

## 5 Pen PC Technology: A Portable Computer

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### Abstract

*A recent advancement in the field of pen computing is known as “5 pen technology.” Computers have a considerably bigger impact on our lives than most of us may realize. Becoming proficient in computer software has become essential for most occupations. The ENIAC, the first computer ever created in 1943, had more power than several hundred contemporary PCs and was the size of a big room. Integrated circuit-based modern computers are compact enough to fit into portable electronics. Table computers are among the smallest computers available right now; the most well-known model is the I Pad, although even that device is only 9.1 inch and weighs roughly 700 grammes. However, picture owning a computer that can tuck into your pencil case. The P-ISM, or Pen-style Personal Networking Gadget bundle, is a collection of five pens, each serving a unique function and operating in tandem to generate a virtual computing environment. This is merely a prototype that NEC Corporation is currently developing. The ITU telecom Word presentation took place in Geneva in 2003, and it featured a proposed P-ISM prototype that cost \$30,000. The prototype was created by the Tokyo-based NEC Corporation.*

**Keywords:** Wireless Bluetooth Technology, Ubiquitous computing, Portable Workstation, 360 degrees camera.

### INTRODUCTION

A new development in the realm of pen computing is called “5 pen technology.” Pen computing is the study of creating pen-like devices with computer-like user interfaces that are more user-friendly than those found on modern systems (such as laptops, desktops etc.). The five pen-like gadgets that make up 5 Pen PC technology serve as a CPU, projector, virtual keyboard, camera, and communication device all at the same time. The five pens are all linked to one another using wireless technology, ideally Bluetooth, or 802.11 BG. The mobile phone pen connects the entire set of 5 pen technologies to the internet. Another name for 5 pen PC technology is P-ISM, or Pen-style Personal Networking. The P-ISM, or Pen-style Personal Networking Gadget bundle, is a collection of five pens, each serving a unique function and operating in tandem to generate a virtual computing

environment [1]. The P-ISM is a compact gadget that can perform five different tasks: photograph pin scanning, virtual keyboard, ultra-small projector, pen phone with handwriting input capability, and low-cost personal ID key. The P-ISM is interconnected by short wireless technology. All sets are also connected to the Internet with the operation of mobile phones. This personal tool is the pinnacle of ubiquitous computing, designed in the minimalist style of a fountain pen. P-ISM is a collection of five devices that includes a pen-style phone with handwritten data input capabilities, a miniature projector, a photo scanner, a virtual keyboard, and a personal ID key with cashless pass functions. P-ISMs are linked to one another via wireless short-range

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technology. The full set is also internet-connected thanks to the mobile phone capability. The ultimate ubiquitous computing is made possible by this small device that has a basic pen design [2, 3]

## LITERATURE SURVEY

Mobile learning tools are increasingly common in educational institutions worldwide. There are still a lot of unanswered questions in the study literature, especially when it comes to data from direct observational studies, despite generally positive research findings regarding the effectiveness of mobile technology for raising student outcomes. A study was analysed by Beng Lee et al [1] an empirical approach to examine how undergraduate university students used tablet computers and digital pens to learn Chemistry. The primary sources of data used in the study were interview responses and observational data in the form of static photos and videos. The theoretical underpinning that guided the data analysis and interpretation was activity theory. The data analysis revealed several themes, including the benefits of digital pen technology for encouraging flexibility, emerging learning, focused learning, reflective thinking, and peer collaboration. It was also discovered that the usage of these mobile technologies came with limitations, was contextualised, and depended on individual characteristics. For instance, there was little synchronisation between the way that mobile devices operated and how people naturally moved. One of the primary conclusions drawn from the study is that, in evaluating the possible advantages and drawbacks of mobile technologies, universities should consider the interactions that take place among various system elements, such as students, technology, and newly developed learning processes.

A prototype of the pencil style computer was developed in 2003. The prototype, named P-ISM, is the prototype personal internet device, developed in 2003 by the Japanese technology company NES. P-ISM presented at ITU Telecom World 2003, Geneva, Switzerland. 5 Toru Ichihashi, founder of Pen Technology, added this idea to himself as What will be the future of computing? He said he asked. While you're still young? pen is good choice, also needs a product. You can touch and feel. In addition, is aimed to have offices in 2003, such a device has not yet been made available to consumers. The design concept is to use five different inks to make a computer. The pen is the CPU, is another camera, one creates a virtual keyboard, the other projects the image and so the screen and the other communicator (phone). All five pens can be placed on a single constant, which charges the battery and houses the main memory. All pens communicate wirelessly, maybe via Bluetooth.

### How does it work?

The five pens in the P-ISM (Pen-style Personal Networking Gadget Package) set are each designed to perform a different purpose. By serving as a keyboard and monitor on flat surfaces, these pens combine to create a virtual computing environment that enables you to carry out operations that you would normally do on a desktop computer. P-ISM uses Bluetooth, a short-range wireless technology, to connect with one another. The complete set is Internet-connected thanks to the cell phone capability [4–10].

The P-ISM's five elements are:

#### *CPU pen*

The CPU's operations are carried out by a pen. called a calculator as well. It has a built-in dual-core CPU and is powered by the Windows OS. The central processing unit (CPU), which is in charge of carrying out the instructions contained in computer programs, is the main part of a computer. Arithmetic, logic, and physical input/output are all completed by the central processing unit through the execution of all programme instructions. The expression has been used in the computer industry since the early 1960s, at the very least. The shape, style, and were unaltered. Originally, CPUs were developed as components of bigger, occasionally specialised computers. However, the development of production processes intended for one or more uses has resulted from this costly method of constructing CPUs for certain applications.

### ***Communication Pen***

Short-range wireless technology is used to connect communication pen PIMs.. Additionally, every set is linked to the internet through mobile phone usage. Three forms of wireless connectivity—Bluetooth, 802.11B/G, and cellular—are used to connect them; these are compacted and carried in little objects like pens.

### ***Virtual Keyboard***

Any device that tracks finger motions with a camera can use the virtual keyboard (as shown in Figure 1). 3D IR sensor technology is used in this bespoke keyboard to create a full-size keyboard. The keyboard layout and input language are both modifiable. This works better than regular keyboards because you don't have to buy a new one for each language. Since spills, falls, and other faults can readily destroy them, they are also simple to maintain.

### ***LED Projector***

The LED projector serves as the screen's substitute.. LED projectors employ LCD technology to create images, but instead of using light bulbs, they use a variety of light-emitting diodes as their light source. It also lasts longer and requires less electricity. The screen measures roughly 1024 by 768 pixels, or the same as an A4 piece of paper [11].

### ***Digital Camera***

Our cameras (as shown in Figure 2) resemble pens. Easy to use for video conferencing and recording, it's simply known as a webcam. It also has Bluetooth connectivity with other gadgets. Its portability and compact size are its key benefits. This visual communication device rotates 360 degrees. Numerous video conversations have been shown in films. Equipment and equipment limit long distance communication. With circle vision and the ultra-wide-angle camera in the centre, the terminal can see the surroundings and facilitate group communication.



**Figure 1.** Virtual Keyboard.



**Figure 2.** Digital Camera on 5 Pen.

### General Techniques of Pen Computing

There are numerous applications for user participation in open computing. For these concepts, real machines frequently employ recipes.

- Pointing and location input: a stylus and tablet are utilised as pointing tools (using a mouse to “drag around the cursor” on the screen), while the tablet serves as the actual point device (indicating where to clear the cursor using a pen).
- When replacing a mouse with a stylus and tablet, there are certain human considerations to consider. A finger can be used as the stylus on a touch-sensitive tablet surface, such as a touch screen.

### Handwriting Recognition

Keyboards or mouse and keyboard can be customised with a tablet and stylus in two different ways:

*Pointing mode:* As previously mentioned, the pen functions as a pointing tool.

*Online Handwriting Recognition mode:* The software recognises the character's stroke or image as handwritten letters input as words entered from the keyboard by analysing the pen as “liquid”.

Different systems use different techniques to transition between the two modes (pointing and handwriting recognition), such as:

- Writing in different tablet areas for the two modes (pointing and handwriting recognition).
- To switch between modes, push a unique button on the stylus's side.
- By context, this includes handling multiple symbols that aren't recognised as text as pointing input.
- By identifying a unique gesture symbol.
- “Online handwriting recognition” refers to handwriting recognition employing a real-time digitizing tablet for input, as opposed to “off-line handwriting,” which involves optical character recognition of fixed handwritten symbols from paper.

### Direct Manipulation

The virtual object can be immediately touched, pressed, and dragged with the pen. The Wang freestyle system is an example. Freestyle works entirely with direct control, with the addition of electronic “ink” to add text.

### Gesture Recognition

*This is the process of recognizing certain images, not text input, not specific characters commands. For example, a good “pig” (often used as a proof sign) indicates a “delete” action. Depending on usage, the symbol can be the object or text from which it is deleted, or the pen can be used as a marker to select what needs to be deleted. In Apple's Newton OS, text can be removed by drawing a zigzag pattern over the text the user wants to delete. The digitizer used by the Fresh system can recognize multiple “pencils” (usually fingers) simultaneously, enabling them to use multiples pointers. Pen Point OS is a unique operating system that integrates running and writing entries at all service levels. Previous systems included gesture recognition to do this only in specific application CAD/CAM applications or writing.*

### Designing of PC pen

#### Merits of 5 pen pc

1. It is suitable to use because of its portability (small and compact).
2. It supports wireless technologies.
3. It is Portable.
4. It has a very long-lasting battery life.

5. It reduces electronic waste.
6. Virtualization reduces costs.
7. It is much lighter than a traditional portable computer.
8. Excellent succession life (up to 2 weeks)

#### ***Demerits of 5 pen pc***

1. It works on wireless technologies and therefore it has limits of range.
2. It is exorbitantly expensive.
3. One of the workings can be easily misplaced.
4. ledge surface should be flat for finest usage.
5. The positioning of pens is very important.
6. Slight disturbances would hamper entire setup.
7. Cost might be high due to technology being new.

#### ***Applications of 5 pen pc***

As a result, technology increases productivity, makes daily work easier, and provides a unique path for many businesses with its size, digital writing capabilities, and multitasking capability. Various applications of 5 pen pc is shown in Table.1.

**Table 1.** Applications of 5 pen pc

<b>Industry/Application</b>	<b>Key Benefits</b>
Education and Learning	Digital handwriting recognition, multitasking, wireless connectivity, learning apps, visual display, and portability
Business and Work	Real-time notetaking and data sharing, creating reports on-the-go, digital handwriting recognition, multitasking, and wireless collaboration.
Healthcare and Medical Fields	Electronic medical records, portable monitoring devices, digital prescription writing, telemedicine, and medical imaging.
Design and Creativity	Digital drawing, high-quality gaming, virtual reality interaction, multitasking, and ample space for storing designs and prototypes.
Military and Defence	Tactical communications, reconnaissance missions, navigation and mapping, intelligence gathering, and multitasking.

#### ***Future of 5 pen pc Technology***

- *Wider adoption:* As more people become aware of the advantages of 5 Pen PC technology, leaders and enterprises will adopt it at a higher rate.
- *Better hardware:* This device may have more potent, dependable, and functioning hardware in future incarnations.
- *Advanced Software:* As technology evolves, software developed for the 5 Pen PC is expected to get smarter and expand its functionality and use.
- *Virtual and Augmented Reality:* Virtual and augmented reality can be combined with 5 Pen PC technology to give users new experiences in learning, business, and gaming environments.

#### **CONCLUSION**

Communication devices are getting smaller and more common. This is just the starter model of the new technology. Less communication equipment means that less room is needed.

These ideas can be easily transferred from one personal location in the world to another. So, they are portable. The pen navigation system is a sought-after system in the market. The PISM is designed for those who want to experience traveling with a” computer in a small bag, but in addition to its lightness and pocket size. Expand the target market and law enforcement. Due to its straightforward concept and niche market appeal, this product will face competition in the market from other companies. However, it is worth producing for its target demographic. 5 Pen PC technology has a

bright future ahead of it and the potential to completely transform the market. By allowing students to take notes more quickly and access digital versions of books from any location, technology can improve learning. Concerns remain, nevertheless, regarding how these changes may affect society. In a world where data breaches are commonplace, concerns over security and privacy have been raised by the rising popularity of electronic gadgets.. Ethical issues should be considered when developing new applications that ensure user security and privacy. Overall, 5 Pen PC technology should continue to evolve as technology advances. With careful use, manufacturers and developers can reduce ethical concerns about this new technology, thereby affecting people for years.

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### REFERENCES

1. Chwee Beng Lee, Jose Hanham, Kamali Kannangara, Jing Qi. Exploring user experience of digital pen and tablet technology for learning chemistry: applying an activity theory lens. *Heliyon*. January 2021; Volume 7, Issue1; e06020.
2. “5 Pen PC Technology”, *International Journal of Emerging Technologies and Innovative Research* (www.jetir.org), ISSN:2349-5162, Vol.5, Issue 6, page no.814-817, June-2018, Available :http://www.jetir.org/papers/JETIRC006145.pdf
3. Rose Mol Joy. 5 Pen Pc Technology. *International Journal Of Engineering Research & Technology (IJERT)*. NSRCL – 2015 (Volume 3 – Issue 28).
4. Mohabe MS. Pen Technology”. *IOSR Journal of Computer Engineering (IOSR-JCE)*. 5;16(6).
5. Arora K, Varshney P. 5 Pen PC: Battle between functionality and portability. *International Journal of Advanced Research in Computer Science*. 2014 Nov 1;5(8).
6. Meyer A. Pen computing: a technology overview and a vision. *ACM SIGCHI Bulletin*. 1995 Jul 1;27(3):46-90.
7. Kulkarni PS, Parchure A. 5 Pen PC Technology.
8. Bedke P, Kulkarni P, Narvekar R, Garagte N, Nilpankar G. 5 Pen PC Technology: A Review. *International Journal for Advance Research and Development*. 2017;2(4).
9. Maxwell OS, Obahiagbon KO, Amenze OJ. 5PEN Technology: A new dawn in homogeneous and heterogeneous computing. *arXiv preprint arXiv:1804.10651*. 2018 Apr 5.
10. Sharples M, Beale R. A technical review of mobile computational devices. *Journal of Computer Assisted Learning*. 2003 Sep 1;19(3):392-5.
11. Press L. Dynabook revisited—portable computers past, present and future. *Communications of the ACM*. 1992 Mar 1;35(3):25-32.