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Pen as a Technology

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Abstract

In the current electronic age where voice mail, cell phones and e-mail are being employed extensively, no substitute has been found to replace the pen. Even when, one is browsing the internet, he or she still puts a pen within reach, which can be used to write down notes, scribble phone numbers or even doodle (Russell-Ausley, 2011). Even though technology has advanced significantly, businesses are still relying heavily on the pen. For some businesses, this may be for legal reasons or convenience. The evolution of pen technology has been discussed by many scholars. However, the users of pens have never thought of how the technology and mechanisms used in writing started. Beginning with sharp stones, which were used by cave men to digital pens, which are currently fancied by many people, this paper traces back the pen technology to its origin.

Key words: Pen; Technology; History of writing; Evolution of the pen

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INTRODUCTION

According to Swaby (2012), people fancy the big blue pens, which costs more than other technologies. At the same time, people have falsely proclaimed that all pens are the same. Pens such as the Cheapo pens are disregarded by people since they leave ink smeared on their notes, they might bleed through their pants pockets or worse, glop up their pages (Swaby, 2012; Al Jenaibi, 2009). However, even cheap pens were considered state of the art at some point in time. In the last century, there have been approximately 150 patents, which have improved the process of writing.

Although the holder of the pens has remained the same and looks almost the same as the stick it was first designed from, many developments have taken place and made the pen technology different from its earlier development. Even though the evolution of people is considered to be essential (Al-Jenaibi, 2014), many lessons have been focused on how writing instructions have been engineered over time. Universities have requested their students to work in groups to design and built functional pens from everyday materials, which can deliver washable liquid color (Russell-Ausley, 2011).

However, while many of them seem to design and develop functional pens, they have not been able to duplicate pens that were used centuries ago. With digital pens becoming a part of many people's lives, ancient pens are likely to be extinct. To some people, digital pens provide cost effective means for paper processing to enter the digital world (Al-Jenaibi, 2015). However, while digital pens seem to take form, many people seem to overlook the interesting part of how the technology of the pen came into being. This paper clearly discusses the evolution of the pen technology from papyrus, which was used by skilled Egyptian people to the introduction of digital pen, which is currently used by many people.

1. LITERATURE REVIEW

The first type of primitive paper was clay tablets, which were engraved using straws, which are also considered as the forerunner of the pen. Straws were cut diagonally in ways that could leave a mark on the soft and wet surface of the clay. This would then be dried making the

lines where were previously engraved on the clay to be imprinted (Collins, 2011; Al-Jenaibi, 2010). The evolution of the pen is considered a direct result of developments of accessories of writing. This evolution has moved from papyrus utilization to parchment, and finally to paper which is currently being used.

2. THE HISTORY OF WRITING

The introduction of pen and paper began with significant change that was dictated from intrinsic characteristics of the papyrus paper, which demanded ink to leave legible marks and lines (Collins, 2011). The Egyptian scribes understood how to fabricate black and red ink using a process that required them to mix soot and oxidized iron with glue and water (Collins, 2011; Al-Jenaibi, 2010). For the Egyptians to write with such elementary ink, the scribe was required to submerge a reed point, which by capillary action would absorb a quantity of ink that is enough to allow a number of characters to be written (Collins, 2011).

The Egyptians repeated this action a number of times until they completed their work. This writing followed writing through its history until the beginning of the 20th century (Frazer, 1878). In fact, the introduction of pen is as a direct result of the development of the accessories of writing, which is the utilization of papyrus to parchment and later to paper that is currently being used. The first instrument used to write with a point was similar to a fountain pen nib that was made from the stem of a papyrus tree (Frazer, 1878). This instrument was developed during the civilization of the ancient Greece.

With the introduction of parchment paper, a goose feather pen was used instead of straws. This was used because of its strength and flexibility. This pen became common in the 16th century when paper was introduced. The process, which was used to make goose feather pen was composed in two phases. In the first phase, the feather was buried for a short time under a layer of warm and fine sand to dry its inner and external membrane (Ibid.). The second phase involved immersing the feather in a boiling solution of alum or nitric acid. This was done to strengthen the feather for future use (Ibid.).

3. THE EVOLUTION OF THE PEN

Even though writing began with clay tablets and straws, the evolution of the pen has raised a significant discussion. According to Swaby (2012), paintbrushes, which were largely used by the Chinese, are regarded as the earliest precursors to the pen. While the Chinese were busy with their paintbrushes, the Egyptians were busy with their papyrus reeds, which they used to write their letters. However, both writing technologies were much overshadowed in the 7th century, when the Europeans started adopting bird feathers to scribble ink on paper (Frazer, 1878). Quill pens are regarded as a huge innovation, even though they were bulky and rigid like all other writing tools that came before them.

The natural bend of early pens helped to ease the friction that existed between the pen and paper while their slender profile made it easier to wield these pens. For many centuries, dipping feathers into ink were regarded as the best way of putting words on paper. However, the beginning of 19th century saw people trading quill writing materials, which were made of metal (Ibid.). The first steel pen point was made in England in 1828. This pen was considered to be a great innovation especially for manufacturers even though its dip, write; dip process was tedious for wordsmiths (Austen, 2013).

The fountain pen, which was developed in 1884 by an American inventor, L.E. Waterman, marked the first innovation of a real pen (Solon, 2013). Although this pen holds ink inside, it was not the only pen that was developed with the technology for holding ink. Even though ballpoint pens date back to 19th century, these pens started taking off in 1940s (Kekre, Scheller-Wolf, & Secomandi, 2009). The "biro" pen, which was developed by Lazlo Biro, a Hungarian journalist, kicked off the writing experience for many people (Ibid.). Biro was the first technology to employ ink that quickly dried after writing, using a ball to regulate the flow of ink.

The technology used to develop the biro pen helped to reduce the friction between the tip of the pen and the paper. Today, ballpoint pens are upgrades of earlier innovations of this writing instrument.

4. IMPROVEMENT IN PEN TECHNOLOGY AND WRITING

Since the introduction of the pen, several aspects have improved. Ink used in writing has also tremendously improved over time. Pens that are used today are able to produce lines that are even and with a thickness that is consistent. The pens which were introduced earlier were oil based with a thick nib that produced thick writings (Accenture, 2011). However, companies are currently producing ballpoint pens that produce thinner writings while the roller that exists at the tip of the pen allows the person writing to use little force when writing.

Currently, the ink that is used in writing is water resistant, bleach resistant and can resist other substances, which it could not resist in the past. In addition to that, other people have started adopting the use of digital or smart pens. Despite this tremendous trend in the development of pen, it is essential to trace back the development of the pen.

5. METHODOLOGY

Researchers have employed different research methods to gather information for their research findings. However,

as study shows, validity is the most essential concept when one is choosing a method to employ. Therefore, the validity of this research lies with the method that will be employed in the research. While methods such as interviews and questionnaires have provided useful information, it is difficult to employ these methods in areas where historical perspective of a study is considered to be essential.

Tracing back the pen technology involves historical flashes, which can only be understood when some research methods are used. This makes the framework for analysis of new technology an essential research method. According to Kekre, Scheller-Wolf and Secomandi (2009), the fundamental issue in managing technological innovations is the comparative evolution of emerging and incumbent technologies. This evolution can be seen in the evolution of the pen technology; one innovation seems to overshadow the previous innovation.

The framework for analysis of new media technology begins with the earliest forms of technology, which is then followed by the modification stage or what many researchers have come to term as design improvement. This stage is followed by another modification stage, which is implemented because of disruptive technology. New era, which is mostly associated with incumbent technology being replaced by other technological innovations, is the following stage, while newer version prediction is always used to suggest that it is possible that another disruptive technology will emerge (Accenture, 2011).

Using this method to analyze the evolution of pen technology clearly shows that one innovation has been surpassed by other innovations. In addition to that, it also provides that the preceding pen technologies have always shown many improvements in the pen technology compared to the previous innovations. Figure 1 shows how this method has been implemented.

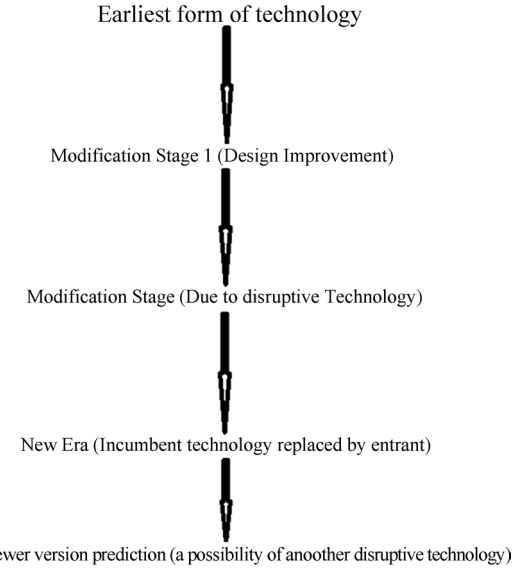

Figure 1
Innovation Processes of Pen Technology

The technology used to develop pens falls from any of the above eras. According to Sieben and Boldt (2008), people all the way back in 4000 B.C needed to record and communicate ideas and information. Therefore, by applying the framework for analysis of new media technology, we clearly find that the need to communicate ideas and record information is not a new thing, but something that goes way back many centuries. Development of the pen technology has come as the idea to communicate and record information evolves in ways that require more than just making scratch marks (Sieben and Boldt, 2008). New era, which incorporates incumbent technology that is replaced by entrants, provides pens that not only write, but contain other technologies such as flash drives, laser pointers and music scanners (Sieben & Boldt, 2008).

6. FINDINGS

By employing the framework for analysis of new media technology, it is easier to trace the technology of the pen back to when it began. Sieben and Boldt (2008) have clearly provided that the need to record and communicate ideas is not new; it is something that people way back in 4000 B.C. needed to do. This model also shows that throughout history, pens have been valuable to almost everybody, and there have always been improvements as one innovation is surpassed by another one. This concept is shown in table 1.

Table 1
Framework for Analysis of New Media Technology Used to Trace the Pen Technology

Needs	Materials	Writing technology	Technology era
			Earliest form
To scratch pictures on the walls of caves they dwelled.	Sharp stones	Sharp stones as writing tools	
To create portable records.	Straws and clay	Clay tablets and straws	
			Modification stage 1
To create alphabets on paper	Metal, bone and ivory, wax coated tablets	Writing stylus	
Required to write on raised stone-carved hieroglyphics	Indian ink (made from soot and lamb oil)	Paint brush	
To communicate information	Papyrus (hollow tubular stems of marsh grasses) and parchment paper	Reed pens	
			Modification stage 2

To be continued

Continued

Needs	Materials	Writing technology	Technology era
The need to record information that stayed for longer period.	Stable ink made of iron-salt, gum and nutgalls, wood fiber paper	Stable ink and advanced Reed pens	
To improve writing.	Bird feather (goose), plant fiber paper	Quill pen	
			New Era
To develop a pen that carried its own ink.	Metal, flexible rubber sac, easy to dry ink	Fountain pen	
The need to give everybody a chance to own a pen	Metallic ball bearing, plastic tube to hold ink, and either plastic or metallic casing to hold all the parts together	Ballpoint pen (biro)	
The need to write something that can be erased if someone makes a mistake	Graphite and wood	Pencils and Eraser trivia	
			Newer versions predictions
The need to develop an advanced pen. Something that will be able to store information in the storage device embedded in it	Technological advanced materials such as microchips that allow the pen to store, share and act upon the information that has been collected	Smart pens	

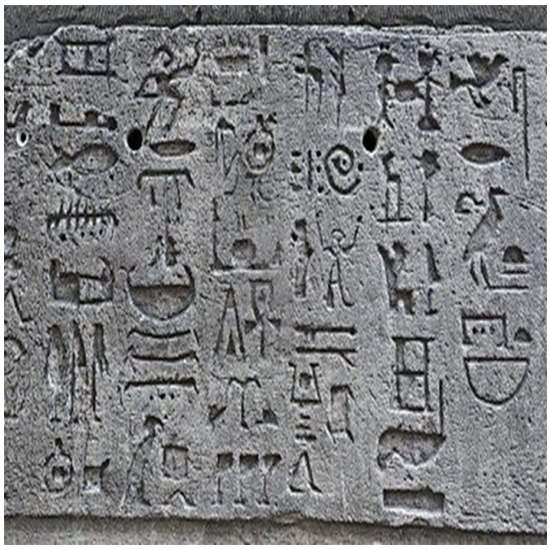

Figure 2
Ancient Writing Stone
Note. Retrieved from http://jillyphil.net/page2/page2.html

Figure 3
Mesopotamian Clay Tablets
Note. Retrieved from http://www.uncp.edu/home/acurtis/Courses/ResourcesForCourses/Writing/WritingHistory.html

Figure 4
Wax Scratcher
Note. Retrieved from http://www.proprofs.com/flashcards/cardshowall.php?title=homers-odyssey

Figure 5
Ancient Paintbrush
Note. Retrieved from http://salmagundi.heracliteanfire.net/post/3600140712/paint-brush-ancient-egypt-via-british-museum

Figure 6
Reed Pen
Note. Retrieved from http://scriptorium.english.cam.ac.uk/handwriting/history/intro/reed.jpg

Figure 7
Quill Pen and Ink
Note. Retrieved from: http://www.123rf.com/photo_11575070_doodle-style-feather-quill-pen-and-ink-well-illustration-in-vector-format.html

Figure 8
Biro Pen
Note. Retrieved from http://en.wikipedia.org/wiki/File:Bol%C3%ADgrafo_marca_birome_I.jpg

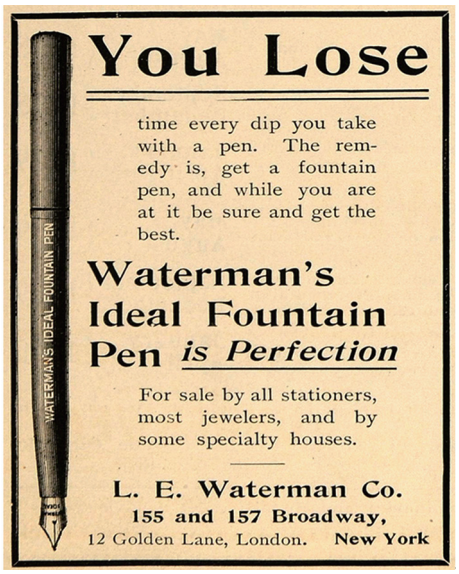

Figure 9
Fountain Pen
Note. Retrieved from http://www.popscreen.com/p/MTI0MDkzODAy/-Waterman-Co-Ideal-Fountain-Pen-Broadway-NY-ORIGINAL-ADVERTISING

Historically, the technology of the pen has improved as the need to record information in a perfect way arises. The earliest writing forms, according to research, were introduced by cave men who invented their hunting club and handy sharpened stone. Their writing involved scratching pictures with sharpened stone tools on the walls of the caves they lived in. However, this writing was not appropriate since it could not be transported from one location to another. Also, it was not easy to translate the drawings since, other than what they symbolized; they could not be used by other people.

From Table 1, it is essential to note that each improvement in pen technology has come as the needs of recording and communicating information are required. For instance, the introduction of clay tablets allowed merchants to write information that was possible to transport from one location to another (Bellis, 2011). The early merchant employed clay tokens with pictograms, which were used to record the quantity of materials that they traded from one place to another. However, the earliest writing that came close to the pen and paper as known today was developed by the Greeks (Ibid.). In fact, it is Greeks who made writing possible since, apart from their invention of the writing stylus that was made from bone, metal or ivory; they also invented letters, which were first used to create text messages (Ibid.).

The Greeks also paved the way for other people to invent their own writing mechanisms. For instance, the Chinese, who invented paintbrush and Indian ink, came up with their own writing mechanisms, which required blacking surfaces of raised stones carved hieroglyphics. The early Egyptians, Hebrews and Greeks also started using papyrus reeds and parchment paper after Greeks had invented alphabets and the Chinese had invented ink (Ibid.).

DISCUSSIONS AND CONCLUSION

After adapting to newer pen technologies, it is possible that many people have clearly forgotten the earlier pen technologies. According to Bellis (2011) pen and paper as we know today was introduced by Greeks. However, this does not mean that writing started there. Cave men, which are regarded as the earliest men on earth employed sharp stones to carve pictures on cave walls. Early merchants used clay tablets and straws to convey the message of how many shipments they made (Accenture, 2011). This concept clearly means that writing has been a valuable thing to mankind since he existed on earth.

The modern pen, which is also known as the fountain pen marks the beginning of proper pen invention. The invention by Lewis Edson Waterman has been considered as the best invention since people were able to write without carrying bottles of ink. This invention is also considered as the beginning of other pen inventions. According to Sieben and Boldt (2008), fountain pens replaced feathers and quills. The pens contained a metal nib made from gold, iridium or steel while the feed was also made of metal and the barrel was made of wood (Sieben & Boldt, 2008).

The reason why pen technology has improved is because people always want to improve the mode of communication. The Biro pen, can be considered as a much improved fountain pen since it uses ink that is easier to dry and its mechanism allows one to create thinner lines on paper. Currently, people have started using smart pens, which enables them to store information within its compartments. In addition, smart pens record everything you hear, say, write, and draw. It wirelessly syncs notes and audio to your personal cloud storage where you can replay, organize and share your interactive notes anytime and anywhere. New brands of smart pens can hold up to 200 hours of audio and thousands of pages of notes that can work on Mac, Windows, iOS, Android, Blackberry, WebOS and most of web browsers. This technology has proved to be valuable. However, when we pick any pen, we still have the feeling that it has evolved or it is a modification of an earlier version.

The pen technology has been improved to fit the communication needs of people. Earlier people did not have any writing needs, which are the reason why they fancied stone tablets and cave drawings. However, in the information world, people need fluid writing, which means their pens are supposed to have easier grip with no skipping, no oil smearing and no leaks. People are also moving toward a world were pens will be required to store information thus the adaption of smart pens.

REFERENCES

Accenture. (2011). *Digital pen and paper.* Accenture.

Al-Jenaibi, B. (2015). E-collaboration, public relations and crises management in UAE organizations. *International Journal of E-Collaboration, 11(*3), 10-28.

Al-Jenaibi, B. (2014). The nature of Arab public discourse: Social media and the "Arab Spring". *Journal of Applied Journalism & Media Studies, 3*(2), 241-260.

Al-Jenaibi, B. (2010). The competition between Al-Jazeera's Arab news diversity and US channels: Content analysis of Iraq war. *Canadian Social Science, 6*(4), 81-96.

Al Jenaibi, B. (2010). New age of press democracy in the Middle East. Arabic News Channels: Al-Jazeera. *International Journal of Academic Research, 2*(4).

Al-Jenaibi, B. (2009). New technologies, cultures and drug campaigns. INTECH Open Access Publisher

Austen, J. (2011). *The writing [implement] of Jane Austen - the quill pen.* ISBN.

Bellis, M. (2011). *A brief history of writing instruments*. Retrieved from http://inventors.about.com/library/weekly/aa100197.htm

Collins, F. (2011). *Pen and ink drawings*. Retrieved from http://www.visual-arts-cork.com/drawing/pen-and-ink-drawings.htm

Frazer, D. (1878). *Paper, pens, and ink: A brief sketch of the principal writing materials used in all ages; with a chapter on how and when we began to write.* D. Bryce & Son.

Kekre, S., Scheller-Wolf, A., & Secomandi, N. (2009). *An integrated framework for the analysis of new technology.* ISBN.

Russell-Ausley, M. (2011). *How ballpoint pens work*. Retrieved from http://home.howstuffworks.com/pen.htm

Sieben, J., & Boldt, T. (2008). *Evolution of the pen.* Slideshare.

Solon, O. (2013). *3Doodler pen lets you hand-draw 3D structures*. Retrieved from http://www.wired.co.uk/news/archive/2013-02/19/3doodler

Swaby, R. (2012). *How the pen evolved from a humble paintbrush into a precise instrument of writing perfection*. Retrieved from ZIGMODO: http://gizmodo.com/5901167/how-the-pen-evolved-from-a-humble-paintbrush-into-a-precise-instrument-of-writing-perfection