



An Introduction to Digital Tables



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About nsquared

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nsquared is a company that specialises in creating multi-user, massive multi-touch software for digital touch screens. We have one ambitious, straightforward goal; to get people talking and collaborating to move the world forward, by putting digital tables everywhere.

Our goal motivates us to design and build robust applications that work seamlessly in 360 degree, collaborative environments. Each of our products is thoughtfully designed to stimulate conversation, encourage collaboration and create deep, long-lasting connections with people. Our clients recognise this and choose us because our software empowers them with the tools that make their hardware more meaningful.

We already have a number of amazing, forward thinking clients in business, education, government and hospitality that are embracing this vision and using our products to enhance and improve their spaces in the United States, United Kingdom, Europe and Australia. For more information on our products, download our [free nsquared software catalogue](#) from our website.



Advent of Digital Tables

A digital table defines an obvious meeting place, offers a true multi-user experience and enhances collaborative engagement. If you've started to think about purchasing a digital table then this document will help you decide what type of hardware and software you will need.

Tabletop computing and digital tables are becoming integrated into business life and work places at an increasing pace. The integration of these devices into business, education and sales spaces is largely in recognition of the increased value of collaborative activities over directed activities.

Where we've been using interactive whiteboards and relying on a single person to talk us through a PowerPoint presentation, we're now engaging in higher levels of discussion for information sharing and problem solving. The technology needs to support and enhance this shift in behavior. While interactive whiteboards offer opportunities for some interaction (by one person who is often facing away from the audience) they cannot replace the humble table as a meeting place and they do not encourage face-to-face communication.

Digital tables are obvious meeting spaces. The form factor of a table is perfect for face-to-face conversations and true multi-user experiences. The digital tabletop further supports and enhances conversations and collaboration by providing quick access to resources. Business, education and sales spaces consistently report increased engagement and long-term connection of participants interacting with digital tables, with corresponding increases in sales revenue and educational success.

Multi-user devices are designed to bring people together and help them to engage and connect at much deeper levels than they would normally. When single user devices are present, they often detract from collaborative experiences, providing distractions from the core conversation and in turn reducing the value of the conversation. Think about the differences in interactions between sitting around a dinner table and standing in front of a digital sign.



A digital table at an auto show

Microsoft released the first commercially available multi-user product, named "Microsoft Surface", in 2008.

Five years later Microsoft Surface's successor, the Samsung SUR40, still provides a premium experience, though in a significantly sleeker form factor than its forebear. Following the lead of Microsoft and Samsung, various other hardware providers have also created digital tabletops. Some of them utilize vision systems and others continue with time-honoured and proven touch detection methods. Each has its benefits and drawbacks. These will be discussed briefly in the following passages.

While there is magic in the hardware, it is the software interface that will determine how the devices can be used and whether or not your space is set up for productive, engaging collaboration and discussion. The design of the software interface will determine the level of engagement and productivity that can be gained from your investment and whether or not your space is set up for true *multi-user* experiences.

Multi Touch or Multi User

As a first step, decide what you need to achieve. Do you want to create:

1. a space that enables people to browse digital content and discover information; or
2. a space that enables several people to interact with each other and digital content seamlessly and simultaneously?

If you're looking to achieve the latter, you're looking to create a *multi user* space.

Digital *multi-user* spaces enable discussion and collaboration around digital content.

To ensure that everyone around the table has equal access to what's on the screen, you'll require a table form factor with massive multi-touch capabilities, and a 360-degree software interface.

How many touch points are required?

For premium experiences, we recommend that you allow for five to 10 touches per person that you plan to have around the table. That said, the decision will be highly budget dependent and for groups of two to ten people, the device and software both need to be capable of responding to a minimum of three simultaneous touches per person. This is especially true for smaller groups of two to four people. In a few cases, you might be able to get away with catering for fewer touches per person. This is generally due to the fact that as groups of adults get larger in number, less people in the group are likely to interact with the device simultaneously.

Allow for three simultaneous screen touches per person at a minimum.

Benefits of multi-user screen spaces and digital tabletops

A multi-user experience is one in which several people will be working on the same screen at the same time. A great multi-user experience can be created with a canvas where all users can face each other to directly interact while still sharing, creating and annotating digital content. Placing interactive screens horizontally, to act as the table around which the users can gather and engage, can create this digital canvas.



In a sales meeting a digital table can help focus people's attention on the content

The horizontal screen becomes a shared space for all the users to work together and focus on the task at hand.

Compare this with many meeting room experiences where the participants arrive with personal devices (laptops, tablets, phones) and the activity on each device is hidden from the other people. This often leads to more distractions during the meeting as people start answering emails, chatting on IM or even other personal tasks rather than being focused on the meeting.

By keeping the people focused on the content, meetings around a digital table should be faster and more focused than those using an interactive whiteboard as the focus for the meeting.

The benefit of a table hosting the content, as opposed to a vertical screen, is that people are face to face and no one has their back to the rest of the team at any time. Vertical screens are often used for presentations, which are an exercise in pushing information out rather than creating a discussion involving everyone at the table.

Horizontally mounted screens promote information sharing and problem solving better than vertically mounted screens.

Screen Size

We consider 30" to be the minimum size required for a good experience by more than two users. Bigger is not necessarily better, once a horizontal screen gets past around 60" some areas on the screen will become hard to access by everyone sitting around the screen. Once a screen is bigger than 100" then the software needs to be designed with the consideration there will likely be an area in the center of the screen that will be hard for anyone to reach even if they're standing.

For digital tables, the most functional screen sizes are between 30 and 65 inches.

Screen Orientation

For a true multi-user experience, the screen will need to be mounted horizontally like a table. This allows people to sit or stand around the device and meet as they always have, face to face around a table, and without extraneous distractions.



Placing the screen horizontally changes the way people can engage with the content.

Remember that as soon as there is any vertical component in the mounting (such as in the case of a lectern), it's difficult to see the content on the screen from all angles and sides.

Make sure that your multi-user space offers a horizontally mounted screen for multi-user engagement.

Do you want object recognition capabilities?

Do you want internal users to have quick, direct access to their own content?

Do you want to be able to place content or objects onto the table and invoke different behaviours? Do you want to be able to put your phone on the table and access specified content?

If you want any of those features, you'll need object recognition capabilities that only a vision system with camera-like functionality will provide.

Lighting

If the space has a lot of natural sunlight, or is flooded with halogen or other incandescent lighting, and the hardware you're considering operates with an infrared vision system (such as the Samsung SUR40), you're going to have to make some choices.

These will most likely involve considering removing or reducing the infrared light sources by replacing halogen or other incandescent lighting with LED or CFC lighting; and (or also) the installation of physical screens like walls, or specialized infrared filtering film (3M's PR 40 and PR 70 window films are known to block infrared sufficiently in several cases).

Work with your supplier to determine what the best way forward is for you.

Software

The most important piece to the puzzle is the software. Just as the hardware needs to promote face-to-face interaction, so does the software. Whether the software is custom built or an off the shelf solution, it should always enable multiple people to interact simultaneously, and at least as they would if the table wasn't a digital one.

Good multi-user experiences are those in which each person around the table can access the interface equally and easily no matter where they are located around the table. Everyone should be able to consider the content the right way up. No one should have to look at anything upside down. The software should automatically adjust items to the orientation of each individual viewing it.

In addition, those same people need to be able to rely on the device to respond without lag to each and every touch made.

People-to people and people to digital content interactions should be intuitive, smooth, and relatively effortless.

Custom Build or Off the Shelf (OTS) Software?

The budget you have available will always be a factor for consideration. Generally speaking, off the shelf software will always be financially less taxing than having custom software built for your organization. Procurement times should also be far less for off the shelf solutions than for custom builds. As time goes on and the market for digital tables increases, it stands to reason that there will be more off the shelf solutions available



Digital Table at Australian Museum in Sydney

There will always be cases where custom builds are required. That said, unless you already have significant experience using tabletop computers in day-to-day business activities, it's always best to start with off the shelf offerings that provide close to what you think you need. Check the features. Many applications provide administrator tools that allow you to customize certain aspects of the application for your preferences or brand. This way you can spend time assessing whether you really need all of the features on your wish list, and whether the custom build you'd envisioned will be justified in terms of return on your investment (ROI).

Good off the shelf software may be all you need and at the very least will allow you to determine your absolute requirements at significantly lower costs and delivery time frames than those associated with custom builds.

Sharing content with personal devices

People will often arrive to a meeting with content on their personal devices that they have gathered or created. A good tabletop experience will enable those people to easily transfer that content onto the digital table for the conversation. It should be a single hit transfer, where the materials being shared can be placed on the table without the need to constantly refer back to the personal device. Once the content is on the table, it is best for the personal device to be put away. Private personal devices are still an important part of the digital world and digital tables should interact with those devices in a way that promotes the content being shared when suitable.

Ensure the software enables quick and easy transfer of content between personal and corporate devices where relevant use cases exist.

Conclusion

Every situation and scenario is different, but wherever you are creating indoor spaces for people to gather in order to collaborate you can expect digital tables to enhance that experience. In the coming years you will start to see more and more digital tables emerge in meeting rooms, libraries, schools, universities and even as peoples' work desks and in their homes.

Depending on the environment and number of people involved, different hardware options need to be considered. The software should always account for people approaching the table from any side and work seamlessly for all the participants around the table.

For more information

If you have any more questions regarding about digital tables or which solution is right for you, contact us

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