

## The Three Device Model for End User Computing

As computing has matured, there appears to be convergence, at least in the business world, on a three device model for user devices. There are a couple of reasons that define the devices and the sizes. If we assume that the average business person is moving towards a smart phone with a display of about 4 inches and a desktop with a display of about 22-25 inches, we can use this to define the other device they may want to have. The reason that smart phones are limited in display size is two-fold, first, they are generally in what is considered the pocket-able device type, they need to fit into a pocket, and second, as they are a telephone and people do not always have some form of ear bud, the device has to be held up to the ear for a phone call. Holding up a device with a 6 inch screen is both unwieldy and makes you look silly (try holding your PC up as a "cell phone" with Skype). For both of the reasons, these are limited in size. Assuming that someone has a desktop location (or a place to plug in a laptop), the desktop is moving to a 22-25 inch size display. To determine the optimal size and functions of this third device, we can look at in a number of ways..

### Death in The Middle for 5-7 Inch Devices

In the world of devices, there are three form factors for devices that can be carried easily other than a traditional desktop PC. One is the pocket-able smart phone, the second is a device with a 5 to 7 inch screen, and the third is a device with a 9-11 inch screen. While the later two are called tablets, together they represent three distinct spaces, with the 5-7 inch tablet clearly in the middle. Figure 1 show why this is a big issue in the enterprise tablet

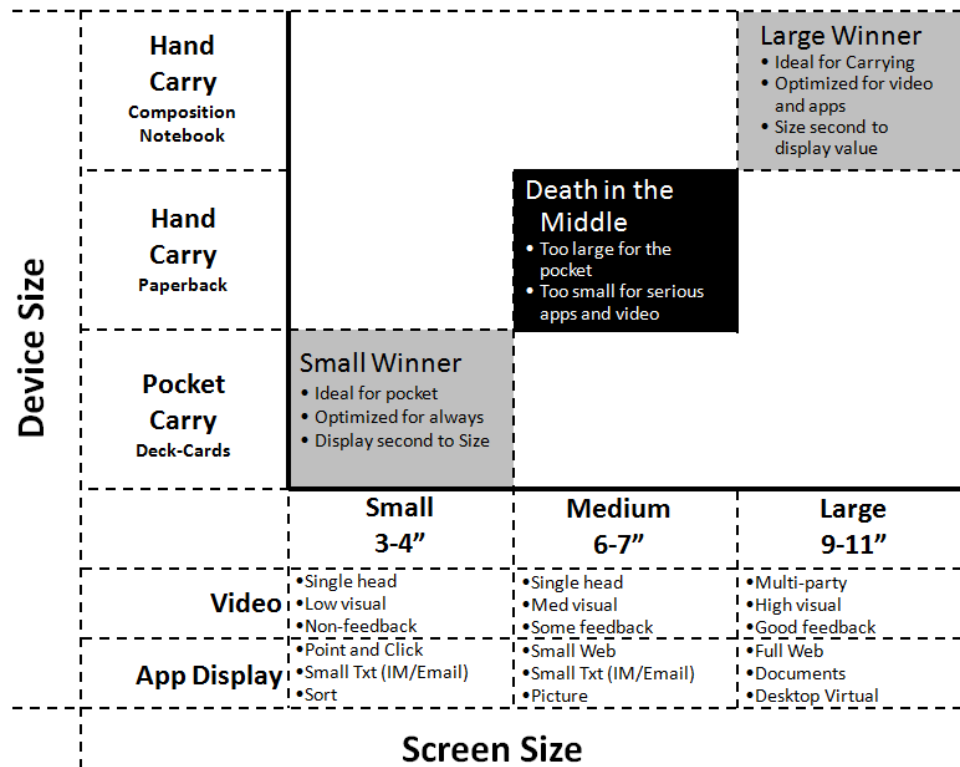


Figure 1 Screen Size Comparisons for portable devices

market.

As can be clearly seen, the combination of screen size and device size lead to a clear segmentation that creates the "Death in the Middle". In screen size, screens 7 inches and smaller are limited to a single head video versus multi-party video, are not large enough to truly see visual expressions, do not have true windowing, do not enable text reading for page views of forms or documents. They also will not enable

desktop virtualization in a meaningful way as they are just too small to replicate in any way the experience on a 15-25" PC monitor. To see this effect, using a cut out window of paper will show how little of your PC screen can be seen at 7 inches. It is critical to remember that usable screen is the square of the diagonal measure, so a screen with 9.5"



Figure 2 Comparison of 7 and 10.5 inch Displays

has twice the area of a 7" screen. This is critical as displaying multi-party video or seeing real response expressions in video requires a minimum size. Note that all of the iPhone video screens shown are a single headshot.....conversely, any screen larger than about 4" precludes the device from being small enough to fit into a pocket easily. So, devices with both mid and large size screens are relegated to being carried versus being a pocket-able device. Figure 16-5 shows a comparison in a video environment of a 7" to a 10.5" screen.

It is clear from this view that the 10" screen is much more effective. While a 7" or 4" screen can be used they will not provide the content or visibility. This is why Steve Jobs of Apple said that 7" tablets were "dead on arrival" in the company's Q4 2010 earnings call.

#### Analysis Based on Size/Value Difference

Another way of looking at this is to assume that we have the 4 inch pocket-able device and the 22-25 inch desktop and think about how those define the ideal range in between. From the above analysis, it can be clearly seen that there is a multiplier of size where it is worth having two devices versus one. If I have a 4 inch pocket-able device, I will probably not invest and carry a 6 inch device, as the things I can



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do on it are not enough "different" or "better" to justify the cost and inconvenience of having the second device. As screen area is the real value, a device that has an 8 inch diagonal screen has 4 times the display area of a 4 inch screen. At this point it starts to get interesting, but I believe that 5X is the real point of difference as it allows the screen to hold much more info. Figure 3 shows how this 5x size difference defines the acceptable display range for a third device based on the 4 and 22-25 inch extremes.

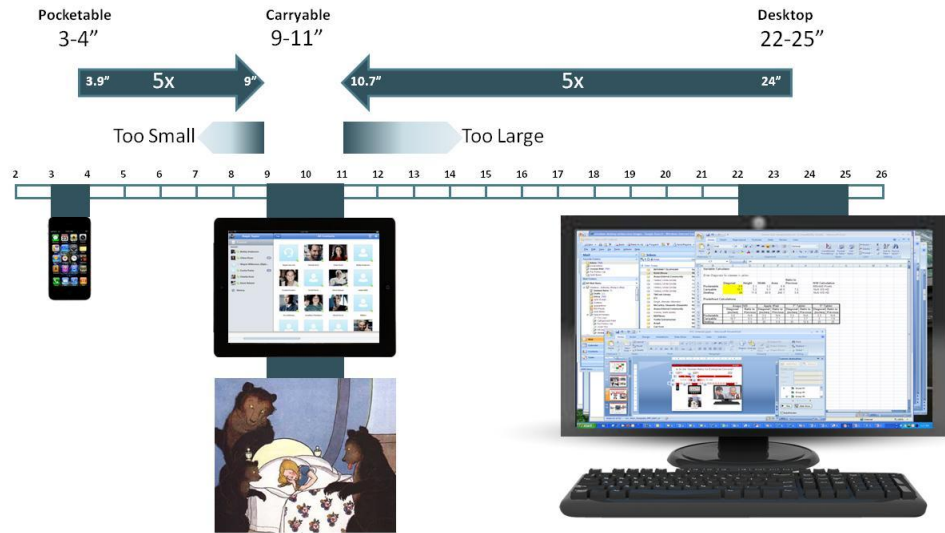


Figure 3 The Ideal Middle

The range that is established is about 9-11 inches, the ideal for utilization, ease of carrying and optimization to the other displays in the users life. The conclusion of this analysis is that users who adopt a three devices model will follow a clear pattern of a small pocket-able device, a large desktop and a carry-able device in the middle. Much as Goldilocks was happiest with the warm porridge in the middle bowl, eaten in the middle chair and slept off in the middle bed, this is the ideal "middle" answer for most users in a three device model. A 6 inch display or a 15 inch laptop do not drive a real value in the model.

## Opening the Door for VDI

The model of three devices may truly open the door to VDI. With a Carry-able/Tablet device to use outside the office on business functions, the need to have a laptop that plugs in for use in the office and on the road is reduced.

If the real need is just for a "display" with compute capability, then using VDI becomes a real option instead of a desktop computer. And, if the VDI system extends to the Carry-able device using the capabilities demonstrated by Microsoft in Office 2013, then the user can access and use common computing from anywhere. Figure 4 shows how this VDI options

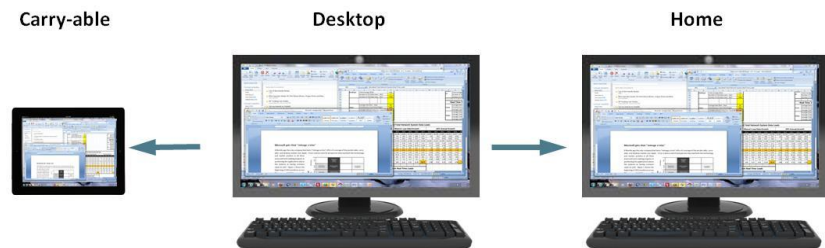


Figure 4 Extending VDI across the devices

can be implemented, using VDI to extend the VDI desktop across the large office screen, the Carry-able screen, and even using a home or third party computer. With Office 2013, and a reasonable cache of recent data, this can be extended to the Carry-able and even the Pocket-able devices when the user does not have a network connection. For many corporations, this new capability to control data and reduce costs will probably justify having a three device model.

### The Tablet Base

If a third device is desirable, then using it as an additional work screen in the office is of value. Today the tablet is generally not used at the desktop or is used as a separate device. There are some tablet bases from companies like Altec Lansing that are good holders, and an app like Air Display allows the iPad to become a display to the desktop (albeit only for Macs). However, integrations that really enable the Carry-able on the desktop have not happened yet. Figure 5 shows a concept for a tablet base that integrates a low function phone capability (for when the Carry-able/ tablet is not present), along with features that optimize desktop use of a tablet. Integrated microphones, speakers, adjustable bracket with tilt for both landscape and portrait modes make this ideal for optimizing use of a tablet in the office. The positioning of the tablet and it's camera at head height eliminates the hulking and nose-hair video typical of today's video phones. By developing innovative ways to integrate a tablet in the office environment, the UC vendors can demonstrate both their ongoing desktop value as well as a new opportunity to create extended value.



Figure 5 Tablet Base Concept

Figure 6 shows how these concepts create an extended work environment. Here the table is integrated in its base when at the desktop or stand-alone away from the office, either in the building or outside. When at the desktop the tablet is in the base and integrated into the desktop workspace so that it can perform certain functions, and the desktop is for others. For example, the table may function as the control for real-time collaboration, being the user experience, while a

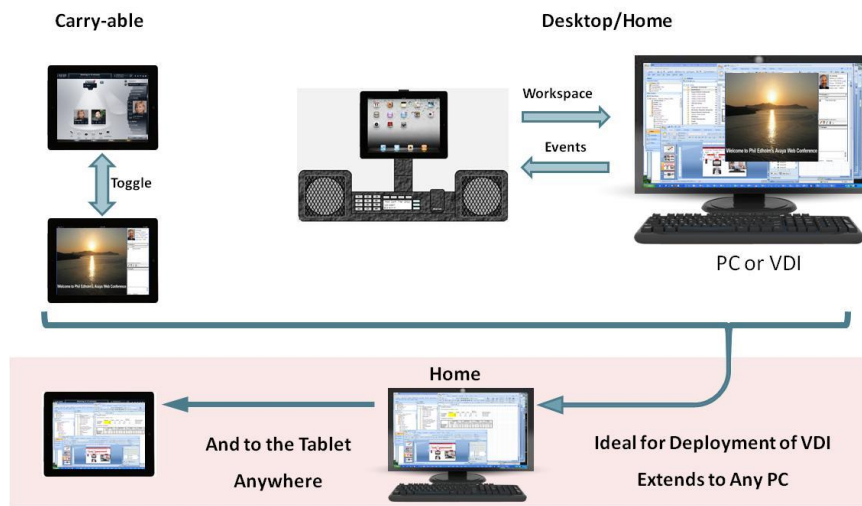
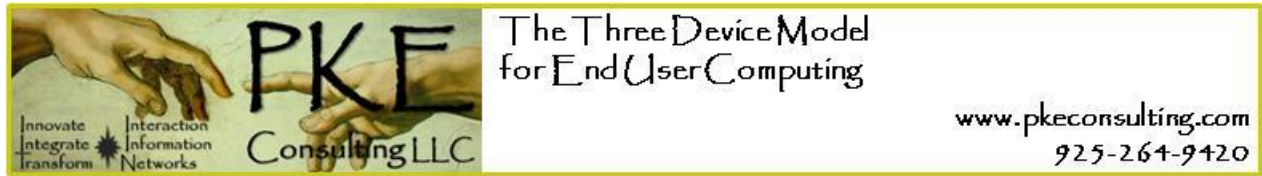


Figure 6 Tablet Base, VDI and the Carry-able Device



work action opened in a collaboration session would open a window on the large desktop display. Similarly, a communications event originating on the large display would open the real-time management on the tablet. With VDI, this experience can move beyond the desktop as other PCs/devices and the Carry-able become the common environment.

## Conclusion

The three device model of computing is coming and for many users will become the ideal environment. The combination of a large VDI desktop with extensibility into the Carry-able/tablet and onto other computers will deliver great value. Combining this with the new Office 2013 capabilities for users that need access when in areas not served by reasonable networks (3G/4G/WiFi) will make the model work equally well. The use of VDI, with the attendant security, control and cost reductions may make this a very attractive option for companies: pay for a low cost Carry-able/tablet to eliminate laptops and desktops and go to VDI. The result may very well be a significant reduction in overall IT costs.