April 12, 2004

The Costs And Risks Of Open Source

by Julie Giera

BEST PRACTICES

April 12, 2004

The Costs And Risks Of Open Source
Debunking The Myths

by Julie Giera
with Adam Brown

EXECUTIVE SUMMARY

Open source, including Linux, is being deployed by a majority of companies in 2004, yet we question whether customers are adequately prepared to deal with the costs and risks of managing these environments. The allure of free software is accelerating the deployment of open source platforms, but open source is not free and may actually increase financial and business risk. Discussions with five companies that tracked their total costs indicated Linux was between 5% and 20% more expensive than Windows. There were two distinct situations where Linux was the clear cost winner: Unix migrations and Linux-only deployments. Linux, and other open source software can provide big benefits to the organization, however, companies need to know what to expect, and plan appropriately to mitigate these concerns.

FORRESTER®

OPEN SOURCE HITS THE MAINSTREAM

Forrester conducted a survey of 140 North American companies on their use of open source platforms in February 2004.[1] We found the adoption of Linux and other open source components is accelerating in key areas of the enterprise. This year, 60% of those companies surveyed indicate they have installed, or will install these platforms (see Figure 1). The impact of open source is broader than just the platforms themselves. The rapid adoption of open source will place further pressure on commercial software providers that have endured slow license sales for the past three years.[2] The presence of open source in the enterprise delivers not just the operational benefits of the platforms themselves but can also place the customer in a much stronger negotiating position with its commercial software providers.

Respondents indicate that the single biggest driver of open source deployment is cost reduction. Eighty-six percent of firms say low acquisition cost is the major reason for their open source decisions, followed closely by 77% that say they expect to lower their total cost of ownership (see Figure 2). But do open source platforms always save a company money?

Cost Reduction Is The Biggest Driver Of Open Source Adoption

Forrester held in-depth discussions with 14 companies that had been running Linux platforms longer than one year to see what the costs really were. Several key themes emerged from these in-depth discussions:

- **Few companies know what they are really spending.** Fewer than half of the companies we spoke to had a formal process in place to measure the financial impact of their open source choices. Only 5 of 14 had kept detailed metrics and of those five companies, Linux was more expensive (5% to 20%) than the current Microsoft environments. Two of the five companies said they expected their Linux costs to go down as they gained more experience.

- **Preparation and planning takes longer with Linux.** Virtually all of the companies we spoke with spent more time in preparation and planning for their Linux deployments than with comparable Microsoft projects. Only one organization indicated that there were no appreciable differences between Linux and Windows in this area. This is not unexpected, since most of these firms are just beginning to establish operating procedures and practices for open source — for many, their Linux projects served as the catalyst for this effort. These preparation and planning activities took 5% to 25% longer for Linux than Windows. This should change, of course, as companies gain more experience with the platform.

Figure 1 Open Source Is Used By The Majority Of Companies In 2004

"Is your company using or planning on using Linux or other open source software in the next 12 months?"

Using today
46%

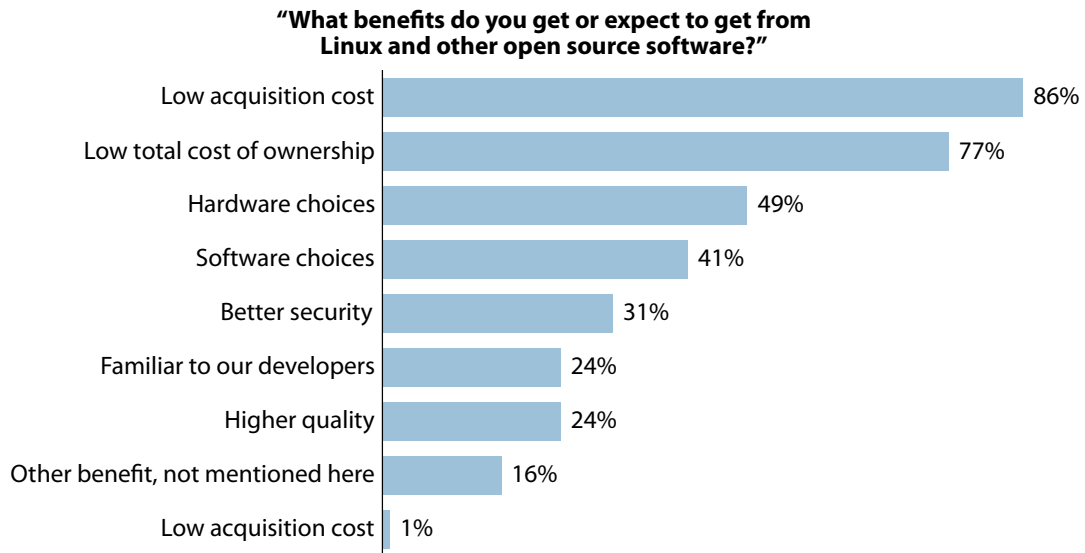No plans
39%

Plan to use
14%
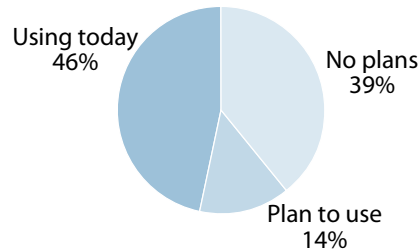
Base: 140 North American firms

Source: March 16, 2004, Trends "Open Source Moves Into The Mainstream"

Source: Forrester Research, Inc.

- **Training for Linux was more robust, more costly.** We discovered that the investments companies made in training for their IT employees were significantly higher than for Linux than Windows — on average, 15% more expensive. When we asked why, almost all 14 organizations cited two basic reasons: 1) training materials for Linux were less available than for Windows, limiting the choices companies had for courses and locations, and 2) customers adopted a more conservative approach to training. Since Linux was new to IT, and would be a production platform, the number of classes per employee was higher than for Windows. Companies felt that because they already had several years' worth of experience on Windows, they would need to schedule more training to overcompensate for the lack of internal Linux knowledge.

- **Software spending was lower, but not free.** Linux can be obtained through several vehicles. Customers can go through distributors, such as Red Hat and Novell, to obtain the code, maintenance, fixes, patches, and support. Or they can take on the code themselves. It's interesting to note that the pricing models being offered from distributors for maintenance and support closely resemble the models used by commercial software providers like Microsoft. The cost of software isn't just the cost of Linux or Windows — there still may need to be investments in systems management and monitoring tools, either direct investments to purchase new products, or investments to upgrade/deploy Linux support in existing systems management suites. Even so, for the 14 companies we interviewed software costs for Linux proved to be less expensive, on a per-server basis, than Windows by at least 60%.

Figure 2 The Desire To Reduce Cost Drives Adoption Of Open Source

**"What benefits do you get or expect to get from
Linux and other open source software?"**

Low acquisition cost	86%
Low total cost of ownership	77%
Hardware choices	49%
Software choices	41%
Better security	31%
Familiar to our developers	24%
Higher quality	24%
Other benefit, not mentioned here	16%
Low acquisition cost	1%

Base: 85 North American firms that use open source software
(multiple responses accepted)

Source: March 16, 2004, Trends "Open Source Moves Into The Mainstream"

Source: Forrester Research, Inc.

- **The cost of maintenance and support represents the bulk of spending.** All five companies that had specifically tracked the total costs of their Linux deployments said that maintenance and support were their biggest areas of spend. The testing processes these companies used for Linux were more involved than for Windows. Companies told us they wanted to make sure Linux would integrate well with their other platforms and that application suites would run in both environments. In all five companies, the firms chose to obtain maintenance and support from external vendors like Red Hat and IBM, even though they had made significant investments in internal IT training. Although we heard time and again that the frequency of Windows patches — due to security concerns — was increasing the costs of supporting that platform, companies still said Linux was costing them more in this category than Windows. The cost differences were mainly isolated to companies that were running Linux in a mixed operating systems environment, and ranged from 3% to 14% higher than Windows.

  One CIO of a large US-based manufacturing company said, "We planned pretty well, we did a lot of training, but testing is taking longer than we expected." Another VP of a medium-size healthcare organization said, "The number of people I have assigned to Linux is almost double my Windows staff for the same number of servers. Some of this is learning-curve related, but honestly, this was a surprise." She went on to say, "We think this will get better as we gain more experience, but I didn't expect it." As

companies gain more experience with Linux and other open source platforms and the tools to manage these environments mature, we expect costs to decrease in this category. But vendors will also be moving more aggressively to package consulting and support services for these platforms, essentially commercializing open source as they've done with packaged software suites.

- **Linux skills are expensive and hard to find.** The 14 companies we spoke to said they had a hard time finding qualified Linux personnel in the marketplace to support their Linux projects. When these companies did find third-party help, they had less leverage negotiating hourly rates than with other Windows consulting resources. Although these customers have been running Linux for more than a year, some of the issues with availability and pricing have already begun to change. As these platforms become more pervasive, and more consulting firms develop these skills, the market will become more competitive, but for now that outside help is likely to cost an estimated 10% to 20% more per hour over similarly skilled Windows help.

- **Hardware savings are significant for Unix customers moving to Linux.** One of the customers had moved from an HP-Unix environment to a Linux platform. It ran Linux on smaller, cheaper servers, saving almost 45% in hardware and hardware maintenance to run the same workloads. And the savings weren't just relegated to the cost of the box. The number of support technicians required for Unix was estimated to be one technician for every eight Unix servers. The company estimated that one technician could now support 15 to 18 Linux platforms and that these ratios would just get better over time.

- **Linux-only deployments are also less expensive.** The other situation where a customer saved significant amounts of money with Linux was in a new, "greenfield" deployment. This company was building a new IT organization from scratch for a startup division of its organization. There was no legacy environment to migrate from and no requirements for multiple operating systems to support. The CIO of this technology company estimated his Linux deployment, "Cost us around 20% less than it would have cost us with Windows." Most companies, though, don't have the luxury of building a brand new IT organization.

Keeping Down The Costs Of Open Source

Customers with experience in open source deployments have said that good planning is the key to keeping costs low. It is important to understand that the cost of open source deployments will vary dramatically company by company, however, there are common areas companies should address to avoid financial surprises.

- **Have an open source strategy.** The decision whether or not to deploy open source technologies should be driven by the needs of the business, and be part of an overall IT strategy. These decisions will broadly impact the organization, affecting everything from the choice of business applications the company can use, to the legal, regulatory, and financial risks of the organization. Decide how open source will be used, the way these platforms will be governed, how this code will be supported, how it will be secured, and whether or not the IT organization will be allowed to change the code. Keeping costs low involves executing a formal plan, knowing where you are going, why, and plotting a path to get there. Installing Linux next week because your CFO is mad at Microsoft is probably not the best business decision.

- **Establish the rules.** Companies that are trying to mitigate the cost of open source need to establish the rules around these platforms well in advance of deploying them. What licensing model(s) will be used? Will internal IT staff change the code? Should the organization purchase maintenance from a distributor like Red Hat? Or, should the company buy maintenance and support from a company like IBM? What testing processes will be used for these components? How will security be dealt with? Can the IT staff download code from the community, like a hardware driver? Establishing the rules governing development, maintenance, security, and support is not only important and necessary — it is one of the keys to saving money. Companies that are just venturing into open source now should obtain qualified outside assistance with planning before installing any of this code.

- **Licenses may be free, management of licensing is not.** There are several different licensing models companies can use with open source.[3] The choice of licensing models will depend on several factors and the most important — will the customer change the code? Companies need to pay particular attention to open source licensing, since a poor choice will not only cost significantly more money, it can also dramatically increase the risk to the organization as a whole. For example, if a customer is planning to change the code, does the licensing model that was chosen obligate the company to distribute those changes back to the open source community? If so, has money been set aside for that process? We recommend companies establish open source advisory groups to deal with the licensing and associated due diligence issues.

- **Limit development.** Companies have understood for a long time that it costs much more money to support a custom or customized environment than it does to support a packaged software environment. Open source is no different. If an organization wants to limit its financial exposure, the best alternative is to avoid changing the code. Remember, if you change it, you own it, and you support it. Just because a programmer can change the code, doesn't mean they should.

- **Negotiate with commercial software providers.** One of the interesting IT spending trends we've seen in the past two years has been lower spending for new commercial licenses and higher spending for maintenance and support — that's because the costs of maintenance and support have been rising steadily over the past three years. Companies with a defined open source strategy can negotiate with commercial software providers to reduce these costs. Vendors, like Microsoft for example, want to protect their install base, and will give some very attractive discounts and concessions, especially in the next few months before the fiscal year end.

THE RISKS OF OPEN SOURCE ARE DIFFERENT THAN COMMERCIAL SOFTWARE

Open source technologies are not without risk. One of the primary reasons commercial software companies exist is to shift the burden of maintenance, upgrades, and support away from internal IT. Commercial software companies take on the burden of operability, provide warranties on workmanship, defend against copyright infringements and intellectual property claims, and commit to supporting these platforms for specified periods of time. The open source movement shifts all of those burdens to the customer. There is so much hype right now surrounding the risks of open source that it can be difficult for customers to know what is real and what is just politicking.

Risks Are Unique, But Commonalities Exist

The risks of open source will depend somewhat on the individual customer environment, the industry the company is operating in, the knowledge and skill of internal personnel, the licensing model chosen, the organizational and governance models the company is employing, and whether the customer intends to change the code. We recommend companies develop a risk assessment team to examine each of the risks of open source, rate those risks in the context of their organization, and recommend strategies to mitigate those risks before proceeding with the development of an open source strategy. The follow areas of risk should be considered:

- **Warranty.** If the company makes changes to the code and provides that code to other organizations via either a product or service using that code, it may be assuming liabilities for the quality and workmanship of the platform. Incidents of downtime or processing errors that affect business partners or customers could become a legal and financial liability.

- **Copyright infringement.** Companies need to be especially careful around the topic of intellectual property. In the US, copyrights have been filed for not only lines of code, but also for topics such as look and feel, technical, or operational processes. A programmer does not have to copy a line of code to infringe on a copyright or intellectual property.
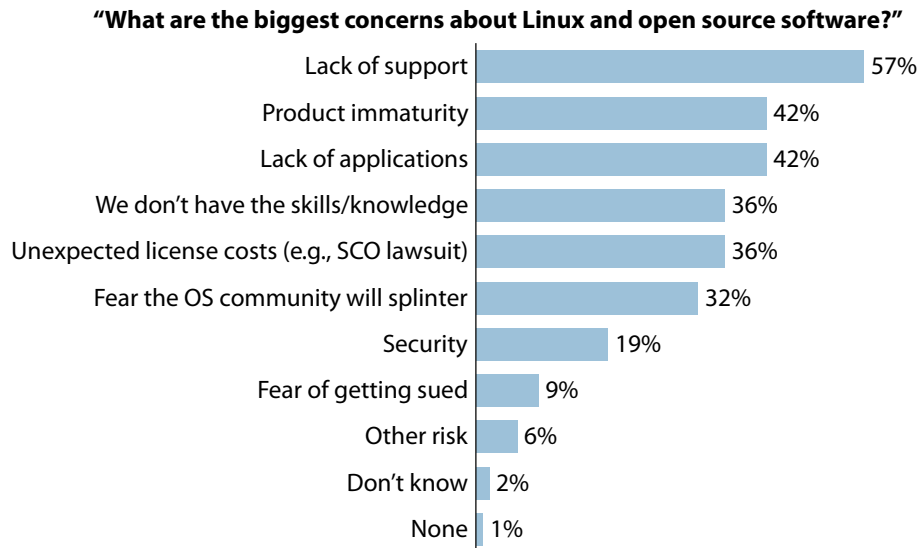
- **Regulatory and compliance.** Companies in regulated industries have to be concerned with regulatory compliance. For example, the FDIC alone can issue more than 30 regulatory changes a year to the banking community.

- **Operability.** Companies that make open source components or products and services running on open source components available to customers or business partners run the risk that the code won't work in the customer's environment. Support for older hardware, integration with older releases of other operating platforms, and problem resolution assistance may be implied in the existing contracts between the company and its partner. Companies that are making open source components or systems available outside the walls of the organization need to make absolutely sure no contracts exist that place them at risk. Companies should undertake, with the assistance of their legal department, a review of all contracts for products and services that may exist in the organization. This includes any existing agreements for business products, services, and support.

- **Licensing and usage rights.** Companies can easily make a mistake surrounding the licensing of open source code, especially when employees often just click through the usage rights posted on free software Web sites. A GNU Public License, for example, could force the unwitting company to release to the open source community — and therefore to competitors — any code changes made to these platforms. This could be disastrous. And, the problem isn't isolated to mistakes with the wrong license type. In some cases, a company's commercial software licenses may restrict usage rights in such a way as to limit, or prevent, interfacing open source components to the platforms.

- **Security.** Open source advocates say these platforms are more secure than commercial software because they are open. But we think the biggest reason there haven't been more hacker attacks on open source is the relatively small footprint these components have within the enterprise. It is not at all uncommon for a company to have 50 Windows servers, three Unix servers, and two Linux servers. Which platform do you think hackers will target? Companies should not be lulled into a false sense of security with open source. It is open, available to anyone that wants to do harm, and, therefore, needs to have special attention with testing and security.

Dealing With Open Source Risks Requires Knowledge, Planning

The risks to the organization with open source components are different than other platforms; however, companies can move to lessen these risks with some common sense approaches.

- **The biggest concern companies have with open source is the lack of support.**
  More than half of the 140 companies surveyed rated the lack of support as a primary
  concern with open source. Even companies that have installed open source worry
  about support (see Figure 3). Fifty-seven percent of those firms said support was their
  primary concern. In fact, when we asked companies why they did not have plans to
  use Linux open source, 53% said that a lack of support was one of the top reasons (see
  Figure 4). Companies can mitigate some of the support risks by employing the skills
  of third-party providers. Linux distributors like Red Hat and Novell are now offering
  maintenance and support offerings for this platform. Increasingly, services providers
  like IBM, HP, EDS, and CSC are offering support for many of these technologies.
  Customers sign maintenance and support contracts much like those for commercial
  software, and receive product updates, fixes, and problem resolution support in return.
  Companies that plan to support the code internally can purchase support incidents,
  or hours, from a knowledgeable provider — just in case they run into something they
  cannot resolve quickly.

- **Review software licensing models.** Companies need to be deliberate about their
  choice of licensing model, and make sure the model aligns with their intentions.
  For example, a customer that chooses a GPL licensing model may be bound to
  release all changes (including proprietary intellectual property) to the open source
  community, whether it intended to or not. Further, understanding the history of the
  code development is important because the company could discover that someone,
  somewhere, infringed on copyrights earlier in the development of the product — this
  is the basic issue with the current SCO lawsuits.[4] Due diligence is a key part of
  licensing open source components.

- **Don't change the code.** The easiest way to mitigate risks is not to change the code. Of
  the 140 companies we surveyed, 22% said they changed the code, perhaps that is not
  a surprise. But 46% said they looked at the code and didn't change it.[5] How do their
  companies know they didn't change the code? It is 4 p.m., your Web site is down, it's
  the busiest time of the day, the programmer can see the code causing the problem
  and he doesn't change it to fix the problem? Of the 14 direct customer interviews we
  did, only one company said it had a formal audit process in place to ensure the code
  didn't get changed. We recommend every company installing open source components
  involve their internal IT audit department, schedule regular periodic audits, and treat
  open source as they would any custom code in their environment.

Figure 3 Customers Using Open Source Say Support Is Their Biggest Concern

"What are the biggest concerns about Linux and open source software?"

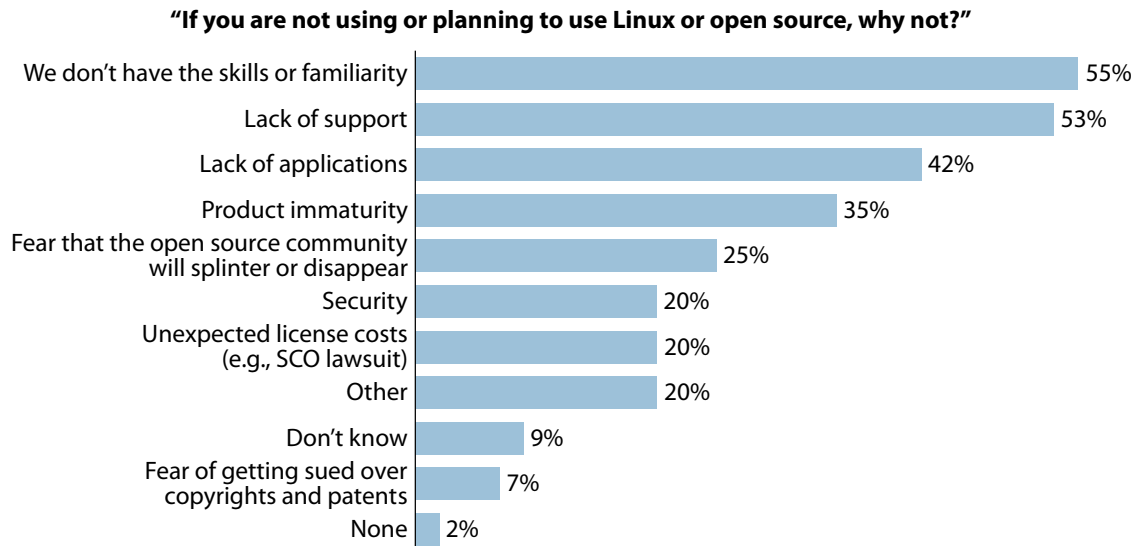|	
Lack of support	57%
Product immaturity	42%
Lack of applications	42%
We don't have the skills/knowledge	36%
Unexpected license costs (e.g., SCO lawsuit)	36%
Fear the OS community will splinter	32%
Security	19%
Fear of getting sued	9%
Other risk	6%
Don't know	2%
None	1%

Base: 85 North American firms that use open source software
(multiple responses accepted)

Source: March 16, 2004, Trends "Open Source Moves Into The Mainstream"

Source: Forrester Research, Inc.

Figure 4 Companies Reject Open Source Due To Lack Of Support And Skills

"If you are not using or planning to use Linux or open source, why not?"

We don't have the skills or familiarity	55%
Lack of support	53%
Lack of applications	42%
Product immaturity	35%
Fear that the open source community will splinter or disappear	25%
Security	20%
Unexpected license costs (e.g., SCO lawsuit)	20%
Other	20%
Don't know	9%
Fear of getting sued over copyrights and patents	7%
None	2%

Base: 55 North American firms that do not use or plan to use open source software
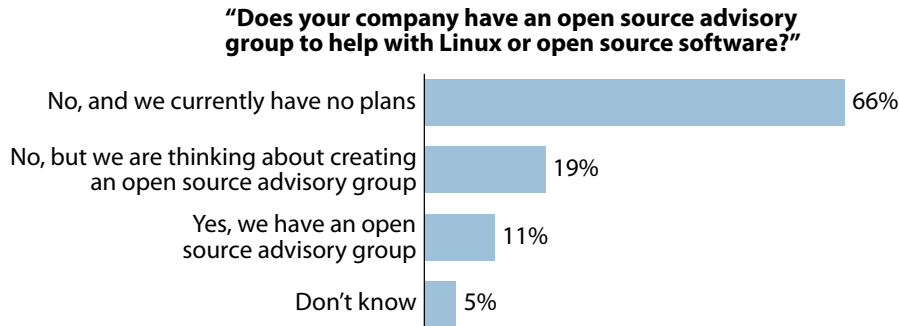(multiple responses accepted)

Source: March 16, 2004, Trends "Open Source Moves Into The Mainstream"

Source: Forrester Research, Inc.

- **If you do change code, isolate the development.** Just because open source is open, doesn't mean companies shouldn't approve and control any changes to the code. In fact, we recommend companies establish formal review and approval processes for any change proposed to an open source component due to the liability issues outlined above. We further recommend companies isolate the development staff allowed to make these changes and give permission only to the most experienced members of the organization. This way, companies can ensure their most qualified staff is responsible for adherence to company policies. These measures may be modified in the future as open source components become more widely used and as experience grows.

- **Form an open source advisory group.** Only 11% of companies have established an open source advisory group, despite the fact that more than 60% have, or will be installing these components this year (see Figure 5).

We have received quite a few questions from clients about these advisory groups during the past several months, for example: Who should participate in an open source advisory group? What should the charter of a team look like? We strongly recommend companies establish these teams with representation from legal, IT, internal audit, the IT steering committee, security, and any vendor representatives that may be involved in creating or supporting open source. The charter of this group should:

- Establish licensing standards and perform licensing due diligence for the organization.

- Formulate internal development, testing, and change management processes for open source.

- Participate in the risk assessment group, rating and ranking the risks of open source, and formulating strategies and processes to mitigate those risks.

- Watch the developments in the open source community to ensure adequate development and support for the components the company is using.

- Develop guidelines and approval processes for changes to open source components.

- Create a support infrastructure, including identification of external vendor support resources that could be available in a crisis.

- Work with HR to develop internal training, and external hiring needs surrounding open source platforms and technologies.

Figure 5 Few Companies Have Open Source Advisory Groups

"Does your company have an open source advisory group to help with Linux or open source software?"

No, and we currently have no plans — 66%

No, but we are thinking about creating an open source advisory group — 19%

Yes, we have an open source advisory group — 11%

Don't know — 5%

Base: 85 North American firms that use open source software

Source: March 16, 2004, Trends "Open Source Moves Into The Mainstream"

Source: Forrester Research, Inc.

RECOMMENDATIONS

COMPANIES CAN MITIGATE COSTS AND RISKS OF OPEN SOURCE

The costs and risks of open source are real, yet companies can do a lot to minimize these problems:

- **Plan appropriately.** Open source can provide great benefits but companies have to cover the bases before deploying these platforms.

- **Establish risk assessment teams.** Getting the business unit executives, audit, finance, and security to assess and plan for the company's unique risks is a crucial component of a successful open source strategy.

- **Minimize change.** Companies that avoid changing code can save money and lessen the total risk to the organization.

- **Get an advisory group.** Although few companies have formalized this function within their organizations, it is crucial.

- **Get help.** Companies should employ the services of third-party providers, if only in small, emergency support contracts to minimize the risks of downtime and other production problems. Once a company has more experience with open source, it may be able to shoulder this maintenance and support burden; however, in the short term get experienced, outside help.

- **Track costs.** Fewer than half of the companies we spoke with actually knew whether they had saved any money with open source, yet the majority said it was the primary driver in their decision to move to the platform. Establish ongoing measurements for support, maintenance, cost of management tools, cost of governance and oversight, and costs of training.

ALTERNATIVE VIEW

OPEN SOURCE WILL MATURE

As open source adoption continues to grow, and as commercial services providers, such as EDS, HP, CSC, and Cap Gemini Ernst & Young, improve their open source offerings, customers will have more choices available to them for support, which will be less expensive than it is today, and the tools available in the market to manage these platforms will become more robust and mature. It is possible, if the service provider community accelerates their support of Linux and other open source components, that the cost of these resources will fall this year.

SUPPLEMENTAL MATERIAL

Methodology

Forrester fielded an online survey to 140 US and Canadian companies that belong to the Forrester Executive Research Panel. We motivated respondents by offering them a summary of the survey results and a chance to win a $50 Amazon.com gift certificate. We heard from a mix of companies: 50% with revenues more than $1 billion, 20% with revenues between $500 million and $1 billion; and 30% with revenues less than $500 million. Additionally, we did in-depth interviews with 14 companies that had been running Linux for longer than one year to determine the impact to IT costs.

ENDNOTES

[1]   Forrester surveyed 140 large companies in North America to find out their open source plans. While 39% will avoid open source for now, the 60% majority are adopting open source — and half of them use it for mission-critical applications. Linux and Apache lead the list, but MySQL and Tomcat are close behind — and even the desktop is in play. See the March 16, 2004, Trends "Open Source Moves Into The Mainstream."

[2]   Our current forecast for US IT spending for 2004 is for growth of 4% from 2003, with 6% growth in 2005. Growth will be led by spending on computer hardware, which will be up 9% in 2004 and 13% in 2005. See the December 29, 2003, Planning Assumption "US IT Spending Forecast for 2004 — Up 4 Percent, as Spending Outpaces IT Budgets."

[3]   Enterprises are intrigued by open source software — but stymied by myths of cost, support, and risk. Smart firms will master these myths to get the open software stack they want. See the September 23, 2003, Report "Your Open Source Strategy."

[4]   SCO Group has filed a series of legal actions claiming copyright infringement by IBM in the creation of the Linux kernel by using SCO Unix code. SCO has also sent notification to numerous companies using Linux, seeking damages for this alleged infringement of its copyrights. The legal actions are pending in the US court systems. See the May 23, 2003, Report "Mitigating the Risk: SCO Group (Caldera) Puts 1,500 Companies Using Linux on Notice" and see the December 5, 2003, "Perspectives: What if SCO Wins — Linux Contingency Planning."

[5]   Forrester surveyed 140 large companies in North America to find out their open source plans. While 39% will avoid open source for now, the 60% majority are adopting open source — and half of them use it for mission-critical applications. Linux and Apache lead the list, but MySQL and Tomcat are close behind — and even the desktop is in play. See the March 16, 2004, Trends "Open Source Moves Into The Mainstream."

FORRESTER

Helping Business Thrive On Technology Change

Headquarters

Forrester Research, Inc.

400 Technology Square

Cambridge, MA 02139 USA

Tel: +1 617/613-6000

Fax: +1 617/613-5000

Email: forrester@forrester.com

Nasdaq symbol: FORR

www.forrester.com

Research and Sales Offices

Australia	Japan
Austria	Korea
Brazil	The Netherlands
Canada	Poland
France	United Kingdom
Germany	United States
Hong Kong	Spain
India	Sweden
Israel	

For a complete list of worldwide locations visit www.forrester.com/about.

FORRESTER®

34146