

## WHITE PAPER

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### The Business Case for Ruggedized PCs

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#### IDC OPINION

The past several years have witnessed a sea change in the personal computing industry, with a shift away from desktops and toward notebook computers. Despite the very difficult economic climate, worldwide notebook sales to the commercial market in 2009 expanded to account for a record 43.2% of PC client shipments, up from 25.6% in the six years prior.

This success has been fueled by factors such as the mobility and convenience notebook computers provide. They are now viewed as critical productivity tools vital to the proper conduct of business across a broad range of industries. But convenience and portability come at a cost. Because notebooks are so mobile, they are much more susceptible than desktops to dangers such as the wear and tear of travel, airport security, and everyday accidents such as bumps or spills.

A recent IDC study found that 19.6% of notebooks used in U.S. businesses break or require repair at some point in their lifetime. Taking into account out-of-pocket costs to repair them, as well as the cost of lost productivity and time required to repair and replace data, IDC estimates the cost to an organization is US\$2,373 for each notebook PC that suffers damage. This estimate does not even take into account the disruption to business continuity due to the loss of critical data kept on the notebooks, the cost of lost or delayed sales, and the potential for customer dissatisfaction.

As the number of notebooks in the workforce grows, the concern over damage to them is now reaching beyond the industries and functions that have traditionally purchased ruggedized notebooks such as manufacturing/construction, mining/utilities, and field operations. Notebook PCs have become the lifeblood for workers across all industries, and any loss or downtime due to breakage can prove to be critically disruptive to the business.

IDC believes that a sound notebook procurement strategy should incorporate clear metrics regarding product quality with an eye toward durability. Companies should look to procure notebooks that are built to withstand a variety of rigors, not just from dust, dirt, and extremes in temperature but also from day-to-day bumps and spills. Companies should look for notebooks in which key components such as keyboards and displays have been hardened while ensuring that the integrated parts are of ruggedized-grade quality.

## METHODOLOGY

To fully understand the costs to organizations of notebook damage, IDC performed an end-user study of 300 U.S. organizations. In this study, IDC interviewed CIOs, IT directors, and managers in organizations of all sizes and across a broad range of vertical industries to understand their usage of, downtime experienced with, and overall perspective on ruggedized notebook PCs. The study was conducted in December 2009.

## SITUATION OVERVIEW

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### **The Rise of Notebooks and Mobile Computing**

Mobile computing has become a critical tool for business and public sector entities alike. No longer confined to senior executives, notebook PCs are being used to expand productivity and streamline communications for a wide range of workers including office/administrative workers, salespeople, field service technicians, and, even to a lesser extent, drivers, delivery staff, and construction workers.

This trend is backed up by IDC's PC Tracker database, which shows that worldwide shipments of notebooks to the commercial sector rose 15.5% in 2008, whereas desktop shipments dropped by 4.2% during the same period. Despite the current economic environment, worldwide notebook sales to the commercial market in 2009 expanded to account for a record 43.2% of PC shipments, up from 25.6% in the six years prior.

IDC believes that this trend is irreversible. As mobile computers drive greater convenience and productivity for the workforce, notebooks will continue to proliferate in the work environment. While this will continue to have a net positive impact on business performance, it introduces some new forms of risk as well.

#### ***Greater Mobility Brings Greater Risk Due to Damage***

One of the key risk factors with mobile computing has to do with the safety and security of the hardware itself. Mobile systems are naturally more prone to risk of damage than desktop systems; thus, they are more sensitive to the environment in which they operate and require more attention to their care and usage.

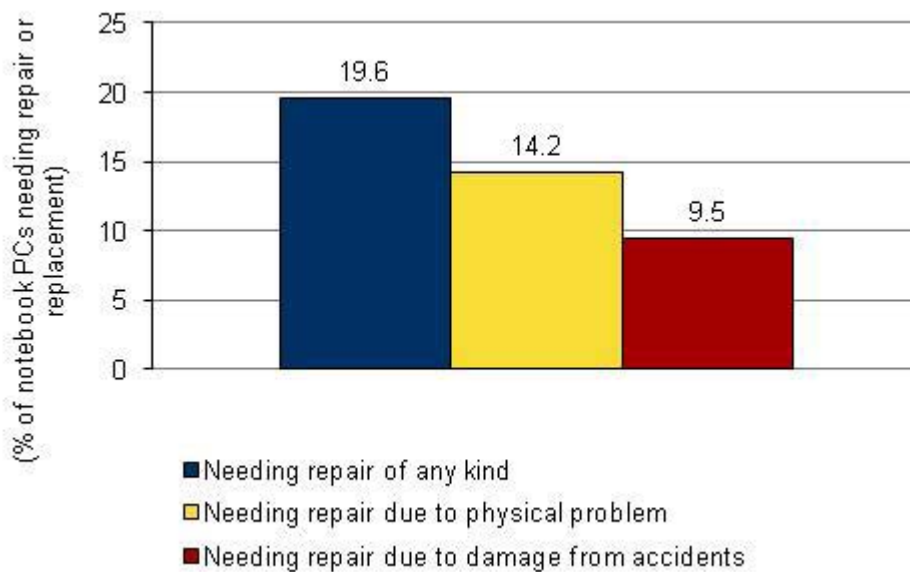
As companies look to mitigate this risk, they should keep in mind that not all notebooks are the same. Some notebooks are more solid in their construction, capable of withstanding natural elements, and therefore more secure and likely to have a longer life than mainstream business notebooks. These systems are known as ruggedized notebooks. For the purposes of this white paper, IDC includes in this definition both systems that are officially classified as "rugged" and those more loosely classified as "semirugged." Rugged systems are computers built using the military standard MIL-STD-810, which incorporates specific characteristics of durability, endurance, and strength. The standard is used by the U.S. Department of Defense (DoD) and also by companies that have operations in harsh environments. Semirugged systems are computers designed with some of the features of the MIL-STD-810 to strengthen specific aspects.

## Notebook PC Failure Rates

Notebook PCs frequently require repair or replacement due to a number of reasons ranging from software problems, to parts failure due to normal wear and tear, to damage as a result of accidents such as drops, liquid spills, etc. Substandard systems built with low-cost materials and parts are also prone to more frequent damages compared with systems built on more stringent durability metrics. Each year, nearly 20% of notebook PCs will need some type of repair (see Figure 1). Many of these repairs will be the result of damage caused by accidents. In our survey, each year 9.5% of notebook PCs in these organizations were damaged due to an accident. Repairs that are needed as a result of accidents or just through normal wear and tear can be mitigated by usage of more rugged notebook PCs.

**FIGURE 1**

Annual Notebook PC Failure Rates



Source: IDC, 2010

## Causes and Results of Notebook PC Damage

### *Components Most Likely to Suffer Damage*

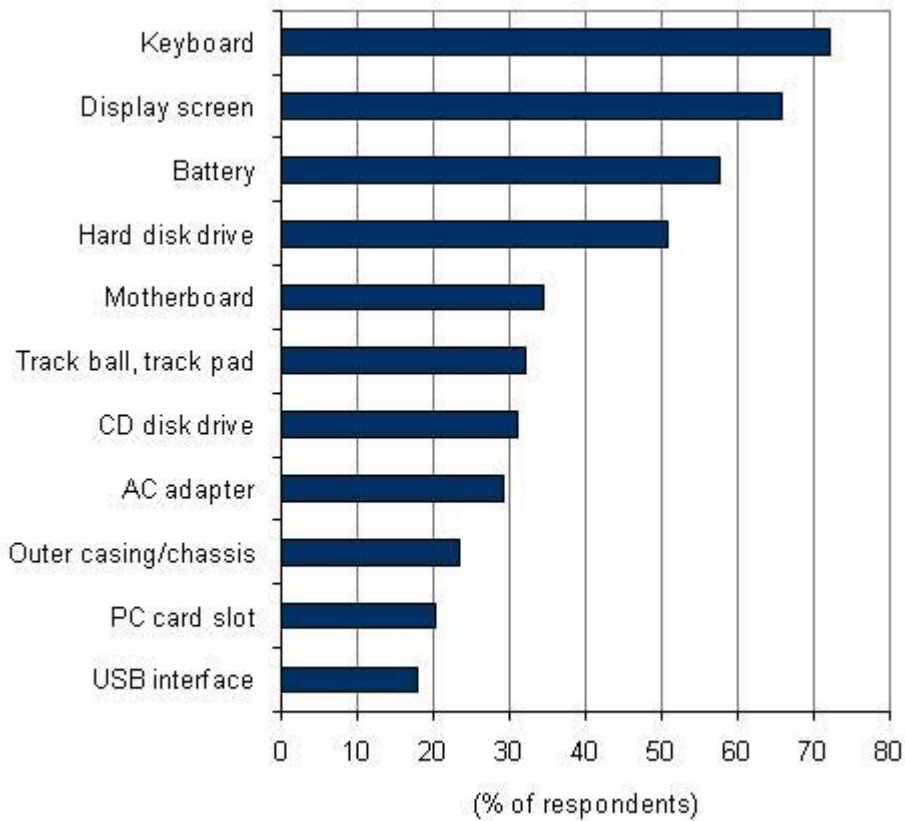
Companies considering ruggedized notebooks should ensure that the systems they procure have hardened the components that would otherwise be most likely to break. Our survey indicates that the most sensitive items prone to damage are the parts of the notebook that are most exposed to the external environment and to human interaction. In our survey, 72% of the respondents with damaged notebooks reported

that they suffered damaged keyboards, followed by 66% that reported damage to the display screen (see Figure 2). Nonexposed parts most prone to damage include batteries and hard disk drives, both cited by over half of the respondents.

**FIGURE 2**

Most Common Components in Notebook PCs That Suffer Damage

Q. In the past 12 months, which of the following components of your organization's notebook PCs have suffered damage or breakage?



Source: IDC, 2010

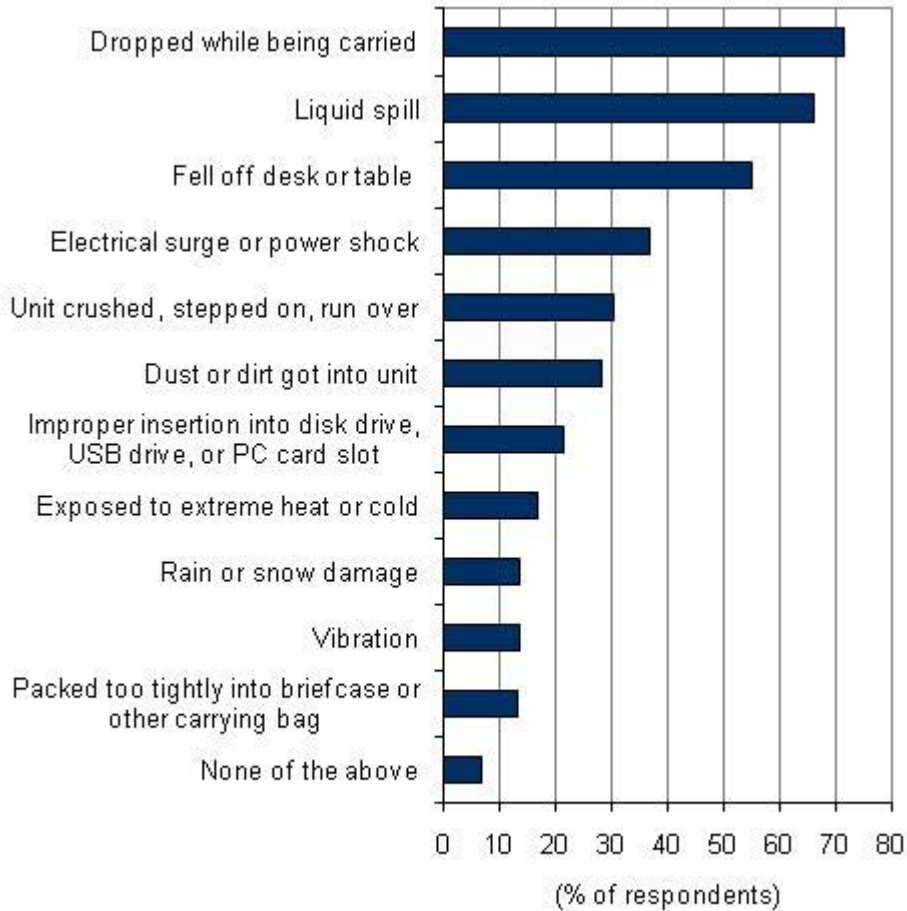
**Sources of Damage**

Human error and carelessness during everyday work situations are the greatest sources of damage caused to notebook PCs. When respondents were asked how their systems break, 72% indicated that the devices were dropped while being carried, 66% said liquid was spilled onto the devices, and 55% said the devices fell off a desk or table (see Figure 3).

**FIGURE 3**

Types of Accidents Causing Notebook PC Damage

Q. In the past 12 months, which of the following types of accidents have caused damage to one or more of your organization's notebook PCs?



Source: IDC, 2010

The three most cited causes of notebook damage are related to human error and everyday usage, which underscores both the importance of understanding usage patterns and the vulnerability of these systems. Buyers should select notebook products that have been designed to guard against the specific dangers of drops and liquid spills, in addition to other threats such as electrical surges, dust or dirt, extremes of heat, and vibration.

**Departments Most Likely to Suffer Damage**

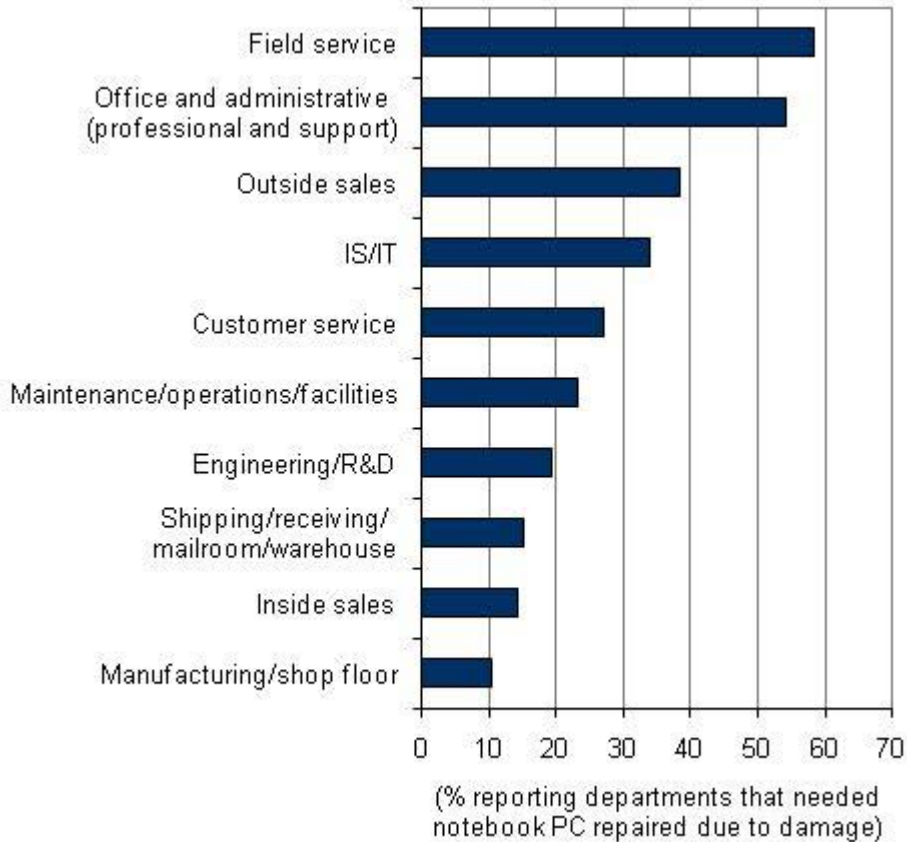
Not surprisingly, the department that represents the most frequent source of damaged notebooks is field service, which was cited by 59% of respondents and which is subject to some of the harshest environmental conditions (see Figure 4). Other departments that may seem unlikely to need repairs due to damage, such as

administrative offices, are often cited as requiring these repairs. This is a result of wider deployment of notebook PCs throughout organizations, business travel, and the practice of taking notebook PCs home each night. In addition, many businesses acquire systems that do not meet basic durability standards and instead focus on lowest procurement cost. This results in systems that are more often in need of repair, adding to cost of ownership. With wider deployment, greater mobility, and lowest-cost procurement strategies, organizations must be prepared for repair needs wherever notebook PCs are used. They also should factor in the potential productivity loss as a result of using substandard computers.

**FIGURE 4**

Departments Most Often Requiring Notebook Repair or Replacement from Damage

Q. Which departments or functional groups in your organization in the past year required notebook repair or replacement due to physical damage?



Source: IDC, 2010

This finding reinforces the point that while field organizations are certainly important areas in which to place ruggedized PCs, more "mainstream" organizations such as office administration and IT can be nearly as great a source of damage and can also benefit greatly from deployment of more dependable, ruggedized systems.

### ***Problems Caused by Notebook PC Damage or Failure***

Respondents cited a number of problems caused by notebook damage or failure. As Figure 5 shows, 63% reported lost productivity, while more than a third reported loss of important company data or information (37%) or lost/delayed sales (34%). This finding underscores the fact that damage to notebook PCs can have significant business impact that can go well beyond the cost of repairing or replacing the units themselves.

**FIGURE 5**

Significant Problems Caused by Notebook PC Damage or Failure

Q. Which of the following significant problems has your company experienced over the past year due to incidents caused by notebook PC failure due to physical damage or wear and tear?



Source: IDC, 2010

### ***Problems Posed by Insufficient Battery Life***

In the survey, 68% of respondents told us that the battery life on their notebook PCs was insufficient for their business needs (see Figure 6), and over half stated that notebook PC battery failure caused serious problems for their business. The most common problem was lost productivity, cited by 45% of respondents, followed by lost/delayed sales (22%) and loss of critical company data (17%) (see Figure 7).

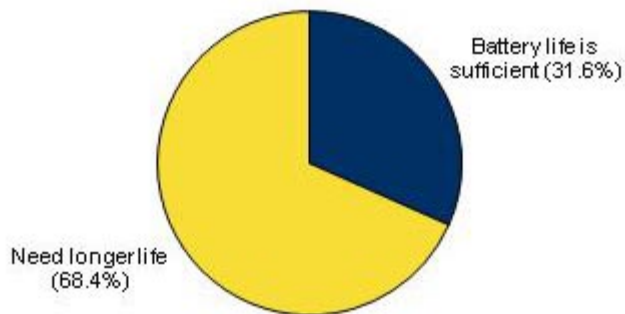
In many cases, notebook PC batteries no longer maintain an adequate charge and must be replaced. In our survey, respondents indicated that 22% of notebook PCs require the purchase of a replacement battery during their lifetime. Respondents in

the survey reported that the average cost of replacing or repairing a battery is US\$109. The alternative is to save cost by not replacing the battery and dealing with the effects of a poorly charged notebook PC cited previously in Figure 7. IDC's view is that businesses looking to procure new systems should include battery metrics such as life expectancy and expected charge time in their procurement strategies so as to anticipate and plan operations accordingly. Good batteries are critical to maintaining business continuity, while poor-quality batteries can compromise productivity.

**FIGURE 6**

Respondents Require Extended Battery Life

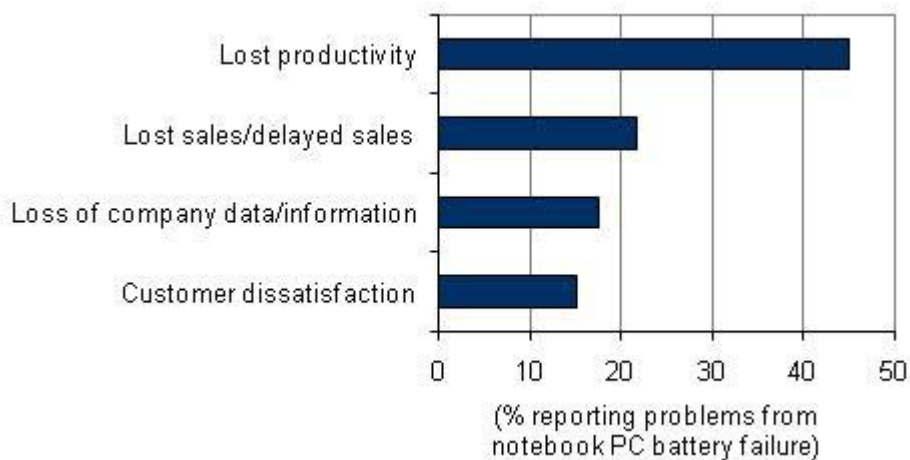
Q. Which of the following significant problems has your company experienced over the past year due to incidents caused by notebook PC failure due to physical damage or wear and tear?



Source: IDC, 2010

**FIGURE 7**

Significant Problems Caused by Notebook PC Battery Failure



Source: IDC, 2010

## COSTS OF NOTEBOOK PC FAILURE

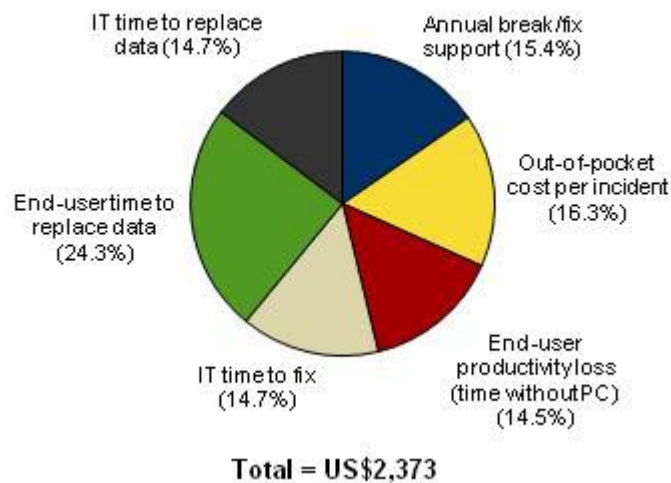
### Costs for Repair and Data Replacement

Notebook failure can be quite costly to the business. This study found that nearly 20% of notebook PCs used in U.S. businesses require some sort of physical repair each year. Further, IDC estimates that the average cost of repair and data replacement for every notebook PC incident is US\$2,373 (see Figure 8). These costs are broken out as follows:

- ☒ **Annual break/fix support costs** — costs to the organization to maintain break/fix support agreements
- ☒ **Out-of-pocket costs** — costs not covered by break-fix agreements or that must otherwise be covered by the organization
- ☒ **Lost end-user productivity time** — the value of lost time and productivity experienced by the user while his or her notebook is out of commission
- ☒ **IT time to fix the incident** — the amount the organization must spend on IT staff salaries to manage, track, and (in many cases) implement the necessary repairs
- ☒ **End-user time to replace data** — beyond the time lost by the end user while his or her system was down, the value of the time required by end users to replace critical lost files and data
- ☒ **IT time to replace data** — the time required for IT staff to assist end users by pulling data from backup systems and otherwise helping recover lost data

**FIGURE 8**

Total Cost per Incident to Repair Notebook PC



Source: IDC, 2010

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## **The Impact on Business Continuity**

Even though the estimates provided above include a broad range of costs, including out-of-pocket costs and the value of the time lost for users and IT staff, they still tell only part of the story. Notebooks have become critical to workers across multiple functional areas in different industries throughout the economy. Loss of or damage to a notebook computer can have a much greater impact on the business than simply the costs to repair or replace it.

Despite policies to the contrary, many employees maintain critical files on their notebooks without regularly backing them up to a centralized facility. Workers who unexpectedly lose their laptops can lose key information they require to conduct important business operations. Workers on the road can lose access to email/communications, corporate databases, and other critical files. For some workers, if a notebook were to suffer damage at just the right — or rather, the wrong — time, it could mean the loss of irreplaceable, sensitive information; contribute to losing important business deals; or be the cause of customer dissatisfaction.

In organizations that demand their workers always be accessible, measure response times in minutes or hours rather than days or weeks, and consider any downtime to be unacceptable, there is no way to put a price on the value of business continuity that can be provided by ruggedized systems.

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## **The Importance of Ruggedized Systems**

Most organizations appreciate the role of ruggedized systems in ensuring business continuity and protecting company information. In our survey, 62% of survey respondents said their companies currently deploy rugged or semirugged notebooks. Further, the larger the company, the greater the rate of deployment, with ruggedized systems found in over 67% of enterprises with 1,000 or more employees. IDC believes these larger entities are more sensitive to business continuity issues and are more likely to have invested resources in procuring appropriate equipment.

In vertical markets, the greatest rate of ruggedized PC deployments was found in federal government (91%), followed by banking and communication/broadband/cable (both 86%). By job function, not surprisingly, the highest levels of deployment were found in the areas where systems are exposed to natural elements. Manufacturing/shop floor functions have a deployment rate of 83%, followed by shipping/receiving/mailroom/warehouse with an 80% deployment rate. But this should not mask the fact that the deployment rate of rugged/semirugged systems in other functions is also very high, including a 64% deployment rate in office and administration.

### ***Businesses Deploy Ruggedized Notebooks to Reduce Repair Costs, Ensure Business Continuity***

One of the obvious reasons to deploy ruggedized systems is to reduce the out-of-pocket costs to repair or replace damaged systems. This study showed that the rate of repair and replacement is high; for example, of those planning to purchase new notebooks in the next 12 months (98% of respondents), fully 19% — nearly one in five — reported planning such a purchase to replace broken/damaged notebooks.

These systems are expensive to repair even when just considering out-of-pocket repair costs as well as the personnel time required to administer the repairs and replace lost company data. When the potential impact on business continuity in terms of lost sales, missing company data, or unhappy clients is considered, the costs can become incalculable.

Notebooks — which are more mobile and subject to dangers such as the wear and tear of travel, airport security, and being dropped — are even more vulnerable than desktops. Moreover, with the shift to laptops, a greater percentage of the overall installed base is exposed every year. Businesses are looking for a more secure environment for their workers, and many are turning to ruggedized notebooks for protection.

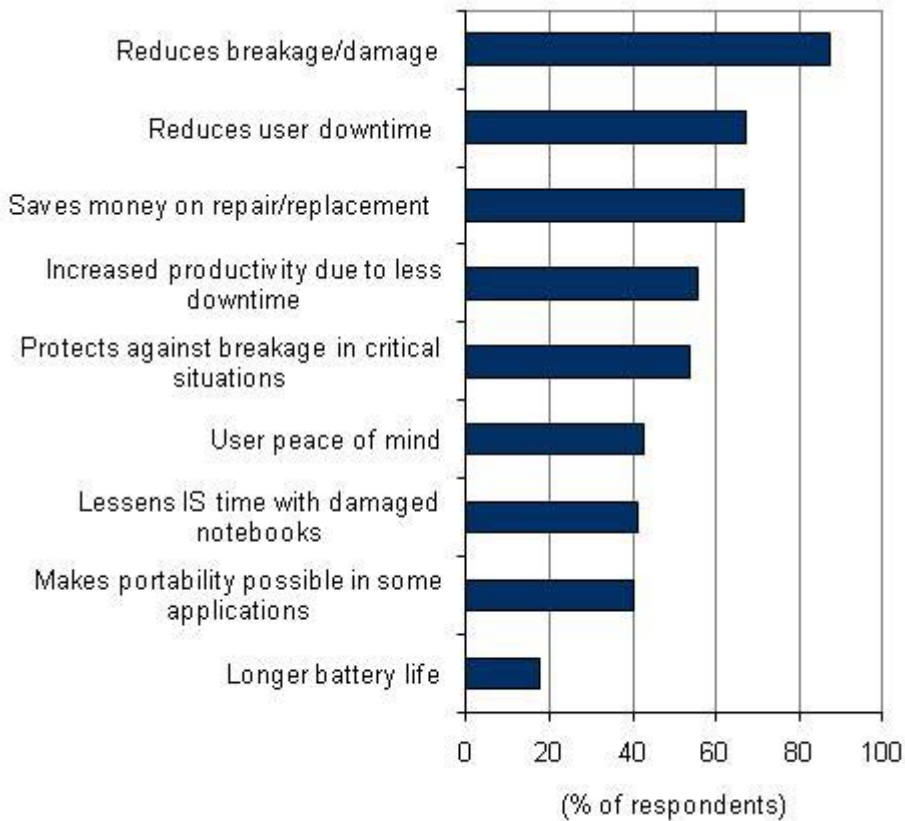
**Benefits of Ruggedized PCs**

Respondents summarized their view on ruggedized PCs by citing a wide range of benefits they provide (see Figure 9). Reduced breakage/damage was the top reason, cited by 87% of respondents, followed by reduced user downtime and saving money on repairs and replacement (both cited by 67% of respondents). Respondents also noted the value on increased productivity due to less downtime, cited by 55% of respondents.

**FIGURE 9**

Key Benefits of Rugged Notebook PCs

Q. What are the key benefits of using rugged notebook PCs?



Source: IDC, 2010

## **Notebook PC Life Cycle: Cost and Environmental Impact**

In our survey, notebook PCs have an average lifetime in an organization of two years and five months (see Figure 10). On the other hand, organizations that have rugged notebooks expect these devices to last three years and six months. For rugged notebook owners, there are several advantages from their notebook ownership compared with mainstream notebooks. In this case, the ability to extend the lifetime of the notebook can result in both cost-saving opportunities and substantial environmental gains. When life cycles lengthen, both cost of ownership and environmental impact are reduced because nonrecurring costs are spread over a longer period of use. Cost avoidance occurs in many ways, including through procurement cost avoidance, which can be significant.

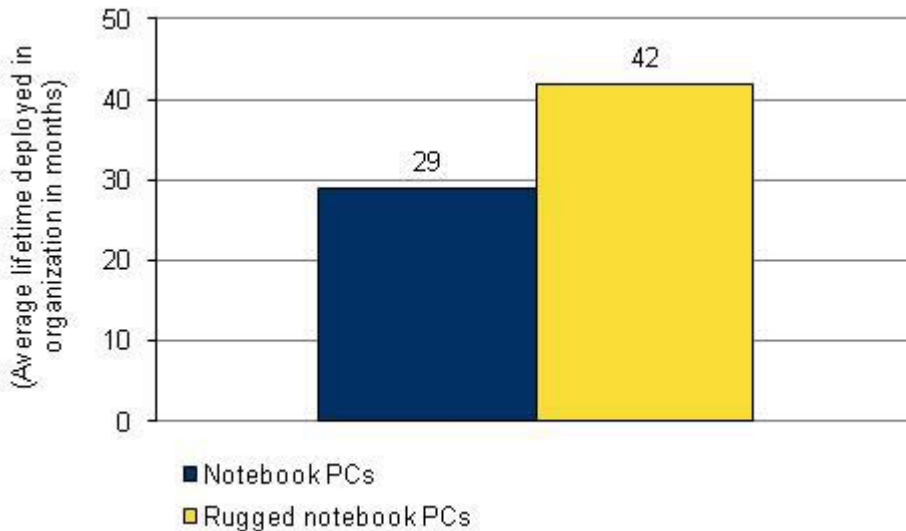
From a sustainability standpoint, PCs are particularly costly products to manufacture, requiring raw material inputs and energy. Elongating the life of a system, as is the case for rugged notebooks, has the benefit of delaying the manufacturing of new units and therefore resulting in savings in terms of using valuable commodities and power. The savings implications are not confined just to the manufacturing aspects; rather, they extend to the subsequent logistics operations, channels creation, and all other aspects of bringing products to market.

In addition, the environmental impact of rugged systems can further be expanded in that such systems take much longer to move into the recycling space compared with mainstream notebooks. Positive implications are found in the form of energy, carbon, and landfill avoidance that are so importance to the environment.

Furthermore, well-designed and well-engineered batteries also have greater positive ecological impact than mainstream batteries. Fast charge, longer use, and longer life spans for batteries mean less power consumption and therefore a reduction in CO2 emissions. In this case, for companies that have large deployments, energy cost savings and CO2 emission avoidance can be significant contributors to a company's bottom line and its environmental footprint reduction.

**FIGURE 10**

Average Lifetime of Notebook PCs and Rugged Notebook PCs



Source: IDC, 2010

## OPPORTUNITIES AND CHALLENGES

Although there is a strong business case for customers to procure and use ruggedized notebooks, both to ensure business continuity and to reduce costs to repair and then replace data, there are nevertheless challenges that vendors must overcome. Two key challenges are helping customers overcome unwillingness to spend the additional up-front purchase price for ruggedized notebooks and addressing concerns regarding their performance.

- ☒ **Up-front costs.** One characteristic of ruggedized notebooks is their initial purchase price, which is higher than that of mainstream notebooks. In nearly every IDC study, purchase price comes in as one of the top considerations when IT executives make purchase decisions. But the purchase price is only one element of the total cost of notebook PC ownership. When additional costs are considered, including reduction in out-of-pocket repair costs, cost of employees' time, and business continuity benefits, these ruggedized devices make more sense.
- ☒ **Performance.** The second concern regards perceived performance of ruggedized notebooks. In vertical markets such as financial services or job functions such as engineering, design, and development, users require the highest-performing systems available and rank considerations such as reliability and durability relatively low. Further, there is typically a "sweet spot" for CPU, RAM, and hard drive specifications that the market expects at certain price points. Ruggedized notebooks do not always have the latest specifications because manufacturers focus investments on quality, durability, and manufacturing processes. Ruggedized notebook vendors will need to work to incorporate the latest-edge components into their products while certifying that they meet all necessary ruggedization standards.

While it is important for vendors to address these challenges directly, they also point to areas of opportunity for ruggedized notebook vendors. Raw computational power has become somewhat commoditized, and most of today's mainstream notebooks are more than adequate to provide the basic connectivity and run the core productivity applications most users require.

On the other hand, dependability is a key consideration, not just for field-based employees whose systems must endure vibrations, dust, and harsh conditions but even for "mainstream" workers whose systems must endure the wear and tear of daily use and travel and for whom losing critical data could be very costly. Ruggedized notebook vendors should focus their messaging efforts to help shift their customers' procurement focus away from a pure emphasis on system performance specs and to instead increase the focus on durability.

## **CONCLUSION**

Ruggedized notebooks have been around for many years and have made important inroads in industries such as manufacturing and construction and in job functions such as field operations, where systems are more likely to take a lot of abuse. While these industries and job functions will likely continue prioritizing durability in future purchase cycles, IDC believes that a much broader range of companies and functions could benefit from the use of ruggedized notebooks.

The global workforce is taking increasing advantage of the mobility and convenience offered by notebooks. Already over 40% of PC shipments, laptops are the fastest-growing PC category and will continue to grow as a percentage of the world's PC installed base. But greater reliance on notebooks brings greater risk of loss due to damage.

Not only are damaged notebooks expensive in terms of out-of-pocket repair costs, lost productivity, and labor hours to repair the device and replace data — costs IDC estimates to be over US\$2,300 per computer — but damaged computers represent a potentially huge business continuity cost as well. As users carry more and more critical files and data on their laptops, a damaged PC could potentially lead to lost sales, loss of sensitive company information, or unhappy customers. IDC believes that any organization that makes significant use of notebook computers and is looking to decrease these risks could benefit from incorporating ruggedization into its notebook procurement process.

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