

The evolution of communication technology



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1. Communication, the transfer of information, has been the key element needed to establish civilized societies, which require organization and planning.

a. In a traditional sense, the advancement of communication technology has also sought to address four unique aspects of information transfer; these are: the speed and distance at which information can be sent and received, the staying power or permanency of the information, and also the volume of information that can be sent.

1. Throughout history, technological innovations have allowed for the steady improvement of all three aspects. However, in the last three decades, advances and globalization has made complicated and convoluted these once unique qualities as factors that were once limiting began to disappear.

1. Vocal and Gestural Communications were Instinct and Natural

1. Had limitations of audibility and clarity. Previous systems of primitive vocations and gestures provided minimal coverage of the three main aspects of human communication.
2. Mutations and evolution provided organ structures that allowed for more complex speech.
3. Although it represented a major advancement of the volume, speed, and distance of communication, the temporary nature of speech and human memory made it unsuitable to foster large amounts of information for long periods of time, a problem that would later be addressed with the aid of technology.

2. Written and Recorded History

1. Earliest were ideograms and pictograms.
 2. Provided minimal but adequate record of history that allowed for passing of information.
 3. Later forms allowed for paper and writing.
3. Distance Communication
1. Signal fires, horns, drums
 2. Sacrificed volume for distance.
4. Modern Age
1. All four factors optimized in the new age.

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Throughout history, the human propensity to communicate effectively has always been a factor that has defined the gap of intelligence between animals and humans. Communication, the transfer of information, has been the key element needed to establish civilized societies, which require organization and planning. The relationship between the advancement of a civilization and the advancement of communication technology is not a simple cause-effect relationship but a relationship of mutual gain; the development of superior methods of communication allow a society to advance while the advancement of a society is necessary for the

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development of new methods of communication. In a traditional sense, the advancement of communication technology has also sought to address four unique aspects of information transfer; these are: the speed and distance at which information can be sent and received, the staying power or permanency of the information, and also the volume of information that can be sent. Throughout history, technological innovations have allowed for the steady improvement of all three aspects. However, in the last three decades, advances and globalization has made complicated and convoluted these once unique qualities as factors that were once limiting began to disappear.

The ability to perform most primitive form of communication, intuitive and instinctive vocations and gestures were ingrained from birth into the bodies of the earliest humanoid species of the Paleolithic age starting over two and a half million years ago with the emergence of the genus homo, an intelligent being capable of forming primitive societies. True speech, familiar to what we hear today was the first major change in the advancement of communication. Anthropologists believe that evolutionary advances and a mutation in the Foxp2 gene around 400, 000 years ago were responsible for producing the modern organ structures of the larynx, tongue, and diaphragm that are responsible for human speech. Although not technically a technology, speech would be the first major improvement in communication. Previous systems of primitive vocations and gestures provided minimal coverage of the three main aspects of human communication. Primitive vocations and gestures provided very little information; additionally, the information would be sent a short distance limited by visual and audible range of human vocations which were both quieter and less clear than

modern speech. Therefore, expressing complex ideas would have taken an exceptional amount of time. Modern speech was louder and provided improved clarity which effectively sped up the rate in which information could be expressed. Abstract ideas became easier to represent through speech and thoughts became easier to transmit. Speech led to the improvement of three aspects of communication: speed, distance, and volume. Though revolutionary, speech also presented a set of challenges. Because speech is ephemeral and only captured in time through memory, the transmissions of information from one generation to the next, or even simply between contemporary humans were limited to what could be remembered and eventually passed on. This problem was evident in Western Africa, as even later cultures continued to operate in a tribal system with only speech as a system of communication. During times of war, rival African tribes would aim to kill the griot, the oral historians, of the opposing tribe in the effort to pacify their enemy. Doing so would result in the loss of many generations of tribal history. Although it represented a major advancement of the volume, speed, and distance of communication, the temporary nature of speech and human memory made it unsuitable to foster large amounts of information for long periods of time, a problem that would later be addressed with the aid of technology.

The next major advance in communication technology came with the advancement of technology in the field of basic tools and shelters. In the late Paleolithic, Mesolithic, and Neolithic times, the emergence of cave paintings, pictograms, ideograms, and petroglyphs addressed the fundamental challenges posed by the previous systems of oral history and

communication. This problem was the staying power or permanency of the information. Cave paintings, followed by my complex systems of pictograms and ideograms allowed for the preservation of thought and thus the transmission of ideas even after death. Early pictograms only represented tangible objects while the later emergence of ideograms were used to convey the abstract ideas associated with a certain object. However petroglyphs, symbols carved in stone, were not the only form of early recorded information. The ancient civilizations of Mesopotamia and China developed early forms of paper to record written information. Uniquely, ancient civilizations in South America, particularly the Inca, did not develop writing but instead a system of tying knots to express numerical ideas. Thus, not only did the permanency of communication increase, the depth and volume of information that could be conveyed also increased as a direct result of the development of recorded information. The technological breakthrough of paper, a surface that compared to stone was lighter and more compact increased the rate at which information could be recorded and shared by providing an easily transportable surface that provided an easier method of writing. The early forms of recorded information, paintings and symbols which later evolved into paper, writing, and eventually printing, provided significant improvements in all four of the fundamental aspects of communication technology but most significantly, the permanency compared to the previous purely vocal and gestural methods.

Though all four of the fundamental aspects of communication technology had improved drastically from Paleolithic times, one aspect not heavily addressed by the technological innovation of recording information

physically was the distance to which information could be transmitted.

Nearly all communication until 3000 BCE was limited to, at maximum the distance to which the human voice could travel. Around this time however, the invention of the signal drum allowed for a drastic increase in the distance in which information could be sent. Other inventions that served a similar purpose were also soon introduced. These included the signal horn and also the signal fire. The latter was used by the early Aborigines but its use continued to Qin China where it was used to quickly pass messages along the Great Wall. All of these methods of communication had a similar benefit as well as a similar drawback. Signal fires, drums, and smoke provided comparatively fast communication at extended distances but because of their very nature that allowed them to transmit information and be understood at a distance, they provided relatively little amounts of information volume. For example, a signal fire could only be used to convey a limited number of messages. Contemporary communication systems such as the postal system, which first emerged in 2400 BCE in Persia under Cyrus the Great allowed for the long distance transmission of a larger volume of information but at a slower rate. The invention of long distance, low volume information transmitters continued well into the 1800s CE with the invention of the telegraph. However, this is not to say that there were not significant advances in the volume of information that could be sent until this time. The invention of moveable type by the Chinese and then improved by Guttenberg in Germany was the major factor that contributed to the end of the Middle Ages. This statement simply emphasizes how the combination these two challenges were exceedingly difficult to overcome. Not until the

invention of the radio would the gap between distance and volume close significantly.

Perhaps the greatest achievements of technological innovation in the field of communication have all taken place in the modern age. Though communication technology has aided civilization since the beginning of human history, the globalization and interconnectedness observed today did not begin to form until the later industrial revolution but more so in recent decades. The greatest strides in communication technology that has nearly maximized the accommodations for the challenges posed by all four aspects of communication technology: speed, volume, distance, and permanency have all occurred in recent years. The invention of the radio in 1902 was both an iconic and realistic definition of the modern communication age. Still in wide use today, in addition to providing the ability to transmit information over a wide area wirelessly, the radio also provided a large step up in information volume from the telegraph by replacing an inefficient system of text messaging to wireless voice communication. The later development of the television in 1923 further developed this same model by adding a new level of information transfer, visuals. Both radio and televisions were responsible for the broadening in the volume and speed at which communication could occur. The later invention and widespread use of taping and personal recording in 1934 added to the expanded the permanency of these communication technologies. The initiating relationship between the role of communication technology in the start of the modern age and the modern age's role in the creation of new technology is a prime example of the convoluted relationship of mutual gain described earlier.

Even in the beginning of the modern communication age with the invention of radio and television, the once distinct lines between speed, distance, volume, and permanency began to blend as each was reaching new heights, perhaps human maximums. The speed of television and radio can be described as a human infinity, or near instantaneous, at least with respect to practicality. In addition to speed, by 1949 the coverage of television had become global in many developed nations, taping and recording become common and therefore information was rarely lost. As speed, distance, and permanency reached new heights, the exact definitions between them were blurred for the first time in history. Puzzling, but perhaps useless questions emerge from this historically unprecedented situation; clearly, the level of communication has risen dramatically, but to name what factor it can be attributed most is nearly impossible as the it is often impossible to distinguish them. The main cause of the confusion has been removal of all historical limits. Using even a relatively recent example, the sacrifice of information volume for speed and distance during the widespread use of the telegraph, a revolutionary invention of its time, was overcome permanently by the use of the telephone, cell phone, radio, and television.

The latest significant advance in communication technology aimed to maximize information volume to a similar degree to which speed, distance, and permanency have been. Computers, but more importantly the release and commercialization of the internet, in 1994 have revolutionized the volume of information that can be sent and received. The major change with respect to television, the previously frontrunner in communication technology is that the internet allows for the individual to request

information in the same format, video, and many others in a comprehensive system. The volume of information that can be received by the computer is scores more than what can be received by the television. The internet which spans the globe has created a society more interconnected than ever before in history by not only providing a networked of linked computers, but also the backbone for all digital information transfer on earth.

It is possible that a human chauvinism for the cotemporary distorts the view of the tremendous advances and advantages the modern age provides, but more likely, the innovations of the modern age in the field of communication technology are simply truly remarkable strides that have created a globally aware population that can communicate at virtually infinite speed, distance, volume, and permanency.

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