

# Microsoft Vista: A Usability Problem

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## Abstract

*We discuss the literature available about Microsoft's latest OS, Vista, to determine the effects of usability issues on the popularity of the OS. Many other factors have contributed, but the effect of usability, particularly in a broader sense of "consumability" is found to be significant.*

## 1 Introduction

Much was made of Microsoft's newest Operating System (OS) Longhorn, which became Vista... which has been something of a damp squib. Despite its much vaunted and heralded arrival (Vista was released worldwide January 30<sup>th</sup>, 2007 [1]), in the end people are not upgrading in droves. In fact, some have taken steps to "downgrade" (and called it "upgrading" [38]); such was their annoyance.

There are plenty of answers offered as to why this was the case. Many people have used the Internet to broadcast their opinion of the shortcomings they personally have found. Other people have been more positive about Vista; they have been reported less. "User Account Control", "Security", and "Hardware Requirements" are frequent themes of complaint.

The purpose of this paper is to discuss how much of the low take-up rate of Vista is due to usability issues. The user experience is undeniably important, and as noted by Donahue [111] there are many broader usability effects. These can strongly affect the business case for software. By looking at the usability issues experienced with Vista in a broader context, we can conclude the affect that it has had on take-up may be significant.

## 2 Vista's Reception

By some measures, Vista has been a success. Microsoft certainly tried to present it that way, announcing within 2 months of the release, in response to media reports reporting low take up of Vista, that it had sold more than 20 million copies of Vista in it's first month; double the number of copies of XP that were sold in it's first month of release [2]. After 100 days Microsoft reported sales of 40 million [3].

However in July 2007, Microsoft downgraded their predictions for Vista. Despite their highest-ever gross income (over \$50 billion) forecasts of revenue from Desktop OSes for 2008 were altered. Vista's forecast was down from 85% to 78% with XP making up the remainder [4]. Whether this is a mark of XP's success, Vista's failure to capture the consumer's imagination or just readjusting over-inflated expectations [5] is debatable.

The hard numbers also don't take into account the massive increase in the number of computers. Double the number of licenses does not mean double the market share. Between December 2004 and June 2008 alone the number of personal computers in use increased from 575 million [6] to over 1 billion [7]. Windows XP was released for widespread availability on October 25th, 2001 [8]. If the number of computers in use has doubled between the release of XP and the release of Vista (a realistic possibility), doubling the amount of licenses sold in the first month would merely be replicating the initial inroads into market share for the previous OS. In fact, whether Vista even achieved this is debatable because the numbers given for the first month in fact included several months prior to that, when many new computers were sold with a low cost or even free upgrade to Vista on release [9] – partly in response to the release of Vista being delayed past the holiday season [10]. Further there is some suggestion that Microsoft had changed their way of accounting so sales are counted when bought from

Microsoft (by a reseller) rather than sold to a consumer [9].

Further evidence that these figures are not strictly accurate comes from HP; reported as saying in July 2008 that majority of business PCs they are shipping come “with a Vista Business license but with XP pre-loaded” [11]. This would be counted as a sale for Vista in Microsoft’s figures, but effectively what has been sold is XP [11] (albeit with the option to upgrade at a later date). This only applied to business machines, but Dell extended this to consumer PCs in May 2008 in response to customer demand [12]. XP was originally slated to be withdrawn from sale January 31st, 2008 but was extended a further 5 months to June 30th [13].

As of October 9th, 2008, it is still possible to buy a Dell PC with XP pre-installed by opting for the “Windows Vista® BONUS”. From Dell’s (US) website [15],

*When you buy a Dell PC system configured with the Windows Vista® BONUS, your PC will come loaded with Windows XP® Professional pre-installed. With the BONUS option, you can transition to Windows Vista when you’re ready. Your BONUS Kit will include Windows XP Professional back-up CD which will allow you to re-install or transition back to XP from Vista if necessary plus Windows Vista Business or Ultimate installation DVD. Transitioning to Vista is entirely your choice. Windows Vista BONUS gives you the opportunity to run the XP OS for as long as you like.*

This is targeted primarily at business users, but the Windows Vista® BONUS option comes is available for both Windows Vista® Business and Windows Vista® Ultimate [15]. Interestingly, there is clearly a market of consumers who are prepared to pay a premium in order to continue using the “outdated” OS. It is unclear how long Dell will be offering this for, however is still possible for consumers to downgrade and buy XP separately until January 31st, 2009 through certain websites by claiming to be a “System Builder” or “Original Equipment Manufacturer” and accepting the terms of the license that go with that [14].

In response to the “I’m a Mac, I’m a PC” ads by Apple [16], 13 of which (as of October 9th, 2008) mock the problems with Vista, Microsoft has unleashed a new advertising campaign, masterminded by Crispin Porter + Bogusky [18]. The first television spot for the campaign [17] was described in the Economist as “bizarre” and derided in the blogosphere; “further proof, if any were needed, that Microsoft just doesn’t get it” [19], the latest advertisements in the

series [21] parody the Apple advertisements. The brief for the advertising firm was to “come up with an answer to Apple’s campaign that does not feel reactive, and somehow makes Microsoft look cool” [18]. The Mojave experiment [20] is another effort to improve public perception of Microsoft (and Vista). Recently released internal e-mails show that Microsoft were concerned about the comparisons to Apple as early as 2005 [112, 139].

It could be, however, that Vista is doing fine – but after numerous delays and five years after the release of the previous OS (XP)... it is just failing to live up to the hype.

### 3 Usability Guidelines and their Implications

Neilsen [22] defines usability as comprising five key quality components

***Learnability:** How easy is it for users to accomplish basic tasks the first time they encounter the design?*

***Efficiency:** Once users have learned the design, how quickly can they perform tasks?*

***Memorability:** When users return to the design after a period of not using it, how easily can they reestablish proficiency?*

***Errors:** How many errors do users make, how severe are these errors, and how easily can they recover from the errors?*

***Satisfaction:** How pleasant is it to use the design?*

Another key component is **utility** – doing what users need. Utility and Usability are equally important; “It matters little that something is easy if it’s not what you want. It’s also no good if the system can hypothetically do what you want, but you can’t make it happen because the user interface is too difficult” [22].

#### 3.1 A Broader View of Usability

As defined above, usability is fairly clear and a strong business case can be made for usable software; increased cost will pay off in productivity [22, 111]. However these principles apply primarily to individual users. Groups of users, specifically businesses, may have additional usability considerations.

Can we take a broader view of usability? In a business context, what makes software “usable” to a business? This would presumably encompass many of the considerations of a typical user, but there are some additional factors, including how “usable” the software is to the people who maintain and install it. For example, no matter how great a user thinks a piece of

software is, if it takes 4 weeks to install and many hours a day of maintenance it may be difficult to make the business case for it – especially if similar software is available that is more easily installed and maintained, albeit slightly less “usable” from the user’s perspective. The software would not be “usable” to the business, even if it were highly usable to the user.

In the book “Outside-in Software Development: A Practical Approach to Building Successful Stakeholder-based Products”, released by IBM press in 2007 a concept called “Consumability” is proposed. At the centre of this concept is the idea that “a successful product should provide value quickly and painlessly after its acquisition” [113]. Tasks affecting the consumability of the software include installation, migration of production data and custom automation scripts, training, and testing of the deployment. When these things (called “meta-tasks”) affect the business value of the product, they reduce the consumability. “[C]onsumability is a far more inclusive and impactful notion than just defect removal or usability engineering. It encompasses those attributes and much more” [113].

## **3.2 The Quality Components of Usability**

### **3.2.1 Learnability**

The learnability of a system will affect how much training a business needs to offer, which will effect how many trainers are required and the length of time it will take to complete the training. This will need to be factored into the implementation plan for a new system and training periods for new members of staff. The main affect of the Learnability of a system to users will be in terms of cost to the company – and so cost-effectiveness of the software.

### **3.2.2 Efficiency**

Efficiency of a system is about the effect on users productivity of the software. From a business perspective, the aim is invariably to increase productivity. In the case of Vista, where users are transitioning from another piece of software that performs much the same function efficiency is going to be an important consideration. Will new software increase efficiency? Decrease it? Have no effect? Because the OS is not task-orientated, it may be difficult to measure and quantify its effect on the user’s productivity. Even if this effect can be measured, it is likely to vary dramatically. One of Vista’s most vaunted improvements for efficiency is the improved search [114], but the usefulness of this is likely to depend on the disorganization and volume of a person’s files.

From the perspective of computer support technicians, efficiency is a question of how easy it is to repair and diagnose broken machines and also how quickly they can set up new machines. The importance of setting up machines may be weighted by considering whether the size of the network is fairly stable or fluctuates. For example, for technology summer camps where machines are set up for as little as 5 weeks, reductions in the efficiency of setup could dramatically increase costs. If the camp is running close to capacity, efficiency of diagnosis and repair can have a major effect.

This is important in calculating time and costs for changing over from XP to Vista as it greatly effects how long it will take to convert the entire company (or, how many technicians need to be deployed to achieve the transition in the desired time scale). During the transition, both systems will be run in parallel – what issues will arise from this and what are their associated costs? How much time will users lose waiting for technicians to perform the upgrade? If upgrades can be done when users are not in their office, are there extra costs associated with this? Etc.

### **3.2.3 Memorability**

Memorability should not be a big issue for changing OS, as it is something users will interact with every day. Except for users who take a sabbatical, long period of sick leave or maternity leave memorability is unlikely to be an issue. Note that this assumes that users do not have to run both OSes, in which case there will be an element of memorability (for both XP and Vista).

If the size of the network is increasing, or fluctuates regularly, the bigger business issue for memorability will come from how easily proficiency in installation can be reestablished in order to set up a new office. This will particularly be an issue where there are infrequent, but rapid expansions of the network.

### **3.2.4 Errors**

Errors will have a big effect for an OS. The typical computer user may not understand what the OS does and is likely to be intimidated and confused by errors originating from it. They may want to call someone for assistance with the error, so increased errors will require increased support (and, obviously, there will be associated costs with this, as described in [111]). There will be further business costs as a result of delays caused by errors. Will errors cause projects or time sensitive tasks to be delayed?

For computer support technicians, there will be the issues of errors in installation, errors occurring in the network, and the fixing of user errors.

### 3.2.5 Satisfaction

As noted by Nielsen [23],

*Finally, subjective satisfaction is perhaps the usability attribute that has the least direct economic impact in the case of software for in-house use, even though it may be one of the most important factors influencing individual purchases of shrinkwrap software*

Because of its lack of economic impact to a business, satisfaction may be largely ignored. From the point of view of the computer support, however, it is unlikely to be very satisfying to be seen to “force” users to transition to software for which opinion is not favorable.

### 3.2.6 Utility

An OS does not do what users need, i.e. it has poor utility if:

- Bespoke / non-standard software does not work
- Peripherals do not work
- It runs so slowly that productivity is impacted.

If considering this in a business context, we need to consider whether *the vast majority of users can do everything they need to do*. If this were not the case, a dual system would be the only way; the practicality of running a dual system would need to be further considered. A dual system might also have implications to cost and space if one person required two machines, and efficiency; rebooting to switch between OSes takes time, and running a virtual machine has a performance overhead.

## 3.3 Implications

Many of the usability problems are compounded in this broader business context. Whilst an individual user, if highly computer literate, might be able to track down the driver for a peripheral, if IT support for a company have to do this for every different peripheral there is a significant monetary and time cost associated with this.

Similarly, if a user has one crucial program they use only on a semi-regular business, they might just keep a second XP box in order to run that and exchange the monitor cable when this is necessary. In a business context, however, this leads to issues of space, cooling (extra computers give off heat), and problems associated with users exchanging cables if they do not have a monitor for each computer (there

may be health and safety, and potentially insurance issues).

There’s a distinction between business usability and cost effectiveness to a business. However usability to a business can have a major impact on the cost effectiveness of a piece of software due to the costs associated with overcoming / providing workarounds to the usability problems. Further the usability of software to the computer support technicians will have costs associated with it.

## 4 User Profiles

Computers are now ubiquitous – perhaps even worryingly so - in January 2007 a poll reported that 65% of Americans spent more time with their home computer than their spouse [24]. In 2008, we are close to realizing the dream that Bill Gates had when he started Microsoft of “a computer in every home” [25], at least in the West. In September 2008, the British Government announced an initiative that by 2011 every 7-19 year old in England will have access to broadband internet at home [26].

With such a broad spectrum of users it is hard to categorize them. There is no “typical” user, but it is possible to define some broad groupings and their likely / commonly reported problems with Vista.

### 4.1 Home Users

The average home user is much talked about, often derided, but rarely defined. People have tried, however; in an article on security accessibility from 2003 [27] there’s the following.

*Almost all of them run Windows at home and at work, usually ME or XP. They all know how to “use” their computers, which means that they can write papers, read email, use the Web, and even install software (as long as it’s not packaged as a ZIP file: most of them have no idea what a ZIP file is or how to use it). In other words, your typical American computer user.*

So we can imagine the average user as someone with a basic level of computer literacy. They probably use their computer mostly to access the internet, and maybe do some document processing. As we move to “cloud computing” a netbook [28] may be perfectly adequate for their needs.

#### 4.1.1 Common Problems

With just a basic level of computer literacy, this user will use the computer but may feel

uncomfortable doing anything they perceive to be “complex”. Error messages, particularly unhelpful ones (non-“polite” [29]), will intimidate them. It is this kind of user that Apple is targeting with their “Mac Genius” service [30].

#### 4.1.2 Specific Problems with Vista

For the typical home user, XP is likely to be completely adequate for their needs. They may be put off by the unpopularity of Vista and, if they use the computer for home entertainment, be confused or have misconceptions about what the in-built DRM means for them [31].

The main issue, however, is likely to be that in order to run Vista they will need a new computer. In May 2006 an article was published in the (UK) Times which predicted that fewer than 5% of UK households would have a sufficiently powerful PC to run the full version of Ultimate [32]. Price will also be a consideration [33]. They will therefore likely wait to buy Vista until it comes with a new PC when the old one is replaced. A more thorough list of reasons for the average user to wait was published on PCWorld.com [34].

#### 4.1.3 Alternatives

This kind of user would be able to do everything they wanted to do on a Linux System with Open Office, or a Mac with either Microsoft Office for Mac, or NeoOffice. It is unlikely that they would be able to set up a Linux machine, however, and might be intimidated by the Mac and prefer to stick with what they know.

### 4.2 Gamers

A gamer uses the computer primarily for playing video games. Whilst they may use the computer for other tasks (such as school work) their primary concern when buying or building a computer will be game performance.

#### 4.2.1 Common Problems

Games are graphics intensive, so a high-spec computer with powerful graphics chip, video card, and fast processors will be required. Will also want a large monitor and good sound. If “modding” games, the specification will need to be even higher.

#### 4.2.2 Specific Problems with Vista

Old games do not run well in Vista, and there are sound issues. That and performance are detailed in [115]. Whilst SP1 improved things, there are still performance issues for some games [116].

#### 4.2.3 Alternatives

The main alternative to gaming on the PC is consoling gaming such as the PS3 or Nintendo Wii. Gamers have traditionally shunned Linux and Mac, although Linux does have a number of games that run natively and emulators for those that do not [117, 118]. Criticized for their lack of gaming options [121], there are now many games for the Mac [119], notably all games released by Blizzard [120] (including Warcraft 3).

### 4.3 Power Users

Wikipedia defines a “Power User” as [35],

*A power user is a user of a personal computer who can use advanced features of programs which are outside the expertise of “normal” users, yet is not capable of advanced, non application-oriented tasks like programming and may or may not be capable of system administration.*

Power Users are highly tech savvy, and un-intimidated by computers. An example of a Power User is Chris Pirillo [37], who runs the blog network Lockergnome [36]. He posted a 52-minute rant to YouTube detailing how and why Vista was not working for him [38]. Another Power User’s problems are detailed in [122].

The typical Power User has lots of software, specific needs and expectations from their computer. They use the computer a lot and a computer is crucial to their work.

#### 4.3.1 Common Problems

As this kind of user is very computer literate, they have few problems in the use of their computer and are not intimidated by change. However they may have a very personalized setup, which may be difficult to install and maintain. It will be time-consuming for them to move to a new OS, and if some of their applications or peripherals won’t work they will only be able to work around it up to a point; as a “Power user” is not a programmer, they will not be able to “port”, for example.

#### 4.3.2 Specific Problems with Vista

Pirillo’s video [38] is very thorough in what is lacking for him in Vista. Mainly it his problems were arising from a lack of support for peripherals and programs “crucial” to his work process. Emphatically, he declared “I can’t live in Vista if the software that I use in my life for productivity does not work”. This included a little known web browser, which being a small project was not yet running on Vista. Having

tested pre-release versions of Vista he felt that some of the feedback given to Microsoft had been ignored [38].

The power user has had 5 years of XP to tweak and customize their system so it is perfectly suited to their needs. Switching to Vista is therefore going to require more work to get that same level of personalization into their system. Whilst unafraid of change, Pirillo was not prepared to compromise on productivity.

### 4.3.3 Alternatives

As the power user is likely to have similar problems on Mac and Linux (although in the video [38] Pirillo does talk about trying to work on only Macs for a month). If workarounds aren't practical, the alternative is to stick with XP until Vista is "ready", as Pirillo said he intended to do. That said, Pirillo himself has now (as of February 2008) moved to the Mac, broadcasting his move on YouTube [123]. He cited 50 reasons why [124], one of which (number 15) being that "Microsoft Windows completely abandoned its power users, period."

## 5 Businesses

Businesses combine many types of user and a wide range of computer literacy and so have a broad set of problems to contend with. The usability and utility problems detailed for the user groups above (with the exception of gamers) will be compounded. Further, expensive bespoke or industry-specific applications may not be Vista compatible. As noted in PCWorld, "The smaller the company, the longer it will generally take for them to support Vista" [34]. The difficulties of moving old software to Vista are in part due to the changes in the way the OS interacts with other programs [39]. Modifying these applications could be very expensive, although most will work in "compatibility mode" if they will not run organically [52].

As mentioned above, businesses face many of the same problems as Power Users – many different applications and peripherals, crucial to productivity. However the additional problem that businesses face is that the person who sets up the computer is not the person who uses it. In fact, with the use of disk images and the distributed nature of computing the person setting up the computer may not be in the same city, or country, or continent even.

With the long delay of Vista, if, as is common, businesses delayed their transition to XP until after Service Pack 1 (released September 2002) their network has been very stable with all machines likely running the same OS for several years.

Upgrading, running parallel systems and training staff is a large and potentially very expensive project. When considering the more powerful hardware required and Office 2007 (although Office 2003 will work on Vista [125]), the cost may become prohibitive [40]. This is going to be a significant issue, in December 2006 it was found that half the average business PCs in the US would not run the lower-end versions of Vista [41] which feature an XP-like UI, and lack the rolodex, tab previews, and task bar preview features [126]. A meager 6% would run Vista Premium [41]. The majority of machines just require RAM upgrades [41] however this has a significant cost, both for the RAM and the installation (even if done on-site).

Continental planned an aggressive deployment of Vista, Microsoft reported that they would deploy up to 10,000 units of Vista by the end of 2007 [42]. An important thing to note, however, is Continental configured some PCs to look like XP, thereby lowering the learning curve and reducing costs [42]; even they have not embraced Vista fully. Intel, a partner of Microsoft went one step further, it was anonymously reported that they had "found no compelling case for adopting Vista" [51]. IBM went one further when, at the end of 2003 / beginning of 2004, the CEO challenged the entire organization (especially IT) to move to Linux by the end of 2005 [53].

6 months after the release to business customers, whilst a quarter of companies were using Vista, the vast majority (91%) were using it on less than 10% of their PCs [44]. Companies may skip Vista because they "do not see value of this upgrade, particularly since it requires new PC hardware at the time when the economy is weak and corporate budgets are tight" [51]. Another key reason is that Vista is falling short of the expectations of technology pros [44]. For some, the business case just isn't there.

A survey of 8 IT pros earlier this year found only one was definitely switching to Vista. 3 were not, and 4 were undecided [46]. This kind of reaction is likely what led to Forrester declaring Vista was the "New Coke" of OSes [47], in July 2008. Having run the figures, they think that the majority of upgrades are coming from older versions of Windows, such as 2000 or 98 [127]. Despite evidence that companies are thinking of skipping Vista [50], and their own negative review, Forrester do not recommend that businesses skip Vista, citing the lack of alternative, need to stay current, uncertainty about XP availability and Windows 7, and finally the feature improvements [49]. In a similar report, Gartner also recommends that businesses do not skip Vista except in certain specific cases such as where all hardware is replaced simultaneously with a replacement cycle in a specific

time frame, or where the company typically undertakes a “forklift” migration [54], and even then given the unknown nature of Windows 7 and Microsoft’s unpredictable (typically delayed) delivery schedule there are significant risks associated with that strategy [45].

So, despite the risks businesses are being encouraged to move to Vista and many will probably have to, however they do not seem to be in any hurry to do so. This is not out of the ordinary; businesses have typically been slow to embrace change and a June 2008 report showed that “general penetration rates for the operating system are following the same slow, steady trajectory as those for Windows XP” [48]. Business adoption of Vista is likely inevitable, although this is not necessarily a ringing endorsement of the OS - more a result of Microsoft’s dominant market position and the lack of viable alternatives [43].

## 6 Pricing and Competition

There are four versions of Vista available: Business, Ultimate, Home Premium, and Home Basic. Each of these comes in an upgrade version and a full version (an existing copy of XP is not necessary to install). Further, since the release of Service Pack 1 (SP1) each of the 8 versions comes with and without service pack 1. As of October 14th, 2008 the pricing on Amazon.com (US) [55] of these 16 versions of Vista is shown in Table 1. The cheapest of each version is highlighted in green, the most expensive in red.

Additionally to this there are also the Original Equipment Manufacturer versions of the various versions of Vista, in 32 and 64-bit. In total on Amazon (as of October 14th, 2008) there are a total 59 results for Vista. Contrast to the latest release from Apple, OS X Leopard, there are merely two options – single license (USD 103.99) and a 5-user family pack (USD 156.49) [56]. The pricing system for Vista is massively more complicated and despite price cuts it is not competitively priced against Leopard [62]. Despite Apple’s hardware being traditionally more expensive, Microsoft is not necessarily the most cost-effective option for a new computer [70, 128]. Microsoft is not trying to compete with Linux, but given the high cost of Vista there is a compelling business case for the Novell’s SUSE Linux [59], which “over 90 percent of the functionality of Windows Vista and Microsoft Office for less than 10 percent of the price” [60].

**Table 1: Versions of Vista and Pricing**

Version	Upgrade?	SP1?	Price (USD)
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Business	Yes	Yes	179.99
		No	N/A
	No	Yes	269.99
		No	209.00
Ultimate	Yes	Yes	184.99
		No	200.28
	No	Yes	267.49
		No	399.99
Home Premium	Yes	Yes	119.49
		No	99.72
	No	Yes	222.99
		No	192.00
Home Basic	Yes	Yes	89.99
		No	59.99
	No	Yes	157.29
		No	141.68

**Table 2: Original US Pricing for Vista [63]**

Version	Regular Price (USD)	Upgrade Price (USD)
Business	399.00	259.00
Ultimate	299.00	199.95
Home Premium	239.00	159.00
Home Basic	199.00	99.95

Original pricing is shown in Table 2 [63]. As can be seen in Figure 1, prices have fallen dramatically in the 21 months since Vista’s release, by an average of 17.9%. The most noticeable change is in the pricing of Vista Business, upgrade and regular – both have dropped in price in excess of 30%. The cost of an upgrade to Home Premium has also reduced significantly, by nearly 25%. Microsoft slashed prices dramatically after the release of Service Pack 1, in order to speed up adoption [66]. The price cuts were criticized as being largely symbolic as they did not include the OEM (Original Equipment Manufacturer) copies and the majority of users upgrade when they purchase a new machine [62].

Whilst the upgrade versions are noticeably cheaper, this does make it more difficult to install, as it will require the old XP CD to be inserted for validation. There is a known workaround to this, but it is unlikely to be used except by the technology-savvy [58]. The pricing of Vista in other countries, notably the UK, was significantly more expensive [61]. The price difference is exacerbated by the fact that British prices will tend to include VAT (at 17.5%) but US prices will have sales tax added on top of them, but is still significant – possibly as much as 80% once this is taken into account [64]. In an ITWire poll of users shortly after Canadian prices were released, over 90% of respondents (in 24 hours) said the price of Vista

made it too expensive [67]. In China, only 244 copies were sold in the first two weeks of release, for which mass piracy, with copies selling at \$1 (US) each, was blamed [65]. Easy availability of Vista on BitTorrent prompted Microsoft to offer free 60-day trials of Office 2007 and online “test drives” of Vista, and claim that pirated versions were riddled with spyware [57].

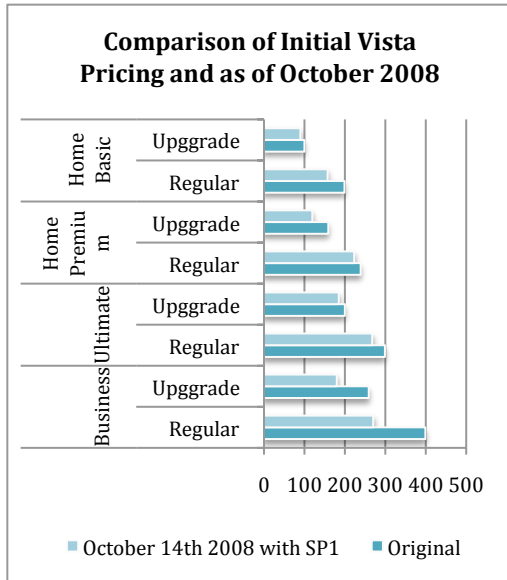


Figure 1: Comparison of Initial Vista Pricing and as of October 2008

Pricing considerations have been a significant consideration in governments moving to Open Source, for example in India where a cost reduction of 15-25% was noted [68]. Linux has long been popular in Europe, and in France “any product for IT use must have an open source alternative in the decision-making process” [69]. Notably, the Munich government’s LiMux project prompted Microsoft CEO Steve Ballmer to visit the city and lobby the Mayor [71, 130]. Despite the offer of a significant price reduction, the city opted to move to Linux, as they “did not wish to place the functioning of government in the hands of a commercial vendor with proprietary standards which is accountable to shareholders rather than to citizens” [130]. The project hit problems in 2004 [129], and commenced the move to the Linux desktop a year behind schedule [131]. However as of November 2008, 1200 workstations have migrated to LiMux, 8000 workstations use OpenOffice and all workstations use Firefox and Thunderbird [132].

## 7 How is Microsoft Trying to Improve the User Experience?

With each new release of Windows, Microsoft has put significant effort into improving the User Experience. The User Interface design team who worked on Windows 95 had two broad goals [78]:

*Make Windows easier to learn for people just getting started with computers and Windows.*

*Make Windows easier to use for people who already use computers-both the typical Windows 3.1 user and the advanced, or “power”, Windows 3.1 user.*

In the paper written on this experience [78], Sullivan notes, “We understood fairly well the problems that intermediate and advanced users had but we knew little about problems beginning users had”. So Microsoft has long been aware of distinct usability problems of non-expert users – and has been working to fix them. The paper details the movement to an iterative design process, as advocated by Nielsen [23] with rapid prototyping and user testing (64 phases of testing, with a total of 560 users) and it’s positive effects on the UI [78].

In an early review of Vista, Finnie [72], notes “There’s a lot to like about Windows Vista”, citing improvements in security, power and performance, graphics, wireless networking, working with data (search etc.), and new applications. Concluding, “It’s not just the best version of Windows ever, it’s the best Windows upgrade ever. In other words, it’s a bigger advance for this time than other versions of Windows were for their time. Windows 95 is the only one that comes close”. He acknowledges the great leaps in innovation and User Experience made in Vista, but does follow that with the opinion that Apple’s OS X is the better OS [72]. This article was the follow up to “20 Things You Won’t Like About Windows Vista” [76], where the negatives of Vista are elaborated on in more detail. Finnie claims that in Vista, Microsoft is “favoring security and IT controls over end-user productivity”, and says his personal belief is that “Microsoft has lost touch with its user base”. The “20 Things You Won’t Like About Windows Vista” includes the high system requirements, User Account Control, “Secure Desktop” (a modal dialogue that not only disables the relevant application, but everything else as well), networking, start menu design, the plethora of different versions and prices, and lack of originality. Many complaints centre on poor user-interface design, or insufficiently thought-through features or changes from previous versions of the OS.

A beta version of Vista was being reviewed, and whilst Microsoft responded to several of his comments not all the problems were fixed in the release.

In the article “Everything You Need to Know About Windows Vista” [79], Gralla is more complementary about Vista, concluding that despite the “clunkers” Vista is a far superior OS “with a much-improved, far more useful (and pleasurable) interface”. In all, he finds it to be a more usable OS and the top 5 improvements (Aero, Search, Network Map, Wireless Networking, and Security) have significant improvements in UI. Of the top 5 “things we hate” (User Account Control, backup, Windows Meeting Space, Hardware Requirements and Space) it seems likely the average user, who will buy their next computer with Vista pre-installed, will notice only User Account Control.

The “Software Protection Platform” (SPP) is the antipiracy system in Vista. It evolved from “Windows Product Activation” and “Windows Genuine Advantage” in the previous OS. Now rather than just nagging the user as the previous messages did, SPP will (after numerous warnings and a grace period) cause Vista to move to “Reduced Functionality Mode” [74]. A review of Vista in November 2006 suggested that end users may be penalized through no fault of their own – for example if they’ve inadvertently bought a pirated copy of Vista in good faith from a unscrupulous reseller [82]. There is plenty of scope for failure; a 19-hour server outage in August 2007 caused many legitimate copies of Vista (an XP) to be marked as pirated and caused mass outrage [75].

The Mojave experiment [20] was designed to improve perception of Vista, rather than actually improve user experience. Despite being billed as an “experiment”, users were not given the opportunity to actually use Vista – merely they were shown demos on security, compatibility, organization, windows media center, file backup, and gadgets [20]. Alshamari and Mayhew [80] in their study of task design conclude that, “task design can play a vital role in the usability testing results”. Not having any tasks at all will surely cause even more of an impact.

Whilst all this gives the impression that Microsoft are at least trying to improve the experience of the users in the design of Vista, even if their success was debatable, the playing down of system requirements and the ambiguity of the “Vista Capable” label has resulted in a class action lawsuit [73]. Whilst this is debatably a usability issue, it is certainly an issue of “consumability”. It has undoubtedly had a negative impact on the user experience of those people who bought ambiguously labeled machines, only to find they would not run the full features of Vista,

including the Microsoft employee with the “\$2,100 e-mail machine” [133].

Internal communications released as part of the lawsuit reveal that many at Microsoft had significant problems with drivers for peripherals (a problem that has been largely fixed), and also with the high system requirements. A Microsoft VP bought a laptop that lacked the necessary graphics chip to run the higher-end versions of Vista [73, 133]. Whilst members of staff made the case for doing the “right thing”, including a Microsoft Co-President [134, 135, 133], they were ignored and consumers, feeling misled, started the lawsuit – now granted class action status. As of November 2008, this has not been resolved and is set for trial April 2009 [84]. Recently released documents indicate that Microsoft bowed to pressure from Intel [137, 84, 85, 86, 87, 88, 138], much to the dismay of HP [89, 136, 137, 133, 138]. It can be noted that Microsoft have changed their labeling approach for Windows 7 [81].

With an incredibly long development cycle and a 5-year gap between releases, perhaps in stands to reason that development has not progressed with expectations – fired up by marketing hype. And, despite the issues, probably Manes [77] description of Vista as “utterly unimaginative, internally discordant and woefully out of tune” is overly harsh. But perhaps in the comparison between Vista and the alternatives to it, we see the power of Open Source (harnessed by both Linux and Apple), as concluded by Goldman and Gabriel in their (open source) book, “Innovation Happens Elsewhere” [83, Chapter 4].

*Of all the business reasons given here, design help may be the most important. Many software products fail because they do not meet the needs of their intended users. An article in Scientific American by W. Wyatt Gibbs (“Software’s Chronic Crisis,” September 1994) stated that “some three quarters of all large systems are operating failures that either do not function as intended or are not used at all.” Indeed, the 1994 CHAOS Report by the Standish Group stated that over 30% of software projects are canceled, with the greatest risk factor being lack of user involvement. User feedback, coupled with the open-source practice of incremental development and frequent releases, helps keep a project in touch with reality and focused on what is most important. Feedback from users includes answering the question of whether the project is even worth doing at all.*

## 8 Security

In May 2007, Information Week reported a survey of 300 IT professionals. Half of them cited Vista's improved security as a reason to adopt the new OS [94]. In January of the same year, however, it was suggested that XP with service pack 2 was perfectly adequate for the average user, and the improved security did not merit the cost of a \$200 upgrade [92]. Shortly before this, an Indian state moved to Linux – citing the cost of Windows and concerns about security [68]. Meanwhile, in February 2008 there was the slightly bizarre requirement that anti-spyware software must crash, something reasonable for regular applications but of questionable value for security applications [95].

It's hard to build a true picture of the security of Vista and the success of the "Secure Development Lifecycle" (SDL) with the various conflicting reports. Microsoft solicited the help of hackers at BlackHat in 2006, and was reportedly well received [106], by the end of that year the potential damage of flaws discovered in Vista was being reported in the New York Times [93]. At BlackHat 2008, an exploitation of buffer overflows was unveiled and widely reacted to [91] in a manner that the security researcher (Sotirov) found somewhat sensationalist [90]:

*The articles that describe Vista security as "broken" or "done for," with "unfixable vulnerabilities" are completely inaccurate. One of the suggestions I saw in many of the discussions was that people should just use Windows XP. In fact, in XP a lot of those protections we're bypassing don't even exist. XP is even less secure than Vista in this respect.*

In the first year of release, Vista had just 14 security related updates compared to XP's 41, vindicating the claim of Jim Allchin (who led the development of Vista) who predicted that as a result of the SDL the number and severity of security updates would be reduced [98].

### 8.1 Usable Security

As noted by Norman [140], "the more thorough the demands of security, the less secure the result", as onerous security demands cause people find ways around them. There is a "constant trade-off between security and usability" [96], though? Even before Vista's release it was reported that whilst security would be dramatically improved, there would be "execution and usability challenges" [102]. A Microsoft Blog post [96] details some compromises

made in order for the improved security in Vista to be "Usable"; mostly, in the case of User Account Control (UAC), and Data Execution Provision (DEP) by toning down the stringency of the protection. In the case of UAC this is so as not to annoy the user to the point where they disable it, and in the case of DEP in order that certain things, such as plug-ins in Internet Explorer, work properly. The disabling of DEP is intended to be a temporary measure, and eventually the blogger (Jim Allchin) "expect[s] we will be able to turn on DEP by default for everything" [96].

### 8.2 User Account Control

In almost every review of Vista read for this paper, User Account Control (UAC) was derided and complained about (including [79, 39, 76, 103, 104, 72]). One reviewer was so incensed he wrote, "And take User Account Control (UAC), please. No seriously, please take it. And kill it. And stomp on its dead body. And then hang it on a flag pole as a warning to others" [99].

In fact, UAC was toned down to reflect usability issues and the threat that it was so annoying that people would disable it altogether [96]. Its purpose is similar to the pop-up on the Mac, which occurs when you wish to install something, or run an application downloaded from the internet for the first time. Actions that trigger a UAC prompt include (from [100], a positive review of UAC):

- Installing and uninstalling applications
- Installing device drivers
- Installing ActiveX controls
- Installing Windows Updates
- Changing settings for Windows Firewall
- Changing UAC settings
- Configuring Windows Update
- Adding or removing user accounts
- Changing a user's account type
- Configuring Parental Controls
- Running Task Scheduler
- Restoring backed-up system files
- Viewing or changing another user's folders and files

Microsoft does claim that UAC is "more than UI" [105]. Vista is a "user-centric operating system" and the purpose is to keep users safe, not punish them [105]. Eventually, the goal is for there to be no UAC prompts and for applications to run well in "standard user" accounts. In the transition to this, since many people have been running as administrator by default. For example, in previous versions of Windows, it was not possible to change the time zone without

administrator privileges [105]. Whilst there is good reason for not allowing every user to change the system time, being unable to change the time zone in our increasingly global society is clearly ridiculous.

UAC is in response to real problems; Enterprise customers want to be able to have staff as standard users, not as administrators; spyware on home computers meant that an unacceptable one third of the time reinstalling was the recommended course of action for software trouble; parents need to control what their children can do on the computer [105]. The problem is elegantly solved on the Mac and in Linux (by the permissions model)... but consensus seems to be that it is not in Vista. One reviewer commented, he “find[s] it interesting that Microsoft decided to take the user access control concept from Mac OS X and make it much worse.” [103]. This is partly deliberate, a Microsoft product unit manager was reported as saying that UAC was in Vista to “annoy users”; something deemed necessary to “change the ecosystem” - encourage software companies to write applications that do not require administrator privileges [101].

An interesting point made in “UAC - What. How. Why.” [105], is that there are some applications that UAC *will not allow the user to run*, indicated by a red dialogue UAC box. This indicates that, “The application is from a blocked publisher or is blocked by Group Policy” [107]. Whilst this is potentially a beneficial thing, saving the average user from themselves; it does lead to a potential situation where Microsoft decide who can and cannot write software [for Vista].

Is UAC usable, though? When one (positive) user reported seeing UAC prompts “once or twice a day” [108]; this seems excessive. Whilst a personal computer user entering their password once or twice a day may be no big deal, in an enterprise setting – that’s a lot of calls to the IT helpdesk. From [43], “The best security is transparent to users... Microsoft has simply tried to transfer culpability to users for letting malware into a system... if users click through a bunch of windows that they don’t understand and activate malware, is it the fault of the users or of Windows for letting it in?”

With all this, is UAC secure? The admission (from a Microsoft employee) that UAC does not “define new Windows security boundaries”, as it does not create “a wall through which code and data can’t pass without the authorization of a security policy” [97] suggests – not completely, and not even as much as you might think. Further, a social engineering flaw was identified in February 2007 [110] (full details [109]).

There’s undeniably been a big emphasis on security in Vista. Compromises between security and

usability have been considered. There are invariably tradeoffs, many of which the average user does not – and has no desire to understand. We’d like our computers to be secure, but invisibly so. To prevent malware, protect us from the unscrupulous people out there and from ourselves and our ignorance... but for us not to notice this happening; to achieve all this without impacting on our user experience. Will this ever be possible? Like computers, hackers, viruses and computer-savvy criminals are here to stay – so probably not.

## 9 Conclusions

To sum up, “You see, Windows Vista isn't perfect. It's not even close to perfect. It's better than Windows XP is, of course, but it damn well should be: It benefits from five more years of experience and work. Being better is the minimum requirement.” [99]

Vista is a leap forward in computing and in many respects highly-usable and well regarded. However, the problems with Vista are manifold: they include usability and utility as well as broader issues of compatibility, installation etc. We can conclude that Vista has poor consumability. On top of this, the perception of Vista has spread virally, by word of mouth, in blogs, news articles, all over the internet. Mojave [20] and some weird adverts [17, 18, 19, 21] cannot seem to stop the tide of bad opinion. The result is a lack of momentum even above and beyond standard resistance to change.

For the most part, Microsoft is in competition with itself, so it is hard for the company to lose. However Apple and Linux are making gains in important places. Linux is increasing in popularity in governments [68, 69, 130] whilst Macs have been gaining in popularity [142, 144], in part due to the success of the iPod [144] to the point where a survey in August of this year, Mac was most popular choice of notebook for college students [141]. In 2007, Wilkes University transitioned to an all-Mac campus [143]. The result of this may be that Microsoft will have to adopt more open standards as interaction between people and government moves more online. Also, the next generation of IT managers will have grown up in a different environment to the current one; where computers were ubiquitous and at college they (or at least several of their friends) owned a Mac. The long-term implications of this are difficult to predict, but there is a small chance that this is the beginning of the end of Microsoft’s near-monopoly.

That said, Microsoft is in a strong position and dominates the market. They have survived other products failing. If Windows 7 delivers everything that

is promised, the status quo may not change significantly. If not, over time, we could see a significant drop in market share. With the recession currently taking place in most Western countries, PC makers are noticing drops in consumer and commercial sales [145, 145]. Companies will be looking to keep costs down in the recession, and consumers will be unlikely to buy a new computer without pressing reasons, and when they do will be looking for value for money. The effect to Microsoft will depend on the length and depth of the recession, and the business areas impacted.

The question that remains is whether or not there remains a market driven to pay for improvements in computing. There will always be those people who want the best, newest, most exciting software – just because it's new, improved and exciting. Has the average user reached the point where they can do almost everything they want to on their computer though? Now they have something good-enough, it will take a lot more to get them excited for changes.

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