- Open source code is open to inspection, so potential violations are easier to spot early in development.
- The SCO/IBM lawsuit is rapidly losing credibility.

Add to that the fact that there is an increasing number of suppliers that include indemnification to customers with their offerings, and the IP issues will continue to fade as a barrier. Concern about IP was expressed more often in the North American than in the European sub-sample, perhaps reflecting cultural differences, although we have no evidence to support this.

## Where Open Source Is Being Used

### Application Infrastructure

We asked our survey sample where in their companies open source software was being used. Among those that are using open source software, 82% were using it for non-mission-critical applications. This is a catch-all term that is hard to define. More important is the 79% of respondents who responded that they were using open source for application infrastructure. This includes everything from Web servers to application servers and databases. This infrastructure can support both mission-critical and non-mission-critical applications and is the foundation for expanding the use of open source.

### Application Development Tools Are Popular

Developers are often the early adopters of open source, and one indication that measures the degree to which open source has become a natural part of developers' lives is the extent to which open source development tools are being used. Two-thirds of our sample are using open source for development tools, a finding consistent with what we were told in interviews regarding the introduction of open source to the organization (see Figure 4). A much larger proportion of the European sub-sample was using open source development tools compared with the North American sub-sample. Development tools can be added to the developer's workbench without the management's awareness or approval, and they are easily used in the course of daily coding and testing work without becoming a part of the completed application. This can all be done under the radar. Once a developer becomes familiar with open source tools, his or her curiosity is sparked, and he or she looks to open source to provide solutions to other needs, as well.

### The Majority Is Using Open Source In Mission-Critical Apps

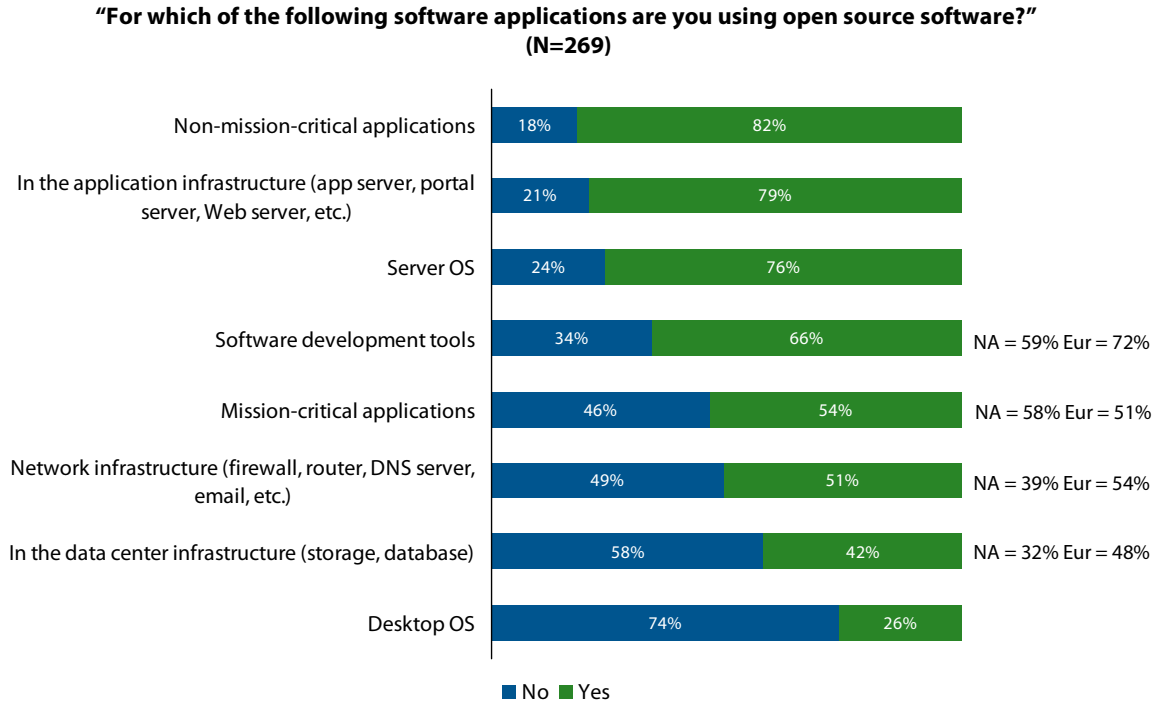
Many of the respondents we interviewed indicated that they were not yet ready to deploy open source software for their company's most critical applications. However, more than half are using it for *mission-critical* applications. Clearly, there is a range of mission-criticality, and an application that is mission-critical for one company may not be mission-critical for another. The key is that the trend is for open source to gradually find its way into more critical applications. We've seen that open source is being adopted as a key part of a company's application infrastructure, which is a leading indicator that it will become an integral part of a growing base of applications as they are developed and deployed in the future.

### Desktop Linux Is Not A Strong Presence

In neither the North American nor the European subsamples was desktop Linux found to be widely adopted. Only 26% of the companies surveyed had any desktop Linux, while 76% of companies indicated that they were using open source as a server operating system. It is true that non-open-source software can run on an open source server, and open source desktop applications can run on non-Linux desktops. Overall though, open source is making its impact today on server applications much more than desktop applications just on the basis of wider server OS adoption.

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Figure 4: Open Source Software Application Use



\*Percentages of "Yes" answers for North America and Europe identified by "NA" and "Eur" percentages  
Source: A commissioned study conducted by Forrester Consulting on behalf of Unisys

### Key IT Initiatives Using Open Source

We've seen that open source is viewed as being important in lowering operating costs and providing application infrastructure for mission-critical applications. We have also found that companies believe that open source is an important element in addressing several other key IT initiatives.

#### *Improving Efficiency And Consolidating IT Infrastructure*

More than 75% of our sample agreed that open source software was making an important or very important contribution to improving efficiency and consolidating IT infrastructure (see Figure 5). This was expressed by a larger proportion of the North American subsample compared with the European subsample. Lower licensing costs and cost-effective support options help to contribute to fiscal efficiency, but open source is providing a migration target for legacy platform and applications to reduce the variety and complexity found in many IT environments. In our sample, 71% of respondents indicated that open source would play an important or very important role in consolidating IT infrastructure, and 76% said that they were using Linux as a server operating system. Consolidation of various proprietary flavors of Unix on a single Linux distribution is a common strategy.

#### *Open Source Will Be Used For Service-Oriented Architectures*

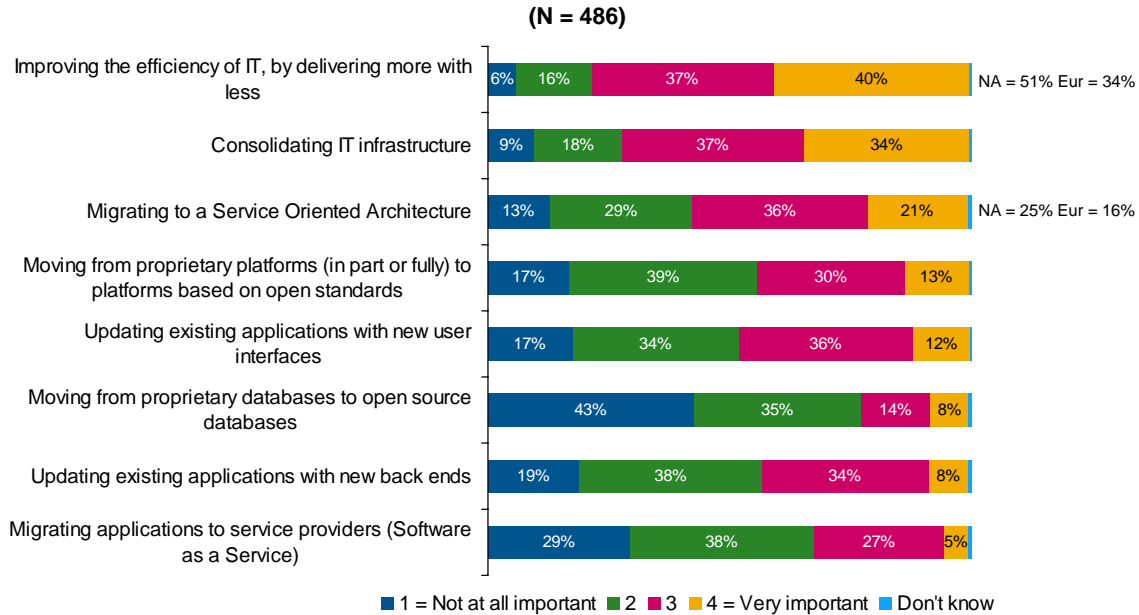
Many open source projects implement specific standards as well as SOA middleware, including Web services engines, enterprise service bus, and messaging infrastructure. This focus on open standards and modularity found in open source software allows it to play an important role in SOA. Forrester believes that SOA is emerging as a standard approach to application architecture,

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development, and deployment. SOA enables a significant amount of integration among various services and legacy applications. It requires confidence in all the components, as well as strong standards support. More than half of the sample agreed that open source software would play an important or very important role in migration to SOA.

**Figure 5: Role Of Open Source In Key IT Initiatives**

“ Indicate the importance of the role open source software, in each of the following IT initiatives within the next 12 to 24 months. Please indicate the level of importance you assign to each”



\*Percentages of “very important” answers for North America and Europe identified by “NA” and “Eur” percentages

Source: A commissioned study conducted by Forrester Consulting on behalf of Unisys

## Justifying Open Source Usage

### Sources Of Economic Benefits

Economic benefits from open source are both direct and indirect. The direct benefits begin with the fact that, generally, open source software is distributed without a software license fee and is extended to the entire hardware and software stack and related services when compared with proprietary systems. In place of the license fee, customers are offered an optional subscription for services or support fee per server. While self-support isn't an option for most customers, entertaining competing bids for support is a very attractive proposition. This can result in lower costs for support throughout the life cycle of the open source component or application.

There are also indirect economic benefits that ultimately accrue to everyone who adopts open source from the more efficient use of resources across the industry, with less redundancy and fewer opportunities for any one vendor to monopolize a product category. This helps to minimize vendor costs and, therefore, keep customer expenses down.

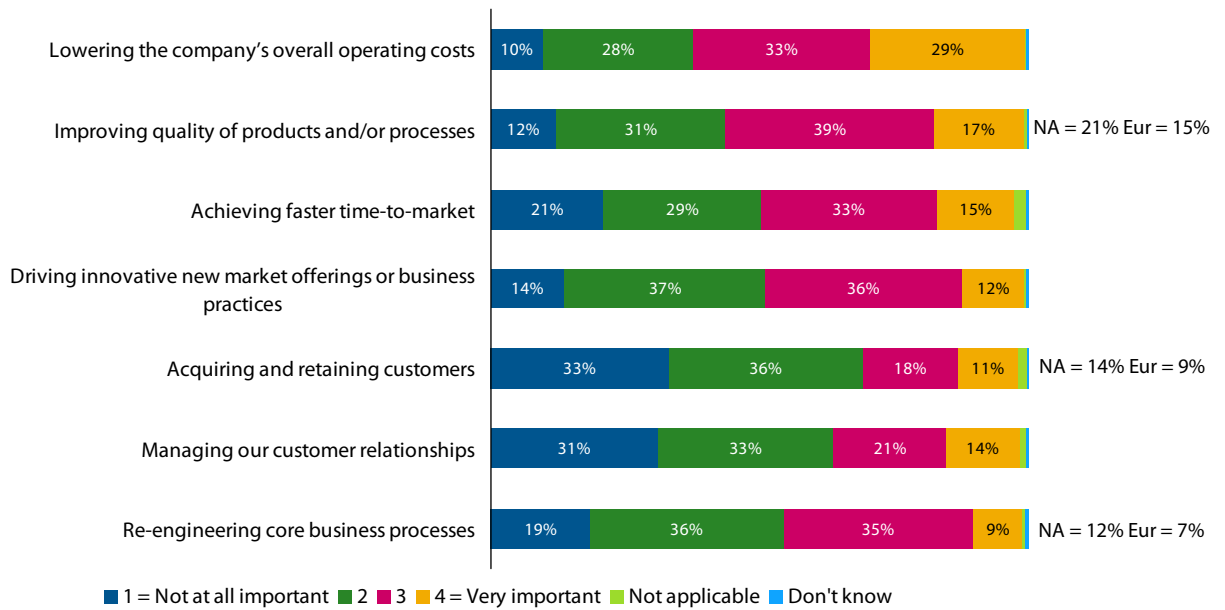
## Business Benefits Found, As Well

By itself, open source software doesn’t necessarily do a better job of delivering business value than commercial software. It isn’t necessarily easier to develop new applications with open source software, and it doesn’t necessarily produce better applications than commercial software. But a majority of respondents did indicate that open source was playing a role in helping to lower their companies’ overall operating costs, a business benefit that can’t be underestimated. A majority of respondents indicated that open source software played an important role in improving the quality of their companies’ products and business processes (see Figure 6). This goes along with the perception of the high quality of open source software itself and the flexibility open source provides that can allow changes and modifications to be made more quickly and with less effort. This is a clear benefit, although one that is difficult to quantify in hard dollars.

On the other hand, a majority of respondents did not see open source playing an important role in directly affecting their companies’ abilities to acquire and retain new customers or to manage ongoing customer relationships. This points to the fact that in practice, open source software is technology, and the impact on customers will come from what a firm does with that technology, not the technology itself. The other attributes of open source, such as community, choice, and flexibility, are harder to translate into customer relationship benefits.

**Figure 6: Meeting Business Goals**

**“Please rate the extent to which you agree or disagree with the statement that open source software can help your company achieve the following business goals.”**  
(N = 486)



(percentages may not total 100 because of rounding)

Source: A commissioned study conducted by Forrester Consulting on behalf of Unisys

## Technological Benefits Of Open Source

In our interviews we asked about the technological benefits people believed could be achieved by using open source software. The leading response indicated a belief that open source gave them freedom from vendor lock-in.

## Open Source Software's Expanding Role in the Enterprise

*"We are seeing some technical benefit and some financial benefit to open source, but there's not an enormous benefit [compared with commercial software]. But I like the flexibility piece a lot. I can better select and support for the business need, so I'm not overbuying in any situation." — Manager, data center*

We explored what that meant and found that it refers to the fact that open source software could be obtained from many sources, that any party could offer support services for the software, and that the source code was available. This gave them assurance that they would not be stranded or abandoned should a vendor go out of business or terminate a product. Among other technological benefits mentioned were that open source:

- **Plays a key role in application infrastructure.** In many of the organizations surveyed, there are several important initiatives underway where open source is playing an important role. These include implementing SOA, moving from proprietary platforms, and updating legacy applications.
- **Software is of higher quality than much commercial software.** Whether or not this is true isn't as relevant as the fact that users believe that it is true. The rationale they accept is that many people who have no vested interest in hiding bugs are able to view the code. Extensive testing during development by the community was another reason given for high quality.
- **Software is more secure.** This is another area where the reality may be different from perception, but users clearly believe this to be true. Although security is an important concern for users, and they watch it carefully, they are convinced that the same process that works for finding and fixing bugs works for finding and fixing vulnerabilities, too.

In terms of the advantages of open source software for their development teams, those interviewed mentioned support for open standards, making integration and interoperability tasks simpler to accomplish.

## Recommendations

### *Lower Internal Barriers To Open Source Adoption*

The success and satisfaction that companies using open source software have had would suggest that more companies could benefit. It really doesn't matter whether your company uses Windows, Linux, Unix, or a combination; There are opportunities for using open source on all those platforms. The challenges lie in the integration among the different operating systems, but it is no greater than integrating commercial software. In fact, open source can facilitate cross-platform integration because of the greater concern for standards and portability.

Among the internal barriers that need to be addressed are selection criteria that are biased against products that come from open source communities, lack of a policy regarding where and how open source can be used, and misinformation about the status of intellectual property with regard to open source. Those topics are beyond the scope of this paper, but ample information is available from Forrester and other firms.

### *Identify Services Before You Commit*

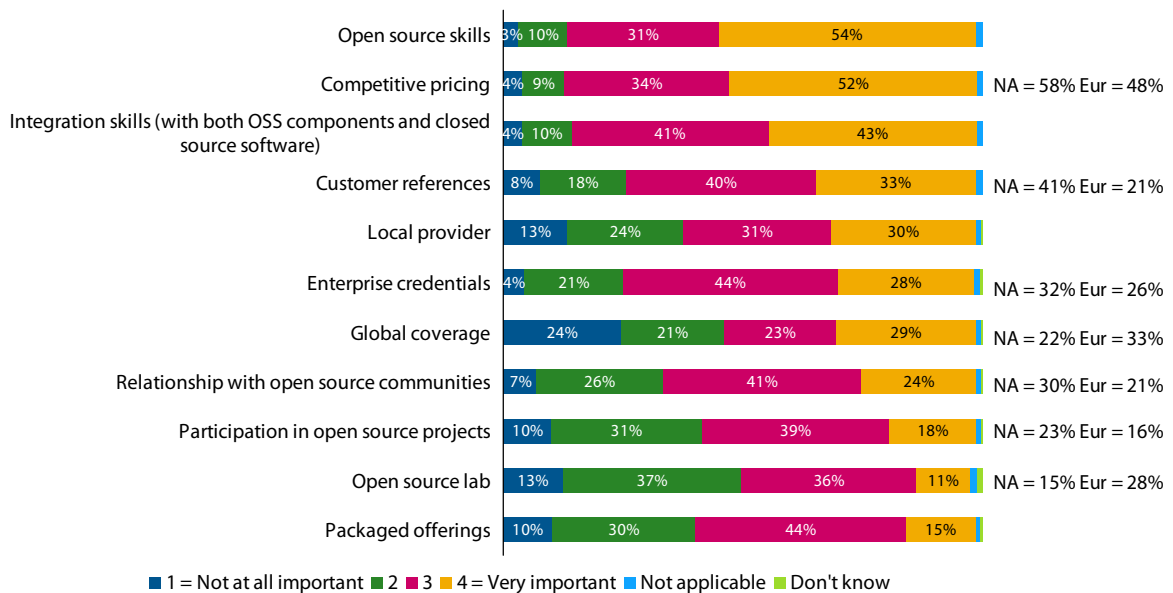
The single greatest barrier to open source as stated by nonadopters is the same as the greatest concern among users of open source: availability of services. The paradox is that because of the

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licensing and openness of open source software, service providers are free to offer competitive offerings on the same technology, something usually unavailable in the world of commercial software. The vast majority of respondents surveyed indicated that open source skills, competitive pricing, and capabilities for integration with other software were the most important attributes to look for when selecting a service provider, although competitive pricing was more important to respondents from North America. Enterprise credentials, customer references, and relationships with open source communities were three other attributes that were rated as important or very important by close to two-thirds of the sample or more (see Figure 7).

**Figure 7: Vendor Selection: Attributes Of Service Providers**

**“How important are each of the following attributes in selecting a provider of open source services?  
Please indicate the level of importance you assign to each.”**  
(N = 486)



(percentages may not total 100 because of rounding)

Source: A commissioned study conducted by Forrester Consulting on behalf of Unisys

## Piloting And Rolling Out

Consistent with our view that open source has lost its novelty and is now a mainstream aspect of IT, we found that customers that were piloting open source software were running relatively short pilots. There were no big surprises requiring long-term or extensive pilots. Nevertheless, piloting is an important process that needs to be included in your development and deployment plan for open source just as with any new technology. When you are piloting, you are not only piloting the code, but the support infrastructure that you will use in production as well. You are also building confidence in a product that often does not have a definable vendor behind it, requiring the code to prove itself in operation and familiarizing yourself with the open source ecosystem.

Once open source is rolled out, collecting best practices and experience across projects is a part of open source collaboration that needs to be internalized within your organization. Your IT organization can be thought of as an extension of many open source communities and can benefit from adopting some of their practices.

## **Open Source Software's Expanding Role in the Enterprise**

Open source represents an innovative approach to software development that is having a significant impact on the industry and can have an equally important and beneficial impact on organizations that internalize its best practices.

## Appendix A: Endnotes

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<sup>1</sup> Although the survey was designed in collaboration with Unisys, survey respondents were not made aware that the survey was sponsored by Unisys, nor were any questions asked about Unisys or its products or services. In addition, no questions were asked about Unisys' competitors nor were questions asked that positioned Unisys against any of its competitors.

<sup>2</sup> In this sample, 59.1% of the respondents were currently using open source (49.6%), currently piloting open source (5.8%), or planning to pilot open source (3.7%). Only 26.8% of the sample had no plans whatsoever to use open source.

<sup>3</sup> Source: "The GNU General Public License Protects Software Freedoms," May 5, 2005 (<http://www.gnu.org/press/2001-05-04-GPL.html>).

<sup>4</sup> There are those open source software proponents who make the animistic claim that "software wants to be free," extending Roger Clark's statement in the 1980s that information wants to be free.