Chapter 2

Subjectivity, Textuality, Narrativity

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_Paper I make my Friend and mind’s true Glass._ - Hester Wyat

_You are infinitely more than you can imagine, subjects of gadgets and instruments of all kinds – ranging from the microscope to radio and television – that will become elements of your being._ - Jacques Lacan

_…[N]arrative is international, transcultural: it is simply there, like life itself._ - Roland Barthes

There is no denying the fact that the question of human subjectivity has remained one of the most intriguing and compelling questions of the last century, a century of unimaginable human savagery in the form of two World Wars, large scale massacres and ethnic genocides, and phenomenal technological growth through scientific developments. The category of unified human ‘self’ has come under serious scrutiny from literary-philosophical and socio-techno-cultural perspectives, as a result of which the self-proclaimed sanctimonious unity of the human ‘self’ stands challenged. It is being increasingly argued that the ‘human’ should always be understood as implicated in the real material world with which the real sensuous human beings are in continuous interaction and participation; and, as such, the becoming of the human only manifests itself in the making of new technologies which are in turn employed in a diverse range of practices. In other words, we could say that the ‘human’ must forever be interpreted not only within the diverse socio-cultural practices and worldviews but also inside the changing and malleable universe of prosthetic tools of her own making.
Tom Boellstorff, in his book *Coming of Age in Second Life: An Anthropologist Explores the Virtually Human*, remarks: “All humans are born, grow and age, and finally, die, but there are patterns to how people understand their life course, and these patterns are not biological pregivens; they are forged through culture, and this can now include culture in virtual worlds” (122). Boellstorff highlights the role culture plays in human beings’ interpretation of their own lives, actions and selves. And since culture is a domain that changes constantly, their understanding regarding their own selves and lives necessarily has to undergo modifications with alterations in the cultural sphere. The changes, of course, not only involve social norms and mores, moral and ethical codes of behavior, and cultural perceptions but all kinds of material changes aided by radical techno-scientific shifts. It seems there may develop a new synthesis between man and the machine as the inexorable rise of the ‘cyborg’ shows, a word coined by Donna Haraway. The synthesis has also given rise to new fields of inquiry and novel disciplines, like *digital humanities, materialist aesthetics, relational aesthetics* and *material culture* which bring to the fore the discursive relationships and inescapable interdependence of various tools, instruments, machines and media at our disposal, and the way we make sense of ourselves and of our inter-personal relationships, and the way we define our social roles and decipher cultural and artistic practices, and view our relationship with the wider physical world. Following Walter Benjamin, Bill Nichols wrote a critical essay titled “The Work of Culture in the Age of Cybernetic Systems,” in which he says:
If mechanical reproduction centers on the question of reproducibility and renders authenticity and the original problematic, cybernetic simulation renders experience and the real itself, problematic. Instead of reproducing, and altering, our relation to an original work, cybernetic communication simulates, and alters, our relation to our environment and mind… [putting the identity of human] at stake, subject to change, vulnerable to challenge and modification as the very metaphors prompted by the imaginary Others that give it form themselves change. (630-31)

The sphere of culture during the last decades of the twentieth century has definitely undergone startling transformations with the onset of digital communication technologies and networked computing. The force of these techno-scientific revolutions compels us to rethink our traditional notions regarding the human being, and what this implies for our socio-cultural and artistic practices.

The impact of writing on human societies has become a field of serious study in recent times. Writing has been studied vis-à-vis its relation to other media of communication and the coming of the printing press during the fifteenth century. The work of Lucien Febvre, Marshall McLuhan, Walter J. Ong, Jack Goody, Henri-Jean Martin, Elizabeth Eisenstein, Roger Chartier, Adrian Johns, and more recently, of Steven R. Fisher is of immense significance for understanding how the socio-cultural practices of writing and the material form of the book have shaped the modern socio-political institutions, cultural sphere and aesthetic sensibility. Tony E. Jackson, in *The Technology of the Novel*, writes that the “unique nature and effects
[of writing] have enabled or required the appearance of a vast array of... human ideas and practices” which we tend to take for granted today (3). In fact, most of our notions like the self, the individual, the social and the very idea of identity in the modern sense are the result of “the gradual shift from the world of orality to the society of writing that... led, in the final analysis, to something quite new - the unleashing of mechanisms that prompted a new view of self and a spirit of abstraction” (Martin 345). Roger Chartier, a French historian working on the history of writing and publishing but with greater emphasis on reading, avers that a new sense of privacy and individuality came into existence with new modes of reading practices aided by the coming of the printing press and the written culture.

The coupling of the human and the machine is frightening but also exciting, intoxicating and challenging. Media, McLuhan argued, are the “extensions of man” (3). In this sense, the media have certainly enhanced human capabilities. No one can deny fact that the human beings have always remained deeply embedded in a never-ending and forever-extending circuitry of all kinds and types of instruments, tools and machines without whose use or presence the world in which we live today would be inconceivable. The work of N. Katherine Hayles has taken shape against the backdrop of this human condition and it arises from her asking how the proliferation of technical media compels us to question the very idea of an autonomous human subject. She believes that we are gradually moving towards the posthuman age in which “there are no essential differences or absolute demarcations between bodily existence and computer simulation, cybernetic mechanism and biological organism, robot technology and human goals” (Hayles, How We Became
Posthuman 3). She takes on the challenge of re-thinking and redefining the concept of human subjectivity with reference to the emerging media ecologies and the inventions of science. Her work has brought the issue of human subjectivity and its embodied character to the centre of the debates related to new media technologies and their role in the construction of contemporary subjectivity. For the challenges are enormous and serious, since the question is whether, in the broader field of literary studies and digital humanities and Arts, the embodied human subject “becomes the centre of humanistic enquiry within which digital media can be understood,” or the media turns to be “the [dominant] context and ground for configuring and disciplining the body” (How We Became Posthuman 87).

The present chapter is an attempt to shed light on the contributions made by N. Katherine Hayles and Marie-Laure Ryan. Hayles has played a pioneering role in theorizing the new forms of writing practices ushered in by what has lately been described as ‘the computational turn’ based on her appropriation of new understandings as to the nature and constitution of the human subjectivity. Ryan is renowned for her distinguished scholarship in the field of narrative studies. She has enabled us to perceive more subtle and discerning relationships between various kinds of narrative strategies made possible by distinct media and their respective physical properties. The work of these two scholars has proved very fruitful for a reassessment of writing in the new media, and in examining how the posthuman ‘digital subjects’ read, write and comprehend literary texts produced by the functionalities offered by the computer and other digital software.
2.1 Literature, Science and Material Culture

Twenty-first century literary theorists and cultural historians are grappling with the fact that the questions pertaining to science and technology are too important to be left to scientists and technocrats. The convergence of art, science and technology at the dawn of the third millennium may come as an opportunity in disguise for a cardinal rethinking of the relationship between science, culture and the arts. The field of literary studies has an inherent bias towards the techno-material aspect of lived life and has generally revered the Arnoldian view of culture as a pure space of aesthetic contemplation. This has led to the growth of “an anti-industrial view both of the novel and of modern… literature as a whole” (Ketabgian 10). In *The Lives of Machines*, Tamara Ketabgian has categorized this tendency as the “pastoralist bias,” which according to him, “has crucially affected which texts qualify as significant works of high culture, as well as the aesthetic standards that uphold them” (10). This has yielded “a remarkably selective history, resulting both in the selective canonization of particular texts and in selective ways of reading them” (10). The same is true in the case of modernism. The modernist artist’s obsession with technology and speed was one of the first manifestations of this long-forgotten desire of the artist to be with the scientist and the engineer, and their modern avatar the programmer. But again the biased anti-technological stance of most liberal humanists has promoted a technology-free history of literary modernism. On the other hand, Sara Danius in her book *The Sense of Modernism: Technology, Perception and Aesthetics* compellingly argues that “it can be [readily] shown that the operations of a variety of technoscientific configurations are
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inscribed in the specific idioms, procedures, and innovations that have commonly been seen as representative of high-modernist aesthetics…” (23). Danius is not satisfied merely with recuperating the role of technology in the modernist literary-aesthetic imagination and practices. She goes further to the point of claiming “that technology is in a specific sense constitutive of high-modernist aesthetics [emphasis in original]” (Danius 3).

The relationship between literature and science has generally been theorized as antagonistic and contradictory. The field of literary studies has been prone to neglecting the role modern science and the scientific temper have played in the shaping of the modern individual and societies. It is evident from the title of C. P. Snow’s famous work, Two Cultures. He wrote another essay, titled “Two Cultures: A Second Look” for the second edition of his book, in which he prophesied a third culture that would bring together the opposing camps. Johnathan Sawday, in his magisterial work of scholarship Engines of the Imagination: Renaissance Culture and the Rise of the Machine, points out that the Renaissance world has been generally theorized and grasped as a world of ideas, as a kind of pre-industrial or pre-mechanical realm of pure human divorced from, to borrow Cary Wolfe’s words, “the technicity of tools” (Wolfe xv). Sawday contests this kind of approach by critically bringing out the role machines (like the steam engine, the internal combustion engine, the electric dynamo, and devices like the wheel and the clock) had played in inspiring the fertile imagination of the Renaissance writers, artists and cultural historians. Sawday avers that “[in] our own noisy post-industrial culture, we tend to think of the world inhabited by the contemporaries of Chaucer, and (later)
Montaigne or Shakespeare as technologically silent when compared to the world we inhabit today” (4). This is certainly not true as far as Sawday is concerned because his in-depth analysis of the complex relationship between the Renaissance culture and the machine makes it fairly evident that “machines and devices of all kinds are to be found at every turn in Renaissance art” (6). In the chapter titled “Milton and the Engine,” he follows the unfinished work of British filmmaker and poet Humphrey Jennings to study how the literary imagery, particularly the image of Pandaemonium, in John Milton’s the *Paradise Lost*, was directly inspired by the industrial revolution. Quoting Jennings, Sawday writes that the construction of Pandemonium should be “equated with the industrial revolution and the coming of the machine… the building of Pandaemonium is the real history of Britain for the last three hundred years” (qtd. in Sawday xvi). Although Milton, Sawday notes, was severely critical of the rise of the mechanistic view of the world during the Renaissance, yet “in his poetry he thrilled to the energy, power, and force which machines and engines seemed to unleash upon the world” (259).

During the Renaissance, the invention of new tools, devices and technologies was generally viewed with ambivalence; it represented the fears, horrors, excitement and anxiety of the times. On the one hand, technology was heralded as a new prosthesis to save the human beings from devastating toil by opening up new possibilities of dealing with the forces of nature and appropriating them for the benefit of man. (This approach was embodied in the “story of the construction and abandonment of the tower of Babel” [20]. The tower of Babel was “imagined as a technological utopia, forged with the help of elaborate and fantastical instruments
and devices” [21]). On the other hand, technology was construed as devilish and as degrading the purity of the human, leading to the destruction of man and his world. (This approach was embodied in “the story of the fall of Icarus” [20]). In other words, man feels anxious and elated both as Freud has also observed: “Man has, as it were, become a kind of prosthetic God. When he puts on all his auxiliary organs he is truly magnificent; but those organs have not grown on to him and they still give him much trouble at times” (44-45). The ambivalence suggested “a volatile and conflicted relationship to machinery and to the practice of mechanics” (Wolfe 1). Furthermore, the question is not only what role machines, tools and instruments of various kinds played in the everyday life of people, but also, as Jessica Wolfe has argued, how to decipher the way “[m]achinery mediates some of the urgent political intellectual problems vexing humanistic culture” (4). The *mediating* aspect of the machinery, Wolfe further says, should be understood “in the most literal sense of the term insofar as [machines] intercede between the external world and the subjective experience of the human intellect or the senses” (4).

We must understand that both of the aforementioned approaches point to the ambivalence of the human beings vis-à-vis technology/the machine. The ambivalence springs probably from what Sawday has called “the foundational myth of technology as transgression” (18). In other words, we could say that technology, in general, has always been seen as corrupting and contaminating the sanctimonious realm of the *human*, alien to the very nature of human beings and their life. Sawday explodes this myth by rigorously interrogating the multifarious works and artifacts of numerous Renaissance artists, writers, painters, travelers, scientists and
mythographers. He highlights how the aesthetic world of the creative people of the Renaissance was imbued with images of machines, tools, devices, instruments and all kinds of technological gadgets. Ezra Pound was correct when he stated that “[y]ou can no more take machines out of the modern mind than you can take the shield of Achilles out of the Iliad” (77). The most exemplary case of what Johnathan Sawday is aiming at can be found in the work of Leonardo da Vinci. In a “Preface,” written to the Notebooks of da Vinci, Martin Kemp observes that it is impossible to know, as one digs through the complete corpus of Vinci’s creative and critical writings, whether one is in the company of Vinci “[t]he artist, the scientist, the engineer, the natural philosopher, [or] the author of literary snippets…” (Kemp vi). In short, the artistic and literary imagination of the Renaissance was greatly influenced by the scientific and technological development of the time, and it was as much a world of the mind, of contemplation and reflection, as it was one of watermills, machines, and other products of technology.

Working along the same lines in his pioneering study Literature and Material Culture: From Balzac to Proust, Janell Watson studies how the proliferation of goods and objects during the late nineteenth century enchanted the modern literary imagination through ‘biblets’, a modern French term used for “…knick-knacks, curiosities, collectibles, antiques, and objets d’art” (1). Confining himself to the works of French literary authors like Honoré de Balzac, Joris-Karl Huysmans, Edmond de Goncourt, Stéphane Mallarmé, Gustave Flaubert and Marcel Proust, Watson reads these authors to advance his argument that “the heavily descriptive novel is as much a product of the nineteenth-century material culture as
is the bourgeois living room” (3). The “heavily descriptive” fin-de-siècle texts, Watson further pose a significant challenge to the fundamentals of classical poetics according to which “persons and events should be privileged over things and descriptions” (3).

The pervasiveness of media in contemporary times has certainly provoked a kind of self-reflection on the part of humans to ponder over what it means to live in a world heavily permeated by machines and information systems of varied kinds. At the same time, it remains to be fully understood how certain technological changes affect the human sensrioum, and how those same changes mediate the interpretive frameworks, conceptual configurations, aesthetic sensibility, cultural and artistic practices, and sense-making endeavour of the humans. There have been many attempts, both creative and critical, to dwell upon the disturbing but inescapable bond between man and the machine. This has aroused the interest of many scholars so as to interrogate the relationship of literary works and the broader sphere of material culture.

The innovative oeuvre of Friedrich Kittler, a highly respected German media theorist of the second half of the twentieth century, may prove quite helpful in shedding some light on this often ignored relationship. Kittler’s provocative remark that “[m]edia determine our situation” brings to light the importance he ascribes to materiality of the technical media in configuring the contours of socio-cultural and aesthetic sensibilities, and the artistic and cultural practices thereby made possible within a given social formation at a particular historical moment (xxxix). Kittler has made significant contribution in the area of “technological mediation and social
relations” by extending Foucault’s method of discourse analysis (Young and Gane 13). His analysis of the technologies of communication inserts “discourse analysis into the reflex and symptom of specific – and since ended – media epoch” (Krämer 97). He treats specific media as “production sites” within a larger discourse network (Krämer 98). This can be seen from his study of the relationship between a particular image of woman and the invention of the typewriter. As he notes, the immediate consequence of the invention of the typewriter was “the introduction of young unmarried women in the production of discourses” (Amritage 32).

It is extremely challenging to align Kittler’ work within the hermeneutic tradition in literary studies since it is a kind of post-hermeneutic criticism which, in Foucauldian terms, locates the conditions of emergence of ‘meaning’, or what gets counted as meaningful, at a given socio-historical juncture. He helps us to see the unfolding of ‘meaning’ as always already mediated by the materiality of specific technologies. Kittler’s work has proved very fruitful in highlighting the extent to which materiality of technologies influences the construction of ‘meaning’ within the changing discursive socio-historical formations. As David E. Wellberry comments:

> A notation system or … a discourse network has the exterior character – the outsidedness - of a technology … such technologies are not mere instruments with which “man” produces his meanings … Rather they set the framework within which something like “meaning,” indeed, something like “man”, become possible at all. (“Foreword”, Kittler xii)
In line with Kittler, but going a step further and overcoming the fissures of Kittler’s idiosyncratic analyses, the work of N. Katherine Hayles should be seen as a continuation of this tradition of scholarship which refuses to “Being in Between,” as Victoria Vesna has put it, by articulating a space for the emergence of longue durée “Third Culture” (121). Hayles’s creative repertoire of such concepts, like the “embodied virutality”, “the materiality of informatics”, “dynamic heterarchy”, “intermediation”, “flickering signifiers” and “fluid analogies”, may encourage a more dynamic and interdisciplinary kind if literary studies more appropriate to twenty-first century landscape of literary production. Moreover, it may help build new theoretical tools and critical frameworks to read and understand such writing practices.

2.2 Dislocating the Liberal Humanist Subject: Cybernetics and Information Theory

During the second half of the twentieth century, owing to certain developments in science, computers and cybernetics, a new paradigm was articulated to better understand the workings of cognitive processes, the human consciousness, and the communication practices among humans, animals and machines. These developments in different disciplines have led to a major crisis for the human as the human is now continuously juxtaposed with intelligent machines. Some see the affinities and interfacing between humans and machines with excitement; for them it is a new opportunity to understand human subjectivity as a construction. Others, however, are more skeptical. Hayles believes that such radical changes in the constitution and conception of human subjectivity affect the entire
range of both electronic and print narratives. To dwell on the nature, structure, function and aesthetics of these electronic and print narratives, we must first of all be ready to confront the implications of these techno-scientific transformations and, thereby, be thoroughly willing to assimilate them in the formulation of new conceptions of human subjectivity.

Hayles begins her critically acclaimed work *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics*, stating that “the historically specific construction called the human is giving way to a different construction called the posthuman” (2). Although different disciplines concerned with the posthuman tend to characterize the coming of the posthuman in distinct ways, yet the thread that weaves all the perspectives together is the acknowledgement of the blurring of boundaries between the human and the intelligent machines. Tracing the characteristics of the posthuman, Hayles writes that the underlying assumptions of this transmutation are: (a) firstly, the privileging of information over material embodiment; (b) secondly, the perspective that consciousness is just an epiphenomenon; (c) thirdly, the understanding that the body is basically the “original prosthesis” which we all learn to use and manipulate; and (d) lastly, the view that the very idea of human being should be reconfigured to match its relationship with the intelligent machines (3).

The liberal humanist tradition has been already under the scanner from various other perspectives like feminism, postcolonialism and postmodernism with each organizing its critique around a specific conceptual constellation. These theoretical frameworks have raised probing questions and criticized the liberal
humanist subject for its unacknowledged assumptions and biases. Once dislocated, things got to so far that the very idea of *man* started disintegrating. It was Michel Foucault who pronounced that the historical construction which we know by the common noun called *man* “has long remained trapped with beliefs and philosophies: it was the effect of a change in the fundamental arrangements of knowledge” (Foucault 387). It may be coming to its inevitable end as we understand it now because, as Foucault writes in his book *The Order of Things: An Archaeology of the Human sciences*:

> If those arrangements were to disappear as they appeared, if some event of which we can at the moment do no more than sense the possibility—without knowing either what its form will be or what it promises—were to cause them to crumble, as the ground of Classical thought did, at the end of the eighteenth century, then one can certainly wager that man would be erased, like a face drawn in sand at the edge of the sea. (387)

The above remark by Foucault indicates how the very idea of *man* came to be seen as a historical construction by poststructuralists which may soon gives way to something entirely new and unthought-of. The cybernetic revolution shares many affinities with such critical perspectives. Assessing the contribution of Norbert Wiener, Hayles writes:

> Writing in the years immediately preceding World War II, Wiener anticipated some aspects of poststructuralist theories. He questioned whether humans, animals, and machines have any essential qualities
that exist in themselves, apart from the web of relations that constitute them in discursive and communicative fields. (*How We Became Posthuman* 91)

It was this discursive relationship that facilitated a *coup d’État* which led to the fall of the liberal humanist subject from the revered chariot of history.

The point of departure for the posthuman was the development of the field of cybernetics and information theory in the wake of Second World War. These developments led to the articulation of new conceptual models to understand social systems, cognitive processes and human consciousness. It all began, according to Hayles, with the launch of the Macy conferences in 1943 which were organized with the aim of formulating “a theory of communication applying equally to animals, human, and machines” (7). The endeavour was largely based on the contributions of Claude Shannon, Norbert Wiener, Warren McCulloch, John von Neumann, and later Humberto Maturana, Francisco Varela, Heinz Von Foerster and others in their respective areas of specialization which “converged on a new theoretical model for biological, mechanical, and communicational processes that removed the human and *Homo sapiens* from any particular privileged position in relation to matters of meaning, information, and cognition” (Wolfe xii).

The cybernetic revolution can be divided into three phases on the basis of the central role ascribed to a particular concept. The first phase (first-order cybernetics), ranging from 1945 to 1960, revolves around the concept of *homeostasis*; the second phase roughly ranges from 1960 to 1980 (second-order cybernetics) in which the concept of *reflexivity* takes precedence over all other problems; the third phase
stretches from 1980 to the present in which the concept of *virtuality* takes the center stage (Hayles 7).

During the first phase of development of cybernetics as a discipline, it was the innovative work of Norbert Wiener and Claude Shannon that set the tone and agenda of the coming cybernetic revolution. The field of cybernetics was theorized right from the start as an inter-disciplinary endeavour. Norbert Wiener, the father of cybernetic revolution, was a child prodigy. His contribution to the field of cybernetics is invaluable. Wiener defined cybernetics as “the entire field of control and communication theory, whether in the machine or in the animal” (3). The word *cybernetics* comes from the Greek word ‘kybernētēs’ which means to govern or the art of steering. Cybernetics studies the relationships of interdependency between a regulatory system and its environment. The functions and processes of the system are in motion to achieve a particular task. Now for the efficient working of such a system, communication and control turn out to be essential processes. A better understanding of communication and control will help us make more effective and efficient systems. Now to grasp how communication and control exist in animals and machines, we must understand how the constituting elements of a system interact with each other, that is, how internal communication is done - on what basis and in what form.

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1 Here it may be noted that the very idea of system itself has witnessed important conceptual transformations as it moved through the three stages of the cybernetic revolution (Wolfe, *What is Posthumanism?*).
Claude Shannon is the progenitor of the information theory. He developed the now famous model of a “mathematical theory of communication” in which he argued that “[t]he fundamental problem of communication is that of reproducing at one point either exactly or approximately a message selected at another point” (Shannon 1). Since mathematics deals primarily with pure forms, it was inevitable that the mathematical theory of communication dealt with the phenomenon of communication at the formal level. The theoretical model was mainly concerned with making communication by means of electronic devices, which make use of signals to communicate, more effective. In the process, information came to be constructed as a theoretical entity with own tendencies and dynamics as communication came to be seen as a network of relationships rather an essence. And information, in this model, is “a probability function with no dimensions, no materiality, and no necessary connection with meaning” (How We Became Posthuman 52).

Both Wiener and Shannon used the mathematical paradigm of communication and information for extrapolating all reality, be it natural, biological, mechanical or social. The question that immediately comes to mind is - why a mathematical model? The answer lies in the fact that electronic devices deal with electronic circuits and in them what matters is the amount of information transferred from the source to the messenger. The amount can only be determined if we will be able to quantify the process. And to achieve quantification, one needs a mathematical model. The contribution of Wiener and Shannon, together with those of other scholars, in the fields of information theory, cybernetics, cognitive sciences,
systems theory, computational biology and simulation have proved of immense significance. The theoretical interventions have over time become the fulcrum of manifold transformations in the field of communication and information theory.

The three factors that became powerful in first order cybernetics were communication, information and control. All three were theorized as constituting an integrated system. The flows of information became central to cybernetics in its theorizing of systems. The theorists of cybernetics hold that the system and its environment exist in dynamic feedback loops in the sense that any changes in the environment, even those induced by the system, are fed back (in the form of information) into the system as a result of which the system adapts itself to the new environmental conditions. This came to be known as homeostasis. The term belongs to the field of biology and is broadly applied to living organisms. It is defined as a process whereby a living organism has an inherent ability to control internal conditions and grow towards the tendency where it achieves a relatively stable state of equilibrium with regard to changes in the temperature or other variables that can affect its internal stability. The concept of homeostasis was first used by the French physiologist Claude Bernard during the nineteenth century. The first phase of cybernetics can be summed up with the observation that cybernetics “focuses on how systems use information, models, and control actions to steer towards and maintain their goals, while counteracting various disturbances” (Heylighen and Joslyn 2). As a result, during the first phase of cybernetics, man was seen as “a homeostatic self-regulating mechanism whose boundaries were clearly delineated from the environment…” (How We Became Posthuman 34).
The second phase began with the innovative researches and field work of John Von Foerster, Humberto Maturana and Francisco Varela. In this phase, it was argued that all our knowledge of the natural world and its processes and functions is mediated through representations or models we build to comprehend that reality “which necessarily ignore those aspects of the system which are irrelevant to the purposes for which the model is constructed” (Heylighen and Joslyn 3). This means that the “properties of the system themselves be distinguished from those of their models” because models are motivated by the goals and aims of their creators (3). The observer who is observing the system cannot be neatly distinguished clearly from the system observed because “the result of observations will depend on their interaction” (3). The stress during this phase was laid on the “autonomy, self-organization, cognition and the role of observer in modeling a system” (3). Maturana and Varela used the term autopoiesis to talk about the self-reflexive and self-productive character of living systems and it became the defining concept of second-order cybernetics. In his book Autopoiesis and Cognition: The Realization of the Living, Maturana writes: “The observer is a living system and any understanding of the cognition as a biological phenomenon must account for the observer and his role in it” (48). Gradually, the observer and the system under observation came to be visualized as two independent living entities interlocked in a circuit through dynamic and mutual interactions. “The emphasis now,” as Hayles observes “is on the mutually constitutive interactions between the components of system rather than on message, signal, or information” (How We Became Posthuman 11). And so the word ‘system’ referred to this circuit.
The third phase of cybernetics revolved around the concept of *virtuality* in the form of emergence of fields like *artificial intelligence* and *artificial life*. This is because now the issues involved were primarily concerned with how *autopoietic* systems adapt to changing external conditions on the basis of their constitution. In other words, the challenge was to take into consideration the phenomenon of evolution of systems in terms of their capacity to *evolve* in directions not anticipated. During the process, the system’s internal organization itself changes towards a more complex organizational structure. The word *virtual*, in common parlance, is used to refer all kinds of computer simulations, that is, a kind of computer-generated environment. But it has another meaning also. The word *virtual* comes from the Latin *virtus* which means *in potential*, that is, *potentially*. The third phase of cybernetics focussed on this aspect of systems which helped them to evolve into new forms.

One may sum up the whole course of development in cybernetics as follows: The first phase was mainly concerned with the analysis of communication and control within the system and between the system and the observer, but both the observer and the system were thought of as independent entities. The second phase primarily focussed on including the observer in the very domain of what we define as the *system*. Now, the focus was on how the observer constructs and perceives the system and both together constitute a circuit. This also brought the idea of reflexivity, autonomy, self-organization and self-production within the scope of exploration; both the observer and the system were theorized as autonomous, self-
organizing, self-producing and reflexive living organisms. The internal reflective
dynamicity of both seriously affected the active mutual interactions between them.
The third phase can be efficiently described by the word “spiral” (*How We Became
Posthuman* 222). Hayles observes that “the third [phase] wants to impart an upward
tension to the recursive feedback loops of self-organizing processes, so that like a
spring compressed and suddenly released, the processes break out of the pattern of
circular self-organization and leap outward into the new” (*How We Became
Posthuman* 222). The focus during this phase was primarily on “emergent behavior”
(*How We Became Posthuman* 236).

It is to be noted here, as Hayles says, that Shannon used the term
‘information’ “as a technical term having to do with message probabilities” (*How
We Became Posthuman* 51). For Wiener, “the flow of information,” writes Hayles
“through feedback loops has been associated with the deconstruction of the liberal
human subject” (*How We Became Posthuman* 2). As a result, the posthuman subject
may be defined as “an amalgam, a collection of heterogeneous components, a
material-informational entity whose boundaries undergo continuous construction
and reconstruction” (*How We Became Posthuman* 3). Now, one can clearly see that
information has become one of the key elements in the constitution of the
posthuman. This may be termed the most suitable reason for defining the
contemporary times as *the age of information*.

To comprehend the posthuman, the peculiarity of the human-machine
interface must be accounted for. Hayles counsels that we must not get carried away
by the popular posthumanism that arouses sheer terror as we encounter this interface. The reason is that “[i]n the posthuman, there are no essential differences or absolute demarcations between bodily existence and computer simulation, cybernetic mechanism and biological organism, robot teleology and human goals” (How We Became Posthuman 3). As a result, the liberal humanist subject is not able to comprehend this blurring of the boundaries through which he/she has defined and understood himself/herself for centuries. Like Donna Haraway\(^2\), Hayles examines the consequences of this interfacing. Hayles argues that this process has opened up new ways to understand human beings. One may also say that the print medium is not probably the best medium for issues raised by the emergence of the posthuman. The new media probably affords a better space to articulate these issues.

2.3 Perils of Disembodiment and the Resurrection of the Posthuman Subjectivity in N Katherine Hayles

The posthuman subjectivity emerged, as has been argued above, with developments particularly in cybernetics, information theory, cognitive science and computer technology. The developments in these fields have enabled us to theorise the constitution of human subjectivity in radically new ways. However, there has

\(^2\) Donna Haraway is a neo-Marxist and postmodernist feminist writer who has worked in the field of history of science. Her path-breaking essay “A Cyborg Manifesto: Science, Technology and Socialist-Feminism in the Late Twentieth Century” has become a watershed essay with reference to contemporary explorations of posthuman subjectivity. It was in this essay that Haraway first talked about cyborgian subjectivity with regard to her understanding of the blurring of the boundaries between man and the machine.
been a general tendency to understate the importance of “material instantiation”  
(How We Became Posthuman 13). In fact, Hayles’s work How We Became Posthuman and the scientific theories and research she discusses is motivated by an earnest effort to explain “the complex interplays between embodied subjectivity and arguments for disembodiment throughout the cybernetic tradition [emphasis in original]” (7). The problems with the cybernetic information revolution began when it propagated a formal structure of subjectivity, solely basing it on the cybernetic model of a system, which completely removed the ‘body’ from any consideration whatsoever. Hayles argues that “[e]mbodiment has been systematically downplayed or erased in the cybernetic construction of the posthuman” (How We Became Posthuman 4). As a result of this, there has emerged a natural disposition to think of the human being as a “set of informational processes” (4). The cybernetic revolution in a way continued the liberal humanist tradition which had overlooked the embodied character of the human subject. The liberal humanist subject prioritized the mind over the body, the famous mind/body problem as it later came to be known as. Moreover, the liberal humanist subject was always seen as “possess[ing] a body… [and not] as being a body” which jeopardizes its self-proclaimed “notorious universality” underpinned by a disavowal of “markers of bodily difference, including sex, race, and ethnicity” (How We Became Posthuman 4-5).

Hayles decodes the information/materiality binary by mobilizing her understanding of the embodied character of human experience and the cultural constructs that give form to this experience in history. She says that her aim is to
“put back into the picture the flesh that continues to be erased in contemporary discussions about cybernetic subject” (5). She starts by interrogating the inherent contradictions of postmodernist/poststructuralist approaches’ with regard to the question of embodiment. On the one hand, most of the poststructuralist/postmodernist thinkers have placed great emphasis on how the body has been marginalized in the Western philosophical tradition, and they made significant theoretical efforts to deconstruct the long established mind/body binary. However, at the same time, these very theoretical frameworks downplayed the materiality of the body by “making it secondary to the logical or semiotic structures it encodes” (192). Commenting on Foucault’s study of the Panopticon as the site of the mechanism of power and making use of Elaine Scarry’s *The Body in Pain*, Hayles says that the Foucauldian analysis of the Panopticon “diverts attention away from how actual bodies, in their cultural and physical specificities, impose, incorporate, and resist incorporation of the material practices he describes” (194). Such “erasure of embodiment” has been the hallmark of much of the contemporary critical theory of distinct shades (4).

This “postmodern orthodoxy” has compromised our ability to seriously negotiate the transformations taking place since the onset of the information regime ref. “Wiener did not intend,” Hayles argues “to dismantle the liberal humanist subject” (*How We Became Posthuman* 7). This is because “[h]e was less interested in seeing humans as machines than he was in fashioning human and machine alike in the image of an autonomous, self-directed individual” (7). Suggesting a way out
of the bizarre impasse, Hayles argues that rather than making grand pronouncements about the disappearance of the body in the era of computation, we should look for a sustained critical engagement with the question of subjectivity. She sees these developments as the rise of “…a certain kind of subjectivity” (How We Became Posthuman 193). “This subjectivity,” she emphatically adds, “is constituted by the materiality of informatics with the immateriality of information” (How We Became Posthuman 193). Building upon Elizabeth Grosz’s terse comment that “there is no body as such; there are only bodies,” and to make her point more clear, Hayles juxtaposes ‘embodiment’ and the ‘body’ so as to make a distinction between the two (qtd. in How We Became Posthuman 196). Hayles writes:

Whereas the body is an idealized form that gestures toward a Platonic reality, embodiment is the specific instantiation generated from the noise of difference. Relative to the body, embodiment is other and elsewhere, at once excessive and deficient in its infinite variations, particularities, and abnormalities. (197)

The disentangling of ‘embodiment’ from the ‘body’, for Hayles, makes space for a radical rethinking of the problematic of the posthuman subjectivity. The challenge is to shed light on the concrete underlying structural configurations of the new regime of information which creates an illusion of the disappearance of the embodied character of the human subject. Hayles warns that the “dematerialization [of the body] depends in complex and highly specific ways on the embodied circumstances that an ideology of dematerialization would obscure” (How We Became Posthuman 193).
Hayles associates embodiment with the enactment of specific actions and practices, which inevitably unfold within the hegemonic cultural constructs vis-à-vis the body. Embodiment takes into consideration the questions of gender, class, race and radical contingency, thereby facilitating a more fundamental understanding of how the embodied practices of human beings always escape complete naturalization of the body with reference to the discourses of the social body politic. Since embodiment is “individually articulated, there is also at least an incipient tension between it… with respect to the body, for at any time this tension can widen into a perceived disparity” (How We Became Posthuman 197). Hubert Dreyfus, in his book What Computers Can’t Do?, made a similar argument against the enthusiasts of artificial intelligence when he said that the computer may never be able to replicate human behavior, precisely because the human process of learning, sense-making and intellection is an embodied practice which exceeds the formal process of cognition. In recent years, there has emerged a full-fledged perspective known by the name of embodied cognition which resists the temptations of the cognitive science to erase embodiment altogether from any discussions of human subjectivity.

Following this thread, Hayles goes on to build a comprehensive argument in defense of the materiality of the human body to overcome the gaps that had existed in various theoretical frameworks that have been developed in response to the new regime of information. She believes that the materiality of informatics should be studied to understand how the appearance of dematerialization of everything in the virtual universe is sustained by the very physicality of the machines that make this regime possible. She further says that “…as the posthuman is increasingly necessary
to understand what counts as human, so understanding the posthuman requires
taking the human into account. We do not leave our history behind but rather, like
snails, carry it around with us in the sedimented and enculturated instantiations of
our pasts we call our bodies” (Hayles, “Afterword: The Human in the posthuman”
137). The question of the posthuman compels us to forge new concept frameworks
which respond to the challenges and the issues of posthuman subjectivity.

2.4 Computation, Intermediation, Emergent Properties and Code

“Literature in the twenty-first century is computational,” declares Hayles
(Hayles 99). The computational nature of literature implies that the role of
customers is “not peripheral or incidental to electronic literature but central to its
performance, play and interpretation” (99). Hayles, thus, corroborates the definition
of electronic/digital literature (that is, writing in the new media) offered by Noah
Watdrip-Fruin who speak of “an important literary aspect that takes advantage of the
capabilities and contexts provided by the stand-alone or networked computer
(Hayles, “EL:What is it?”, par. 2). Computation, for Hayles, is central to developing
any critical understanding of the contemporary literary experimentation in the digital
universe. Tracing the recent developments in quantum mechanics, cognitive sciences
and the studies related to the functioning of computers and especially interventions
in the field of artificial intelligence, she argues that computation has come to be
defined as a process “that starts with a parsimonious set of elements and a relatively
small set of logical operations” (My Mother Was a Computer, 18). The fundamental
thesis is that once a very simple process is set into motion in a system, it gradually
builds on itself, through recursive feedback loops, both within the system and outside the system with the environment, to keep the system in working condition. In other words, computation should be understood as a perspective which argues that “simple rules can indeed generate complexity” (18). Computation works both as a metaphor and as a mechanism in the broader social space and the two aspects interlock in complex ways that “imaginatively invest computation with world-making power, even if it does not properly possess this power in itself” (20).

The process of computation requires a complex feedback loop mechanism if it has to work at all. Hayles defines this process as “intermediation” through which the system automatically organizes itself to respond to new social and environmental conditions by adopting new properties, known as “emergent properties,” which facilitate smooth working and organization of the system at any point of time.

*Intermediation* and *emergent properties* are the two concepts which can help us form a more nuanced understanding of the idea of computation. For Hayles, the twin concepts of *intermediation* and *emergent properties* are crucial to understanding the computational perspective in vogue today. She writes:

Complex feedback loops connect humans and machines, old technologies and new, language and code, analog processes and digital fragmentations… [and] all these feedback loops evolve overtime and thus have a historical trajectory that arcs from one point to another, [and] it is important not to make the mistake of privileging any one point as the primary locus of attention, which can
easily result in flattening complex interactions back into linear casual chains. (*My Mother Was a Computer* 31)

Hayles explains here the concept of intermediation and how it can prove useful to fathom the dense complexity of social systems and the materiality of socio-cultural practices. Moreover, it enables us to go beyond the reign of linear causality by positing dynamic inter-mediating interfaces, processes and reciprocative causalities that exist in both natural-biological and social-cultural systems. From this we can conclude that the concept of intermediation may be defined as “the recursivity implicit in the coproduction and coevolution of multiple causalities” (31).

In this scenario, the relationship between *language* and *code* become extremely significant. Code may be understood as a broad term denoting the existence of new languages suitable to computers and other programmable machines. Code is all-pervasive; it is inscribed in the very DNA of the human being. Hayles argues that speech, writing and code each constitutes an independent way of making sense of the physical world (which she defines as “worldviews”) and the corresponding human social reality (16). The respective frameworks come with inherent assumptions, presuppositions, tendencies and implications for interactions between the physical world and the human world. Through a close reading of Saussurean linguistics and Derridean grammatology, Hayles shows how the “…code exceeds both speech and writing,” which means it has characteristics which were absent in the earlier systems of speech and writing (40). This is true also because the peculiarity of new media writing is its inability to be accessed unless “performed by properly executed code” (*Electronic Literature: New Horizons for the Literary* 5).
“The immediacy of code to the text’s performance is fundamental to understanding electronic literature,” says Hayles (5). The code plays an essential role in the production of writing in the new media, acting as a link between human brains and intelligent machines. The intertwining of machine and natural language is inseparable in new forms of writing practices. We have moved “deeper into the machine” (Hayles, “Deeper into the Machine”, par. 2) as complex programming protocols are being used that allow sophisticated navigation and certain effects specific to electronic environments. This kind of navigational complexity is possible only because of the underlying code and programming. Furthermore, navigation does not only provide access to a work, it makes the users become “an important part of the work’s signifying structure and [also] create meaning through the functionalities it offers” (par. 5). As a result, code turns out to be one of the constituent elements of the text which itself needs to be taken into consideration in interpretive frameworks.

2.5 Digital Subjects and Electronic Textuality

With the posthuman future fast approaching, Hayles believes that the time has come to re-think foundational literary concepts like ‘text,’ ‘work,’ and ‘document,’ so that a new paradigm of textuality may be forged to respond to new kinds of digital literary objects in the age of computers. She firmly accepts that the transformation in the nature of writing and reading practices can be comprehended only if we situate the relevant technological changes within their broader socio-historical and cultural context. We cannot separate writing in the new media from various other sites of related cultural production such as gaming, animation,
graphics, and design. She argues that amidst the many technological and cultural changes the questions facing literature

…cannot be answered without first considering the contexts that give them meaning and significance, and that implies a wide-ranging exploration of what electronic literature is, how it overlaps and diverges from the print, what signifying strategies characterize it, and how these strategies are interpreted by the users as they go in search of meaning. (Electronic Literature: New Horizons for the Literary 2)

The work of Katherine Hayles systematically studies writing in the new media against that in the print medium with reference to its advantages, characteristics, similarities and dissimilarities. Moreover, she tries to bridge the gap that has long existed between literature and science by juxtaposing both in her analysis. What is probably most significant about her work is that she carries on a sustained critical analysis of some important works in the new media and, in this process, redefines the literary conceptual universe.

Hayles stresses that any attempt to understand the nature of writing practices in the electronic environment has to respect their material specificity in terms of the physical dynamics and constitution of the digital media. As new forms of writing emerge, we need to critically reflect on their specific nature and function in the contemporary cultural universe. For instance, how the artists and writers are mobilizing the resources and capabilities inherent to the computer and other programmable media. This will not only help us decipher writing in the new media but also broaden our understanding of the print medium. In her book How We
Became Posthuman, she devotes a complete chapter for undertaking a critical reading of four print texts which grapple with the responses of “excitement” as well as “terror” to posthuman subjectivity (222-247). It will also make us aware of our thinking practices, particularly what we have come to understand by literature over centuries of its association with the print medium. Hayles says that the “readers come to digital work with the expectations formed by print, including extensive and deep tacit knowledge of letter forms, print conventions, and print literary models” (Electronic Literature: New Horizons for the Literary 4). A systematic study of the specificity of writing in the new media will provide us with a better understanding of the role a particular medium plays in signifying practices and at the same time it will prompt us to re-think our existing notions of what literature is and can be.

Building on her understanding of the embodied character of human practices, Hayles re-examines the question of materiality in the context of writing in the new media by situating it specifically within this “[r]egime of computation” (My Mother Was a Computer 15). She argues that the performance of a work in electronic/digital medium cannot be separated from the coding and programming which go into its making. In this regard, she employs two related concepts: “technotext” and “inscription technology”.

By materiality, Hayles understands how a work is in dynamic relationship with the physical medium in which it is instantiated: materiality is not only about the physical resources mobilized by the work but emerges also “from the dynamic interplay between the richness of a physically robust world and human intelligence as it crafts this physicality to create meaning” (Writing Machines 33). It is not that
materiality was absent in the print medium. The issue is that writing in the new media questions even the writing in the print medium, exposing its limitations even as it foregrounds the role of the technical devices in the production and reception of any writing (Bouchardon, “The Aesthetics of Materiality in Electronic Literature”). For Hayles, materiality relates to possibilities opened up by a particular medium and how that particular medium closes off certain other possibilities because of its material characteristics. Henry Jenkins aptly summarizes this argument:

> Digital media structure into text certain opportunities for interactions, providing the reader for engaging with richer, more vivid representations of the story world, but also foreclose other interactions that might arise from a less impoverished narrative universe. (Toby Miller and Robert Stam 251)

Moving on, Hayles defines “technotext” as a text “that connects the technology that produces texts to texts’ verbal constructions” (Writing Machines 25-26). In other words, textuality cannot be limited to its verbal dimension only but has a hidden technological side also. This hidden side is deliberately brought into visibility by the new media writer. Hayles thus exhorts us to understand the relationship between the physical properties of a textual object and the rhetorical strategies adopted by the writer as he/she tries to write. This understanding helps read a given text in a better way. For example, when a literary work foregrounds and interrogates the “inscription technology” that produces it, it brings into light the unseen components taking part in the production of meaning. Inscription technology, moreover, is a
technology which “must initiate material changes that can be read as marks”\(^1\) (\textit{Writing Machines} 24).

Hayles argues that the nature of a work, when it is read or experienced on the computer, changes as it now exists in collaboration with other programmes. For instance, it needs to be double-clicked for execution. When you read a text on an electronic reader, you have to sit in front of your desktop or laptop. Moreover, an electronic text always exists in a dispersed form: it exists neither in the computer nor in the networked system in the same form as it comes to have when executed and displayed on the screen. Before its display, it only exists as raw data in the form of zeros and ones stored at various places in the computer memory. It does not have a prior existence as compared to the book which exists in identical printed copies. The book, once printed, exists more or less in the same form. An electronic writing, on the other hand, may have as many variations as there are copies of it. What is even more important is that there can be any number of its copies, none of which might be exactly identical. Hayles stresses this aspect of the electronic text when she contends that in this sense “electronic text is more processual than print; it is performative by its very nature, independent of whatever imaginations and processes the user brings to it” (\textit{My Mother Was a Computer} 101).

Pursuing the above line of inquiry, Hayles argues in \textit{Writing Machines} that any attempt to interpret writing in the new media has to adopt media-specific analysis (MSA). She defines media-specific analysis as “a kind of criticism that pays attention to the material apparatus producing the literary work as physical artifact” (\textit{Writing Machines} 29). It helps us to understand how a certain medium shapes our
understanding of a text. Moreover, any particular medium operates in collaboration with other media. As a result, media always “engage in a recursive dynamic of imitating each other, incorporating aspects of competing media into themselves while simultaneously flaunting the advantages their own forms of mediation offer” (Writing Machines 30). An instance of this could be the use by television of certain features of the computer. The continuous process of mediation and re-mediation determines our understanding of any object of study. Not paying heed to this process would severely hamper our understanding of the way our experiences are structured by various media. She further argues that media-specific analysis attempts to comprehend how the materiality of the embodied form interacts “dynamically with linguistic, rhetorical, and literary practices to create the effects we call literature” (Writing Machines 31). According to her, the use of media-specific analysis would engender a “new critical language” which is required for better appreciation of writing in the new media (Hayles, “Deeper into the Machine: The Future of Electronic Literature” par 4).

Hayles argues that we need to further broaden our understandings of concepts such as work and text that have emerged with the rise of print culture. She says that a text is a produced object in which “physical properties, verbal content, and nonverbal signifying strategies work together” (My Mother Was a Computer 105). Texts change when they are taken into another medium. Hayles argues that understanding a text as an inert and abstract entity that can be poured unchanged in different containers does not allow us to regard the peculiarity of an electronic text. In this way, she carries forward Roland Barthes’s argument into the domain of the
new media. An electronic text exists in a dispersed and ‘open’ form, having perhaps no essential and inalienable form; it is a process taking shape when certain commands and procedures are employed. Similarly, a work can be defined as “a cluster of related texts that quote, comment upon, amplify, and intermediate one another” (My Mother Was a Computer 105) These nuanced and changing senses of an electronic literary work help us decipher its peculiarity, relationships and its growth as it grows and transforms itself with the changing nature of relationship among form, content, medium and the socio-cultural environment. Similarly, a work in the new media is, according to Hayles, an “assemblage”. It is important that when we think of a work as an “assemblage”, it requires a different view of authorship than that which “undergirds the idea of the work as an immaterial verbal construction” (My Mother Was a Computer 107).

Hayles’s work is very significant for the present project as it raises some fundamental and crucial questions about writing in the new media. It can help us identify the major issues that are relevant to a critical understanding of writing in the new media. In a way, she sets the agenda for criticism and theory of writing in the new media. Not only that, she even illustrates the practice of such criticism in her book Writing Machines. After elaborating her theory of writing in the new media, she evaluates some of the writings, such as Talan Memmott’s Lexia to Perplexia, Tom Phillips A Humument and Mark Z. Danielewski’s House of Leaves etc. Her value as a pioneering theorist of writing in the new media is probably here: she not only theorises but also exemplifies the uses of theory in reading the texts being produced in the new media.
2.6 Narrative and New Media Writing: Marie-Laure Ryan

Narrative may be understood as one of the most universal and essential constituents of human life on earth. The act of story-telling may be described as the primordial attempt of human beings to begin their search for meaning in the world by carving out stories from their experience. The desires, aims, intentions, expectations, conflicts and the complex psychological make-up of human beings and the interweaving web of inter-personal social relationships get a minimal level of causal regularity which enables them to produce meaning of their own actions, practices and relationships in the world. Stories lend a certain level of coherence to human experience so as to render it meaningful or comprehensible. This becomes clear if one gives a cursory look to the presence of such terms ‘past’, ‘present,’ and ‘future’ which define the basic time-frame of human life. Narrative is so ingrained in our sense of being alive that we literally survive on it just as we do on air. In his essay “The Narrativiation of Real Events,” Hayden White writes:

Narrative is a form of human comprehension that is productive of meaning by the imposition of a certain formal coherence on a virtual chaos of events, which in themselves cannot be said to possess any particular form at all, much less the kind we associate with stories.

(795)

It is only by telling stories that human beings learn to make sense of their existence, their place in the universe, their inter-personal dependence and an evolving and dynamic matrix of social relations, and finally what it means to live. At the most basic level, narrative is composed of a story that tries to link the unending series of
varied events into a coherent order by making sense of the ubiquitous disorder in the universe. Human beings are as much social animals as they are sense-and-meaning-making creatures.

Narrative came to the fore when Jean-Francois Lyotard, in his book *The Postmodern Condition*, wrote that the postmodern age is defined by “incredulity towards Grand Narratives” (xxiv). Although the book was planned as a report on the contemporary state of knowledge in the advanced capitalist societies, yet the way Lyotard analyzed the state of the *contemporary times* demands attention because, in the process, he brought to light the role of narrative in human life. Lyotard attributed the prevalence of meaninglessness in postmodern times to “the fact that knowledge is no longer principally narrative” (26). This amounts to saying that there is no overarching temporal narrative structure that imparts legitimacy to the happenings taking place in the broad spectrum of human social life. Lyotard analyzed narrative as a structure of relationships used by a particular culture to legitimate its social pursuits and other moral and ethical questions by articulating a meaningful whole that processes every human activity.

Narrative, we could say, is an integral aspect of being human. As White says: “To raise the question of the nature of narrative is to invite reflection on the very nature of culture and, possibly, even on the nature of humanity itself” (5). Narrative imparts a definite sequence to the disparate, chaotic and random events, both social and natural alike, tied together by a causal chain of relationships. Narrative has almost become natural like breathing, for
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…we dream in narrative, daydream in narrative, remember, anticipate, hope, despair, believe, doubt, plan, revise, criticise, construct, gossip, learn, hate, and love by narrative. In order really to live, we make up stories about ourselves and others, about the personal as well as the social, past and future. (Hardy 5)

It has become so ingrained in our sense of being alive and human that we take it for granted in the sense that it seems to have existed prior to humans and, thereby, has been made “into a paradigm the form that reality itself display to a realistic consciousness” (White 271). At the same time, narrative should be considered as a socio-cultural construct if seen from a formalist perspective since narrative has to have a certain structure in order to be able to produce any meaning at all.

The question of the significance of narrative, its modes, forms and structure has drawn sufficient attention as an independent field of inquiry right from Aristotle to modern times. But it is only in the twentieth century that narratologie (“narratology”), a word coined by Tzvetan Todorov, became an independent discipline for institutional study of narrative per se. Following the lead of Ferdinand de Saussure’s study of linguistics and Claude-Levi Strauss’ structural anthropology, Todorov defined narratology, in The Grammar of Decameron, as “the science of narratives” which may be understood as an attempt to decipher the structure, forms and techniques that govern the construction of narratives in literature (qtd. in Onega 275). The study of narrative right from the start was conceived as a project which the aim was to develop a scientific and systematic understanding of narrative which would be interdisciplinary and relatively independent of the media in question. The
focus was mainly on finding those fundamental structural elements which constitute narrative forms across different media so that there may emerge a systematic way of studying narrative.

Narratology emerged as a sub-discipline of the structuralist paradigm and, its emphasis was (as in the case of structuralism and Russian Formalism in general) on formulating a general set of rules rather than a close reading of individual literary works. Monica Fludernik, an Austrian scholar in the field of narrative, in her excellent survey of the discipline of narratology since its beginnings, argues that much of the early narratology was imbued with “[a] passion for typology and classification…” (38). Narratology aspired to the objectivity of physical sciences and “promised to provide guidelines to interpretation uncontaminated by the subjectivism of literary criticism” (Fludernik 38). It was Vladimir Propp, the famous Russian Formalist, who exemplified the possibilities opened up by narratology in his classic study of Russian folktales. The basic argument of Propp’s study was that all folktales are constituted by seven (7) *dramatis personae* and thirty-one (31) functional relationships among them. He further stated that any folktale can be constructed from this basic formal structure. After Propp, it was Roland Barthes who extended the concept of narrative by applying the insights of Propp. Carrying on from where Vladimir Propp left, Barthes, in his essay “An Introduction to the Structural Analysis of Narrative,” studied the constituent elements of narrative from a structuralist perspective. But it was only with Gérard Genette’s book *Narrative Discourse: An Essay on Method*, published in 1980, that the field of narratology went on to become one of the major sub-disciplines of literary theory which attained
new heights in the last two decades of the twentieth century. Subsequently, there have been many attempts to develop a systematic and comprehensive analytical framework for the study of “the semiotics and grammar of narrative” by the likes of F.K. Stanzel, G. Prince, Paul Ricoeur, M. Fludernik, Mieke Bal and S. Chatman (Fludernik 39).

Narratology, however, has often been seen as an attempt to develop a transmedial science of narrative. This approach becomes apparent from Claude Bermond’s following point:

[…]Story] is independent of the techniques that bear it along. It may be transposed from one to another medium without losing its essential properties: the subject of a story may serve as argument for a ballet, that of a novel can be transposed to stage or screen, one can recount words in a film to someone who has not seen it. These are words we read, images we see, gesture we decipher, but through them, it is a story that we follow; and it could be the same story. (qtd. in Ryan, Avatars of Story 3-4)

One could see that the discipline of narratology began the aim of developing our understanding of the narrative that transcends specific media. But, as Ryan argues, the discipline gradually started concentrating solely on literary fiction to talk about narrative. It deviated from the professed aim of studying narrative as a “transtextual project unconstrained by the particularities of media or culture” (Page and Brown 4).

During the twentieth century, the problematic of narrative has been studied from varied perspectives, which mainly include existential, sociological, aesthetic,
cognitive and technical. For the present project, we have limited our study to Ryan’s exploration of narrative in the digital environments. Ryan, like Hayles, argues that we must respect the specificity of the medium if we want to understand new forms of writing practices and the narrative techniques and strategies employed in them and to build a comprehensive and critical understanding of these works of art. The proliferation of narrative studies in recent times has once again brought the problematic of narrative to the forefront of critical studies. Fludernik clearly captures the point when she writes that “whereas, in the 1960s, everything became a text (including Paris viewed from the Eiffel Tower), we are now experiencing a ‘narrative turn’” (Fludernik 46).

The work of Marie-Laure Ryan should be seen in the light of the ongoing “narrative turn,” in which she meticulously studies new media writings. Ryan’s aim is to understand techniques, styles and forms of narrative strategies employed in such writing practices and how these techniques, styles and forms of narrative affect the experience of the reader, and with what consequences. This not only helps her to bracket out narrative in the digital/electronic media platforms, but also enables her to better decipher the properties and specificities of different media platforms with the added advantage of understanding how does the specificity of medium effect its narrative potential. Moreover, it also enables her to study the relationship between signifying strategies of digital media and the narrative pattern of the same. Ryan aspires to develop a kind of transmedial approach to narrative, as was the case in the beginning of the discipline of narratology, but without succumbing to the temptations of devising formal structures which make the narrative completely
independent of its actualization in a particular medium. She says that we should keep in mind that not all media possess same “narrative resources” and, as a result, we no longer believe that “the migration of a story from one medium to another does not present cognitive consequences” (4). Ryan in fact argues that although “a core meaning mat travel across media, but its narrative potential will be filled out, actualized differently when it reaches a new medium” (4). At the same time, she challenges the celebratory mood of the new media enthusiasts who treat new media as a magic elixir that helps in the creation of interactive, immersive, and participatory kinds of narratives as opposed to the printed ones by making an in-depth analysis of the narrative techniques of new media writings.

2.7 Narrative and the Poetics of the Medium

Both Manovich and George Landow are aware of the consequences of the new media for contemporary artistic practices and aesthetic sensibilities. Manovich juxtaposes the logic of narrative against the logic of database within a broader socio-cultural space that is undergoing radical transformations aided by the imprint of the digital and the computers. He says that the general tendency has been to “correlate database and narrative forms with modern media and information technologies, or deduce them from these technologies,” whereas they should be thought of “as two competing imaginations, two basic creative impulses, two essential responses to the world [italics mine]” (Manovich 233-34). For Manovich, narrative and database are independent cultural forms which organize the world in certain ways and, thereby, create possibilities of meaning-making, interpretation, understanding and a specific
form of relationship with the world. Manovich captures the ambiguity of categorizing new media artifacts when he says that we find ourselves in a kind of theoretical quagmire because we “have not yet developed a language to describe these strange new objects” (Manovich 228).

George Landow, on the other hand, argues that the reconfiguration of narrative is inevitable in the digital environment. Landow says that narrative undergoes important transformations in the digital domain because the digital space opens up the possibility of a different way of weaving together a literary text. Traditionally, narrative has been associated with the linearity of all life with inherent cause-and-effect relationships between successive stages. Linearity became the *raison d’être* of successful narrative construction. As a result, narrative predominantly came to be understood a sequence of events related to each other through clear-cut causal relationships, inevitably culminating in a resolution of all conflicts in turn generating a sense of completion or closure in the reader. New forms of writing practices challenge these age old Aristotelian conceptions of narrative, plot and story. Landow says that “[h]ypertext… challenges narrative and all literary form based on linearity, calls into question ideas of plot and story current since Aristotle” (181). We could say that the new media technologies have opened up new possibilities for innovative narrative strategies and structures which are more suitable to new forms of writing practices.

The coming of digital platforms has once again drawn attention to the centrality of narrative and its role in the construction of literary artifacts. Ryan’s contribution in the field of narrative studies has been immensely significant.
Following Manovich and Landow, Ryan contends that the coming of the digital media, for quite some time now, has been forcing us to re-think our popular beliefs, perceptions and understandings vis-à-vis the new forms of experimentation in literary writing. In the introduction to the book *Narrative across Media: The Languages of Storytelling*, edited by her, Ryan forewarns that prior to any systematic analysis of narrative, we should be careful of the following distinction:

The study of narrative across media is not the same project as the interdisciplinary study of narrative: whereas one project directs us to the importance of narrative in mostly language-based practices, the other focuses on the embodiment, that is to say, the particular semiotic substance and the technological mode of transmission of narrative. Its categories are language, image, sound, gesture, and, further, spoken language, writing, cinema, radio, television, and computers rather than law medicine, science, literature, and history.

(Ryan 1)

The above statement clearly marks the boundaries of Ryan’s own analysis of narrative in the digital domain. For Ryan, the critical study of narrative strategies adopted and employed by writers and artists working in the field of digital media is basically an attempt to fathom the implicit narrative possibilities of an alternative mode of *structuration* unleashed by a particular medium, so that we may better understand the constraints and advantages of respective media in successfully taking care of the narrative. In other words, it is an effort to explore how specific “technological mode of transmission of narrative” affects its organization, grammar,
reception, and semiotic and aesthetic capabilities, that is, how the physicality and materiality of the medium delimit or enhance narrative production and reception (1).

Conventional notions of narrative came under scrutiny with the coming of modernism. The attempt to break the hegemony of linear writing started in the eighteenth century with Laurence Sterne’s *Tristram Shandy* and this mood soon followed into the twentieth century. T.S. Eliot’s *The Waste Land* (1922), James Joyce’s *Ulysses* (1922), and Virginia Woolf’s *Mrs Dalloway* (1925) are some of the noted examples of such attempts to break with the notion of linear writing. All these works, together with many avant-garde movements, can be considered struggling, at different levels, for a different “mode of writing” within the confines of the book.

There have also been experiments with the book form, like the short early twentieth-century movement known as artists’ books. James Joyce’s *Ulysses* has been described as “the book to end all books” (Kiberd xxi). And this is important since all such experimentation in the narrative structure and techniques of literary writing has been taking place within the space of book-form. Of course, many of these experiments may be said to have anticipated hypertext.

All three above-mentioned works broke with the traditional notions of a linear narrative, with a beginning, middle and an end, in which events have to be related through a cause-and-effect relationship. These authors wanted to break free of the constraints of a certain conception of order, fixity, coherence, and causality imposed by conventional beliefs. The experimentation that started with modernism in the field of literary writing paved the way for self-conscious postmodernist writing which took experimentation to the next level and “sometimes carried [it] to
an extreme… but also [included] diverse attempts to break away from modernist forms which had, inevitably, become in their turn conventional” (Abrams 177).

Jorge Luis Borges, the Argentinean Nobel-prize winning writer, in his story “The Garden of Forking Paths,” writes that “[in] all fictional works, each time a man is confronted with several alternatives, he chooses one and eliminates the others…” (33). Borges is trying to play with the possibilities of creating a new kind of narrative form which will simultaneously engender all alternatives within its structure and the reader will be free to choose one of them. Vladimir Nabokov’s Pale Fire (1962), Julio Cortázar’s Hopscotch (1966), Robert Coover’s short story “The Babysitter” (1969), Derrida’s Glas (1974) and Milorad Pavic’s Dictionary of the Khazars (1988) could all be seen as innovative attempts to realize this possibility of new narrative form in the medium of the book. All these works explore the expressive potentialities of the materiality of the book as they struggle to break away from the confines of the page. To an extent, linearity was a constraint imposed by the very nature of the print medium as there could hardly be any alternate structuring of paragraphs once the text was out in print form. In other words, we could say that the writers were attempting to play with the flatness of the page by digging out special depth if there is any. In her famous work, Hamlet on the Holodeck: The Future of narrative in Cyberspace, Janet Murray maintains that new media promises “to reshape the spectrum of narrative expression, not by replacing the novel or the movie but by continuing their timeless bardic work within another framework” (10).

New media writing practices create fundamentally fresh possibilities, engaging the artists to explore new ways and modes of designing and structuring
narrative. Such writing practices have enabled the writers to interrogate the assumptions and attitudes that have come to define the notions of narrativity, plot, textual coherence and closure associated with five hundred years of print. As a result, “[w]riters using the new media,” argues Ilana Snyder “have played with the electronic medium’s capacity to create open-ended stories with multiple narrative strands and have found alternative strategies and techniques for engaging readers’ attention” (Snyder 1996). This led to the creation of new kinds of literary artifacts that primarily demand novel ways of relating to and experiencing the text, in turn facilitating the production of interactive, immersive and participatory forms of writing.

The advent of new media writings is hailed as full of possibilities for disrupting the varied hierarchical relationships facilitated by the print culture and the consequent linearity of the narrative in print form. Moreover, the observers see writing in the new media as essentially and self-consciously experimental, challenging and subverting the notions of individual genius or creativity, canon formation and even the institutional legitimacy of canonical works. The theorists of writing in the new media consider it as the heir to modernist/avant-garde movements like dada, surrealism, collage writing and underground writing as it challenges the institutional understandings of writing, reading and literature.

2.8 Interactivity and Immersion: Narrative and Virtual Reality

The new media articulated many new forms of experiences, producing new kinds of art objects and other expressive spaces which are said to be more interactive and immersive. Virtual reality is one of those spaces created by the ability of
computers to forge “a computer-generated three dimensional landscape in which we would experience an expansion of our physical and sensory powers” (1). Virtual Reality embodies the interactive and immersive character of new media technology in a radical manner. The interactive and immersive nature of new media technology has been greatly emphasized in an effort to highlight the liberatory and participatory character of new media technology; this is particularly true in the case of virtual reality or simulated environments, both associated with the development of human-computer interface. They assist in fabricating new functioning realities which blur the difference between the real and the virtual by means of simulation and immersion. Cyberspace is the notional space produced by the computer networking of the whole world. Commenting on its nature, Ryan points out that cyberspace “is traversed by jumps and seemingly instantaneous transportation (known as teleporting) rather than being traversed point by point like Cartesian space” (Ryan 86). Cyber-culture thus denotes the emergence of a technologically driven culture that is the result of networking, faster communication and virtual reality experiences. Whereas the focus of cyber-culture is “on the social and on networking”, the new media is concerned with “cultural objects and paradigms enabled by all forms of computing and not just by networking” (Manovich 16). Virtual reality, according to Ryan, “is an immersive and interactive experience of a world generated by the computer” (86). Mark Poster, arguing on similar lines, states that the term ‘Virtual Reality’ has expanded its associations from “computer-generated immersive environments” to certain “communication facilities on the Internet” and, finally, to “all electronically mediated exchanges of symbols, images, and sounds so that a
second world is constituted over against the ‘real’ world of sensory proximity” (43-44). The two terms cyberspace and virtual reality are somewhat similar. Poster argues that virtual reality and simulation also are quite similar in suggesting “a sign system in which cultural objects are divorced from their referents, in which words and images appear in their electronic reproduction without firm connection to a prior real world, thus functioning not as representations but objects themselves, as entities whose meaning resides within” (45).

Ryan explores the notion of the virtual by tracing its etymological roots to bring to light its two possible meanings which are important for an understanding of the virtual (since terms like virtual and virtuality exert a powerful influence on the contemporary popular imagination). The word virtual comes from the Latin virtus, meaning strength or manliness, which later became force or power in the scholastic tradition in Latin. Ryan writes that in scholastic Latin the word virtualis means the potential (Ryan, Narrative as Virtual Reality, 26). She further cites the Aristotelian distinction between the potential and the actual, that is, in potentia vs in actu, to further develop the notion that both meanings of virtual had existed in a dialectical relationship until quite recently. In this sense, the virtual is not something which is not real; it rather designates something which has the power of becoming actual or real. It is only in recent times that this dialectical relation has come to be seen as “a binary opposition to real: the virtual becomes fictive and [the] nonexistent” (Narrative as Virtual Reality 27). Ryan reads through both the dystopian and utopian perspectives on the virtual through the works of Jean Baudrillard and Pierre Levy respectively to foreground the competing tendencies to interpret the rise of the
virtual. Baudrillard argues that the virtual has overshadowed, or rather bombarded, the very notion of the real. This is because, as Baudrillard says, simulation is more about the construction of fake realities which in turn make the real itself seem like the virtual and, thereby, blurs the distinction between the real and the virtual. For Baudrillard, the virtual is generally treated as fake or illusory which justifies his pessimistic view of virtuality for human society. Levy, on the other hand, sees the virtual as the potential in the sense that it always opens up the possibility of fabricating new imaginary, fantastic and magical realities. For Levy, virtualization is close to concepts like generalization and abstraction because “[i]f thought is the production of models of the world—that is, of the virtual as double— it is through the consideration of the virtual as potential that the mind puts together representations that can act upon the world” (Narrative as Virtual Reality 57). The notion of the virtual as potential makes the virtual an inseparable part of the very process of visualizing and representing the world through the creation of models. The virtual forever remains pregnant with the possibility of actualization. The virtual has been treated both as fake and potential by two different theorists of virtuality.

Ryan believes that both conceptions of the virtual, that is as fake and as potential, can be valuable for contemporary literary theory. She superimposes these twin sides of the virtual on the notion of ‘text’ in literary theory. Ryan writes that “the ‘fake’ interpretation of the virtual entertains obvious affinities with the concept of fictionality” (Narrative as Virtual Reality 41). Quoting Aristotle’s long passage from Poetics where he talks about human beings’ natural propensity for imitation and an inherent inclination for deriving pleasure from the images of objects created
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in imitation which allows them to understand, at the most basic level, the objects and their inter-relationships, Ryan argues that the reason we derive pleasure from artistic duplication is primarily because it enables us to create intelligible models of the world we live in. Such kind of pleasure presumes, she further argues that “the readers or spectators of artistic texts do not fall victim to a mimetic illusion…, [and this is so] because they know in the back of their minds that the text is a mere double that they appreciate the illusionist effect of the image, the fakeness of the fake” (Narrative as Virtual Reality 40). Moreover, any art object is virtual in that it follows its own logic of rules and relationships, thereby creating a reality of its own which cannot be reduced straightforwardly as a mere depiction of real world events because, the art object is relatively independent of any “particular spatio-temporal context” (42). “As a real object inscribed in space and time,” Ryan says, “the work of art is in the world, but as a virtual object that creates its own space and time, it is not of the world” (42). All art is virtual in this sense. Ryan further argues that the other aspect of the virtual, that is the virtual as potential, can also help us understand the notion of text in contemporary literary and textual theory in a much better way. Here again she starts with Aristotle who, in Poetics, says that the task of the poet is not only to say what has happened but also what “would happen” with reference to the twin principles of “probability and necessity” (Aristotle 16). Ryan emphasizes the dimension accounted for by the word would with regard to the potentiality embedded in the text. The above definition, Ryan notes, “seem[s] to restrict literature unduly to the representation of events and objects that could occur in the real world,” and inevitably leaves out “fairy tales, science fiction, the fantastic, and
magical realism… the absurd, the symbolic, the allegorical, and the dreamlike” from its broad sweep (*Narrative as Virtual Reality* 44). But it can all be accounted for if we just widen the logic of probability and necessity to include “the territories covered by a purely imaginary brand of possibility” (44). This possibility is not which reigns free of socio-human referent; it works on the implicit laws and dynamics of a particular textual world as articulated by a given artist. As Ryan comments “[…It] must be sufficiently consistent to afford the reader a sense of what is and isn’t possible in the textual world as well as an appreciation of the imaginative, narrative, and artistic ‘necessity’ of what ends up being actualized” (44).

During the 1990s, virtual reality emerged as a technology that would shape and reshape a whole of range of human practices. The enthusiasts of virtual reality technology welcomed its emergence as the dawn of a new age in the history of technological innovations. Dreamers, developers, and philosophers all contributed to the popular image of virtual reality technology. The aspect that distinguished virtual reality technology from all previous technologies is mainly its immersive character which is achieved through a new “sensory diversity”, “spatiality of the display”, “transparency of the medium” and increased potential for forging active three-dimensional simulated environments that respond to user activity and inputs just like the real physical world. Tracing the characteristics of virtual reality technology that makes it a kind of technology which extends and realizes the possibilities of earlier interventions (the panorama, the cyclorama, the perspective, the stereoscopes and the cinerama) in more concrete and potentially significant manner, Ryan finally ends
up discussing it as a form of art which creates fresh forms of self-expression and new ways of aesthetic and artistic exploration (Narrative as Virtual Reality 48-74).

Ryan juxtaposes narrative and virtual reality in an attempt to understand each in the light of the other in order to extend the range and contours of each independent domain and to develop a more nuanced perspective when it comes to the contribution of virtual reality technology to the field of narrative. The eagerness of its enthusiasts to qualify its immersive and interactive character by using literary metaphors, mainly the experience of reading, that is “reading as an immersive experience”, “lost in a Book”, “transportation”, and the narrative proclivity of human culture in general (Narrative as Virtual Reality 89-114). From the perspective of narrative, immersion takes place at three levels: spatial, temporal, and emotional. Spatial immersion takes place at the level of setting which is concerned with the place of action, that is the demographical landscape which forms the background; temporal immersion takes place at the level of plot which involves the logic of events, situations or happenings; and emotional immersion occurs at the level of characters and refers to the persons and people involved in a particular sequences of happenings or situations in a given place. Ryan reads the works of nineteenth and twentieth century writers like Emily Brontë, Honoré de Balzac, Gustave Flaubert and Marcel Proust to exemplify how each is known to have used the method of detailed description in settings, character and plot to give the reader a sense of being there, a kind of atmospheric ambience of persons, situations and their interdependence. Balzac is specially known for his evocative renderings of settings. The characters are described in minute detail whereby the reader is led to take note
of certain idiosyncratic features, behaviour or tendencies. This helps the reader to identify with a character at a concrete level, leading to emotional immersion. In the case of plot, immersion takes place in alliance with the tide of a defined set of events which are so designed as to builds up an inquisitive desire in the reader to know what will happen to the character involved by narrowing down the field of potential consequences and a regular generation of a “new range of possibilities” (*Narrative as Virtual Reality* 141). Temporal immersion is intense in detective and suspense narratives, known as dramatic tension in literary terminology. All of this is conventionally was achieved by switching between first- and third-person modes of narration, and shifting between direct, indirect and dominant “fictional free indirect discourse” way of reporting the speech (134). The above-mentioned notion of detailed description does not imply “pure intensity of the information,” as could be the case in so many instances; it rather entails a more subtle handling of various details, directly or indirectly concerned with any of the three, setting, character and plot, and of playing with the intricacies of everything related to the textual world (124). Ryan observes that “for immersion to retain its intensity, it needs a contrast of narrative modes, a constantly renegotiated distance from the narrative space, a profile made of peaks and valleys” (137). For this will enable the writer to set the tone and tempo of closeness, intimacy and a minimal distance from the textual world.

Interactivity, according to Ryan, is the second most significant aspect of virtual reality technology. At the most basic level, interactivity is noticed when the machine responds to the inputs of the user. But the concept of interactivity is highly
problematic since all literature, or all art, is interactive in one way or another. Ryan states:

We tend to think of interactivity as a phenomenon made possible by computer technology, but it is a dimension of face-to-face interaction that was shut off by manuscript and print writing and reintroduced into written messages by the electronic medium, together with several other features of oral communication: features such as real-time (synchronous) exchange, spontaneity of expression, and volatility of inscription. (*Narrative as Virtual Reality* 204)

To make sense of the interactive character of literary writing, the text could be understood in two ways: text as world and text as game. The notion of immersion has been seriously questioned in much of contemporary literary theory since it “requires a transparency of the medium that makes it incompatible with self-reflexivity,” which, for many of the critical approaches in literary theory in the twentieth century, have been regarded as the most essential characteristics of all art (*Narrative as Virtual Reality* 175). Contemporary literary theoretical approaches are primarily more concerned with foregrounding the *constructedness* of all art. They focus on how the very experience of immersion is brought to bear upon the reader and what literary or rhetorical devices and techniques are used to create such art objects. Ryan says that it is universally accepted that “…attention to rhetorical devices through which a world emerges out of words is an essential aspect for aesthetic appreciation” (*Narrative as Virtual Reality*, 176). And this becomes possible if we conceive of the text as a game since the metaphorical association of
text with game encapsulates many of the poststructuralist notions of textuality from Jacques Derrida, Vladimir Nabokov, Italo Calvino, Roland Barthes, Mikhail Bakhtin to the Oulipo movement. Moreover, the concept of game has been the “dominant aesthetic guideline for the production of texts… [as well as a] critical paradigm that promoted a rereading of the texts of the past” (176).

Interactivity may be determined by the amount of freedom permitted to the reader and “the degree of intentionality of his interventions” (205). As a result, interactivity can be categorized into two types: selective interactivity and productive interactivity. Selective interactivity refers to the kind of participation where the reader is offered alternatives among a given set of options in the sense that following the option (a) will let her/him experience the unfolding of events in a different way than following the option (b). In other words, we could say that selective interactivity enables the reader to determine the unfolding of the narrative worlds, and it is exemplified best by hypertext fiction as the reader is given the choice of clicking on any of the links within a lexia. Productive interactivity is one in which the participation of the reader affects the very dynamics of the “textual world” brought to life by the narrative logic of the text. This is to say that the participation or the input of the reader determines the very outlook of the textual world by way of significant intervention at a crucial juncture in the narrative. The most appropriate example of this can be computer games. Interactivity may exist at two levels: firstly at the level of medium or technological support; and secondly at the level of artwork, its intrinsic composition. In the case of new media writing practices and their interactive character, we need to take into consideration, on the one hand, the
affordances of new media technology such as fluidity of text, encyclopedic abilities, hypermedia characteristics, possibilities of animation, “exploitation of temporality” and dynamic run-time display (216). Simultaneously, we need to focus on how a particular writer deploys these properties of the medium to the construction of her/her art object.

The twin question of immersion and interactivity in new media writing practices should be tackled in a subtler manner and one should always stay away from broad generalizations. Radical interactivity may seriously hamper immersion in the textual world of the narrative which may further lead to substantial disorientation on the part of the reader. “Whatever advantage interactive narratives present over standard ones in the creation of forking paths and multiple realities,” Ryan remarks, “[it must not lead] to a degree of complexity that no longer supports narrative motivation” (260). Both immersion and interactivity should be part of the art object and the varied possibilities of each should be defined in such a way that the total experience of coming into contact with the art object should leave the reader relatively aesthetically enriched and satisfied.

2.9 Approaches to Digital Narrative

New media writings have surely raised new questions about the extent to which they may correspond to the traditional notions of narrative, plot and story in literature. And since the essential constituting elements of a text have undergone changes, it is inevitable that for fashioning a comprehensive understanding of such writings and for interpreting them, we need to evolve suitable theoretical approaches to match the material specificity of new media writings. This is crucial because the
affordances of a particular medium weigh on “the type of meanings that can be encoded” (*Avatars of Story* 17). In accordance with this aim, Ryan builds a critical framework by distinguishing between narrative and its modes, and media and the various ways, like semiotic, cultural and technological, in which we can grasp the use of media and the practices associated with each of those media.

In the introduction to her book *Avatars of Story*, Ryan describes four approaches to digital narrative depending on the emphasis laid on a particular aspect of narrative in each of them. The four approaches are: the practical, the metaphorical, the expansionist and the traditional (Ryan xiii).

The practical approach to digital narrative is not concerned with the inherent possibilities of digital media for constructing and developing new forms of narrative; rather it is more aligned with the notion that the digital media have enabled the larger mass of people to tell their own stories in new ways like chat rooms, e-mails, blogs, social networking sites, photo sharing sites like *flickr* and other such platforms which encourage feedback from the visitors. In other words, we could say that a certain kind of democratization of story-telling has taken place where each individual has been given the power to narrate his/her own stories. “The internet,” as Ryan says “is overflowing with narratives” (xiii).

Getting inspiration from the significant role and value of narrative in human life, the metaphorical approach seeks to embed narrativity into the very designing of software applications. By taking into consideration the relevance of narrative in human life, the approach wants to promote the creation of such computer software as make the interaction between the user and the computer more human and user-
friendly. This approach “provides an antidote to the cold indifference, rigid
determinism, and unbending logic of the computer by giving a human face to the
machine…” (xiv).

The expansionist approach is the one that treats narrative as a dynamic
concept which varies with concrete material and cultural changes in the socio-
historical situations, particularly as a result of recent technological innovations.
George Landow champions this approach. In fact, he has devoted a whole chapter,
entitled “Reconfiguring Narrative” in his book *Hypertext 2.0*, to the question of the
transformation of our traditional conceptions of what we understand by narrative.
Adalaide Morris says that

[hypertext] narratives typically [consist] of verbal text with little or
no multimedia supplementation. The feature that exhilarate[s] writers
and readers alike [is] their built-in flexibility. Consisting of blocks of
text joined in multiple paths at nodes a user clicks to switch between
screens and navigate across fields, these hypertexts are “read”- even,
in some sense, ‘written’- by interpreters threading their way through a
textual maze. (Morris and Swiss 12)

In new media writing, narratives are created by the participation of readers. The
traversal path followed by a particular reader during his/her reading of the text
determines what kind of narrative shall be experienced by that reader. This leads to a
fundamentally different conception of narrative, in which narrative has no beginning
or ending, nor any predefined linear structure embedded in the text once and for all.
Narrative rather becomes an open-ended, expandable and mutable field of ever new
possibilities. It is never definitive and always in the process of forming new relationships via new linking options unleashed by choices of the reader.

The last one is the traditional approach. In this approach, the narrative is conceived as “an invariant core of meaning” which makes it completely distinguishable from and independent of other kinds of discourses and which impart to it a “transcultural, transhistorical and transmedial identity” (xvi-xvii). Narrative is here seen as an autonomous way of making sense of the world and our experience therein. It has an implicit capacity to produce meaning independent of the specific socio-cultural changes and techno-historical variants.

Ryan, in her critical study of the narrative in the new media writing, endeavours to forge a middle way between an uncritical and celebratory expansionist approach and a narrow-minded traditionalist approach. She advises theorists and practitioners from both sides to overcome their barriers and be ready to learn from the insights provided by the opposite camp. Ryan asks of the traditionalists to shun off the seduction to copy great works of literature and, instead “learn … to customize narrative patterns to the properties of the medium” (xviii). Whereas the traditionalist approach enables one to think of the concept of narrative as a “common denominator that allows a better apprehension of the strengths and limitations in the representational power of individual media,” the expansionist approach in contrast helps us to see this “representational power of individual media,” and forces us to take into consideration the technical specificity of each medium and its complex interplay with the semantic aspect of narrative strategies and techniques (4).
After surveying the four approaches, Ryan moves on to talk about various narrative modes, which are classified into the following pairs: External/Internal, Representative/Simulative, Diegetic/Mimetic, Autotelic/Utilitarian, Autonomous/Illustrative, Scripted/Emergent, Receptive/Participatory, Determinate/Indeterminate, Retrospective/Simultaneous/Prospective and Literal/Metaphorical (Avatars of Story 13-15).

In the first pair, the narrative meaning is embedded in material signs in the external mode, whereas the internal mode does not involve such textualization of meaning as it involves the telling of stories “in the privacy of our minds” (13). In the second pair, the representational mode represents a given situation, action or series of events and the simulative mode generates a given set of possibilities of events and actions on the basis of certain fixed and variable parameters. The diegetic mode in the third pair is about the act of verbal storytelling by a narrator. As a result, this mode presupposes oral or written language. The mimetic mode is about the visualization of narration; it involves “an act of showing, a visual or acoustic display” (13). And both modes in this pair, as Ryan says, intrude into each other in the various forms of their concrete actualization. In the Auotelic/Utilitarian pair, the autotelic mode is one in which the story is shown for its own sake, whereas in the utilitarian mode the story becomes subordinate to some overarching aim or goal.

The autonomous mode tells a new story to the reader. The illustrative mode, on the other hand, recycles a story with whose plot the reader is already familiar. The scripted mode in the next pair is one in which the story and discourse are embedded in a permanently encrypted text, like the print narratives or dramatic
performances. The emergent mode represents a mode in which discourse and, as Ryan says, “some aspects of story are created live through improvisation by the narrator” (14). In the next dyad, the receptive mode is one where the reader plays no part in the unfolding of events; s/he merely receives the account of story form narrative action. The participatory mode, however, enables the reader to actively participate in the unfolding of the narrative action. The determinate mode, “the text,” Ryan states “specifies a number of points on the narrative arc to project a reasonably definite script” (13). In the indeterminate mode, the number of points specified is only one or two, and the rest is “up to the interpreter to image one (or more) of the virtual curves that traverse these coordinates” (13). For example, the narrative paintings depict only “a pregnant moment” from which the interpreter infers what has happened before that moment and what is going to happen forthwith (Lessing quoted by Ryan).

In the triad Retrospective/Simultaneous/Prospective, the retrospective mode recounts the happenings of the past, the simultaneous talks about what is happening at the present moment and the prospective concentrates on the events of the future. In the last set, the difference between the modes depends largely on how we define narrative, considering that “while literal narration fully satisfies the definition, the metaphorical brand uses only some of its feature” (15). The term on the left side of each pair is the ‘unmarked’ term because texts displaying this feature will be considered narrative in form more easily than the texts which make use of the other term.
We can now consider certain other significant issues pertaining to the media, particularly media as technologies, media as cultural practices and media as semiotic phenomena, and can try to grasp their complex relationships. It will further help us define media for our purposes; how media may be approached when one follows the perspective of transmedial narratology.

It is important to be clear about what we mean by media when we talk about transmedial narratology. Media exist at the level semiotic phenomena, technologies and cultural practices. Each level intersects with others and significantly affects the practices of usage with reference to a particular medium. The semiotic approach takes the sensory channels as supported by various media to be fundamental when it comes to distinguish between various media types. On this basis, it divides media into three types: verbal, visual, and aural. Ryan says that the semiotic approach deals with “narrative affordances and limitations of a given type of signs and stimuli,” when it comes to the application of narrative possibilities. Among the three types, verbal form is the strongest of all the three in implementing a more subtle and comprehensive form of narrativity. This is so because it based on language and can clearly explicate clear-cut relations of cause and effect and, thereby, impart order to events. The visual and the aural are primarily consist of pictorial representation and music. Both are comparatively more illustrative and metaphorical in nature since they require a “far more intensive gap-filling activity than verbal texts to be interpreted normatively” (20). But, on the other hand, when all the three types are used simultaneously in a single act of creation, each contributes and complements the overall affectivity of narrative construction and narrative meaning to a
significant extent in the formation of imaginative experience as in this case
“language [works] through its logic and its ability to model the human mind,
pictures through their immersive spatiality, and music through its atmosphere-
creating an emotional power” (21).

Media are also categorized as technologies of production and expression.
This approach concentrates on the raw materials used by respective media to create
and construct its objects. In this case, it is necessary, according to Ryan, to
differentiate between “technologies of pure production” from technologies that only
opens up new possibilities of expression by widening the space of creation through
the production of new kinds of art objects (21). In the aural category, there have
been significant technological innovations through the human history, but, as Ryan
correctly observes, it is very difficult to trace how those changes have affected
narrative possibilities of music. Following the semiotic approach, we could say that
in the verbal category, technologies refer to methods of inscription, whereas in the
case of visual type, technologies correspond to “methods of capture”. And it is only
in the case of verbal and visual modes that new technologies have greatly affected
narrative forms and techniques. The approach based on technology not only
enhances the different semiotic categories of media types, but it also cuts across
those very types to facilitate new kinds of differentiation between media types, like
the popular and accepted distinction between the old media and the new media. The
old media is mainly analogue at the most basic level of technology. The new media,
on the other hand, is new primarily because of its digital nature. New Media, at one
level, is understood as everything which is produced and performed through the
computer. At another level, it is thought to be a new digital mode of production which includes everything beyond the range of computers, like digital photography and digital recordings etc.

Ryan cites the work of Walter Ong as the classic example of transmedial narratology which is based on technological categorization of media types. In his highly influential study *Orality and Literacy: The Technologizing of the Word*, Ong analyzes the influence of writing on social and creative make-up of societies with the coming of printing. Narrative in the oral cultural traditions has been used “as a mnemonic device for the transmission of knowledge; its memorization was facilitated by prosodic features, fixed formulae, and standardized image[s]” (Ryan 22). The fallible nature of human memory was compensated by “a relatively free episodic structure which allowed, within reasonable limits, permutation of units” (Ryan 22). Ong argues that the novel has come into existence with the coming of printing by making the mnemonic features associated with oral practices obsolete as new means of preservation, relatively more reliable, had become available. It also brought with it a notion of fixity and a kind of organizational coherency to the text. This further encouraged the construction of more complex characters, situations, and web of relationships, and well-knitted plots, sub-plots and storylines.

The existence of media significantly shapes the cultural practices. Moreover, the uses made of a particular medium reciprocally affect how that medium is experienced and understood. From a cultural point of view media have been given an increasing relative autonomy even though the media in use may not be different in terms of semiotic channels or technological specificity. For instance, both the
book and the press have been considered independent media in spite of the fact that both make use of the printing technology. Similarly, television and cinema are categorized as independent media though each makes use of visual representation to create its objects. What is important to note here is that the use of the media shape in important ways the practices associated with them, which in turn impacts how we understand media in a broader socio-cultural space.

Such detailed exploration of narrative modes and media as attempted above is required to understand the relationship between narrative and media in a more nuanced way. Ryan then moves onto transmedial narratology. According to Ryan, the specificity of narrative requires us to take into account three semiotic domains: semantics, syntax and pragmatics. Semantics deals with meaning, that is, plot of the story; syntax deals with formal rules, that is, narrative techniques; and pragmatics deals with the study of the uses of narrative. Ryan says that it is quite possible that a particular medium may embody immense narrative possibilities as compared to other media. Therefore, a particular medium “should be considered narratively relevant if it makes an impact on either story, discourse, or social and personal use of narrative” (25). Therefore, Ryan states, “mediality” should be understood more as “relational rather than an absolute property” (26).

Narrative experience is affected by the following fundamental features of media: spatio-temporal extension, kinetic properties, the number of semiotic channels and the priority of sensory channels. Some media are predominantly temporal whereas others are spatial, and there are some which are spatio-temporal. For example, language and music are temporal in nature; painting and photography
are spatial, and cinema and dance are spatio-temporal. ‘Kinetic’ refers to motion. It distinguishes between a static and a dynamic medium. A static medium is one in which the content of the medium does not change over time and, thereby, the user follows his/her own pace. A dynamic medium is one in which the contents are dynamic in the sense that they impose a certain tempo on the user for perception to take place. The distinctions static/dynamic and spatial/temporal are not marked by clear-cut boundaries. The real practices and nature of media always overlap and cross-cut these analytical distinctions. Different media use different number of semiotic channels in their creations. The spatial media use one semiotic channel like painting; the temporal (language or music) may use one or two semiotic channels in combinations like songs. The spatio-temporal use multiple semiotic channels, for example, drama, dancing, films etc. Each medium prioritizes a particular sensory channel over other sense. As a result, it imposes certain advantages and limitations on its users. Ryan cites the example of opera and theatre to clear his point. In opera, she notes, the plot is secondary to music, whereas in theater it is the locus of interest (26-27).

To develop a critical framework for an in-depth analysis of new media writings, we must take into consideration the relationship between the specificities of the medium and the narrative strategies and techniques used by the artists/writers. A detailed analysis of media and narrative above can shed crucial light on this relationship and on how to make sense of their complex interactions. This, however, requires a sustained effort to explore how the narrative uses significant affordances of a particular medium and vice-versa, and how those affordances facilitate the employment of certain kinds of narrativity.
3.0 Digitality and the Future of Narrative

The question of the future of the narrative in digital space and simulated environments is one of the most significant questions pertaining to the new forms of writing associated with new media technology. The specificity of new media technology in terms of its dependence on the underlying executable code and programming that go into its making has to be accounted for if we want to construct a comprehensive understanding of narrative in new media writing. This requires channeling our over-enthusiastic responses to new media technology into a rigorous critical engagement and a healthy skepticism towards its much vaunted liberatory characteristics. One thing that has certainly happened with the coming of new media writing practices is an increased awareness of how the properties of a particular medium determine the range of experimentation. In other words, the new media writings have forced us to rethink our relationship with print media in a way that would not have been possible with the absence of writing in the new media.

As has been discussed above, narrative is one of the most basic and universal ways of making sense of life. It is also one of the essential constituents of literary arts, be it oral story-telling or printed. This aspect of narrativity and its significance for literature should be taken into account when analyzing digital literary texts, together their inherent abilities, both at the level of medium and semiotic-semantic dynamic which the medium in turn makes possible, for exploring the narrative efficiency of new media technology. The obsession with narrative experimentation has been there right from the early twentieth century. Writers have been earnestly experimenting with art of literary narration so as to invent new ways of narrativizing
life in response to modern man’s anxieties, achievements, failures and aspirations in modern times. For critical theorists of new media writing practices, the question is how new forms of writing practices make use of the ample and varied possibilities of new media technology for an effective embodiment of aesthetic experience.

Ryan brings to bear her understanding of narrativity in literature upon her critical reading of new media writing without succumbing to the temptation of the visual in its digital or electronic form. The evolution of narrative in digital media has passed through many mutations since it first made appearance in the contemporary aesthetic landscape of literary writing in the form of hypertext. With technological innovations, new vistas have been opened up in new media writing practices and increasingly more and more new media writing forms incorporate audio, visual and programmable capabilities (sounds, audio, images, movies, animations) in the construction of digital texts. After two decades of new forms of writing practices, Ryan counsels that the time has come when we need to “[learn] to think with the medium,” rather than align with enthusiasts of hypertext and other forms of new media writing. The general tendency has been to glance over the critical issues that need to be scrutinized before making any evaluative assessment about the character and aesthetics of new media writings practices. For Ryan, learning to think with the medium does not merely mean giving sufficient attention to its physical properties and implicit dynamics; it also involves paying due attention to the material specificity of writing in the new media. She writes:

Thinking with the medium is not the overzealous exploitation of all the features offered by the authoring system, but an art of
compromise between the affordances of the system and the demands of narrative meaning. Nor is thinking with the medium synonymous with thing about the medium, a formula which describes the currently fashionable habit of sprinkling digital texts with theoretical comments on the nature of digital textuality. A work that truly thinks with its medium does not have to think about it, because it inspires readers to do the thinking themselves. (516)

Narrative remains central to writing in the new media. The dynamics of its application need to be examined in the case of new media writing; it still deserves critical attention if the literary aspect of new media writing has to be deciphered in its specific socio-cultural and literary context. With this we have concluded the theoretical part of writing in the new media through a careful and critical reading of selected works of Lev Manovich, George P. Landow, N. Katherine Hayles and Marie-Laure Ryan, each of which has contributed significantly in exploring a particular aspect of new media technology and new media writing in its detailed socio-cultural and technological context. The new part will attempt to make a critical reading of selected works of three new media writers by using appropriate insights of different theorists developed in the first two chapters of the study.