

White Paper

The Practical Use and Operational Value of Kingston Client SSDs

End-user Research Analysis

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May, 2011

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Introduction

There's a lot of buzz around the advent and adoption of solid state drives/disks (SSDs) in all parts of the IT world—from tablets, through laptops and servers, and all the way to data centers. And yet, in many instances, there's little or no good analysis when it comes to users really think about SSDs: what operational and financial value do they expect and what do they actually get? Are they happy with their decisions? Are the benefits they get measurable and quantified? What are the operational advantages? Will they buy more?

Kingston Technology wanted to find out more about the genuine operational use and practical value of its client¹ SSDs. This paper represents a detailed report of end-user research interviews ESG conducted in order to achieve this. The interviews covered 14 different organizations with headcounts ranging from 1000 to 200,000 and revenues ranging from \$250M to over \$200B. These users represented a broad range of SSD experience (from just getting started through to 2+ years) and the majority had (as is typical) a low adoption rate to date. By far the most common operating system was Windows XP, but the group also included users of Vista, Windows 7 (which just about everyone was moving to), and others; most all respondents had encryption for their SSD-based devices and were running a broad array of applications.

At a summary level, certain points are clear from this project:

- Client device SSDs are delivering substantial value to end-users:
 - The majority of adoption is for mobile users although there's a notable subset of desk-based "power application users" as well.
 - There was an even split between SSD being acquired via net new purchase or being retrofitted to existing equipment.
- Value is just as likely to be measured in softer (although nonetheless still useful and desirable) operational benefits as it is to be translated into strict economic benefits;
 - Users generally spoke in glowing terms about the increased general satisfaction level of their SSD users (and a number had such an improvement as a goal).
 - While strict performance improvement was the driver in some cases—and appreciated in all cases—the most common reason SSD purchase was improved ruggedness compared to HDDs.
 - In terms of performance specifics, a good guide for targeted "power" applications was to reduce the time taken by 80%; general users reported boot times reduced by 50% or more as well as dramatic improvements in the time to load/change between applications (that could save many minutes per user per day).
 - The typical additional costs per user per week for having SSD could be justified (in terms of burdened labor rates) by the saving of literally just a few minutes per day. Aside from the power users (a notable exception), most of the respondents' organizations were happier to measure in this manner (time saved + generally improved satisfaction) than to drive to rigorous analysis and measurement of productivity improvements.
- Many users have so far only "dipped their toes" in the waters of SSD:
 - Some are using their SSDs for specific low hanging fruit applications where the benefits are extremely obvious.
 - Some are moving deliberately slowly as they test and evaluate the value of a new technology.
 - Some are struggling with the continuing acquisition cost delta between SSDs and HDDs even when they are happy with the value, they are getting from the more expensive SSDs. This is

¹ The term "client" is what Kingston uses to describe devices with, generally speaking, PC-like functionality. The respondents to this research used a variety of descriptors from PCs, to clients, to desktop infrastructure, to endpoint devices.

further broken down by some organizations where the impact of the economic slowdown is still being felt in terms of budget constraints and others where it's simply a sticker price issue (despite the fact that in most cases providing an SSD for an individual end-user costs only a \$2-3 per week depending on the organization's asset replacement policy, which, in the majority of organizations, would seem fairly easy to justify).

- A significant minority are frustrated by the lack of SSD choice offered by their chosen PC/laptop provider.
- Kingston is extremely well-regarded as a supplier by its client SSD users—a simple rating (from 1 to 5) produced a 95% positive rating for Kingston in this area:
 - Not only are users overwhelmingly planning to do more SSD business with Kingston, they are also overwhelmingly willing to recommend Kingston SSDs to their peers.
 - Most of the respondents had previously, and successfully, used Kingston for memory products.

Research Methodology and Notes

ESG conducted 14 in-depth end-user interviews from mid-January through March 2011. Detailed qualitative interviews (average length was 50-55 minutes) are a good compromise between mass but inflexible online or postal surveys and the lack of balance—or ability to draw general conclusions—that can result from individual case studies. Interviews were conversational and investigative in order to draw valuable insight from the respondents. ESG then analyzed the results in order to project a likely value for those considering SSD technology, as well as to draw lessons and other useful comments.

Interview Comments: Comments have not been identified by respondent as most users wished to remain anonymous; for others, the effort and complexity required to get approval for external publication was deemed too great given that these interviews were conducted independently. Furthermore, the comment sections have been organized in random order so as to fully protect the respondents from any particular comments being attributed to them or their organizations. This is partly just common courtesy and partly because this is a “warts and all” commentary on the respondent organizations and their approaches and self-knowledge as much as it is on Kingston and its client SSD products.

Respondent Demographics

Table 1 is a summary of the industries and revenues represented by the interviewees. The middle column shows the overall headcount of each organization as well as the number of IT personnel employed. The far right column summarizes “SD experience” in terms of how many months each organization had SSDs in use at the time of ESG's interview along with the percentage of each organization's client devices currently using SSDs.

As the table shows, a good range of industries and organizational sizes were surveyed. Headcounts ranged from under 1,000 to 200,000 with revenues (at least those that were public) ranging from \$250M to over \$200B. The organizational headcounts—both in total as well as those of each organization's IT as a proportion of its total—also varied widely, showing a broad respondent selection. IT might, in some cases, be under 1% of the personnel while others had IT at 10% (or in one case even 18%) of the overall headcount. Users had SSD experience ranging from “literally only just at the POC²” stage to two years or more in four cases. Many users were at a low adoption level of SSDs; half of the respondents were at 5% or less (of which five were at 1% or less), although a couple were around 30% and one at 75%.

² Proof of Concept

Table 1. Respondents by Industry, Headcount, and SSD Experience

Industry / Revenue \$M	Headcount (IT)	SSD Time / %
Electronics Manufacture / 250	600 (33)	18m / 30
Online Retail / 9,000	20,000 (250)	30m / 5
Insurance / 15,000	30,000 (3,000)	3m / <1
Advertising / 2,000	6,200 (330)	24m / 10
Financial Technology / Private	800 (75)	12m / <5
Financial Services / Private	1500 (275)	15m / 75
Energy / 204,000	60,000 (1200)	3m / <1
Semiconductors / 1,900	9,200 (100s)	5m / c.10
Software / 80,000	92,000 (4,000)	24m / <10
Government Hosting / 5,000	25,000 (1000)	24m / c.12
Retail / 43,000	200,000 (1,600)	POC only / <1
Insurance / 9,000	8000 (200)	18m+ / 1%
Financial Services Co-Op / 415	1200 (120)	9m / 35+%
Financial / 54,000	50,000 (7,000)	6m / 0.5%

Source: Enterprise Strategy Group, 2011.

The specific respondents were senior managers³ responsible for their organization’s client infrastructure. Some interviewees also gave information on the server side of their business and any information relevant to the overall research study was kept for this report.

Who Chooses and Procures SSDs?

In almost all cases, the IT team was responsible for specifying the choice of SSDs—and certainly for completing the purchase. However there were a number of initial “motivators” mentioned as to why various organizations even started looking at SSDs:

The storage team decided ... there was some end-user pressure, plus “we were given a free one to try, which really helped move us along.”⁴

“Our users suspected the SSD value and approached IT, who ran with it.”

“Our netbook vendor determined the idea as a pragmatic value choice.”

SSDs were originally just for the organization’s VPs and “special cases” but upper management pushed for broader adoption as they wanted everyone to have “the best.”

Users drove demand and adoption.

“Our developer group wanted special, better performance and less drive failures and then ‘roped in IT’ to specify which product and manage it all.”

Devices, Operating Systems, and “Client Device” Support Personnel

Table 2 summarizes the overall number of “client” devices (i.e., devices with PC functionality) split by desktops and portables together with the main OS and the number of FTEs supporting the client device infrastructure.

³ Sample titles included IT Director, IT Lead (Ops), IT Professional, End User Technical Manager, IT Infrastructure Engineer, Director of Client Technology, Manager of Global Hosting Services, Director of Sys Admin., Systems Director, Head of IT Procurement, Global HW Product Mgr.

⁴ Throughout this report, the *blue italicized lists* are the raw noted comments taken from the interviews with the respondents; any direct verbatim quotes are shown as such while all the other phrasing and points are direct from the interview notes.

Note that there are fewer entries compared to Table 1 due to the less relevant server focus of a few respondents.

Table 2. Respondents: Number, Style, and OS of Client Device, plus Specific Support Headcount

# of Devices / Main OS	Desktops / Portable	Support Heads
1100 / XP	700 / 400	8
32,000 / XP	16,000 / 16,000	600
6,800 / XP	3,400 / 3,400	30
750 / XP – 90%	350 / 400	10
2200 / XP – 65%, W7 -35%	300 / 1900	31
80,000 / Vista	40,000 / 40,000	15 (core only)
6,000 / XP + W2000	1,200 / 4,800	30
275,000 / W7 80%	275,000 total	100 (core only)
33,000 / XP	23,000 / 10,000	155
11,500 / XP	8,000 / 3,500	20
1,200 / XP	300 / 900	14
100,000 / XP	82,000 / 18,000	c. 1,000

Source: Enterprise Strategy Group, 2011.

Table 2 both reveals and obscures some interesting notes. For instance, despite the preponderance of XP, everyone was at least testing Windows 7 and many expressed an intention to migrate (some citing that “at least Windows 7 knows what an SSD is!”) although it was rare for Windows 7 to yet have been declared an official standard. In terms of devices, the bigger the organization, the more likely respondents were to state that the ratio between desktops and portable devices was “stabilized.” Note also that in a few cases, the number of devices exceeds the number of personnel; this is partly because some mobile employees have both static and a portable devices and also the result of those organizations having an extensive machine base for R&D and/or training facilities.

SSD Experience & Usage

Which Client Device Type Gets SSDs?

The results here were very clear: the prime traction for SSDs to date is in the mobile/portable market. Many respondents cited sales personnel and other customer-facing employees as early recipients of SSDs, although a number admitted to a straightforward RHIP (“Rank Hath its Privileges”) approach whereby senior employees receive SSDs regardless of need. To have SSDs thus become an IT “tool of ostentation” is an intriguing position for the industry, although it has likely long also been the case with any “cool” technology (BlackBerry, iPad, etc.), but it can slow adoption as much as speed it. For the majority of the need-driven mobile adopters, performance was mentioned as a desirable improvement, but by far the more prevalent intent was to improve the ruggedness and durability of those mobile devices. While in general, some users still expressed caution about the long-term reliability of SSD (simply because it has not yet—and could not yet have—been proven in the real world), one of the respondents had 20% of their portables (around 700 machines) with Kingston SSDs for two years without any problems.

Only one user had implemented specifically on desktops and that was for a high level, heavy duty analytics team where multiple SSDs were installed on each device and application performance was the clear—indeed, sole—driver. But, contrary to what one might expect, this was the exception rather than the rule.

“We only have SSDs on desktops with multiple drives per machine. They’re for a high level analytics team, using Xeon class machines, that needed more performance but had already ‘maxed-out’ on RAM and processor upgrades ... which left their old spinning storage as the one remaining bottleneck”

Mobile users and applications only; while it is just “getting serious,” this organization had been testing SSDs for two years, although with no early commitments because it did not feel the cost/performance equation was enough initially. Now starting adoption, it feels SSDs are particularly “natural” for tablets and slates which suffer “abusive mobility.”

“We’re putting SSDs on laptops only as we don’t think they are needed on desktops.” Initially, the SSD use was a test for this user, but now all its new laptop machines automatically include an SSD.

Are SSDs Adopted via Net New Devices or Retrofitted?

In terms of how SSDs are being added to organizations’ asset bases, the results were evenly split between net new and retrofitting. Just a handful of users were doing both and even then they typically had a significant preference for one or the other. Both approaches had some good logic and a number of users reported having become more pragmatic as end-users clamored to get an SSD after seeing others in their organization with them.

Retrofits

“We have to retro fit SSDs because our laptop provider won’t do what we want—we’re pushing them hard to make it easy for us to get the SSDs we want on new devices.”

“We would ultimately like to buy SSDs from scratch when getting new machines as the retrofitting option can easily cost us \$70 to \$140 of technical support costs per hour to make the change, which can effectively double the cost of the SSD!”

Net New

One organization had an interesting approach to getting SSDs on net new machines: its VAR actually rips out the standard-supplied HDD from the new devices (it has the standard problem of its PC OEM not supplying the SSDs it wants pre-fitted) before end-users receive them. However, those HDDs are not wasted but are kept as spares for the high failure rate they experience on HDDs and to replace drives seized for litigation investigations.

“We’ll only buy SSDs on net new machines—we don’t consider it worth the time and cost to add an SSD retroactively to an \$800-900 notebook ... we replace such machines every 2-3 years in any case, at which point the extra \$200 or so [plus a little IT time] is perfectly OK.”

This organization prescribed standard-issue 12” notebook using an ultra low voltage processor, so an SSD is a good match.

What Motivated the Investigation and Purchase of SSDs?

The reasons why respondents went toward SSDs—what motivated the investigation and what they were hoping to get from adoption—were very interesting. Performance improvement (whether for boot times or for application response) was, not surprisingly, the motivation that received the most mentions; and it is only fair to report that there was a small minority of applications and users for whom performance was absolutely critical. However, for many other users, although performance was mentioned, it was more of a “nice to have” rather than a “need to have.” In such cases, it was secondary to the desire to gain either reliability/durability or power consumption improvements. Put differently, improved performance received the most mentions overall, but not more “number one” mentions than durability and power. Also interesting was the fact that power consumption was very much a black and white issue: either vitally important or cynically dismissed as barely noticeable. There were no gray areas. This would logically be attributable to some other factor in play at an organization—perhaps the sheer availability of power or a particular “green” or efficiency focus.

We got SSDs to “breathe life into our older infrastructure ... and to enable encryption, which is necessary to enhance the security of corporate information on our portable devices, and which we have found makes a regular HDD-based machine way too sluggish.”

SSDs at this organization were “for more performance ... period.” Its heavy analytical users had nowhere else to turn to get the requisite performance. As a consequence, this organization set no real goals for its SS’s after a successful POC because the performance justification was so strong.

“Industry regulations mandate that all our data must be encrypted ... which essentially made SSDs a prerequisite for us as file decrypt and encrypt had been giving us huge IO problems. We’d changed each part of the hardware except the HDDs which were shown to be anchors and bottlenecks on our business.” This respondent further noted that although users needed portable devices for their jobs, they had “hated” them prior to getting SSDs added because they were 4-5 times slower to boot and load applications than their old desktops!

This user quoted “two and a half reasons” for getting SSDs:

1) Performance – this organization remains a little skeptical of the value here, saying “you need a whole bunch of users to go from 1.5 hours to 20 minutes on something before it’s worth it.”

2) Durability – seen as a major upgrade (although the respondent also noted that their ruggedized “Toughbooks” were still functioning on spinning—although perhaps not “regular”—drives!).

3) The “half” reason this user gave was improvement in battery life (per charge, not longevity).

“We’d had lots of HDD failures both generally and then a particularly bad rash. SSDs were bought largely to address this issue; yes, raw speed and application performance are nice, and even desirable, but basic reliability is the number one key driver for us to move to SSDs.”

One organization was very focused on “saving Watts” especially in many areas of Asia where power availability is at a premium. Some of its developers also needed “the extra oomph!”

Is Software Encryption Used?

More than 80% of the respondents were using some form of software encryption, although a wide variety of tools had been employed: Sophos, SafeNet, Credant, Pointset, SafeGuard Easy. Two respondents were already using the BitLocker tool built into Windows 7 and three others mentioned definite plans to migrate to it in step with moving to Windows 7. Of the non-encryption users, one merely said “there’s no need; everything sensitive is on desktops behind locked doors” and the other is currently investigating options to add software encryption.

How and Why was Kingston Chosen as the SSD Supplier?

Almost no one had done a formal competitive benchmark before deciding to use the Kingston client SSD products; the nearest was a handful of users that had ended up doing more than one POC—the second of which was invariably with Kingston after various issues with the initial SSD provider (Intel had early supply constraints, for instance, as well as the TRIM issue which Kingston can overcome in hardware). In terms of market investigation, less than half of the respondents reviewed even basic comparisons and market studies, although for those that did the exercise was important and had a significant impact on their choice. Very often, Kingston was the purchase choice made *after* some initial one-off trial (whether or not that SSD was itself Kingston) provided by an organization’s PC vendor.

So, if there were not many formal benchmarks, how was Kingston chosen? The majority answer was pedigree and existing relationships; one of the most commonly heard phrases from the vast majority of respondents went along the lines of “We’ve used Kingston for years as a reliable and trusted supplier for memory; we’ve been happy and we were therefore pleased to be able to get SSD from them.” The educational “lunch and learn” events that Kingston runs regularly were specifically mentioned by a good number of respondents as the pivot point at which they started to look seriously at SSD. Both points are testimony to Kingston’s trust in the market, particularly with existing clients.

The only real negative for Kingston in this area is that many users expressed considerable frustration that they cannot work easily with their PC platform vendor to specify either SSD at all and/or the SSDs that they would like (Kingston's).

"We were going with Intel (that appeared to have the best performance and good overall specifications) until they hit the TRIM issue; Kingston had good timing and turned up with not only a sound product alternative, but one with a hardware TRIM solution. So we did some market research and reading as well as a POC with Kingston, which we found to be close enough in terms of performance and specifications and certainly enough for our needs. So far Kingston has been good—easy to deal with as we'd known from dealing with them for memory over the years."

This organization did not test anything other than Kingston, which they did a POC with; it saw no reason to conduct a "bake-off" as Kingston "... has been a sound source of RAM for many years and we have no reason to go elsewhere."

This is another example of a user that was heading down an Intel path early on; Intel was seen as "big and safe." However, demand soon exceeded supply with Intel lead times quoted at six months, so this organization looked to Kingston, which was seen as "good value and we'd dealt with them very satisfactorily on memory." This user actually did look at an independent benchmark model—especially with and without encryption. It found that encrypting without SSDs drove performance down to less than 45% of the norm but adding SSD in with encryption improved performance to around 170% above the norm! Since this user had been operating close to the benchmarking model's norm before adding encryption, the SSDs took them from potentially halving their performance to more than doubling it.

Operational Value

Operational value was a major area of investigation in the research interviews, with extensive comments from respondents. Many comments are recorded verbatim by category rather than user, but some high-level points are:

- Clearly, many users are measuring improved user satisfaction and reduced user frustrations just as much as they are measuring more standard and specific IT operational goals.
- Kingston SSD reliability has been excellent overall (in full disclosure, one respondent was a noticeable exception with around 10% early life failures, but ESG heard sufficient evidence from all the other respondents to assume that something else must be going on in that situation).
- Boot speeds have typically been reduced by 50% or more, even allowing for the addition of encryption.
- Specific heavy IO applications (such as analytics and Visual Studio) can see dramatic *percentage* elapsed time improvements (down to 20% of the original time is a good guide) and are also the most significant in terms of *absolute* time saved.
- Outlook opening in heavy use environments can drop from around 60-90 seconds to as low as 10-20 seconds.
- Battery life improvement is not noticed by most users unless they are specifically looking for it.
- SSDs are useful across a broad range of applications and users; there are no application restrictions either applied or reported found by users.
- Implementation and use of the Kingston client SSDs was universally reported as both very straightforward and successful.
- Somewhat surprisingly, most of the respondent organizations had set few—or no—specific goals surrounding their SSD acquisition and instead implemented SSDs based on a POC (although often still without specific goals other than "considerably faster") or merely to make users happier.

Reliability

"We have converted 30% (125) of our laptops so far to Kingston SSDs and have experienced NO failures."

This user had run about 700 portables for up to two years on SSDs and "you can count the number of failures on one hand ... and that's with a couple of fingers held down!" The respondent stated that this level of reliability was "literally an order of magnitude better than the HDD failure rate it had suffered."

"Our users have not immediately 'jumped for joy,' BUT the SSDs are definitely more stable (only a few of the 100 initially purchased were DOA) and our executive team loves the SSDs both in terms of the product and the concept."

"The reliability has been great ... we've had zero issues and that's with over 1,600 Kingston SSDs for over a year ... and compared to at least one HDD failure per month before across the same population."

"Also, reliability has been really good—both in our test bed and in the real implementations; so far the failure rate has dropped from around 5% per annum (for HDDs) to around 0.5% pa."

Boot Up

"Our boot up times were in the region of two minutes and could get up to five minutes—with the Kingston SSDs, the times dropped to under a minute and have remained under two minutes despite the addition of full disk encryption."

One user said boot up is much better, but was leery of quantifying.

"Boot up has gone from literally 10-15 minutes to around two minutes (at most) ... I think our users now—really—skip the extra coffee break! The SSDs have been a huge win for us as we wanted to keep our user community productive."

While one respondent admitted that boot times had gone from around three minutes to about one minute, he asked "but does that really change your life? After all, boots are pretty rare for us."

Specific Applications

"Our analytics team has experienced a 4-5X improvement with job run times dropping from five hours to one hour: they are very happy campers."

"There's been a notable improvement on building OS images—this saves us loads of time which drives up the productivity of people. An extra surprise bonus was that the time taken for the first encryption of a drive is way down too—maybe by 50-60%."

"Users are not waiting for applications to load—it's 20-30% better overall; specifically my best guess is that each user on average saves 30 minutes per day of 'just waiting.' That's valuable. For instance, opening Outlook has improved from taking around a minute to sub-ten seconds."

While this respondent reported many of its SSD-equipped users being rather unexcited ("ho-hum"), its Visual Studio Suite users had gone "from jobs taking something like an hour and a half to only 15-20 minutes." This, reported the respondent, was "SO much of an improvement that the users initially thought that the application had hung...!"

"Outlook opening has gone from over 90 seconds to around 20 seconds."

This respondent's implementation of SSD is squarely tied to BitLocker encryption, where it has enjoyed a 75% reduction in the time take n... from 4-6 hours to encrypt an HDD down to under one hour for an SSD. "Also, our application opening times are improved between 12.5% and 20%; with this helping 10-15,000 users every day, who cares about boot times!?"

"Our CAD application has a 25% better run time."

“I’m a little ambivalent—although, on a ‘nice to have’ basis, we have 80,000 seats, so if each one could avoid a little time wasted in waiting just a few times a day, that’s clearly good.”

“Our software developers have liked SSDs as their compile times are halved, going from 15 minutes to seven minutes.”

General IT and Support

“SSDs are helping to reduce time for IT to provide system upgrades—in other words, IT staff productivity is up. For instance, we upgrade most of our 2200 machines once per year and it was taking 2.5 to 3 hours for the OS image; with SSD, it’s now around an hour and going from Office 7 to 10 takes only about 30 minutes.”

One respondent only had anecdotal comments: “users are queuing up at the door to get an SSD.” This organization has not measured the results, but “everyone is happy so it [SSD] must be good.” This respondent also mentioned that “by the way, for financial reasons, we only give 128 GB SSDs versus 320 or 500 GB hard drives and yet we’ve had no complaints.” (Note that the replaced hard drives are kept for backup usage).

Note: many respondents reported reducing the capacity they provide when moving their users to SSD and almost no one had noticed or complained.

One downside surprise: one respondent’s recovery company (for failed drives) was unable to get anything off of a failed SSD.

One respondent had used a pilot group “who loved their ‘new’ laptops”—even though they’d only added SSD to old ones!

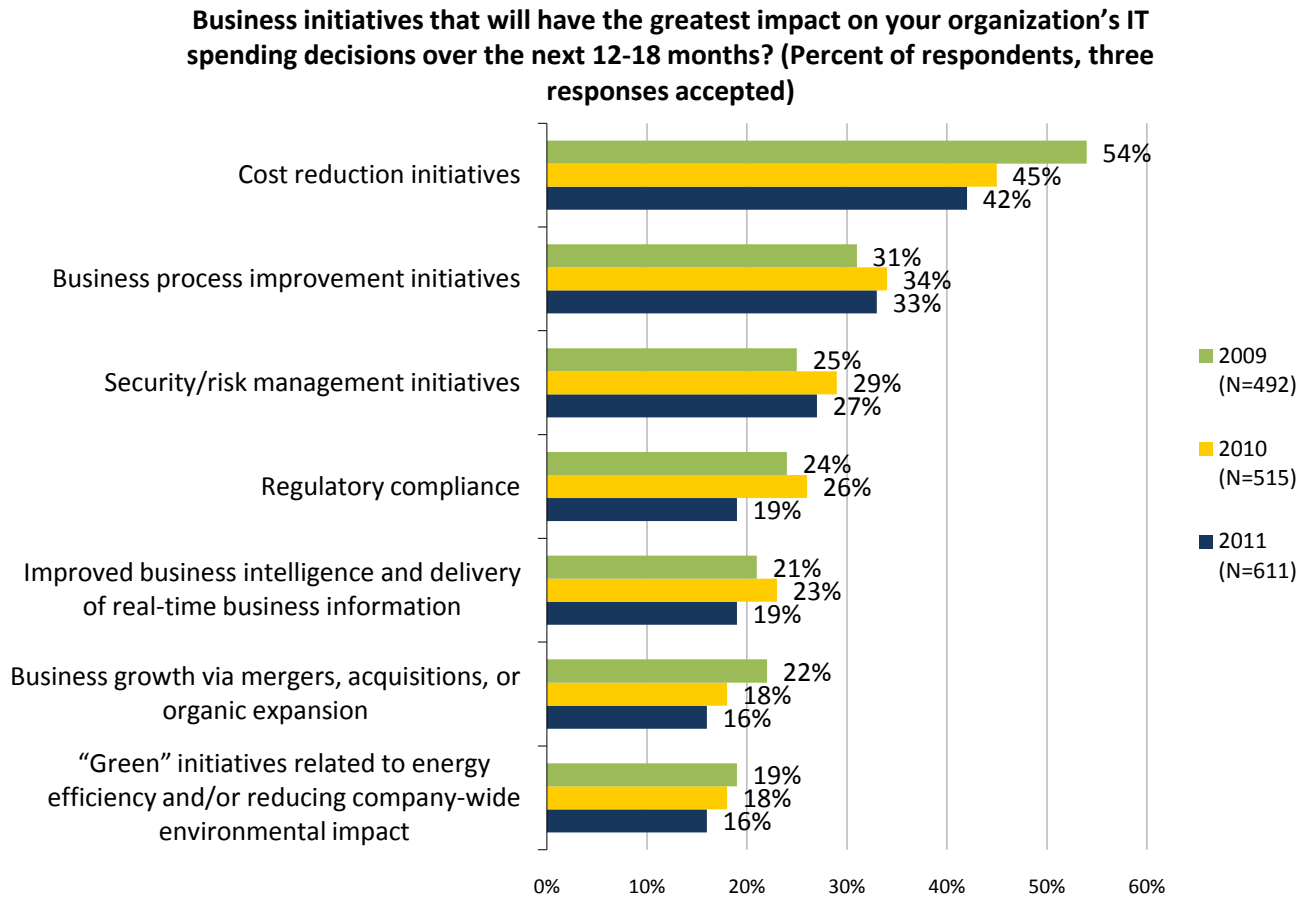
Business Value

Despite the lack of specific goals that most users had set for themselves when moving to adopt SSD technology in their client devices, many were able—albeit after some gentle interview prodding—to discover some pretty specific business benefits. Clearly, each potential new user of SSDs will be a unique case and will need to apply their own parameters to the comments below, *but* the findings from the respondents do two things:

- They help to size the kinds of savings and benefits that SSDs can bring.
- They also help potential adopters to start to think about the areas to investigate for business and financial opportunities.

This side of the equation is very important because ESG’s research shows that being able to show a mix of operational cost advantage together with business process improvement (precisely the sort of thing Kingston’s SSDs can provide to organizations) is exactly what management teams will look for in terms of the business initiatives that will impact their IT spending decisions. As can be seen in Figure 1, this statement has been true for the past few years and applies to users’ forward-looking view of IT spending.

Figure 1. How IT Expenditure Gets Justified, 2010-11



Source: Enterprise Strategy Group, 2011.

That said, it’s only fair to report that many of the respondents in this research were not investigating fully or adequately the opportunities and impact of their SSDs. Both Kingston and its users could be sub-optimizing as a result and further efforts here to investigate and measure the real and potential business impacts could help everyone.

Some specific summary points, followed by the usual more in-depth user comments, are as follows:

- Clearly, the reduction in real prices for SSDs is helping users decide to make the investment.
- While faster boot times are “nice,” most respondents struggle to turn that “recovered” time into measurable/credible productivity.
- Certain applications can give back huge amounts of time that is genuine productivity returned to/generated for a business.
- At a rough cost for a client SSD of maybe \$2 per user per week, one respondent pointed out that it doesn’t take a lot of productivity to make the ROI good. For someone costing a company a burdened rate of \$100k per annum, it’s less than three minutes a week for the company to break even.

“We budget around \$2k all-in for new “client” machines, but for around \$400-450 for both new SSD and upgraded memory we can extend the life of such machines from three to five years. This is a great ROI and TCO case ... by the way, although we have not calculated it precisely, we feel that the faster boot time (now only 60 to 90 seconds compared to many minutes before) precludes users from wandering off for coffee or a chat!”

One respondent was initially skeptical of value, but when pressed to evaluate more closely, agreed that faster boots were probably saving his organization 250+ man hours per year.

“Our typical user saves 10 minutes on boot and 30 minutes on non-productive waiting per day. What’s the value and cost of this is? Forty minutes of productivity! We’re also gaining a lot in terms of IT support staff productivity—returning 1.5 to 2 hours annually per machine of IT time ... which is valuable in itself (at the IT staff burdened rate) and a very big deal when we have over 2000 machines.”

“We did a POC for our CAD application which is mission critical to our business. Five years ago, it took 30 minutes to save a large design ... hyper-threading and multi-core processors took this down to 15 minutes ... and now SSDs have shaved another 4-6 minutes off of that. With 20-30 files per week per person being generated, that’s (at five minutes on average and 25 files average) around two hours of regained productivity per person per week—which is 5% of a typical 40 hour week. There’s always plenty of work to do, so it’s real value—and worth loads to the organization irrespective of the value of the output.

User Reactions & Next Steps

Future/Continued Purchases

There’s a wide range of user intentions regarding ongoing or future purchases of SSD; everything from “full steam ahead to 100%,” via “we’re going slow right now because budgets are still really tight,” to “we’re still not convinced.” In terms of whether anything will make companies go faster or slower the simple answer is the mighty dollar—both in terms of the health of the economy and the raw price of SSDs.

“SSDs will go to all field personnel plus senior ranking people ... and permit us to move to Windows 7 even on older machines. We don’t yet honestly know whether they’ll last. Our company is still in tough times so even \$300 matters.”

“We are stable—we’ve done the main areas in terms of SSDs so we will make additional decisions based on cost and the health of the company finances.”

“We’ve done [SSDs on] a third or more so far of our machines; users get them at hardware refresh time—whether laptop or desktop—and we should be around 100% by the end of Q3 2011. We have slowed a little (due to the economy plus a January freeze), but we will still get it all done.”

“All the SSDs have been seamless and great—we just wish we could afford more and faster!”

Many respondents are still frustrated that it’s tough to specify and get SSDs from their PC manufacturers.

Market Leadership?

When asked which vendor the respondents viewed as the leader in SSDs, there was pretty much an even split. Many viewed Kingston as the leader—a huge compliment to the company as these organizations invariably had neither experience nor had they tested any other SSD. Then there was the second camp that said it did not know (or did not have enough information to do so) who was the leader (a few mentioned Intel positively) but nonetheless this group invariably still viewed Kingston as a leader. As mentioned previously, many of the respondents had excellent long-term experiences with Kingston as a supplier of memory.

“We feel Kingston follows trends well, is top in performance, and we’ve had good past experience with Kingston.”

“I can’t be categoric on absolute leadership, BUT Kingston looks to be doing really well—we are initially skeptical of their controller, but all is fine.”

“We do consider Kingston ‘a’ leader in SSD.”

Will Respondents Buy More SSD from Kingston?

The logical, pragmatic, and highly important follow-on question to all the respondents was whether they would buy more SSDs from Kingston. There were a few indirect caveats (“we can’t guarantee forever” or “not buying right now” or “like to remain pragmatic”) but all else being equal, the essence of the answer to the question was 100% “yes,” which is very impressive. Many respondents clearly did not want to sound too unthinkingly “stuck” on Kingston, BUT clearly Kingston is generally very well liked and respected by its users.

Would Respondents Recommend Kingston to Peers?

When asked whether they would recommend Kingston SSDs to a peer, the 13 respondents that expressed an opinion scored over 95% positive (on a five-point scale from “Very likely” to “Definitely not”) in favor of Kingston. Only one respondent did not reply “Very likely” and even that respondent scored “Somewhat likely.” Again, this is an excellent endorsement for Kingston’s SSD from some of its biggest users.

The Bigger Truth

This exercise was extremely revealing. One might reasonably have expected before conducting this research to find that SSDs are bought entirely for performance gains, are relatively expensive, and would therefore be intricately measured in terms of both the expected and delivered benefits. However, it turns out that SSDs are being bought at least as much for ruggedness and reliability as for performance, are not actually so expensive (looked at in terms of cost per user over time), and tend to be implemented more on a general than on a specific improvement promise.

Given the supposed sticker shock that many users assert for SSD, it was surprising how few had really done much in the way of detailed analysis. To be fair, sometimes this was simply because the results with SSD were so much better that measurement seemed superfluous. However, given that price remains the biggest stated obstacle (even by existing users) to further or faster adoption, there are a couple of points that should be emphasized here:

- Even though it is tough to accurately measure the productivity impact (or, conversely, the opportunity cost) of an SSD for an individual user (and perhaps this is why many organizations were satisfied to gain “happier” users), nonetheless the impact to break even is small. Based on an additional net cost of \$2 per week to supply the SSD and a burdened employee cost of \$100k per annum, a company would recoup its investment based on that employee being productive for less than an extra three minutes per week. If actual business benefit can be produced, so much the better, but this, *prima facie*, seems a low bar to clear.
- When pressed, many users began to reveal/realize the considerable real business values that could certainly be measure in hard \$\$ rather than soft benefits of SSD’s impact. These surrounded specific applications as well as reduced IT support time and the like.

Certainly, this investigation showed that users were generally benefitting more from their SSDs than even they recognized. Both they and the SSD vendors, such as Kingston, would benefit from further analysis and capture of these hard benefits. Finally, in terms of Kingston itself, the vendor emerges from this review in a very positive light not only for its products but also for its business practices. Putting this together with the genuine—even if not always specific or apparent—business value of SSD produces a very promising outlook for Kingston client SSDs.



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