

NEW MEDIA AND INFORMATION SOCIETY – CURRENT ASSESSMENT AND FUTURISTIC LANDSCAPE

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Abstract: *Media and society has a close relationship with each other and often media guides the society with appropriate information and predictions. There have been many instances where society went under some major changes by strong media involvement for the good sake of society. The concept of Information Society was born the time when media was reprovisioned to deal with digital information. Information accessibility was multiplied by several times and rapid technological developments helped people to catch up to the pace at which information was flowing across globe. Media went through several generations as more and more innovations took place in science and technology and the information society became more intelligent with multiple information channels catering to the need of individual user. People are now living in a virtual shell made by millions of tiny information channels from where the user can tap information at anytime from anywhere in the world. More and more things around us are getting Internet enabled thereby acting as a live node of information and constantly exchanging that with several information channel to make the life easier for people. This paper researches the journey of media with society, the effect of new media to create information society and the structure of the information society in different ages of media along with a futuristic landscape of new media and Information society.*

Keywords: *new media, information society, generations of media, information society model, information channel, rise of new media, social media, evolution of media, information domain, Internet*

Introduction

Wikipedia, one of the strongest information repositories of modern times, defines information as “Knowledge communicated or received concerning a particular fact or circumstance” and information in its technical sense, is a sequence of symbols that can be interpreted as a message. So one thing everyone would agree on is that information needs to be communicated in order to justify the significance of the information and to bring a state of coherence within a society. The idea of World Wide Web and the Internet started from this very desire in early 80’s and information started to become streams of 0s and 1s courtesy to the digital technology and we were able to communicate digitally encoded information at the speed of light. So ideally the digital footprint revolutionized the

way information was produced, shared or consumed in a society. Information is much free flown now and the availability of information has considerably lowered the information entropy within the society. People within the society are much aware of the existence of a virtual information sphere around them from where they can tap relevant information at anytime from anywhere in the world. People around the world across many different societies are well connected now with an invisible string of information and this has led to the concept of “Information Society” where millions and millions of people within societies are characterized by only a pattern of relationship and that’s the relationship of information or in other words the socio-information relationship. The good thing about this society is that since all of them are connected by means of information, everyone in the chain is involved in manipulating the information and this eventually would hasten the information mutation. Information mutation is needed for a society in order to mature up with an adaptive and next- gen information model for the future that would take care of all informational needs and intelligently discards redundant and non-relevant information. This paper does a theoretical study of all the aspects of information in modern day context and beyond and identifies more informational links not only between people but across people, process and things in a coherent way. The Information Society by its true means should be driven by information by orchestrating a harmonious relationship between its people, the underlying processes where the people are inevitably involved and the things or day to day materials that could also be sources of information.

The rise of new media

Considered to be the most effective way of information exchange, human civilization has witnessed several forms of media over years. The traditional media often counted as first generation media, approaches from newspaper, television, printed materials, radios, telegrams, cable phones and flyers really have had a magical effect and were leveraged mostly to communicate information for quite a prolonged period of time. But as innovation does happen quite naturally for the sake of human and society this particular field was also no exception and things started to change after the invention of computers and the new way of digital computing. Information or more precisely analog information slowly started transitioning to digital and media was the first to get affected with change. The traditional media houses reshaped their underlying technology to digital in order to get the benefits such as ease of transmission, less error, less consumption of power and better management of information. These all happened from late 1950s to the late 1970s in the developed countries and started drifting towards the developing nations in late 80s. But, people were still worried about the widespread exchange of digital information though some experimentation was done with ARPANet when people were able to send some packet switched data over ARPANet from University of California, LA to Stanford Research Institute. This was a real milestone in the history of media as ARPANet was expanded to include other networks and the Internet Protocol Suite (TCP/IP) was standardized in 1982. Commercial Internet service Providers began to emerge from late 80s when ARPANet was decommissioned and Internet was commercialized in 1995. Media rebirthed that day and emerged as a new media of second generation with some of fancy armors like electronic mails, instant messaging, web portals, video and voice calls over Internet, remote sharing etc. People started to use these new media types and soon realized the power behind this. It not only proved to be beneficial but also made information exchange pretty quick and almost in real time. No wonder, this also impacted the business and economy as information exchange became smoother and real time, a primary requirement for these fields. As more and more people started using Internet and information was getting digitized and communicated over the public network, people started to realize three factors that could become bottleneck of the system:

1. The bandwidth to carry vast amount of digitized information
2. The enormous storage that is needed to store this vast amount of information
3. Security measures taken when sensitive information is aired

The first problem was handled quite intelligently in a twofold way by increasing the capacity of the underlying transmission lines and introduction of wireless technology and integration with packet switched networks. The

introduction of wireless technology opened up another dimension of the second generation media when people were set free to exchange information even while travelling. People started to become more connected and real time information exchange was becoming a reality.

The second problem was literally handled by introduction of data centers and distributed storage where each node of the network stores some piece of information. Large data centers were setup across different parts of the globe to store or provide information more easily in a fault tolerant mode. The introduction of data centers also addressed part of problem #3 as data was more secure against any hacks and physical damages due to natural calamities.

The solution to the third problem was more towards to the software side where different security protocols are made mandatory for certain types of information exchange and different security certifications were introduced. People were made assured that any information exchange using those security certificates are really trustworthy and safe.

The journey of the second generation media was quite impressive covering almost two decades. Information exchange was far easier and fun compared to first generation media types. People loved the simplicity of the approach and engaged more people in the chain. Two major things happened in this era which virtually laid the foundation of the next big era that I'll come into shortly. Firstly, people realized the infinite possibilities of the Internet in exchanging information in real time and secondly personal computers are not the only medium to hook into the Internet. There could be multiple other ways to connect to the Internet. The success stories of second generation media goes beyond this in regard to assisting the first generation media and help them running parallel. The first generation media was hugely benefitted with the second generation technology and that's the reason they continued to operate even amidst the free flow of information.

The second generation media did a wonderful work in getting the Internet functional and gain user's trusts towards it, there were still some grey areas for good sake that helped it to reach another milestone. The most important of that was unavailability of any on demand service for information. People were looking for some master source of information that can be used on demand and this curiosity opened the gateway for the third generation of media with the introduction of commercial search engines. Another event which should be counted with the same significance is the use of cellular technology in tapping information from the Internet.

These two events can be marked as the birth event of third generation of media. Few of the commercial search engines became very popular within a short time due to a widespread coverage of information almost instantaneously. Information was more easily accessible not only from computers but also from mobile devices. Internet became more faster and users started to feel more relaxed while within the Internet. By this time, Internet became the de facto standard for any kind information exchange and people almost considered digital information to be the de facto standard for information. A lot of web sites and portals became the major sources of information and the need is felt to associate third generation media tools in automating process flows in different sectors of life. Web portals became the face and spokesperson on behalf of industries, markets, governance, education, entertainment and many other sections. Information conveyed from the web portals were considered with the same importance and this whole chain once again established the potential of Internet in information exchange.

Though quite a lot of websites and portals were running as part of third generation media, they all were lacking one basic concept of information and that was information should come from people as much as possible. So people are the source of information and not the websites or portals, thereby engage people to create information. This very idea is popularly known as Web 2.0 which basically helped to convert static web sites and portals into dynamic and Rich Internet Application (RIA) enabled. This small change in third generation media triggered another huge shot and the history of media faced a big information explosion in terms of Social Media. Social Media is a great new media of collaborating people and information which provides a virtual stage for real time exchange of information. Information through social media are so live that it can be sensed and people feel proud while collaborating with social media tools. This is an emphatic win for third generation media because till now media tried to drive users

and now users are trying to drive the media. The idea of social media formulated the following six types of information collaboration:

Social Networks: Services that connects people of similar interests and background for information sharing and collaboration. This is the most popular of all of the other types and common players in this area are Facebook, MySpace, LinkedIn etc.

Bookmarking sites: Similar to our traditional bookmarking idea, this helps to manage information in different web sites and portals by maintain a bookmark and efficiently managing them through a common repository. The bookmarks can be tagged further to make them easy for search and share. Common players in this area are Delicious and StumbleUpon

Social News: A platform to share news items or external links and then users decide the relevancy of the item by some form of voting. The items that are voted are displayed more prominently and users get an idea of which news items are mostly viewed. So this is highly a user driven service who determines the fate of information. Common players in this space are Digg and Reditt.

Media Sharing: Information collaboration platform where mostly the information is in the form of pictures and video. The media sharing platforms are one of the most popular media tool for the third generation media. People can experience on demand video services from here and express his/her concern towards it. The most common players are YouTube, Picasa and Flickr

Micro blogging: A platform to quickly send status update in the form of short messages and people who are subscribed to receive the updates gets the update in real time. Popular players are Twitter and different data feeds like RSS, Atom etc.

Online Forums: Allows members to discuss on some topic, resolve some technical issues by discussion and just a place for hangout. Popular players are Google+, Hangout etc.

In all of the above types, one thing that comes common is people and it's the people who drive the service or rather the media in a bigger sense. People have started to realize the power of information collaboration in real time and the different information management tools are also gaining importance in order to streamline various types of information.

Now in this journey of third generation media, when the search engines started operating many of the web sites and portals started tagging their content so that search engines could find them earlier in the search. A separate branch of information analytics started popularly known as "Search Engine Optimization" and quite a lot of investments are made in making the web sites and portals search engine friendly. This is a significant event in third generation media as people started thinking about information metadata more closely in order to deliver accurate information as per the need of people. During this course SEO underwent two revisions where the first revision of website and image optimization continued to multimedia, social media, monetization and content delivery networks in the second revision.

Third generation media types are more dynamic in nature where the web sites and portals are constantly evolving with technology in order to provide on demand information to the user from any part of the world. Speed has become a necessary concern for all the information providers through web sites. Sloppy web sites and portals are not even considered by the search engines even if they are good in terms of information. So, a constant endeavor is going on to serve the people more gracefully and some commercial organizations are playing a leading role to make that happen.

The evolution of third generation media was also backed by few of the other factors without which we couldn't have witnessed the state in which we belong right now:

Faster hardware – The underlying hardware went through a massive change in terms of speed, capacity, scalability, power consumption and off-course price. Hardware became cheaper with increased capacity and speed thereby providing the biggest catalytic effect on third generation media.

Faster execution of code – A lot of different types of software and firmware were written in order to take advantage of the fast hardware underlying. Operating systems and databases underwent some massive performance improvements that boosted up the application performance by many times.

Faster networks & more bandwidth – The network bandwidth also increased considerably to several Gbps in order to support faster exchange of information and more and more people. The increased bandwidth allowed multimedia features like two way video streaming, on line gaming and several others.

Secured network – Apart from networks getting more faster they were also getting secured while transmitting sensitive information. Several hardware and software changes collaboratively decided network to be a more secure place than any time before.

The third generation of media is still evolving for a better management of information and the time is not very far when we are going to experience the rise of the fourth generation of media. I'll hold this discussion for some time here as I'm going to look at the journey of our information society across the different media cycles after which I'll be back continuing our discussion towards the rise of fourth generation media and believe me that's a fascinating journey.

The Information Society

So far we experienced the rise of media and the transitioning states media underwent throughout its journey from the first generation to the third. In this section, we will find the structure of the society on the realm of information and different snapshot of this in the different media generations. I'll also try to unleash the changes that our society has undergone with respect to information usage during this period due to change of media types.

Society, as per the definition, is some collection of people involved with each other through persistence relations and cultural resemblance. A society is not bound by geographical boundaries and can exist beyond territories. Society is mostly comprised of three entities (Fig. 1 below) in an abstract form, the people, the processes involved in the society and the common things that the society is generally made up. The people and process are easy to understand within the realm of the society but things play a very important role within the context of people and process. I'll explain this part shortly in the next section and just want to give a brief heads up on the diagram now. Fig1 actually is a representation of society from the perspective of information production and consumption. As per the fig there are three main information channels that run between people, process and things. These channels are bi-directional means information flows in both ways and two of them are persistent in nature means information needs to be saved across these links. Information channels from people and things can trigger processes and one process can trigger multiple other processes with different sets of information. The output of the final process can affect both people and things.

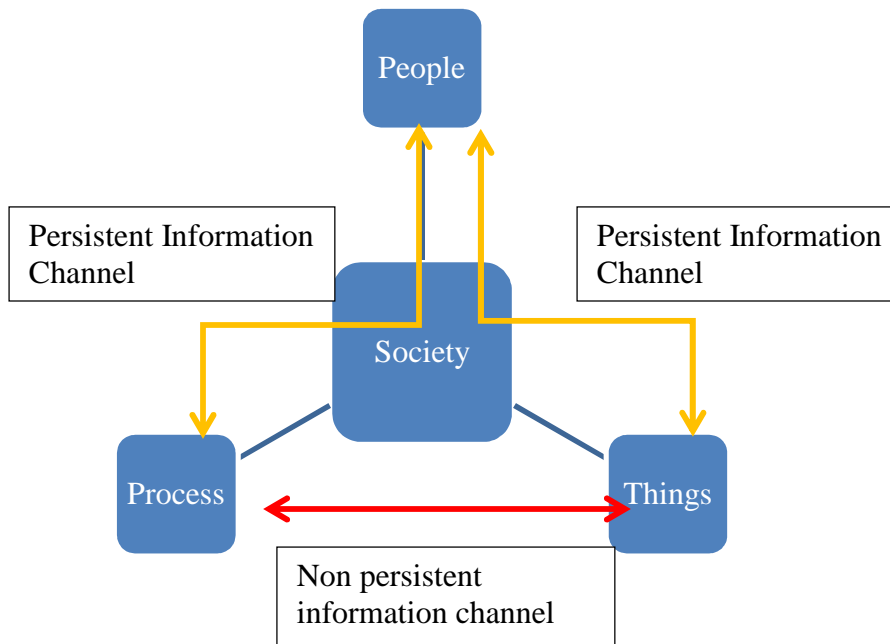


Fig. 1: The structure of society

With this being said, let's focus on the individual pieces of the diagram and understand how they work within the realm of information.

The People

People are the foremost important part of a society. All information floating within the society are destined for people and they are considered one of the most important producers and consumers of a society. The information produced or consumed by people can be generally categorized into following types:

Personal information: Information related to his personal life (like his bank account, social security number, investments, salaries, benefits etc.), likes and dislikes, hobbies, lifestyle, cultural, political and spiritual views etc. Each of the individual sets can be termed as information domains. Personal information is the one that varies most from person to person but we still can group them under the laws of set theory. For e.g. if A be a specific personal information domain of a user, then for a group of N people, the total number of possible groups that can be made with that common information domain will be

$${}^N C_1 + {}^N C_2 + \dots + {}^N C_{N-2} + 1$$

The symbol ${}^N C_i$ actually suggests out of N people, (N-i) persons share the same informational domain and the total number of combinations of that.

Now if $A_1, A_2, A_3, \dots, A_m$ be the m different informational domains of a user and there are N people, then total number of possible groups would be

$$A_1 * A_2 * A_3 * \dots * A_m$$

$$= ({}^N C_1 + {}^N C_2 + \dots + {}^N C_{N-2} + 1)^m$$

The benefit of finding the common information groups lies in finding the information channels that would be of interest for one or more persons in the society. These channels also uniquely identify the persons who would be interested for that particular piece of information. Fig 2 shows how personal information channel gets perforated into different domains and hits consumers of similar interest once it's headed towards the society.



Fig 2: Information domains with similar interests

The personal information channels might or might not trigger external processes based on the context of the information. I'll capture this more while discussing the processes. Information exchange across domain can happen rarely as most of the information is personal but few cases always exist where information exchange does happen between people like a person's likes and dislikes, lifestyle, hobbies and any other general information.

Business Information: These are the kind of information related to business, workplace, trade, customer, finance, policies etc. Most of this information is sensitive and relevant to only a group of people. Information security is of high concern here and information eavesdropping might be dangerous. So, the division of information domain and finding paths of common interest is not simple compared to personal information. Information in this domain carries a weight factor that determines the sensitivity of the information. Each domain can have sets of information with varying weight factor and commonality of information varies inversely with the weight factor (Fig 3). This means more the weight factor or sensitive is the information there is less chance the information would turn up common or can be shared.

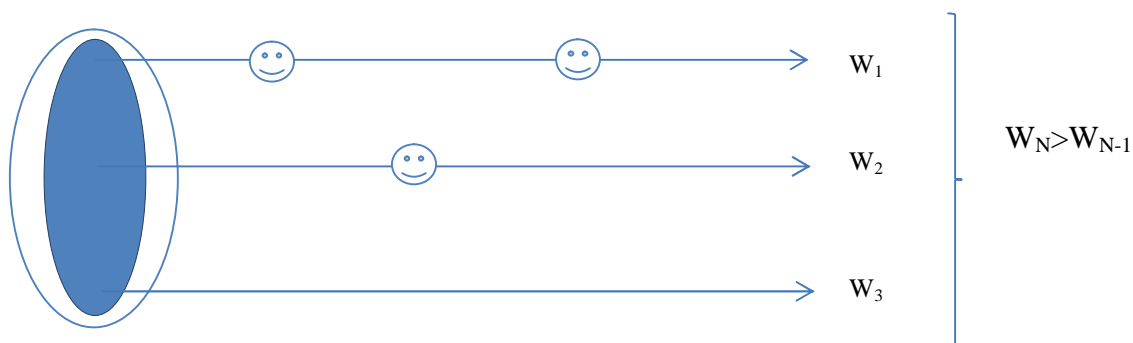


Fig 3: Weight factors associated with business information

Fig 3 depicts an information domain having three information channels with different weight factors W_i . The more the weight factor less is the chance of commonality of that information channel. The weight factor is generally a function of three parameters as

Weight factor = f (Exclusivity: e, Business Value: b, Confidentiality: c)

Now the exclusivity varies inversely with no. of similar kinds of information which we can term as n . So, exclusivity or

$$e = 1/n \text{ or } e = k1/n \text{ where } k \text{ is some constant}$$

The business value is directly proportional to the loss the business would incur if that particular piece of information is lost. The loss could be monetary, people's faith, goodwill and similar parameters. So, if l can be termed as the potential loss, then

$$b = l \text{ or } b = k2 * l$$

Finally, the confidentiality directly varies with first two factors exclusivity and business value. So, confidentiality c can be termed as

$$c = e * b = (k3 * k2 * k1) * l / n = k * l / n \text{ where } k = k1 * k2 * k3$$

So, the weight factor $w = k * (l/n)^2$ for some constant

Business information can trigger lots of processes and the processes also could generate business information that is normally persistent in nature. Business information is critical in nature in the sense that people often demand business information to be very accurate and in real time. So, technology needs to play a vital role to increase the accessibility and dependability of information. Information exchange can happen across different domains depending on the context and business justification.

Academic Information: These are mostly related to academic institutions and related entities. Information in this domain can be mostly characterized as open unless the information is business related. The open information signifies the information channels under this can be shared to the fullest extent and people should be encouraged to share as much academic information as possible to alleviate the academic information bottleneck we have in our society right now. The new age media can play the vital role in raising the importance of academic information across all the societies. Academic institutions are encouraged to leverage the power of new media to share information like course curriculum, subject matter information, research activities, and trends in academics and conduct special programs in under developed societies to establish the importance of academics to give them the basic infrastructure to continue in academic programs.

The different information channels under this are interdependent in the way that influences the information usage pattern in other channels. For an example the information related to the research trend in some discipline can vastly drive the future research pattern and restructure of academic curriculum. This even influences considerably other information domains such as business and personal as well. Information in academic domain can influence business process information and this has a very close relationship with another category, the scientific and technological information domain. I'll introduce a parameter 'Information Influence Factor', that measures the degree of influence of information over other set of information. Mathematically this can be modeled as a set valued function

that associates a point in set X to one or many points in set Y . Formally this is the function form X to the power set of Y , written as

$$f : X \rightarrow 2^Y \text{ such that } f(x) \text{ is non empty for every } x \text{ belongs to } X$$

then w can be defined as

$$w = k * (l/n)^2 \text{ where } k \text{ is some constant that normalizes the relationship.}$$

Information influence factors associated with individual information can also be grouped to define a composite influence factor for an information channel. The composite influence factor can be defined as

$$C = I_1 * I_2 * \dots * I_n$$

Scientific and Technological Information: This is a critical information channel for any society to take the society ahead with time and provide the necessary infrastructure for the society to run smoothly. Most of the information under this channel comes from domains such as research, investigations, review, development, testing and maintenance. Scientific and technological information domains are very closely related to each other and hence can be grouped under the same channel though ideally they are different. Scientific information gets fed the technological domain heavily and often comes back with another set of information that might trigger external processes or influence information in scientific domain. Scientific information domain correlates with the academic channel and should step in feet by feet in order to maintain the balance of information across different information domains. Technological information often acts as a bridge between scientific and business information and involves a lot of processes underneath that.

Both of the information domains are dynamic in nature and kind of self-renewable. The information set gets updated in every minute across the globe and this can be termed as a universal information channel that affects almost all the domains in all the channels.

The entire domain of scientific and technological information can be categorized into two types, real time and non-real time. The real time channels are often originated from the existing knowledge base and mostly influences the process behavior. Ideally there is zero tolerance for any erroneous information that is being used in real time, so appropriate processes must be running in order to check the information correctness.

Medical Information: This is yet another dynamic information channel that is closely related to personal, business, academic and technological information channels. A majority of the information under this domain comes from people and existing knowledge base. The different information channels under this can exchange information and information commonality is expected and almost follows the same rule as derived earlier. Like academic domain, information in medical domain is also encouraged to be shared spontaneously as there is a huge influence of medical information over personal information channels.

Social Information: Though it's pretty much related to personal information channels and most of the information arises from people or society, this still can be considered as an information channel after the new third generation of media came into existence. There is a basic difference between the social information channels with the others discussed so far. The social information exists in the form of information chains where the information chain is made up of individual information. Social information in singular state is very rare and almost doesn't exist. The social information chain can be modeled using the binary approach as below:

$$\text{Social information chain } (I_{sc}) = I_1 + I_2 + I_3 + \dots + I_n$$

where I_i is an individual piece of information which can exist in two states, 'active' or 'passive'. The active state of the information signifies that the information is fresh and can be consumed. On the other way, passive state implies the information is stale and is not being updated for quite some time. Given this approach, where information can have two states, the social information chain I_{sc} can have 2^n states. Out of these, not all the states might not exist in actual, but the states are transferred from one to another.

For $n=3$, the information chain can have $2^3 = 8$ states as below

1 1 1, 1 1 0, 1 0 1, 1 0 0, 0 1 1, 0 1 0, 0 0 1, 0 0 0

Where 1 signifies the information is active and 0 determines passive information. Out of the 8 states, the state with all 1s is considered to be the most effective state of the chain as all the individual information are in updated state whereas the state with all 0s can be considered as most ineffective state as all the information are stale. The duration

in which the information chain remains in all 1s state can be called as ‘Peak life’ of the chain and an estimate of all peak lives can portray the state of the channel overall.

The Process

The processes can be considered as the back bone of a society as processes orchestrate the different information channels by acting over information and providing the service. Like people, processes are the big consumers and producers of information. Ideally, processes can be thought of an automated agent that polls different information channels and leverage that information for the sake of the society. So, each of the information domains that I discussed in the previous section is associated with several processes that are dependent on the corresponding information channels within that domain (Fig 4).

Processes can operate within the domain of the information or across multiple domains where the information produced by some process does not necessarily fall within the same informational domain rather may serve in other domains as well.

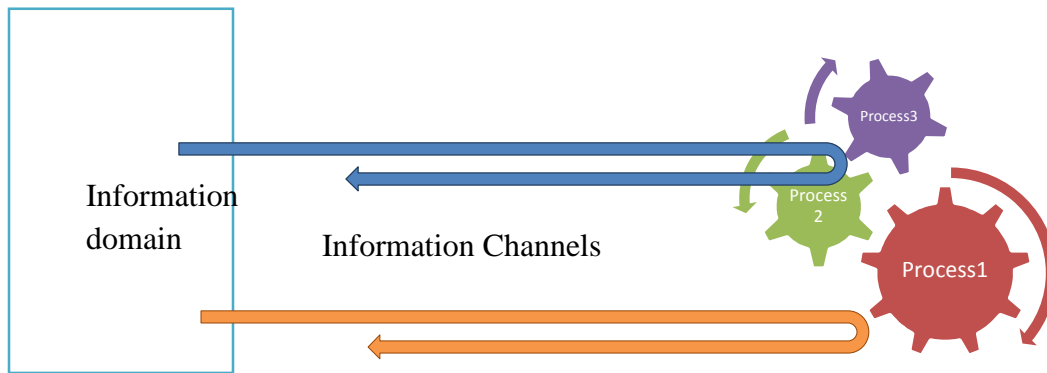


Fig4: Information channel and process

So, processes can be well modeled as one to one or one to many mathematical functions that map information from a certain domain to a set of ranges that belong to other informational channels (Fig 5). In this way, fig 4 shows a process that maps information in one to one approach.

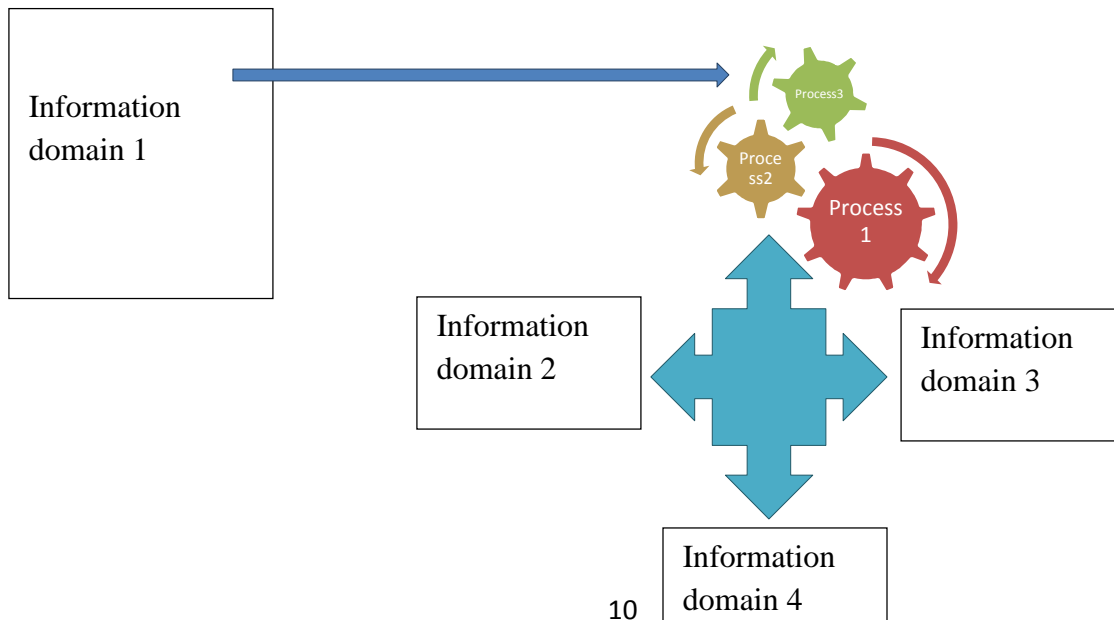


Fig 5: Process with multi domain influence

Processes are mainly triggered either singularly or in a composite manner by any of the external factors

People

Other process

Things

The first two factors are most common in today's society where most of the processes get triggered. The third factor is not quite active in triggering processes but could prove to be a promising factor in future society. I'll discuss this more shortly in the next section.

A process may go through a life cycle or process work flow during its life where the process traverses through multiple stages confronting different information channels. Now in every stage of the process, it generates some sort of output in the form of information channels that might affect other process, people or things. The exact stages will depend on the context of the process but a generic outline would like as below

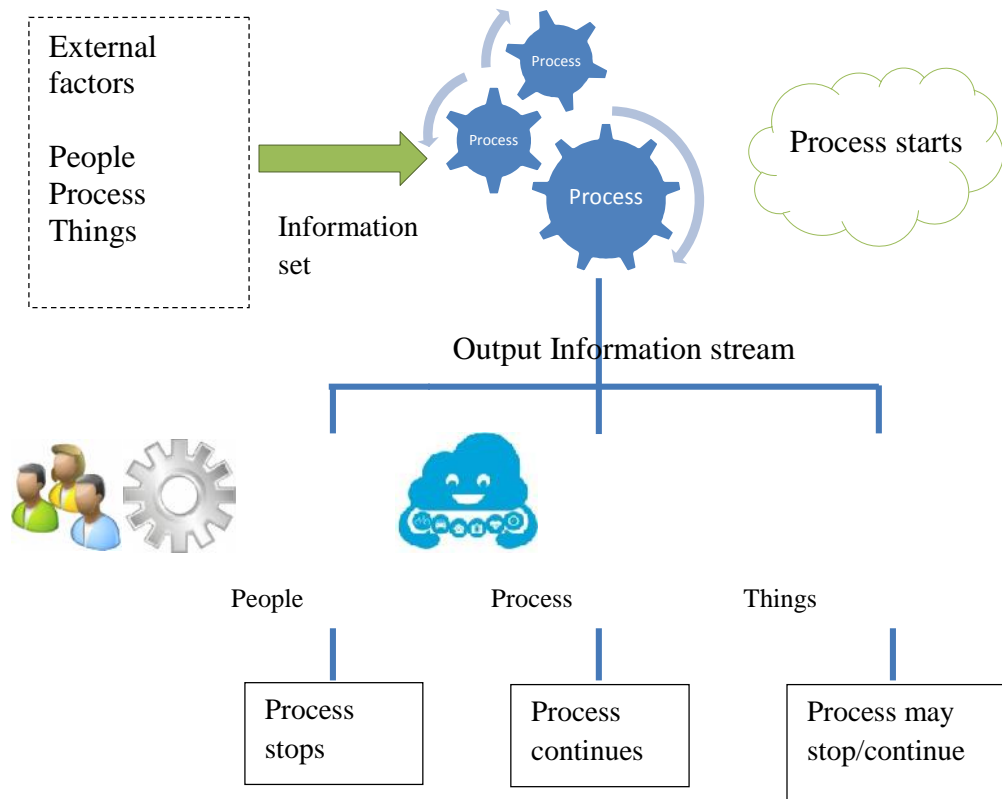


Fig 6: Process Life Cycle

Process output channel if directly reaches to the people marks as the end of the process with the output information channel being consumed by the people. If however, the process output is directed to another process either within

the same or different information domain, it generally continues in that domain and might as well as affect people or things in other domains. So, this mapping actually suggests many to many and formulates a complex mathematical model. Process output, if however, reaches to the things, might indicate end of the process or the process may continue with different set of data. Things may as well trigger more processes and this also follows the similar life cycle.

One of the concept that is relevant in this context is the '*process chain*' that can be viewed as the chain of processes involving multiple information channels across multiple domains. The process chains can exchange information either directly or through things at different stages of their cycle. The degree of correlation () of a process chain measures the number of checkpoints that process chain goes through during its life cycle where a checkpoint identifies the phase of the cycle when the information chain either consumes or produces information. Checkpoints can be either incoming or outgoing depending on whether the process is consuming or producing information from other channels. Normally, the outgoing checkpoints are asynchronous in nature where the process just fires the information out and proceeds without waiting unlike that of incoming checkpoints where the process polls for the required information from the predefined sources. The degree of correlation is also a measure of the complexity of the process chain that often determines the priority of the chains.

The Things

The things corresponds to yet another important category of the information society. Things literally means internet enabled devices like computers, mobile phones, tablets, netbooks, eReaders, Smart TVs etc. that can hook up to the Internet and exchange information. Things play a vital role in Information society as this serves as the intermediate tool between people and processes and vice versa. A true information society involves exchange of information between people and processes through the internet enabled devices and the functional operation of information society is very much dependent on the operations of these devices. The idea of seamless information society can't be established without a seamless connectivity service for all the people within the society and the seamless connectivity requires a substantial improvement in the following areas:

- People should be connected seamlessly across different devices.
- The state information should be maintained in each connectivity session so that people never lose any information when he switches the device.
- Processes need to be smart enough to present information to user according to the device he is using.
- Both processes and devices need to be fault tolerant while using an information channel. Any fault detected at either end should be captured early in the session and accordingly route the information channel to a different device.
- More devices need to be internet enabled.
- Internet needs to more widespread and should not be limited to certain areas of the society.

As more and more things are Internet enabled, one aspect that becomes mandatory is that the devices should be intelligent in terms of establishing connectivity with different processes, handling information channels without any manual intervention and selectively filter those information channels according to the user profile. So the things around a person should know about his culture, likes and dislikes, requirements etc. and accordingly search different information channels intelligently and provides more specific information to the person.

So, as a brief summary, processes and things behave as an information facilitator to people as people are the ultimate end point of information in an information society. In the next section I'll go through the state of our information society in different generations of media and a futuristic landscape of fourth generation media with its corresponding information society.

The journey of media and information society

The structure of the information society during the first generation of media was quite incomplete in the sense that there were very few options of automated information exchange. The notable devices that happened to exchange information remotely were Televisions, Radios and Cable phones and apart from the cable phone the other two devices were not enabled to exchange information as the communication was one way towards the people. So, almost all the information channels were single directional where people were only the consumers of information. The only media that supported bidirectional information exchange was telegrams and letters but they were not in real time or on demand. The concept of real time information exchange was kind of dream that time. So our information society model during the first generation of media looked something as below

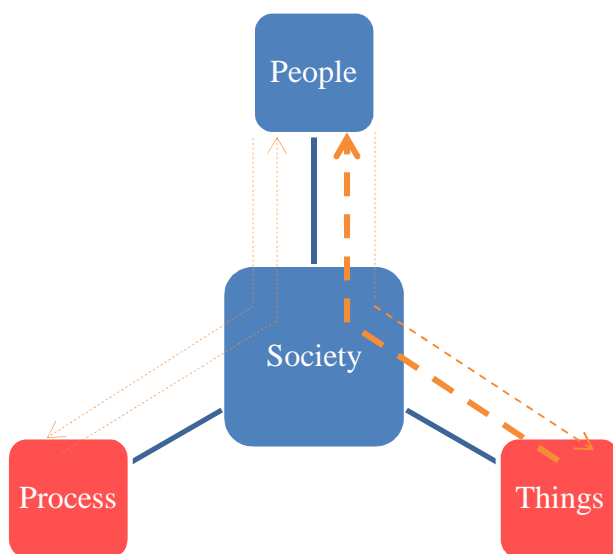


Fig 7: Structure of information society during first generation of media

As depicted, the information channels between people, process and things were weak suggested by the broken lines. The bold line out of that signifies a relatively strong information channel. Things in red signify either the devices were not Internet enabled or processes were not smart or intelligent to deliver information to people in real time.

The second generation structure of the information society went through a major modification in terms of availability of Internet enabled devices though it was restricted to computers only. The availability of Internet strengthened the information channels between the entities and made them bidirectional. Processes were provisioned to impart intelligence so that they could talk to devices and people almost in real time. But still there was some bottleneck in terms of network availability, bandwidth, self-intelligent processes and unavailability of lightweight Internet enabled devices. The structure of our information society looked something like below

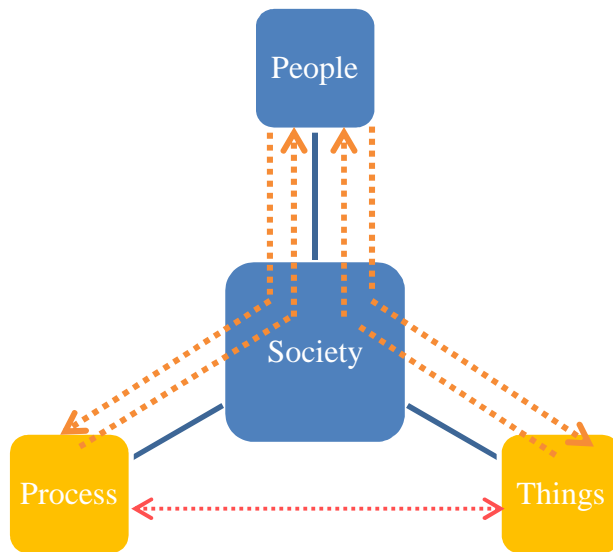


Fig 8: Structure of information society during second generation of media

As expected, the second generation structure looked more consistent in comparison to our information society structure. The information channels became bidirectional in most of the cases and people started to exchange more information using Internet enabled devices and smart processes. Devices could now exchange information with processes. But information channels were still lacking dependability due to various factors and thus still shown here as broken lines but more organized in comparison to first generation structure.

The third generation structure was also a major modification in terms of availability of more Internet enabled devices, dynamic and intelligent processes providing real time information exchange and more engagement of people towards contributing and building the information knowledge base. The model of the third generation information society is depicted in Fig. 9. The information channels between the entities are more matured and secured. Sensitive information can travel through the third generation media channels more securely and people are considered to be prime contributors in the information channels. Green boxes signifies the entities are doing as expected but still there are missing pieces due to which the structure is still not complete in third generation.

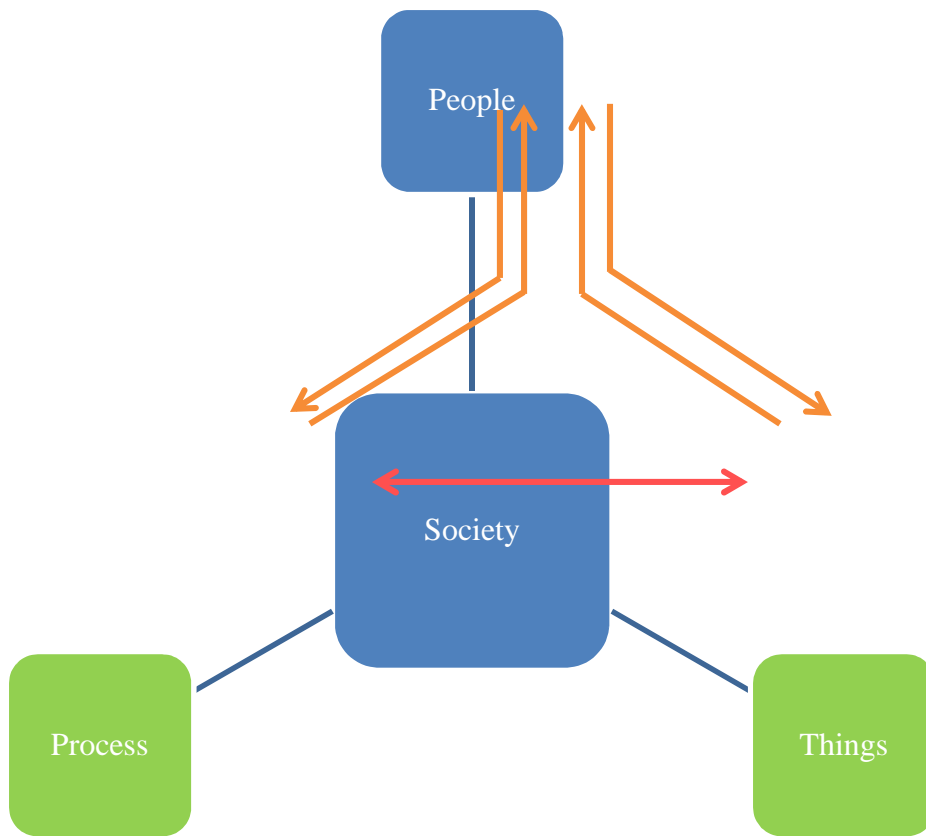


Fig 9: Structure of information society during third generation of media

The fourth generation of media and hence the corresponding information society targets at more Internet enabled devices in a more granular level. The fourth generation of media expects a mini information society across each home where the following information exchange happens at all the time:

- Information exchange between all the house hold electrical devices like TVs, refrigerators, ovens, alarm systems, electrical controls, computing systems and similar other entities. This way, all such devices becomes a live node in the Internet and search for the best operating environments under different conditions.
- Information exchange between the control processes that resides either in the devices or in remote locations that decides how the devices will behave or any direct information that could be of interest to the person.
- Information exchange between all the members of the house seamlessly across all the devices

These mini information societies can be formed using virtual LAN concept and each of these mini societies hook up to the Internet using some gateways. The gateway can uniquely identify the VLAN or mini society thereby providing a seamless information channel to each of the mini society. These mini information societies collectively form a bigger domain of society with complex rules guiding the information channels (Fig. 10). Under the fourth generation media, each person should mandatorily have a profile mentioning the details of his entire Internet enabled devices, the VLAN address that he belongs to, personal likes and dislikes, social status, workplace information, skillsets etc. Based on that the person can selectively control all of his internet enabled devices from anywhere in the world or let them automatically choose the best operating environment depending on conditions.

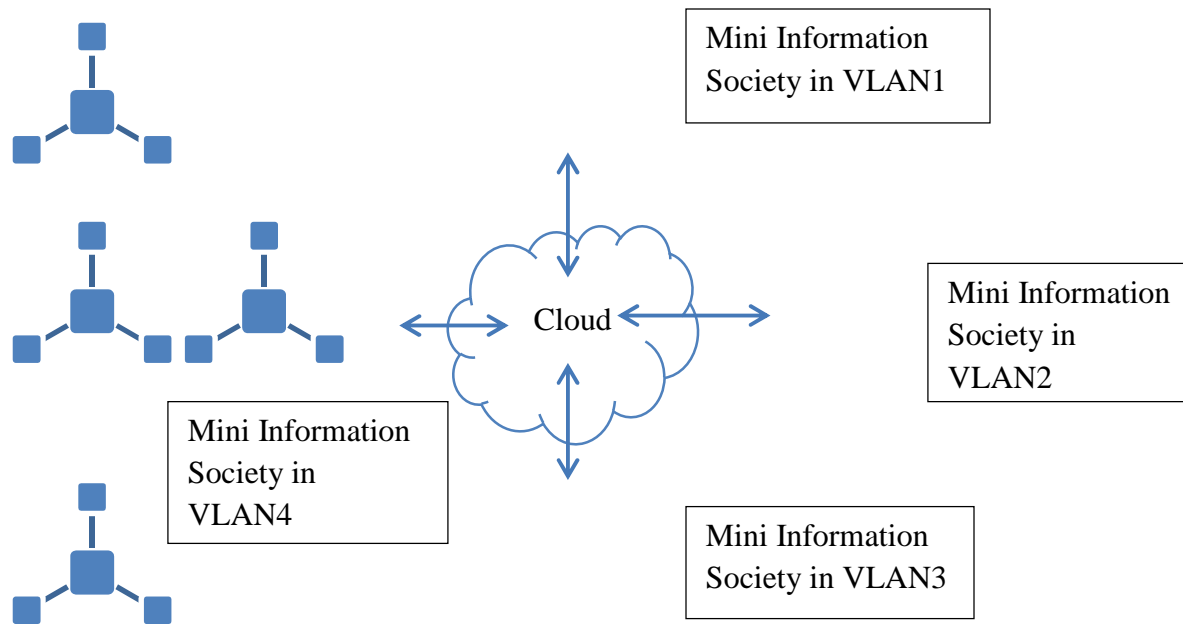


Fig 10: Structure of information society during fourth generation of media

Besides promoting more Internet enabled devices, processes need to readjust to self-learning mode where the processes mutate themselves based on the information requirement and processing pattern of individual person. This is pretty much related to what a human being does in everyday life. Thus processes need to be more intelligent and self-learning so that it could apply its own judgment over its imparted intelligence when analyzing some information. This way the information society self-adjusts itself based on a variety of information content across different channels.

The fourth generation media allows people to share more information seamlessly from anywhere in the world and virtually people becomes the live node of Internet. Search engines could be much smarter incorporating thought readers and instantaneously displaying the most relevant information at that condition and probable other information paths that might also exist. Information in various domains can leverage smarter tools to collect information ahead of time and inform people about his potential destination based on the analysis of current information and user profile.

The journey towards the fourth generation has already started in some of the developed countries but this is in a very nascent stage. More works are needed to establish the structure and get the benefit of the super fascinating fourth generation media and corresponding information society.

Conclusion

The journey of media along with Information society is now fast paced and technological advancements are hastening this growth rapidly. Today's information society is capable of exchanging information in real time through a number of Internet enabled devices. But a major problem in today's information society is the availability of piles of redundant and irrelevant data which are consuming the information channel bandwidth. Information filtering is now a major concern for users as there is no significant automated way of filtering irrelevant information and users spend lot of manual effort in resolving that. Fourth generation media should address this issue urgently by introducing some concept of information aging where each information should be associated with an age which will

be determined by the frequency of access of that information. The less frequent information is accessed the more would be the age of the information and the automated agents would periodically discard the old information based on some policy. This way, the information channels can be reused more efficiently without burdening the bandwidth too much. Information channels also need to be multidimensional in grouping information of similar kinds. Such fine information channels need to be tagged properly to retrieve information fast and to keep that channel unique as per the dimension is concerned. This seamless information exchange in fourth generation media opens up the scope for more work towards information security. Malwares and phishing entities could halt the entire information society structure blocking all the major information channels. Therefore care should be taken whenever any Internet enabled device tries to hook up to the Internet and use the information channels which are supposed to be encrypted by some n-bit encryption logic. The transition from third to the fourth generation of media or even beyond is not a distant dream rather media is contemplating itself fast through many of the minor stages between the third and fourth generation and we all are looking for a more intelligent information society catering to the user need more gracefully.

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