Introduction
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Technology, Materiality, Writing

*Technics is the unthought.* - Bernard Steigler

*Trying to build machines to do what at one time only human beings could do, and thereby saving the necessity of human effort, is one of the most constant and conspicuous preoccupations of our species. So much so that it would be remarkable if in the course of civilization no philosopher had come to the view that human beings themselves are just highly intricate machines.* - Roy Harris

This is a study of the theory and practice of writing¹ in the new media. The aim is to bring out the peculiarity of the certain new forms of writing practices on account of their embeddedness in the new media. Related issues which have been addressed include the nature of such writing with reference to the writing in the print medium and its function in the emerging formations of culture, particularly the literary culture. It can be argued that a critical view of such writing practices shall also enhance our understanding of the writing practices associated with the print tradition of literary writing.

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¹ The choice of the term ‘writing’ over ‘literature’ is based on current trends in literary and cultural studies. Interventions in the realm of theory have significantly problematised the concept of ‘literature,’ especially in the wake of the critique of canon formation, and established writing as a relatively non-hierarchical object of literary and critical studies. Needless to add, ‘writing’ for our purposes does not include just any kind of writing but that which is done essentially for its own sake and which, as such, is creative, imaginative and ‘literary’.
We live in an age that has been described as “the late age of print” (Bolter 1). The widespread use of computers and digital communication technologies during the last half century has radically restructured our everyday socio-cultural environment. The cultural landscape of the twenty-first century is dotted with ever new technological gadgets. Computing and communication technologies and devices have become an essential part of our life. They have been integrated into workspaces, pedagogical practices, artistic endeavors, leisure activities and everyday communication. Life has actually become unthinkable without some kind of technological tool at our disposal which performs certain functions for us. We are increasingly enmeshed in a web of technology which determines and drives our interaction in society.

The prevalence of mediation summons us to think the technics as the horizon which lays down the ‘framework’ for the emergence of any kind of understanding and how, to a large extent, this opening of the framework determines our relationship with the physical world and our understanding of social reality. Of course, within the sphere of socio-cultural production, mediation cannot be described as an innovation of our times; it has been there since ancient times. However, owing to the pervasiveness of current technologies we have now become acutely aware of its unprecedented power and role in structuring the ‘socio-cultural’ matrix of our world.

The new media obviously have immense implications for culture, which we have just begun to understand systematically. It is primarily new on account of the central role it gives to information, its digital and computational nature, its
networking abilities and its interactive and simulative character. The rate at which digitized data can be stored, retrieved, shared, transferred and updated has greatly speeded up the processes of communication. The mark of the digital can be seen in all walks of life.

The discipline of literary studies cannot but engage with the questions of technology and materiality. It needs to understand better its own status in a technologically mediated world. In the midst of widespread cultural and social transformations facilitated by the technological advances in computer-aided networked communications, writing has also not remained untouched. New forms of writing, hitherto scarcely imaginable, are challenging our conventional ideas of literature, the literary and the institution of literature. Sometimes, the emergent forms of literary writing in cyberspace are referred to as electronic or digital literature. However, Electronic literature or digital literature is not simply the old kind of writing on electronic/digital platform. The very nature of such writing is peculiar; for instance, it is often integrated with visual and aural components and is no more just verbal. Indeed, writing may soon not remain the way it has been for the last five hundred years, and it already has ventured into hitherto uncharted domains and unknown territories both at the level of theme and form, as the rise of modernism at the beginning of the twentieth century and, subsequently, the coming of postmodernism during the 1950s and 60s also highlight. “The future,” as Derrida says “can only be anticipated in the form of an absolute danger” (5). Indeed, the humanities also need to think of their own future in terms of this danger.
Technology\textsuperscript{2} has been with us since ancient times. The instruments and tools, helping us in the process of labour and other daily activities, have played a significant role in the development of our ‘sense of self’ as human beings, different from animals and with peculiar abilities. Inventions of the wheel, paper and gunpowder are only some of the instances without which the modern-day world cannot be visualized. These technological inventions have played a central role in the growth and shaping of human societies, their forms, culture, communication, politics and social organization. The discoveries of faraway lands and cultures like America and India would have been impossible without the technologies that went into ship-making and navigation. With Renaissance came the printing press which radically inflected the trajectory of human societies, both culturally and politically. Yet in our understanding of the social, cultural and political aspects of human societies, we often tend to overlook the role machines and technologies play in the construction of, to use Kittler’s words, a “discourse network” within which these

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\item The word ‘technology’ has always been very problematic. Heidegger’s essay “The Questioning of Concerning Technology” is regarded as the standard reference point to talk about the critique of technology in the twentieth century. The word has its roots in the Greek word ‘techne’ which, according to Heidegger, was originally close to ‘poiesis’, and as such was understood as craftsmanship, craft, or art. In other words, we can say that there was no sharp distinction between ‘techne’ and ‘poiesis’; there was an element of the ‘poetic’ even in the making of material tools, instruments, devices etc. used for various practical purposes. It meant ‘bringing-forth’. In contemporary vocabulary, however the word ‘technology’ predominantly designates “material practices by which people intervene in the natural world” (Sawday 1). It is only with the coming of Industrial Revolution that the word ‘technology’ came to be associated with industrial and material arts. My use of the term is based on post-Renaissance understandings of the word ‘technology’. 
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aspects are actualized through various practices (Kittler 177). Every technological breakthrough alters the temporally established equilibrium of the social, the cultural, the political and the natural. We gradually try to forget the disturbances generated by the coming of any new technology which has re-configured the existing complex texture of society.

Humanities scholarship, especially in the field of literary studies, has generally relegated the medium to an insignificant substrate. The materiality of the medium on which writing is inscribed has not been sufficiently foregrounded as constitutive of our notions of writing, the ‘literary’ and the institution of literature. Elizabeth Eisenstein, the renowned scholar of the social-cultural impact of printing and the printing press on human societies, has characterized such tendencies as the “venerable tradition of proud ignorance of matters material, mechanical, or commercial” (706). The dominant tradition of liberal humanism in literary studies, until it was questioned by cultural materialists and poststructuralists, treated ‘literature’ as a kind of permanent and immutable essence, as the transparent expression of an individual’s ‘self’, experience and ideas, with something inherently organic, human and ‘sacred’. Moreover, literature was ignored as part of a broader sphere of cultural production. It is only through the illuminating insights of Walter Benjamin, Raymond Williams, Alan Sinfield, Benedict Anderson and others that we

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3 By ‘materiality’ I here mean, to use Katherine Hayles words, the emerging “interactions between physical properties and a work’s artistic strategies” (Hayles 33). Materiality is the emergent dynamic relationship between the physicality of the medium, the artistic and signifying strategies employed by the writer, and the reader.
have come to appreciate literature’s inseparable relation with other forms of cultural production. Literary writing as an artistic practice cannot be removed from the domain of cultural production; rather, as Terry Eagleton notes, it needs to be, “re-situated within the field of general cultural production … [where] each mode of such production demands a semiology of its own, which is not conflatable with some universal ‘cultural’ discourse” (166). Such studies have highlighted the inseparability of the materiality of the medium from the kinds of forms which the materiality makes possible. The text cannot be detached from the matter of which it is made. Changes in materiality affect the meaning, function and recognition of the artifact (as analyzed by Benjamin essay “The Work of Art in the Age of Mechanical Reproduction”). The specificity of the medium has to be taken into account to make any sense of textuality at all. The practices of textual production are central to what texts are, how they are received, what kind of function they perform in society, and what kinds of relationships with the readers become available.

Writing as an artistic practice has been often thought of as an exercise of the writer’s creative expression in the process of contemplating nature, existence, her/his relationship with these forces, and an expression of the self in dialogue. Writing has acquired the aura of a ‘sacred practice’. As a term, it has been thoroughly naturalized to mean a particular type of communicative mental activity. This notion of writing, as a transparent process of self-expression, without any kind of noticeable mediation, has become so central and natural to our habits of thinking that it has become nearly impossible to think of the becoming of writing. We do not
usually ask what writing can be in its process of mutation within the changing socio-cultural structures in which it takes shape as a practice.

Writing has always been embodied in some medium. All material tools – from the quill, pencil or pen (different forms included), the material surface on which writing is inscribed (clay, Egyptian papyrus, bamboo books, wax, leaves and wood, pergamum and parchment, paper), to the materiality of language itself – have been erased from sight. Writing has often been seen as a transparent expression of the writer’s voice, self, meaning, or her/his ideas in the form of the written text. On the contrary, the text’s materiality, including its typography, form, structure, organization and the process of its production, are often deemed unimportant.

The radical impact of the printing press, which appeared around 1440, on the socio-cultural practices and thinking of people was famously analyzed by Benedict Anderson in *Imagined Communities*. Anderson argues that it paved the way for the formation of nation-state and modern democracy by arousing in people a sense of belonging through the emergence of national consciousness. The printing press brought with it a new technology of textual production and distribution. It became possible for the first time to generate multiple copies of the same text, that too in a very short period of time. In one of his interviews, McLuhan comments at length on the significance of printing for human culture:

> Printing, remember, was the first mechanization of a complex handicraft; by creating an analytic sequence of step-by-step processes, it became the blue-print of all mechanization to follow.

> The most important quality of print is its repeatability; it is a visual
statement that can be reproduced indefinitely, and repeatability is the root of the mechanical principle that has transformed the world since Gutenberg. Typography, by producing the first uniformly repeatable commodity, also created Henry Ford, the first assembly line and the first mass production. Movable type was archetype and prototype for all subsequent industrial development. Without phonetic literacy and the printing press, modern industrialism would be impossible. It is necessary to recognize literacy as typographic technology, shaping not only production and marketing procedures but all other areas of life, from education to city planning. \(\textit{(Playboy Magazine)}\)

In other words, we can say that with the rise of the printing press, a radical reconfiguring of the existing social, cultural, political and economic fabric of society took place even as processes of the evolution of new forms of political participation and organization got under way.

Printing press also brought with it the effect of ‘freezing’ a text, an idea, or a design, which could now be communicated without change or disintegration from one place to another and even from one generation to another. A certain kind of fixity, a temporary stabilization of the text seemed to develop with printing, which has surely influenced our notion of literature as something permanent. According to Walter J. Ong, printing prioritized sight over hearing. Printing press also brought with it a new sense of private/public space which emerged as the book facilitated a kind of personalized ‘reading’. Reading gradually became a personal vocation in the privacy of one’s room, in isolation from the collective. Ong argues that the idea of
personal privacy, private ownership, and a sense of closure associated with literary text can be related to the advent of printing (117-138). Furthermore, as George Landow notes, “Gutenberg’s invention produced what we today understand as scholarship and criticism in the humanities” (18). In the pre-printing era, the process of compilation of manuscripts in the form of books was dispersed through the entire community and was, as such, collective. It was a labourious activity, which involved “raising, feeding, and then slaughtering of animals, the manufacture of vellum from their skins, the mixing of inks from organic and mineral sources which in turn had to be mined, collected, or harvested” (Sawday 80). Printing brought this whole process of textual production under the roof of a single ‘shop’. The ‘shop’ came to signify a centralized space of production, getting a group of people to come together and work with the machine at the centre, a process that led to what Michel Foucault has described as “the automatism of habit” (Foucault 135). Manuscript culture fostered new typographical schemas for the organization of written script. Gradually, “[the] invention of individual pages, chapters, paragraphing, and spaces between words” paved the way for a new kind of organization of script. Subsequently, the book technology found “enhancement by pagination, indices, and bibliographies” (Landow 21).

We can see that the entire process in its mundane materiality shaped our understanding of the practices of writing. Obviously, the role of technology in the practices of writing is not marginal. In fact, literary writing has occasionally even taken technology as its subject matter and systematically considered the implications of specific technologies, their impact on subjectivity and human relationships, and
on the socio-cultural environment they shape\textsuperscript{4}. Nevertheless, literary analysis has conventionally regarded a written text as self-evidently complete in itself and as a transparent window on another world, that of meaning or idea. The page, its shape, the method of reading it facilitates and its logic were, for example, never taken into account. The book as a material object and process was regarded only as a marginally necessary medium for the text, with the real thing supposed to be composed of words and meaning only, that is a meaningful construct in language. Indeed, the lack of recognition of mediation in the analysis of literary texts remained the hallmark of literary scholarship right up to New Criticism.

Post-structuralism, however, endeavoured to radically question the assumptions of traditional liberal humanistic criticism. It helped us to see the materiality of language and the way language structures our perceptions of reality. It reopened the question of the nature of literature. What gets counted as ‘literary’? How does the materiality of language affect literary writing? What role does language play in the construction of a text? What is the relationship between author, text and reader? What is the role of readers in the interpretation of a text? How is a

\textsuperscript{4} This is demonstrated as much by Mary Shelley’s \textit{Frankenstein}, a nineteenth century classic, as by the whole genre of twentieth century science fiction. Isaac Asimov and Kingsley Amis are two of the best known science fiction writers of the last century. And then there is William Gibson who writes cyberpunk, a science fiction genre that deals with high technology and mundane life. Gibson’s works \textit{Neuromancer} (1984), \textit{Pattern Recognition} (2002), and \textit{The Difference Engine} (1998, with Bruce Sterling) deal with socio-cultural implications of the pervasiveness of technologies of various kinds, in particular the computing and communication technologies like virtual reality, cyberspace and the internet.
particular text constructed socially, culturally, politically and linguistically? In fact, the repercussions of such fundamental rethinking were to be widespread and unsuspected. Liberal humanistic criticism had been based on a particular understanding of the ‘human’. As post-structuralism was an attempt to rethink the defining aspects of the ‘human’, the very idea of ‘human’ too underwent a corresponding change.\(^5\)

The present study has been organized in two parts. In the first part, we concentrate on the theory of writing in the new media. The second part deals with specific instances of the practice of writing in the new media, broadly in the light of the theoretical framework elaborated in the first part.

In the first part, we consider the contributions of four major theorists of writing in the new media, namely, Lev Manovich, George P. Landow, N. Katherine Hayles and Marie-Laure Ryan. This part consists of two chapters: the first chapter examines the contributions of Manovich and George Landow, and the second chapter makes an in-depth analysis of Katherine Hayles and Ryan’s theoretical frameworks. The broader aim of the first part is to build a theoretical framework on the basis of each theorist’s specific contribution vis-à-vis the new media as a technology and new media as a creative space for aesthetic expression and artistic production. This is attempted through a critical reading of their selected texts. The

\(^5\) The liberal humanist notion of a unified, rational and transparent self was replaced by the notion of subject who is the sum-total of socio-cultural and linguistic practices of a given social formation, and as such a constructed entity which have significant epistemological and ontological implications.
second part of the project critically studies the works of three new media writers, primarily in the light of the theoretical framework elaborated in the first part. The selected writers are Michael Joyce, Talan Memmott and Mark Amerika.

The organization of the study into two parts, theory and practice, has been made only to help us clearly chalk out the theoretical and the practical aspects of the new media writing. Otherwise, both theory and practice in the case of writing in the new media not only overlap, but rather intersect with each other. Most practitioners of the new media arts, including writers, are also theorists in their own right. Joyce, Memmott and Amerika have all written theoretical works which illuminate and comment on their creative works and critically explore the space of new media technology in which the works are instantiated and embedded. Both theory and practice in the case of new media writing and technology are hybrid in character. The theoretical aspect of new media technology and its artistic possibilities, in the form of a comprehensive perspective, came to light primarily during the early years of the first decade of the twenty-first century with a significant number of scholarly studies giving voice and form to new media studies as an independent discipline for critical inquiry.

The significance of this emergent discipline can be seen in the light of various theoretical insights offered by theorists working in the area. For instance, Manovich studies the coming of new media as a recently invented technology. The new media, for him, is basically marked by a shift from analog to digital. In addition, the new media is primarily new on account of the following: the centrality of information, its digital and computational nature, its networking abilities and its
interactive and simulative character. Manovich makes an in-depth analysis of the digital character of new media in an attempt to highlight how the new media is fundamentally different from the old media. At the same time, he warns that discontinuities between the old media and the new media must not blind us to continuities that also exist between the two. In other words, one has to historically situate the rise of the new media to understand how the old media paved the way for certain radical innovations in the form of the new media. Manovich’s meticulous survey of the new media stresses on those aspects of the new media that make it ‘new’. He mentions five principles - modularity, automation, numerical representation, transcoding and variability - that distinguish it from the old media. Manovich also deals with the origins of new media, its evolutionary trajectories, its forms and the stylistic and technical developments that aided its rise as an independent platform.

George P. Landow’s work explores the relationship between new media technology and literary theory, especially poststructuralist literary theory, to foreground how the new media technologies have afforded us the possibility to materially experience many of the poststructuralist concepts like infinite play of signifiers which leads to the deferral of meaning, inter-textuality, de-centering, the writerly text, and multi-linearity. And this in turn creates the possibility of constructing new kinds of literary texts which embody innovative writing practices which, in turn, require us to rethink the meanings of narrative, textuality, reader, text, and writer. It is interesting, Landow observes, that many features of the new media writing can be seen as at least partly anticipated in the works of Laurence
Singh

Sterne, Stéphane Mallarmé and Marcel Proust, and in the theoretical insights of Mikhail Bakhtin, Roland Barthes, Michel Foucault, Jacques Derrida and Julia Kristeva. Landow studies the implications of emerging computing technologies for the art of literary writing, how the very processes of reading and writing, the construction of narrative, and even literary pedagogy will undergo radical transformations in the near future, and he speculates also on what this entails for the study of literature in the age of computers.

The focus of the second chapter is on the work of Katherine Hayles and Marie-Laure Ryan. The contribution of both Hayles and Ryan has been of immense significance for theorists and artists working in the field of writing in the new media. Hayles has been active in the domain of electronic literature for two decades and she is one of the most articulate theorists of new media writing. Hayles studies posthuman subjectivity, the man-machine interface and the intertwining of code and language, all of which have emerged during the second half of the twentieth century in the wake of certain developments in mainly computers and cybernetics. She argues that resulting changes in the constitution of subjectivity affect the entire range of creative aesthetic practices, including the electronic and print narratives. One may also say that the print medium is not probably the best medium for the issues raised by the emergence of the posthuman. The new media probably affords a better space to articulate these issues. She believes that we need to build new critical frameworks suited to facilitate a nuanced reading of new media artifacts, including the new media writing practices, to better understand them by situating them within the contemporary socio-cultural space. For this, she counsels that we must
concentrate on carrying out a media-specific analysis of these new kinds of literary artifacts. Hayles’s work focuses on the specific materiality of the new media writing in the context of coding and programming. Hayles also critically interrogates the forms of new media writing and makes a serious effort to do justice to the significance of these experiments in electronic literature.

Marie-Laure Ryan tries to bring out what is not new in the new media. For her, interactivity and immersion have been always present in literary writing as it has always made readers experience and dwell in Virtual Reality. According to her, these are not the defining aspects of the new media as argued by many theorists and artists. She argues that we need to thoroughly scrutinize the new media literary writing so as to identify its technological specificity and not get carried away by popular opinion as in the case of concepts like interactivity and immersion. For Ryan, the critical study of narrative strategies adopted and employed by writers and artists working with various new media platforms is basically the attempt to comprehend the implicit narrative possibilities of structure in a particular medium, so that we may fathom the constraints and advantages of respective media. Ryan’s is a call to explore how a specific medium of transmission of narrative affects its organization, grammar, reception, and its semiotic and aesthetic capabilities. In other words, we can say that it is an attempt to understand how the physicality/materiality of the medium delimits or enhances narrative construction. Ryan also explores how interactivity affects the narrative grammar of the new media artifacts.

The second part of the project critically studies the works of three new media writers, primarily in the light of the theoretical framework elaborated in the first
part. The selected writers are Michael Joyce, Talan Memmott and Mark Amerika.

Michael Joyce is one of the pioneers in hypertext fiction. His hypertext fictional works *afternoon: a story* and *Twelve Blue* are now regarded as the classics of writing in the new media. Joyce employs hypertextual technology to construct a labyrinth of lexias which form new patterns with each reading. Talan Memmott is another renowned contemporary new media writer. His selected works include *Branded*, *Next:[n]ex(i)t* and *Lexia to Perplexia*. Memmott merges code, programming and natural languages in a way that code and programming become inseparable from the work. Programming and coding play an essential part in the performance of Memmott’s work. Mark Amerika, the American new media art theorist, critically acclaimed artist and web publisher, whose creative work has been exhibited at national and international art festivals across the world, is another acclaimed and active new media writer. His famous works are *Grammatron*, *Phon:e:me* and *Filmtex*.

In the third chapter, we study Michael Joyce’s *afternoon, a story* and *Twelve Blue*. The chapter argues that the work of Joyce is characterized by the explicit use of hypertext technology which facilitates new ways of creating, organizing and designing a literary text. It suggests that what makes hypertext fiction different from subsequent forms of new media writing is the use of text and the linking strategies used by the author. Both *afternoon, a story* and *Twelve Blue* exemplify the open-ended, dynamic and polysemous nature of hypertext fiction: in random motions, it infinitely extends itself, forming new relationships in a shared network, and with no clear-cut boundaries. There are no ‘beginnings’ and ‘endings’ in hypertext; the
reader is always in a network of lexias. Every entry and each step forward into the work becomes a fresh point of departure in the unfolding of narrative. Both texts achieve the writer’s aim of creating an active, participatory and intrusive reader, one who infringes upon the hegemonic power of the writer and even topples it. Reading, as a result, essentially becomes writing. Writing, on the other hand, correspondingly changes into collaborative authoring. The author is no longer to be regarded as an inspired genius, in dialogue with himself, contemplating his work perhaps in the lap of nature, affirming and legitimizing the meaning of his or her art object. In the new media, the author thus becomes a site performing different functions, depending on location in the network.

The fourth chapter concentrates on the work of Talan Memmott which can be placed in the category of network fiction. The characteristic feature of network fiction, together with its non-hierarchical nature, is its potential to enable the writer to construct emergent and recombinatory narrative structures with the integration of sounds, images, graphics and programmable designing patterns. Narrative may not be the dominant structuring principle of the network fiction, although it may play some part in the work. In other words, it is not essential to the performance of the work as it was in the case of hypertext fiction. Memmott’s work is characterized by implicit coding and programming that go into the making and performance of his works. His creative works are infused with neologisms like *cell.f, bi.narrative, remotional, exe.termination* and *I-terminal* through which he brilliantly evokes the complex inter-penetration and hybridization of code and natural languages, of human cognition and intelligent machines. The three works of Memmott under
consideration make ample use of images, sounds and graphics and open up and extend the possibilities offered by coding and programming for the construction of digital literary artifacts.

In the fifth chapter, we analyze the work of Mark Amerika. The chapter examines the evolution of writing in the new media in his career in terms of the shifts from hypertext fiction to later network fiction through his Grammatron, Phon::e::me and Filmtext, collectively known as the Net-art trilogy. The work of Amerika has generally been classified as belonging to an independent genre of net.art or Internet Art, the field of digital art practices in which artists make use of the internet for the creation of innovative art works. Amerika’s provocatively famous play I link, therefore I am… against the backdrop of Descartes’s well-known statement: “I think, therefore I am…” captures his uniquely creative and critical engagement with the implications of living in a network culture, and the way the experience affects aesthetic practices and cultural production. Amerika heralded the coming of the World Wide Web as a new possibility for devising fresh modes of cultural production and distribution, and for engaging with issues of form that might have been exhausted in the book-form. Amerika proposes that rather than becoming nostalgic over losing the age-old stereotypes of individual author-as-genius, we should cheerfully open ourselves to new forms of writing practices like collaborative and participatory authorship facilitated by the network-distributed environment.

Taken together, the aforementioned theorists and writers of the new media are fairly representative of the diversity of writing in the new media. As such, a study of their works does justice to the aims and objectives of the present study. The
entire project has been so framed as to provide a reflection on the implications of writing in the new media for the practices of literary writing in these times of change. The project also looks at the practices of new media writing in order to see how literary writing and theory undergo significant changes under the pressure of technological innovations and, thereby, demonstrate that the aesthetic and the technological aspects are deeply integrated at all levels in the best of literary writing in the new media.