

Computing Today

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Computers compute. Robby The Robot along with the Star Trek Enterprise ship computer might have declared that something "does not compute." To compute or not to compute was a question regarding machine activity. For humans, we were said to be *using* computers. To use them or not to use them was the question. It's a lot like any other tool, screw drivers, toasters, faucets, lawn mowers - we *use* them. The phrase *Using Computers* changed for humans to the more active verb *Computing* by the late 1980's or early 90's as something humans do. In Education, *media* had changed to *educational computing*, at least for teachers, which very quickly evolved into the more global term still in use today, *Instructional Technology*. The latter change of course meant to include tablets, gaming tools, portable devices, smart boards and more.

This all seemed appropriate as the technology had certainly evolved well beyond just an isolated or even self-contained computer unit. Computer Literacy, a concept founded in the early 1980's (Galloway, 1985), applied mostly to the development of teachers as they were expected to adapt to the relatively new computer revolution. Teaching strategies and methodologies were in flux (of course, in the field of education, such things are always in flux and never settled "science") and being developed to fit the new world of technology. It was thought that students of all ages were growing up in and with a world of technology and would surpass the usefulness and ability of teachers to relate.

Early limitations included fundamental misconceptions (Galloway, 1987), an inability to relate to and extract information from visual screen displays and even a lack of dexterity in manipulating basic computing tools including keyboards and a mouse (let alone track balls, nipple mouse, or touch pads). However, younger students were growing up with such tools as inherent and fundamental components of life. Unlike their teacher counterparts, they did not have to unlearn bad habits and change their life-tools paradigm from old to new. Like the quote from Charles Darwin, "The One Thing That Never Changes is... Change!" emphasizing the prime importance of adaptability, the young were already born into that mode.

Students and teachers alike were taught word processing, database management, spreadsheets (the big three), and in some cases, telecommunications, designing and gaming tools. A world of dedicated educational software sprung up quickly in the early years which ranged from simple, one-dimensional drill-&-practice tools to more complex interactive simulations with extensive thinking and problem-solving aspects. Students were immersed in the effort to achieve traditional outcomes (skills and knowledge) but through the use of new educational software tools based in the newest technology. It was too rarely questioned as to whether these were achieving improved outcomes versus merely an improved end to the same outcomes.

Students were also being taught to use computer technology to create better products. An array of software tools helped students in their work and helped them to produce more efficiently and to create better products. At least, that was the intent. But, it was still thought that students of the day were headed for a life wherein these tools, newly evolved, and even as yet unknown would become commonplace tools of creativity, problem-solving, and more as a

part of their everyday lives. However, today's computing world for those early students now well into adulthood is not at all as we once envisioned. Certainly, computers are everywhere. Technology is everywhere and in everything we touch and do. We were not wrong about the influx and infusion of technology. If anything, we underestimated the growth and certainly the speed of this takeover as technology in general has invaded our lives like the Borg from Star Trek, The Next Generation. Whether this infestation is benevolent or an evil scourge destroying us from within is perhaps yet to be proven.

Nevertheless, we had a vision, an expectation, glorified and grandiose perhaps, but exciting and wondrous. The power of these advancements would be at the fingertips of people everywhere. Like Harry Potter's magic wand, the full range of conception, invention, construction and development by average citizens would be limited only by their imagination. No longer were folks to be the mere recipients or targets of life being conceived and created by those up on Mount Olympus. And, just as Prometheus gave humans the tool of fire, we would all become the gods of our own world planning and inventing our lives on the fly with our newfound talisman, provided by today's not so mythical gods: Wozniak, Jobs and Gates.

But, it hasn't really worked out like that. Certainly, there are technologies everywhere from within us as prosthetic tools of survival to unseen in our larger society affecting our lives from afar. But, what are people really doing with technology as part of carrying out their everyday lives? What of this dream, this vision of modern life and what has it actually become? Are we really the creators and inventors? Are we the manufacturers or still the recipients and targets of others? Do we create, invent and produce? Or, do we consume and use? Do we really live on Mount Olympus now or are we still the subordinate creatures living the lives dictated and provided by others.

Certainly, the larger institutions in society from manufacturing to government and more have integrated computer technologies extensively. From medicine to manufacturing, marketing, entertainment and even the military, their worlds, the "lives" of those institutions, have made incredible advancements in adopting and integrating computer technologies. But, what about young Johnny or Sally from that 1980's junior high school? What do their own lives now as adults involve? George Jetson's world of *Spacely Space Sprockets* (the cartoon produced by Hanna-Barbera) ironically suggested the futuristic continuation of the old mechanical world unadapted to the digital revolution (thus the market for mechanical sprockets). Do we still just turn another crank, push another button, flip another lever or are we the designers and inventors promised by the earlier days of computing? This essay offers a criticism of the status-quo and suggests a categorization of computing and how our lives are manifest in those uses.

Non-Inclusive: Computer technologies outside of personal uses

With technology, per se, as a somewhat separate or more diverse category, it includes everything from interface devices, hardware for the handicapped, smaller cables and connections, electronic controllers, more efficient materials and more. Certainly, devices and, by virtue of our lives with technologies, depend on computer chips and other behind-the-scenes controls that may involve microchips, data sets, instructions, software, etc. I have no idea what data my automobile is holding and managing and usually I don't care. I have no idea

whether my toaster tracks pushes or down-time to better manage the heating of the bread - and I don't really care. Even in my electronic grand piano, the OFF switch is automated and tracked by a computerized mechanism within that I never see nor control. Many, if not most, such computerized technologies are single-purpose and dedicated task tools not usually involving general input from users.

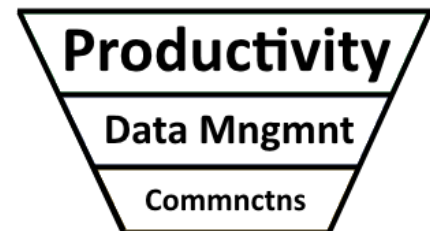
These sorts of technologies are excluded here as separate from the purposeful and goal-oriented human usage of computers and computer technologies, per se. The mere transference of experiences from paper to screen or from pen to keyboard or pencil to stylus is not enough here to qualify such usage into the categories suggested below. Microchips and computer technologies track information, control machinery and electronic devices, inform mechanized actions as a part of their design and function but are considered separate or non-inclusive in the goal-oriented computing activities of everyday people. The range of such tools is far beyond my ability to account for them here and surely changing hourly.

Perhaps the most debatable of such exclusions is game software. Obviously, there are computerized controllers for toys and game devices that do whatever they do to provide the game world for the player that operate independently. But, the tools and software themselves could be argued as a separate and worthy category. On the other hand, even these tools might best be considered a means to an end (skill development, problem solving, entertainment) and not an intrinsic goal of computing, per se.

That leaves us with the rest of the world of computing (perhaps over-simplified) in three general categories: 1. Communications, 2. Data Management, 3. Productivity. I would suggest that the early vision, the dream of early computing as young students challenged their teachers to keep up, included an expected hierarchy of importance and significance of achievement and development with number 1 at the bottom and number three at the top. Perhaps that ordering characterized number 1, Communications, as base or fundamental and foundational. Perhaps it was considered somewhat one-dimensional and even unsophisticated in spite of its usefulness or transient value. It seems to offer a foundation and a means for a greater purpose.

I would also suggest that number 2, Data Management, holds the fodder of computing. Therein lies the boards and materials from which a house might be built. This is where the carrots, potatoes, meat and broth might be found from which a soup and a meal could be fashioned. It is hard to build a house with no boards and no nails just as it is hard to prepare a meal without the necessary ingredients. This inevitable category, as necessary as it may be, is gray and bland and without great character as it does not inherently suggest any usage, no goals, no blueprints, no plans and no achievements beyond the obvious movement of information into and out of its residential storage in the tech world.

This characterization is also why number 3, Productivity, might be considered the most noble or significant of the three. There was promise of great potential for the average computer user to become the designer, the manufacturer. Young Johnny and Sally could become the architects and craftsmen of their new world fashioning it in real-time. The other areas of computing being lesser or more base and foundational by their nature, seemed best



classified as a means to a greater end - that, being the goal of productivity. So, let's look at our reality as it has now come to pass. Where are we at this point?

1. Communications

Still a major part of a general liberal arts education and a respected college degree among schools everywhere, one can earn a degree in communications. This includes areas of study from journalism and broadcasting to public relations, marketing business, and more. Whether the exercise of that education in today's world of communications and broadcasting, in news, print, airways or electronic, is indeed a noble and worthy thing might be debatable among many today. Surely there are examples of both ends of the spectrum. Regardless, information delivery and information sharing is a significant and fundamental aspect of everyday life at least among those in the modern world.

We depend on both synchronous and asynchronous communication. The former would include a news broadcast, a weather bulletin and other things that are sent and received in real-time. The speed, facilitated by ever faster technologies, seems to shrink our world to the smallest it has ever been. To the Kentucky farmer of 1917, working large fields, miles from the nearest town and beyond visual or shouting distance from even the nearest neighbor, sending a boy to fight in some foreign country in Europe could not seem more remote and further away. Today, we can hear about a simple altercation, an accident or a benign conversation occurring moments before or even live on the streets of Paris or Moscow all during our evening meal at our own dinner table. So, more and more is available and present in our daily lives. Real-time communication, with its ever-broadening reach and ever-increasing speed, shrinks our world around us.

Perhaps nothing today seems a better example than real-time one-to-one video chatting. Sometimes called Skyping, because of popular telecommunications software called Skype that establishes this sort of communication, fully synchronous video and audio can be exchanged between any two points on Earth where a broadband connection is available. Young children in America can chat casually with kids in Australia while each seeing and hearing the other in their own environment. This can be done on a large desktop-model traditional style computer but is probably more common between laptop computers or even hand-held devices and smart phones.

Cell phones everywhere stand ready to jump into action to film, to document and report on every event from recording someone's fall to documenting the police or criminal to just filming their plate lunch. The ultimate point of course is communication. Sure, it is immediate, convenient maybe, but most importantly it is a direct connection to society and the larger world beyond. Many cases serve a useful purpose. Many do not and instead provide a false sense of connection and achievement. Nevertheless, this is a big area of communication today.

Fully synchronous audio communication has been common place since Alexander Graham Bell but the telephone did not utilize computer technology until the latter half of the 20th Century. Cellular phones today provide not only voice communication but other forms of communication as well. Known as Smart Phones, these portable hand-held devices provide multiple software tools (called "apps" - short for applications) and, in that manner, function as

small hand-held computer-like devices. Aside from their role as a game platform and some data management usage, smart phones' primary duty is, by far, in communication.

Texting is essentially an asynchronous (not simultaneous or in real-time) means of communication. Even though each message, the initial contact and the subsequent sequence of replies, can be sent quickly and as an immediate response, they are each a separate instance of messaging and could, just as likely, occur after long delays. An initial message might not be viewed immediately and will remain in the queue virtually forever until viewed and managed by the recipient. Nevertheless, it is also commonplace today for entire conversations to be exchanged entirely via texting. Probably more useful for handing over packets of information, such as an address, or a phone number, or instructions, etc., the presence of the devices already in the hands of people inclined to use these tools for virtually everything yields elaborate dialogues based entirely in texting.

It is commonly argued, to no avail, that such exchanges lack important elements of communication such as tone, attitude, inflection and more leaving the intent compromised and certainly a great deal of misunderstanding can and does occur. Texting, in spite of the impressive speed of typing on a small device with only thumbs which some folks have managed to achieve, still takes more time and seems more inefficient than a simple voice phone call. Texting does provide a record of the communication but this is likely an insignificant value as it fails to explain why so many rely on and prefer texting over voice. It would seem that the real value of texting in postponing responses until a more convenient time is of a small concern as most seem to seek text messages as soon as they arrive and interrupt their routines to respond immediately.

It seems more likely that the use of smart phones and hand-held technologies is an obsession in itself. So, utilization of that available tool as a solution to any and all needs - especially as the capabilities expand - is a common and presumed lifestyle among the current, younger generation. To suggest that young people are involved with and even dependent on technology is, at least to this extent, an understatement.

Even voice recognition can compose text messages to be transmitted via smart phones. Likewise, the reply, with text-to-speech translation capabilities, can provide an audio message from an incoming text message. Regardless, all such usages are a matter of computer technologies for communication. But, in the process, one might seriously question the value of such communication. Screen sizes are small as are the attention spans of the people using them.

The quick exchange of "chat"-style dialogues tolerate only the most brief and succinct comments. The longer narrative of traditional email messages, especially a short essay or expanded discussion, can be transmitted but will likely be ignored. Instead, email is used less and less on fully capable computers while short-cut connections are established by smart phones so people can read and send email from the hand-held devices. Recipients are used to the short message that takes less than 10 or 12 seconds to read and seem to tolerate or consider only material that is brief and less substantial. They might argue that the convenience of the hand-held device readily available to respond to email messages immediately makes it the preferred medium. Thus, while communication is growing as a significant area of computing, and maybe the quality of the technical construction and transmission and

management is improving, perhaps the meaningfulness and sophistication of content is diminishing.

Whether this is good or bad or provides worthwhile sacrifice for preferred advantages is for others to debate. But, it is an undeniable condition of the modern world. The acquisition and consumption of real-time communication in all its forms has become a basic staple of life if not an all-consuming preoccupation for many.

Social Media has become for many an all-consuming preoccupation. Children are reportedly involved with computer (or hand-held) screens up to 7 hours per day. So what are they doing? Social media of various sorts include tools used for sharing communication beyond the one-to-one dialogue and provides a communications platform shared with the whole of society and, indeed, the whole world. This includes Instagram, FaceBook, MySpace, Google, YouTube, Yahoo and more. The wide-spread use of and even psychological dependency on these tools now has even the government talking about regulating and controlling how they operate.

If one considers a ratio to illustrate value wherein a genuine, tangible and positive outcome is contrasted with a more pointless, fanciful whimsy, or self-indulgent preoccupation, then social media may score poorly. Many would argue the waste of time and effort spent in the endeavor of social sharing if not accounting the harm and dangers of such a tool. The loss of privacy, loss of innocence, risks of violation and abuse are the obvious dangers that easily overshadow the potential for delusion, false confidence, isolation and more. Nevertheless, this category is very much a matter of, if not exclusively within the realm of, communication. Generally, nothing is produced and nothing is managed except the process and fodder of communication itself, whether text, audio or video. It is, of course, ironic that such a poignant, wide-spread and intense use of computing for the sake of communication might actually result in a reduced ability to communicate and relate to others and stifle or suppress an otherwise mature development for the young.

2. Data Management

This is the in's and out's of computing. It's just basic information. I have attempted on many occasion to teach students how information, in and of itself, doesn't really mean anything. It's just stuff like 13, 47, 22, Fred, 1776, House of Commons, Moon, Quark, etc. So, what does "FRED" mean? Of course, it means nothing in itself. It is just there to be used or stored until needed. There is an old joke about a deeply philosophical community that build a super-computer to which they may pose a question on the meaning of life. After generations of computer processing, finally the giant machine issues its answer: 47. The point of course is how a machine really does not understand meaningfulness, what might be profound or important versus trivial and benign information. What else should one expect from a computer?

All sorts of information gets managed with computers and not just for the government (FBI, NASA, IRS, DMV, criminal records, etc.) or large corporations. Individuals keep records too. Some might keep recipes or tax records or medicine and prescription information. Certainly the proverbial little black book, the address book, often known as contacts, is now a

commonplace part of everyone's computer system, whether hand-held phones or desktop machines used for email.

Computer technology has always been used to store and retrieve data of all sorts and in a variety of storage formats. All sorts of tools are provided for performing these tasks and which provide creative controls for organizing and manipulating that data to yield what is needed. So, this category would include any activity focused on managing that information including tracking, moving, arranging, consulting, input, retrieval of any sort, etc.

Searching for relevant data is an inherent part of research activities. This sounds grandiose and noble, like writing a paper on the effects of relativity or the background and hierarchy of influence in a New Guinea tribe. But, searching the Google or Yahoo database might simply be to find the best prices on a ball point pen or the latest consumer reports on your favorite car. This is information and finding something meaningful and useful is part of this data management category. This can be a vital, important and useful role of computer technology but it really depends on the ultimate purpose of the information. Finding out what time a local store opens might be useful but it's hardly grand or life-enriching. Of course, while internet information searches might be for little things like a date, a name or word definition on Google, more sophisticated interests might include a full study of Napoleonic battle strategies, historical trends, scientific interests, anthropological questions - or any other aspect of educational endeavor. All involve information to be acquired from and with computer technology.

I have found numerous personal needs for managing information. Now retired from teaching, my classes of students and their activities were managed with elaborate databases. For each class, all students' personal information, attendance, assignments, grades and assessments, progress, quiz, test and exam scores and much more were maintained throughout the semester for each and every course and student. After a course completes, the database then serves as a long-term archive of historical information virtually forever. Indeed, most if not all of those files are still in storage today.

Currently, working as an entertainer and recording artist, I maintain several databases in managing music and performance information. One stores song titles, keys used in solo and band versions, classifications for energy-level, genre, length, recording status and more. This database allows me manage my access to the information in creative ways. Filters provide controls that can limit and focus on specific attributes, to exclude songs (records) based on meeting certain conditions, to sort and create displays to reveal hidden information that can be useful for decisions and planning. For example, it also includes records for each and every venue where and when a song was performed. This allows each new show at each venue to be customized to include only unperformed and previously unexposed material for that audience. New material gets flagged. Categories like Christmas music are easily hidden until the time of year demands those selections. The level of control and management with today's data management tools is impressive and makes new achievements possible.

A similar database is used for material that is recorded. This functions both as a historical record but also for managing the content of published CD's and recordings not previously released to the public. An elaborate database with all of the standard controls and management tools helps to protect the historical record and allow more professional planning decisions.

Yet another database actually manages the bookings and performance engagements on a daily basis. Performance site, address, phone, contact person, date, time, duration, fee charged and more. It includes whether or not payment has been received and the date of that payment. It flags the need for confirmation, invoicing, tax forms and dates when those were provided. The database can accumulate and aggregate individual records to provide summary data that informs a larger perspective on both client management and overall professional progress.

Traditional database management software, such as *Access* by *Microsoft*, provides these sorts of tools in both Table layouts (rows & columns) as well as individualized record displays. For example, your dentist or doctor might display your individual record showing your medical data, appointments and so forth. Spreadsheets, such as *Excel* by *Microsoft*, are typically used to manage numerical data and to build complex scenarios, real and hypothetical, of numbers and calculations. But, for mere Table-style layouts, spreadsheets can serve well as simplified data management software.

The point is, while the Internet provides great access to a whole world of information, individuals such as myself can also benefit from personally managing information of all sorts. This sort of use of technology is readily available to literally every U.S. citizen anywhere in this country. And, with libraries providing access to useful computers and software virtually free to everyone, there is no reason why people everywhere can't employ this use of technology in their everyday lives.

3. Productivity

What did you make today? What did you create? Design? Build? Compose or construct? What if you were to remove from your daily experience all data input and storage activities? Consider even removing all data retrieval activities where the information is not used in the capacity of production. In other words, if the data is merely being shared, transmitted or communicated rather than contributing to a productive endeavor, it's discontinued. No more email. No more texting. No more blogging. No social media. No communication via technology with others. What is left? How much actual *computing* would you still be doing?

This paper is created with a word processor. It was set aside for a time, while work was focused on a different topic. After that was completed, the work on this topic resumed. The word processor allows for the development and creation of this paper, this essay, this, document, which is, at this precise moment, is the latest product of my endeavors.

The inclusion of this graphic image, shown here, employed the use of graphics software to create the image. The drawing tools included text tools and allowed this image - this graphic product - to enhance this essay making it, presumably, an even better product. Graphic imagery is used to enhance professional flyers, CD covers and packaging, website displays and, yes, to assist in the purpose of this paper to convey ideas. The work in these tools and many others are directed at production, to produce something, to create a tangible outcome.



Merchandise, manufactured goods, new tools, creations of all sorts are useful and potentially important results. They represent a kind of achievement with technology. They can intrinsically justify the effort, the endeavor and even the technology itself.

So, where are we now?

It was asked above that we look at our reality as it has now come to pass. Like the old question, "is it really something better or just an improved means to an unimproved end?" is the focus of today's technology usage for the average citizen really productive? Is it real development? Is it real creation? Is it the achievement of a real thing, an end in itself? Or, are we just moving information around?

This paper offers an answer. Granted, like any position, it can be debated and challenged and argued by almost anyone. That's fine and even that would likely be useful. I do not have hard facts and statistical reports providing clearly documentation of these claims - but, of course, that doesn't mean my conclusions are inaccurate.

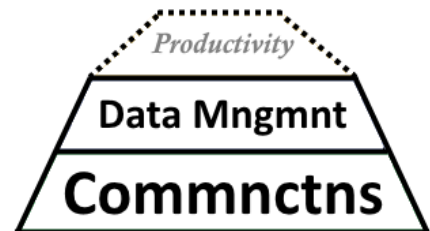
Today's usage of technology by the general public (like students and teachers - moms and pops - everyday, average folks) is in area #1. Communications. Popular notions call it social media. Whether the old, obsolete MySpace or the mega-giants like FaceBook and Google, or the current trends of Twitter and Instagram, these tools are used as means of communication. Messages in both text and video, as well as still-imagery and photos, are transmitted and received by almost everyone. Everyone has a phone that includes a camera and, ironically for some, the camera is more predominant and used more often than placing a voice phone call.

It was suggested above that one should considered an absence of technology usage in categories #1 and #2. No more communication and no more pointless manipulation of meaningless and trivial information. This paper suggests that there would be virtually no computing remaining among the general public.

We talk but are we just talking to be talking or we really saying anything? I would suggest we consider just how many pictures of cats appear on FaceBook for no apparent reason. I would suggest we consider how often someone posts a picture of their lunch plate or offers a useless cliché on the newsfeed to no one. What are we saying when we click "LIKE" for someone's posting? Are we really expressing a meaningful declaration of approval and praise or is it just an acknowledgement? And, so what if we are? Does any of this make any difference? What is produced? What product would be lost if no one ever used social media again. Probably nothing.

The problem today is that the concentration of computer usage is reversed from what it should be and needs to be. Data management seems employed only to the extent that it facilitates communication and the area of Productivity is practically non-existent in comparison. The very existence of the so-called smart-phone is all about achieving this exact outcome.

How many people use at home in their daily lives a desktop-model computer with a full screen? How many people use laptop computers with enhanced graphics capabilities - but not at all for games? How many people learn to use drawing software? CAD or drafting software?



Database management tools? Or, even word processors - if they haven't been forced to write papers in some academic class?

Certainly, the answer is some do. Some people clearly do make use of these productivity tools and do produce things with technology. The point is more that the dream of the 80's and 90's, the dream of making everyone computer-literate, was not for the sake of texting "LOL" to friends, placing rants on Twitter, or posting pictures of cats on FaceBook. The dream had to do with capturing the power of the microcomputer revolution and learning to make our lives better. That is, actually a better outcome and not just an improved means to the same old thing in a different form.

Galloway, J. P. (1985). What is computer literacy? Presentation at the 1985 Texas Computer Education Association Area IV Fall Conference, Houston, TX

Galloway, J. P. (1987). "Students' Misconceptions of Computing Concepts," December, 1987 – Unpublished Dissertation for Doctor of Education degree, University of Houston, Houston, TX